

7. INDUSTRY OVERVIEW

PROTEGE ASSOCIATES SDN BHD (200401037256/675767-H)
SUITE C-09-12, PLAZA MONT' KIARA
2 JALAN KIARA, MONT' KIARA
50480 KUALA LUMPUR, MALAYSIA
GEN +603 6201 9301 FAX +603 6201 7302
www.protege.com.my

Protégé
ASSOCIATES

BRAND | FINANCE | MARKET

The information in this Section 7 is based on market research conducted by Protégé Associates commissioned by CPE Technology Berhad for the purpose of the IPO.

Date: 27 June 2022

The Board of Directors
CPE Technology Berhad,
No. 4 (2nd Floor Office),
Jalan Indah Gemilang 5,
Taman Perindustrian Gemilang,
81800 Ulu Tiram,
Johor

Dear Sirs,

Strategic Analysis of the Engineering Supporting Industry in Malaysia

Protégé Associates Sdn Bhd ("Protégé Associates") has prepared this 'Strategic Analysis of the Engineering Supporting Industry in Malaysia' for inclusion in the prospectus of CPE Technology Berhad ("CPE Technology") in relation to its listing on the Main Market of Bursa Malaysia Securities Berhad.

Protégé Associates is an independent market research and business consulting company. Our market research reports provide an in-depth industry and business assessment for companies raising capital and funding in the financial markets; covering their respective market dynamics such as market size, key competitive landscape, demand and supply conditions, government regulations, industry trends and the outlook of the industry.

Mr. Seow Cheow Seng is the Managing Director of Protégé Associates. He has 22 years of experience in market research, having started his career at Frost & Sullivan where he spent 7 years. He has been involved in a multitude of industries covering Automotive, Construction, Electronics, Healthcare, Energy, IT, Oil and Gas, etc. He has also provided his market research expertise to government agencies such as Malaysia Digital Economy Corporation Sdn Bhd, Malaysia Debt Ventures Berhad and Malaysia Technology Development Corporation Sdn Bhd.

We have prepared this report in an independent and objective manner and have taken adequate care to ensure the accuracy and completeness of the report. We believe that this report presents a balanced and fair view of the industry within the boundaries and limitations of secondary statistics, primary research and continued industry movements. Our research has been conducted to present a view of the overall industry and may not necessarily reflect the performance of individual companies in this industry. We are not responsible for the decisions and/ or actions of the readers of this report. This report should also not be considered as a recommendation to buy or not to buy the shares of any company or companies.

Thank you.

Yours sincerely,


SEOW CHEOW SENG
Managing Director

7. INDUSTRY OVERVIEW (CONT'D)



1.0 Global Economic Overview

Following a decline of 3.1% in the global economy in 2020 due to the novel coronavirus disease 2019 ("COVID-19") pandemic causing a significant slowdown in the global economic activities, the global economy rebounded by 6.1% in 2021. The expansion in the world output was broad-based with both advanced economies as well as the emerging markets and developing economies registering positive growths during the year. Advanced economies experienced a positive growth of 5.2% in 2021. In particular, the USA grew by 5.7% in its output for 2021. In the Far East, Japan's economy expanded by 1.6% whilst the Euro Area grew by 5.3% in 2021. The emerging market and developing economies witnessed an economic expansion of 6.8% in 2021. The emerging and developing Asia region as a whole registered an increase of 7.3% whilst the Emerging and Developing Europe region grew by 6.7% during the year.

Moving forward, the global economy is expected to further expand, with the world output projected to grow by 3.6% in 2022 and 2023 respectively. The projected economic growth in the advanced economies as well as the emerging markets and developing countries are expected to provide the impetus for the strengthening of the global economy. Despite the projected expansion of the global economy, its growth is subject to downside risks such as changes in trade, fiscal and monetary policies and global financial conditions and geopolitical stability as well as a resurgence in COVID-19 cases across the globe.

2.0 Malaysia Economic Overview

While the Malaysian economy contracted by 5.6% in its real gross domestic product ("GDP") in 2020, due to the COVID-19 pandemic causing a significant economic slowdown in the country, the economy of Malaysia registered a rebound in 2021. While there had been a resurgence in COVID-19 cases in the country during the year, the recovery in economic activities as well as continued policy support led to an expansion in GDP of 3.1% in 2021. In addition, strong external demand amid the continued upcycle in global technology also aided growth in the country.

Going into 2022, the Malaysian economy is on the recovery path supported by better external and domestic demand. Despite a rise in COVID-19 cases across the country, the impact on growth is expected to be less severe than before as more economic sectors are allowed to operate on the account of a growing vaccination rate. The Government had also introduced a number of economic stimulus packages as well as the Twelfth Malaysia Plan and the Budget 2022 to stimulate the recovery of the economy. Other factors expected to support growth in the country include improvements in external conditions as well as gradual recovery in economic activities as a result of the progress of the National COVID-19 Immunisation Programme. Nonetheless, the downside risks to the growth outlook remains and stem from the continued uncertainties from the COVID-19 pandemic and a risk of tighter containment measures, prolonged and severe disruption in global supply chains, as well as a weaker-than-expected global growth recovery.

3.0 Introduction to the Engineering Supporting Industry

The engineering supporting industry ("ESI") mainly revolves around the manufacture of intermediate metal products that are later used to produce various end products. The segmentation of the ESI as per the Malaysian Investment Development Authority ("MIDA") is as below:

Moulds and dies are generally used for the manufacturing industry. A mould is a container in which molten metal or other liquid substances are poured into to form the final products in the same shape as the mould once the substance solidifies. A die is a block of metal of specific shape or pattern cut and is used for shaping a metal workpiece through mechanical forces. Mould or die casting is particularly suitable for series and mass production of components as the metal moulds or dies can be reused for all of the same components.

Machining refers to the process of producing high-precision machined parts and components through advanced computer numerical control ("CNC") machines. Advanced CNC machines are also capable of multi-axis machining, in which machining tools can move in four or more directions to manufacture complex parts and components. Some examples of precision machined parts include shafts, pins, brushes, jigs and other machined components like parts found in a hard disk drive.

Metal casting includes foundries, die casting, magnesium injection moulding (Thixomoulding®) and investment casting. A foundry is a factory in which molten metal is poured into a mould to produce a specific metal part or component. Die casting is a process in which molten metal is injected into dies at high pressures to form a casting that takes the shape of the die used. Similarly, Magnesium injection moulding (Thixomoulding®) is a process which uses magnesium alloys that are heated into a semi-solid state and injected at high speeds into moulds to produce precision moulded components. An investment casting process involves creating a three-dimensional ("3D") wax version of the final product and subsequently dipping the wax product into a ceramic suspension that hardens over the wax structure. The ceramic is heated to remove the wax, thus creating a ceramic mould. Molten metal is poured into the mould, and upon cooling down, the ceramic mould is destroyed to remove the metal

7. INDUSTRY OVERVIEW (CONT'D)



casting. Other types of metal casting include sand casting, which involves pouring molten metal into a mould created by compacting sand around a pattern or model of the final product (the pattern is removed after the sand is compacted to allow molten metal to be poured into the mould).

Metal stamping is the process of manufacturing stamped metal parts from sheet metal, in particularly for the electrical and electronics ("E&E"), machinery and equipment ("M&E") as well as automotive industries.

Surface engineering is the process of modifying the surface properties of a metallic or non-metallic product using a wide range of technologies (generally via a plating process). Examples of surface engineering include improving corrosion resistance to prolong component life or providing special properties such as non-stick surfaces.

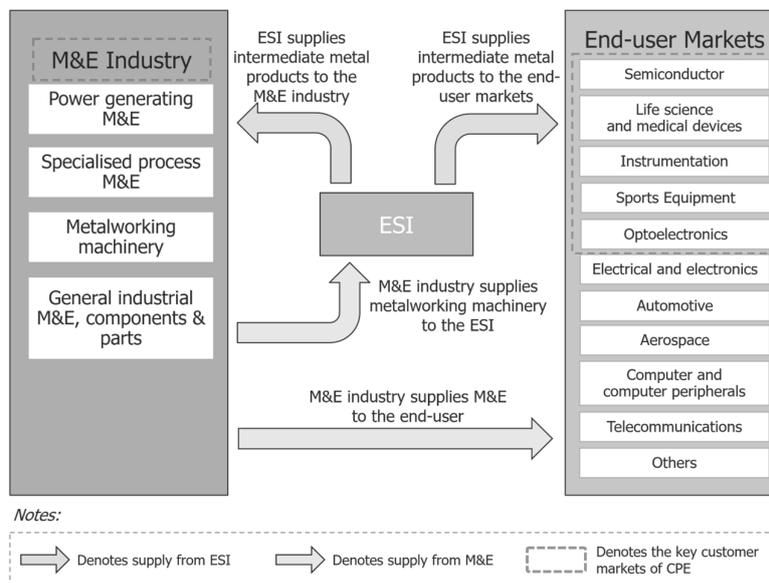
Heat treatment involves the heating and cooling of metal to various temperatures to alter its physical and mechanical properties.

Forging is a process involving the use of physical force to bend and alter the physical shape of a metal into a desired form. Forging is mainly used in the manufacturing iron and steel products.

Metal fabrication generally involves the process of creating metal structures from metal materials via cutting, bending, welding, machining, forming and assembly to create the final product. End products can range from small simple household items to large complex metal structures used in the construction industry or on oil drilling platforms.

The ESI produces and supplies intermediate metal products to both the M&E industry as well as to other end-user markets. These intermediate metal products are utilised in the production of various finished products by both these end-user markets. The relationship between the ESI and its user industries are depicted in Figure 1.

Figure 1: ESI and User Industries



Source: Protégé Associates

The M&E industry comprises of the power generating M&E, metalworking machinery, specialised process M&E, and general industrial M&E components and parts sub-segments. The ESI supplies intermediate metal products to the M&E industry, which in turns uses it to produce various machinery and equipment. These machinery and equipment are then supplied to other end-user markets. The ESI also directly supplies intermediate metal products to end-user markets.

4.0 Overview of the M&E Industry and Selected End-User Markets

4.1 Overview of the M&E Industry in Malaysia

Malaysia is still reliant on imported M&E to fulfil local demand, with M&E imports increasing over the years. The value of imports of M&E had increase from RM54.57 billion in 2013 to RM69.64 billion in 2019. The value of

7. INDUSTRY OVERVIEW (CONT'D)



imports fell in 2020 to RM60.13 billion due to the COVID-19 pandemic disrupting global economic activities. The local M&E industry recovered in 2021, with imports for the year reaching RM68.55 billion. Malaysia mainly sources imported M&E from countries such as the United States ("USA"), Japan, Singapore, China, Thailand and Germany.

Malaysian exports of M&E have also been on the rise over the years. The export value of M&E had increased from RM27.07 billion in 2013 to RM41.60 billion in 2019. Similarly, due to the effects of COVID-19, M&E exports fell in 2020 to RM39.45 billion. Exports rebounded in 2021 in light of increased global demand for electronics and electrical products, with M&E exports reaching RM49.59 billion. Main export destinations of Malaysian M&E include Singapore, the USA, Germany, the United Kingdom, Indonesia, Thailand, Hong Kong and Australia. Due to its crucial part in driving Malaysia's economic and technological development and advancement, continuous investment has been poured into the local M&E industry. A total of 42 M&E projects worth RM1.6 billion were approved in 2021.

The Malaysian M&E industry is expected to continue on an expansionary trend going forward, supported by the expansion of its end-user markets in the manufacturing sector. As the manufacturing sector expands, higher investments are expected to increase or improve production, which would translate to increased demand for M&E in Malaysia.

4.2 Overview of the Global Semiconductor Industry

The rising demand for semiconductor across the world stems from increased semiconductor usage in both traditional and non-traditional industries. After a fall in demand in 2019 arising from factors such as global trade unrest as well as cyclicity in product pricing, demand has recovered in 2020. Global semiconductor sales was valued at USD440.39 billion in 2020 and estimated to reach USD555.89 billion in 2021.

Going forward, the global semiconductor industry is projected to continue expanding as an as ever-increasing number of E&E devices are being produced with embedded semiconductor technology. The advancement in technology is expected to lead to the launching of new electronic devices which would contribute to higher demand for semiconductors.

There is currently a global shortage in semiconductors, whereby the insufficient supply of integrated circuits ("ICs") has led to production disruptions in various end-user markets including the automotive and consumer electronics industries. The recent war between Russia and Ukraine is also expected to affect the production of semiconductors. Ukraine is a supplier of a large portion of the global consumption of neon gas, specifically purified neon gas which is a requirement in the manufacturing of semiconductors. Purified neon gas is required to operate a laser used during the semiconductor fabrication process. Notwithstanding the above, given the rising demand mentioned, the global semiconductor industry is expected to reach USD646.46 billion in 2022.

4.3 Overview of the Global Life Sciences and Medical Technology Industry

Life sciences mainly revolve around the scientific study of organisms, including microorganisms, fauna and flora, as well as human beings. On the other hand, medical technology involves the application of medical science in developing products and services to improve the healthcare sector, in particular in the field of diagnostics and treatment. Due to the similarities in their driving motivations, namely an aging population as well as the prevalence of chronic disease, there is often linkages between the development of the life sciences industry and the medical technology industry. At present, one of the main aims of both these industries are to improve existing technologies by incorporating new technologies into consumer-oriented medical devices and healthcare equipment. As such, the innovation in the life science and medical technology industry has manifested in many new products, ranging from the invention of new medical devices such as needle-free diabetes care to surgical robot for precise operations.

The outlook of the life sciences and medical technology industry is expected to remain bright, supported by an ageing population and healthcare reforms requiring increased need for healthcare and medical products. The United Nation has estimated that there were 727 million persons aged 65 years and over in the world in 2020. This figure is projected to double to 1.5 billion in 2050.

4.4 Overview of the Global Instrumentation Industry

Instrumentation equipment refers to equipment that are used to measure, analyse, test and record electrical data. These test and measurement equipment function by generating electrical signals and then capturing the feedback from to device to determine if the object being tested is faulty and if it is functioning properly. Examples of common instrumentation equipment include oscilloscopes, frequency counters, and spectrum analysers.

The advancement in technology and industrialisation has been the driving factors behind the expansion of the instrumentation industry. This is due to instrumentation equipment being widely used to evaluate the performance as well as defects of semiconductors and consumer electronics during the manufacturing process to limit waste

7. INDUSTRY OVERVIEW (CONT'D)



of resources. As such, the outlook of the instrumentation industry moving forward is expected to remain bright, supported by a wide range of end-user markets and the advancement in technology such as adoption of 5G and the Internet of Things ("IoT"). The industry is estimated to reach USD26.18 billion in 2021, and forecast to expand at a CAGR of 4.5% from USD27.09 billion in 2022 to USD32.62 billion in 2026.

4.5 Overview of the Global Optoelectronics Industry

The global semiconductor optoelectronics industry is a subset of the global semiconductor industry, and its products are used in optoelectronic devices, which combine electronics and light. Optoelectronic devices can mainly be divided into light-emitting and light-detecting devices. Light-emitting devices uses voltage and current to produce electromagnetic radiation (e.g. light) and are commonly used for purposes of illumination, display or in indicator lights. In contrast, light-detecting devices are designed to convert received electromagnetic energy into electric current or voltage. Some of main usage of light-detecting devices are for light sensing and communication. Some of the common optoelectronic devices include photodiodes, photovoltaic (solar cells), photoresistors, light-emitting diodes ("LEDs"), encoder sensor integrated circuits, laser diodes and optical fibres.

As optoelectronic devices are widely used in various fields ranging from telecommunications to consumer electronics to specialised healthcare, they play a crucial role in the equipment and systems that shape the very infrastructure of our society. The global optoelectronics industry was valued at USD43.40 billion in 2021, up from USD40.40 billion in the previous year. Going into 2022, the industry is expected to reach USD43.53 billion.

4.6 Overview of the Global Sports Equipment Industry

Sports equipment (also known as sporting goods) refers to the tools, materials, apparel and gear that are used to train for or compete in a sport and varies depending on the sport. Sports equipment can range from balls, nets, racquets, bats, fishing rods and reels to protective gear such as helmets and knee and elbow pads and training equipment such as weights and other equipment for the gym.

The sports equipment industry has been on an expansionary trend as more and more people are increasingly taking up sports, working out and participating recreational activities due to growing health awareness and stress management. At the same time, advancement in technologies has also led to the introduction of new and better materials (which includes composite materials or enhanced surface coating), which are in turn used to manufacture sports equipment that are lighter, more durable or can improve performance of the user.

The sports equipment industry endured a difficult year in 2020 as the COVID-19 outbreak and accompanying lockdown measures in many countries restricted sports participation both on the recreational and professional level. However, as countries loosened restrictions in 2021, the global sports equipment industry expanded to reach USD62.58 billion. With global vaccination efforts taking place, the global economy is expected to continue improving going forward. The global sports equipment industry is expected to reach USD65.09 billion in 2022 and expand at a CAGR of 4.6% to reach USD79.11 billion in 2026.

5.0 Overview of the ESI in Malaysia

As an industry serving a wide range of end-user markets such as the global semiconductor, life science and medical technology, optoelectronics as well as M&E industries, the Malaysian ESI is reliant of export demand from these end-users. At the same time, growth in the industry as a whole generally follows cyclical trends in tandem with the fluctuation in global economic growth and volatile foreign currency, in particular the USD which tends to affect export demand.

The cyclical growth performance can also be attributed to the cyclical nature of technology-based end-user market, notably the semiconductor industry. The cyclical nature of the semiconductor industry with frequent introduction of new or better electronic devices (which mainly consist of semiconductors) has resulted in older technology becoming obsolete at a faster pace. As a result, pricing of existing devices tends to depreciate in order to remain competitive in the marketplace. The downward pricing pressure is also passed to the entire value chain of the semiconductor industry, including the ESI which supplies various parts and components.

The historical performance and growth forecast of the ESI in Malaysia is based on a combination of resources, including data from the Department of Statistics Malaysia ("DOSM"), MIDA, Bank Negara Malaysia ("BNM") and the annual reports of public listed ESI companies. Data is also gathered from further secondary and primary research works conducted such as searches on private ESI companies with the Companies Commission of Malaysia to gather more disclosure on their business performance. Primary research works are conducted with stakeholders in the local ESI such as industry players, suppliers and customers to gather their insights on the industry. All the findings are collated, analysed and/or computed to ascertain the outlook of the ESI in Malaysia. The estimated

7. INDUSTRY OVERVIEW (CONT'D)



market size (in terms of sales value of manufactured products in Malaysia) and growth forecast of the ESI in Malaysia is shown in Figure 2.

Figure 2: Estimated Market Size (in terms of sales value of manufactured products in Malaysia) and Growth Forecast of the ESI in Malaysia, 2019-2027

Year	Market Size (RM billion)	Growth Rate (%)
2019	7.93	-
2020	6.23	-21.4
2021 ^e	7.62	22.3
2022 ^f	8.36	9.6
2023 ^f	9.05	8.3
2024 ^f	9.84	8.8
2025 ^f	10.71	8.8
2026 ^f	11.67	9.0
2027 ^f	12.73	9.1

Notes:

1. CAGR (2022-2027) (base year of 2021): 8.9%;
2. All figures are rounded;
3. ^e denotes estimate, ^f denotes forecast
4. The estimated market size and growth forecast exclude sales of products from metal fabrication activities which range from simple household items to large-scale metal fabricated structures for skyscrapers and oil drilling platform.

Source: Protégé Associates

In recent years, the performance of the local ESI has been affected by the growing trend of trade protectionism, whereby various governments across the globe have been protecting domestic industries from foreign competition through the implementation of tariff, import quotas, products standards or government subsidies. This is particularly noteworthy with the trade war between the USA and China. The trade tension between the countries has caused disruptions in the global supply chain and trading activities, leading to downside risk to the global economy. The COVID-19 outbreak in 2020 further aggravated the situation. In order to curb the spread of COVID-19, governments around the world, including Malaysia, have imposed multiple travel and movement restrictions. This has affected the global supply chain and led to shortage of supplies, delays from suppliers to customers, and an increase of raw material prices and logistic costs. Due to the deep linkages of its end-user markets in the global supply chain, the Malaysian ESI is sensitive to economic cycles and its performance is affected by current developments in the global economy. As such, any adverse impact on the global economy, such as trade protectionism policies and viral outbreaks, is likely to have a negative impact on the Malaysian ESI.

In the short term (2022-2023), performance of ESI is likely to be affected by the recovery in the global economy amidst the ongoing COVID-19 outbreak. The International Monetary Fund ("IMF") is projecting the global economy to register a growth of 3.6% in 2022 after an expansion of 6.1% in 2021. Global efforts in boosting vaccination rate is expected to underpin economic recovery, which will promote the recovery of the ESI in Malaysia.

In the medium to long term (2024-2027) the ESI in Malaysia is likely to experience cyclical growth due to fluctuations in the global economy and a volatile foreign currency exchange that are expected to continue impacting the export demand for the intermediate metal products from the ESI in Malaysia. Growth of the ESI is likely to be driven by factors such as technological advancements, strong government support towards the M&E industry and end-user markets, the global ageing population. The ESI in Malaysia was estimated at RM7.62 billion in 2021, and is projected to expand from RM8.36 billion in 2022 to RM12.73 billion in 2027 at a CAGR of 8.9% for the period.

5.1 Competitive Analysis

The local ESI is highly competitive with around 2,000 domestic and foreign companies (*Source: MIDA*) competing fiercely against one another to gain market share.

CPE Technology and its subsidiaries ("CPE Technology Group") is an engineering support services provider principally involved in the manufacturing of sheet metal parts and precision machined components. For the purpose of this report, Protégé Associates has used the following criteria when selecting industry players in Malaysia for comparison with CPE Technology Group:

- Involved in the production of sheet metal parts and precision machined components;

7. INDUSTRY OVERVIEW (CONT'D)



- Cater to M&E, semiconductor (electronic devices), life science and medical technology and instrumentation end-user markets; and
- Registered an annual turnover of between RM50 million and RM300 million based on the latest publicly available financial information (The threshold is selected based on Protégé Associates' study on the list of companies in the ESI in Malaysia and their financials).

The above criteria are used to narrow down the list of industry players that can be selected for comparison with CPE Technology Group. The criteria are used in order to select industry players that are deemed to be more similar to CPE Technology Group in terms of upcoming revenue, type of products and principal activities. After taking into consideration the above criteria, Protégé Associates has selected the following industry players for comparison purposes. It needs to be highlighted that the list of industry players used for comparison purpose is not exhaustive. These market players cater to a wide range of end-user markets and may not entirely be the same as CPE Technology Group.

Coraza Integrated Technology Berhad ("Coraza")

Coraza is principally involved in the manufacture of sheet metal parts and precision machined parts and components. Coraza's end-user markets include the M&E, life science and medical technology, semiconductor, instrumentation and aerospace industries.

Frencken Mechatronics (M) Sdn Bhd ("Frencken")

Frencken is principally involved in the manufacture of machined parts and components for the E&E industries, semiconductor industrial machinery equipment, aerospace industry, medical equipment industry, environmental equipment, professional machines and other solar energy equipment and machineries.

Kobay Technology Berhad ("Kobay")

Kobay is currently listed on the Main Market of Bursa Malaysia Securities Berhad. It is an investment holding company while principal activities of its subsidiaries include manufacture of metal works and structures, modules and parts for oil and gas production and extraction equipment, manufacture of semiconductor assembly and testing equipment, manufacture of precision moulds and parts, precision plating and surface treatment and manufacture of precision metal stamping, sheet metal and die casting parts.

SFP Tech Holdings Berhad ("SFP")

SFP is currently listed on the ACE Market of Bursa Malaysia Securities Berhad. It is an investment holding company while principal activities of its subsidiaries include provision of sheet metal fabrication, CNC machining, assembly services as well as automation equipment solutions. SFP's end-user markets include the M&E, semiconductor, electrical and electronics and solar PV industries.

UWC Berhad ("UWC")

UWC is currently listed on the Main Market of Bursa Malaysia Securities Berhad. It is an investment holding company while principal activities of its subsidiaries include provision of precision sheet metal fabrication and value-added assembly services and provision of precision machined components. UWC's end-user markets include the semiconductor, life sciences and medical technology, telecommunications, and M&E industries.

Figure 3: Comparison between CPE Technology Group and Selected Industry Players in the ESI in Malaysia

Company	Information from FYE	Revenue (RM'000)	Profit before Tax (RM'000)	Profit after Tax (RM'000)	Profit before Tax Margin ¹ (%)	Profit after Tax Margin ² (%)
CPE Technology Group	30 June 2021	93,444	24,880	18,675	26.6	20.0
Coraza	31 December 2021	106,133	16,060	12,847	15.1	12.1
Frencken	31 December 2020	214,436	13,202	13,066	6.2	6.1
Kobay	30 June 2021	156,991 ³	35,383	26,933	22.5	17.2

7. INDUSTRY OVERVIEW (CONT'D)



Company	Information from FYE	Revenue (RM'000)	Profit before Tax (RM'000)	Profit after Tax (RM'000)	Profit before Tax Margin ¹ (%)	Profit after Tax Margin ² (%)
SFP	31 December 2021	50,412	20,878	19,680	41.4	39.0
UWC	31 July 2021	285,024	114,789	91,533	40.3	32.1

Notes:

- The above figures (which are based on the latest available audited financial information) only provide an indication and are not considered directly comparable as not all companies carry out activities which are completely similar to each other or in the same geographical area;
- The list of industry players is not exhaustive;

¹ Profit before Tax Margin = Profit before Tax / Revenue

² Profit after Tax Margin = Profit after Tax / Revenue

³ Includes revenue generated from property development division of RM14.1 million

Sources: CPE Technology Group, Companies Commission of Malaysia and Protégé Associates

5.2 CPE Technology Group's Market Share Analysis

For FYE 30 June 2021, CPE Technology Group generated revenue of RM93.4 million, equivalent to 1.2% share of the total size of the ESI in Malaysia of RM7.62 billion in 2021. This is based on CPE Technology Group's revenue of RM93.4 million against the market size (in terms of sales value of manufactured products in Malaysia) of the ESI in Malaysia of RM7.62 billion in 2021.

6.0 Demand Conditions

Figure 4: Demand Conditions Affecting the ESI in Malaysia, 2022-2027

Impact	Demand Conditions	Short-Term	Medium-Term	Long-Term
		2022-2023	2024-2025	2026-2027
+	Technological Advancement	High	High	High
+	Strong Government Support towards the M&E Industry and End-User Markets	High	High	Medium
+	Global Ageing Population and Healthcare Reforms	Low	Low	Low
-	Geopolitical Tension Across the Globe Affecting Economic Activities	High	Low	Low
-	COVID-19 Disrupting Global Supply Chain	Low	Low	Low

Source: Protégé Associates

Technological Advancement

Along with the advancement in technology, there has been an increasing number of electronic components that have been incorporated into conventional and new devices in various industries. As the ESI relies heavily on the performance of its end-user markets, the industry stands to benefit from the rapid evolving technological trends which has driven the expansion of these end-user markets. Some of the key technological trends driving the expansion of the semiconductor industry and other end-user markets are detailed below.

Invention of new technologies

The introduction of new and innovative electronic devices has been one of the key driving forces behind the growth of the global semiconductor industry. For example, the proliferation of augmented reality ("AR"), virtual reality ("VR") and 3D printing in the recent years had led to the launch of new electronic devices such as AR glasses, VR headsets and 3D printing machines.

Advancement of telecommunication technologies

As telecommunication technologies advance, so has the number of ICs being used in telecommunication devices and transmission infrastructure. This trend has bolstered the development of the semiconductor industry to provide mutual support. One of the latest telecommunication technologies attributes to the development of the fifth-generation wireless broadband technology ("5G") that provides faster speed and wider coverage. The new technology is expected to feature a greater number of multiple input and output streams, which would lead to having a higher data transmission rate than the present fourth-

7. INDUSTRY OVERVIEW (CONT'D)



generation wireless broadband technology. The greater data transmission rate alongside the expansion in input and output streams require the support of more advanced semiconductor technology.

Internet of Things ("IoT")

The IoT refers to a network of physical objects enabled to communicate with one another through the use of electronics, software, sensors and network connectivity embedded within them. The growing prominence of the IoT has led to increasing usage of sensors and semiconductors in both consumer and industrial products, ranging from cloud computing, drone cameras, smart home devices, wearable technology, to smart manufacturing where manufacturing equipment are connected to each other through a network system.

Internet of Medical Things ("IoMT")

An ageing global population coupled with the occasional viral outbreaks has led to the continuous rollout of new life science and medical applications to keep human beings and other living organisms safe and healthy. In particular, a current popular trend within the healthcare shows the adoption of IoMT, which refers to the usage of medical devices that are embedded with connectivity and sensor technology to monitor a patient's health conditions. The use of IoMT devices also provides healthcare providers with the necessary data required to take immediate health actions or detect health issues at an early stage.

Achievements in Materials Engineering

The introduction of new materials has been one of the great achievements of modern history as they have contributed to the growth, prosperity, security and quality of life of human beings. These new materials have enabled the development of new technologies in various industries, including civil, chemical, construction, aeronautical, agricultural, mechanical, biomedical, and electrical engineering. The use of a new material in a product has also played an influential role in deciding to use, purchase or construct a new device, machine or structure.

Strong Government Support towards the M&E Industry and End-User Markets

The local ESI has largely been supported by the M&E industry in Malaysia, which generally acquires intermediate metal products that are manufactured by the ESI. The Malaysian M&E industry plays a crucial role in the transformation of the country into a high-technology nation, mainly due to its linkages to various important economic sectors such as the manufacturing, construction and services industries. This has led to the strong support from the Malaysian Government, as witnessed by its inclusion into the Third Industrial Master Plan ("IMP3") to promote the industry's growth.

The local E&E industry is yet another industry that has garnered the attention of Malaysian Government. As an important economic pillar that contributes significantly to the GDP of the country, the local E&E industry has been named as one of the National Key Economic Areas ("NKEAs") under the Economic Transformation Programme to promote its development. Furthermore, under the Twelfth Malaysia Plan ("12MP"), the Government is set on accelerating the development of eight strategic and high impact industries and activities, which includes the local E&E industry. In particular, the focus will be on boosting the E&E industry to move up the value chain, whereby industry players will be encouraged to adopt advanced technologies and produce more sophisticated products. To achieve a more comprehensive ecosystem to ensure the sustainable development of the E&E industry, a national E&E roadmap will also be formulated to provide strategic direction for the industry. Any development in the E&E industry can only serve to benefit its supporting semiconductor industry.

Malaysia is also committed to improving healthcare delivery standards to provide world-class medical products and technologies. The Government established the Medical Device Investment Advisory Panel ("MDIAP") to assist the industry's growth and development, by providing strategic initiatives to promote the growth of the medical device industry in Malaysia.

Global Ageing Population and Healthcare Reforms

According to the United Nations, there was an estimated 727 million persons aged 65 years and above in 2020. This number is projected to more than double by 2050, reaching over 1.5 billion persons. This means that the percentage of older persons in the global population is expected to increase from 9.3% in 2020 to 16.0% in 2050. With an increase in older demography, the demand for healthcare and other associated spending is expected to increase in tandem.

At the same time, there has also been an increase in healthcare reforms over the world in recent years to provide better healthcare services for the general population. At present, the population's access to healthcare facilities

7. INDUSTRY OVERVIEW (CONT'D)



and treatment varies widely around the globe, with poor countries seeking basic infrastructure such as clean water and sanitation, while developed economies have abundant hospitals but struggle with cost containment. The combination of an ageing global population coupled with more healthcare reforms is expected to lead to higher demand for healthcare services globally, which in turn is expected to drive demand for life science and medical technology products. This will in turn drive demand for the ESI in Malaysia.

Geopolitical Tension Across the Globe Affecting Economic Activities

As a part of the global supply chain, economic activities in Malaysia are subject to geopolitical events that may affect economic activities across the globe. Global trading avenues has witnessed a rising trend of trade protectionism, led by the major economies, notably the USA and China. The trend of trade protectionism has the potential to adversely impact global trading activities, posing a downside risk to global economic growth. Furthermore, impact of the downside risk may increase if the uncertainties over trade protectionism are prolonged.

On a more recent note, the war between Russia and Ukraine has also caused disruptions to the global supply chain. As one of the largest exporters of oil in the world, Russia's involvement in the war throws oil supply from the country into doubt. This has led to oil prices spiking above USD110 per barrel and renewed supply chain disruptions, including for the automotive industry with the high fuel price. The high oil prices is also likely to aggravate inflation in the US as well as in some European countries, which may affect demand from these countries. At the same time, in order to curb the spread of COVID-19, governments around the world, including Malaysia, have imposed multiple travel and movement restrictions. In particular, the recent COVID-19 outbreak in China had led to lockdowns in some major cities. While the lockdowns had been gradually lifted since 1 June 2022, it is expected to negatively impact China's economic growth in 2022. This has affected the global supply chain and led to shortage of supplies, delays from suppliers to customers, and an increase of raw material prices and logistic costs. All these factors are expected to affect demand for products and goods globally.

In Malaysia, many of the end-user markets of the ESI are sensitive to economic cycles and are subject to the conditions of the global economy. As such, the trade protectionism by major economies and the war between Russia and Ukraine is expected to adversely affect the demand for end-user market products, and in turn demand for intermediate metal products from the ESI in Malaysia.

COVID-19 Disrupting Global Supply Chain

Despite global efforts in hastening vaccination programmes, the COVID-19 outbreak has not yet been able to be brought under control. According to the IMF, the global economy contracted by 3.1% in 2020 but rebounded by 5.9% in 2021, with growth led by emerging markets and developing nations at 6.5%, followed by advanced economies growing by 5.0%. While global economic conditions had largely improved in 2021, the flare up in COVID-19 cases in various countries had led to shutdowns and had affected productions, which resulted in disruptions in the global supply chain. In particular, the arrival of the Omicron variant COVID-19 strain which is more transmittable than other variants is expected to prolong the combat against the virus.

As a supporting industry to the manufacturing sector, the decline in industrial production across the world is expected to slow the overall demand for ESI in Malaysia. However, the impact of the COVID-19 is expected to diminish over time as the pandemic is gradually brought under control as the global vaccination rate increases in 2022. This is supported by the IMF forecasting a further growth of 4.4% for 2022.

7.0 Supply Conditions

Figure 5: Supply Conditions Affecting the ESI in Malaysia, 2022-2027

Impact	Supply Conditions	Short-Term	Medium-Term	Long-Term
		2022-2023	2024-2025	2026-2027
+	Expansion within the ESI	High	High	High
+	Growing Sophistication of Manufacturing Technology	High	High	High
+	Support from the Government	High	High	High
-	Downward Pricing Pressure from Customers	Medium	Medium	Medium

Source: Protégé Associates

Expansion within the ESI

To prevent being obsolete in the global market, market players have been continuously upgrading production facilities as well as adopting the latest manufacturing technologies to be able to meet the expectations of its end-

7. INDUSTRY OVERVIEW (CONT'D)



user markets. This trend also applies to the ESI, whereby industry players have invested in their production facilities and newer technology to remain as a qualified vendor of customers. At the same time, some industry players have also opted to enhance their competitive advantage by offering integrated services and total manufacturing solutions or even focus on niche segment products that require additional design and development capabilities to meet the demands of clients. This includes working closely with the customer to develop a product, by creating and refining a product's design to the final required prototype of the product, as well as other related issues such as process and material requirements product and quality assurance, and manufacturability.

Growing Sophistication of Manufacturing Technology

The term technostucture facilities and resources refers to the various state-of-the-art machine and tools, the use of computer system along with advanced computer-aided design and other related design and engineering software, R&D facilities, quality control facilities. The advancement of technostucture facilities and resources has long been driving the expansion of the manufacturing sector globally. This is due to more advanced technostuctures enabling the production of higher precision end products with minimal human error. As part of the manufacturing sector, the advancement in the technostucture also benefits the expansion of the local ESI.

Support from the Government

Due to its close linkages with the Malaysian M&E industry for supplying parts and components and other metal fabrication services, the local ESI has also been included in the IMP3 to support the future growth of the M&E industry. The Malaysian Government has introduced various supporting programmes in the form of business advisory services and other assistance, all which are expected to aid in the expansion of the ESI in Malaysia.

Downward Pricing Pressure from Customers

The ESI faces constant challenges from downward pricing pressure from technology-based end-user markets, notably the semiconductor industry. The semiconductor industry is cyclical in nature and is characterized with the frequent introduction of more advanced or improved products. This has led to products manufactured using older technologies becoming obsolete at a quicker pace. This has led to the price of older products depreciating to remain competitive in the marketplace. The downward pricing pressure is then passed through to the entire value chain of the semiconductor industry, including the ESI which supplies various parts and components. This has resulted in ESI players forced to lower margins or reduce production cost to fulfil orders at lower prices from customers while still remain financially stable.

8.0 Prospect and Outlook of the ESI in Malaysia

The market size (measured by sales value of manufactured products in Malaysia) of the ESI in Malaysia was valued at RM7.62 billion in 2021, which was a double-digit expansion from RM6.23 billion in the previous year. Going forward, the local ESI is forecast to reach RM8.36 billion in 2022 and expand by a CAGR of 8.9% to reach RM12.73 billion in 2027 with growth supported by the advancement in technology as well as expansion in end-user markets. In particular, the global semiconductor industry which was valued at USD555.89 billion in 2021 is expected to reach USD646.46 billion in 2022. Growth in the industry is expected to be underpinned by an increasing number of electronic components being incorporated into both emerging and traditional industries, thus spurring demand for more semiconductors. At the same time, the global semiconductor industry is also expected to be driven by the advancement in telecommunication technology such as the rollout of 5G technology and the increasing adoption of IoT and IoMT, in which both will boost demand for semiconductors. The ESI is also set to benefit from the expansion of its other end-user markets such the life sciences and medical technology, instrumentation and sports equipment industries, all of which rely on the ESI to supply parts, components and services to them. The on-going global recovery from COVID-19 and continued spending is expected to help these industries rebound moving forward.

Closer to home, the local ESI can rely on the expansion of the local M&E industry to drive growth, whereby the local M&E industry serves as an important supporting industry for the local manufacturing sector. While the local manufacturing industry had been adversely affected by the COVID-19 and resulting lockdown measures, growth is expected to rebound in the near term as the economy reopens. This will rejuvenate the local M&E industry and translate to higher demand for engineering supporting services.