INSIDE: MANISH SABHARWAL,
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"India Cannot Become A Semiconductor Powerhouse With Fabs Alone"

SANDEEP KUMAR, Chief Executive, L&T Semiconductor Technologies, discusses the company's product and design focus, long revenue cycles, and the opportunities in energy and power in a conversation with BW Businessworld's **Rohit Chintapali**

L&T Semiconductor Technologies was set up at a time when India's semiconductor conversation was heavily focused on fabs. What was the thinking behind starting with product design instead?

The thinking was very simple. Building fabs is important and good for the country, but someone has to build products that go into those fabs. Our view is that India needed strong product companies, not just factories. So we decided to focus on products rather than fabs.

What we set up is a fabless design company. At scale, we are the first product company of this kind in India. There are many startups doing product design, but they don't have this scale or long-term backing.

At the time of India Semiconductor Mission 1.0 (ISM 1.0), design was not as prominent in policy conversations. How do you see this changing in ISM 2.0?

ISM 1.0 was largely built around fabs, OSATs and manufacturing. We had discussions with the government and said that while factories are important, you also need to incentivise product build-out. That thinking has started to evolve. ISM 2.0 has more clarity that design is critical. DLI exists, though it is more startup-focused today. Going forward, I expect more policy support that recognises the longer gestation and capital intensity of product companies like ours.

Semiconductor product companies are known for long revenue cycles. How should one look at your ramp-up timeline?

This is not a fast business. For anything other than defence and space, even a simple product takes a year to a year-and-a-half to design. After that, the customer has to build a system around your product, which takes another six months to a year. So effectively, you are looking at a three-year cycle before you see revenue. That's if everything goes right and you have a full team from day one.

For us, the first year was spent building the team. We are about two years and two months into the journey. Realistically, we are another two years away from meaningful revenue. So think of it as one year to build the team and three years to get products into the market.

How have you structured your business and product focus in this phase?

At the outset, we had to start somewhere, so we initially thought in terms of industry verticals. Today, our four core verticals are industrial, energy, communications and mobility. Over time, we realised that many power products can serve multiple verticals. A power product designed for energy can also work in industrial, mobility or even telecom.

So we restructured the business. Innovation and R&D are now more centralised, allowing cross-pollination of ideas. Earlier, when we were small, that wasn't possible. At one point, it was just me. Then we became 100 people. Now we are around 500 people, and cross-innovation makes a lot of sense. Sales and marketing, however, remain vertical-specific because you still sell differently to an energy customer versus a mobility customer.

Which verticals are likely to see early traction and revenue?

In the near term, we are seeing very high interest in industrial products and communications. Those are likely to be early revenue generators. But the really large revenue opportunity is in energy and power products. There is huge demand

there, but those products take time to develop and ramp.

If you look at the next three years, industrial and communications will contribute more. Three to four years out, the mix will flip, and power products will be much bigger than the rest.

Can you explain why energy and power are such large opportunities from a semiconductor standpoint?

If you look at how energy flows today, it's very inefficient. You generate power, step it up to high voltage for transmission, then step it down multiple times before it reaches homes or data centres. At every step-up and step-down, there is a loss. You never convert 100 per cent of what you put in.

If you have 10 stages in the pipeline and each stage is 95 per cent efficient, the final usable energy is around 60 per cent. Even at 98 per cent efficiency per stage, you're still losing a lot. Today, only about 60 per cent of generated energy is actually usable.

This is where power semiconductors make a massive difference. Higher efficiency conversions mean lower losses, less heat and significantly reduced cooling requirements. In data centres, for example, a single conversion improvement can reduce cooling needs by 60 per cent and allow you to pack much more power per rack. That's a huge structural change.

How does this translate into product strategy for L&T Semiconductor Technologies?

We started by understanding product-market fit across compute, communications and power. We wanted to show customers that we had differentiated ideas and could bri real value. Once we saw that pow products were relevant across mobility, energy, industrial and communications, it made sense to consolidate R&D.

Now, ideas developed for one sector can be reused or adapted for another. That leads to better optimisation of R&D spend, faster execution and stronger products overall.

What about geography? Where are you seeing customer interest coming from?

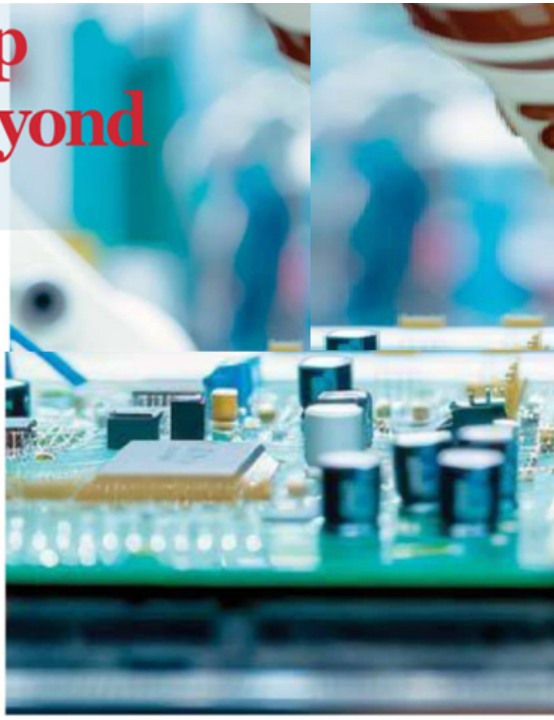
We see interest across the US, Europe, Japan and India. Roughly speaking, the demand is fairly distributed, though it varies by product and vertical. Industrial and communications see strong traction in developed markets, while energy and power have massive long-term potential everywhere, including India.

What should investors and policymakers understand about building semiconductor product companies in India?

This is a long-term game. Product companies need patience, capital and policy support that recognises long development cycles. You can't judge progress quarter to quarter. If India wants a complete semiconductor ecosystem, it needs strong product companies alongside fabs and OSATs. That's the gap we are trying to fill.

India's Chip Future–Beyond Fabs

India has semiconductor talent at scale, but turning design strength into globally competitive IP-led chip companies remains the bigger challenge By Urvi Shrivastav



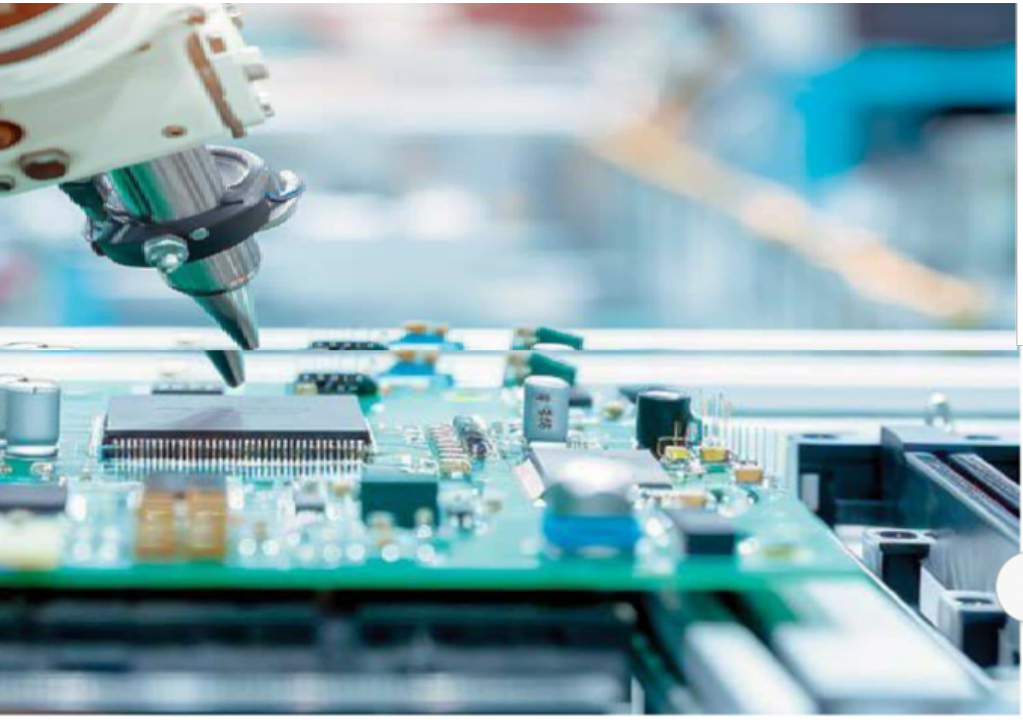
Photograph by Gerain0812

INDIA'S SEMICONDUCTOR narrative today is dominated by manufacturing ambition. Large fabs, multi-billion-dollar investments and job creation dominate official messaging under the India Semiconductor Mission (ISM). But semiconductor manufacturing is a long-cycle play, often taking years before becoming [illegible]al and commercially viable. Even as the government [illegible] to push manufacturing through subsidy-led incentives and ecosystem building, the immediate opportunity may lie in semiconductor design, where India already commands one of the world's largest pools of chip design talent but still lacks globally competitive fabless firms with meaningful intellectual property (IP) ownership. The Union Budget 2026–27 allocated Rs 1,000 crore toward the India Semiconductor Mission (ISM) 2.0, while the government has already approved 10 ISM projects worth Rs 1.60 lakh crore across six states. India's semiconductor market is also projected to reach $100–110 billion by 2030, underlining the scale of the opportunity ahead.

India's Real Chip Advantage

What is often underplayed is that India is already one of the world's largest semiconductor design talent hubs. Global chipmakers continue expanding engineering operations in the country, and Indian engineers contribute to some of the most advanced semiconductor products globally. "India's design talent has scaled strongly through global design services, but transitioning to IP ownership now needs deeper risk capital, stronger product management and better market access," said Navin Bishnoi, VP & India Country Manager at Marvell Technology.

Industry executives also argue that the global semiconductor conversation is often misunderstood in India. While fabs dominate headlines, much of the value creation globally comes from semiconductor products, architecture and IP ownership. Design and intellectual property contribute a significant share of a chip's value, while fabless semiconductor firms continue to account for a meaningful portion of global semiconductor innovation and commercialisation. With India accounting for



nearly 20 per cent of the world's semiconductor design engineers, industry leaders believe the country holds a structural advantage in the very layer of the semiconductor value chain that drives long-term differentiation and competitiveness.

"The opportunity now is to ensure design gets proportionate and sustained attention, because a country with extraordinary design talent has every reason to aspire to be not just a contributor to the global semiconductor supply chain, but a creative force within it," said Kamolika Gupta Peres, Vice President, India and SAARC, Autodesk.

"Manufacturing matters, but it's not where differentiation starts," said Sandeep Kumar, CEO of L&T Semiconductor Technologies, during an interview with BW Businessworld recently. The rise of fabless semiconductor firms globally has reinforced this trend, with companies focused on specialised chip design increasingly driving industry growth and shareholder returns.

This gap is precisely what the government attempted to address through the Design Linked Incentive (DLI) scheme under ISM. The policy aimed to support fabless startups, encourage indigenous IP creation and reduce dependence on imported technologies. More recently, policy conversations around ISM 2.0 and recent budget announcements have increasingly shifted toward strengthening the design ecosystem alongside

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manufacturing. Government data shows the DLI scheme has already sanctioned 24 semiconductor design projects, leading to 16 tape-outs, six fabricated chips and the creation of over 140 IP cores.

Industry observers note that investor interest in India's semiconductor ecosystem has strengthened in recent years, supported by policy interventions such as the India Semiconductor Mission and the Design Linked Incentive scheme, alongside growing geopolitical emphasis on semiconductor supply-chain diversification. Rather than competing directly in advanced fabrication, many Indian startups are increasingly focusing on fabless chip design, semiconductor IP, RF technologies, embedded systems and power electronics, areas where India can leverage its strong engineering talent base.

"The market has witnessed a visible inflection point in recent years, supported by stronger policy momentum, increasing strategic relevance of semiconductors and expanding investor interest in deep-tech innovation," said Neha Singh, Co-founder, Tracxn.

The Execution Gap

However, industry voices say policy execution remains inconsistent. Startups continue to point to delays in approvals, disbursement cycles, auditing requirements and procedural complexity. Semiconductor design startups operate in a capital-intensive and time-sensitive environment, where delays can directly affect product development timelines. "The intent behind the DLI scheme is directionally strong, but the next phase should focus on operational efficiency, faster disbursement cycles and simplified compliance," said Nikul Shah, Founder & CEO of IndieSemiC.

There are also deeper structural gaps that policy alone cannot immediately solve. Semiconductor businesses require patient capital, long development cycles and sustained ecosystem support. Unlike software startups, semiconductor companies often take years before generating meaningful commercial returns. Industry executives point out that semiconductor development follows a fundamentally different commercial cycle compared to conventional technology businesses, with chip validation, integration and testing of-

NIKUL SHAH

Founder & CEO, IndieSemiC

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FUNDING MOMENTUM

Funding in India's semiconductor and chip-design startup ecosystem remained muted for much of the last decade before accelerating sharply after 2023, signalling rising investor interest in fabless and deep-tech semiconductor ventures

ten taking several years before revenue visibility emerges. A single tape-out can cost millions of dollars, while the journey from initial design to a market-ready product can often take three to five years. India's venture ecosystem has historically remained cautious around deep-tech investments, limiting the ability of startups to scale aggressively even when technical capability exists.

The Missing Demand Engine

Another challenge is that India's large electronics demand does not automatically translate into success for Indian semiconductor firms. Semiconductor sourcing decisions remain deeply global, driven by performance, reliability, cost and long-term supply assurance rather than geography alone. Industry leaders say Indian semiconductor startups will need to compete on global benchmarks from the outset rather than relying on domestic demand alone to create sustainable market opportunities.

At the same time, executives argue that stronger domestic procurement support could play a critical role in helping Indian semiconductor firms scale commercially. A stronger domestic demand engine, where government bodies, defence, infrastructure players and large enterprises act as early anchor customers, could help startups secure first commercial wins, establish credibility and attract future investment. Industry leaders say such early adoption is often one of the strongest accelerants for deep-tech ecosystems globally.

At the same time, industry leaders argue that India's manufacturing-first approach was not entirely misplaced. In a geopolitically sensitive industry shaped by supply chain disruptions and strategic dependencies, fabs became symbolic of seriousness and strategic intent. Executives say large-scale manufacturing announcements helped position India more credibly within the global semiconductor conversation, even if manufacturing itself remains a long gestation play.

The broader consensus emerging across the industry is that India now needs to move from semiconductor ambition to semiconductor depth. That means faster policy execution, institutional continuity, patient capital and stronger commercial adoption of Indian-designed chips. Such commercial validation, executives argue, is critical for helping startups transition from outsourced design services to globally competitive product companies with state-of-the-art capabilities and meaningful IP ownership.

Manufacturing will remain important, but it is still a long-term game. In the near term, semiconductor design remains India's clearest leverage point, and the success of ISM 2.0 may ultimately depend not only on how many fabs India builds, but whether India can create globally competitive semiconductor product companies with strong indigenous intellectual property.

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