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From Jagiroad to Japan
Positioning Northeast India as the New Hi-Tech Hub with Japanese Collaboration

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Abstract

As the push to transform Northeast India into India's strategic gateway for Southeast Asia gains momentum, Japan has emerged as the region's most reliable and strategic partner. India's semiconductor revolution has grown actively from 2022 with earliest breakthroughs being in Karnataka and Gujarat. Northeast India emerged as an unexpected frontrunner with regards to India's semiconductor ambitions in 2024 when the Government of India approved the setting up of a Semiconductor OSAT plant in Jagiroad, Guwahati, Assam. It marked the entry of the NER into the semiconductor ecosystem of the country and also helped to position the region into a new manufacturing and skills hub in India's broader electronics strategy.

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Introduction

In the past decade, Northeast region (NER) of India has received significant importance and has been at the focal point of India's Act East Policy. New Delhi has shown renewed vigour and urgency in promoting holistic development in NER, and the area has been a recipient of several big-ticket projects that have spanned across various sectors from Infrastructure to High-Tech and Agri-Tech which have been driven at a rapid rate. The investment by the TATA group has created a significant buzz in the Japanese industrial segments. During the Fifth Indo-Japan Intellectual Conclave 2025 hosted by Asian Confluence in February this year, Japanese Ambassador to India, H.E Mr Ono Keiichi visited the semiconductor plant site at Jagiroad with the Japanese delegation and various other industry members. The visit by the ambassador created a positive impact for the project and also accelerated the conversations surrounding the sub-ecosystem. The Japan Bank of International Cooperation (JBIC) together with Japan Chamber of Commerce and Industry in India (JCCII) and Japan External Trade Organization (JETRO), held the fifth meeting of the JCCII Semiconductor Committee on March 3, 2025. The conference marked a significant milestone regarding facilitating the conversations around the semiconductor industry with NER emerging as an important potential area of cooperation.[1] The semiconductor market in the global context is a key pillar of the contemporary digital economy. It underpins across a vast variety of sectors like consumer electronics, automobiles, telecommunication and renewable energy technologies. Countries like South Korea and China have been dominating the manufacturing sector while the UK, US and EU have been dominating the design and equipment. The semiconductor industry is projected to reach $1 trillion by 2030, with India aiming to contribute around 10 percent ($110 billion).

Figure 1- Depicting the global semiconductor market share

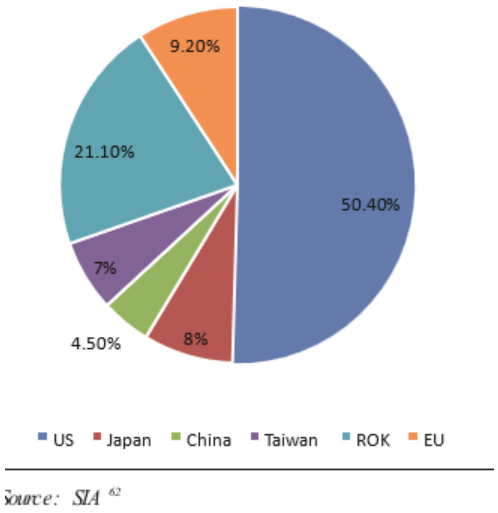
Metric	Value / Target	Source / Context
Projected Global Market Size	USD 1 Trillion	By 2030
India's Target Contribution	USD 110 Billion (10% Share)	By 2030, driven by the India Semiconductor Mission
Key Global Value Chain Stages	Design: US / UK / EU Fabrication & Assembly: Asia	Southeast Asia controls ~80% of global fabrication and assembly

India's Strategic Entry Point	Assembly, Testing, and Packaging (ATMP)	Lower-risk entry point before capital-intensive fabrication

Source: *The semiconductor decade: A trillion-dollar industry*, McKinsey & Company, 2022

Semiconductors are integral to daily life, powering devices like phones, computers, and communication tools. Semiconductors undergo three main stages: design, fabrication, and assembly. While design is dominated by the US and China, Southeast Asia controls 80 percent of fabrication and assembly processes, with key players in Japan, Singapore, Korea, and Taiwan. The key players in the semiconductor industry include equipment manufacturers like ASML, design automation companies like Cadence, and foundries such as TSMC. India's involvement has historically been limited, but recent initiatives like the Semiconductor Mission 2021 signal a shift.

Figure 2- Figure depicting the Global Semiconductor Market share by various countries



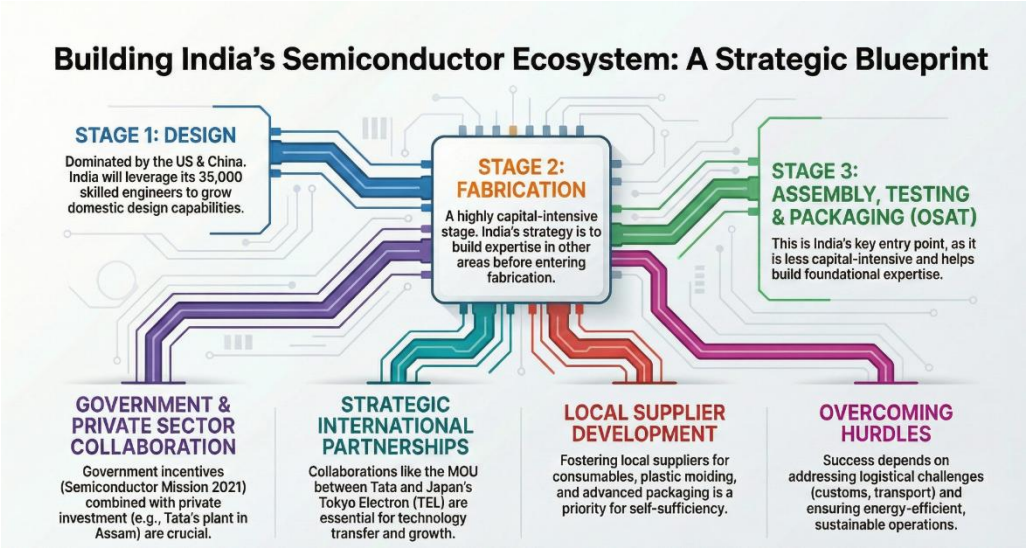
Source: SIA [62]

India's entry into the market and the prospects

India's journey in the semiconductor industry began with the national semiconductor mission that was launched in 2021, with Gujarat and Guwahati emerging as key hubs. The purpose is to revitalize the industry and lead to major opportunities, especially in assembly, testing, and packaging. India is trying to establish itself as a robust, self-reliant electronics manufacturing ecosystem within the global network. A key part of the focus has also been in the Research and Development sector. Prioritizing entry into the assembly, testing, and packaging sector as a

first step before moving to capital-intensive fabrication is critical. This approach reduces financial risk while building expertise in the industry. Capitalizing India's large pool of skilled engineers (35,000 working for multinationals) to boost design and development of semiconductor technology can propel growth in this sector. Collaboration between private companies like Tata, regional hubs such as Guwahati, and international partners will be crucial for the successful establishment of a semiconductor ecosystem in India.

Figure 3 - Infographic Depicting the Strategic Blueprint of India's Semiconductor Ecosystem



Source: Author's illustration based on Government of India semiconductor policy documents and industry reports.

Assam as the lead anchor of Northeast India's Semiconductor Push

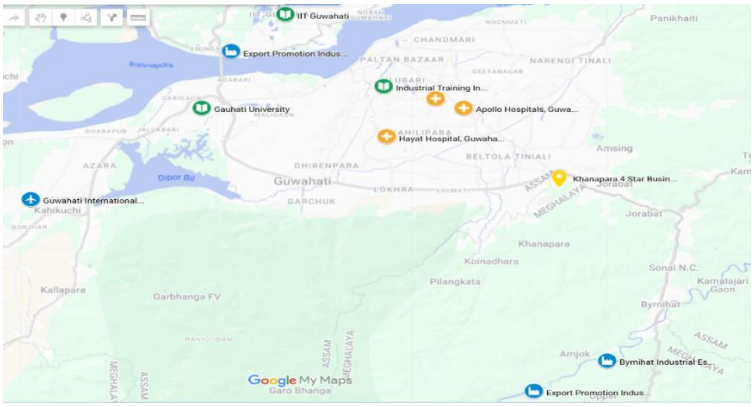
Assam has a significant advantage when compared with other hi-tech hubs in different parts of India due to a variety of factors. The state has already seen significant investments across different sectors including JICA investing in the water supply project in Guwahati along with other livelihood promotion projects. The state has had proactive engagement thereby allowing it to position itself as the new semiconductor hub in India. It is worth examining the advantages working in favour of Assam as India's newest semiconductor ecosystem are:

Strategic Location aiding Investment Opportunities

One of Assam's greatest advantages is its geographical positioning located at the crossroads of South and Southeast Asia. Assam is a vibrant hub of cultural and economic convergence. This strategic location not only makes Assam, the gateway of India's Northeast but also a crucial link to Southeast Asia and the broader Indo-Pacific economic landscape. This offers immense opportunities for trade, connectivity, and investment. Assam is strategically positioning itself as a desirable destination for Japanese high-tech investment and collaboration by combining its semiconductor strategy with the establishment of specialized industrial parks, educational partnerships, and diplomatic efforts. This integrated approach effectively co-brands the state as a key player in the hi-tech sector.

The new terminal 2 of the Guwahati airport has also been inaugurated recently which will handle 13 million passengers annually, thereby positioning Assam as the regional aviation hub.[2] The state has a road network that spans over 4,000 kms of national highways and a rail network of over 2000 kms connecting NER with all the different states of the rest of India. Assam is also set to get a multimodal logistics park in Jinghua. The immense potential in multimodal connectivity reaffirms Assam's ability to efficiently move semiconductor components, precision tooling, and skilled talent besides making it an attractive destination suited not only for manufacturing but also for integrated services, R&D, and supply-chain facilities.

Figure 4- Map depicting the Semiconductor Corridor in Assam featuring the airport, hospitality industry, educational institutes and industrial hub.



Source: Author's compilation using Google My Maps

Value for the Japanese Investors

Assam has been working actively to provide high value to the Japanese investors for investing in Assam. The state has a median workforce age of 22.7 which is way lower than the national median age of 27. The startup economy has been rapidly evolving, over 500 startups incubated in the last 5 Years. The state has the capacity to develop a broad semiconductor ecosystem with active focus on logistics, education and tech infrastructure. Building a robust semiconductor ecosystem through partnerships such as the MoU between Tata and Tokyo Electron (TEL) is essential. These collaborations can expand into advanced packaging and drive growth opportunities.

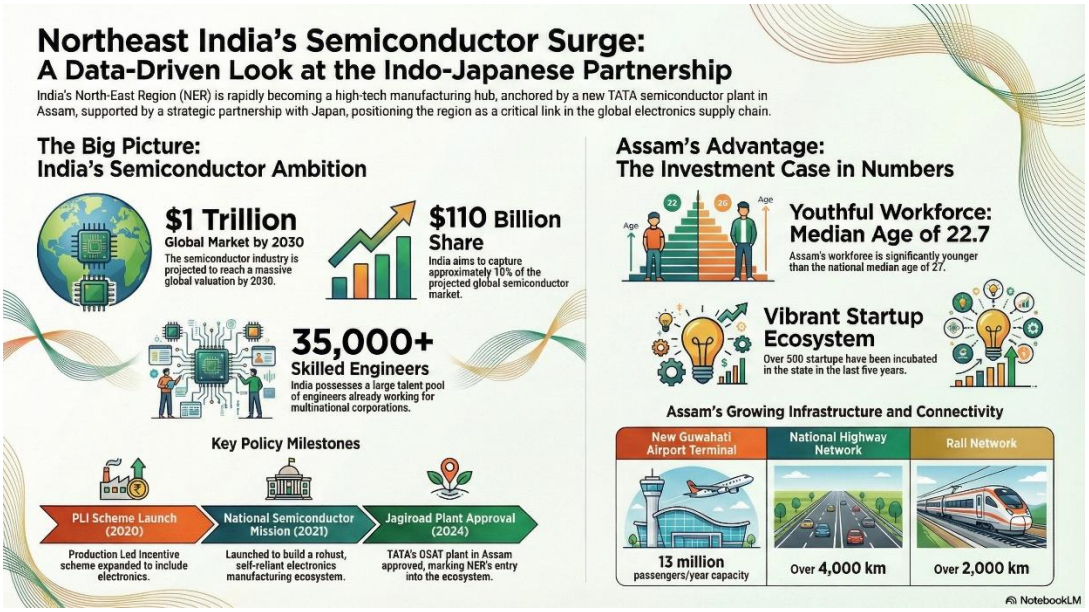
The Assam government had proposed the creation of a Japanese Industrial Township near Guwahati. The main purpose of this will be to provide the Japanese firms with facilities designed to meet their manufacturing and innovation requirements.[3] Increased partnerships between Indian and Japanese stakeholders to enhance the flow of skilled labour, focusing on both talent exchange and capacity building in regions like the Northeast. In this aspect, Assam can play a critical role given that it is home to some of the best educational institutions in the region including IIT Guwahati, Guwahati University, Tezpur University, etc. A new proposed IIM is also coming up in the state as has been sanctioned by the government.

Creating a sustainable and Regionally Integrated Semiconductor Ecosystem

To streamline the import and assembly of semiconductor materials and equipment, a dedicated green channel with clear rules, regulations, and facilities is essential. Japanese semiconductor equipment manufacturers such as Tokyo Electron, Nikon, and Canon, which operate within globally time-sensitive supply chains, can assist Northeast India in designing. A potential industrial value chain between Assam and Bangladesh can be explored. Japanese institutions like JICA, JBIC and JETRO are already operating actively in Bangladesh. They can play a crucial role in facilitating the process. The fabrication process could be carried out in Assam, while assembly and packaging might be conducted in Bangladesh. This kind of collaboration can help leverage each other's strengths and boost the semiconductor ecosystem in the Bay of Bengal area.

Semiconductor production requires significant energy consumption. As the industry grows, there must be a concerted effort to implement energy-efficient solutions, such as dynamic energy monitoring and recycling of gases and water. These initiatives will help ensure that the semiconductor industry in India remains sustainable, both from an environmental and cost perspective. The setting up of a Japanese Language Testing Centre in Assam will facilitate employment opportunities for Assamese youth in Japan. Strengthening collaboration in Technical Intern Training Program (TITP) and Specified Skilled Worker (SSW) programs to enhance human resource exchanges is also a key factor. Assam has also proposed the development of a Skill University in partnership with Japan to build a talent pipeline for global industries. For this mission to be successful, industry-academia partnerships need to be strengthened.

Figure 5- Infographic depicting the Indo-Japan Collaborations in the Semiconductor sector in NER



Source: Author's illustration (AI-assisted formatting).

How Meghalaya can benefit from Semiconductor Ecosystem in the NER

The establishment of the Semiconductor OSAT plant by TATA in Jagiroad, Assam has marked a new industrial milestone for Northeast India. The facility which is likely to be operational in

2026 is expected to be a game changer in the NER that will lead to large scale employment opportunities. Meghalaya's geographical proximity to the site can help in the development of supporting ecosystems in the state including roads, healthcare, hospitality, and clean energy. Meghalaya can strategically look to align its own growth in the allied sectors. The semiconductor plant in Assam will necessitate a strong need for skilled technicians, engineers, personnel trained in quality control and others like process specialists. The Japanese electronics firms including the ones that manufacture equipment and those that are precision engineering companies, bring in the vast plethora of experience in training and workforce development. Meghalaya should look to leverage this by creating partnerships with the Japanese firms and various training institutions for designing specially curated modular training programs in the segments like——assembly, manufacturing and quality assurance.[4]

Furthermore, establishing vocational pathways in partnership with Japanese institutions where the youth of the state will receive training and exposure to the Japanese manufacturing and operational culture. Signing MoU for skill exchange between educational institutions in the state and Japanese institutions so that the polytechnic and engineering colleges in the state can be strengthened.

One of Japan's biggest strengths lies in the fields of supplier development and long-term MSME integration. Japanese firms look to invest their time and resources in the upgradation of local supply chains as their reliance is not solely on imports. Meghalaya can adopt this approach by looking to use Japanese technologies like Kaizen and Monozukuri which will help local MSMEs to meet the quality and reliability standards which are required in the field of semiconductor manufacturing. Besides this, the state should also look to facilitate partnerships between Japanese SMEs and Meghalaya-based MSMEs for technology transfer, mentoring, and joint production. This approach would allow the gradual integration of MSMEs in Meghalaya into semiconductor value chains. This will help the state though, initially limited to the non-core supporting functions.

Meghalaya can be a crucial stakeholder in ensuring a broader Northeast India semiconductor corridor. The state's role will be to link Assam's manufacturing base with skills, services, and suppliers in the region. Having Japanese involvement will be important to credibility, technological depth and investment confidence. Joint infrastructure projects such as industrial parks and logistics hubs for high-tech manufacturing in collaboration with Assam and

Meghalaya can be set up in the region. The proposed Guwahati-Dawki-Moreh industrial corridor can also come into play in this regard.[5] Meghalaya can also push forward for the formation of an integrated skill-ecosystem hub. This will feature trainees from all Northeastern states. Besides, there can be investment projects with global semiconductor equipment suppliers which will help to attract capital, technology transfer, and industry linkages.

Figure 6- Map depicting the possible corridor for a semiconductor sub ecosystem in Meghalaya

Source: Author's compilation using Google My Maps

With the announcement of TATA's project at Jagiroad, the foundation for industrialization at a grand scale has been laid in NER. However, as the region seeks to grow and develop with Japanese expertise and technical cooperation, there has to be greater innovative planning and transparent policy frameworks that can help to create the confidence among the Japanese industries which have already expressed keen interest to partner in the region. India and Japan have already signed a Memorandum of Cooperation (MOC) in 2023 which aims to strengthen cooperation and build resilient supply chains for the semiconductor industry. "This MoC for the Japan-India Semiconductor Supply Chain Partnership aims to expand further and deepen cooperation in the electronics ecosystem"[6] This government-to-government framework will need to be operationalized at the state level in NER through bureaucratic support. Assam can take the lead in working to create a State Level Committee that can align with the MoC's

objectives which in turn will simplify approvals, track incentives, and engage Japanese industry delegations proactively.

Key Policy Enablers for Japanese Investment

Policy Initiative	**Mechanism**	**Objective**
State-Level MoC Alignment	Creation of a State-Level Committee in Assam to align with the 2023 Japan–India Semiconductor MoC.	To simplify approvals, track incentives, and provide a single point of proactive engagement for Japanese delegations.
Dedicated Investor Facilitation	Establish a Japan-Centric Cell within each state's investment promotion agency.	To act as a dedicated point of contact for Japanese companies, reducing bureaucratic friction and accelerating investment.
Regulatory Stability & Clarity	Provide clear and stable policy assurances on land pricing, labour regulations, and environmental clearances.	To meet the Japanese industry's preference for long-term stability over short-term incentives, reducing renegotiation risks.
Leverage National Incentives	Actively utilize the central government's Production Linked Incentive (PLI) scheme for electronics and semiconductors.	To combine regional benefits with powerful national financial incentives, maximizing the attractiveness of the investment.

Japanese companies place a great deal of emphasis on stable policies, clarity of regulation mechanism and always seek stability over a longer duration over short term incentives. The NER region is actively looking to attract hi-tech investment, especially to strengthen the manufacturing sector and the R & D sectors around the semiconductor industry. In order to

achieve this target, the states need to actively pursue a policy implementation model which will cater to the interests of the Japanese companies and ease their burden of doing business.

A specific Japan centric cell needs to be created within the investment promotion agencies of all the states. To attract Japanese investment, dedicated units should also be established in all Northeastern states to facilitate Foreign Direct Investment (FDI) from Japan. This cell and these units will look to act as a point of contact for Japanese companies and industries looking to invest in the respective states and the region and will instead reduce the burden on the other departments and authorities. It will also ensure that a greater amount of investment is secured. There has to be better policy assurances on issues like land pricing and labour regulation. The respective states and the union government can also look to ease the issue of environmental clearances for manufacturing led incentives so that Japanese firms do not have to renegotiate every now and then and ensure work goes on seamlessly. The central government already has in place schemes like the PLI (Production Led Incentive), which was launched in 2020 and expanded to 14 sectors including electronics and semiconductor. India has a dedicated vision towards creating a "Self-reliant Semiconductor Ecosystem" by 2030 and the India semiconductor mission along with broader framework of PLI can be used to its advantage by the Northeastern states seeking to attract Japanese investments in this regard. [7]

The policy spectrum spanning different states in the region varies in nature thereby producing a significant challenge when it comes to policy harmonization. The need of the hour is a single functioning economic zone that can span across several states like Assam, Tripura, Meghalaya, etc. If the respective states and stakeholders can come together to create a Governance Consortium that will consist of bureaucrats, industry representatives and Japanese officials then it would help to solve the problem of standardizing operations when it comes to aspects like workforce mobility along with supply chain logistics and multimodal connectivity planning.

Ensuring Risk mitigation for the Japanese Companies

The Japanese industries and their participation in India's semiconductor strategy extends into the arena of financial collaboration. Over the years, Japanese institutions such as Japan Bank for International Cooperation (JBIC), the Japan External Trade Organisation along with the JCCI have been heavily involved in aid-based projects and financing in sectors like equipment, logistics and construction. The governments in the NER should work actively to engage these financial institutions to design de-risked investment products with credit facilities co-

guaranteed by Japanese and Indian banks for capital expenditure. Partial risk guarantees for MSMEs can be upgraded to supplier readiness standards. Moreover, joint funds could be set up for workforce training in semiconductor and advanced electronics manufacturing between India and Japan. Working with Japan's financial institutions will reduce the perception of risk associated with investing in a region which has been traditionally untapped and will help to unlock deeper Japanese participation in future.

Conclusion

NER's role in India's industrial transformation has become critical in the last few years. The region is now being considered as the pioneer in India's strategic conversations with regards to South and Southeast Asia. The semiconductor ecosystem that is growing around Jagiroad can be a game changer with the participation of neighbouring states like Meghalaya. The Japanese companies have an opportunity to engage early in the region which has immense potential in growth, scale, and strategic geography. Japan's role in this transformation is both timely and strategic. As a global leader in semiconductor equipment, precision manufacturing, logistics, and workforce development, Japan brings not only capital but also long-term industrial philosophy, supply-chain resilience, and institutional credibility. The convergence of India's Act East Policy and Japan's Free and Open Indo-Pacific vision as well as Semiconductor Supply Chain Partnership provides a strong geopolitical and economic foundation for deeper collaboration in the region. For this opportunity to translate into sustainable outcomes, coordinated action is essential. State governments in the Northeast must move swiftly to operationalize policy frameworks, harmonize regulations, and create Japan-centric facilitation mechanisms that inspire confidence among investors. Simultaneously, building a skilled talent pipeline, strengthening MSMEs, ensuring sustainable infrastructure, and integrating the region into global value chains will be critical to long-term success.

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***Disclaimer**: The views expressed above and the information available including graphics and images are those of the author/s and can therefore in no way be taken to reflect the position of Asian Confluence.*

Endnotes:

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