6. INDIA'S FIRST SEMICONDUCTOR PLANT - ECONOMY

Prime Minister Narendra Modi inaugurated India's first semiconductor facility at Sanand in Gujarat. India has taken a major step toward building its semiconductor ecosystem with the inauguration of the country's first semiconductor assembly and packaging facility.

The plant has been established by Micron Technology, a leading American semiconductor company, under the Semicon India Programme.The facility is located in Sanand, Gujarat, marking a milestone in India's ambition to develop domestic chip manufacturing capabilities.

1. Project Overview

1. The semiconductor plant is an Assembly, Testing, Marking, and Packaging (ATMP) facility, representing the backend stage of semiconductor manufacturing.
2. The project involves a total investment of ₹22,516 crore, supported through incentives under the Semicon India Programme.
3. The plant will manufacture and package memory and storage semiconductor products, including:
    1. DRAM (Dynamic Random Access Memory) used in computers, smartphones, and servers.
    2. NAND Flash memory used in storage devices.
    3. SSD (Solid State Drives) used in data centers, laptops, and high-speed storage systems.
4. The facility will initially focus on semiconductor packaging and testing, which are critical components of the global chip supply chain.

2. Semicon India Programme

1. The Semicon India Programme, launched in 2021, aims to develop a sustainable semiconductor and display manufacturing ecosystem in India.
2. The Government of India has allocated $10 billion in incentives to attract global semiconductor companies.

Objectives of the Programme

1. Establish semiconductor fabrication and packaging units in India.
2. Develop a strong semiconductor design ecosystem.
3. Encourage technology transfer and domestic innovation.
4. Integrate India into global semiconductor supply chains.
5. Under this programme, 10 semiconductor-related projects have been approved.
6. Additional semiconductor facilities are expected to begin operations in:
    1. Noida, Uttar Pradesh
    2. Assam
    3. Odisha
    4. Punjab

These projects aim to develop a complete semiconductor value chain in India.

3. Importance of Semiconductor Manufacturing for India

1. Reducing Import Dependence

• India currently imports nearly 100% of its semiconductor requirements, mainly from:

1. Taiwan
2. China
3. South Korea

• Semiconductors are critical components used in:

1. Smartphones
2. Computers
3. Automobiles
4. Telecommunications equipment
5. Consumer electronics

• Developing domestic manufacturing capacity will reduce import dependence and improve technological self-reliance.

2. Alignment with Atmanirbhar Bharat

• The project aligns with the national vision of Atmanirbhar Bharat, which promotes domestic manufacturing and technological self-sufficiency.

By building semiconductor capabilities, India can:

1. Reduce dependence on foreign suppliers.
2. Strengthen indigenous innovation.
3. Promote domestic electronics manufacturing.

3. Strengthening Supply Chain Resilience

• The global semiconductor industry has experienced disruptions due to:

1. The COVID-19 pandemic
2. US–China trade tensions

• Establishing semiconductor facilities in India will help:

1. Diversify global supply chains.
2. Reduce geopolitical vulnerabilities.
3. Improve supply stability for domestic industries.

4. Strategic Importance for National Security

Semiconductors are essential for several strategic sectors, including:

1. Defence technology – missiles, radar systems, surveillance equipment.
2. Telecommunications – 5G and future 6G networks.
3. Artificial Intelligence and high-performance computing.
4. Space technology – satellites and launch systems developed by Indian Space Research Organisation.
5. Electric vehicles and smart mobility systems.

• Domestic semiconductor capabilities therefore strengthen technological sovereignty and national security.

4. Economic and Employment Impact

1. The semiconductor facility is expected to create:
    1. Over 5,000 direct high-skilled jobs including engineers and technicians.
    2. More than 15,000 indirect jobs in logistics, services, and supply chains.
2. The semiconductor industry has strong multiplier effects, promoting growth in:
    1. Electronics manufacturing
    2. Advanced materials
    3. Precision engineering
    4. Research and development
3. India aims to capture 5–10% of the global semiconductor market, which is projected to reach $1 trillion by 2030.

5. Boost to Electronics Manufacturing

• Semiconductors form the foundation of the electronics industry.

• Strengthening domestic chip production will support:

1. Electronics manufacturing clusters
2. Mobile phone manufacturing
3. Electric vehicle production
4. Data centers and cloud infrastructure

• This will help India emerge as a global hub for electronics manufacturing.

6. Challenges in Developing a Semiconductor Ecosystem

1. High Capital Costs
    • Semiconductor fabrication plants require investments of billions of dollars.

2. Technology Complexity
   • Chip manufacturing involves highly advanced and specialised technologies.
3. Supply Chain Dependencies
   • Semiconductor production relies on global suppliers for materials, chemicals, and equipment.
4. Skilled Workforce Requirements
   • India must develop a large pool of engineers and technicians trained in semiconductor technology.

7. Way Forward

1. Develop semiconductor fabrication (fab) plants in addition to packaging facilities.
2. Invest in semiconductor design, research and development, and talent development.
3. Strengthen international partnerships with major semiconductor-producing countries.
4. Build a complete semiconductor value chain, including materials, equipment, and chip design.

Conclusion

The establishment of India's first semiconductor ATMP facility by Micron Technology marks a historic milestone in India's industrial and technological development. It represents the first step toward building a comprehensive semiconductor ecosystem under the Semicon India Programme. By strengthening domestic chip manufacturing capabilities, India can enhance technological self-reliance, supply chain resilience, and long-term economic growth.

Source: https://indianexpress.com/article/cities/mumbai/declared-murdered-in-court-but-still-alive-in-govt-records-navi-mumbai-cops-family-fights-on-10560171/?ref=infinite