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Challenges in the Electronics System Design and Manufacturing (ESDM) Sector in India

19th Feb'25

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Overview of the ESDM Sector in India

THE INDIAN ESDM MARKET IS PROJECTED TO REACH $300 BILLION BY 2026.

INDIA AIMS TO BECOME A GLOBAL HUB FOR ELECTRONICS MANUFACTURING.

GOVERNMENT INITIATIVES LIKE "MAKE IN INDIA" AND PLI (PRODUCTION-LINKED INCENTIVE) ARE BOOSTING THE SECTOR.

DESPITE GROWTH, SEVERAL CHALLENGES HINDER RAPID PROGRESS.

Key Challenges in the ESDM Sector

- **1. Infrastructure & Supply Chain Constraints**
- Limited semiconductor fabs and dependency on imports.
- High logistics and transportation costs.
- To reduce the Logistics lead time of Imports which currently at 1 week by AIR and 4 – 6 weeks by SEA, impacts not only TAT, but the Inventory too.
- Reduce the logistics costs for ICs, high-tech PCBs, connectors, transistors, and other components etc., to 2% Vs current 3.5%

- **2. High Import Dependency**
- Over 80% of components are imported, mainly from China, Taiwan, and South Korea.
- Lack of domestic semiconductor manufacturing capabilities.
- Heavy reliance on foreign technology and intellectual property.
- Fluctuating Raw Material Prices
- Develop a viable mechanism to stabilize the prices of critical semiconductors with constrained global supply, especially during production bottlenecks or geopolitical disruptions

Key Challenges in the ESDM Sector

- **3. Skilled Workforce Shortage**
- Shortage of trained professionals in chip design, embedded systems, and high-end manufacturing.
- The ESDM sector requires a skilled workforce with expertise in various areas like design, manufacturing, and testing. There is a need to bridge the skill gap through training and education programs.
- Limited R&D investments affecting innovation.

- **4. Regulatory & Policy Challenges**
- Complex taxation and regulatory frameworks.
- Long approval timelines for setting up manufacturing units.
- Inconsistent policy implementation across states.

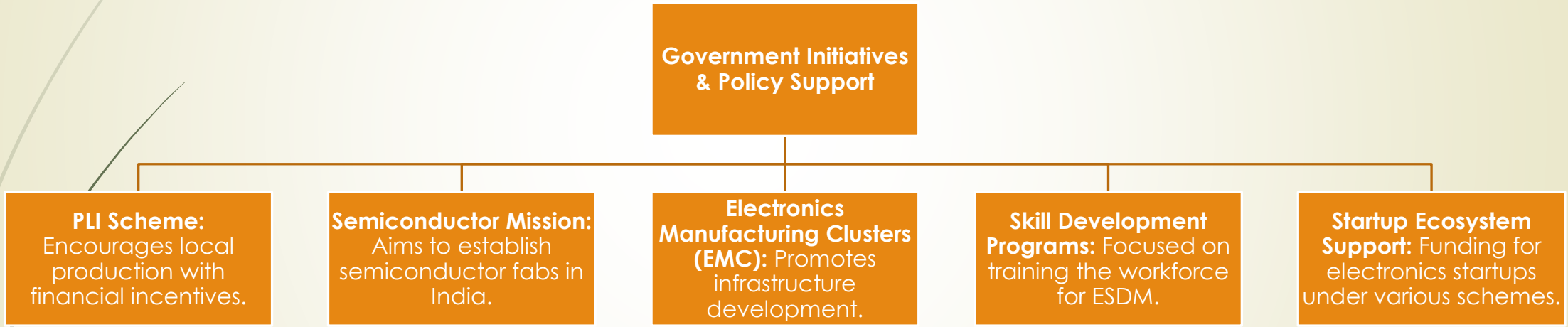
Key Challenges in the ESDM Sector

- **5. High Capital Investment & Funding Issues**
- Initial investment in semiconductor fabs is extremely high (~$10 billion per fab).
- Limited access to venture capital and financial support for startups.
- Lack of private sector involvement in large-scale investments.
- **6. Customs and Central Excise duty's**
- On average 30%, impacting the over all product cost competitiveness leads to losing the business opportunities.
- Challenges in competing with global players in R&D.

Key Challenges in the ESDM Sector

7. Global Competition:

- **Competition from other countries:** India faces stiff competition from other countries with established ESDM sectors, particularly in terms of cost competitiveness and technological advancements.



Problem Statement Title	Description of the Problem	Suggested Methodology to provide a Solution
Reduce logistics costs for ICs, high-tech PCBs, connectors, transistors, and other components to 25% of the Ex-Works cost of respective components, down from the current 3.5%.	Logistics Cost Challenge	1. To reduce logistics costs, focus on optimizing supply chain processes, implementing automation, and leveraging AI technologies. 2. Key strategies include route optimization, real-time tracking, and predictive analytics to enhance efficiency and reduce operational expenses.
Improve customs and import clearance processes (such as delays due to ICE GATE) to ensure faster availability of components/parts at manufacturer sites.	Import Clearance Challenge	1. Ensure seamless integration between customs systems, logistics providers, and manufacturers for a cohesive flow of information. 2. Establish feedback loops to continuously assess the effectiveness of implemented solutions and make necessary adjustments.
To reduce the Logistics lead time of Imports which currently at 1 week by AIR and 4 – 6 weeks by SEA	Logistics Lead Time Challenge	1.Utilize AI algorithms to analyze traffic patterns, weather conditions, and shipment priorities. 2. Deploy integfrated systems that automatically generate and submit customs documentation 3.Leverage data analytics tools for insights into logistics performance.
Establish 24/7 traceability mechanism for components/parts throughout the entire supply chain (from supplier to manufacturer site), addressing the current lack of visibility	Traceability Challenge	1. Utilize IoT devices and RFID tags to monitor the movement of components in real-time 2. Implement a blockchain system to create a tamper-proof ledger of all transactions and movements within the supply chain. 3. Utilize AI-driven analytics tools to process data collected from IoT devices and RFID systems.4.Create a centralized platform for communication and data sharing with suppliers.(Vendor Portal)

Conclusion

The Indian ESDM sector has immense potential but faces several challenges.

Strategic investments, government support, and industry collaboration can accelerate growth.

Strengthening the domestic ecosystem will reduce dependency on imports and position India as a global electronics hub.

THANK YOU

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