

India's Semiconductor Pursuit

New Delhi is clearly making a push to expand its capabilities in the critical semiconductor industry.



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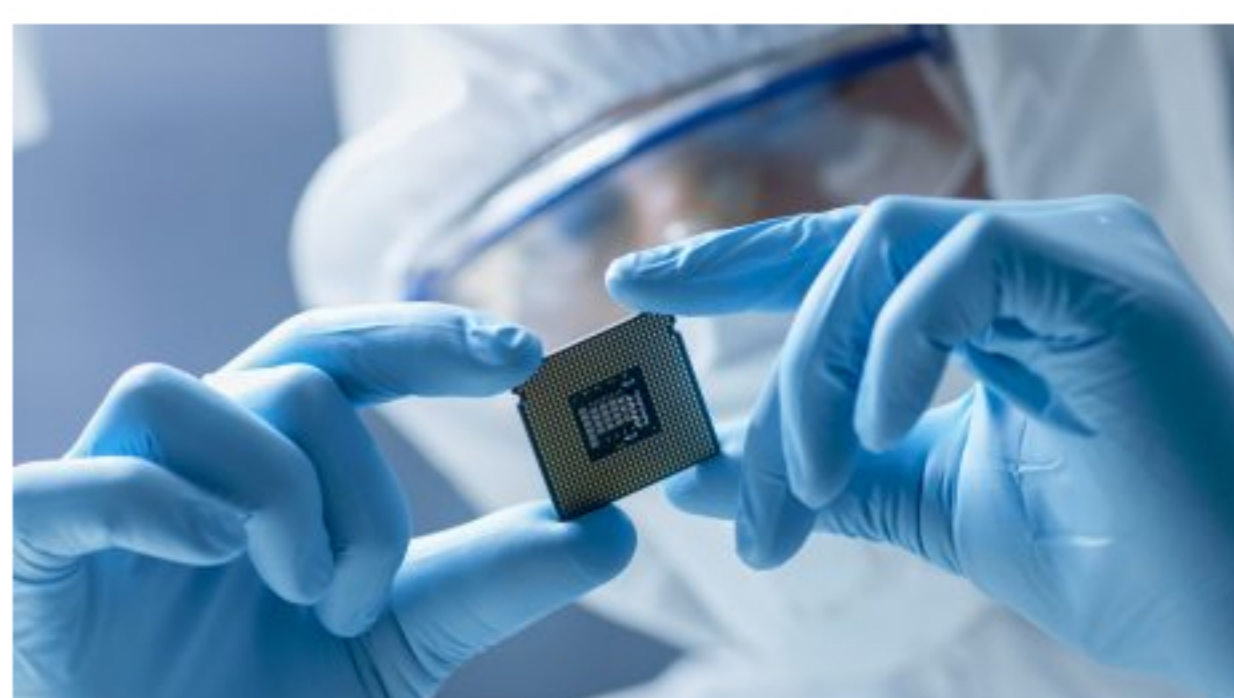


Amid the COVID-19 pandemic, many countries including India have come to recognize the importance of global supply chains and the vulnerabilities in the absence of any concrete action to diversify supply chain partners. This is particularly true in the case of semiconductors.

Semiconductors are [essential](#) elements in electronic devices in a number of sectors including healthcare and medical devices, communication, computing, defense, transportation, clean energy, and key emerging technologies like artificial intelligence and quantum computing. The U.S. continues to be a leader, with about 50 percent of global market share, worth \$208 billion in 2020. Semiconductors are one of the top five U.S. exports, with more than 80 percent of the U.S. sales to overseas customers. The U.S. industry invests around one-fifth of its revenue into research and development (\$44 billion in 2020), ranking as the second highest after the pharmaceutical industry.

China, which is another emerging player in the semiconductor industry, is making fast progress. In 2015, [China](#) had a meager share of 3.8 percent of the global chip sales, amounting to \$13 billion, but by 2020 China had improved its score, marking an annual growth rate of 30.6 percent, capturing a 9 percent market share and about \$40 billion in annual sales. According to the Semiconductor Industry Association, China has surpassed Taiwan for two years in a row, and is only behind Europe and Japan, each of which had a market share of 10 percent in 2020. If China were to sustain its current growth rate in the industry, its annual revenue could reach \$116 billion by 2024, reaching a market share of close to 18 percent, putting it behind only the U.S. and South Korea as far as the global market share is concerned.

India has a fairly small presence in the semiconductor arena, meant for strategic applications alone. India's [current facilities](#) are the Semi-Conductor Laboratory (SCL) Mohali; Gallium Arsenide Enabling Technology Centre (GAETEC), Hyderabad; and Society for Integrated Circuit Technology and Applied Research (SITAR), Bengaluru. But this could change if New Delhi takes the initiative to bring in greater talent and investment. Prime Minister Narendra Modi's address at the Indian Mobile Congress [highlighted](#) Indian ambitions, with the prime minister saying that "From 5G technology to artificial intelligence, virtual reality, cloud, internet of things and robotics, the world looks towards India with optimism to provide technology enabled solutions that are affordable and sustainable." The government has begun to appreciate the critical role that semiconductors and displays will play in "the [foundation](#) of modern electronics driving the next phase of digital transformation under Industry 4.0." Semiconductors and display manufacturing are both capital and technology-intensive with long gestation and payback periods, and India is looking for both capital support and technological collaborations.



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In December last year, the Indian government [cleared](#) a Program for the Development of Semiconductors and Display Manufacturing Ecosystem in India. This involves an outlay of over \$10 billion and the government has declared incentives for every bit of the supply chain including electronic components, sub-assemblies, and finished goods. A total of \$7.5 billion has been sanctioned under PLI (Production Linked Incentive) for large scale electronics manufacturing, PLI for IT hardware, SPECS (Scheme for Promotion of Manufacturing of Electronic Components and Semiconductors) and the Modified Electronics Manufacturing Clusters (EMC 2.0) Scheme. There is also the PLI for quantum of \$13 billion that has been sanctioned for allied sectors that include ACC batteries, auto components, telecom and networking products, solar PV modules, and white goods. All in all, the government has made a [commitment](#) of \$30 billion "to position India as global hub for electronics manufacturing with semiconductors as the foundational building block."

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On December 21, while announcing [four schemes](#) for the semiconductor industry in India, the Ministry of Electronics and Information Technology (MeitY) [said](#) that the Indian semiconductor market, estimated around \$15 billion in 2020, is expected to grow to around \$63 billion by 2026. The ministry expects that by 2030, India's semiconductor market will be driven by wireless communications, consumer electronics, and automotive electronics with 24 percent, 23 percent, and 20 percent of the market share, respectively. In recognition of the growing demand, the ministry added that India has to "develop secure and resilient semiconductor supply chains for industrial growth, digital sovereignty, and technological leadership." They also [announced](#) that they expected to start receiving applications from January 1, 2022 from industry players for setting up semiconductor fabs (fabrication plants), and display units. In an effort "to drive the long-term strategies for developing a sustainable semiconductors and display ecosystem, a specialized and independent '[India Semiconductor Mission \(ISM\)](#)'" is being created. This mission is supposed to be run by global experts in semiconductor and display industry, and "will act as the nodal agency for efficient and smooth implementation of the schemes on Semiconductors and Display ecosystem."

Meanwhile, in another significant move, the government is [reported](#) to be in talks with Taiwan to set up a semiconductor manufacturing facility in India. The Indian government has already selected several sites for this purpose. If the talks succeed, one of Taiwan's major semiconductor producers – the Taiwan Semiconductor Manufacturing Company (TSMC) or the United Microelectronics Corporation (UMC) – could be executing it.

There is also domestic interest in the semiconductor industry. In December, the Vedanta Group [publicized](#) its plans to invest \$15 billion on display and

Reportedly, the plant will "[assemble](#) and test semiconductor chips after sourcing the sophisticated silicon wafers from semiconductor foundries like Taiwan-based TSMC, Fitch Solutions." The government appears to be [excited](#) about the Tata proposal.

Others are also entering the Indian market. The U.S. chip-maker Intel has also expressed [interest](#) in setting up a semiconductor manufacturing plant in India, which the Indian MeitY minister immediately welcomed.

Clearly, India appears to be making a major push to increase its presence in the semiconductor manufacturing sector. Whether these many initiatives that the government is sponsoring will overcome the traditional obstacles of bureaucracy, red tape, and a capricious tax regulatory regime remains to be seen.