AUSSENWIRTSCHAFT AUSTRIA

AUSSEN WIRTSCHAFT BRANCHENREPORT MALAYSIA

INDUSTRIE 4.0, DIGITALISIERUNG & AUTOMATISIERUNG IN DER INDUSTRIE

MARKTEINTRITT UND STAATLICHE FÖRDERUNGEN
TRENDS UND CHANCEN FÜR ÖSTERREICHISCHE FIRMEN
VERANSTALTUNGEN UND MESSEN
KONTAKTE UND LINKS

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1. INTRODUCTION TO MALAYSIA: SOCIETY, ECONOMY, POLITICS

A federal constitutional monarchy, Malaysia consists of 13 states and 3 federal territories. Its landmass is separated into Peninsular (where the country's capitals Kuala Lumpur and Putrajaya can be found) and East Malaysia on Borneo by the South China Sea.

The population of Malaysia is estimated at 32.5 million in 2020, consisting of 29.8 million (91.7 %) Malaysian citizens and 2.7 million (8.3 %) non-citizens. The slight decrease in population compared to 2019 is largely due to the departure of non-citizens in the wake of the Covid-19 pandemic. The Malaysian population is made up of a wide variety of ethnic groups, with the majority (69.4 %) being Bumiputras ("Son of the Soil"). 24 % of the Malaysian population is under the age of 15 and 69.3 % are between the ages of 15 and 64, making the average population relatively young. Due to the country's multicultural demographic, the majority of its residents grow up multilingual and speak at least two languages fluently. In large cities this generally includes English, which is the language of business throughout the country.

Malaysia ranked 55th out of 157 countries according to the World Bank's Human Capital Index. In order to realize the full potential of its population, it will greatly need to make further progress in education, health and nutrition, as well as in the outcomes of social protection. Improving the quality of school education, rethinking nutritional interventions, and providing adequate social protection are therefore among the main priority areas.

Malaysia is one of the leading nations in the Southeast Asian economic area: the gross domestic product (GDP) per capita was estimated at USD 11,400 in 2021, only behind Singapore and Brunei, and has almost doubled since 2005, seeing a strong recovery from the 2020 drop to USD 10,350, and continuing its upward trajectory to reach over USD 13,270 as of April 2022. Today Malaysia can be seen as a stable emerging country with a diversified economy. In addition to a traditionally strong agricultural sector, the production and service sectors also make a large contribution to the economy today. Meanwhile, the country has become a leading exporter of electrical appliances, electronic parts, and components.

According to the World Bank, Malaysia is one of the most investment-friendly economies in the world (ranking 12th for Ease of Doing Business in 2020). This has been a major contributor to job creation and income growth. After the global financial crisis in 2009, the Malaysian economy recorded average growth rates of around 6 %. However, this growth slowly flattened out over the years and was 4.3 % in 2019. According to Bank Negara (Malaysia's central bank), this was the lowest economic growth since the great financial crisis and was mainly due to lower production of palm oil, crude oil and natural gas, as well as a decline in exports amid the trade war between the US and China. Due to the unstable political situation and the effects of the Covid-19 virus, the economy shrunk by -5.6 % in 2020, rebounding slightly to +3.1 % in 2021. The 2022 forecast by the World Bank (as of Sept 2022) is +6.4 %.

In 2021, Malaysia was under a state of emergency between January to August, and a resurgence in cases prompted the government to declare a nationwide lockdown on June 1st to curb the spread of the coronavirus. The tightening of containment measures will push the country back into recession for the first half of this year. However, the year end's modest recovery was achievable due to the country's strong vaccination rollout as of July 2021. As of May 1 2022, almost 98 % of the adult population, and 82 % of the general population have been fully vaccinated.

The nation's borders fully reopened on April 1 2022, allowing Malaysians and international tourists quarantine-free entry, provided they have been fully vaccinated and test negative. This should lead to a strong economic recovery, as the tourism sector was one of the strongest contributors to GDP.

The current economic indicators per the Economist Intelligence Unit (EIU) forecasts (as of November 2022) are as follows:

Key indicators	2022[a]	2023[b]	2024[b]	2025[b]	2026[b]	2027[b]
Real GDP growth (%)	6	4	4.5	5.3	5.1	5
Consumer price inflation (av; %)	3.4	2.6	1.7	1.9	2.2	2.1
Government balance (% of GDP)	-6.1	-5.6	-5.5	-5.2	-5	-4.5
Current-account balance (% of GDP)	1.6	1.4	1.7	1.6	1.9	1.6
Short-term interest rate (av; %)	2.4	3.4	3.5	3.5	3.5	3.7
Unemployment rate (%)	3.9	4	3.9	3.7	3.6	3.5
Exchange rate M$:US$ (av)	4.42	4.51	4.33	4.2	4.1	4.01

[a] EIU estimates.
[b] EIU forecasts.

A detailed statistical analysis can be found in the Country profile Malaysia.

In the medium term, it is expected that Malaysia will successfully transition from an "upper middle-income economy" to a "high income economy" by 2024. According to the World Bank, Malaysia's economy will depend heavily on government measures to strengthen the private sector in the short term. Currently, the external environment makes export-oriented growth difficult, while local or investment-based expansion remains limited as the country recovers from the pandemic.

In the long run, economic growth will depend on increasing productivity levels. Although the productivity level in Malaysia has risen sharply over the past 25 years, it is still below that of several regional countries by comparison. Ongoing reform efforts are crucial.

At the political level, Malaysia is also far from stable. In 2018, the ruling coalition, Barisan Nasional, which had been the dominant party, was defeated by the opposition for the first time since Malaysia's independence. This gave the country a strong, if temporary, upturn in sentiment. However, the resignation of the Prime Minister two years later, in February 2020, and that of his successor in August 2021, showed that the country still appeared to be at a political impasse even after a change of government. The 15th General Election was held on November 19, 2022. You can find more about the current political situation in our Economic report Malaysia as well as our Malaysia country report.

2. STATUS QUO

Malaysia's Economic Relations with Austria

The importance of Malaysia for Austrian foreign trade is often underestimated and lesser known compared to other countries in the ASEAN community. In reality, however, the situation is very different, as the following graphic illustrates.

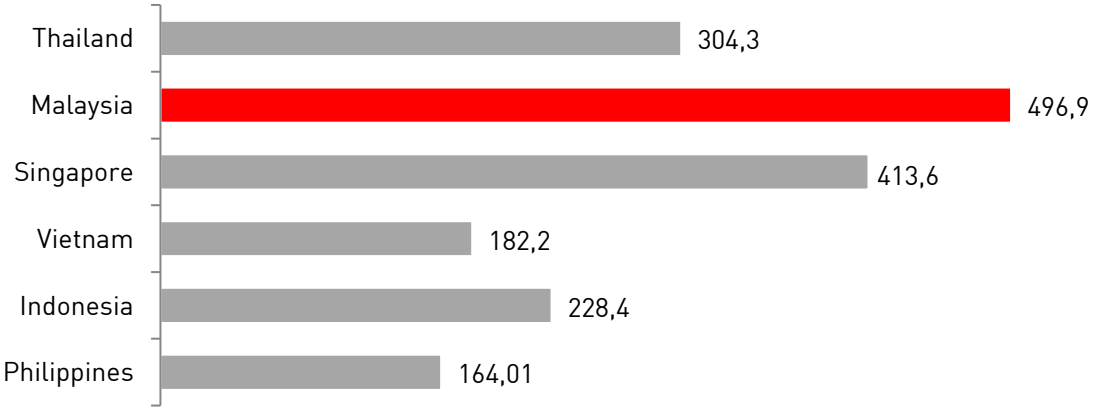


Figure 1: Austria's exports to the most important ASEAN countries in million euros (year 2021) (source: Statistics Austria, 2022)

Due to the effects of Covid19, all of the countries saw a steep drop from 2019, but the recovery in 2021 was particularly promising for Malaysia: **Austrian exports to Malaysia reached 496.9 million euros**. This reflects a strong recovery with a +23.4 % YoY growth and reaffirms Malaysia's position as most important buyer of Austrian goods and services in the ASEAN region. Only Singapore experienced a stronger recovery, but in terms of export volumes, still ranks after Malaysia, at 413.6 million euros. It is also important to note that some of the export goods reported for Singapore also have their final destination in Malaysia. On the contrary, exports to Thailand declined strongly, falling by 16.8 % to 304.3 million euros. The rapid recovery positions Malaysia as the biggest and one of the most promising future markets for Austrian companies in the region.

Austria exports RM2.25 billion (ca. 476 M EUR) to Malaysia and imports RM1.94 billion (ca. 411 M EUR) from the country, making Malaysia one of Austria's most important Asian economic partners. The electronic components, machinery, and electrical devices are among the most traded things.

More than 50 Austrian companies have invested RM18.9 billion (ca. 4B EUR) into Malaysia, in the sectors of oil and gas, healthcare, automotive, electronics, plastic goods, and construction materials, amongst others. These companies also share their technological knowledge with local partners, with many of them functioning as regional centres for the Asia-Pacific region. In the future, there will be new investments, particularly in the food and beverage, environment, and renewable energy sectors.

Malaysia's Manufacturing Industry

Manufacturing sales in Malaysia totalled RM158.9 billion in October 2022, up 12.9 % year on year. The Food, Beverage, and Tobacco Products subsector expanded by 16.6 % in October 2022, while the Petroleum, Chemical, Rubber, and Plastic Products subsector rose by 4.6 %. Over the previous year, the Electrical & Electronics Products subsector increased by 23.8 %. In terms of labour volume, the Manufacturing sector employed 2,321,179 people, a 3.6 % increase over the previous year (October 2021: 2,241,048 persons). Expansions in the petroleum, chemical, rubber, and plastic goods business (2.0 %), the food, beverage, and tobacco products industry (4.3 %), and the electrical and electronic products industry (5.6 %) drove the growth.

In conjunction with the increase in employment, wages and salaries in the manufacturing sector increased by 4.8 % to a total of RM7,880.9 million. In comparison to the same month in 2021, sales per employee increased by 9.0 percent to RM68,441, while average salaries and compensation were RM3,395.

Manufacturing sales increased 17.1 % from January to October 2022, reaching RM1,485.2 billion, compared to the same period in 2021. Meanwhile, total payroll increased by 3.6 % to 2.32 million employees, or RM78.1 billion, representing a 5.3 % rise over the previous year. During the relevant time period, the average sales value per employee was RM638,852, representing a 13 % rise year on year.

Along with the fast growth of the global semiconductor market, especially for chip products, the E&E sector of export-oriented industries in Malaysia is expected to grow. As more people adopt cutting-edge technologies, the demand for industrial products, particularly those used in the digital sector, is expected to rise, which will in turn boost the chemical sector. In the meantime, all sectors within domestic-focused industries are anticipated to expand further, with the transportation, food, and metal sectors leading the way. The restoration of normalcy in the manufacturing and commercial sectors has bolstered demand for sectors related to transportation. It is anticipated that the food and hospitality industries will prosper as a result of rising private consumption and a revitalised tourism sector. The metals industry is also expected to improve as a result of the construction industry's revival. There will likely be a 6.3 % increase in manufacturing activity in 2022.

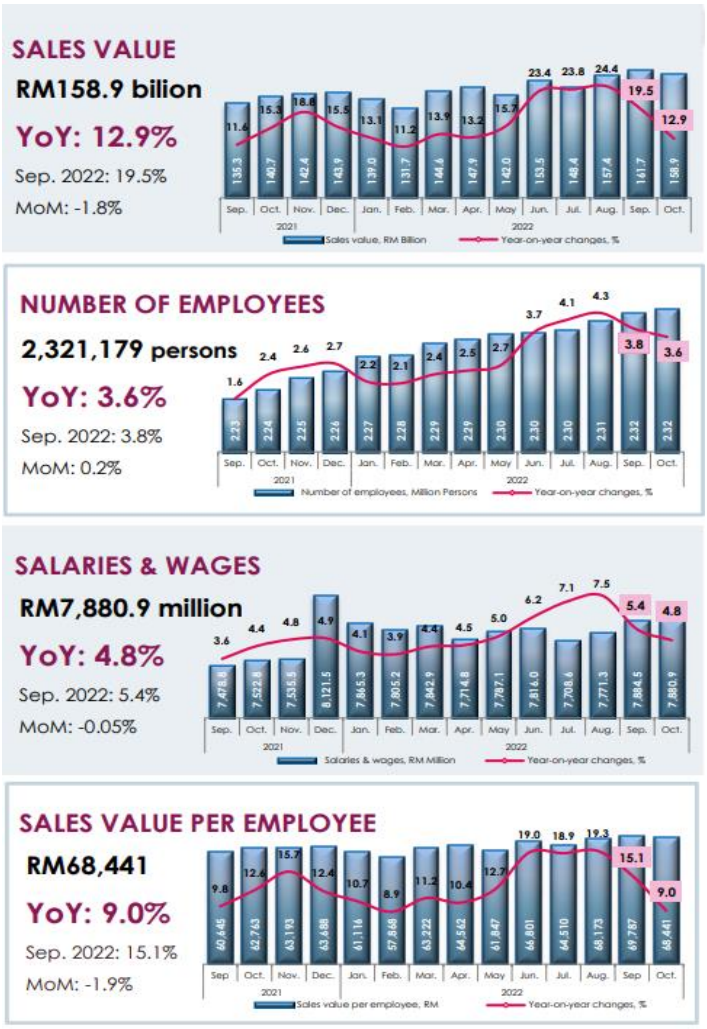
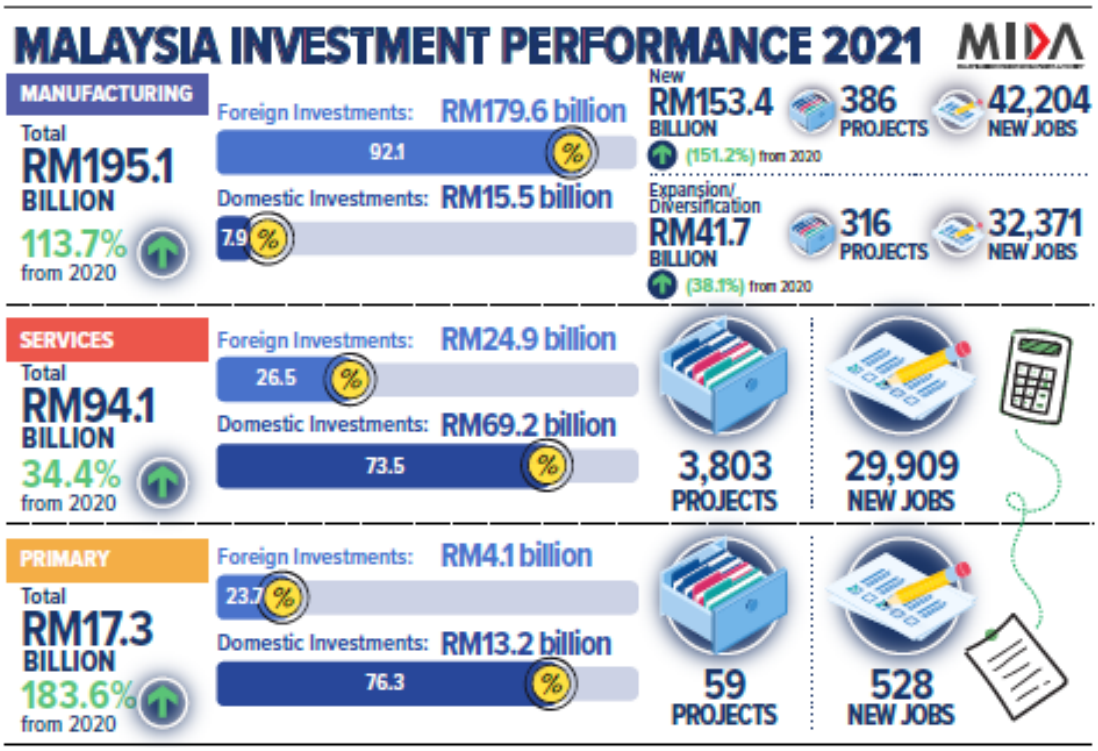


Figure 2: Malaysia Manufacturing Industry Statistics (source: Department of Statistics Malaysia,2022)

Investment Performance in Manufacturing Sector

According to the Malaysian Investment Development Authority, Malaysia attracted a record number of approved investments totalling RM306.5 billion in the manufacturing, services, and primary industries in 2021. This was driven by increasing FDI and projects in the manufacturing sector, as well as expanded projects in the E&E sector. Malaysia's Foreign Direct Investment (FDI) was valued at RM208.6 billion, accounting for 68.1 % of total approved investments. Malaysia's Domestic Direct Investment (DDI) was valued at RM97.9 billion, accounting for 31.9 % of the total. MIDA has already secured 352 projects that are in the pipeline, with anticipated investments totalling RM39.2 billion. These are manufacturing and service-related projects. The Netherlands (RM74.9 billion), Singapore (RM46.6 billion), Austria (RM18.9 billion), the People's Republic of China (RM16.6 billion), and Japan (RM7.5 billion) accounted for 88.9 % of total FDI approved in manufacturing, services, and primary industries.

The manufacturing sector saw an increase of 113.7 % in approved investments, up from RM91.3 billion in 2020. The services sector saw an increase of 34.4 %, and the primary sector saw an increase of 183.6 %, both from RM6.1 billion and RM70 billion respectively. Risen Solar's RM42.2 billion investment for the design, development, and manufacturing of solar modules and solar cells led the E&E industry's total approved investments of RM148 billion, followed by Intel Electronics' RM30 billion investment to produce wafer fabrication and stacked dies in Pulau Pinang; AT&S' RM8.5 billion investment to establish the design, development, and manufacturing of integrated circuit substrates at the Kulim Hi-Tech Park; and Infineon Technology's RM1.5 billion.



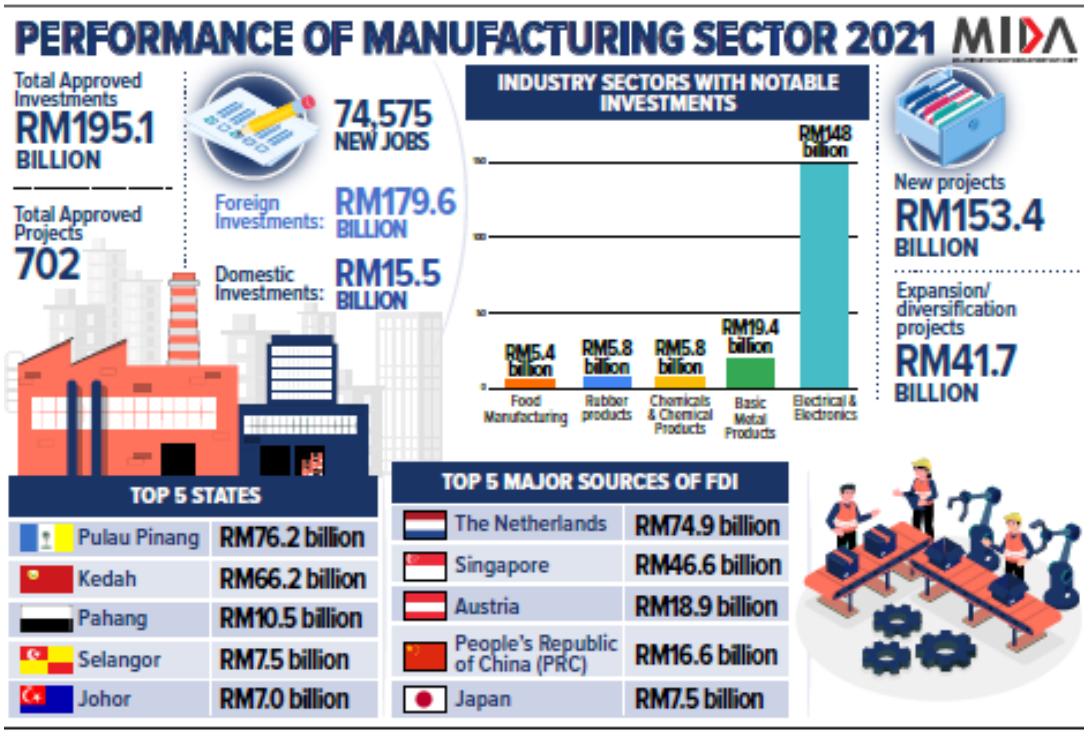


Figure 3: Performance of Manufacturing Sector 2021 (source: MIDA, 2022)

Focus Sectors for Investments in Malaysia's Manufacturing Industry

The priority will remain on producing higher value-added, diverse, and complex products, particularly in the catalytic sub-sectors, namely electrical and electronics (E&E), machinery and equipment (M&E), and chemicals. The other two high potential growth sub-sectors, namely aerospace and medical devices, will also be pursued.

Talent pool development and Industry 4.0 remain the main focus areas of Malaysia's manufacturing sector. Companies are encouraged to increase their productivity by accelerating automation and innovation, undertaking research, development, and commercialisation (R&D&C), implementing green and sustainable production practices, and leveraging industry associations in sharing best practices.

According to MIDA, approved domestic direct investments (DDI) in the manufacturing sector were dominated by new investments (70 %), while 30 % were from expansion or diversification projects. Domestic investors were most keen on Petroleum (including Petrochemicals) products, representing RM12.6 billion, followed by Rubber products (RM3.9 billion), while the Food Manufacturing and M&E both brought in RM2.3 billion. Approved foreign investments for 2020 were largely in the sectors of metal products (RM14.1 billion), E&E (RM13.6 billion), Paper, Printing & Publishing (RM6.9 billion), M&E (RM4.8 billion), and Chemical & Chemical Products (RM4.6 billion). The main investors were China, Singapore, the Netherlands, British Virgin Islands, and the USA.

A comparison chart of the foreign vs domestic investments:

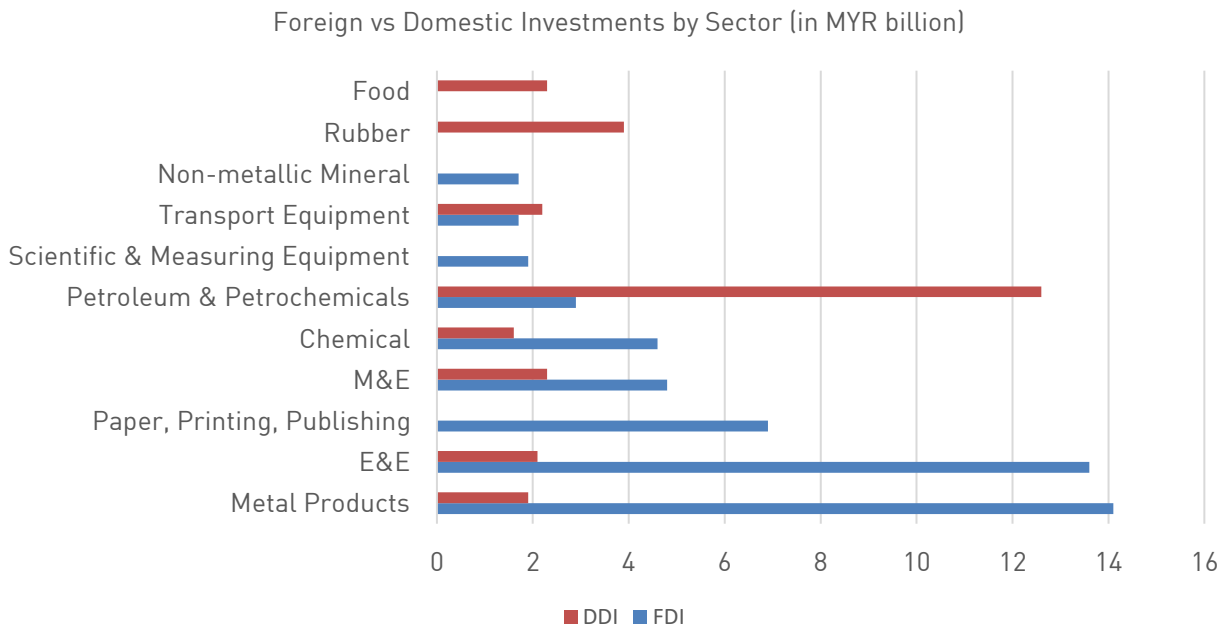


Figure 4: DDI VS FDI (source: Department of Statistics Malaysia,2022)

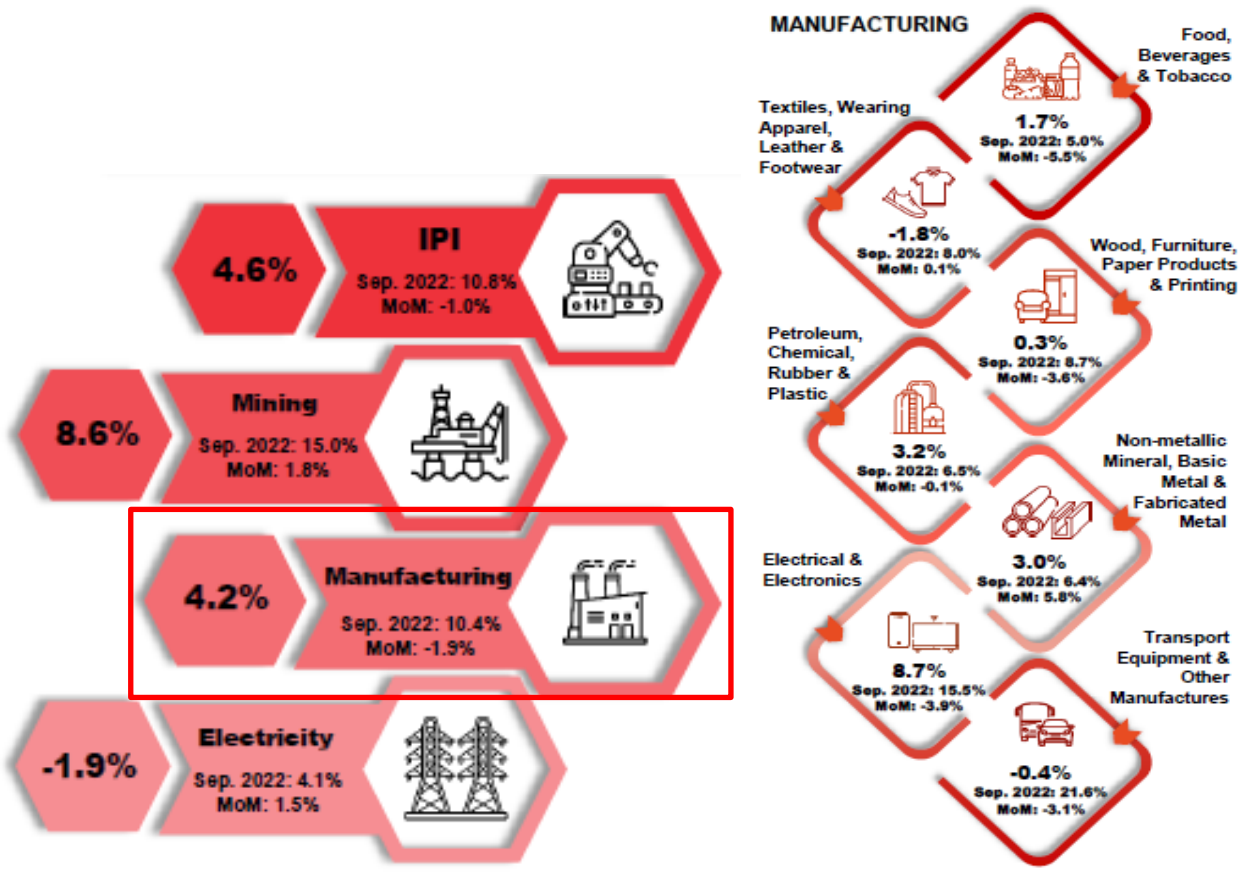


Figure 5: Industrial Production Index 2021 as of October 2022 (source: Department of Statistics Malaysia, 2022)

The Industrial Production Index (IPI) increased by 4.6 % in October 2022. The slowdown in expansion was also attributable to the high base index reported in the same month of the previous year. The increase in the

Mining index (8.6 %) and the Manufacturing index (4.2 %) contributed to the growth of the IPI during the month, while the Electricity index declined by 1.9 %.

The main subsectors that contributed to the expansion were Electrical & Electronics Products (8.7 %), Petroleum, Chemical, Rubber & Plastic Products (3.2 %), and Non-metallic Mineral Products, Basic Metal & Fabricated Metal Products (3 %). During the month, the Manufacturing sector was helped by both industries that focus on exports (5 %) and industries that focus on the domestic market (2.5 %).

Despite early-year obstacles from the ongoing worldwide pandemic and supply chain issues, MIDF (Malaysia Industrial Development Finance) Research predicts that industrial output will rise at a slower pace this year in anticipation of rising demand. According to MIDF, Malaysia's IPI would expand at a moderate pace of 4.3 % in 2022.

Malaysia Export and Import Statistics

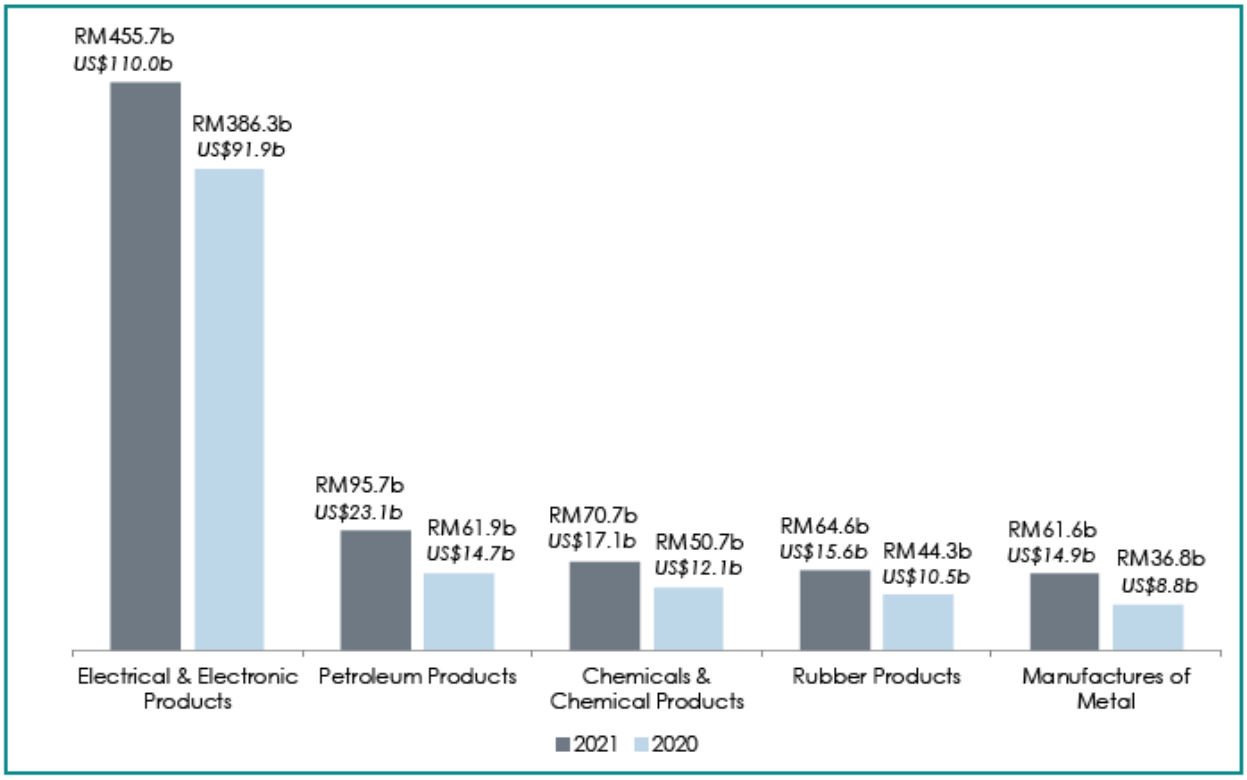


Figure 6: TOP 5 Malaysia's Export (source: Department of Statistics Malaysia, 2022)

The E&E industry is vital to the country's industrial development. Malaysia is, in reality, a key global manufacturing centre for the E&E industry. It accounts for around 13 % of global back-end semiconductor output. According to the graph above, the E&E industry will continue to be Malaysia's main export sector in 2020 and 2021, followed by petroleum, chemical, rubber, and metal products. The E&E industry's export value increased significantly from RM 386 billion in 2020 to around half a trillion in 2021.

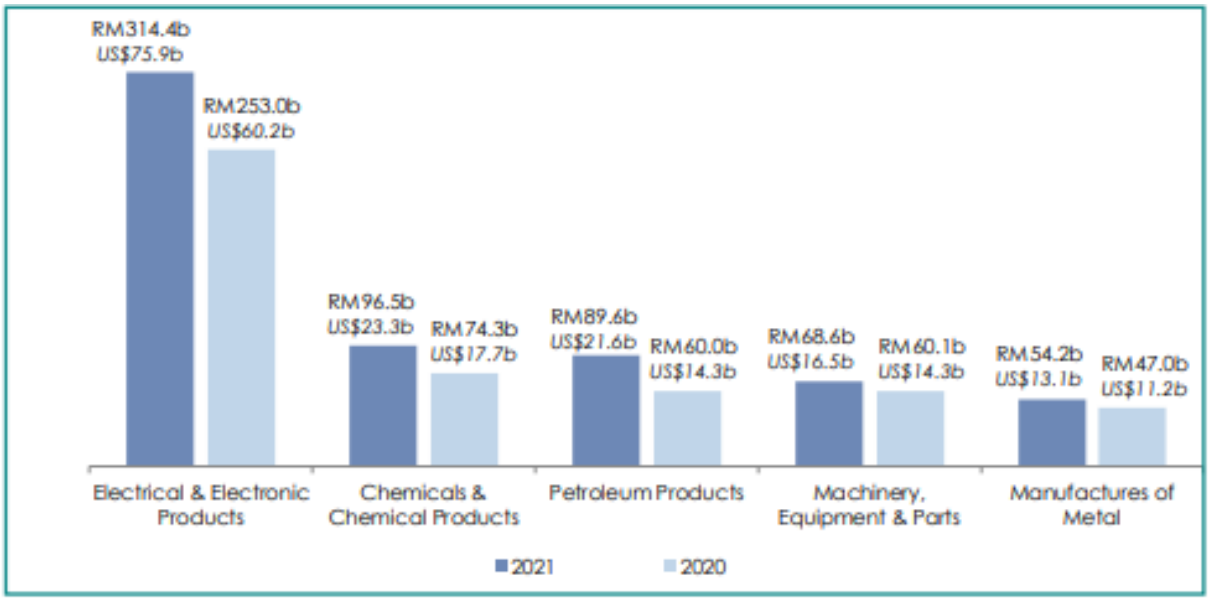


Figure 7: TOP 5 Malaysia's Import (source: Department of Statistics Malaysia, 2022)

The graph above depicts Malaysia's top five imported products in 2020 and 2021. Because the E&E business contributes the most to Malaysia's GDP, it is projected that E&E products will lead the imported value of industrial items, followed by other sectors that contributed roughly the same amount.

Other Important Sector: Automotive

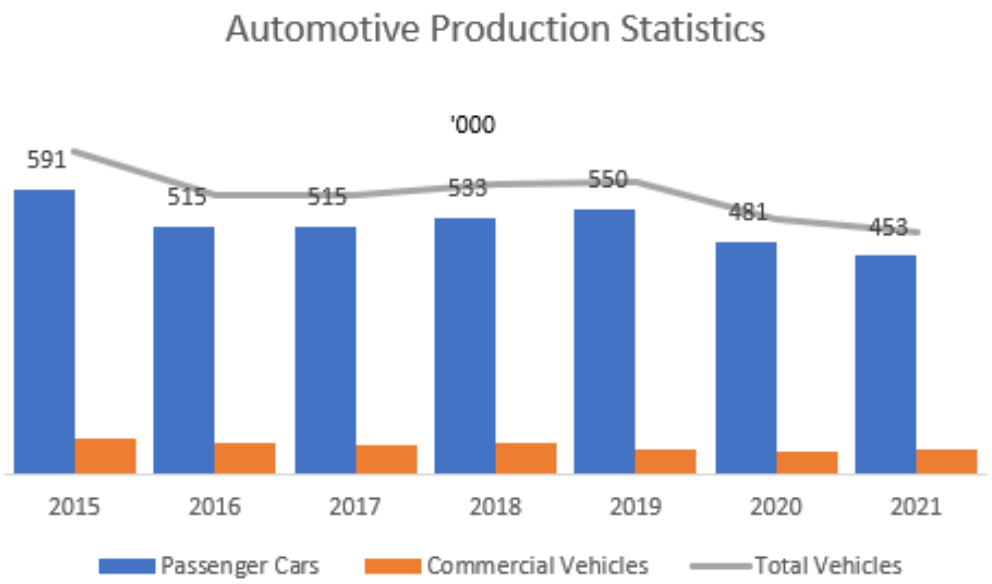


Figure 8: Production Volume in Automotive Sector in Malaysia (2015-2021) source: Paultan

Car production in Malaysia has been stagnant over the past few years, with available data indicating an annual output in the region of 500,000 to 590,000 vehicles. This is due to the country's low population growth rate. In contrast, the automotive industry makes a major contribution to Malaysia's industrialization, which in turn leads to high-value economic activities that improve the quality of life and create well-paying jobs. Both upstream businesses like steel and chemicals, and downstream ones like IT and maintenance services, benefit from the industry's presence.

Even now, automakers from all over the world see Malaysia as a promising market. Honda, Toyota, Nissan, Mercedes-Benz, and BMW, all Japanese automakers, have opened local factories to meet surging local demand. Geely Auto Group, a significant Chinese automobile manufacturer, acquired a majority share of Proton in 2017. As a result, it is clear that Chinese investors see Malaysia as a gateway to the rest of Southeast Asia. Many worldwide component manufacturers, including ZF, Delphi, Continental, Nippon Kayaku, PD Kawamura, Akashi Kikai, Denso, and Bosch, have established regional headquarters in Malaysia.

In the past few decades, the automotive industry in Malaysia has seen significant transformation. The country was transformed from an assembly line into an automobile producer thanks to national automotive industry projects such as Proton and Perodua. The Proton plant in Tanjung Malim, which uses lean manufacturing techniques, has been fully automated as a result of the incorporation of robotic technology.

Despite the country's economic recession, Malaysia's manufacturing industry contributes 4 % of GDP, and the country has the third-largest automobile market in ASEAN. There are now 28 factories in Malaysia that produce and assemble automobiles, lorries, motorcycles, scooters, and auto parts. The production and assembly processes are part of the ecosystem, together with research and design, product and process development, materials management, and after-sales services. The expansion of the engineering, auxiliary, and supporting sectors of the economy can be directly attributed to the industrial sector. So, it helps develop the skills of experts in engineering and technology. Also, the global trend toward digitalization and creative business models is expected to increase, and Malaysia's automotive industry will not be an exception. In the next 10–15 years, the auto industry is expected to experience substantial transformation as a result of technological developments. The future of the vehicle sector in Malaysia is uncertain, but it also promises a host of attractive potential.

The National Automotive Policy (NAP) was first introduced in 2006 as part of the Third Industrial Masterplan (IMP3) 2006-2020, with the goal of modernising the automobile industry as one of the primary contributors to our economy. It emphasised crucial strategies and initiatives for making the local car sector more sustainable and competitive. The policy's second iteration was introduced in 2009 with the intention of improving the investment climate and bolstering local automaker’s competitiveness.

Conclusion

Malaysia's manufacturing industry is rebounding after a year of interruptions caused by the pandemic outbreak. Manufacturing companies, on the other hand, are struggling to keep up with persistent global economic uncertainty. Manufacturers' pre-pandemic challenges, such as optimising manufacturing processes, lowering operational costs, getting raw materials, managing workforces, and boosting profitability, have suddenly become even more difficult.

Manufacturing organisations in Malaysia are typically hampered by manual data processing tasks, antiquated IT infrastructure, and difficult-to-connect systems. Many businesses collect data from a variety of systems and sources, making it impossible to identify a single version of reality. As a result, decision-makers are unable to predict the impact of disruptors on supply chains, demand fluctuations, cost structures, and other crucial profitability components. This is not the case, thankfully, for manufacturers who were early adopters of technology and the data analytics method. According to some research and experience, manufacturers have discovered that using data and analytics has enabled them to reap benefits across the value chain, including increased industrial and supply chain efficiency.

Improved industrial operations and supply networks have the greatest impact. Production processes and supply chains can be interconnected and are increasingly more complex in this digital era. To maximise output volume and efficiency, manufacturing companies must review every area of their operations and supply chain. Data and analytics insights make this feasible. Manufacturers who properly employ data and analytics may keep detailed track of their crucial company performance with only a few mouse clicks. This helps them to track important performance parameters such as production volume, downtime, defect rate, production costs, and capacity utilisation rate. This monitoring can be used to create backup plans to avoid dangers and identify underperforming components during the manufacturing process.

3. INDUSTRY 4.0 in MALAYSIA

Malaysia is constantly exploring novel approaches to broaden its consumer base and improve the quality of the goods it manufactures. The nation in Southeast Asia has made significant strides in modernising its industrial sector over the course of the past several years, which has propelled it to the forefront of the global market. As a direct consequence of this, Malaysia developed into a leading industrial nation. The country's industrial sector has undergone tremendous change over the past several decades, shifting from large-scale production to the utilisation of robotics in order to achieve higher levels of productivity. Experts in the field have figured out how to incorporate a huge workforce as well as advanced technologies into production lines and supply networks, which has made it possible for the sector to continue its rapid expansion.

Trends

As a result of the development of Industry 4.0, Malaysia has acquired the skills necessary to integrate automation into their various systems as well as their core business activities. The quantity of technologies in the industry has little influence on the evolution of the industry. Nevertheless, it is mostly based on how successfully they have been applied to the basic obligations that have been assigned to them.

Malaysia is one of the countries that has mastered the use of efficient manufacturing technologies and smart digitization to increase the value of its products and services. This makes it possible to automate all significant tasks without having to rely on the participation of humans, which leads to enhanced productivity and efficiency.

Industry 4.0 refers to the current trends of process automation and data interchange using sophisticated industrial technology. These technologies include Internet of Things (IoT), Industrial IoT, cyber-physical systems (CPS), cloud computing, artificial intelligence (AI), cognitive computing, 3D printing, predictive maintenance, smart sensors, and others.

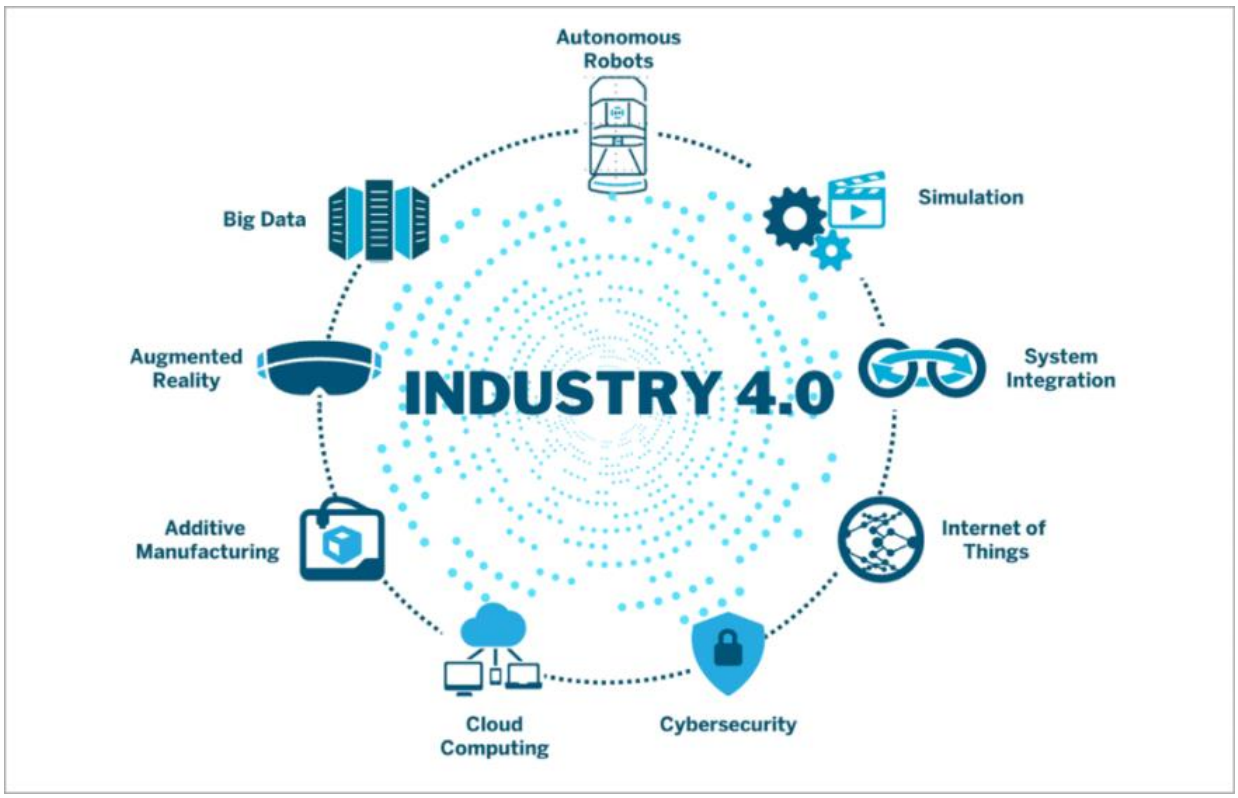


Figure 9: Industry 4.0 Elements

These technological advancements are designed to facilitate machine-to-machine (M2M) communication while minimising or eliminating the need for human intervention. The purpose of implementing the Industry 4.0 model is to transform a manufacturing company into a "Smart factory," giving them a competitive advantage over other brands and retailers.

Industry 4.0 is changing the way products are created, designed, transported, used, and operated. It also enhances and monitors after-purchase performance, such as maintenance and servicing. Overall, the Fourth Industrial Revolution has the ability to transform industrial businesses' processes, operations, machinery, supply chain management, and overall energy footprint into "smart factories."

Due to the deployment of Industry 4.0, Malaysia has been successful in growing its market globally and providing services to international clients. These smart technologies have enabled industries to personalise their products to match the particular needs of today's digital consumers, while also automating basic corporate operations.

Furthermore, Industry 4.0 has the potential to tackle a variety of industrial-related difficulties, such as efficient supply chain management, efficient use of precious resources such as time, money, and labour, waste reduction, and employee health and safety. In short, there are endless opportunities for growth if one understands how to apply the appropriate technologies.

Spearheading Industry 4.0 in Manufacturing Sector

On a global scale, manufacturing companies are already rethinking the future and exploring the boundless possibilities of Industry 4.0. Traditional manufacturing processes and machinery are being digitised and technologically transformed in order to increase efficiency, flexibility, and speed in order to compete in today's market.

Talking about Malaysia, the country’s manufacturing sector is rapidly shifting to digitization, delivering higher value-added products and services, efficient resource utilization, and implementing advanced manufacturing resources. Furthermore, the country has recognised the importance of increased productivity, improved innovation capability, increased job creation, a highly qualified labour pool, and maintaining societal well-being while facilitating economic development. Thus, putting these plans into action can help the entire country establish itself as a global leader in the smart manufacturing business.

The Malaysian government and industry have already made several measures at the national, state, and regional levels. Malaysia has taken steps to embrace the Fourth Industrial Revolution (4IR) in order to ensure that the manufacturing sector remains competitive in terms of productivity, innovation, and talent, while also producing the employment required for long-term prosperity. The Industry4WRD: National Policy on Industry 4.0 can pave the way for all of these Industry 4.0 trends and practises to become a reality.

Furthermore, this would assist the government in meeting its commitment to the United Nations' Sustainable Development Goals (SDGs). The goal of enhancing the country's manufacturing sector is to streamline and establish a more unified national agenda in order to speed the country's transition towards a smart manufacturing system.

Issues and Challenges Faced by Malaysia

The common challenges faced by Malaysia include:

- Lack of awareness of the need for and the impact of Industry 4.0 technologies, especially among SMEs, thus reducing the chances of exploring opportunities and the disruption of business models.
- Lack of easy access to vital data to understand the industry best practices and analyze the relevant use cases.
- Shortage of the necessary skills, talents and knowledge for adopting Industry 4.0, especially in areas like AI, IoT, robotics, cybersecurity, and many others.
- Higher adoption costs and a longer payback period for the 4IR processes and technologies.
- Lack of proper understanding of the benefits and costs associated with Industry 4.0 transformation.
- Determining the unique customer demands and expectations for customizing products and facilitating faster deliveries.
- Exposure to cyber threats and attacks with technology and connectivity up-gradation, especially IoT.
- Limited use of adoption and low digital transformation in the manufacturing industry, especially among SMEs.
- Fewer visible success stories of Industry 4.0 adoption by local companies.
- Limited coordination among the stakeholders to work towards a common goal.
- Lack of conducting proper training programmes to upgrade skills and talents, both for the existing and new workforce.
- Lack of appropriate collaboration with research institutes, industry leaders, and universities.

To address these above-mentioned potential issues and challenges that Malaysian manufacturing companies often face, the government has initiated the National Policy on Industry 4.0. Additionally, a series of the government agency and industry-specific workshops were conducted to involve and reach a board community of stakeholders and industry experts.

The Future

From the above analysis of the common challenges and issues, five key themes emerge that encourage the growth of an end-to-end 4IR ecosystem in Malaysia. These include:

- Upskilling and reskilling all the existing as well as future talents and skills.
- A significant evolution in collaborative platforms and innovation capabilities to develop and have access to more efficient and cost-effective technologies for addressing specific consumer needs.
- Inclusion of SMEs to encourage better involvement for enhancing productivity.
- Focused funding strategy and support is required for faster and more efficient Industry 4.0 adoption.
- Powerful digital infrastructure is needed to secure 4IR operations, thus increasing reliability and safety.

Therefore, these primary themes would guide developing and streamlining the National Policy on Industry 4.0, as well as the four major goals of Malaysia's manufacturing sector – GDP contribution, high-skilled employment, national productivity, and innovation capabilities.

Gearing Up for IR4.0 in Malaysia

Malaysia is making significant efforts to capitalise on the Fourth Industrial Revolution's potential (IR4.0). The Malaysian Investment Development Authority (MIDA), a state-owned body focused on assisting the manufacturing sector in realising its full potential, is supporting these efforts. Malaysia's automation business is expanding rapidly. In 2010, there were approximately 25 Malaysian industrial automation firms with a total market value of RM 234 million. Today, there are more than 50 companies, with the market value of the top ten alone exceeding RM 25 billion.

Global markets have a big influence on this tendency. The global industrial automation market is expected to be worth USD 191.89 billion in 2021, with an annual growth rate of 9.8 %. As a result, its market capitalization might reach USD 395 billion by 2029. According to the World Economic Forum's 2020 forecast, by 2025, automation would have rendered 85 million jobs obsolete while creating 97 million new ones. This enormous potential can also help Malaysia move to a high-income country.

Malaysia is currently hanging between IR2.0 and IR3.0, and the majority of manufacturing is done by SMEs, who account for 90 % of Malaysian enterprises and generate 38 % of GDP and 48 % of total employment. As a result, SMEs are crucial to MIDA's automation plan.

Lack of experience and perceived high equipment prices are major barriers to greater automation among SMEs. Companies, on the other hand, frequently overestimate the expenses of automation equipment. Another common misunderstanding is that the entire production line must be automated. a number of a single person in the world. There is also a plethora of quick and simple instruments for identifying such opportunities, such as placing equipment such as sensors that allow data collection and analytics. The progression to more advanced technologies, such as AI, can then occur gradually.

MIDA has established the new Automation Project Initiative (API) to assist manufacturing enterprises in realising their automation potential. This is a platform that connects manufacturing enterprises, particularly those that rely on unskilled and foreign labour, with the appropriate Factory automation suppliers or system integrators. MIDA has held a series of meetings and webinars with key industry players as part of the effort.

The government offers particular programmes to help with further automation:

- The Industry4WRD policy focuses on projects that improve workforce skills and productivity.
- The Industry4WRD Readiness assessment advises businesses on how to maximise their automation potential.
- The Industry4WRD Intervention Fund provides a 70:30 match for automation expenses up to RM 500,000.
- The Automation Capital Allowance gives a 200 % tax credit on the first RM 4 million in labour-intensive industry expenses incurred between 2015 and 2023, and on the first RM 2 million in other industries.

So far, enterprises have invested over RM 685.6 million through these initiatives, rationalised over 2448 unskilled foreign workers, and recorded a 201.7 % increase in manufacturing volume.

Furthermore, there is the "Penjana" tax incentive for new and current manufacturing enterprises that either incur new investments or repatriate production:

- For new enterprises, new investments between RM 300 million and RM 500 million are taxed at 0 % for ten years. The exemption is extended to 15 years for investments over RM 500 million.
- Existing companies that transfer production to Malaysia and undertake capital investment of more than RM 300 million are eligible for a 0 % tax rate for the first five years, which is offset against their total statutory income for each of the five years.

MIDA has developed a Project Acceleration and Coordination Unit (PACU) to deal with all essential clearances and supplement the existing 12 state offices in order to speed up the administration of all company requests. All of these initiatives help to boost Malaysia's manufacturing sector's competitiveness and play an important role in the country's ambitions to lead the IR4.0 revolution.

4. DIGITALISATION in MALAYSIA

The digital economy contributes 22.6 % to Malaysia's GDP, an increase of 100 % since 1996 when the country's first digital businesses entered the market. Malaysia is strategically positioned in the Global Islamic economy and Islamic fintech contributes significantly to the sector's rapid expansion.

Furthermore, the cyber security business plays an important role in the region's digital economy. Indeed, the Global security Index 2020 ranked Malaysia on 2nd place in ASEAN. This success is supported by 3 main government agencies:

- Malaysia Digital Economy Corporation (MDEC)
- Malaysian Global Innovation and Creativity Center (MaGIC)
- Malaysian Technology Development Corporation (MTDC)

In February 2022, the Malaysian government also started a project called Malaysia Digital Economy Blueprint (MyDigital), which aims to fix problems in certain sectors. For example, in addition to the current 335,834 SMEs and micro-enterprises benefiting from the e-commerce sector, MyDIGITAL aims to encourage a total of 875 000 SMEs.

There are still still certain obstacles to overcome. For instance, despite the fact that the Jalinan Digital Negara (JENDELA) plan has already accelerated the expansion of network coverage across Malaysia, additional efforts are still required. Inclusion of more excluded people in the technology business might also have positive outcomes. Moreover, despite the country's abundance of skill, the number of computer and software graduates has space for growth.

The framework of the National Technology and Innovation Sandbox and the National Regulatory Sandbox further aids start-ups on their growth paths. As a result, Malaysia's first unicorn, the car-selling app "Carsome," has emerged. "Boost" and "Fave" are also well-positioned to surpass the USD 1 billion value threshold in the near future.

The supportive ecosystem has also enabled the development of a dynamic dronetech sector, which includes numerous successful start-ups such as Aerodyne and Polardrone, which grew locally but now thrive globally. In 2020, Malaysia's start-up market value surpassed USD 15 billion, and The Global Startup Ecosystem Report 2020 rated Malaysia's start-up ecosystem on 11th place worldwide with the highest score in terms of performance.

On top of MDEC's agenda is the increased effort to foster sustainable growth, as the digital economy is in the pole position to become a driver of environmentally friendly solutions and promote social cohesion. Although awareness and appreciation of Environmental, Social, and Governance (ESG) issues is high, it has not yet fully translated into business practices. By promoting and enabling this transition, MDEC's activities align with the UN Sustainable Development Goals. In fact, MDEC is committed to becoming the first Malaysian agency to participate in the UN Global Compact and has recently supported the SDG Ambition Month 2021, organised by its Malaysian network.

Transforming Malaysia's Digital Economy

One of the largest players in Malaysia's digitalization strategy is the Swedish company Ericsson. To transform Malaysia into a digital economy, Ericsson teamed up with the Digital Nasional Berhad (DNB) in installing the 5G network in Malaysia. DNB is a Malaysian special-purpose vehicle corporation that is owned by the Ministry of Finance and governed by the Malaysian Communications and Multimedia Commission.

Malaysia's 5G rollout is already one of the world's fastest, which is why by 2025 Ericsson will connect approximately 80 % of Malaysia's populated areas to 5G. With 125 live networks in 55 countries Ericsson was named the world's number one 5G developer by Frost Radar for the second year in a row and named a leader in the 2022 Magic Quadrant for 5G Network Infrastructure for Communications Service Providers report by Gartner.

A key success factor is Ericsson's strong emphasis on investment in R&D which amounts to 18 % of its global revenue. This allows Ericsson to pioneer innovations such as "Dynamic Radio Resource Partitioning" or the "voice over new radio" technology, which will benefit Malaysia's 5G network.

Beyond the installation of the 5G network, Ericsson plays a vital role in developing Malaysia's whole 5G ecosystem. Via its cooperation with DNB and the Malaysian Research Accelerator for Technology and Innovation (MRANTI), Ericsson further accelerates the development of innovation clusters within the country. Additionally, Ericsson cooperates with the Universiti Teknologi Malaysia (UTM) to train annually around 1200 Malaysian students on 5G and other emerging technologies.

Ericsson's firm commitment to the Malaysian market is moreover highlighted by its continued investments in local facilities. Thus, the company has recently commissioned a new distribution centre located in proximity to KLIA from which it delivers hardware inventory and spare parts to over 20 countries across the region. This complements the existing maintenance and support centre, thus consolidating Ericsson's already strong presence in the region.

In order to create even more direct and indirect job opportunities for locals and support Malaysia in its strategy to embrace Industry 4.0 technologies, approximately 90 % of the Ericsson's overall spending for services for the 5G network is awarded to Malaysian contractors. The fast rollout of the 5G network will moreover particularly benefit suburban and rural communities, as their access to quick and stable internet had so far underperformed.

5G is expected to contribute RM 8,5 billion to Malaysia's GDP by 2025. The rapid growth of the 5G network will thus play a vital role in Malaysia's national development will contribute to bridge the digital divide.

5. STARTUP ECOSYSTEM IN MALAYSIA

The start-up ecosystem is part of the Small to Medium Enterprises, the backbone for the Malaysian Economy where 97 % of the registered companies in Malaysia are SMEs. They account for more than 50 % of the total employment in Malaysia. Formal small and medium-sized businesses can contribute up to 40 % of the national income in developing nations (GDP). These numbers significantly increase when informal SMEs are taken into account. Small and medium-sized firms, which often serve as a pillar of the middle class, are vital for social harmony, creativity, inclusive economic growth, and poverty eradication.

When discussing the start-up ecosystem, the ultimate goal for the ecosystem is to generate as much as possible companies that could attain "unicorn" status. In the venture capital sector, a unicorn is a privately held start-up firm with a valuation of more than $1 billion. Many people in Malaysia are still bitter over the lost opportunity to house Grab (originally founded in Malaysia, but subsequently moved their headquarters to Singapore due to more favourable terms), which is not only the first firm to be valued at more than $1 billion in Malaysia but also the first decacorn (a company valued at more than $10 billion) in Southeast Asia.

Carsome is the first firm in Malaysia to be valued at a billion dollars. Carsome is the most comprehensive online marketplace for automobiles in all of Southeast Asia. They have a presence in Malaysia, Indonesia, Thailand, and Singapore, and their goal is to digitalize the used of automobile market in the area by revamping and updating the experience of buying and selling vehicles. The process of selling a car has been simplified on all fronts, from the automotive inspection and ownership transfer to the direct financing. Carsome alleviates the challenges that are inherent in the conventional method of selling used cars by delivering end-to-end solutions that are effective for both consumers and used vehicle dealers. The business publication Straits Time estimated the worth of CARSOME at $1.3 billion.

The second company is AirAsia Digital, which was formerly referred to as RedBeat Ventures. It serves as the digital venture branch of the AirAsia Group. In doing so, it converts the AirAsia brand into a fully-fledged digital corporation by combining the physical and digital assets owned by the Air Asia Group. This results in the creation of an ecosystem of businesses that interact with the customers. AirAsia Digital blends the group's continued commitment on innovation with its business development expertise, best-in-class technological solutions, people development programmes, and big data analytics in order to assist travel and leisure firms in succeeding in the ASEAN region. It has been estimated that the all-in-one platform, which includes the Air Asia Super App, logistic services, and fintech, is worth more than 1.1 billion USD in the United States.

The third unicorn from Malaysia is Edotco which is the first unicorn in the telecommunication sector. Edotco is the backbone infrastructure arm for the listed company, Axiata Berhad where Axiata owns the majority stake with 63 % of shares followed by Network Corp of Japan, Khazanah and Kumpulan Wang Awam Persaraan (KWAP) which own 21 %,10 % and 5 % respectively. Edotco was established in 2012 and is being recognised the top 10 global tower companies. With 50,000 number of towers portfolio, Edotco has a regional presence across Malaysia, Myanmar, and Laos, Indonesia, Cambodia, Philippines, Bangladesh, Sri Lanka, and Pakistan.

Despite the numerous challenges, there will be more start-ups that will be produced in the future. Even though Malaysia is far behind and progressing quite slowly in comparison to India, start-up companies such as Boost Holdings, Exabytes, Eatcosys, Jirnexu, Mindvalley, Neurogine, Says, Lapasar, and PolicyStreet are on the verge of becoming emerging giants. In order to drive the start-up ecosystem further, financial institutions need to demonstrate a commitment to giving start-ups with the required support so that they can expand their operations beyond Malaysia in order to become an emerging giant or a unicorn.

According to Digital News Asia on Aug 30, 2021, thousands of Malaysian entrepreneurs are developing lucrative technology enterprises in locations such as Kuala Lumpur, Penang, Johor Bahru, and Kuching. According to official start-up estimates, Malaysia has roughly 3,000 companies. However, the unofficial figure might be far higher. Many of these businesses are formed as small to medium-sized businesses that employ technology to reach their target audience. It is sad that these firms do not become well-known, but

there is a chance for Malaysia to transform them into high-growth venture-backed companies that can expand locally and internationally.

Malaysia appears to have lagged behind in recent years in terms of technological investment. In 2019-2020, Malaysian start-ups received just US$362 million (RM1.51 billion), overshadowed by Indonesia's US$5.63 billion and Singapore's US$1.47 billion. Thailand and Vietnam, two neighbouring countries with lower ICT investments in the past, drew much more venture and growth capital during the same time. More worrisome is the fact that so many venture investors seem to see Malaysia as a market for investment opportunities rather than as a main focus of their investment mandate.

However, one of the biggest problems for Malaysian start-ups is that the venture capital (VC) industry is still not as big as it could be. This makes it harder for start-ups to get funding. The Institute for Capital Market Research Malaysia (ICMR) closely watches how the Malaysian VC market works. So far, the government has been the main investor in VC, which means that too much money comes from the government. So, the private sector needs to be more involved in venture capital, and the VC industry needs to be encouraged to build up its skills. Some of the stimuli that are already in place, like tax incentives, have not worked well enough to get the results that people want. But some new programmes, like Founders Grindstone, which tries to match VC investors with start-ups, have been created in recent years. Scaleup Malaysia also works with international investment firms like the Chinese Quest Ventures and the US-based Indelible Ventures to bring in money from abroad. Still, MDEC's Chief Executive Officer Mahadhir Aziz says that more needs to be done, like a Fund-of-Funds model or a single platform for market access.

Therefore, they need a strong financial support to make the company sustain until they manage to get the business traction. In order for start-up businesses to escape from this challenge, Malaysian government under Ministry of Science and Technology (MOSTI) and few collaborative agencies under different ministries such as Malaysia Research Accelerator for Technology & Innovation (MRANTI) and Malaysia Digital Economy Corporation (MDEC) have officially launched 'Malaysia Start-up Ecosystem Roadmap 2021-2030'. This effort will entail uplifting the start-up ecosystem, offering incentives for private and public investors, and giving support to enable entrepreneurs to overcome the hurdles and barriers of becoming a leading and successful global start-up ecosystem. In addition, the development of this road map is being done with the intention of making the start-up ecosystem in Malaysia one of the top 20 in the entire globe by the year 2030. It will also assist Malaysia in realising aim of generating 5,000 businesses by the year 2025, including five companies that achieve the status of unicorn.

Besides this roadmap, the recent launch of the Malaysia Digital (MD) national strategic plan would further catalyse MDEC's commitment to the national aim of developing five Unicorns by 2025. A primary goal of MD is to boost the value of the ecosystem as a whole by giving "Soonicorn"s a right assistance and tools they need to become Unicorns. The type of collaboration between the public and commercial sectors will be critical in order to get some positives outcomes.

In terms of attracting investors to choose Malaysia as a start-up centre, Malaysia is an appealing destination for entrepreneurs to explore for start-up incubation due to low costs, an outstanding quality of life, progressive talent, fast-tracked visas, and also strong government support. This will become an enticing incentive for investors to come to Malaysia and invest.

6. NATIONAL POLICIES

National 4IR Policy

The primary purpose of the National Fourth Industrial Revolution (4IR) Policy is to capitalise on 4IR growth possibilities. It takes a human-centered approach, focuses on increasing overall population wellness, and stresses trust and inclusivity. By doing this, it is in line with the Sustainable development goal (SDGs) and 'Wawasan Kemakmuran Bersama (WKB)' or Shared Prosperity Vision 2030. Important parameters of progress include:

- Increase of quality of life, for instance reaching 136.5 points in the Malaysian Wellbeing Index
- Increase of local capabilities, for instance 30 % productivity increase between 2020 and 2030, reaching top 20 in Global Innovation Index
- Enhanced ecological integrity, for instance reduction in greenhouse gas emissions intensity by 45 % by 2030, reaching top 50 in Environmental Performance Index

Malaysia has a strong electrical and electronics (E&E) industry which is the country's largest export earner and has achieved great advancements in the past decade. Nevertheless, Malaysia still faces challenges in fully embracing 4IR such as insufficient innovation-led mindset, inadequate 4IR-ready talent and lack of quality basic infrastructure. Therefore, the National 4IR Policy aims at tackling these main issues.

Purposes:

- Enhance policy coherence in enabling sustainable resource optimisation and implementation coordination of other related policies
- Support the delivery of national agenda, including the strategic direction outlined in WKB 2030, as well as the country's commitment to the SDGs
- Provide guidelines to address risks arising from 4IR technology adoption, whilst preserving values and culture

Policy thrusts:

- Equip the population with 4IR knowledge and skill sets
- Forge a connected nation through digital infrastructure development
- Future-proof regulations to be agile with technological changes
- Accelerate 4IR technology innovation and adoption

Focus sectors

The 4IR Policy targets specifically 10 key sectors, whose selection is based on their contribution to the GDP, as well as their role to influence the growth of other sectors. The application of 4IR technologies in these sectors is anticipated to create the highest impact.

- Transportation and logistics
- Wholesale and retail trade
- Tourism
- Finance and insurance
- Professional, scientific and technical services
- Utilities
- Education
- Manufacturing
- Healthcare
- Agriculture

Foundational Technologies

There five focus technologies of the 4IR: AI, IoT, blockchain, advanced materials and technologies, cloud computing, big data analytics.

The National 4IR Policy aims at harnessing the potential originating from these focus technologies as they are particularly suited for the increase of public wellbeing.

Implementation Strategy

The plan started in 2020 and is divided into 3 implementation phases:

- Phase 1: Completion by 2022: Enhance 4IR awareness and adoption
- Phase 2: Completion by 2025: Drive transformation and inclusivity of 4IR
- Phase 3: Completion by 2030: Achieve balanced, responsible, and sustainable growth by leveraging 4IR technologies

Industry 4WRD Policy

The Industry4WRD Policy is a national plan to change the manufacturing industry and related services between 2018 and 2025. As outlined in this plan, Malaysia will be what it wants to be in three ways:

- a main destination for investment in the high technology industry;
- a strategic partner for smart manufacturing and related services in the Asia Pacific region;
- a whole solutions provider for cutting-edge technology.

The Industry4WRD Policy is Malaysia's reaction to Industry 4.0 and beyond. It advocates for the transformation of Malaysia's manufacturing industry and associated services into more intelligent and powerful ones, powered by people, processes, and technology.

The development of a robust manufacturing sector would pave the way for increased productivity, job creation, innovation capabilities, a pool of highly qualified individuals, economic success, and societal well-being. The implementation of Industry 4.0 presents opportunities for competitive advantage for Malaysian manufacturing companies, particularly small and medium-sized enterprises (SMEs). With this in mind, this Policy was established to advance small and medium-sized enterprises (SMEs), with the goal of making them more agile and adaptable so that they can address the difficulties. The Preparedness Assessment programme will further assist small and medium-sized enterprises (SMEs) in measuring their readiness and gaps in order to guide their adoption of Industry 4.0 technologies. This programme is included as part of the Industry4WRD Policy.

In the end, the Policy will propel Malaysia toward being a strategic partner for smart manufacturing and related services in the Asia Pacific region, a primary destination for the high-tech industry, as well as a whole solutions provider for advanced technology.

The 12th Malaysia Plan (2021-2025)

In its five-year plans, the Malaysian government regularly sets some strategic goals and formulates fundamental commitments to the economic policy pursued. The manufacturing sector, being a significant contributor to the country's GDP, has always played a role in Malaysian economic planning, with increased focus from the 8th Malaysia Plan (2001-2005), following plans set out in the nation's Industrial Master Plan 2 (IMP2, 1996-2005).

Although Malaysia was ranked 26th out of 63 countries in the Institute for Management Development (IMD) World Digital Competitiveness Ranking, there are still some challenges remaining. These are in particular:

- Slow Growth of Digital Economy
  - ➢ Local companies lack experience and readiness to go global
  - ➢ Current policies and legal framework do not allow for full data sharing, which is fundamental for the progress of the digital economy
  - ➢ Shortage of skilled workers
- Widening Digital Divide
  - ➢ Geographical terrain makes digital coverage in rural areas more challenging

- Challenges in Adopting the Fourth Industrial Revolution Technologies
  - ➢ Digital adoption among MSMEs lags behind due to the lack of awareness and high cost
  - ➢ Absence of a platform to resolve cross border eCommerce disputes
- Insufficient Investment in Research, Development, Commercialisation and Innovation

The Twelfth Malaysia Plan aims at tackling these issues.

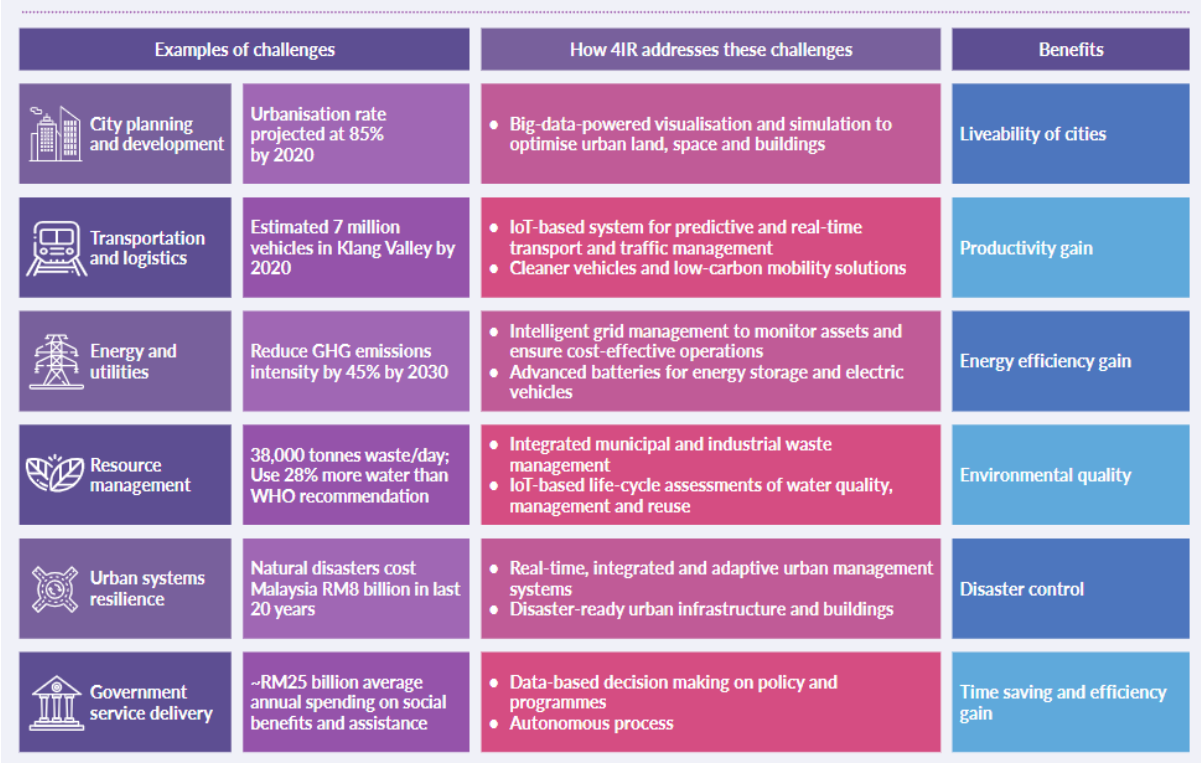


Figure 10: 12th Malaysia Plan Snapshot (source: 12th Malaysia Plan)

Altogether, the Twelfth Malaysia Plan shall boost the sustainable growth of Malaysia's digital economy.

Manufacturing Policy

Manufacturing sector requirements under the Industrial Coordination Act (ICA) of 1975 include local firm establishment and the application for a Manufacturing Licence for manufacturing projects. There are no limits on foreign stock ownership, and policies are generally friendly to those seeking to work abroad. Manufacturing policies promote the free flow of money for foreign investments in Malaysia. The rights to intellectual property (IP) are well-protected. Corporate tax rates range from 24 % to 30 %, while individual tax rates range from 0 % to 30 %. The Employment Act of 1955 requires that some minimum employment requirements be met. Manufacturing policies promote responsible trade unions and cooperative labour relations. Below are some policies that are already in place:

- Local company incorporated
- Manufacturing Licence application
- No restriction on foreign equity ownership
- Expatriate's employment policy
- Protection of intellectual property rights
- Company tax rate 24 %
- Individual tax rate from 0 % – 30 %
- Minimum conditions of employment under the Employment Act 1955
- Compulsory contributions are:
  - Employee Provident Fund (EPF)
  - Social Security Organisation (SOCSO)
  - Human Resource Development Fund (HRDF)
- Investment Guarantee Agreements (IGA)
- Double taxation agreements
- Controlled environmental management policy

Budget 2022

Budget 2022 was developed as a result of a series of on-the-ground engagements across several Malaysian states, including over 30 focus group meetings and discussions, as well as an examination of over 1,100 memorandums and approximately 50,000 recommendations received through the dedicated Budget 2022 webpage. Below are few key highlights for manufacturing, technology, automation, and digitalization in Budget 2022:

I. An investment of RM80 million from MITI will help train 20,000 people who work in industry clusters like MRO in Subang, E&E in Kulim, and chemicals in Gebeng.
II. The state skills development centre has been given RM50 million to improve TVET training.
III. The government has given Bumiputera-owned small and medium-sized enterprises (SMEs) a matching grant of RM100 million so that they can look into business opportunities in the aerospace industry.
IV. RM25 million has been given to the Halal Development Corporation to help it create more halal Micro SME (MSMEs) or start-ups.
V. The Innovation Hub: The Fourth Industrial Revolution will be set up with RM30 million.
VI. The Cradle Fund will get RM20 million to help small businesses get back on their feet and make their economies stronger.
VII. RM45 million has been set aside to help push technology toward the Fourth Industrial Revolution.
VIII. Allocating RM200 million in Budget 2022 to digitalize small and medium-sized businesses (SMEs) can help speed up the economic recovery, which was slowed down by the Covid-19 pandemic, especially in the SME segment.

7. MARKET ENTRY

Actors and Institutions

The main players in the manufacturing sector in Malaysia are the Ministry of Industrial Trade and Industry (MITI) and its agency, Malaysia Investment Development Authority (MIDA), mandated as Malaysia's cutting-edge, dynamic, and pioneering force in opening pathways to new frontiers around the globe. It also takes care of financial matters, attracts investors, and advises investors on government policies and procedures. These representatives include officials from the Department of Labour, Immigration Department, and Royal Malaysian Customs.

The Federation of Malaysian Manufacturers (FMM) are also an important association of local manufacturers, that advocate for the industrial players, provide training, advice and other resources to its members. They also have several sub-industry groups under their umbrella, including for the chemical industry, food manufacturing, automotive manufacturing, cosmetics and toiletries, biodiesel, and petrochemicals. Most notable is the Malaysia Automation Technology Association (MATA) which focuses on the development of automation in the industry.

The main ministry for the technology sector is the Ministry of Science and Technology (MOSTI) which is specifically looking forward "to "creating a conducive environment for the advancement of science and technology as a means of generating knowledge, wealth, and raising the quality of life through sustainable development." MOSTI also will be involved in promoting and coordinating science and technology research and development activities in basic science and in the fields of industries, agriculture, electronics, communication, building, energy, and medical sciences.

Other important agencies under MOSTI are Malaysia National Applied Research and Development Centre (MIMOS), serving a central role in Malaysia's digital transformation journey, and nurturing relationships with internal and external stakeholders, in the spirit of smart partnerships and inclusive growth models and strategies. Another stakeholder under MOSTI is Malaysia Technology Development Corporation (MTDC), mandated to lead strategic investment companies in Malaysia for start-up companies up until companies are ready for listing. To date, MTDC has funded and invested in more than 850 Malaysian companies, of which some have been successfully listed on local and international equity markets, achieving more than RM 1 billion in market capitalization. In order to drive research and innovation in a high-tech environment, agencies like the Malaysian Research Accelerator for Technology & Innovation (MRANTI) will take the lead in accelerating ideas to market.

For the digitalization effort, the ministry that is in charge of spearheading the digital economy is the Ministry of Digital Communications (MODC), and its agency, the Malaysia Digital Economic Corporation (MDEC), is tasked to implement the Multimedia Super Corridor (MSC) initiative. MDEC's aspiration is to firmly establish Malaysia as the "Heart of Digital ASEAN," a regional digital powerhouse launching global champions to lead the Fourth Industrial Revolution, ensuring our digital economy will drive shared prosperity for all Malaysians.

Legislation & Policy

The Industrial Co-ordination Act 1975 (ICA)

The Industrial Co-ordination Act of 1975 regulates the manufacturing sector in Malaysia. A number of laws implemented under the Industrial Co-ordination Act of 1975 apply to businesses participating in or proposing to engage in the manufacturing industry. The purpose of the compliance mandates is to ensure that the manufacturing sector is effectively regulated by the proper authorities. This process also guarantees that enterprises are producing goods that do not conflict with national economic and social goals. It promotes the orderly growth of the manufacturing sector and reduces the number of negative impacts the sector has on society, such as improper waste management, pollution, and other environmental issues.

The ICA also mandates manufacturing enterprises with shareholder's funds of RM2.5 million or more, or with 75 or more full-time paid employees, to apply for a manufacturing licence for approval by the Ministry of International Trade and Industry (MITI). Applications for manufacturing licences must be filed with the Malaysian Investment Growth Authority (MIDA), an organisation under MITI that promotes and coordinates industrial development in Malaysia.

In addition to the Industrial Co-ordination Act of 1975, the Manufacturing Industries Development Authority (MIDA) has published on its website a Guideline on the application for Manufacturing Licence, which includes the following criteria:

- Companies whose shareholders' funds total at least RM2,500,000 or who employ 75 or more full-time, paid staff members are eligible to apply.
- The company's total full-time workforce must consist of at least 80 % Malaysians, and projects must have a Capital Investment Per Employee (CIPE) of at least RM140,000.00. The employment of foreign workers, including personnel obtained through outsourcing, is subject to the policies that are now in place;
- The total number of managerial, technical, and supervisory levels (MTS) staff with a degree and/or diploma/certificate is at least 25 % of the company's full-time employment or having a product's value-added of at least 40 %;
- The project needs to be in line with the country's economic and social goals and help the manufacturing sector in Malaysia grow in a planned way.

Interim Approval Letter

An interim approval letter is a document issued by MIDA before the manufacturing licence is issued. The interim approval letter specifies the documentation that must be presented to MIDA in order for the manufacturing licence to be issued. The interim approval letter will be sent to the applicant within four weeks of obtaining all relevant information, according to MIDA's Client Charter. Following the delivery of the approval letter, the applicant must submit MIDA with the documentation mentioned in the interim approval letter, along with the interim approval letter, before the manufacturing licence certificate is issued.

Exemption of Approval Letter

A company that does not match the aforementioned conditions but falls within the scope of the Industrial Co-ordination (Exemption) (Amendment) Order 1986 may request a confirmation letter by submitting an ICA 10 form to MIDA, which provides for an exemption from manufacturing licence approval. To avoid confusion, the ICA 10 form is applicable to manufacturing enterprises that do not meet the criteria of having shareholders' funds exceeding RM2,500,000 and/or employing 75 or more full-time employees. MIDA's guidelines for submitting an application for the ICA 10 exemption are accessible here.

8. SUBSIDIES & FISCAL INCENTIVES

Incentives for Manufacturing Companies
Companies that engage in the manufacturing sector may qualify for a number of tax benefits, the two most common of which are the Pioneer Status and the Investment Tax Allowance. Companies can qualify for Pioneer Status and the Investment Tax Allowance based on a variety of factors, including the value they create, the technologies they employ, and the number of connections they have to other industries.

i) **Pioneer Status:** When a business is awarded the Pioneer Status (PS) designation, the company is eligible for a partial exemption from the payment of income tax for a period of five years. It is subject to tax on 30 % of its statutory income, with the exemption period beginning on the day that it produced its goods or services (defined as the day its production level reaches 30 % of its capacity).
Unused capital allowances that were incurred during the pioneer period have the ability to be carried forward and deducted from the company's income that was generated after the pioneer period. The corporation is entitled to carry over and deduct from its post-pioneer income any losses generated during the pioneer period for a period of seven consecutive years.

ii) **Investment Tax Allowance:** If a company doesn't want to be a Pioneer, they can apply for Investment Tax Allowance instead (ITA). A business that has been granted ITA is eligible for a deduction equal to 60 % of the amount of its qualifying capital expenditures (factory, plant, machinery, or other equipment used for the approved project) that it makes within 5 years of the date it made its first qualifying capital expenditure. This allowance can be subtracted from the corporation's statutory income by up to 70 % for each year it is assessed. Any part of the allocation that is not used up can be carried over to the next year. The remaining 30 % of its statutory income will be taxed at the standard rate for businesses.

Incentives for High-Tech Companies
A high technology company may be eligible for the following benefits:

i. Pioneer Status, which grants the company an income tax exemption equal to 100 % of the statutory income for a term of 5 years. Unused capital allowances that were incurred during the pioneer period have the ability to be carried forward and deducted from the company's income that was generated after the pioneer period. The company is allowed to accumulate losses that were incurred during the pioneer era, and those losses can be carried over and deducted from the company's income after the pioneer period for a period of 7 years in a row; or

ii. An investment tax allowance of 60 % on the qualifying capital expenditure incurred within 5 years from the date the first qualifying capital expenditure is incurred in the business. Every year that is being assessed, the allowance might be applied as a reduction or elimination of 100 % of the statutory income. Any allowances that are not used up can be carried over to the following year and used up there till finish.

Incentives for Strategic Projects
Strategic projects entail national-level products or operations. They often require large capital investments with extended gestation periods, are technologically advanced, integrated, produce broad linkages, and have a big economic impact.

i. Pioneer Status with income tax exemption of 100 % of the statutory income for 10 years; Unabsorbed capital allowances incurred during the pioneer period can be carried forward and deducted from the company's post-pioneer income. Accumulated losses incurred during the pioneer phase can be carried forward and subtracted from the company's post-pioneer income for a period of 7 consecutive years.

ii. Investment Tax Allowance of 100 % on qualified capital expenditures incurred within five years of the first qualifying capital expenditure. This allowance can be applied to 100 % of the statutory income for each assessment year. Unused allowances can be carried over to consecutive years until they are entirely used.

9. TRENDS AND OPPORTUNITIES FOR AUSTRIAN COMPANIES

COVID-19 Impact & Post-Pandemic Recovery

COVID-19 has forced Malaysia into several lockdowns, known as Movement Control Orders (MCO) since March 2020. Due to the prolonged nature of these lockdowns, the Malaysian economy was heavily impacted. In order to cushion the effects as much as possible, a total of 3 stimulus packages with a total value of RM260 billion have been announced.

Moving forward, the Malaysian government has announced a resilience plan to rejuvenate Malaysia economy post-pandemic. "Strengthening Growth Enablers" is one of the nine focusses in the 12th Malaysia Plan, which defines the country's ambitions to become a high-income and high-tech nation by adopting new technologies and strive to create as well as develop our own technology. To elaborate further, the Malaysian government has highlighted a few aspects of technology adoption that will be focused on, such as digitalisation and advanced technology, including 4IR Technology. Today, the digital economy contributes 22.6 % to Malaysia's GDP, an increase of 100 % since 1996 when the country's first digital businesses entered the market.

The framework of the National Technology and Innovation Sandbox and the National Regulatory Sandbox further assists start-ups on their growth trajectories. This has allowed the car-selling app "Carsome" to become Malaysia's first unicorn. "Boost" and "Fave" are also well-positioned to surpass the USD 1 billion valuation threshold in the near future. The supportive ecosystem has also enabled the development of a dynamic dronetech sector, which includes many successful start-ups such as Aerodyne and Polardrone, which grew locally but now thrive globally. In 2020, Malaysia's start-up market value hit USD 15 billion, and The Global Startup Ecosystem Report 2020 ranked Malaysia's start-up ecosystem on 11th place worldwide with the highest score in terms of performance.

In addition, the Malaysian government launched the Malaysia Digital Economy Blueprint (MyDIGITAL) in February 2022, an initiative aimed at addressing specific sector bottlenecks. For example, in addition to the current 335,834 SMEs and microenterprises benefiting from the e-commerce market, MyDIGITAL intends to encourage a total of 875,00 SMEs (small to medium enterprises).

On the other hand, the Malaysia Budget 2022 has shown great promise for the electrical and electronics (E&E) sector in Malaysia, federal government will allocate RM100 million for smart automation matching grants to benefit 200 manufacturing and service companies. In Budget 2022, the federal government allocated RM45 million to encourage technological transformation towards Industry 4.0 among small and medium enterprises as well as mid-level companies in the manufacturing and service sectors, providing a good direction and area of focus for the E&E sector to grow and more development towards Industry 4.0.

Trends

Malaysia is making great efforts to embrace the potential of the Fourth Industrial Revolution (IR4.0). These efforts are supported by the MIDA, a state-owned agency focused on assisting the manufacturing sector in harnessing its potential.

Malaysia's automation business is expanding rapidly. In 2010, there were approximately 25 Malaysian industrial automation firms with a total market value of RM 234 million. Today, there are more than 50 companies, with the market value of the 10 largest alone over RM 25 billion. This trend is strongly influenced by global markets. The global industrial automation market was valued at USD 191.89 billion in 2021 and boasts a projected growth rate of 9.8 % annually. Therefore, its market capitalization might reach USD 395 billion in 2029. The World Economic Forum report 2020 estimates that by 2025, automation will make 85 million jobs obsolete but at the same time create 97 million new ones. This vast potential can also bolster Malaysia in its transition to a high-income country.

Key Industries

The Mega Science 3.0 study by the Academy of Sciences Malaysia (ASM) 2015 – 2016 looked at five industries namely Furniture, Automotive, Creative, Tourism, and Plastics and Composites. These industries were selected on the basis of their combined contribution to national GDP in 2014, which was valued at RM 148 billion and is projected to increase towards 2050. Therefore, we foresee that IR4.0 technology in these fields, notably Furniture and Automotive, would be important drivers for their development. The food and agricultural industry in Malaysia would also be well-served by the fourth technological revolution.

Furniture: Malaysia has a well-established wood-based furniture industry, due to abundant and high-quality wood resources. However, for Malaysia to be a world leader, it would need to develop design capabilities to leverage on the disruptive 3D printing technology that is rapidly advancing. This would enable the Malaysian furniture industry to evolve from original equipment manufacturer (OEM) to original design manufacturer (ODM) and ultimately to original brand manufacturer (OBM), commanding higher market share and returns.

Automotive: The Malaysian automotive industry contributes 2.5 % to the nation's annual GDP and 5.84 % to employment, meaning there is tremendous growth potential, if it aligns to global trends and future demand. The key disruptive technology trends in the automotive sector are expected to be diverse mobility, autonomous driving, electrification, and connectivity. With most countries declaring carbon neutrality by 2050, the industry is also pushing for vehicles with greater fuel efficiency and lower carbon emissions. In Malaysia, the government plans to have 10000 EV Charging stations by 2025 – management and monitoring of these systems would also lead to high digitalization requirements.

Food: The food industry has gone through substantial transformative stages over the years, from simple farming, to food manufacturing and mechanisation, followed by technology-based products, advances in processing machineries and attention towards genetically modified foods. In the 4.0 revolution, the focus is largely to attain sustainability , safety , cost effectiveness, and affordability in food production. Among key technologies are nanotechnology (to aid in faster food production and processes); digital technology for traceability of food content and its supply chain; IoT to decrease maintenance costs while improving productivity and attaining quality standards; artificial intelligence (AI) to reduce food waste, as well as generate effective data analysis and cost effective process projections.

Key Solutions

Generally, across the board no matter what industry, there are some technologies that we see repeatedly as solutions needed to improve efficiency and digitalisation:

- **Connectivity Solutions**
- **IoT**
- **Autonomous Mobile Robots**
- **Edge Computing**
- **AI/VR/Digital Twins**
- **Data Analytics**
- **Predictive Maintenance – to allow for better management of machinery and maintenance**
- **Digital Security**

Next, we also share snapshots of opportunities as identified by MDEC and MATA and shared in our collaborative webinar "Industrial Digitalisation in Southeast Asia", as held on 01.03.2022.

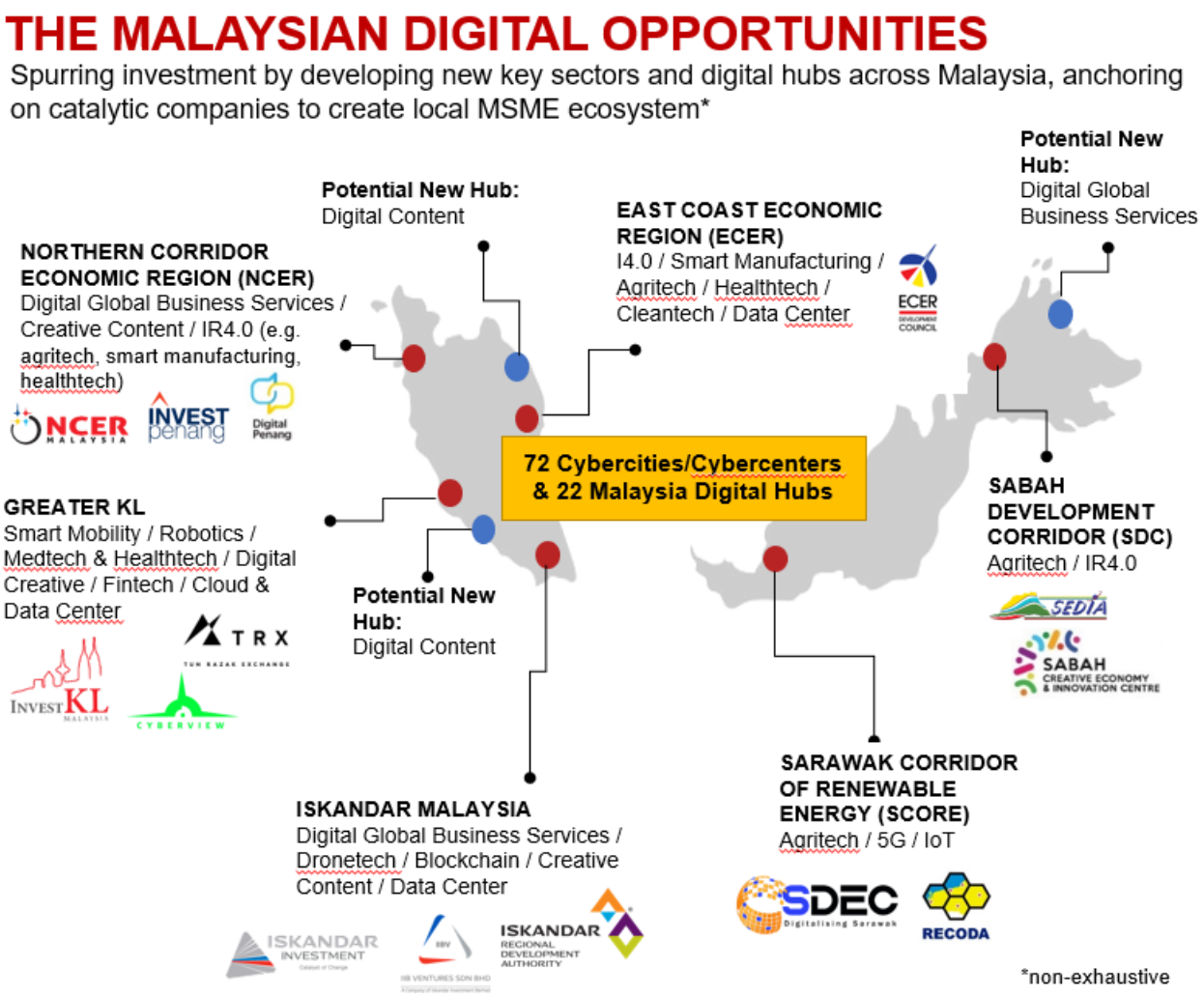


Figure 11: Snapshot of Digital Opportunities in Malaysia by Region (source: MDEC)

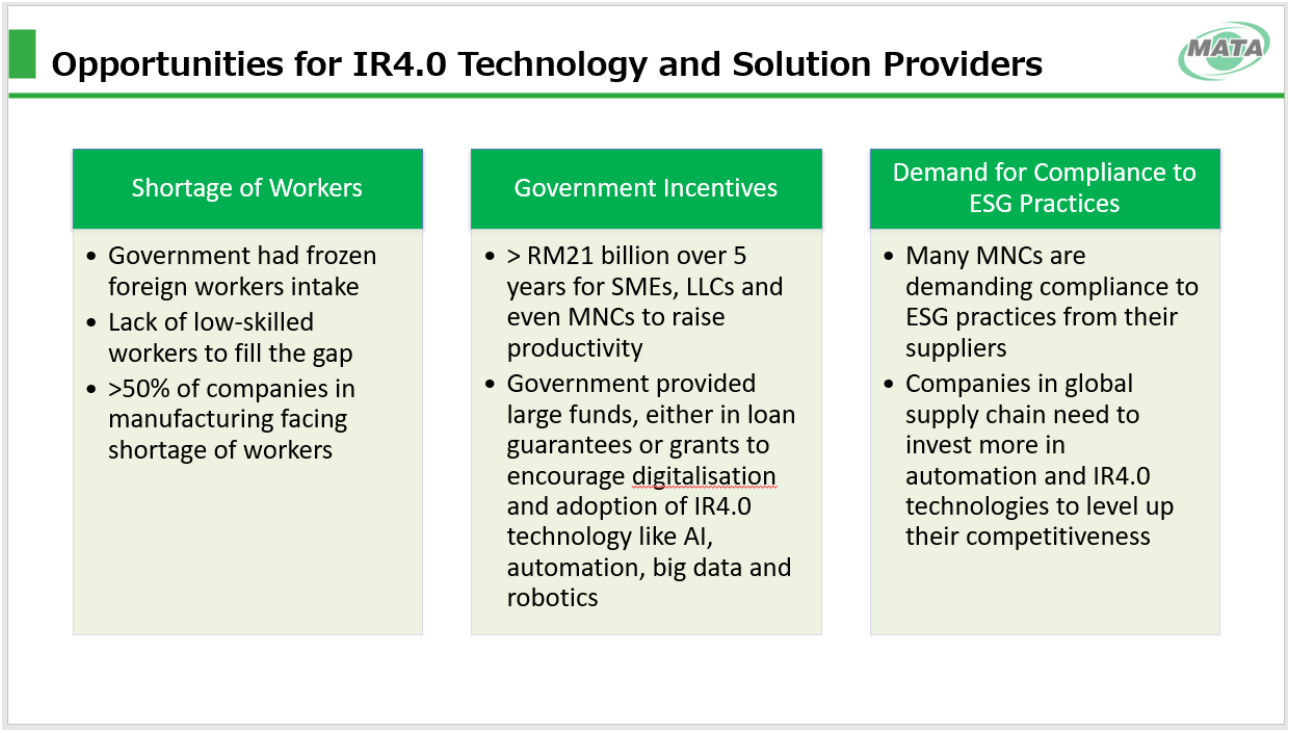


Figure 12: Opportunities for IR4.0 Tech and Solutions in Malaysia (source: MATA)

10. EVENTS AND TRADE FAIRS IN THE SECTOR

Automechanika Kuala Lumpur
Kuala Lumpur | 16-18 March 2023
Note: Automechanika Kuala Lumpur is the dedicated exhibition on automotive aftermarket and part of the global 'Automechanika' brand.

Malaysia International Technology Expo (MTE)
Kuala Lumpur (Hybrid)| 16-18 March 2023
Note: MTE is the region's leading innovation event through collaboration with local and foreign academia, investors, inventor's associations, and research partners. MTE is focussing on nurturing and encouraging more innovative spirit and excellence in research communities that would contribute to the global innovation & technology ecosystem.

Control World Expo
Kuala Lumpur | 23-24 May 2023
Note: Control World Expo is the only event in ASEAN focused to industrial quality assurance, showcasing the newest trends and developments in test, measurement, and inspection solutions for the manufacturing and processing industries. As ASEAN manufacturers continue to move up the value chain amid a shift towards Industry 4.0, quality assurance has become a key area of focus, leading to rising investments in world-class TM&I equipment. The Asia-Pacific (including ASEAN) is currently the fastest growing region in the USD 25.7 billion global TM&I equipment market. Control World Expo will showcase a wide range of innovations for high-value end-users looking to meet ever-evolving standards of quality, reliability and precision.

34th International Invention, Innovation & technology Exhibition Malaysia (ITEX'23)
Kuala Lumpur | 11-12 May 2023
Note: ITEX attracts the right target group in the science and technology industry and is often used to unveil a new invention or product. ITEX is where commercialization of inventions/new products happens. Inventors can seek out potential investors here and convince them why funding their invention can benefit society.

SEMICON Southeast Asia
Penang | 23-25 May 2023
Note: SEMICON Southeast Asia is the premier event that promotes the growth of the semiconductor and microelectronics ecosystem in Southeast Asia by connecting companies, suppliers, and buyers from across the supply chain – from R&D and design to manufacturing and application development.

Metaltech & Automech
Kuala Lumpur | 31 May – 3 June 2023
Note: Metaltech & Automex is renowned by the manufacturing industries as the progressive platform for suppliers to launch their new products and services to local and regional buyers, gaining new contact and attaining new businesses. It will be a great chance to meet with thousands of local and international exhibitors representing various industry sectors with specialised profiles on machine tools and sheet metal technology, industrial hardware & supplies, robotics & automation and precision metrology arranged in different exhibition halls

SMART NATION EXPO
Kuala Lumpur | 19-21 September 2023
Note: Smart Nation Expo 2023 will be Malaysia's biggest event on 5G, Smart Cities, IR4.0, Emerging Technologies and Applications. Themed: "Connecting Smart Innovations", SMART NATION EXPO 2023 is at the centre of this transformation and provide the key regional platform to connect stakeholders with innovative smart technology and solutions providers.

Events of AußenwirtschaftsCenter Kuala Lumpur

Please visit **https://wko.at/aussenwirtschaft/my -> Veranstaltungen** for more details on the events below.

Metaltech & Automex Trade Fair (Austrian Pavilion)
Kuala Lumpur **| 31 May – 3 June 2023**
Metaltech & Automex is renowned by the manufacturing industries as the progressive platform for suppliers to launch their new products and services to local and regional buyers, gaining new contact and attaining new businesses. It will be a great chance to meet with thousands of local and international exhibitors representing various industry sectors with specialised profiles on machine tools and sheet metal technology, industrial hardware & supplies, robotics & automation and precision metrology arranged in different exhibition halls

11. CONTACTS – MINISTRIES, AGENCIES & ASSOCIATIONS

Malaysian Investment Development Authority (MIDA)

MIDA is the government's principal agency to oversee and drive investment into the manufacturing and services sectors in Malaysia. MIDA assists companies which intend to invest in the manufacturing and services sectors, as well as facilitates the implementation of their projects. The services provided by MIDA include providing information on the opportunities for investments, as well as facilitating companies which are looking for joint venture partners. They also evaluate the following applications for projects in the manufacturing sector and selected services sub-sectors: Manufacturing licenses, Tax incentives, Expatriate posts, and Duty exemptions.

Federation Malaysia Manufacturer (FMM)

The organisation was previously known as the FMM-Automation Technology Industry Group (FMM-ATIG) and operated under the auspices of the Federation of Malaysian Manufacturers to promote the advancement of automation technology in Malaysia, to serve as a bridge between the government and the industry, and to build a cohesive automation technology community. FMM also provides a good

Standards and Industrial Research Institute of Malaysia (SIRIM)

SIRIM is Malaysia's leading industrial research and technology organisation, entirely owned by the Minister of Finance Incorporated. SIRIM is mandated as the machinery for research and technology development, as well as the national champion of quality, with over forty years of experience and knowledge. SIRIM has always played an important role in the growth of the country's private sector, focusing on developing new technologies and advancements in the manufacturing, technology, and services industries by using their skills and knowledge base.

Selangor Human Resource Development Centre (SHRDC)

Selangor Human Resource Development Centre was founded through a tripartite agreement between the government and industry. It is ISO certified, non-profit, and award-winning talent and skills development centre. By delivering relevant industry training, the goal is to correctly prepare Malaysians to be a sustainable pool of highly trained, innovative, and adaptable workers for Malaysia's successful transition into a digital economy for firms and businesses. Creating a path for filling the talent shortage and narrowing the skills gap for new and existing talent.

Penang Skills Development Centre (PSDC)

The PSDC (Penang Skills Development Centre) was founded in 1989 and is Malaysia's first tripartite, industry-led skills training and education centre. The PSDC has evolved exponentially since its foundation to become the country's foremost learning institution, dedicated to meeting the urgent human resource demands of the business sector as well as supporting and strengthening corporate requirements. It has received national and worldwide attention as a truly successful example of collaborative learning and a model institution for human resource development that may be replicated both within and outside of Malaysia. In order to enable industry growth and development, the PSDC implemented its Industry 4.0 initiative in 2016, a plan that supports Malaysia's new phase of industrial revolution. To meet the industry's current needs and demands, the PSDC will expand its role and gear toward becoming the Centre of Excellence for Industry 4.0 in Penang and Malaysia by providing leadership, the right platform for learning best practises, and talent development support through its high-end Shared Services facilities.

Ministry of International Trade and Industry (MITI)

The Ministry of International Trade and Industry (MITI) is responsible for international trade, industry, investment, productivity, small and medium enterprise, development finance institution, halal industry, automotive, steel, and strategic trade. Their goals are to promote and strategise Malaysia's global competitiveness in international trade by producing high value added goods and services, and to spur the development of industrial activities. MITI plans, legislates and implements international trade and industrial policies that will ensure Malaysia's rapid development, encourages foreign and domestic investment, and promotes Malaysia's exports by enhancing national productivity and competitiveness in the manufacturing and services sector.

Ministry of Science Technology & Innovation (MOSTI)

MOSTI's goal is to transform Malaysia into a high-tech nation through Science, Technology, Innovation and Economy (STIE), and to use STIE to address national issues and challenges for sustainable development. They aim to develop local technology and innovation by strengthening policy and regulation, and provide effective and efficient STIE enablers and services through agile governance.

Malaysia Industry Forward Association (MIFA)

Malaysia Industry Forward Association is the foremost community platform that offers exceptional member value in relation to Malaysia Industry4WRD Policy. It will provide connected stakeholders, entrepreneurs, researchers, and policymakers with a powerful voice of influence on the innovation, development, and market deployment of I4.0 and IR4.0 technologies and applications, while also stimulating and leading a favourable business climate.

The National Tech Association of Malaysia (PIKOM)

With over 1,000 active members, PIKOM represents Malaysia's technology industry, dominating 80 % of total tech business in the country. As the voice of the tech industry, PIKOM is committed to increasing the size and potential of Malaysia's tech-related business. PIKOM's focus is on the following:

- Lead, promote, and support the development of Malaysian technology resources, professional skills, and programmes.
- Act as the local IT industry's representative when dealing with local and international governments and private companies.
- Create a space for tech players and users to meet, network, learn, and share ideas in order to expand the industry and improve applications.
- Promote high standards of conduct, service, and performance across the technology industry.
- Promote and promote local technology services in foreign markets.

Malaysia Semiconductor Industry Association (MSIA)

Malaysia Semiconductor Industry Association (MSIA) is an industry association that represents individuals and companies incorporated in Malaysia that are directly or indirectly involved in the Semiconductor Industry (Electronics and Systems), the Semiconductor Industry supply chain, institutions providing significant related services to the Semiconductor Industry such as engineering, finance, legal, and those societies, associations, chambers, and government-linked agencies.

Malaysia Board of Technologists (MBOT)

Malaysia Board of Technologists (MBOT) is a professional body that gives Professional Recognition to Technologists and Technicians in related technology and technical fields. As a whole, these professionals have integrated roles from concept to reality. MBOT also assists in ensuring the quality of the profession is in line with the dynamic development of the current industry and current trends in manufacturing technologies include, among others, automation, Internet-of-things and cyber physical systems.

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