

India Semiconductor Mission: Why experts are stumped by interest shown by two giants

Vedanta and Foxconn are leaders in their own fields but they will need a competent tech partner to make their chip-foray a success. This is a multi-part series on companies vying to be a part of India's leap into the future

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Experts say that the applicants so far lack core expertise in wafer fabs. (Photo: Pexels)

One of the applications to be filed under the Rs 76,000-crore **India Semiconductor Mission (ISM)**, and that which has generated much interest, was by Vedanta and its JV partner Foxconn.

The JV has sent in two fab proposals.

While both are giants in their respective sectors, they do not have expertise in chip making. So industry observers are puzzled and are wondering who they will rope in as a technology partner.

But this is a concern not just with Vedanta and its partner Foxconn's bid. It extends to all the five applicants who have expressed interest so far. The consensus among experts interviewed by Moneycontrol is that while these companies have been successful in their respective domain areas and have investment capability, they lack core expertise in wafer fabs and will need to find competent technology partners.

India's mission

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In December 2021, the Union Ministry for Electronics and IT (MeitY) invited applications under the India Semiconductor Mission (ISM).

Semiconductor chips are what powers the modern economy. They are needed to build electronics, home appliances, automobiles and medical equipment.

If a country is looking to be self-sufficient or self-reliant, it cannot do without a vibrant semiconductor industry. Therefore, the ISM.

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Bids were invited for two silicon CMOS fabs (or fabrication plants) in the 65 nm (or smaller) nodes with a minimum investment of ₹20,000 crore, two fabs for TFT LCD or AMOLED displays with a minimum investment of ₹10,000 crore, and compound semiconductor fabs. The government has offered up to 50% fiscal support, depending on the technology being offered.

Sceptics may point out that 65 nm nodes are among the larger nodes, and are now 10–17-year-old technology. Transistors—the building blocks of chips—can now be etched as small as 5 nm, about the width of two DNA molecules. However, due to lower cost and complexity, the larger nodes still find use in chips for lower-end uses such as automotive electronics, consumer gadgets, mobile devices, IoT (smart devices and internet-connected industrial machinery and sensors), and smart wearables (such as Fitness trackers and smartwatches).

In response to MeitY's invitation, five applications were sent in.

Three were for chip fabs – A JV between Vedanta and Foxconn, another from a group led by Singapore-based IGSS Ventures, and a third bid for the India Semiconductor Manufacturing Corporation (ISMC) from Abu Dhabi-based NextOrbit Ventures in partnership with Israel's Tower Semiconductor.

Two were for display fabs—from Vedanta Group, and Elest. Display units account for up to 25% of the value of smartphones and 50% for TVs. Given India's strong electronics industry, a display fab can offer significant value addition potential.

MeitY is also looking to support fabs for compound semiconductors, which are used in high-voltage circuits, LEDs, photonic sensors, telecom equipment, and other uses. These proposals for these are being accepted till 2025, to allow interest from diverse groups.

Miner and the motherboard maker

Vedanta sent in two fab proposals: a bid for a display fab, and a joint venture with Foxconn for a 28 nm CMOS fab. In a webinar on February 22, MeitY minister Ashwini Vaishnaw also mentioned Innolux Corp, a leader in display fab. Innolux Corp is a subsidiary of Foxconn; Innolux's customers include Samsung, LG, Dell, as well as electric car maker, Tesla.

Vedanta, primarily a mining and minerals company, has some experience in the semiconductor space, with a previous abortive attempt to set up a display fab in 2016.

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In 2017, it acquired a majority stake in AvanStrate Inc., a Japanese display glass substrate maker. Under the aegis of Sterlite, one of its subsidiaries, they formed Twinstar Display Technologies. However, the project was abandoned in 2019, owing to delays from the government.

According to news reports Vedanta expects the display fab unit to become operational by 2024 and the silicon fab in 2025. Their prior preparations will likely come in handy. “They were almost finalising the land at a few chosen locations and had done their due diligence. It was never put on the backburner, so whatever deals they were trying to negotiate earlier, they can probably rejuvenate and quickly go ahead with that. Getting into construction and getting started with production shouldn't be a problem for them,” says Vivek Saxena, a semiconductor-industry veteran and former CEO, Global Accelerator.

For Vedanta's chip fab venture, Foxconn will likely invest around \$118 –\$120 million with a 40% minority stake. “These are very serious players, especially Foxconn, they say we don't need a market, we ourselves will consume everything that we can produce in five fabs”, Ashwini Vaishnaw said in the webinar. Foxconn has significant internal needs for chips and displays, as well as strong design capabilities, which might explain the disproportionately large stake.

Neither Vedanta nor Foxconn have fab expertise and might need to bring technology from outside. “Foxconn is not a fab expert, it's an ECAT (Electronic Card Assembly and Test) expert. What is the underlying technology that Foxconn is going to bring?” asks an industry veteran, who did not want to be quoted. ECAT is an assembly process used to make motherboards.

“Vedanta says Foxconn has 28 nm IP, but this is usually related to design libraries. What you really need is the detailed technology, the various manufacturing steps. It isn't clear if they have a technology partner lined up or if they are still looking for one,” opines Arun Mampazhy, semiconductor veteran and analyst.

Pranav Komerwar, India CEO of Vedanta's Electronics Display and Semiconductor Division deferred to the advice of Vedanta's PR team and declined to answer queries at this time.