

About Semiconductor Manufacturing in India

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Why in news?

- Taiwanese electronics manufacturer Foxconn has decided to pull out of its joint venture with Vedanta to set up a \$19.5 billion chip manufacturing plant in India.
- India has identified chip-making as a key priority for future economic growth, hoping to capitalise on companies looking to diversify their operations from China.

Semiconductor manufacturing in India

Need for domestic manufacturing of semiconductors

- **Foundation stone of modern electronics industry**

- Semiconductors and displays are the foundation of modern electronics industry.
- These are critical components that power electronics – from computers and smartphones to the brake sensors in cars.

- **To reduce import dependency**

- As India does not produce any semiconductors, the country's demands are met with imports.
- The demand for semiconductors in India will reportedly reach around USD 100 billion by 2025, up from the current demand of USD 24 billion.

- **To overcome the disruption in supply-chain**

- The absence of local manufacturing affected India the most during the lockdown imposed due to the Covid-19 pandemic.

- **Geopolitical significance**

- In the current geopolitical scenario, trusted sources of semiconductors and displays hold strategic importance.
- These are key to the security of critical information infrastructure.
 - E.g., The Department of Telecommunications has in the past raised concerns over possible bugs in the telecom equipment sold by the Chinese company.

Steps taken by the Govt to promote indigenous semiconductor industry

- In December 2021, the Central government had approved the comprehensive program for the development of sustainable semiconductor and display ecosystem in the country. This includes:

- **India Semiconductor Mission -**

- It will be set up as the nodal agency for efficient and smooth implementation of the schemes on Semiconductors and Display ecosystem.
- It will drive the long-term strategies for developing a sustainable semiconductors and display ecosystem.
- The Mission will be led by global experts in semiconductor and display industry.

- **Semiconductor Design Companies -**

- Support will be provided to 100 domestic companies of semiconductor design for Integrated Circuits (ICs), Chipsets, System on Chips (SoCs), etc.
- The scheme intends to facilitate the growth of not less than 20 such companies which can achieve turnover of more than Rs. 1500 crore in the coming five years.

- **Semiconductor Fabs and Display Fabs -**

- The Scheme for Setting up of Semiconductor Fabs and Display Fabs in India shall extend fiscal support of up to 50% of project cost.
- Central Government will work closely with State Governments to approve applications for setting up at least two greenfield semiconductor fabs and two display fabs in the country.
- **Fiscal Support -**
 - The Central Government has announced incentives for every part of supply chain including electronic components, sub-assemblies, and finished goods.
 - The Government has committed support of **Rs. 2,30,000 crore** (USD 30 billion) to position India as global hub for electronics manufacturing with semiconductors as the foundational building block.
- **Production Linked Incentive (PLI) scheme for semiconductor**
 - In September 2022, Union Cabinet recently approved changes to the Rs 76,000-crore semiconductor Production Linked Incentive (PLI) scheme.
 - With this, all semiconductor fab plants will receive fiscal support of 50 per cent, irrespective of node size.
 - **Node size** refers to the size of the smallest feature that can be reliably manufactured on a semiconductor wafer using a particular fabrication process.
 - It is often measured in nanometers (nm).
 - Earlier, incentives for semiconductor fabs were based on the size of the node.
 - For example, higher end nodes were given an incentive of 30 per cent of the project cost.
- **Chips to Startup (C2S) programme**
 - The government has also introduced the Chips to Startup (C2S) programme aims to train 85,000 engineers (Bachelors, Masters and Research level combined) qualified in ESDM disciplines over a period of 5 years.
 - ESDM – Electronic System Design and Manufacturing.

News Summary: Foxconn pulls out of \$19.5-billion chip plan with Vedanta

- The Indian government has approached Foxconn, a Taiwanese contract manufacturer, to set up a semiconductor fabrication facility in India.
- This comes after Foxconn announced its decision to withdraw from its joint venture with Vedanta.
- Foxconn has not given any reason for its decision to pull out.
- However, it is believed that ability of Vedanta, which is reeling under a heavy debt load, to pay for acquiring the necessary technology for chip making played a key role.

Background:

- In September 2022, Vedanta and Foxconn had signed a memorandum of understanding with the Gujarat government to set up separate chip and display manufacturing plants in the state for an estimated \$19.5

billion.

- Last month, the Vedanta-Foxconn joint venture had reapplied for the chip incentive scheme, this time for a 40 nanometre (nm) process.
 - This was after its initial proposal to set up a 28 nm chip production plant failed to sign up a technology partner.
- Neither Foxconn nor Vedanta have the in-house technology to design and manufacture chips, and India's scheme requires such entities to have a technology partner to plug that gap.

What is the status of other proposals?

- Aside from Vedanta-Foxconn's proposal, the Centre had received two other applications to set up a fab in India. However, both have faced difficulties.
- ISMC, backed by Abu Dhabi-based Next Orbit and Israel's Tower Semiconductor, has asked the Centre not to consider its proposal owing to a pending merger between Intel and Tower Semiconductor.
 - The merger continues to be delayed more than a year after its first announcement.
 - The consortium had initially said that it would set up a \$3 billion semiconductor fab in Karnataka.
- Singapore-based IGSS Venture's proposal was not found to be up to the mark by the government's advisory committee.

Q1) What is Semiconductor?

A semiconductor is a material that has electrical conductivity between that of a conductor and an insulator. It is a crucial component in the field of electronics as it can control the flow of electrical current. Semiconductors are typically made from materials such as silicon or germanium, which have properties that allow them to be easily manipulated for specific electronic purposes.

Q2) What are Semiconductor Fabs?

Semiconductor fabs, short for semiconductor fabrication facilities, are advanced manufacturing plants where semiconductors are produced. These fabs are highly specialized and operate under controlled environments to ensure precise fabrication processes.

Source: [Foxconn pulls out of \\$19.5-billion chip plan with Vedanta, Govt asks it to set up independent unit](#) | [Ministry of Electronics & Information Technology](#) | [Business Today](#) | [The Hindu](#)

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