Malaysian E&E industry: The Past, Present and Future? June 2021

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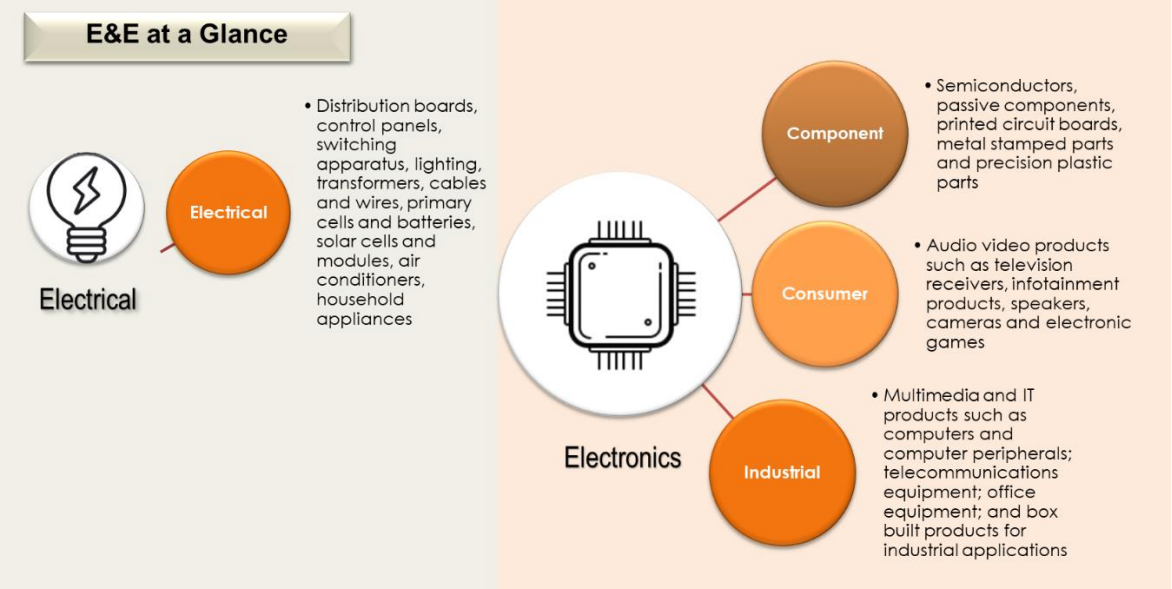
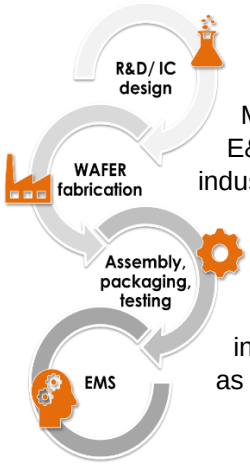
Malaysia's diverse electrical and electronic (E&E) industry is in its 5th decade of operations, having started with just 8 component production companies in the 1970s. Today, the E&E industry is one of the pillars of the Malaysian economy, manufacturing products ranging from semiconductor devices to consumer and industrial electronics. These include printed circuit boards, electronic components and appliances such as televisions and mobile devices.

The country's E&E industry is known for its manufacturing strengths in semiconductor assembly test and packaging, storage, electronics manufacturing services (EMS), medical devices, light-emitting diodes (LEDs), solar systems, and industrial electronics as well as global business services and automation systems.



The E&E industry accounted for a notable 6.8% of the country's GDP in 2020 (2019: 6.3%) and contributed 39% of export earnings (2019: 37%). This mature industry continues to grow with the adoption of new, innovative, and advanced technology. In the fast-expanding E&E market, our major export destinations include Singapore, Hong Kong, USA, China and Japan.

Malaysia ranks 7th in Global E&E exporters (World Trade Atlas)



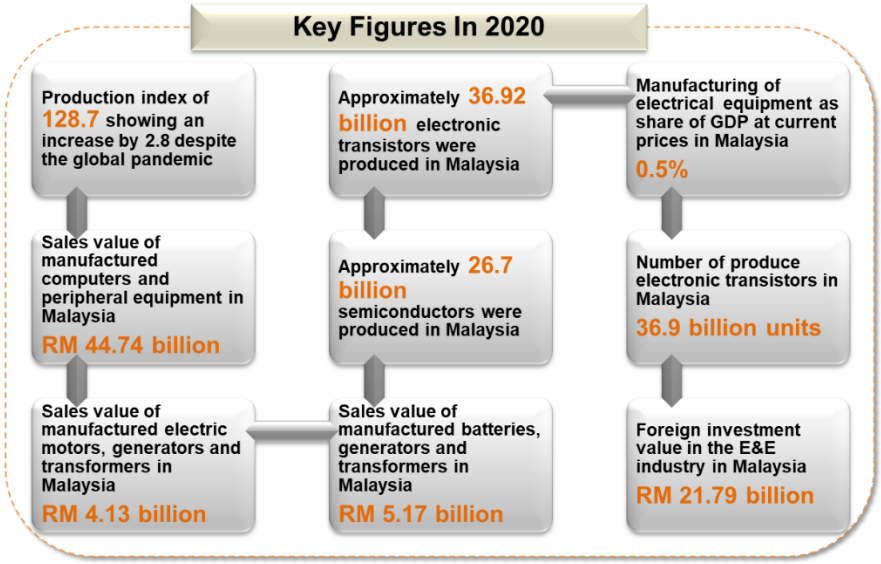
Malaysia has one of the most comprehensive ecosystems in the region in the E&E, machinery and equipment, aerospace, automotive, and medical devices industries. However, most of the local E&E companies listed on Bursa Malaysia are only involved in the mid to lower end of the E&E value chain (back-end), serving foreign semiconductor manufacturers, brand owners, integrated circuit (IC) developers and fabricators. Malaysia's E&E industry has minimal participation in the higher value-added activities (front-end) such as generating intellectual property, design and development of ICs, wafer fabrication as well as software development and engineering.

Ranked 29th out of 60 countries in the Bloomberg Innovation Index 2021, Malaysia slipped by 2 positions from the previous year. While we fared poorly in terms of the share of labour force with tertiary education (50th) and productivity (46th), we came in 10th for manufacturing value-added. This means that we are relatively good at adding value to items that are being manufactured, moving it further towards its end state, but at the same time, we do it rather inefficiently and labour-intensively.

Despite a significant E&E import, the local value-adding had increased to 35% as at end-2020, up from 24% a decade ago. Nonetheless, the fundamental characteristic remains: value-adding is relatively low at the back-end. So, have we reached a point of stagnation?

According to Datuk Seri Wong Siew Hai, the Chairman of Electrical and Electronics Productivity Nexus (EEPN) and former coach in the Cradle Growth Programme for SMEs, Malaysia's E&E industry is a leader in the back-end manufacturing (assembly, test and packaging) which contributes only 10% to the value of the finished semiconductor chip. The remaining 90% are contributed in equal portions by front-end manufacturing (wafer fabrication), and design and development. This does not mean we are not doing well, because **back-end manufacturing also involves high technology**. **However, we should also develop our capabilities into high value areas** where we are lacking, such as design and development.

"Electronics manufacturer, Inari Amerton Bhd is a role model; it has spent hundreds of millions in supporting local companies," says Wong. In recent years, EEPN has organised SME leadership training for companies with revenue from RM3 mil to RM 10 mil. The focus is to provide exposures towards business and marketing strategies, pitch and win, digitalisation and ways to develop and retain talent.



In the late 1990s and early 2000s, Malaysia took steps to enter the extremely challenging and competitive area of IC fabrication as well as expand into IC design. South Korea, China, Taiwan and Singapore also followed this pathway, and to date have shown that their front-end industries are thriving. What about the situation in Malaysia?

Silterra was first conceptualised in 1995, and eventually launched in 2001 after six years of planning, fundraising, construction, commissioning and technology acquisition. The campus in Kulim was to house three cleanrooms and was supposed to confidently drive Malaysia forward in this global business. It was meant to push our exports up towards the higher end of the value chain. After more than 20 years, the fabrication facility is still sub-scale in its output and is a miniscule player in this competitive global landscape. Without sufficient volume production, it is challenging to recover the high costs of semiconductor process development and engineering.

Taking the design of an IC into the physical world depends greatly on the abilities and willing support of the fabrication facility. Even if the facility is capable of fabricating a design, it may or may not choose to proceed to fabrication as the decision is purely business driven. As such, the healthy relationship between the IC design market and having an accessible and supportive fabrication facility is critical.

Early stages of innovation to create the prototypes, testing and developing the concepts require as much support as possible. To drive the E&E industry in Malaysia to new heights, there must be government support for improved tax incentives for local companies and foreign investors, strategies to attract and develop talent, policies to boost local capabilities in designing IC and industrial software, as well as campaigns to encourage buying locally produced components and machinery.

MIDA, the Malaysian investment Development Authority is therefore trying to adjust the Malaysian business environment on the growing needs of the E&E industry by embracing the industry 4.0. This includes investments in core focus areas such as FHE materials scale-up, thinned device processing, device/sensor integrated printing and packaging, system design tools, and reliability testing and modelling. These are some of the areas along the value chain where aspiring SMEs can participate and venture into. Moreover, the Ministry of Energy, Science, Technology, Environment and Climate Change (MESTECC) has a programme – Dana Modal Teroka – where it provides venture capital financing to companies in the E&E sub-sector.

The global health crisis has propelled a surge in demand for mobile devices such as laptops, smartphones and tablets, as well optoelectronics and storage devices. Malaysia's place in the global technology landscape is unique. Our costs are competitive, we have an established back-end industry and are seen as respectful of intellectual property laws. While we need not compete head-on with the established players globally, there are opportunities for Malaysia to be a part of the technological future by focusing on the high-value and high-growth manufacturing activities.

Sources:
BMI Research, Statista, EMIS Company Database, Euromonitor, Frost & Sullivan, The Edge Malaysia (opinion piece by Kamarulzaman Mohamed Zin), The Star, Electrical and Electronics Productivity Nexus (EEPN), Belfer Centre for Science and International Affairs (Harvard Kennedy School, July 2020), SME Corp, MIDA, DoSM and SME Bank SCEA

EEPN is an industry-driven and government supported initiative that was formed in 2017 under Ministry of the International Trade and Industry's Malaysia Productivity Corporation, to boost the E&E industry's contribution to the national economy.

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