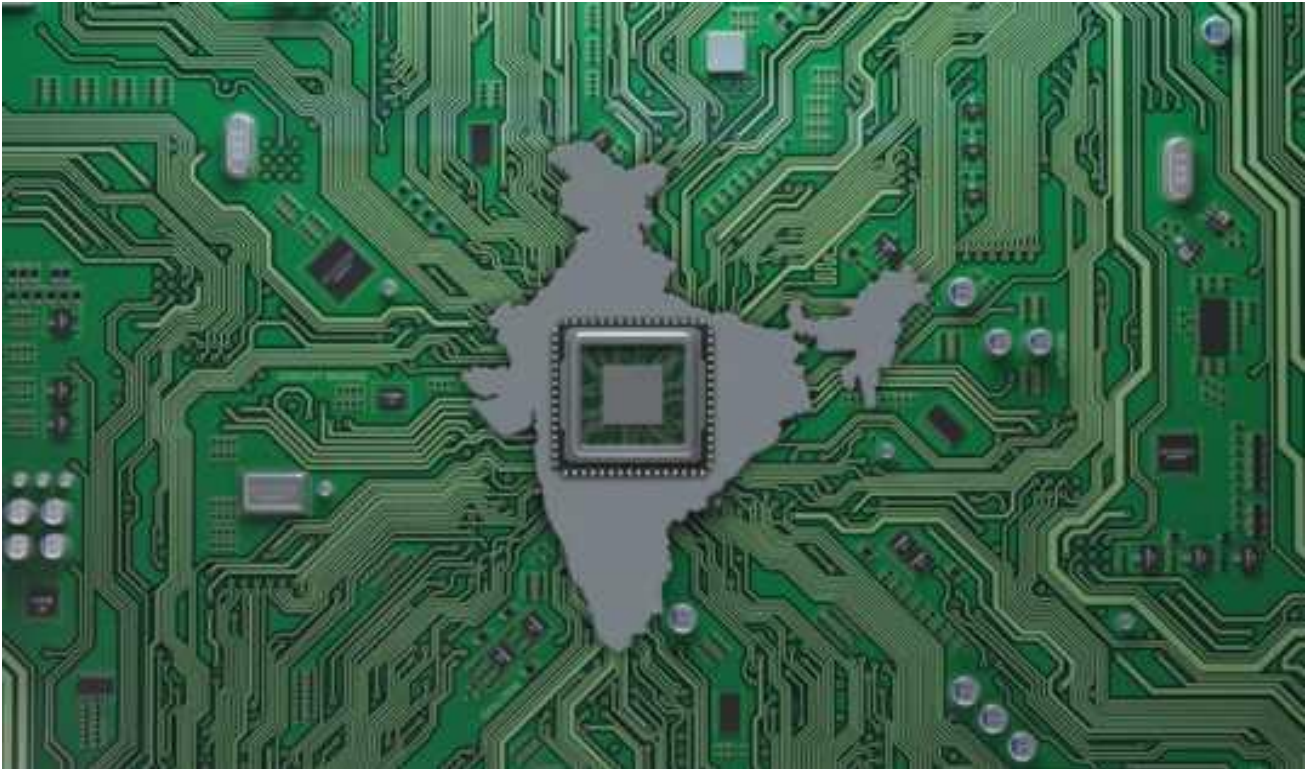


4. India's push for semiconductors

Prelims Syllabus: Governance

Mains Syllabus: GS-III Science & Technology - Indigenisation of technology



Why in News?

- As part of its efforts to encourage the electronics supply chain to India, the Union Government has disbursed close to ₹1,645 crores through performance-linked incentives (PLI) for electronics manufacturers.

Why are countries prioritising semiconductor manufacturing?

- Semiconductor fabrication units or fabs are manufacturing plants that help turn raw materials such as silicon into integrated circuits which are a part of almost all electronic hardware.
- Semiconductor fabrication units or fabs are highly capital-intensive undertakings and require billions of dollars in the case of large facilities.
- Fabs also require a highly reliable and high-quality supply of water, electricity, and insulation from the elements and a high degree of precision, cost and capital are required to make the sophisticated circuits.
- Countries across the world have now realised strategic value associated with the segments of the value chain for fabs.

- As per a report by the Semiconductor Industry Association (SIA), in 2022 China surpassed Taiwan in terms of share of global sales from fabs.
- The U.S. enacted the CHIPS Act in August 2022, which extends about \$280 billion in subsidies and investments to encourage manufacturers to set up fabs and make semiconductors in the U.S.
- The government's Invest India agency says that electronics manufacturing as a whole sector would be worth \$300 billion by FY 25–26.
- Further, facilities for assembling finished products have been steadily increasing in number in India.
- However, the number of fabs for making chipsets and displays, which are essential parts of the manufacturing process for electronic devices in the country, is a cause of concern.
- According to the Minister of Electronics and Information Technology, the first semiconductor manufacturing fab will be announced in the coming future.

Opportunities for India

- The Semiconductor Industry Association (SIA) has said that India must rely on its strengths in the electronics manufacturing value chain.
- A significant portion of semiconductor manufacturing involves design and intellectual labour. India is said to have an advantage as a large share of semiconductor design engineers working across the world are either Indians or of Indian origin.
- Further, top chipmaking firms like Intel and NVIDIA have already established large facilities in India and have provided the required exposure to Indian talent.
- Experts feel that China is losing control over such an advantage on account of sanctions and an ageing population.

Way forward

- Setting up display and semiconductor fabs is looked at as one of the strategic and economic goals of India and both the Union as well as the State governments are looking for opportunities to connect with popular brands such as Apple.
- The government is also looking to develop various parts of the ecosystem that promise sustainable growth and fiscal feasibility.
- As per the SIA, rather than setting up “foundry companies”, which turn silicon into semiconductors, countries like India must focus on encouraging companies that specialise in Outsourced Semiconductor Assembly and Test (OSAT).

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- Foundry companies require huge capital investment with entry costs alone being close to billions of dollars.
 - The OSAT set-ups are involved in the less capital-intensive processes of chipmaking which include assembling the components and undertaking testing.
 - OSAT set-ups hence are less expensive and generate better margins.
 - Furthermore, like-minded countries must specialise in different aspects of semiconductor manufacturing and come together for distribution which can help solve the geopolitical problem of Chinese dominance.

