

Singapore's pipeline of local semicon talent still years away from meeting demand: industry watchers

Recent flexibility to hire foreigners for certain roles will help firms close near-term gaps

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SINGAPORE'S pipeline of local semiconductor talent is still years behind industry demand, even though efforts to build it up are underway, said industry observers.

In the meantime, semicon firms must rely on foreign manpower to make up the shortfall – especially for roles requiring specific technical skills and expertise, such as in integrated circuit design and manufacturing process optimisation.

To address this, the Ministry of Manpower (MOM) recently gave companies more flexibility to hire foreign talent for certain roles.

In November, three new semicon engineering roles were added to the shortage occupation list for Employment Pass (EP) applicants: semiconductor, instrumentation and process engineers.

Applicants for jobs on this list get bonus points under the current EP framework, making it easier for them to qualify.

Local workforce buildup

The addition of these semicon roles will help companies address immediate manpower needs while they wait for sufficient local talent to be developed, said industry players.

In response to *The Business Times*' queries, an Economic Development Board (EDB) spokesperson noted that in the last two years, Singapore secured more than \$18 billion worth of semiconductor-related investments in manufacturing, as well as research and development.

"These investments are generating demand for talent in areas such as integrated circuit design and microchip engineering, which require skill sets that will take time to build up," said the spokesperson.

"Occupations on the shortage occupation list will help the industry meet these immediate skills gaps, to support the growth of the semiconductor industry and the local supplier ecosystem that includes precision engineering SMEs."

Singapore Institute of Technology (SIT) associate professor and

electrical and electronic engineering programme leader Neelakantham Venkatarayalu noted rising interest from students in semiconductor-related courses.

From 2022 to 2024, SIT's undergraduate intake for engineering courses grew 18.9 per cent to 1,015. Courses relevant to the semiconductor industry have a "healthy" subscription rate of three students for each course vacancy, he added.

While the admission process is "holistic", the high subscription rate does mean that higher-performing students tend to be offered these courses.

Fresh graduates still need to be trained when they enter the workforce, he added.

Companies need to transfer specialised knowledge of "their own products, manufacturing and processes capability".

Given all this, it may take three to five years for Singapore to see a "more noticeable increase" in the local semicon talent pool, said Ang Wee Seng, Singapore Semiconductor Industry Association (SSIA) executive director.

"Building a strong local semiconductor talent pipeline takes time as students need to be trained, gain industry exposure and develop the necessary expertise before they enter the workforce in full capacity," he said.

AMD Singapore Chai Chee site lead El Saravanan estimated that it could take about seven to eight years for an engineering student to gain enough knowledge and proficiency to take on in-demand job roles.

Since various training initiatives – including AMD's own programmes – were rolled out only in the past few years, it will take time for them to bear fruit, he added.

The recent addition of semicon roles to the shortage occupation list comes as multinational chip giants make new investment commitments in Singapore.

These include Vanguard International Semiconductor Corporation, NXP Semiconductor, Siltronic and Micron, all of which have announced and opened new plants in Singapore – with associated job creation – since March 2024.

For instance, Micron's new advanced packaging facility at Wood-



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lands is expected to create 1,400 jobs, on top of the company's current Singapore headcount of over 9,000.

Foreign employees whose roles are on the shortage occupation list may enjoy greater certainty, as this makes it easier for them to renew their EPs, said AMD's Saravanan.

"It gets difficult for them to... keep their families with them... so that is a push factor for some of the brightest minds to leave this country," he said.

Greater certainty may allow them to bring their families to Singapore, keeping them more rooted here.

Less impact on local firms

However, the shortage occupation list additions are not expected to have a significant impact on local semicon companies.

Local firms have adapted to employing fewer foreign workers as quotas have tightened over the years, said Grand Venture Technology (GVT) chief executive Julian Ng.

GVT is looking to hire local engineers with mechatronics experience to introduce new products.

Foreign workers are considered only if they can offer specialised skill sets.

That EDB was the supporting sector agency for the additional shortage roles suggests that the move aimed to support multinational corporations rather than local businesses, noted Ng. Typically, local small and medium enterprises would seek help from Enterprise Singapore.

An MOM spokesperson told BT that the shortage occupation list is developed by MOM and the Ministry of Trade and Industry (MTI) in consultation with sector agencies such as EDB, as well as tripartite partners.

Occupations for the list are evaluated based on three criteria: strategic importance to Singapore's economic priorities; the degree and nature of labour shortage; and the sector's commitment to developing the local pipeline.

"The SOL (shortage occupation list) is a dynamic list that is regularly reviewed by MOM and MTI to ensure it remains responsive to changes in the labour market," said the spokesperson.

Meanwhile, both companies

and institutes of higher learning (IHLs) continue to invest in programmes to attract and train more talent for the sector.

The EDB spokesperson said that the agency and Enterprise Singapore continue to work closely with semiconductor companies and IHLs to equip Singaporeans with skill sets to participate in the sector's growth.

Many options for learning

Since 2022, AMD has partnered SSIA to hold an integrated circuit design camp for undergraduates, giving them the chance to learn from practising engineers and obtain work experience.

Also since 2022, the College of Design and Engineering at the National University of Singapore (NUS) has allowed students to specialise in advanced electronics. The course covers industry practices related to semiconductor fabrication, chip manufacturing, IC design and prototyping.

"Students have also shown increasing interest in pursuing semiconductor-related courses and specialisations, such as advanced electronics," said an NUS spokes-

person. NUS graduate programmes also offer internship opportunities at companies and research institutes such as GlobalFoundries, Stats ChipPac and A*Star's Institute of Microelectronics.

Nanyang Technological University offers programmes that equip graduates for roles such as IC designers, failure analysts and process engineers, and provides students with internship opportunities in the sector.

But associate provost for undergraduate education Gan Chee Lip noted that interest in semiconductor-related specialisations has fluctuated over the years, due to perceived challenging work conditions and cyclical trends in the industry.

Training must also go hand in hand with talent retention, noted AMD's Saravanan. That is why the company puts existing engineers through upskilling programmes in collaboration with EDB and local universities.

"To get past MOM's relief that they have given us, we have to focus on building our local pipeline for longer-term needs," he said.

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