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Semiconductor Manufacturing – India's Bargaining Chip at the Global Stage!

What's the Point?

On September 05, 2024, a committee of the Maharashtra Cabinet approved an investment proposal worth ₹83,947 crore (US$10 billion) for a joint venture (JV) between Israel's Tower Semiconductor and the Adani Group. This JV aims to establish a semiconductor chip manufacturing facility in Panvel, Maharashtra. This project is likely to be India's second chip manufacturing facility and the sixth semiconductor plant in the country. While this proposal is one of the important developments in increasing India's dominance in its manufacturing capabilities, the Government has been making a concerted effort to increase India's semiconductor market by over 5x – from US$35.18 billion in 2023 to US$109.8 billion by 2030. This will ultimately help India build its domestic manufacturing capacities and realize its vision of becoming *Aatmanirbhar Bharat*.

Noteworthy Semiconductor Manufacturing Projects proposed or underway

In addition to the proposed JV between Israel's Tower Semiconductor and the Adani Group to establish a semiconductor chip manufacturing facility in Maharashtra, under the Programme for Development of Semiconductors and Display Manufacturing Ecosystem (Outlay of ₹76,000 crore), the Union Cabinet approved the proposal of Kaynes Semicon Pvt. Ltd. to setup a semiconductor unit in Sanand, Gujarat on September 02, 2024. The proposed unit will be setup with an investment of ₹3,300 crore with an expected capacity of 60 lakh chips per day.

Currently there are 4 semiconductor units already under construction, which are expected to bring an investment of nearly ₹1.5 lakh crore with a cumulative capacity of ~7 crore chips per day. With the addition of a fifth unit, the Government is taking another step to develop a vibrant semiconductor ecosystem in India. The 4 projects underway are as follows:

Scheme	Applicant	Location of the Unit	Total Project Cost (in ₹ crore)	Eligible Project Cost (in ₹ crore)	Incentive Approved (in ₹ crore)
Modified scheme for setting up of Semiconductor Fabs in India	Tata Electronic Private Limited (TEPL) (Commercial Fab)	Dholera, Gujarat	91,526	67,956	33,978
Modified scheme for setting up of Compound Semiconductor / Silicon Photonics / Sensors Fab and Semiconductor / ATMP (Assembly, Testing, Marking, and Packaging) / OSAT (Outsourced Semiconductor Assembly and Test) facilities in India	Micron Technology Inc. (ATMP)	Sanand, Gujarat	22,516	22,516	11,258
	Tata Semiconductor Assembly and Test Pvt Ltd (TSAT) (ATMP)	Morigaon, Assam	27,120	20,449	10,225
	CG Power & Industrial Solutions Ltd. (ATMP)	Sanand, Gujarat	7,584	7,002	3,501
Total			**1,48,746**	**1,17,923**	**58,962**

Source: Press Information Bureau (PIB) and other publicly available information

Building Capabilities through India-Singapore Semiconductor Ecosystem Partnership

Singapore's established semiconductor ecosystem has produced a strong cluster of semiconductor companies, which are keen to participate in the growth of India's semiconductor industry. With India aiming to establish itself as a global node for semiconductor manufacturing, driven by strong domestic demand in the electronics, electric vehicles, and manufacturing sectors, India and Singapore recently signed a Memorandum of Understanding (MOU) to partner and cooperate in the field of semiconductors.

Under this MOU, India and Singapore is expected to leverage complementary strengths in their semiconductor ecosystems and tap on opportunities to build resilience in their semiconductor supply chains. This will include

government-led policy exchanges on ecosystem development, supply chain resilience, and workforce development. The Ministry of Trade and Industry (MTI) and India's Ministry of Electronics and Information Technology (MeitY) will establish a Policy Dialogue to facilitate discussions, oversee the implementation of the areas of collaboration, and exchange best practices.

Increase in Skill Levels expected to increase Employment Opportunities

Bolstering manufacturing activity in high-tech sectors such as semiconductors not only provides a significant source of high-value-added, high-paying employment opportunities, but can produce significant employment, and economic, multiplier effects. For example, as per Information Technology & Innovation Foundation (ITIF), in the United States (US), the semiconductor industry's jobs multiplier is 6.7, which means that for each US worker directly employed by the semiconductor industry, an additional 5.7 jobs are supported across the wider US economy.

According to PIB, the semiconductor units established by TEPL, TSAT and CG Power & Industrial Solutions Ltd. are expected to generate a direct employment of 20,000 advanced technology jobs and about 60,000 indirect jobs. Since the Government and various universities see significant employment opportunities in this industry, and recognize the multiplier effect of semiconductor manufacturing, they are making initiatives to increase the skill level of the youth of India. With a step-up in investments in the sector, several premier engineering institutes like IIT Kanpur have introduced courses in the related fields. Furthermore, the All India Council for Technical Education (AICTE) has also designed a curriculum for Bachelors in Technology in Electronics (Very-Large-Scale Integration (VLSI) Design and Technology) and Diploma in Integrated Circuit manufacturing.

Opportunity for India to show its dominance at the Global Stage

India needs manufacturing to ensure economic growth in its *Amrit Kaal*, provide employment to the world's largest workforce, and ensure macroeconomic stability. More importantly, building domestic manufacturing capabilities will aid India to show its dominance at the global stage. With semiconductors powering every aspect of modern, digital life – from tiny smartphones to mega data centres that control the internet, manufacturing them would signal that India is becoming the "Factory to the World".

India has 20% of the world's semiconductor design workforce, a rapidly evolving technology landscape and a thriving domestic market, all of which are conducive in building an indigenous semiconductor ecosystem (Source: KPMG). Furthermore, since semiconductor manufacturing is a costly endeavour, the increasing support in the form of public (National Electronics Policy, US$10 billion PLI Scheme) and private investments is playing a crucial role. KMPG's report highlights that India should continue to improve its capabilities in areas – OSAT, ATMP, design, R&D – where it already has an edge, while focussing on building a fabrication plant. This would create an end-to-end ecosystem, and ultimately boost India's economic growth, and bring the Government closer to its vision of *Viksit Bharat* by 2047.

Sources: PIB, Ministry of Trade and Industry Singapore, ITIF, KPMG, and other publicly available information

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