A Steady Gait in India's Semiconductor Mission

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Amidst global re-configuration in semiconductor supply chains and yet another round of escalation in the 'Chip Wars' between the US and China, a series of recent and significant developments have brought the 'Indian Semiconductor Mission' back into the spotlight. To begin with, on 5 September, PM Modi and his counterpart PM Lawrence Wong signed an MoU for the India-Singapore Semiconductor Ecosystem Partnership. On the same day, the Maharashtra Govt. approved a $10 billion semiconductor project, pitched by an Adani Group and Tower Semiconductors (Israeli) Joint Venture, which will set up a fabrication plan (India's second) in Panvel.

Later, on 9 September, the US State Department's International Technology and Security Fund (ITSF), created by the US CHIPS Act, announced a partnership with New Delhi to reorient the global supply chain in Washington's favor. Notably, the development came days after *Bloomberg* reported that Beijing warned Tokyo of severe economic retaliation if Japanese firms further restricted the sale of chipmaking equipment to China,

even as the White House prepared to expand export controls and restrictions on Chinese access to advanced chips. Unsurprisingly, geopolitical risk assessments and fear of supply chain disruptions in the semiconductor industry have risen worldwide.

In India, at the moment, steady momentum has led to bullish sentiment for investors (Kaynes Tech India picked up 9 percent on the market after the Union Cabinet approved its proposed OSAT unit in Sanad, Gujarat, earlier this month) and media observers alike (at least, for now).

The Foxconn-Vedanta Story and The Need for a Sober View

The Indian media discourse on the country's semiconductor aspirations is prone to wildly oscillate between unrealistic optimism and unwarranted cynicism. Inadvertently, balanced analyses of developments in a policy landscape (of utmost strategic importance) are often obfuscated in this churn.

For instance, the materialization of the Adani-Tower fab unit is entirely contingent on whether the ISM (under the Ministry of Information Technology and Electronics) will grant a 50 percent subsidy (or $5 billion) for the project. At present, the Maharastra Cabinet's initial nod is likely motivated by upcoming state elections, and careful scrutiny of the JV's proposal (at the appraisal stage) is entirely the prerogative of the ISM's technical committee backed by the Centre.

It's pertinent to recall that an identical (albeit more ambitious) project was planned by the Foxconn-Vedanta JV in Maharastra in 2022. Multiple rounds of talks were held with the state leadership and auxiliary industry stakeholders. In July, a Foxconn delegation met with CM Shinde and his Deputy Fadnavis, who had just orchestrated the break up of Shiv Sena and wrested political control of the state that month. Immediately after, the Maharastra Industrial Development Corporation announced that the JV had visited Talegaon and

found the location to be “an ideal match for their requirements.” The press note further stated that “the $22 billion investment can generate 200,000 direct and indirect jobs” in the state. When, in September, the project was abruptly moved to Gujarat instead, the Maha Vikas Aghadi (the opposition alliance) alleged that the state government had surrendered to BJP’s electoral efforts in PM Modi’s home state, which kicked up a political firestorm.

The next year, in June, Vedanta was fined by market regulator SEBI for a breach of disclosure rules in its partnership with Foxconn. Concurrently, reports surfaced that the Centre had demanded the JV’s third-party technology partner, STMicroelectronics (Europe), have “more skin in the game” (an equity stake) given the industry’s complexity, which the latter refused. In early July, Foxconn withdrew from the JV without an official explanation, and the project fell apart.

Given that the proposed unit was expected to mark India’s entry into chip fabrication (the most capital-intensive, complicated, and strategic of the many sectors in the semiconductor business), it triggered a wave of pessimism for Indian semiconductor observers and strategic commentators at the time.

The JV’s Potential Advantages

While the story serves as a useful reminder of the need for tempered expectations in the long and arduous game of chips, the Adani-Tower JV indeed offers promise. While critical details of their plan are not yet available, Tower Semi’s expertise in the fabrication of analog chips circumvents the need for a Manufacturing Grade Technology Licensing Agreement with a third party, even as the proposed unit is likely to target legacy nodes (65 nm). This is in line with the Indian strategy, thus far, to steadily integrate into global supply chains and eventually work its way up the semiconductor ladder to reach advanced chips (sub-10 nm),

where real *Atmanirbharta* arguably lies. For instance, the approved Tata-PSMC unit will also make legacy chips (28 nm), and Indian analysts forecast reasonable market demand in both nodal segments for the next decade.

Moreover, Tower Semi enjoys a close working relationship with the Center, and has helped set up the strategic and state-run SCL fabrication facility in Mohali (which made chips for ISRO's Mission Mangalyaan). Even seemingly inconsequential details, such as the plant's planned location near Mumbai, will work in the project's favor, as the same would play a role in talent attraction in a highly competitive industry plagued by a global lack of expertise. In contrast, a prominent semiconductor analyst has argued that Tata-PSMC's location, Dholera (a small Gujarati town), could become a considerable hurdle for the JV.

Talent Hunt and International Partners

By one estimate, India will need 300,000 skilled professionals for its semiconductor industry in the next three years, which is where its recent partnerships with Singapore and the US come into focus. According to *Foreign Policy*, the US-backed ITSF will likely aim at 'workforce development and skills training' in India and, after a review of the latter's semiconductor ecosystem, decide the exact nature and magnitude of investments to funnel from its $500 million budget.

Similarly, the India-Singapore partnership is also likely to focus on 'talent development' and 'exchange of best practices' and potential cooperation with semiconductor equipment and material manufacturers on the island-state (that controls 20 percent of this vital global market segment), which is a hub for legacy nodes within Indian purview. Parallely, as the cost of production, land, and labor increases in Singapore (which, unlike other nations, has no plans to offer chip incentives), some semiconductor firms may be expected to diversify their operations to India.

ISM Phase II

With the December 2021 budgetary allocation of $10 billion already committed to five semiconductor projects, the ISM is expected to gear up for Phase II. Multiple press reports indicate that a blueprint is already on the horizon, even as it is unclear whether the final outlay will be $10 billion (*The Economic Times*) or $15 billion (*The Indian Express*).

In any case, the Adani-Tower fabrication unit, if approved, will eat up a significant chunk of any allocation right off the bat. This may be just as well, given that the Centre has reportedly decided to reduce the capex subsidy for ATMP/OSAT facilities from 50 percent to 30 percent (or 40 percent for more advanced facilities in the segment) and, instead, increase its focus on fabrication units. Notably, the GoI has already approved 4 ATMP and OSAT facilities (in contrast to 1 fabrication unit), and the 50% incentive bracket has received criticism from industrial policy experts (even a Union Minister and leader of a key NDA ally questioned the wisdom in net 70 percent subsidy coverage, with state govt incentives added, for the US-based Micorn's $2.75 billion ATMP plant in Gujarat, but later backtracked)

Ideally, Phase II would also reduce (if not entirely do away with) incentives for the Display Fab Scheme (which has not attracted any real interest), as it is hardly a strategic imperative for India and a "wasteful exercise," in the words of one prominent semicon analyst. However, initial media reports indicate otherwise.

Furthermore, the GoI reportedly plans to introduce support for auxiliary industries, such as gases, chemicals, equipment, and raw materials – in line with its commitment to build an "entire semiconductor ecosystem" (aspirational, at present). Relatedly, India may also seek to revamp its Design Linked Incentive (DLI) scheme (part of the ISM) this year, which, thus far, has performed far below GoI projections (20

start-ups per year). Almost three years after its announcement, the Centre has approved support for just 12 semiconductor design start-ups, even though the sector is considered a low-hanging fruit for India. Consequently, the scheme has come under heavy fire from experts. On a lengthy list of concernsare strict provisions that discourage FDI, confusion over IP rights ownership, and the appointment of a state-owned firm (which happens to be a competitor in the domain) as a nodal regulator.

The Long View

Meanwhile, New Delhi's semiconductor diplomacy will continue to leverage India's economic heft and translate the same into domestic capacity building with external assistance. For now (the next decade), the legacy node strategy appears sensible, and progress in the ATMP/OSAT sector is noteworthy. Indeed, there may be an inherent risk in targeting nodes below 10 nm, as they could get rapidly 'outmoded' by the 'AI Race.' In any case, India's own partners, such as the US, have announced capital subsidies and incentives in the segment that are far more attractive for global players.

On the other hand, a recent report by the Indian Electronics and Semiconductor Association, in partnership with MeITY, indicates that by 2032, sub-10 nm nodes could make up to 60 percent of the market demand in value terms (a dramatic increase from 25 percent at present). Clearly, India will thus remain largely import-dependent, as there is no realistic path to achieve self-reliance in such a short period.

In this context, New Delhi will have to eventually double down on a partnership with Taiwan (where TSMC alone makes 90 percent of advanced chips in the world). In particular, this may have to take the shape of an FTA (to easily import specific components required for high-end chips not readily available elsewhere), as the Taiwanese Foreign Minister recommended in April this year, and further

structural tariff and infrastructure reforms, as a pre-requisite to attract the global leaders. However, these are perhaps longer-term concerns.

As the adage goes, India must learn to walk before it runs, and recent developments indicate a steady gait.