ELECTRICAL & ELECTRONICS

TRANSITIONING TOWARDS HIGHER VALUE-ADDED ACTIVITIES

Together with Penang and the Klang Valley, Johor is a critical electrical and electronics (E&E) centre in Malaysia — with back-end semiconductor manufacturing facilities as well as serving as an electronic manufacturing services (EMS) hub for some the world's largest EMS companies. The state's attributes, particularly its proximity to Singapore, continue to present tremendous opportunities.

THE electrical and electronics (E&E) industry forms a significant part of Johor's manufacturing sector. According to the Malaysian Industrial Development Authority (Mida), the industry accounted for almost 20% of approved investments in the state's manufacturing sector between 2019 and 2023 (RM10.1 billion out of RM54.4 billion), potentially creating more than 19,140 job opportunities.

The top three foreign investors — from Taiwan, Singapore and Japan — displayed significant interest in Johor's E&E industry, underlining its growing importance globally. Data from the Malaysian Semiconductor Industry Association (MSIA) puts the E&E industry as the leading industry in Johor's manufacturing sector in 2021, with almost a one-third share. With a value-add of RM13.386 billion in 2021, the state contributed 14% of Malaysia's E&E sector in terms of gross domestic product (GDP), says MSIA.

Mida CEO Datuk Wira Arham Abdul Rahman says, over the years, "Johor has garnered the esteem of some of the world's most renowned electronics companies, such as STMicroelectronics, Micron Semiconductor, Flextronics, Dyson, Celestica and Foxconn Technology. Multinational corporations (MNCs) often establish manufacturing facilities in Johor due to its strategic location, infrastructure and supportive government policies."

The E&E industry's start in Johor can be traced to the 1970s and 1980s. Arham says back then, Malaysia, including Johor, embarked on an ambitious industrialisation drive, attracting foreign direct investments, particularly in labour-intensive manufacturing sectors like textiles and electronics. "The government offered incentives such as tax breaks and infrastructure support to lure MNCs to set up manufacturing bases in the country. During this period, much of the investment in Johor's E&E industry centred on assembly operations. MNCs would set up assembly plants to manufacture components or products for export. These operations often involved labour-intensive processes," he says.

Nonetheless, it was not until the 1990s that Johor's E&E industry began to develop, driven by MNCs shifting out of Singapore, and changing industrial policies in the state. Celestica head of Asia operations, advanced technology solutions, Yong Chong Chin says, historically, Singapore was the manufacturing hub in Asia. "Over the years, because of the cost escalation in Singapore, they had to start moving the manufacturing out of Singapore and, at that time, given its proximity, Johor made a lot of sense. These companies could still have the so-called

MIDA

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CELESTICA

control tower in Singapore with a lower cost manufacturing arm in Johor."

But this scenario evolved, he says, thanks to Johor's maturing manufacturing sector — particularly in industries such as plastics and sheet metal. "These industries are quite established in Johor; creating a good ecosystem for the E&E companies."

Arham points out that in the last two decades, Johor's E&E industry has transitioned towards higher value-added activities such as semiconductor manufacturing, research and development (R&D), and design services. "This shift reflects Malaysia's aim to move up the value chain and reduce dependence on low-skilled assembly work. The industry has diversified its product offerings beyond traditional consumer electronics to include semiconductor devices, industrial automation equipment, telecommunications hardware and more. This diversification has enhanced the resilience of Johor's E&E sector," he adds.

Starting with printed circuit board assembly, E&E players today, like Celestica, offer a full range of integrated vertical capabilities.

"At Celestica Johor, for example, we manufacture ultrasound machines for our healthtech customers," says Yong.

Johor's E&E industry began to develop in the 1990s, driven by MNCs shifting out of Singapore

Celestica's business in Johor began in 2001 when it acquired an EMS company that was already operating in the state — expanding the operations over the years. Today, the group has four campuses in Johor, totalling six factories and a headcount of more than 2,000 employees. The operations in Johor are diversified, he says, adding that they serve customers from industrial, semiconductor, healthcare and consumer segments. Most of its customers, he adds are Tier 1 original equipment manufacturers.

The evolution and maturing of companies supporting the E&E industry did not happen overnight, he adds. "We helped develop the ecosystem. For example, wafer fabrication equipment assembly requires a lot of machining and sheet metal, and local vendors were not familiar with the stringent requirements and processes. So, we sent our subject matter experts to help them establish their process and help develop their capabilities."

Arham also points to the establishment of high-tech parks and industrial clusters to promote innovation and collaboration within the E&E industry.

"Iskandar Malaysia, for example, hosts several high-tech parks aimed at attracting

investments in advanced manufacturing and technology-intensive industries. In recent years, there has been a strong emphasis on adopting Industry 4.0 technologies within Johor's E&E industry. The government has introduced initiatives to support digital transformation, automation and the adoption of smart manufacturing practices to enhance competitiveness and productivity. There is a growing focus on promoting R&D and innovation within the E&E industry. This includes partnerships between industry players, academia and government agencies to drive technological innovation and develop indigenous capabilities," he adds.

Today, this mature ecosystem and established supply chain are the selling points of Johor's manufacturing sector. "When we have new customers, I do bring them to Johor; those who have a design and regional office in Singapore more often than not prefer Johor to Penang. So, the proximity to Singapore is a unique proposition for Johor," says Yong.

Arham concurs, adding that Johor's proximity to Singapore presents opportunities for collaboration and synergies between industries in both regions. "Companies in Johor can leverage Singapore's expertise in areas such as R&D, technology innovation, and access to capital markets," he says. He reckons that compared with states such as Penang and Selangor, Johor offers a relatively lower cost of living and operating, including land and labour costs. "This cost-competitive environment is attractive to investors, particularly for labour-intensive manufacturing activities."

In addition, that Johor's E&E industry is part of a diverse industrial base, which includes other sectors such as manufacturing, logistics and services, is another advantage. "This diversification offers resilience against economic fluctuations and provides opportunities for cross-industry collaboration and innovation," says Arham. These factors, he adds, collectively contribute to Johor's attractiveness as a destination for E&E investment and manufacturing activities, particularly in the era of Industry 4.0.

"The rising need for cloud services and data centre operations in Johor is drawing in numerous IT infrastructures dedicated to hyperscale data centres. Key players like Wiwynn, Supermicro, Compuware, and Ablecom have chosen to establish their operations in the region, indicating Johor's increasing importance as a tech hub."

MSIA director Andrew Chan Yik Hong agrees, pointing out that "the announcement by Nvidia Corp, a US$2 trillion semiconductor fabless company listed on the US Nasdaq, that it will build a RM20 billion AI infrastructure in Johor opens up a new E&E opportunity for Johor and Malaysia".

He says the proposed Johor Singapore Special Economic Zone (JS-SEZ) will be another boost for Johor. "If we were to take the best of what Johor and Singapore have to offer, the JS-SEZ could be a true game changer for both Malaysia and Singapore. Malaysia's abundant supply of land and access to human capital, combined with Singapore's relative comparative advantage in investment capital and access to technology, would be hard to beat.

"Malaysia and Singapore are key players in the semiconductor value chain. MNCs would not have to choose whether to invest in Malaysia or Singapore. The JS-SEZ would combine the best of Malaysia and Singapore in one location. China's Shenzhen SEZ, set up in 1979 and adjacent to Hong Kong, offers a window to what is possible for JS-SEZ," he says, adding that critical to the success of the SEZ is its framework, implementation and consideration of the input from relevant stakeholders, especially the private sector.

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Like other industries, the E&E industry has its share of challenges. Arham concedes that given the more attractive Singapore dollar and the proximity of Johor to the city state, retaining talent in the E&E industry can be challenging. Skilled workers may be lured by higher salaries and better career opportunities across the border, he says.

Then there is the challenge of skills mismatch and desired competency. Mismatches in required skills, shortages of graduates experienced in high-skilled job categories,

MSIA

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the lack of soft skills — such as communication, problem-solving, competency and the preference among students to be part of the gig economy rather than the manufacturing sector — are some of the challenges plaguing the E&E industry and the manufacturing sector as a whole, both in Johor and throughout the country.

To address these issues, he says, Mida has undertaken initiatives to develop future-ready talent to address industry's manpower requirements. These include industry-academia collaboration, where Mida is connecting industries with academia to develop crucial skills required by industry and foster information exchange among industry and higher learning institutions.

"Another strategic initiative between Mida and academia to bridge the gap between talent and industry is the door-to-door talent internship facilitation programme," says Arham, adding that Mida has also collaborated with training institutions to reduce the skills gap and address unemployment.

"These include talent development programmes tailored to support the E&E ecosystems, with 15 focus areas identified to meet industry needs, Skills and Technical Enhancement Programme (STEP), which covers 24 focus areas such as big data analytics, integrated IOT and cybersecurity, welding inspection, mechatronics system, to name a few, and the upskilling and reskilling programme, including specialisation in CAD-CAM, engineering competence for Industry 4.0, industrial robotic and automation, manufacturing technologies and advanced CNC technologies," he adds.

OPPORTUNITIES IN JOHOR'S E&E INDUSTRY

As is the case with other E&E hubs in Malaysia, Johor's E&E industry benefits from the US-China chip war. In 2021 and 2022, Malaysia's E&E exports grew 18% and 30% respectively, MSIA's Chan says.

"Malaysia's 3% contraction in 2023 to RM575 billion is much lower than the 8.2% global contraction mainly because MNC's factories in China diverted some of their products to Malaysia. There are also companies implementing a mitigating strategy by selecting Malaysia as their 'plus one' location," he says, adding that this is a trend that will continue as many Chinese companies are evaluating Malaysia as their "plus one" location to mitigate the challenges faced by the geopolitical tensions.

In 2024, the global technology upcycle is expected to create high demand for semiconductors. Quoting the World Semiconductor Trade Statistics, Arham says global semiconductor sales are expected to grow by 11.8% in 2024.

For Johor, the upcoming SEZ and other drivers such as increased investment, infrastructure development, technological advancements, collaboration opportunities with Singapore, diversification and supply chain integration translate into a promising outlook for the E&E industry. "By capitalising on these opportunities and addressing challenges effectively, Johor's E&E industry is poised for sustained growth and competitiveness in the global market. In addition, there is a lot of potential in Johor as the E&E industry plays an important role in enabling various technological applications, among others medical devices, industrial automation, transportation systems, Internet of Things, aerospace technology and renewable energy solutions," he says, adding that the focus on high valued-added activities is also in line with the New Industrial Master Plan 2030.

Yong adds that fostering greater collaboration between industry and the state government, particularly in addressing business needs, will also be a critical component of growth for Johor's E&E industry. ● *By Sreerema Banoo*

The interview with Datuk Wira Arham Abdul Rahman took place in March 2024, prior to his retirement from public service on April 17, 2024.