CASE STUDY

Singapore

Singapore shows how coordinated education, training and industry collaboration can build the workforce needed for a growing semiconductor sector

Singapore is one example of a semiconductor industry arriving before the talent existed to support it. The country has built and fostered the development of talent to support a system that now produces one in ten of the world's chips[43]. Australia faces a similar starting position: it lacks a talent pipeline to support the current industry and research capacity and capability needed for today. Singapore's history shows what closing that gap can look like in practice, one mechanism at a time, layered over decades.

In 1968, Singapore had no electronics industry or domestic skilled workforce to support one[44]. Singapore's Economic Development Board engaged US chipmaker National Semiconductor that year, to set up a presence in Singapore with a promise of cost competitive, disciplined and readily trainable workforce[45]. Other companies followed, and the industry took hold before any talent pipeline existed. Vocational institutes built with international partners followed, training Singaporeans directly for the electronics jobs multinational companies were creating.[46]

By the late nineties, the workforce skill profile had markedly improved as the industry developed its capability across the value chain. Chartered Semiconductor Manufacturing, Singapore's domestic wafer fab[47] was training local engineers and partnered with universities National University of Singapore (NUS) and Nanyang Technological University (NTU) on research.[48]

However, there was still a need for more professional, technical and specialist talent that the domestic system could not produce fast enough.[49] The government began actively recruiting international talent to support its industries including semiconductors through recruitment missions abroad to attract foreign students and improved pathways for skilled migrants.[50]

Through the 2000s, local universities including NUS and NTU introduced microelectronics and IC design majors run jointly with industry, producing talent purpose-built for roles in the sector.[51] This ran alongside the vocational training system and the international recruitment drive already in motion.

Today, Singapore delivers a program containing several initiatives to continue building its talent pipeline. University and vocational training, spanning NUS, NTU, Singapore Institute of Technology and the polytechnics, feed a steady pipeline of engineers and technicians straight into industry. A mid-career conversion program has moved almost 3,000 professionals from sectors like precision engineering and aerospace since 2016, with up to 70 per cent salary support during training.[52] Targeted visa settings, including acknowledgement of specific semiconductor roles on the national Shortage Occupation List, fast-track foreign talent into the gaps neither pipeline can fill fast enough.[53]

Singapore faced a challenge Australia now confronts. It closed that gap through sustained, layered investment over decades, adding new mechanisms as the industry evolved while maintaining those already in place. Vocational training, university pathways and skilled migration were each strengthened or introduced in response to different stages of industry development and workforce demand. Australia's task is similar: to build the mechanisms that meet today's talent needs while progressively developing the deeper domestic pipeline required for the future. This will require sustained commitment over decades, with successive interventions building on—not replacing—those that came before.