



India-US Pact on Semiconductor

Prelims: Scheme for Promotion of Manufacturing of Electronic Components and Semiconductors, Major Manufacturers of Semiconductor-chips.

Mains: India-US Pact on Semiconductor.

Why in News?

Recently, India and the US have signed Memorandum of Understanding (MoU) on establishing the **Semiconductor** Supply chain during **India - USA 5th Commercial Dialogue 2023**, which can help **India** realize its long-nurtured dream of becoming a hub for electronic goods.

- The MoU seeks to establish a collaborative mechanism between the two governments **on semiconductor supply chain resiliency and diversification** in view of **US's CHIPS and Science Act** and **India's Semiconductor Mission**.

What is the Significance of the Deal?

- **Commercial Opportunities:**
 - The US and China are giants in chip manufacturing. So, this pact with the US to strengthen cooperation in the semiconductor sector to facilitate commercial opportunities and development of innovation ecosystems **is likely to help India immensely**.
- **Electronics Supply Chain:**
 - It can help India get aligned into **a more central role in the global electronics supply chain**.
- **Can Address Semiconductor Crunch:**
 - The crunch in semiconductors supply began during the **Covid-19** and went on to intensify in 2021. A Goldman Sachs report suggested that **at least 169 industries had been impacted by the global chip supply shortage** in 2021.
 - The crunch has eased now but some disruptions in the supply chain still exist.
- **Realignment towards Chip Manufacturing:**
 - From a domestic perspective, this could also prompt a **potential realignment of India's current policy approach on chip manufacturing**: which is currently focused, almost entirely, on the manufacture of **mature nodes - generally defined as chips that are 40 nanometres (nm) or above** and find application in sectors such as the automotive industry - before trying to attempt an entry into **the more advanced nodes (smaller than 40nm)**, which are far more strategic, but require exceptional manufacturing capabilities and project execution skills.

What are the Challenges for India?

- **High Investments Required:** Semiconductors and display manufacturing is a very **complex and technology-intensive sector** involving huge capital investments, high risk, long gestation and payback periods, and rapid changes in technology, which require significant and sustained

investments.

- **Minimal Fiscal Support from Government:** The level of fiscal support currently envisioned is minuscule when one considers the scale of investments typically required to set up manufacturing capacities in the various sub-sectors of the semiconductor industry.
- **Lack of Fabrication Capacities:** India has a decent chip design talent but it never built-up chip fab capacity. The [ISRO](#) and the [DRDO](#) have their respective fab foundries but they are primarily for their own requirements and are also not as sophisticated as the latest in the world.
 - India has only government-owned semiconductor fabrication unit- can be added as there might be other private fabs old fab which is located in Mohali, Punjab.
- **Extremely Expensive Fab Setup:** A semiconductor fabrication facility (or fab) can cost multiples of a billion dollars to set up even on a relatively small scale and lagging by a generation or two behind the latest in technology.
- **Resource Inefficient Sector:** Chip fabs are also very thirsty units requiring millions of litres of clean water, an extremely stable power supply, a lot of land and a highly skilled workforce.

Where does India Stand in the Semiconductor Market?

- India currently imports all chips and the market is estimated to touch USD 100 billion by 2025 from USD 24 billion now. However, for the domestic manufacturing of semiconductor chips, India has recently launched several initiatives:
 - The Union Cabinet has allocated an amount of Rs 76,000 crore in 2021 for supporting the **development of a 'semiconductors and display manufacturing ecosystem'**.
 - Consequently, a significant number of incentives would be provided to design companies to design chips.
 - India has also launched the [Scheme for Promotion of Manufacturing of Electronic Components and Semiconductors \(SPICES\)](#) for manufacturing of electronics components and semiconductors.
 - In 2021, India announced its roughly USD 10 billion-dollar [Production-Linked Incentive \(PLI\) scheme](#) to encourage semiconductor and display manufacturing in the country.
 - In 2021, the MeitY also launched the [Design Linked Incentive \(DLI\) Scheme](#) to nurture at least 20 domestic companies involved in semiconductor design and facilitate them to achieve a turnover of more than Rs.1500 Crore in the next 5 years.
- India's own consumption of semiconductors is expected to cross USD 80 billion by 2026 and to USD 110 billion by 2030.

What are the Top 5 Countries Producing Semiconductors?

- Top 5 Countries that produce the most semiconductors are Taiwan, South Korea, Japan, United States, China.
- **Taiwan and South Korea make up about 80% of the global foundry base** for chips. TSMC, the world's most advanced chipmaker, is headquartered in Taiwan.
- Currently, **foundries in Taiwan account for over 70% of the chips** that mobile devices made in India utilise, according to industry estimates by the Indian Cellular and Electronics Association.

Way Forward

- It is likely that India will achieve its long-nurtured dream of becoming an electronics hub and help ensure that there is no demand-supply gap in semiconductors.
- It is also likely that buyers won't ever have to wait for the second key to their vehicles.

[Source: IE](#)

