

# India's Semiconductor Diplomacy

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## [GS Paper 2 - Foreign Policies, Indigenization of Technology]

**Context** - The current decade presents a unique opportunity to India. . India must seize this opportunity and become an attractive alternative destination for semiconductor manufacturing.

### Semiconductors and their Importance

- Semiconductors are materials which have a conductivity between conductors and insulators. They can be pure elements, silicon or germanium or compounds; gallium, arsenide or cadmium selenide.
- Semiconductor chips are the lifeblood of the modern information age. The semiconductor is the cornerstone of all electronic products.
- They enable electronic products to compute and control actions that simplify our lives.
- These semiconductor chips are the drivers for ICT development and one of the key reasons for the current flattening of the world.

### Global cooperation driven by semiconductors

- The manufacturing cycle of a semiconductor chip from sand to a finished product, sees it change hands approximately 70 times across international borders.

- Concentrated in a few geographies: The semiconductor manufacturing capacities are concentrated in a few geographies.
- Nearly all leading edge (sub 10nm) semiconductor manufacturing capacity is limited to Taiwan and South Korea, with nearly 92 per cent located in the former.
- Further, 75 percent of the semiconductor manufacturing capacity is concentrated in East Asia and China.

## Opportunity for India

- Companies are looking to diversify their supply chain and for alternatives to their bases in China. The chip shortages due to Covid-19 have hit automakers with a revenue loss of \$110 bn in 2021.
- The Russia-Ukraine conflict and its implications for raw material supplies for the semiconductor value chain has also poised chipmakers to invest in strengthening the semicon supply chain.
- India must seize this opportunity and become an attractive alternative destination for semiconductor manufacturing. The way ahead is conceptualizing a semicon diplomacy action plan.
- Placing semicon diplomacy at the heart of India's foreign policy is essential both strategically and economically.
- The multiplier effect on the economy: The establishment of the value chain for semiconductors would ensure a multiplier effect on the entire economy.
- National security implications: Semiconductors are used in critical infrastructures such as communication, power transmission etc., that have implications for national security.
- Reducing the BoP: Domestic production would be saving forex and reducing the balance of payments, especially vis a vis China.

## How to Achieve it?

- One of the ways of leveraging semicon diplomacy is increasing multilateral and bilateral cooperation.
- **Role of Quad:** A key institution with immense potential in this regard is the Quad. Australia, being rich in raw materials required for semiconductors, can be an important supplier to fill in India's deficits. The US and Japan can be leveraged for capacity building and their advanced semiconductor technology in logic and memory segments.
- **Pivot India's Act East Policy:** Considering that the semiconductor manufacturing and testing bases are heavily concentrated in East Asia, the Act East policy provides an opportunity to connect and strengthen ties with key players in the region.
- **Technological exchanges with ASEAN:** Frequent technological exchanges between a regional bloc like ASEAN via tracks in forums like the East Asia Summit and the ASEAN regional forum will be beneficial.
- **Collective growth:** Attaining self-sufficiency in semiconductor manufacturing can mean collective growth of the South Asian region.

- India needs to harness its strengths, such as the strong presence of global EMS players, diaspora, world-class design ecosystem, demographic dividend, and use it as a pedestal for global partnerships and outreach.

## Way Forward

India's concept of self-reliance is not an individualistic endeavor but one that encourages growth and prosperity of all, in the spirit of Vasudhaiva Kutumbakam, meaning the entire world is one family. Similarly, we don't have an option but to be self-reliant in semiconductors.