



India's semiconductor dream

While the government has already provided incentives for manufacturing, more needs to be done to make India self-reliant.

Highlights:

1. The pandemic has brought to the fore the fragility of the global supply chain of semiconductor manufacturing. The situation is exacerbated by the overdependence of the world on East Asia for fab manufacturing, the rising price of silicon, and the China-U.S. trade war.
2. No wonder, countries are scampering to safeguard their interests by introducing attractive packages to attract more chip manufacturing. The U.S. has announced a \$50 billion package to create foundries there.
3. Intel is adding two more foundries to its Arizona campus and also developing its own foundry business to compete with chip-makers such as TSMC and UMC. TSMC, which controls 24% of the semiconductor supply chain, is setting up a \$12 billion facility in Arizona.
4. Japan and Germany have got TSMC to start speciality technology fabs in their respective countries.

Advances in semiconductors and silicon wafers are driven by the demands of diverse electronic products





Indian efforts to promote semiconductor chip manufacturing:

1. It is timely, therefore, that India has approved a \$10 billion package to incentivise the manufacturing of semiconductors in the country.
2. The government has drawn out a list of incentives to get leading international manufacturers to set up their manufacturing unit in India either by themselves or with the help of a local partner.
3. Considering the current geopolitical dynamics and the fact that semiconductors are at the core of fourth industrial revolution technologies, this is a welcome first step.

Fab manufacturing

1. In the microelectronics industry, a semiconductor fabrication plant (commonly called a fab; sometimes foundry) is a factory where devices such as integrated circuits are manufactured.
2. Getting fab manufacturing will also build on India's strength in design. We have the largest number of chip designers outside of the U.S. who are working on state-of-the-art systems and technologies. For example, Karnataka boasts over 85 fabless chip design houses of various global companies.
3. To create the ecosystem for fab manufacturing, it is important to lock in the demand for semiconductors produced within the country.
4. Similar work needs to be done to develop raw material supply capabilities. The India Electronics and Semiconductor Association is exploring the opportunity to start supplying processed raw materials like minerals and gases to the fab and ATMP (Assembly, Testing, Marking, and Packaging) industry.
5. Fab clustering, where key semiconductor supply chains and related businesses are in one place to create backward and forward linkages, would also play a key role in creating an ecosystem for the semiconductor industry.
6. The availability of an uninterrupted power supply and semiconductor grade Ultra Pure Water to the extent of 10 MLD per fab are also key requirements.
7. Additionally, a conducive environment needs to be created for women to work night shifts along with zero labour disputes.

14.02.2022

Monday



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Promote domestic enterprises:

1. Apart from incentivising more FDI in electronics to deepen our supply chains through incentive schemes, we need to focus on encouraging Indian manufacturers and start-ups to enter and master complex R&D and manufacturing verticals.
2. We can then ensure that valuable Intellectual Property is created and owned by Indian companies. The semiconductor industry is changing fast as new-age technologies require innovation at the design, material, and process levels.
3. Indian engineers have contributed immensely to this area in multinational companies. We must encourage them to set up their design start-ups with handsome government grants and tax incentives.
4. Premier research institutions such as the Indian Institute of Science should also be asked to work aggressively on R&D in chip designing and manufacturing.