India Semiconductor Industry

Why in news?

Recently, at Semicon India Summit, the Government has made a fresh bid to attract major global chip manufacturers into the country.

Status of Semiconductor Industry in India

- **Workforce** - India's semiconductor design engineers makes up 20% of the global workforce.
- About 2,000 integrated circuits and chips are designed in India every year with engineers involved in varied aspects of design and verification.
- **Semiconductor market** - As per Deloitte report, India's semiconductor market is to reach $55 billion by 2026 with more than 60% of the market being driven by 3 industries
    - Smartphones and wearables,
    - Automotive components, and
    - Computing and data storage
- Global players operating R&D in the country include Intel, Micron and Qualcomm among others.

What steps were taken by the government to promote the sector?

> *Gujarat will become the first state in India to have a large-scale semiconductor manufacturing facility.*

- **India Semiconductor Mission-** It is an independent business division within *Digital India Corporation* having administrative and financial autonomy.
- It aims to formulate and drive India's long term strategies for developing semiconductors and display manufacturing facilities and semiconductor design ecosystem.
- ISM has been working as nodal agency for the schemes approved under Semicon India Programme.
- There are 4 subcomponent schemes announced under India Semiconductor Mission.
    - **Scheme for setting up of semiconductor fabs in India**-It provides fiscal support for setting up semiconductor wafer fabrication facilities in the country.
    - **Scheme for setting up of display fabs in India-** It provides fiscal support to eligible applicants for setting up of display fabs which is aimed at attracting large investments.

    - **Scheme for setting up of Compound Semiconductors / Silicon Photonics / Sensors Fab and Semiconductor Assembly, Testing, Marking and Packaging (ATMP) / OSAT facilities in India -** Extends a fiscal support of 50% of the capital expenditure
    - **Semicon India Future Design-Design linked incentive (DLI) scheme -** Offers financial incentives, design infrastructure support across various stages of development and deployment of semiconductor design.
    - The scheme provides
        - **Product design linked incentive** - up to 50% of the eligible expenditure subject to a ceiling of ₹15 crore per application.
        - **Deployment linked incentive** - of 6% to 4% of net sales turnover over 5 years subject to a ceiling of ₹30 crore per application

- **SPECS scheme**- It is the scheme for promotion of manufacturing of electronic components and semiconductors and provides financial incentive of 25%.
- **Program for Development of Semiconductors and Display Manufacturing Ecosystem**- The modified programme offers fiscal support of 50% of project cost.
- **Semicon India Conclave 2023**- India will emerge as global hub of semiconductor and chip-making industry.

What are the challenges?

- **Weak intellectual property-** India holds a small portion of IP in design though it has thriving manpower.
- **Broader industry dynamics-** Policies for semiconductor industry require long term strategy as the sector is capital intensive.
- **Low annual revenue-** The cumulative annual revenue of domestic semiconductor design companies is meagre at ₹150 crore.
- **Long gestation periods-** The returns from the investment are not immediate as setting up of design and fabrication units require long duration.
- This implies that the design firms are not able to attract potential investors and venture capitalists as software companies have.
- **Higher valuation by foreign buyers-** The Government plan to become a venture capital firm for chip design companies is ineffective as companies would pick foreign buyers.
- **Dependence on import-** In 2021, India is the 9th largest importer of semiconductor devices in the world valued 2.17 billion dollar.

What lies ahead?

- **Adopt best practices of China**- India focuses on building new logic fab, whereas China backed by massive financial support of the Government acquired loss making fabs and then set up its own.
- **Advantages of acquiring existing fabs-** Reasonable price, stabilised technology, supply chain ecosystem, established product line and market.
- **Improve value chain-** India must leverage value added activites to enable the ecosystem in a positive direction.
- **Robust mechanism-** There should be an independent investment committee and a

framework for governance to mitigate the moral hazard posed by politically driven equity investments.

- **Link investments-**It must be linked to drive more innovation and employment generation in the chip sector.
- **Improve intellectual property-** Realignment towards equity from the government requires consideration of the IP, this would foster the domestic chip companies to keep the IP.
- **Government as a stakeholder**- It has the potential to create a state-of-the-art design ecosystem which will serve the national interest and also be a supplier to the rest of the world.

References

1. The Hindu| Explained Chip tactics on India
2. The Hindu| Mapping India's chip ecosystem
3. PIB| India semiconductor mission