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**EDITORIAL ANALYSIS**

# The Missing Middle – India's Electronics Components Manufacturing Gap

 MINT

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MAINS RELEVANCE:

GS Paper 3



## INTERVIEW ANGLE

*"India assembles iPhones but imports the components inside them. MeitY's ECMS is trying to fix this. What is the structural challenge, and can India develop a domestic electronics components ecosystem in a world where China dominates the supply chain?"*

India assembled approximately 330 million smartphones in FY2024-25 — enough to be the world's second-largest smartphone manufacturer by volume. Yet most of the value in those smartphones — the printed circuit boards, capacitors, displays, camera modules, and semiconductors — was imported, primarily from China, Taiwan, South Korea, and Japan. This is India's **electronics components gap**: a structural weakness where final assembly has grown rapidly but the upstream components manufacturing remains absent.

MeitY's approval of 22 new projects worth Rs 41,863 crore under the third tranche of the Electronics Components Manufacturing Scheme (ECMS) is the most systematic attempt yet to address this gap.

## WHY COMPONENTS MATTER

The economics of electronics manufacturing are determined by where components come from. In a typical smartphone:

Component	% of Bill of Materials	Primary source
Display	15-20%	South Korea (Samsung, LG), China (BOE)
Camera module	10-15%	China, Japan
Processor (SoC)	10-20%	Taiwan (TSMC fabbed), USA (Qualcomm/Apple designed)
Memory (DRAM/NAND)	8-12%	South Korea (Samsung, SK Hynix), Japan (Micron)
PCB (bare board)	5-8%	China, Taiwan
Connectors, passives	8-12%	China, Japan, Taiwan
Battery	10-15%	China (CATL, BYD supply chains)

When India assembles a smartphone, it adds manufacturing value (labour, assembly, logistics) but captures only 5-15% of the total value. The rest flows back to component suppliers abroad.

### The import dependence numbers:

India's electronics imports: ~\$80 billion annually (2024) — one of the largest import categories

Components within this: ~\$50-55 billion

Net trade: India is a large net importer in electronics despite growing assembly

### Why this matters for UPSC:

India's electronics trade deficit is a significant contributor to the **current account deficit (CAD)**. When India assembles iPhones for export but imports all components, net foreign exchange earned is far less than gross export value. The National Policy on Electronics 2019 explicitly identified import substitution in components as a priority to improve the trade balance.

## THE ECMS ARCHITECTURE — WHAT IT IS AND ISN'T

The **Electronics Components Manufacturing Scheme (ECMS)** is not a PLI scheme — it does not pay incentives based on incremental production. Instead, it provides:

**Capital subsidy:** A percentage of capital expenditure for eligible projects

**Interest subvention:** Reduced financing cost for manufacturing investment

**Technology development support:** Funds for R&D in component manufacturing

### What ECMS covers (11 segments approved as of January 2026):

**Passive components:** Capacitors, resistors, inductors — tiny components used in the hundreds per PCB

**Connectors:** Mechanical connection between circuit boards and cables

**PCBs (Printed Circuit Boards):** The substrate on which all components are mounted

**Lithium-ion cells:** The battery component (different from complete battery packs)

**Camera modules:** Multi-lens assemblies integrating sensor, lenses, autofocus mechanism

**Display modules:** Integrating screen, backlight, and touch layer

**Optical transceivers:** For fibre-optic communication equipment

**Anode materials:** For lithium-ion batteries

**Copper clad laminates (CCL):** The base material for PCB production

**Aluminium extrusions:** Structural components for electronics enclosures

### What ECMS doesn't cover (addressed elsewhere):

Semiconductor chips: DLI Scheme + India Semiconductor Mission (Semicon India)

Mobile handset final assembly: PLISM (PLI Scheme for Mobile Phones)

## THE CHINA CHALLENGE

Any honest analysis of India's electronics component ambitions must grapple with **China's dominance**:

### China's component manufacturing scale:

China produces ~40% of the world's PCBs (by value)

China produces ~80% of the world's passive electronic components (capacitors, resistors)

Shenzhen alone has more electronics component manufacturers than most countries combined

China benefits from decades of accumulated supply chain expertise, specialist workforce, and infrastructure

### Why China is hard to displace:

**Scale economies:** Chinese component plants operate at volumes that drive unit costs down. A new Indian plant must achieve comparable scale — often requiring 5-10 years of ramp-up

**Supplier clusters:** Electronics manufacturing is inherently clustered — a PCB manufacturer needs copper clad laminate suppliers, drilling equipment, plating chemicals all nearby. China has these clusters; India must build them

**Technical knowledge:** PCB manufacturing at multilayer (8-20 layer) specification requires process knowledge built over decades

**Chicken-and-egg problem:** Component manufacturers need volume buyers; assembly plants need local components. Without both simultaneously, neither side invests

### What gives India a chance:

Despite the challenges, India has real opportunities:

**The China+1 strategy:** Global electronics brands are actively seeking alternatives to China for supply chain diversification after COVID-19 disruptions. India is the most scalable alternative

**Existing scale in PCBs and displays:** Some Indian players (BHARAT FIH, Tata Electronics, Dixon Technologies) have growing component capabilities

**PLI success in mobile phones:** Apple now manufactures 14%+ of its global iPhone production in India — creating a large captive customer for Indian component suppliers

**Battery supply chain:** India has cobalt (import) and lithium sources (Salal/Rajasthan, limited); ECMS's lithium-ion cell coverage is strategically important for EVs and electronics

## THE MISSING POLICY PIECE — INDUSTRIAL CLUSTERS

The single most important thing India could do to accelerate ECMS outcomes — and what the policy currently undersupports — is **dedicated electronics manufacturing clusters**:

**Japan's model:** METI (Ministry of Economy, Trade and Industry) designated specific zones as electronics clusters with shared infrastructure — power substations sized for 24/7 manufacturing, ETP plants for chemical effluent, cleanroom zones for precision manufacturing

**China's model:** Shenzhen Economic Zone, Dongguan, Zhongshan — government-planned zones where component suppliers, PCB makers, assemblers, and logistics companies are all co-located within 30 km

**India's current state:** Industrial areas are not electronics-specific; power supply is unreliable for precision manufacturing; ETP infrastructure for chemicals used in PCB/display manufacturing is absent at most industrial estates

**The ECMS gap:** ECMS supports individual company investments but not the cluster infrastructure that makes those investments viable. Without reliable power, water, and waste treatment infrastructure, even ECMS-subsidised plants will underperform.

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**ELECTRONICS COMPONENTS MANUFACTURING SCHEME (ECMS):**

Ministry: MeitY (Ministry of Electronics and Information Technology)

3 tranches total: 46 projects; Rs 56,567 crore total investment (as of January 2026)

3rd tranche: 22 proposals; Rs 41,863 crore; 11 segments; 8 states (AP, Haryana, Karnataka, MP, Maharashtra, TN, UP, Rajasthan)

11 product segments: PCBs, capacitors, connectors, enclosures, Li-ion cells, camera modules, display modules, optical transceivers, Al extrusions, anode materials, copper clad laminates

**INDIA'S ELECTRONICS SECTOR:**

Manufacturing output: ~\$100 billion (FY25 estimate)

Mobile phones: ~330 million assembled (FY25); 2nd largest manufacturer globally

Electronics exports: ~\$25 billion (FY25)

Electronics imports: ~\$80 billion (FY25) — net importer despite assembly growth

Components as share of imports: ~60-70% of total electronics imports

**PLI FOR ELECTRONICS — RELATED SCHEMES:**

PLISM (PLI Scheme for Mobile Phones): Rs 12,195 crore outlay; targets Rs 10.5 lakh crore production in 5 years; beneficiaries include Apple (Foxconn/Tata), Samsung, Dixon

PLI for IT Hardware: Rs 17,000 crore; laptops, servers, tablets

Semicon India: Rs 76,000 crore; fabs, ATMP, DLI chip design

**NATIONAL POLICY ON ELECTRONICS 2019:**

Target: \$400 billion electronics manufacturing by 2025 (domestic + exports)

Achieved: ~\$100 billion (FY25) — significantly below target

Priority: Net zero imports in electronics by 2030 (aspirational)

**KEY ELECTRONICS COMPANIES IN INDIA (2025):**

Tata Electronics: iPhone assembly (Hosur, TN) + Pegatron acquisition; ECMS beneficiary

Dixon Technologies: LED TVs, mobile phones, washers; India's largest contract manufacturer

Bharat FIH (Hon Hai/Foxconn subsidiary): Mobile assembly

Amber Enterprises: AC units and components

Kaynes Technology: PCBs and electronics manufacturing services (ECMS beneficiary)

**OTHER RELEVANT FACTS:**

PCB (Printed Circuit Board): The substrate (usually fibreglass) with copper traces connecting components; multilayer PCBs (8-20+ layers) are required for smartphones and servers

CCL (Copper Clad Laminate): The raw material for PCBs; India currently imports most from China

ETP (Effluent Treatment Plant): Required for chemical processes in PCB/display manufacturing; absence limits location options in India

China+1 strategy: Global supply chain diversification away from China; India, Vietnam, Mexico, Thailand as beneficiaries

Sources: Mint, MeitY, PIB, FICCI Electronics Report



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