INDIALAW

TECHNOLOGY LAW

How The Act East Policy Can Complement India’s Semiconductor Ambitions: Opportunities for Strategic JVs, Investment and Technology Partnerships

AUTHOR Arpita Dutta

PUBLISHED 14 September 2026

Following the successful conclusion of SEMICON Taiwan, held in Taipei from 2–4 September, global attention is now turning towards India's semiconductor ambitions. With SEMICON India scheduled to take place from 17–19 September, the international semiconductor community is increasingly looking to India as an emerging destination for investment, manufacturing, technology partnerships and supply-chain diversification. India's semiconductor ecosystem is witnessing unprecedented momentum, driven by the India Semiconductor Mission (ISM) and a strong policy commitment to developing a resilient, end-to-end semiconductor value chain. Through the rapid expansion of the India Semiconductor Mission and related policy initiatives, the country is steadily narrowing its technological and manufacturing gap. However, India continues to rely on imports for more than 90% of critical semiconductor inputs, including silicon wafers, specialty gases, advanced materials, manufacturing equipment, and finished microchips. This dependence highlights that long-term competitiveness cannot be achieved through fabrication facilities alone. A truly resilient semiconductor ecosystem requires parallel investments across the entire value chain—from raw materials, precision equipment, and specialty chemicals to advanced packaging, testing, logistics, design, and research and development. The semiconductor ecosystems of Taiwan, Japan, and South Korea demonstrate that sustained global leadership is built upon deeply integrated domestic supplier networks and specialized industrial clusters. By adopting a similar ecosystem-driven approach, India can strengthen supply chain resilience, reduce import dependence, enhance strategic self-reliance, and position itself as a trusted global semiconductor manufacturing and innovation hub.

The trajectory of India's semiconductor ecosystem is best examined through the established models of Taiwan, Japan, and South Korea. These economies have demonstrated that long-term competitiveness is achieved by developing complementary strengths across the semiconductor value chain, an approach that India is seeking to adapt through the creation of an integrated, end-to-end semiconductor ecosystem rather than focusing solely on fabrication capacity. The semiconductor ecosystems of Taiwan, Japan, and South Korea demonstrate that global competitiveness is not built around a single fabrication facility, but through a deeply integrated value chain in which each segment reinforces the next. Taiwan has developed an unparalleled manufacturing cluster centred on foundries, advanced packaging, and a dense network of suppliers; Japan has established global leadership in semiconductor-grade materials, specialty chemicals, silicon wafers, and precision manufacturing equipment; while South Korea has built vertically integrated capabilities spanning memory chips, fabrication, packaging, and electronics manufacturing. These complementary models illustrate that a resilient semiconductor industry depends on the seamless integration of research and development, chip design, raw materials, equipment manufacturing, fabrication, packaging, testing, logistics, and downstream electronics production. Recognising this, India is pursuing a broader ecosystem approach under its semiconductor initiatives. Given that the country currently relies on imports all critical semiconductor inputs, including raw materials, specialty gases, silicon wafers, and finished microchips. Its long-term objective extends beyond establishing fabrication plants to developing domestic capabilities across the entire semiconductor supply chain. By fostering integrated industrial clusters, strengthening ancillary industries, encouraging research and innovation, and attracting global suppliers alongside domestic enterprises, India seeks to build a resilient and globally competitive semiconductor ecosystem that reduces import dependence while positioning the country as a trusted partner in global value chains.

From Policy Announcements to Commercial Partnerships:

The evolution of India's semiconductor policy is already being reflected in a growing pipeline of strategic investment projects. The collaboration between Tata Electronics and Taiwan's Powerchip Semiconductor Manufacturing Corporation (PSMC) to establish a semiconductor fabrication facility in Gujarat, the Tata Electronics–ASE Technology partnership for semiconductor assembly and testing, the CG Power–Renesas Electronics–Stars Microelectronics consortium for an OSAT facility in Gujarat, and the Micron Technology ATMP project in Sanand collectively demonstrate that India is attracting not only capital but also technology partnerships, manufacturing expertise, and global supply chain integration. These investments signify a broader shift from policy announcements to commercial implementation, creating opportunities for supplier localisation, ancillary industries, and skilled workforce development. As additional global semiconductor companies explore India as part of their supply chain diversification strategy, the next phase of growth is likely to be driven by cross-border joint ventures, strategic alliances, technology licensing arrangements, and mergers and acquisitions, all of which will require sophisticated legal and regulatory structuring.

The semiconductor supply chain or industry ecosystem is an extremely globalized and interdependent value chain covering all aspects from raw material through semiconductor equipment, electronic design automation (EDA), patent application, chip design, fabrication, to assembly and testing of chips. The ecosystem consists of fabless design companies, foundries, integrated device manufacturers (IDMs) and OSATs (outsourced semiconductor assembly and test providers).

An effective ecosystem for semiconductors will involve coordinated capability development along several connected stages, which includes raw material and research & design, semiconductor machinery, wafer fabrication, assembly and test, and downstream electronics production. Since one company cannot effectively build these capabilities independently, JVs and M&A strategy could prove to be helpful in linking various segments of the value chain. As India's semiconductor ecosystem matures, the focus must extend beyond manufacturing capacity to strategic collaboration and technological advancement. Well-structured joint ventures (JVs), mergers and acquisitions (M&A), and technology partnerships can facilitate capital inflows, knowledge transfer, supplier localisation, and access to global markets. Joint ventures enable Indian companies to collaborate with global semiconductor leaders by combining capital, technology, manufacturing expertise, and market access while allowing foreign partners to retain strategic control over sensitive technologies. Similarly, mergers and acquisitions facilitate the acquisition of specialised capabilities, supplier networks, intellectual property, and skilled talent, thereby accelerating ecosystem development and strengthening domestic manufacturing capabilities.

At the same time, sustained investment in research and development, advanced manufacturing processes, quality control, and skilled talent will be essential to enhance the quality, reliability, and competitiveness of semiconductor chips. India cannot develop a semiconductor ecosystem solely through government incentives; it will be built through strategic joint ventures, technology collaborations, acquisitions, licensing arrangements, and cross-border investments. Together, robust legal structuring and continuous technological innovation will strengthen India's position as a trusted global semiconductor manufacturing and innovation hub.

India's competitiveness in its semiconductor manufacturing eco-system will also depend on the gradual creation of advanced semiconductor chip manufacturing. Process nodes 28 nm, 14 nm, 7 nm, 5 nm, and 3 nm are some of the commonly used standards in measuring semiconductor technology with smaller nodes providing for greater transistor density, better processing speeds, low power consumption, and performance. In the realization of the technology intensive and highly capitalistic nature of advanced semiconductor fabrication, the current plan for semiconductor manufacturing in India seeks to produce mature-node semiconductors with nodes between 28nm to 90nm which serve the auto, industrial electronics, telecom, defense, and power management industries. Nonetheless, in line with the mission of India Semiconductor, the Government has set a long-term goal of producing 3 nm semiconductors by 2032. In addition to this, advanced semiconductor chip designs for 3 nm are currently being done in design centres such as Renesas in Noida, while advanced research is being carried out in research centres such as the Indian Institute of Science (IISc) in Bengaluru where atom-thin materials for future semiconductor manufacturing are being investigated.

The Legal Architecture of India's Semiconductor Future

The next phase of India's semiconductor journey will therefore be defined not only by engineering excellence but also by the legal architecture governing collaboration, technology transfer, intellectual property, foreign investment, and strategic transactions. While international partnerships will remain essential to India's semiconductor ambitions, access to the deepest layers of advanced process technology and manufacturing know-how is likely to remain limited, as these capabilities constitute strategic economic and national security assets for leading semiconductor nations. Consequently, India's long-term competitiveness cannot rely solely on technology transfer or foreign investment. Instead, it must cultivate a highly skilled domestic talent pool capable of absorbing, adapting, and ultimately advancing semiconductor technologies. This requires sustained investment in semiconductor-focused education, specialised vocational training, industry-academia collaboration, applied research, and workforce mobility across design, fabrication, equipment engineering, materials science, and advanced packaging. India's demographic advantage, coupled with its established strengths in engineering and chip design, provides a strong foundation to develop indigenous expertise. Over time, such a knowledge-driven workforce will enable India not only to operate advanced semiconductor facilities efficiently but also to innovate across the value chain, reducing dependence on external technology and strengthening its position within the global semiconductor ecosystem.

For India, the strategic task is to connect these capabilities with its own strengths in engineering talent, semiconductor design, electronics manufacturing and market scale. This legal architecture will become increasingly important as India moves from attracting individual projects towards creating an interconnected semiconductor ecosystem for a sustainable period.

Related Practice Areas

Information Technology