India's semiconductor story still loading

Getting a silicon fab plant off the ground might take longer

SURAJEET DAS GUPTA
New Delhi, 20 July

It's been forwards and backwards with India's semiconductor sweepstakes. Just last month, there was a breakthrough. Micron Technology, one of the top-five chip makers globally, agreed to set up an assembly testing, marking and packaging plant (ATMP) in Gujarat with an investment of $850 million. News also came in that South Korean giant SK Hynix said it might join the bandwagon.

But in July, things slipped back when the government's aggressive move to kick off India's first fab plant suffered a jolt as Taiwanese EMS (electronic manufacturing services) giant Foxconn abruptly walked out of its JV with Vedanta to set up a ₹1.54 trillion fab plant in Gujarat.

Ministers put on a brave face. They said Foxconn and Vedanta will pursue their plans separately with new partners. But there was no escaping the feeling that things had fallen back, 18 months after the government's $10 billion incentive scheme to put the country on the global semiconductor map was first announced.

But such setbacks are always expected in the high stakes and strategic semiconductor business, especially given that India does not have an ecosystem or supply chain in place. But despite that, leading global players are coming to India to attend the three-day Semicon India event in July-end. They include Young Liu, chairman of Foxconn, Sanjay Mehrotra, CEO of Micron Technology, Anirudh Devgan, CEO of Cadence, Siva Sivaraman president of technology and strategy, Western Digital, and possibly Gary Dickerson, president and CEO of Applied Materials. And just a few days ago, Japanese semiconductor company Renesas — supported by the Japanese government — discussed areas of cooperation with the Indian government.

Of course, India's foray into semiconductors has coincided with a global rush by the US, European, Japanese, South Korean and Taiwanese governments to be self-sufficient in semiconductors by collectively pumping in $200 billion in subsidies.

Companies such as TSMC, Intel, Samsung and Micron are already committed to investments of $200 billion to set up plants in the US, Germany, France and Japan. India is clearly not on the radar of most of these companies.

Meanwhile the government is also learning from its initial enthusiasm, such as a bizarre 45-day deadline for companies to apply for setting up fab plants and give a detailed business plan requiring billions of dollars of investment.

It received only three proposals, two of which were not seriously considered and one — Foxconn-Vedanta — had big names but no real expertise in building a fab plant.

Semiconductor experts across the globe have advised the government to establish clear eligibility criteria to build a fab plant, as the government will be offering 50 per cent of the cost of building it up as subsidy upfront and it cannot afford to make a mistake.

The government has also opened the doors for new fab proposals, this time with an extended December 2024 deadline. "Experts have told us that we have done the right thing by first building the ecosystem rather than rushing and awarding a company to build the first fab plant," said a top government official.

The key to a fab plant, he said, is the complex technology required not only to set it up but to ensure its smooth running. "It is not enough to pay and get technology and the drawings to make a fab plant. We want the technology partner to have more teeth in the game," said an official in the Ministry of Electronics and Information Technology.

So, it will not be enough for an applicant to have a technology provider, as Foxconn-Vedanta did in STMicroelectronics. The provider, too, has to take a minimum 26 per cent stake in the company to show serious commitment. It is believed that STMicroelectronics was not willing to do so.

The technology provider also has to sign contracts taking responsibility for reaching the desirable yields that have been agreed (the total number of chips produced to the maximum chip count on one wafer) for the plant and, in an ideal situation, it should be over 90-95 per cent.

Finally, the government has acknowledged that initially there will be very limited buyers of wafers of any fab plant in India because there are hardly any fabless design companies like Qualcomm to place orders. This means the foreign technology partner should also commit itself to a substantial buyback and offtake agreement.

Officials say that their discussions with fabless companies like Qualcomm, NXP Semiconductors and HP have been fruitful as they are ready to shift orders for making chips for their Indian requirements to domestic fab plants. But with one condition: the quality should be the same as available globally and the price has to be competitive. That can only happen if the technology partner plays a key role.

Where the government feels more confident is dealing with IDM players who make their own design and fabricate the chips in their own fab plants.

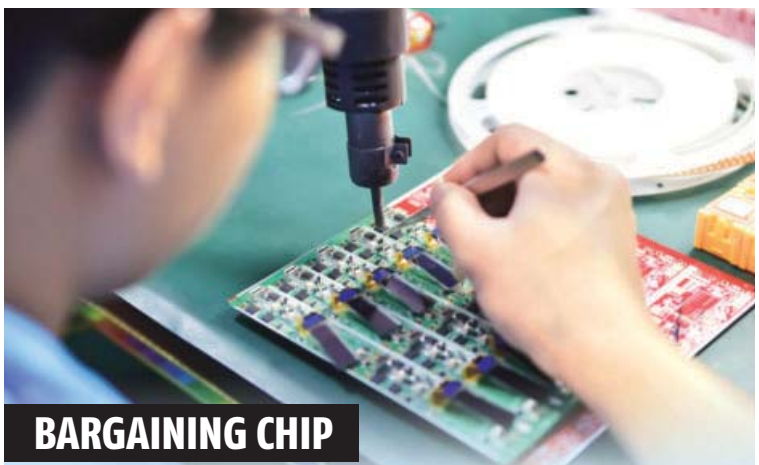
"There are several advantages to getting them to India. We don't have to worry about offtake from India or technology, as both are assured," said a government official.

The problem here is that the big IDMs like Intel or Samsung have not shown much interest in India, even though both have a substantial presence. But Micron and SK Hynix seem to be close to taking the first steps in that they are willing to shift their ATMP functions to India to test the waters.

Micron has already signed a transfer pricing agreement with the government, under which its plants globally will import the wafers that will be processed and exported from India. Talks are on to push it further to set up a fab plant but that could take some doing.

Many experts say India should concentrate on compound semiconductor plants based on gallium nitride or silicon carbide rather than pure silicon. They require investments ranging from $100 million to $500 million, can be built quickly, and enjoy a growing market in cars, telecom equipment and power electronics.

In fact, post-withdrawal, Foxconn is looking at a gallium nitride-based compound semiconductor plant that could meet its automobile chip requirements. It is expected to unveil its plan to build more than one fab plant very soon. And some Indian players are also on the horizon. That could well be the way to begin.



BARGAINING CHIP

- India's semiconductor foray has coincided with a rush by US, European, Japanese, South Korean and Taiwanese govts to be self-sufficient by pumping in $200 bn in subsidies
- Experts have advised India to establish clear eligibility criteria to build a fab plant, as the govt will be offering 50% of the cost of building it up as subsidy upfront, and it cannot afford to make a mistake
- The govt has also opened the door for new fab proposals, with an extended Dec 2024 deadline
- It has acknowledged that initially there will be limited buyers of wafers of any fab plant in India because there are hardly any companies to place orders
- Where the govt feels more confident is dealing with IDM players who make their own design and fabricate the chips in their own fab plants