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Malaysian Industry-Government Group for High Technology

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Journey to Sustainability: Are we on the Right Track?

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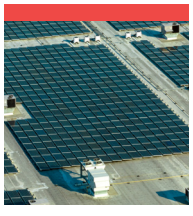

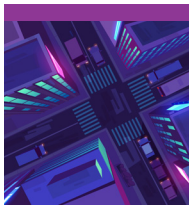

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1. Anticipate Malaysia's future possibilities;
2. Promote foresighting at national, sectoral and corporate levels;
3. Identify key technologies to support sectoral development;
4. Outline key future R&D areas.

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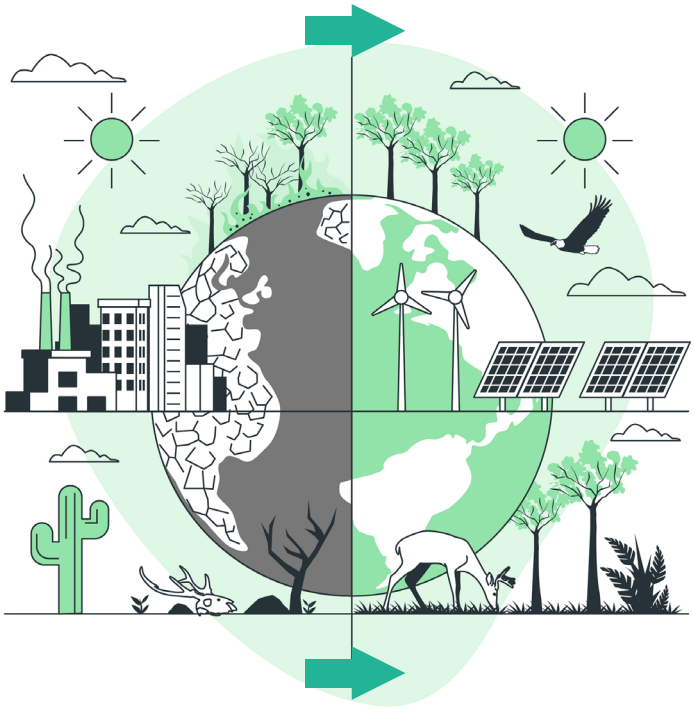
Initial Thoughts



Sustainability is a multifaceted concept that embodies the balance between our needs, the environment, and the well-being of future generations. The concept has been gaining traction around the world since the report "Our Common Future," was released by the Brundtland Commission in 1987. It introduced the term "sustainable development," which emphasises meeting the needs of the present without compromising the ability of future generations to meet their own needs

More importantly, the concept is not rhetoric, as the case for change is real. The Intergovernmental Panel on Climate Change (IPCC) reported that global temperatures are already 1.1 °C above pre-industrial levels, and experts predict they will reach 1.5 °C in the early 2030s. Without realising it, we are already experiencing its impacts, like heatwaves, heavy precipitation, droughts and tropical storms.

> ***Some people change when they see the light... others change when they feel the heat.***
>
> **Caroline Schoeder**

All parties guided by the Sustainable Development Goals (SDGs) have increasingly accepted and practiced sustainability efforts. The motives are varied, ranging from the need to protect ecosystems, wildlife and plant species, reducing pollution and effectively conserving resources, fairness and justice, reducing inequality, ensuring the long-term viability of businesses, leaving a legacy and responsibility for future generations.

Recognising the situation, sustainability has become everyone's business. The efforts to move economic activities from a high carbon footprint to low carbon footprint demand commitments from every country to realise Net Zero targets. In the case of Malaysia, the government has set its sights on achieving carbon neutrality by 2050 as part of the Twelfth Malaysia Plan (12MP). To meet this ambitious target, the country has pledged to reduce its greenhouse gas (GHG) emissions by up to 45% by 2030, in accordance with the Paris Agreement (MIDA). Focus initiative can be looked at a city, for example, as it is not only a significant economic wealth generator but also a source of emissions and pollution. Among the major contributing factors to emissions are activities from transportation, industry, urbanisation, residential and commercial, energy production, deforestation and land use. Most major cities around the world have embraced the smart city concept as a way to address sustainability issues. The primary goal of a smart city is to optimise city functions, promote economic growth and improve the quality of life for its residents by utilising smart technologies and data analysis.

At the industrial level, companies take the Environmental, Social and Governance (ESG) requirements seriously and demonstrate them wherever possible to remain competitive in an increasingly eco-conscious consumer market. Additionally, incorporating the idea of the circular economy into all processes (upstream, midstream and downstream) that allow materials and goods to circulate for as long as possible will achieve this. It reduces material use, redesigns materials and products to be less resource intensive and recaptures "waste" as a resource to manufacture new materials and products (US-EPA).

From economic perspectives to the environment, increasing temperatures affect not only humans and their activities but also plants and animals. More pressing challenges are related to food and water security. It has been observed that agriculture productivity has been slower over the past 50 years, with a slight shift of staple food crops towards extinction.

So much more effort at the global level needs to be made to keep 1.5 °C in check. Financial constraints and expertise to conduct research, development and innovation in related domains will always be an uphill challenge. Therefore, striking collaboration across countries worldwide through science diplomacy, could be an approach to build capacities and capabilities collectively, to accelerate progress towards realising the SDGs agenda.

In summary, sustainability is crucial for balancing our needs with the well-being of future generations and protecting the environment. Climate change is a real threat and we must act now to address it. Countries like Malaysia aim for carbon neutrality, while cities are adopting smart technologies. Businesses are also embracing eco-friendly practices. Collaboration through science diplomacy is key to accelerating progress towards our sustainability goals. It is not just an option but a necessity for a better future for all.

This edition highlights sustainability as a worldwide concern that tackles environmental and social issues. It discusses topics such as ensuring food security amidst climate change, lowering carbon emissions in cities, and implementing ESG measures in sectors like rare earth mining. The sharing economy is showcased as a means to empower communities while also enhancing high-tech ecosystems digitally. The importance of sustainable modernisation of fishing vessels and advancements in air mobility are underscored. Additionally, the issue delves into smart grid policies for urban development, contributing to shaping global city megatrends in favour of sustainability.

MOHD NURUL AZAMMI MOHD NUDRI

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From the desk of...

Rushdi Abdul Rahim
President and Chief Executive Officer,
Malaysian Industry-Government Group for High Technology

Navigating Challenges, Embracing Sustainability:

A MIGHT Story

31 Years of Sustainable Technological Growth

This year, MIGHT celebrates its 31st anniversary, where it has evolved and grown from an organisation of less than 20 people in 1993 to close to 100 personnel today. Beyond the number of staff, MIGHT's journey has left its mark in not less than 28 industrial sectors, playing an advisory role to the government, driven by industry-government partnership and consultation, roadmaps, blueprints, and whitepapers, among other things.

While it would not have been apparent at the time, since its early days of technology prospecting, MIGHT's industry policy advocacy has consistently prioritised sustainability as a central cross-cutting developmental parameter, well before it was '*de rigour*'. The application of Foresight techniques and methodologies further strengthened this. Foresight application made possible quantum advances in policy formulation, by systematically avoiding incremental, piecemeal approaches to problem solving and enabling comprehensive 360-degree assessment.

The National Technology Foresight in 2010 is a case in point. It correctly anticipated 'environmentally friendly' as well as 'aligning with sustainable practices' as key features of technological suitability in the year 2020.

Future technologies were examined in terms of their impact on national security and sovereignty. These encompass not just issues pertaining to the military and defence security of the country, but also information security, as well as those impacting the affordability and accessibility of food, water and energy, all key elements of sustainability.

Another important segment is mobility especially in an increasingly networked society. This includes mobile telecommunications and the dissemination of data and information. Renewable energy source and use of less carbon-intensive materials became key game-changers.

Modular and scalable design in both products and processes also emerged as a significant strategy for commercialisation advancement, application, and spread of technology, in addition to improving the product life cycle.

Pervasive, Multi-Stakeholder Approach

Sustainability is not a novel notion and has always been of interest and concern to all levels of society. However, in light of the current state of the world, sustained and methodical game plans become necessary, particularly when the perils of neglecting it become excessively apparent. Radical uncertainty, unprecedented change and extreme complexity, require new systematic approaches to sustainability, as organic growth is no longer sufficient.

At the highest international level, this takes the form of the global Agenda for Sustainable Development 2030 as a declaration of a worldwide commitment to sustainable, resilient and inclusive development through the implementation of 17 Sustainable Development Goals (SDGs).

MIGHT actively participates in the annual Conference of the Parties (COP), where Malaysia is a party to the United Nations Framework Convention on Climate Change (UNDCCC). Through the mobilisation of its multiple platforms, MIGHT's undertakings directly support Malaysia's commitment to reduce its greenhouse gas (GHG) emissions intensity by 45% in 2030 compared to 2005 levels.

By integrating the principles of foresight and prospecting, MIGHT deep-dives into key areas of intervention by co-developing the Green Technology Foresight 2030 (GTF2030). GTF2030 identified environmentally friendly technology in nine crucial sectors as essential for Malaysia's long-term success and attainment of carbon neutrality by the year 2050 i.e. Energy, Transportation, Buildings, Manufacturing, Waste, Water, ICT, Agriculture and Forestry.

Again, based on the principle of 'scalable and replicable', MIGHT also participated in the GEF-6 (Global Environment Facility) Sustainable Cities Integrated Approach Pilot (IAP) designed and implemented by The World Bank. Melaka became one of 28 cities in 11 participating countries to promote sustainable urban development through better integrated models of urban design, planning and implementation.

We established the Malaysia International Centre for Sustainable Cities (MyICSC) portal through the project, conducted extensive capacity-building programmes, and spearheaded a smart grid demonstration project. Perhaps most notably, together with the State Government of Melaka, MIGHT co-developed The Smart Melaka Blueprint 2035 (SMB2035) to address the challenges arising from rapid urbanisation and digital revolution, for Melaka's sustainable and inclusive growth.

Taking It Home

Perhaps on a smaller scale but no less significant, is MIGHT's own Net Zero Energy Building effort. In 2021, MIGHT and GSPARX collaborated to install rooftop solar with a capacity of 100.44-kilowatt peak (kWp) through the Net Energy Metering (NEM 2.0) initiative.

MIGHT, together with Wasave Sdn Bhd, also implemented COLDGROW technology on its premises, focusing on advanced cooling and heating systems. The technology utilises Liquified Natural Gas (LNG) cool energy to chill water for air-conditioning purposes. This is projected to reduce MIGHT's carbon emission by up to 75% and reduce energy use by up to 15% monthly. The Zero Capex business model used, is also designed for easy replicability.

Also in the pipeline is the installation of solar-powered EV charger, virtual energy management system, and other potential emerging technologies. This includes micro-CHP for small buildings, hydrogen fuel cells, battery energy storage systems (BESS), indoor air quality management and rainwater harvesting. These technologies are forecasted to be implemented in stages within five years. These initiatives will then be accounted for, via a Carbon Credit (CC) system, to enable MIGHT to monetise the carbon saved, where it will further add value to the system.

Envisioning A Collaborative And Sustainable Future

It is evident that MIGHT's approach transcends the conventional boundaries of a think tank. While we continue pursuing our best collective efforts, our journey as a nation and an organisation is still ongoing. MIGHT remains aspired to stay ahead of the curve and respond to the challenges that inevitably come with broad-based changes associated with engraining sustainability practices.

I am optimistic about the possibilities that lie ahead as we navigate our collective journey towards a more sustainable and innovative future. MIGHT welcomes all who share our vision for a sustainable world to join us in crafting solutions for a sound, sustainable future for the nation.

Emeritus Professor Tan Sri Dr. Zakri Abdul Hamid
Joint Chairman (Government)
Malaysian Industry-Government Group for High Technology (MIGHT)

Science Diplomacy and Multilateral Negotiations

Science diplomacy is the relationship between two or more countries in addressing common problems predicated on scientific knowledge. It is also a good compliment to sustain good relations between two countries in times of strained public diplomatic relations. An excellent example: at the height of the Cold War between the Soviet Union and the U.S. (1947-1991) "scientific and technical people-to-people exchanges" continued to be promoted to encourage communication and dialogue. The exchanges had a positive impact on bilateral relations and wider implications on world politics.

Personal contacts between the scientists fostered mutual trust and better understanding, thus eventually encouraging political leaders on both sides to improve relations and sustained a peaceful coexistence amidst the threat of nuclear warfare.

The 21st century presents the world with a myriad of interconnected challenges of sustainable development which could only be solved through a comprehensive effort in multilateralism. These challenges include climate change, biodiversity loss and plastic pollution. The approach to overcome them must be underpinned by science, technology, and innovation. Science has the answer, but it is through a healthy exchange between the scientific community and the policymakers and politicians — the science-policy nexus - that a consensus be built to take the necessary set of actions.

Two recent landmark events are testimonies to the impacts of science diplomacy. The first is the 2015 Paris climate change agreement, in which nearly 200 countries agreed that humans must slow climate change, a view held by virtually all world scientists. It has taken a long time for governments to catch up with the science and to act on their understanding.

The second triumph of science diplomacy is last year's — Kunming-Montreal Global Biodiversity Framework (GBF) agreement adopted by 196 Parties to the UN Convention on Biological Diversity (CBD) to halt biodiversity loss by 2030.

Since it came into being three decades ago, the CBD has never been able to halt biodiversity loss. Only sustained effort by the scientists, including a warning that up to one million species of plants and animals are under threat of extinction, compelled the political leaders to agree to set aside 30% of our earth as protected areas by 2030.

Eight years after the watershed Paris Climate Agreement of 2015, national governments have not done enough to address a problem creating untold harm to lives, livelihoods and natural systems.

Science in International Relations

In the 19th century, renowned French chemist and microbiologist Louis Pasteur famously said that "Science knows no country, because knowledge belongs to humanity, and is the torch which illuminates the world." The wisdom of that remark has proven itself often in the many decades since.

Successfully advancing research depends on sharing ideas and knowledge with colleagues worldwide, And the benefits of such cooperation can draw together ever the staunchest of enemies.

Cold War hostilities were put aside, for example, when American Albert B. Sabin helped pioneer the use of a live-virus, oral polio vaccine in the Union of Soviet Socialist Republics, leading to the vaccine's adoption worldwide. Since then, the scourge of polio, so dreaded in my childhood years, has all but disappeared from the planet (though not eradicated; occasional outbreaks remind us of the need to be vigilant).

We also have seen tremendous international coalitions formed around the world's common interest in polar science. The Polar Regions have in many respects been good models for international scientific cooperation. This started with the two so-called Polar Years of 1882–83 and again in 1923–33, during which many nations collaborated in simultaneous scientific measurements at remote polar sites. These investigations focused primarily on the Earth's climate and its magnetism.

A sequel to the International Polar Years was the International Geophysical Year (IGY) in 1957-58, which focused on Antarctica and outer space. Despite the Cold War there was good cooperation in Antarctica, which continued well after the IGY. In the Arctic, scientific cooperation proved to be quite difficult, however, because of the military confrontation between the Soviet Union and the United States.

Some 15 years ago, the American Association for the Advancement of Science (AAAS) opened a Centre for Science Diplomacy, and two years later teamed the United Kingdom's Royal Society on a joint report, which described three forms science diplomacy: scientific collaborations that improve international relations; using evidence and scientific expertise to help formulate foreign policy and, diplomacy that promotes and supports international scientific cooperation.

In addition, a global network of Foreign Ministries Science and Technology Advisers was initiated in 2016. Its initial meeting involved advisers from Japan, New Zealand, the UK and the US, and diplomats from 12 other nations in Africa, Asia, the Americas and Europe.

The network underlines that science and technology advisers to foreign ministries "are not necessarily experts on all scientific matters, but they understand science and know where to find the most appropriate expert on any given topic. They have the skills to explain evidence required for informed decision-making about foreign affairs, serving as evidence brokers in our increasingly trans-boundary world with constantly emerging complexities. They utilise their roles as evidence brokers to reveal options that contribute to informed decision-making by nations across the international landscape."

More recently, the network teamed up with the UN Economic and Social Council (ECOSOC)'s Commission for Science and Technology for Development in Geneva. Among the main discussions was the role of science, technology and innovation (STI) in foreign aid. An increasing proportion of foreign aid has a core STI element and research may be specifically funded as a development assistance tool. Indeed, the success of much foreign assistance requires science and technological effort, and donor academic institutions are often involved.

A good example of the role of STI in foreign aid is the Newton Fund established by the UK. Malaysia is among 18 nations chosen to participate in this global initiative (known nationally as the Newton-Ungku Omar Fund) which builds scientific innovation partnerships to support economic development and social welfare. It also develops research and development innovation capacity for long-term sustainable growth. Its national counterpart is the Malaysian Industry- Government Group on High Technology (MIGHT).

Today, more than 250 joint collaborations are funded in various fields of STI between both countries from programmes and activities such as the Institutional Links, Research and Innovation Bridges and Researcher Links. At least eight technologies and innovations are being co-developed. These products and innovations have significant outcomes in terms of commercialisation and solving global challenges.

Malaysia itself actually put the idea of foreign aid through cooperation into practice 40 years ago when it embarked on the Malaysian Technical Cooperation Programme during the First Commonwealth Heads of Government Meeting in Sydney. The programme emphasises human resource development through training in public administration, good governance, healthcare services, education, sustainable development, agriculture, poverty alleviation, investment promotion, banking and other essential areas.

More than 100 short-term specialised courses are offered by not less than 50 training institutions. More than 20,000 participants from 140 countries have benefited so far.

Clearly, science advice and diplomacy are crucial. Developing cross-disciplinary, multilateral responses to global challenges such as the Sustainable Development Goals depends on the interconnected roles they play.

Role of Science Advisers

The COVID-19 pandemic created a demand for science advice, with policy and decision-makers actively reaching out to the scientific community for guidance and solutions. The pandemic highlighted the importance of evidence-based policymaking, and the value of science advice, especially in crises.

In the face of constantly changing situations, with new evidence emerging every second, science advisors must also be flexible and receptive while being able to deliver their advice in a timely manner. Science advice is not only pivotal for policymaking but critical for building diplomatic relations as cross-border and multi-disciplinary challenges can only be solved with collaboration between all stakeholders and sectors of both local and international societies.

The three hallmarks of science advice are credibility, salience and legitimacy. It must be independent and not tied to any political agenda and should never be policy prescriptive, only policy relevant.

As described by Sir Peter Gluckman, president of the International Science Council and founding chair of the International Network for Governmental Science Advice (INGSA), science advice requires a pluralistic synthesis of evidence, prior to knowledge brokerage.

This means that science advisors must be able to not only consider all aspects of science and technology, but also societal cultures and values which relate to public perception, trust, and acceptance, as well as the potential economic implications of any advice in order to ensure that it is both relevant and practical.

They must also play the role of the 'honest broker', which means they must be able to disclose both the knowns and unknowns, including any gaps and shortcomings as well as alternative scenarios and solutions based on the best available information, and they must be able to package and communicate their messages in a manner that could be understood by policymakers and political leaders.

The Art and Science of Science Diplomacy

This topic is best described from my personal experience, which began more than 30 years ago as a member of the Malaysian delegation negotiating the CBD. Trained in the biological sciences and more at ease as a professor in Malaysia than in the plenary hall of the UN Environment Programme headquarters in Nairobi, I was thrown into the world of diplomacy and multilateral negotiations as the delegation science adviser. There were times, during the early days of my involvement, that I thought of withdrawing due to the wide difference between the lifestyle of an academic and that of a member of a national delegation, the latter's credo being, "my country, right or wrong." But such doubt evaporates when duty calls for King and Country.

There was much excitement and anticipation in the run-up to the Earth Summit (officially named as the United Nations Conference on Environment and Development, held in June 1992 in Rio de Janeiro, Brazil. The world community was at a crossroads; how to balance the imperatives of robust economic growth and the needs of a growing population against the ecological necessity to conserve our planet's most precious resources — land, air and water.

After two weeks of intense negotiations, Rio delivered and gave added meaning to the phrase, "sustainable development," first introduced five years earlier by the Brundtland Commission in 4987. The Earth Summit also produced some far-sighted milestones such as the Rio Declaration on Environment and Development, Agenda 21, Forest Principles, and two important legally binding agreements, namely the UN Convention on Biological Diversity and the UN Framework Convention on Climate Change. Rio had its critics, some pointing out that it has not gone far enough in alleviating poverty or conserving biological resources.

Malaysia played a prominent role at the Earth Summit. We were one of the leaders of the Global South in a category known as the Group of 77 and China, articulating the needs of and protecting the interest of the developing countries. Malaysia's prominence was neither coincidental nor unplanned. From, 1990 to 1992, a standing committee chaired by the Secretary-General of the Ministry of Foreign Affairs met regularly to prepare the country's stance on various issues to be discussed at the summit. Guided by a strategic document, "The Road to Rio," the Committee's members included representatives from related ministries, academia, NGOs and the private sector. As we were dealing with multilateral negotiations, the chief spokesperson was regularly in touch with our missions, in particular those in Brussels, Geneva, Nairobi, New York or Rome, ensuring that the country's delegation to various multilateral negotiations were always prepared and armed with the latest developments.

The views and contributions of the scientists and experts needed to be well understood so that they could be articulated by the career diplomats and translated by policymakers into policies, programmes and projects at the international and national levels. This is the raison d'etre of science diplomacy and multilateralism.

During this period the tools of the trade came into regular use: aligning with the positions of ASEAN, the G77 and China, and the Like-Minded Megadiverse Developing Countries; appreciating the historical context of climate change and biodiversity loss, appreciating the Principle of Common But Differentiated Responsibilities, and the need for funding, technology transfer and capacity building for countries in the Global South.

Malaysia's Pivotal Role in the Negotiations of the Cartagena Protocol on Biosafety

Biotechnology has the potential to bring about dramatic changes in our lives by addressing food and health problems as well as poverty. While conventional biotechnology has been with us for a long time, modern biotechnology (including genetic modification) is relatively new, and its judicious application is necessary. Effective protection and management to ensure environmental health is paramount, however, for human well-being. It is in this context that the Cartagena Protocol on Biosafety (CPB) was created.

The CBP has its roots in the CBD, especially Article 19.3, which obliged Parties to consider appropriate procedures in the field of the safe handling and use of any living modified organism (LMO) that may adversely affect biodiversity.

At the 8th meeting of the CBD process in November 1991, Malaysia tabled a proposal which later became a core element of the CPB: prior informed consent from countries where genetically modified organisms (GMOs) are to be introduced. At that time, there were already several reports that emerged describing plans to conduct tests involving GMOs in developing countries that have little knowledge of this new technology. In a report to Plenary concluding the meeting, the negotiation chair, Viet Koester congratulated Malaysia for having taken this initiative in respect to biosafety, not knowing, of course, its implications for future negotiations.

Climate Change as a Case Study of Science Multilateralism

In March 2023, the Nobel Peace Prize winning Intergovernmental Panel on Climate Change (IPCC) tried again to shake the world out of its lethargy with powerful language in its new report.

This latest work summarises six previous reports over the last few years involving 700 expert authors from 95 countries, including Malaysia. It comprised thousands of pages gleaned from publications produced by the scientific community and reviewed and endorsed by expert representatives of governments. The report confirms the indisputable direct role humans play in causing climate change. And the problem is getting worse. Already global temperatures are 1.1°C above pre-industrial levels and experts predict it will reach 1.5°C in the early 2030s.

Eight years after the watershed Paris Climate Agreement of 2015, national governments have not done enough to address a problem creating untold harm to lives, livelihoods and natural systems. The report cites evidence that "global warming drives extreme and deadly climate disaster like heatwaves, heavy precipitation, droughts and tropical cyclones".

For example, according to the World Bank, the October 2022 floods in Pakistan resulted in economic losses of US$15.2 billion, with rehabilitation and reconstruction in a resilient way estimated to require around US$16.3 billion. The floods killed over 1,700 of the 33 million people affected, and more than 2.2 million houses were damaged or destroyed.

Malaysia is no stranger to devastating floods. The "once in a century" floods of December 2021 left at least 54 dead, displaced 400,000 people, and resulted an estimated RM6.1 billion in losses.

United Nations Secretary-General Antonio Guterres described the climate as a "ticking time bomb" that requires developed countries to "decarbonise" their economies by 2040 and developing countries by 2050. The report maintains "the 1.5°C limit is achievable... but it will take a quantum leap in climate action".

As Malaysian Tan Sri Michelle Yeoh's Oscar-winning movie title suggests, our world needs climate action "everything, everywhere, all at once". That means making sure that global use of coal is eliminated, oil declines by up to 90 per cent, and gas by up to 85 per cent by 2050. But, as someone recently remarked, "the lack of progress toward those cuts since the Paris Agreement isn't stymied by the science but by political and economic considerations."

Several years ago, James Gustave Speth, a former administrator of the United Nations Development Programme, commented: "I used to think that top environmental problems were biodiversity loss, ecosystem collapse and climate change."

"I thought that 30 years of good science could address these problems. I was wrong. The top environmental problems are selfishness, greed and apathy, and to deal with these we need a cultural and spiritual transformation. And we scientists don't know how to do that."

The challenge was also well summed up by Heidi Steltzer, a US climate researcher who said, "more reports aren't going to do it. We have already done that. Reaching global climate goals may require a transformational vision of science that starts to consider values, like love and hope, because they aren't easily measured."

"Whatever goals the world sets, we don't get there without love," she said. "We can't get to 1.5°C or whatever target we set without love for ourselves, without knowing ourselves and without connecting to, and caring for one another, our planet and the universe."

To complement this, we also need hope, that ingredient which can spark societal changes. I was a victim of the December 2021 floods that struck Bentong. I still recall the anguish and horror watching the water rapidly rise to the ceiling of our house in the middle of the night and inflicting major damage to our property.

Conclusion

My youngest grandson, Leo Mateen, was born at the start of spring this year. I shudder to think that, without a change of course, he is likely to suffer several times as many climates extreme events in his lifetime as I have. We all need to find it in our hearts to love this planet as much as we love our children and their children and act accordingly.

This article was originally published in Foreign Relations, Issue 03, September 2023, by the Institute of Diplomacy and Foreign Relations (IDFR).

Towards A Harmonious, Prosperous, Progressive and Sustainable Malaysia

Tan Sri Dr. Omar bin Abdul Rahman

Founding Chairman,
Malaysian Industry-Government Group for High Technology (MIGHT)

Tan Sri Dr. Omar bin Abdul Rahman is one of the Founding Chairmen of Malaysian Industry-Government Group for High Technology (MIGHT). In 1984, Tan Sri Dr. Omar bin Abdul Rahman made history by becoming the first Malaysian to be appointed as a science advisor to the Prime Minister, showcasing his groundbreaking thinking in the field. Trained as a veterinarian, Tan Sri Dr. Omar stands out as a prominent figure in the realm of science, leveraging his strategic mindset to develop a portfolio of innovative concepts and attributes. During its initial sprint, MIGHT concentrated on enhancing innovation and technology exploration within Malaysia's high-tech sectors, aiming to address forthcoming opportunities effectively.

National Aspiration Through the Years

Our national aspirations have often been spearheaded by political slogans. From *Wawasan 2020* and *1Malaysia,* to *Transformasi Nasional, Wawasan Kemakmuran Bersama* and *Keluarga Malaysia*; and now we have *Malaysia Madani.* Inevitably, it has and will always be veritable changes for our socio-economy – which can cause disruptions and stunted growth if not seamlessly converted.

The ***Rukun Negara*** serves as Malaysia's national blueprint for fostering unity, encompassing several core objectives. It aims to achieve greater unity of her people while maintaining a democratic way of life. Additionally, creating a just society with equitable sharing of prosperity. Embracing a liberal approach, it encourages harmony amidst the country's diverse cultural traditions. Furthermore, it strives to build a progressive society by harnessing modern science and technology.

With a shared commitment to our nation's aspirations, we, the people of Malaysia, unite our endeavours guided by the following foundational principles: belief in God, loyalty to the King and Country, respect for the supremacy of the Constitution, adherence to the rule of law, and the practice of courtesy and morality.

Harmonious, Prosperous, Progressive and Sustainable Malaysia (HPPS)

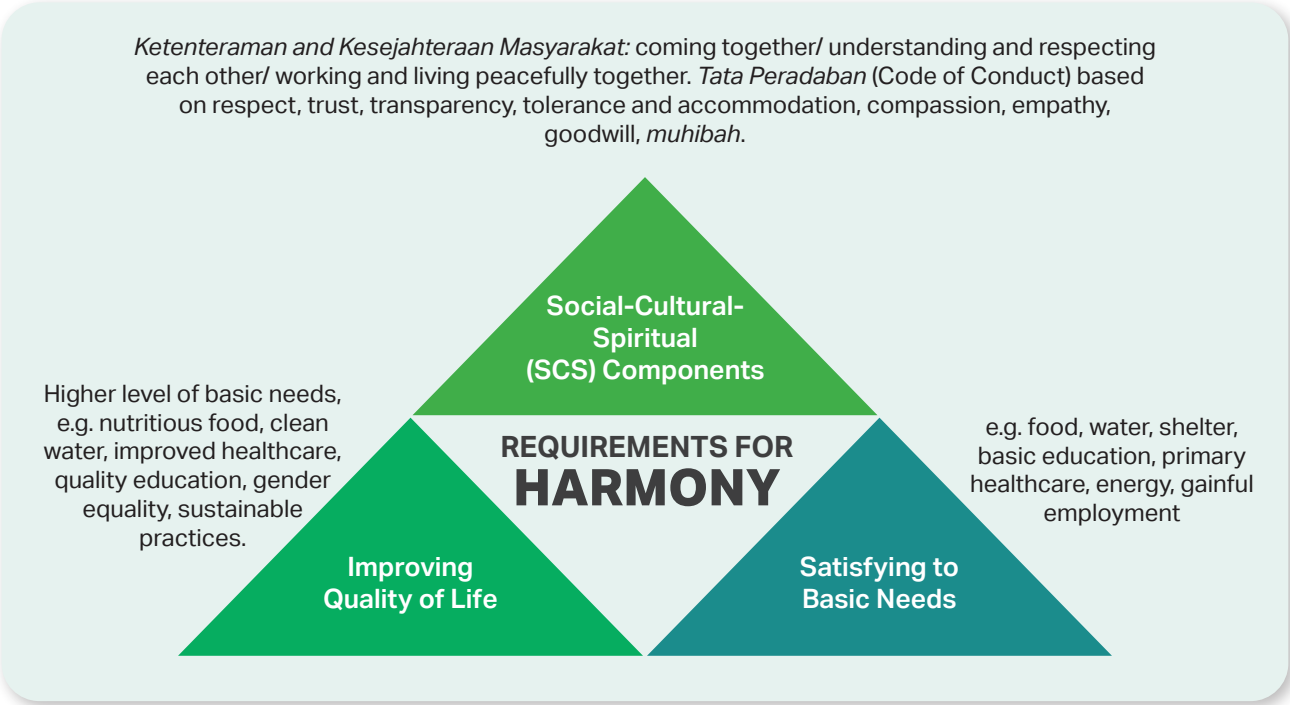
We can sum up the five objectives of *Rukun Negara* into just four words - Harmonious, Prosperous, Progressive and Sustainable Malaysia (HPPS).

Leveraging on the words alone, *Wawasan 2020, Transformasi Nasional* and *Wawasan Kemakmuran Bersama* (Shared Prosperity) appeared to embody HPPS as a whole. *1Malaysia* and *Keluarga Malaysia* seemed to emphasise the 'harmonious' component. Malaysia Madani – the Malay acronym for SCRIPT, which stands for sustainability, care and compassion, respect, innovation, prosperity, and trust – is also an expression of HPPS, albeit a little heavy on the 'care and compassion', and 'respect and trust' sides. Again, the slogan too emphasises the 'harmonious' component.

What is missing from both the ***Rukun Negara*** and the national aspiration slogans that followed, is the 'sustainable' element.

Requirements for HPPS

The overarching goal of our national aspiration is an 'HPPS Malaysia'. It is a consistent yet simplified paradigm, that is easier to monitor, evaluate and augment.



The first requirement for **Harmony** is satisfying our society's basic needs such as food, water, shelter, basic education, primary health care and gainful employment. Parallel to that, is improving quality of life and achieving higher level of basic needs. The third requirement for harmony is the social, cultural and spiritual (SCS) component. This governs the way we behave, interact and engage with each other, which is particularly important to Malaysia's multiracial, multireligious and multicultural society.

Requisites for **Prosperity** are gainful employment and equitable income distribution derived from a robust, high income, innovation-driven, public sector-led economy.

Being **Progressive**, on the other hand, calls for playing an active part of the present and an influential part on the global stage in the future. It also entails us to be future-aware and future-ready.

Finally, **Sustainability** requires awareness, comprehension and commitment, as well as takes appropriate, actionable and sustainable practices at all levels.

The overall requirement for HPPS is effective, efficient, and responsible governance. We need consistent policies, sustained commitments, persistent implementations, and the four critical enablers, which are **political, economic, social,** as well as **scientific and technological** in which must be optimal and competent.

Sustainability Component of HPPS Malaysia

Out of the four critical enablers mentioned above, the **scientific and technological (plus innovation) (STI)** enablers are expected to bring improvement and innovations towards achieving sustainability.

The STI enablers serve as the cornerstone, facilitating progress across various domains. Complementing these are four extended enablers: technologies for meeting basic needs, enhancing quality of life, fostering wealth creation and inclusive economic growth, and promoting good governance and responsible government practices.

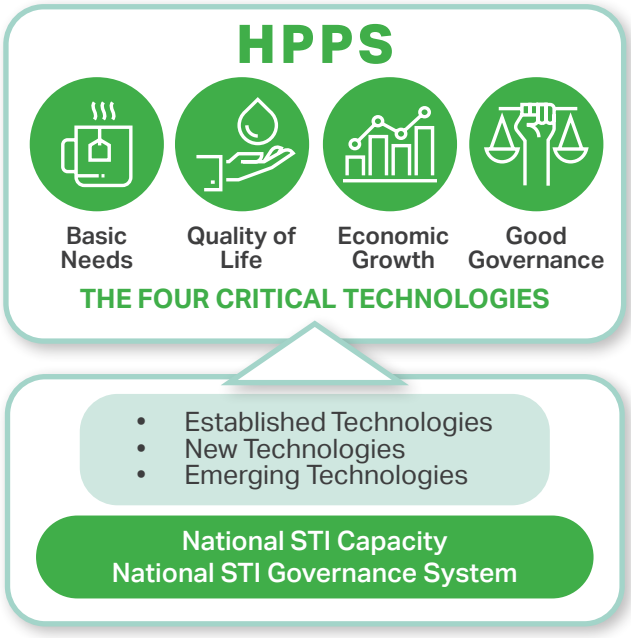
OVERALL REQUIREMENTS FOR HPPS

The Four Major Enablers:

- The Political,
- The Economic,
- The Sociological,
- The SCIENTIFIC AND TECHNOLOGICAL (S&T)

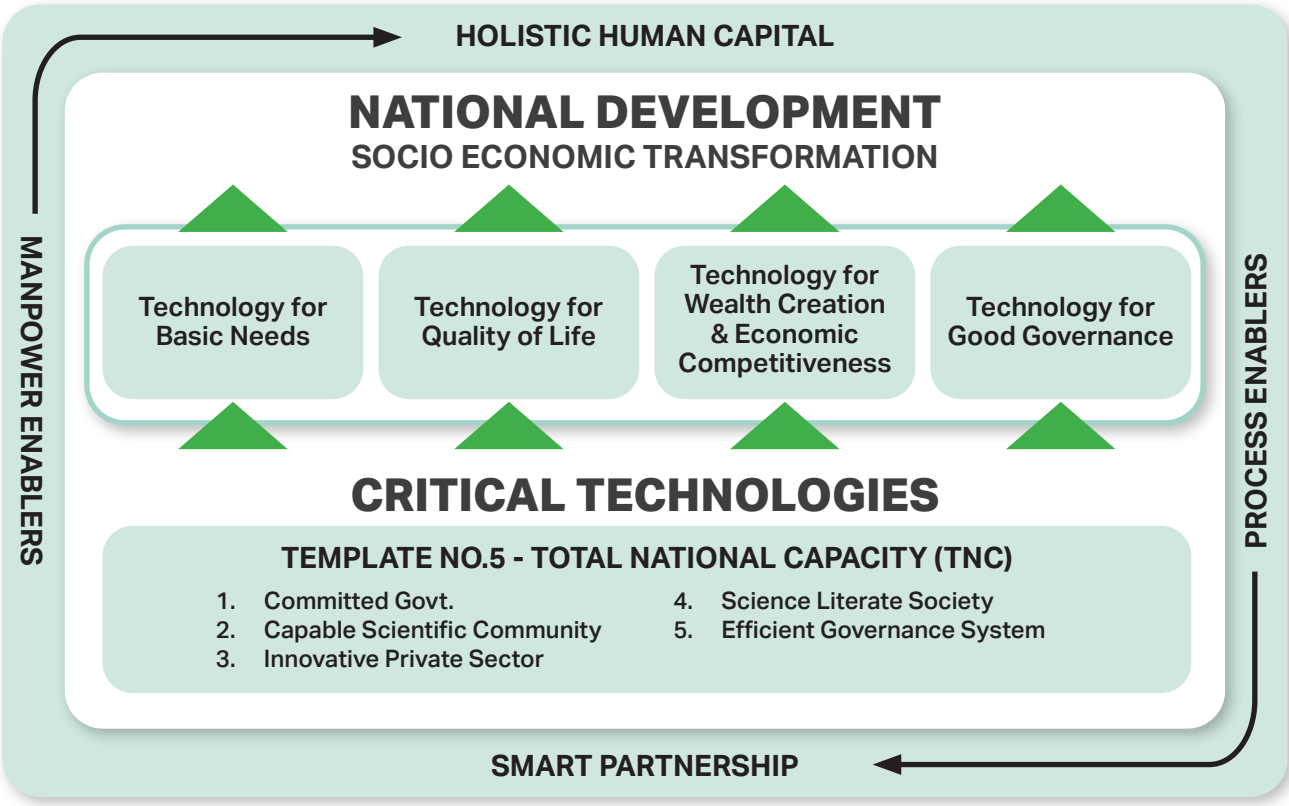
The FOUR CRITICAL TECHNOLOGIES:

- Technologies for Basic Needs,
- Technologies for Improving Quality of Life,
- Technologies for Wealth Creation and Inclusive Economic Growth and
- Technologies for Good Governance and Responsible Government



STI play a vital role in enhancing current efficiencies, increasing business productivity and profitability, as well as refining governance practices – hence, ensuring the sustainability factor in HPPS Malaysia.

To foster robust national capacity, a comprehensive Total National Capacity creed must be upheld, aiming at cultivating the following elements: a government dedicated to establishing inclusive physical and soft science, technology, and innovation (STI) infrastructure; a scientifically adept and ethically sound community capable of both contributing to and leveraging the global reservoir of scientific knowledge and technological expertise; a vibrant private sector poised to generate prosperity by integrating technology and innovation across all sectors of the economy; a populace versed in science, steeped in a culture fostering creativity, innovation, and entrepreneurship; and an effective governance framework facilitating informed policy formulation, meticulous planning, and efficient implementation, while also fostering public discourse and international partnerships, ensuring enduring commitment to STI advancement.



The Rational - The Need for TNC to leverage Critical Technologies to Achieve Socio-Economic Transformation

Essentially this initiative expounds the sustainability factor within HPPS Malaysia that advocates awareness, comprehension and commitment, and founded upon appropriate, actionable and sustainable practices at all levels – eventually thrusting our nation to be one that is harmonious, prosperous, progressive and sustainable.

Conclusion

To further emphasise the importance of STI in nation building, it is not surprising that our *Rukun Negara,* which was coined 67 years ago, included the following line as one of its founding objectives:

> *"Building a progressive society that will make use of science and modern technology"*

Therefore, by seamlessly integration the dogma of HPPS Malaysia in any current or future national aspirations, any initiative that embeds the Harmonious, Prosperous, Progressive and Sustainable essence as its strategic intent, will eventually lead us back to our altruistic *Rukun Negara.* Hence a Harmonious, Prosperous, Progressive and Sustainable Malaysia can be achieved, perhaps in a more holistic, effective and efficient manner, with the help of Science, Technology and Innovations.

Sustainable Packaging:

Navigating Future Trends and Technological Innovations with Free The Seed

Ramaness Parasuraman
Chief Executive Officer,
Free The Seed

Ramaness Parasuraman, with his MBA, is a dedicated entrepreneur focused on green initiatives. He has filed two IP applications with WIPO Switzerland for novel production processes of Biodegradable Packaging from cellulose fibrous pulp. He has created new products for the electronics industry, validated for large-scale use. His scientific journals have been published internationally. His innovations in green and biotech fields have earned him numerous awards. Under his leadership, Free The Seed has received multiple product certifications.

Sustainable consumer products are increasingly vital in today's environmentally conscious world, driven by consumers' growing awareness of the impacts of their purchasing decisions. This shift towards sustainability emphasises the importance of products that minimise harm to the planet and society throughout their entire lifecycle, from production to disposal. One significant aspect of this movement is the focus on packaging. Industries are responding to the Environmental, Social, and Governance (ESG) movement by adopting more sustainable packaging solutions. This includes strategies such as reducing single-use plastics, utilising recycled materials, and implementing innovative packaging designs that minimise waste and environmental impact. Embracing sustainability throughout supply chains is essential for companies to remain competitive in an eco-conscious market. Businesses are realising that investing in sustainable packaging not only aligns with consumer preferences but also enhances brand reputation and reduces long-term operational costs. Moreover, it demonstrates a commitment to environmental stewardship, which resonates with environmentally conscious consumers. Consumer demand for sustainable products is reshaping industries globally. With increasing awareness of environmental issues, consumers are seeking eco-friendly alternatives. This trend is driving companies to innovate and adopt sustainable practices throughout their supply chains. Staying ahead of these consumer needs and global trends is essential for businesses to remain competitive in a rapidly evolving marketplace.

Looking at the Future Trends and Emerging Technologies

Keeping abreast of the future trends and emerging technologies is critical in any industry to be sustainable and able to create a high-impact business. Back in 2014, Free The Seed participated in and benefited from the Global Clean Tech Innovation Programme (GCIP). It is a programme, that benefits the B40 category farmers in coming into the sustainable supply chain and earning additional income. One of the GCIP components is to identify future trends and emerging technologies. This is one of the tools that all the participants must learn so that they can apply in mapping and planning for their business.

Coming back to our industry, we have identified that the electronic sector, especially the high-end electronic sector, is going into a paradigm shift to replace their single use plastics in their packaging supply chain with biodegradable compostable packaging solutions. This is due to the Net Zero 2050 government's climate target, Net Zero Sustainable Development Goals (SDG) solution, Environmental Social Governance (ESG) requirement and circular economy concept is moving the industry to go from a high carbon footprint to low carbon footprint wherever possible and replacing single use plastics in the supply chain. We have identified that this is one of the core component businesses that will accelerate revenues. Our business has positioned strategically in this market. Today, the top three electronic companies in the world are talking to us, doing business with us where emerging electronic products go into green packaging. Soon, we are developing solutions for Japanese and American client products to meet their sustainable requirements.

> **"High technology is an essential component too, in our business and in our case, biotechnology, advanced material technology and nanomaterial technology play major roles. These are the three components that we have embraced in our research and development and introducing New Product Innovation (NPI)."**

Our New Product Innovation is currently focusing on the electronic segment. In addition, the medical segment also is seeking compostable packaging products in their medical supply chain. Thus, high technology plays a vital role, and the support from MIGHT and other agencies are imperative.

Within the Industry 4.0 ecosystem, we have embedded the advanced material, National Industry Master Plan 2030 (NIMP) into our component as the substitute for new material and to bring new product that can meet international standards. It is to comply with the climate change requirements, end-of-life packaging waste requirements, the waste directive requirement and many other green component requirements.

The Importance of Collaborations and Partnerships

> **"Move fast, move alone, move far, move together. That is the key mantra in our business too. Industry and other collaborations are crucial in continuing, sustaining and developing our business to a greater level."**

SMEs especially, must go into deep dive to identify collaborations and networks for them to continuously develop, enhance and be market-ready as well as market-acceptable. These are key components Free The Seed has collaborated from the day we started our company till now.

We have collaborated with eight local agencies and three international agencies, and these collaborations are continuously moving into a more significant and additional phase, extra milestones and more challenging partnerships while identifying the solutions to bring products that meet needs and market requirements. We have also collaborated with MIGHT, Malaysian Bio Economy Development Corporation, Forest Research Institute Malaysia (FRIM), University Technology Malaysia, University Malaysia Perlis, Universiti Teknologi MARA and other agencies at the international level. These collaborations include research on gaps in R&D, product costing, market readiness and market acceptability.

From our humble experience, I urge all SMEs to participate in this kind of working partnerships. Identify your needs through your gap analysis and from there know your suitable partner within the Malaysian ecosystem. It can be research, financial or development institutions. And the developments may be related to product, process or business development. These collaborations will help to further accelerate your business values, tank and position in the market.

Yesterday, Today and Tomorrow

> **"We always flashback yesterday, we always review today, and we always analyse what can be tomorrow. We were a startup doing research and development back in 2009. Slowly and steadily, we have developed our technology readiness level from one to nine now, from two workers to sixty today, and growing further to 250. Also, from one factory, we have expanded to eight factories currently."**

With the help of MIGHT and other ecosystem partners, we aspire to be the top ten of the sustainable packaging companies in the world by volume and capacity and to do that we have all the components that are already being assembled in our jigsaw puzzle. We still need to identify and implement further improvement measures, but I am confident, our future is looking very bright.

Sustainable packaging, sustainability, ESG, circular economy, net zero carbon climate reduction, decarbonisation are big topics in the post 28th Conference of the Parties (COP28) UN Climate Change Conference in Dubai. We are on the right track to further expand to 30 factories within the next five years, expanding the direct employment up to 1000 workers and supporting the supply chain B40 paddy farmers from ten farmers to 1300 farmers towards a common goal to reduce 10 million metric tons of CO_2 from Malaysia's carbon footprint in the supply chain of *'jerami padi'* (paddy straw) to the international market. We are not forgetting the other element of business in terms of return-on-investment financial metrics, which we are also expanding the improvement measures towards that.

Free The Seed shows us how looking ahead, embracing advanced technology, and collaborating with others are crucial for driving sustainability. By keeping an eye on future trends and using high-tech solutions like biotechnology, our company stays competitive while being eco-friendly. Through partnerships with local and international groups, we gain valuable support, helping us grow and make a more significant impact on sustainability. In essence, our company teaches that by thinking ahead, using smart technology, and working together, we can build a more sustainable future.

Seed
www.freetheseed.com.my

MiGHT
Malaysian Industry-Government Group for High Technology

NATIONAL BIOMASS ACTION PLAN 2023-2030

NEW INDUSTRIAL MASTER PLAN 2030

BIOTECHCORP
BIONEXUS STATUS COMPANY

GCIP
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Free The Seed

"Waste-2-Wealth"

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- Location: 32,000 hectares Rice-Fields in Kedah, Malaysia

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UNIDO
GCIP Global Cleantech Innovation Programme
gef
CLEAN TECH OPEN
MiGHT Malaysian Industry-Government Group for High Technology
FELADANG

Sustainability?
I'm Trying, Who's Helping?

Liz Alexander, PhD
Futurist. Author. Consultant.
Speaker

Dr. Liz Alexander has been named one of the world's top female futurists. She combines futures thinking with over 30 years' communications expertise to produce publications that showcase the advice of fellow futurists on issues, including the future of education and how businesses can practically benefit from working with the futures community.

Dr. Liz is the author/co-author of 22 non-fiction books published worldwide that have reached a million global readers. She has contributed to leading US technology magazine Fast Company and also Psychology Today, and her work has been featured in journals such as Knowledge Futures and World Futures Review. She earned her PhD in Educational Psychology at the University of Texas, Austin.

According to the Centre for Biological Diversity, there are twelve ways that individuals can live more sustainably. I pretty much adhere to most of them, mindful that we all have to do our part for this project to succeed overall. However, as with any complex challenges requiring a systems approach, that is not as simple or straightforward as most of us would like to think. I often feel that some parts of the system are not pulling their weight as effectively as they should.

Using a few of these sustainability factors as a framework, here are some personal anecdotes about the sustainability challenges I face daily. Which of them do you share?

Think twice before shopping

As a single woman living alone, my needs are few. But, mindful that if I rarely or never shop for anything other than food, I am not contributing to the economy and life is less enjoyable, I do splash out occasionally. That was the case recently when I decided to buy some new cosmetics, as I would been using the same colours and products for years.

A friend of mine works for a major cosmetics store and had given me a makeover following product recommendations. What horrified me after agreeing to make this purchase was that each individual, pencil-like product was housed in its own metal case. As I was buying half a dozen of these things, this seemed like an enormous waste. When I expressed this to my friend, she assured me that the company involved (not Malaysian!) was looking to be more mindful of their packaging in the future. I just wonder if the planet has the luxury of waiting until their creatives come up with such a solution.

When it comes to supporting sustainable habits, one might argue that many companies – especially the "high-end," luxury ones – appear to be fudging their ESG responsibilities.

Ditch plastic altogether or reuse

It took me a while to get into the habit, but I now take a separate, reusable shopping bag, made from recyclable materials, whenever I go to the supermarket. Most outlets will ask if I need a plastic carrier (which I do not) and make a small charge should anyone do so. The problem is less at the payment counter, and more what happens before that. As a matter of course, employees involved in weighing and pricing my produce (always organic where available!) tend to place these items in individual plastic bags. They then secure those bags with tape which means I have to rip the plastic open at home, rendering it useless for anything else.

What I attempt to do now is to tell the person handling my produce to stick the pricing barcode on the item itself; I do not need a bag for a single onion or a bunch of bananas. But for this to be successful, I have to be vigilant. Maybe most consumers want their items bagged individually, and supermarket employees are not trained to consider ways in which plastic could indeed be "ditched," let alone reused for other purposes. But that is hardly contributing to our overall sustainability goals, is it?

Take extinction off your plate

I have been an almost-vegetarian for years now. I used to consume Norwegian salmon to boost my intake of health-giving Omega-3s until I watched a recent Netflix documentary about the unhealthy environment in which such fish are "farmed," and decided to omit that from my diet too. It was not until I began watching the TV series 'Yellowstone' about a ranch-owning family in Montana, USA, that I realised the impact that not eating meat was having on those whose livelihoods and way of life depend on livestock. Am I making the right choice for "Team Human," by totally eliminating meat from my diet?

I have no answer to this conundrum. I am well aware of the greenhouse gases emitted by farm animals, especially cows, along with the desecration of vast swathes of Amazonian rainforest so Brazil can export more beef . As the Centre for Strategic and International Studies points out,

> ***"Cattle ranching is an important driver of deforestation in Brazil's Amazon. The rainforest, especially during the burning season, is slashed and burned to make space for illegal pastures. Although cattle traders and beef producers committed not to buy cattle from illegally forested land in 2009, the Amazon continues to lose thousands of square kilometres every year."***

While we wait for technology to "drive solutions to untangle the opaque nature of supply chains," progress is hampered by the Brazilian state's apparent inability to enact environmental protections. Not least because "many politicians – at both the state and federal levels – owe their election in part to agribusiness interests."

Sadly, information like this makes me despair whether my individual choices and actions are doing anything to save this planet and our continuing existence on it.

Even when it comes to where I choose to go on holiday, I am left wondering how effective my individual decisions will be, in the long run.

Simplifying holidays

Flying, once relatively enjoyable, is no longer fun, in my view. Mindful of leaving too big a carbon footprint, I only take long haul flights once every year or two. I choose to stay in hotels that promote a 'green' outlook and take trains whenever possible, since I do not own a car. More and more I am keen to spend my money in Malaysia and experience the wonderful places – Sabah, Sarawak, the islands off the east coast that I have not yet seen – rivalling anywhere abroad. Which is just as well, because there are an increasing number of spots around the globe now actively discouraging tourists from visiting.

A recent Time Out article listed twelve destinations attempting to "fight against overtourism," including Amsterdam, Bali, Bhutan, Japan, Venice (where a tourist tax is long overdue, in my opinion), and Machu Picchu in Peru.

On the other side of the coin, pristine destinations are currently being touted by travel companies as the next "big" tourist attractions. When media companies like the Discovery channel promote "the last unspoiled places on earth ," on their website and travel companies begin to market Antarctica, Mongolia, and Lake Monowai in New Zealand as must-see locations to avoid the tourist crowds, how long will it be before thousands if not millions of people's footprints negatively impact these places too?

Frankly, I am not sure the message of sustainability as it pertains to holidaying is getting through.

Living 'green'

The burden that the consumer bears when it comes to being environmentally responsible was brought home to me a few years ago when I visited family in the UK, where local councils require householders to separate their dry waste into different coloured bins. It was even reported that some English policymaker had suggested introducing seven different bins , presumably to separate glass, paper, plastic, metals, food scraps, fabrics, and whatever waste is "unrecyclable." I know very few people, working long hours and without the space required, who would willingly go to those lengths, regardless of how environmentally aware they consider themselves to be.

One thing often overlooked is the education needed to help consumers understand whether something is recyclable or not. Another is the extent to which governments are failing to exert sufficient pressure on manufacturers to do better. As the environment spokesman for the UK's Local Government Association pointed out:
"At a time when councils are working towards achieving net zero, they are doing so with one hand tied behind their back courtesy of manufacturers who are littering our communities with plastic they know cannot be disposed of sustainably ."

What is the point?

Imagine if years ago, futures thinking had been part of every school syllabus, mandated as a college course, and injected into every corporate training module. The result being that every citizen, future policymaker, politician and others had been taught and trained in the art of anticipation. Not least to consider the knock-on effects of ideas some thought would be beneficial, but over time would harm this planet. Imagine how different our lives might look now.

With sufficient foresight, we could have been living in a world where chemists perfected ways to produce rapidly bio-degradable plastics – or more sustainable alternative materials in which to wrap and pack things; where manufacturers had been required to think through the impact of polluting our land and seas with their waste, earning the appreciation of those of us who want to consume fish without a side of microplastic particles; and a citizenry educated in what actually happens to the waste we otherwise mindlessly throw away and forget about.

Idealistic? Perhaps. But I am a futurist and believe in the motivational pull of best-case scenarios. As the saying goes, "The best time to plant a tree was twenty years ago. The second best time is now." We do not just need more systems thinking, but more foresight thinking. Sustainability is a system-wide challenge for which we need more people to consider the future, not just obsess about the present bottom line.

In the meantime, perhaps all we can do is rely on more legislation to ensure that those who are not pulling their weight sufficiently in this highly complex web of sustainable practices are doing much, much more.

> ***"Sustainability involves fulfilling our human needs without compromising future generations' ability to do the same ."***

In order to protect this planet and every individual living on it, we need everyone to play their part. Which is why The Centre for Biological Diversity encourages everyone visiting their website to share this twelve-point list of ways to live more sustainability. How many of them do you adhere to?

1. **Think twice before shopping.**
Buying things impacts the environment, from production to disposal. Ask if you really need it before buying. If yes, consider used items and eco-friendly materials with less packaging.

2. **Ditch the plastic and switch to reuse.**
Plastic lasts forever and harms ocean animals. Help by using reusable bags, avoiding single-use bottles and bags, and choosing products without plastic packaging. Using reusable items whenever possible is good for the planet.

3. **Take extinction off your plate.**
Eating less meat helps the environment, as meat production is bad for water, pollution, and habitats. Also, wasting food is a big problem, so plan your shopping and eat what you buy to help reduce waste.

4. **Simplify the holidays.**
Celebrations, like holidays and birthdays, create a lot of waste. For instance, Americans produce 23% more trash in December. But you can make your celebrations eco-friendly by using natural decorations, giving homemade or secondhanded gifts, and using reusable dishes.

5. **Choose organic.**
Choosing organic products helps the planet and wildlife by avoiding harmful pesticides. Gardening without pesticides and growing native plants protects wildlife. Opting for organic keeps harmful chemicals away from our land, water, and families.

6. **Ditch fast fashion and animal-based textiles.**
Fast fashion is growing fast and harming the environment. Take care of your clothes, buy second-hand, or choose durable, sustainable materials like organic cotton to help.

7. **Be water wise.**
Save water by using less and choosing water-efficient appliances. Plant native, low-water plants in your yard. Eat less meat and dairy to save water from animal agriculture..

8. **Drive less, drive green.**
Drive less and use greener transportation options like walking, biking, carpooling, or public transit. Support electric vehicles and car-free days in your community. Keep your car maintained for better fuel efficiency.

9. **Green your home.**
Keep your home well-maintained for energy savings. Use insulation, efficient windows, and a programmable thermostat. Consider solar energy and check for state incentives for upgrades.

10. **Boycott products that endanger wildlife.**
Avoid buying products made from endangered animals or harming their habitats. Choose sustainable materials like bamboo and dine at restaurants that don't serve imperilled species like bluefin tuna.

11. **Fight for the right to choose when and if to start a family.**
Population growth and consumption harm wildlife. Talking about family planning and supporting sex education and access to contraception and abortion help.

12. **Take action. Use your voice.**
Get involved in politics to help wildlife and the planet. Vote for candidates who prioritise the environment and support stronger policies. Spread the word to friends and support organisations working to protect wildlife.

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Crops on the Brink:
A Climate Crisis Food Security Wake-Up Call

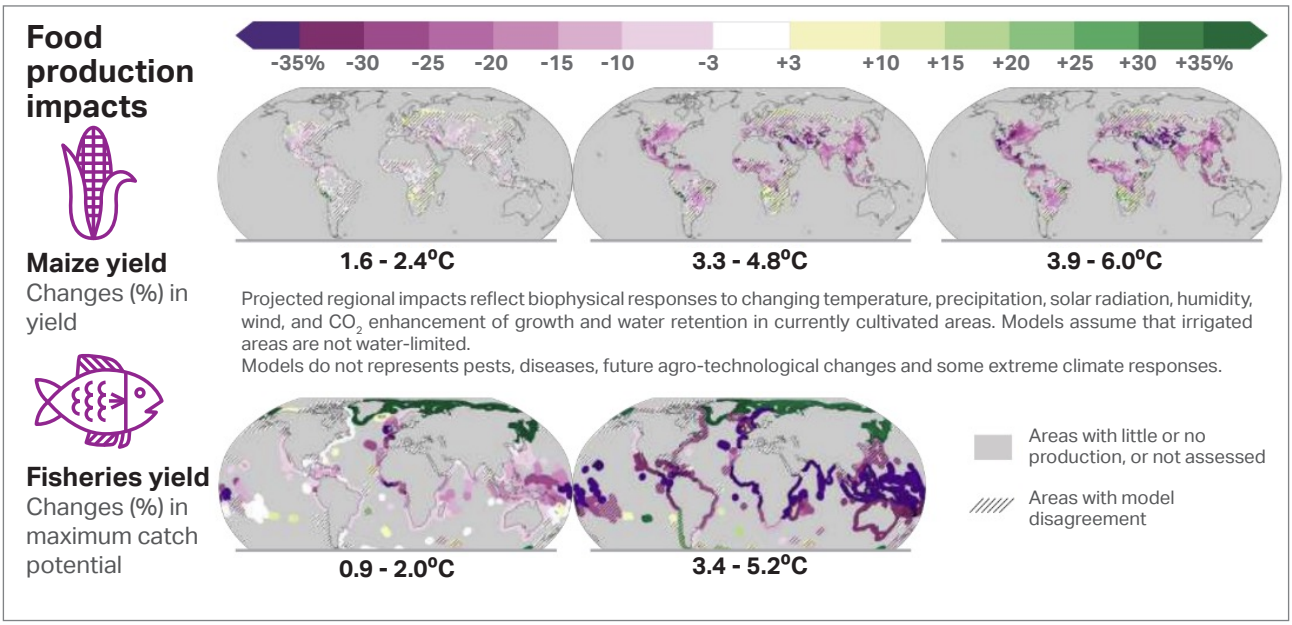
On 7th September 2023, the news title reads, 'Medvedev sweats out 'brutal' US Open win to reach semi-finals,' stating that Daniil Medvedev defeated fellow Russian Andrey Rublev in scorching conditions as temperatures in New York soared to 35 °C. In 2022, India, the second largest wheat producer, placed an export ban after unseasonably hot weather affected the wheat crop yield, sending local prices to soar due to the low supply. These events highlight how the significant temperature increase impacts not only humans and their activities but also plants and animals.

In 2018, the Intergovernmental Panel on Climate Change or IPCC warned of catastrophe and irreversible impact of climate change if global warming is not kept below 1.5°C of pre-industrial levels. The most significant driver of the observed climate change is greenhouse gas emissions, with Carbon Dioxide (CO_2) being the primary greenhouse gas emitted. Global surface temperature reached 1.1°C above the pre-industrial era (1850–1900) in 2011–2020 with considerable increase over land than over the ocean, leading to a series of heat waves, heavy precipitation and ice melting, which subsequently led to the rise in sea levels. The average rate of sea level rise increases significantly from 1.9 [0.8 to 2.9] mm per year between 1971 and 2006, to 3.7 [3.2 to 4.2] mm per year between 2006 and 2018.

Global net anthropogenic greenhouse gas (GHG) emissions are estimated to be about 12% higher in 2019 compared to 2010 and 54% higher than in 1990, with the largest share and growth in gross GHG emissions occurring in CO_2 from fossil fuel combustion and industrial processes followed by methane. Despite the increasing efforts in recent years, the emissions reductions of CO_2 from industrial processes due to improvements in energy intensity of GDP and carbon intensity of energy, have been less than emissions increased from rising global activity levels in industry, energy supply, transport, agriculture and buildings.

The high GHG emissions not only caused an increase in temperatures but are also affecting our health, food security and water supply, with those emitting the least GHG paying the heaviest price of climate change. The biggest impacts are seen in parts of Africa, Asia, Central/South America, LDCs, Small Islands, and the Arctic, with people in highly vulnerable areas experiencing human mortality up to 15 times more likely compared to the most resilient areas due to floods, droughts and storms.

IPCC reported that ocean warming and ocean acidification due to CO_2 emissions have adversely affected food production from fisheries and shellfish aquaculture in some oceanic regions. The agricultural productivity growth is also impacted by the increase in temperature, where slower growth is observed over the past 50 years, mainly in mid- and low-latitude regions, with positive impacts reported in some high-latitude regions due to migration.



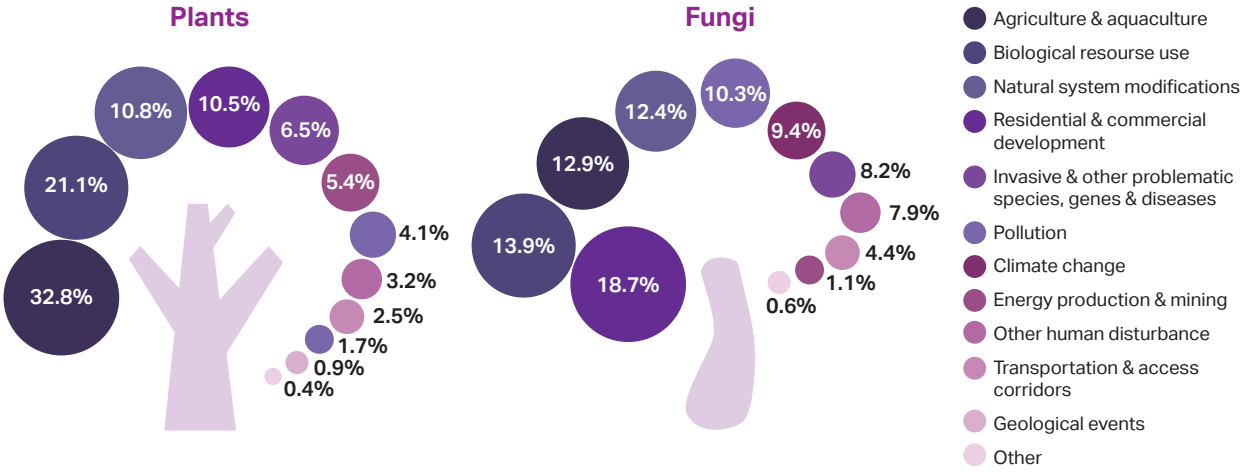
Source: IPCC, 2023

2 in 5 plants are estimated to be threatened with extinction. A study conducted, showed a slight shift towards extinction is observed for monocots and legumes, threatening our food security as currently rice, maize and wheat are the staples of more than half of the people on earth. Another study by Goettsch found that climate change is driving wild relatives of popular crops to extinction including potatoes, avocados, vanilla, wild cotton, wild bean, squash, chili pepper, husk tomato, banana, apple, prunes and ginger. Native varieties of vanilla in South and Central America are at the highest risk of extinction, while wild cotton is second on the list, followed by avocados and then wild potatoes.

While agriculture, aquaculture and biological resource use are the main threats to plant species, natural system modifications, development, pollution and climate change represent about 30% of the overall threat to plant extinction. 40% of all edible crops face imminent extinction due to constantly changing climate conditions. With temperatures rising and the salinity of the soil changing, these plants cannot adapt. Currently, weeds, which mainly thrive in heat and elevated CO_2, have already caused about 34% of crop losses apart from losses caused by insects (18%) and disease (16%).

Why species are at risk

The major threats to plants (A) and fungi (B) that have been assessed for the IUCN Red List of Threatened Species.



Source: Kew Royal Botanic Gardens, 2020

Rising temperatures are also causing growing seasons to become longer and warmer with plants using more water. Many crops, depending on type and water availability, start to experience stress at temperatures above 32° to 35°C. When soils are dry, plants become stressed and do not absorb as much CO_2, which could limit photosynthesis. Additionally, an increase in temperature has also been found to speed up the plant lifecycle so that as the plant matures more quickly with less time for photosynthesis, it eventually produces fewer grains and smaller yields.

Maize, or corn, is largely grown in countries nearer the equator but also spread across the world. The combination of heat and dryness have caused maize yields to fall by 20% in some parts of the US and 40% in Eastern Europe and southeast Africa. NASA predicted that maize crop yields are projected to decline by 24%, while wheat could potentially see growth of about 17%. The scientists found that the change in yields is due to increases in temperature, shifts in rainfall patterns and elevated surface carbon dioxide concentrations from human-caused greenhouse gas emissions, making it difficult to grow maize in the tropics. Wheat, which grows best in temperate climates, may see a broader area where it can be grown as temperatures rise, including the Northern United States and Canada, North China Plains, Central Asia, Southern Australia and East Africa.

In response to warming temperatures, some plant species are gradually moving north or to higher elevations where it is cooler. Many North American plants have moved approximately 36 feet to higher elevations or 10.5 miles to higher latitudes every ten years for the past several decades. The Arctic tree line is also moving 131 to 164 feet northward towards the pole each year. The move resulted in less space and more competition for resources and when they have nowhere left to move, they will eventually be disadvantaged.

Animals are the medium to pollinate and transport seeds. The decline in the population in bees, birds and mammals are affecting the plant population due to the decline of these pollinators. Researchers are estimating that in current conditions, about 60% less seeds are being spread far enough to adapt to the climate change. At the same time, warmer winters and longer growing seasons also help pests, pathogens and invasive species harm vegetation. Scientists have found that insect metabolism speeds up with heat and they eat more. More generations of pests can reproduce as these warmer temperatures speed up insect life cycles. The rising temperatures are also driving some insects to move and invade new territories, affecting the local plants.

With these changes, drastic collaborative actions are needed to curb the diminishing food resources. Political commitments, inclusive governance, international cooperation, effective ecosystem stewardship and sharing of diverse knowledge are critical. Barriers such as limited resources, lack of private sector and citizen engagement, insufficient mobilisation of finance (including for research), low climate literacy, lack of political commitment, limited research and/or slow and low uptake of adaptation science and low sense of urgency need to be immediately addressed. If things do not change climate-wise, food security will be severely affected. It does not help that in 2019, more than 3 billion people, around 2 in 5, could not afford healthy diets and almost 690 million went to bed hungry.

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Malaysian Cities Decarbonisation, Can We Make It Happen?

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Global Climate Concerns

Climate change is every nation's concern. Realising its profound impact, cities worldwide aggressively address the growing environmental issues on many fronts. During the recent UN Climate Change Conference (COP 28), the climate summit in Dubai 2023 demonstrated a critical opportunity for strategic decisions and meaningful outcomes to avoid the catastrophic consequences of climate change. We must rethink energy production and consumption and switch to zero and low-carbon solutions to fully decarbonise.

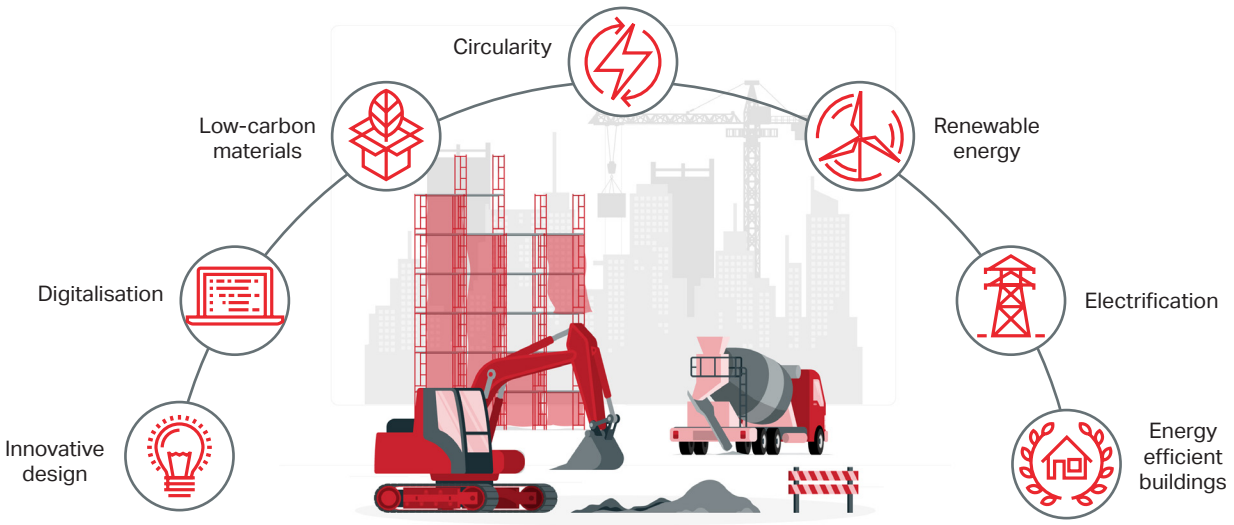
Strong evidence shows cities' vulnerability to extreme heat, floods and droughts, making it crucial to immediately adapt to and mitigate potential climate change impacts. We need integrated solutions for climate-resilient designs to combat rising temperatures and biodiversity losses. The path to decarbonisation requires all sectors to rethink ways to reduce carbon emissions. The government need to strategise its purchases and subsidies, while encouraging collaborations between industries, and leveraging on technologies that can significantly contribute to a sustainable future for cities.

Malaysia updated its Nationally Determined Contribution (NDC) in July 2021 as a signatory to the Paris Agreement, to help implement and accomplish the agreement's objectives. The country increased its mitigation ambition with an unconditional target to cut carbon intensity against Gross Domestic Product by 45% by 2030, compared to 2005.

In the first NDC, the unconditional emissions reduction target was 35%, with an additional 10% conditional on external support. Moreover, the revised NDC covers seven greenhouse gases, compared to the first NDC, which only covered three. Malaysia also expanded the adaptation component, focusing on protecting biodiversity and mainstreaming climate resilience into urban planning.

Realistically, setting ambitious decarbonisation targets is an easy move, but making consistent progress towards profound decarbonisation is far more difficult without first establishing the necessary policies, strategies, budgets and responsibilities associated with it. As cities shift away from fossil fuels, creating a cost-effective decarbonisation pathway, encouraging resilience and maximising the variety of attainable advantages will undoubtedly present an even more significant challenge for municipal leaders.

Rethink the decarbonisation efforts in cities



Malaysia's Cities Transition

Malaysia is currently one of the fastest-growing countries in the region in terms of urbanisation and economic development. This contributes to increasing environmental and societal challenges. Fortunately, Malaysia has explicitly reflected the importance of sustainable urbanisation development as a national priority. The existing governance structure offers excellent potential for funnelling the national climate aspirations to the state level, which holds custodianship of natural resources, as well as to cities that are major economic wealth generators and sources of emissions and pollution.

Many cities in Malaysia have already set a bright low-carbon vision and developed a series of action plans to prepare greenhouse gas inventories that can help track low-carbon initiatives. Urban areas such as Kuala Lumpur, Iskandar Malaysia, Seberang Perai and Melaka have joined city alliances such as the C40 and ICLEI, committing to minimising their carbon footprints. Meanwhile, 52 local authorities are now part of the Low Carbon City Framework Programme, which encourages strategies and actions to reduce carbon emissions at the regional level. These cities are part of a group of almost 10,000 cities globally that are stepping up and committing to inspirational action to reduce carbon emissions in the near future.

Cities Infrastructure:

Urban consumption has a high adverse effect on carbon dioxide levels. Improving energy distribution networks and reducing carbon emissions across the power grid will significantly affect efforts to reduce urban carbon footprint. These efforts include replacing standalone heating and cooling systems with district systems, which could minimise cities' carbon emissions by reducing the energy consumption associated with temperature regulations. Another initiative is smart grid electricity, which can improve data sharing, automation and connectivity amongst its many parts, saving electricity bills. Unified communications, which provide multiple communication channels within and between businesses, such as voice, team messaging and content sharing to facilitate Work From Home (WFH), can also help reduce carbon emissions. With garbage, Waste Robotics in Artificial Intelligence (AI) lowers the amount of rubbish sent to landfills because they automate the recycling process and decrease the margin for error.

Transport Technology:

One-fifth of all greenhouse gas emissions come from the transportation sector. In high-income nations, individual's transportation habits might make up the most significant portion of their carbon footprint. Mobility as a Service (MaaS) is a mobile or web app that connects different modes of transportation into one seamless experience, making travel easy on a combination of public transport and reducing pollution levels.

On the other hand, Vehicle-to-Grid technologies (V2G) for electric vehicles (EVs) connect and draw electricity from the power grid, transforming vehicle batteries into energy storage. Autonomous Vehicles (AVs) may reduce carbon emission levels and are the most promising technologies for an investment involving Tesla, Uber, Amazon and Microsoft. Lastly, there is the rise of hydrogen-powered vehicles, which have the potential to revolutionise the way we drive in a greener way.

Building and Constructions:

Building Automation Systems (BAS) may provide 20% more efficient heating and cooling and 8% more efficient energy use for lighting, appliances etc. Digital twins, a virtual representation of a real-world object or system, enable city planners to use the twin to monitor and adjust performance in real-time, comprehending how buildings, infrastructure and the built environment interact.

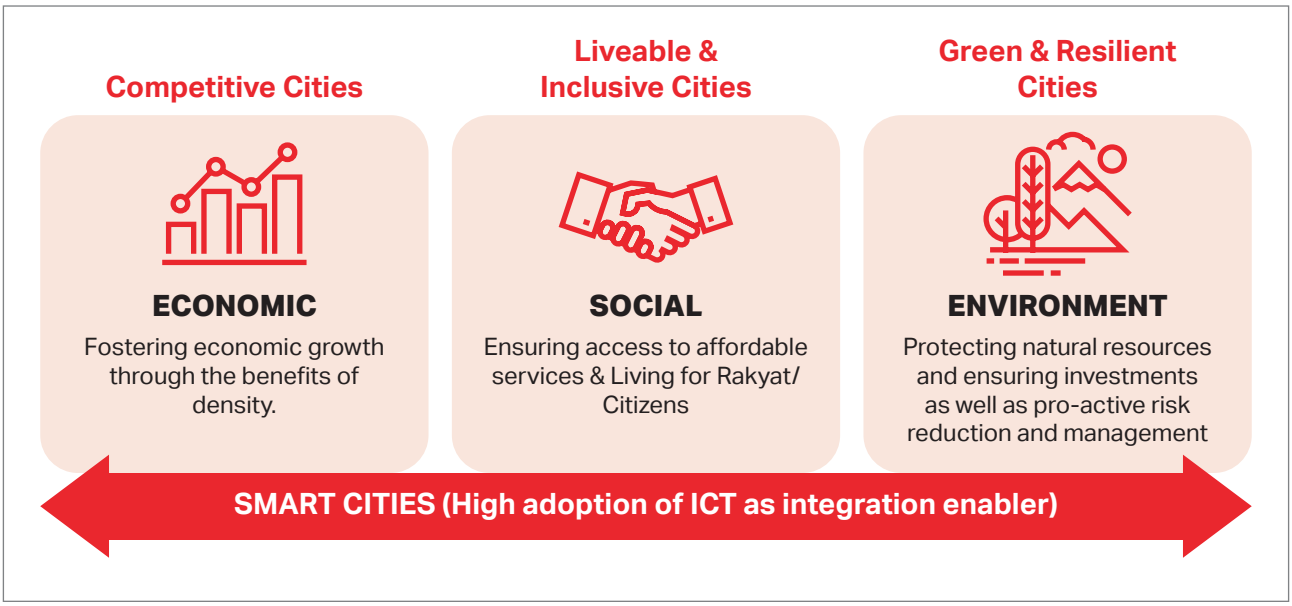
Meanwhile, high-efficiency heat pumps draw heat from the surrounding air or earth using electrical energy and then move the heat either outside to cool buildings or inside to heat them. In addition, low-carbon cement and concrete alternatives can perform as well as, if not better, than conventional cement, which could minimise carbon emissions.

The Integrated Approach

MIGHT, as a national technology think tank, is gearing up to implement an integrated approach for the decarbonisation of cities, which necessitates the implementation of integrated solutions at the city level. This will amplify the smart and sustainable city agenda guided by the national policy, i.e. The Malaysia Smart City Framework and Climate Change Actions under the 12th Malaysia Plan.

This initiative will support the country's localised implementation of the proposed National Adaptation Plan. Political leadership was demonstrated via the existing National Physical Planning Council and Malaysia Climate Action Council (MyCAC) chaired by The Prime Minister, an institutional arrangement for sustainable urban development. The structure facilitates a whole-of-government approach and cross-sectoral collaboration as it is mandated to work seamlessly across ministries and the federal-state governments.

The proposed approach is to mainstream Nature-based Solutions (NbS) for carbon reduction, urban resilience, health benefits and biodiversity conservation. It is also to promote a circular economy in key sectors, that relies on policy coherence and investment generation. This integrated approach is unique in Malaysia and addresses existing governance, planning and implementation gaps in cities. It is expected to contribute to global environmental targets under the Multilateral Environmental Agreements (MEAs) and help address environmental degradation in Malaysian cities.



Adoption of an integrated approach in designing developmental programmes

Moving beyond siloed approaches and integrating systems to create multi-beneficial solutions, can provide long-term sustainability gains that help overcome resource and political challenges. Many barriers are likely similar in cities with normal operations, practising stand-alone and opaque decision-making, reducing the capacity to develop integrated solutions. This is especially true to climate change-related impacts on cities.

With technological advancement, urban planners can use self-management methods to construct smarter cities and focus more on community and local development to create healthy living within the limits of our planet. The intended impact is to promote city-level action and peer-to-peer learning and engagement. Gradually, it will generate ripple effects and build the potential for cities and states to lobby national government and regional institutions on specific areas for economic recovery, as well as intelligent and sustainable development of cities.

This approach will ensure broad stakeholder engagements and entail the coordination of objectives and programmes amongst different city stakeholders (e.g. government, industry sectors and citizens), as well as develop linkages between and within socioeconomics sectors and activities.

As such, MIGHT F.I.R.S.T® Matrix analysis tools can help examine the fundamental aspects of Funding, Infrastructure, Regulation, Skill and talent, and Technology (F.I.R.S.T®) required to address the issues and challenges of each city. While mitigation strategies are still crucial, more emphasis must be placed on measures to cope with climate change's unavoidable consequences and associated economic, environmental and social expenses.

Affordability, gentrification and displacement have emerged as significant challenges for many tech-oriented cities. Economic revival cities and small rural communities are employing workforce and economic development strategies and placemaking (i.e. creating different scales and built environments).

Integrating urban planning with energy policies, plans and practices can provide a comprehensive approach to strategic local municipal processes for mid to long-term urban decarbonisation. This includes critical involvement of local stakeholders in integrated energy planning processes as tools for effective energy decarbonisation modelling. The approach focuses on the essential factors for smart urban decarbonisation, covering central government and planning milestones to accelerate urban decarbonisation through local municipal action.

The existing city-level engagement platforms will be expanded to mobilise financial and technical assistance, promote partnerships with academia and civil society, conduct continuous public awareness, encourage nature-positive pathways for climate resilience, and accelerate decarbonisation efforts. MIGHT interventions at the city-level will follow an integrated approach, covering climate mitigation and adoption, biodiversity and circular economy, bringing them together to create new business models for innovative and sustainable urban services.

MIGHT to 'Walk the Talk'

MIGHT is consolidating its efforts to be the frontrunner of the decarbonisation agenda, working hand in hand with government agencies and industry players to realise the national target of net zero carbon emissions by the year 2050. MIGHT plans to convert its operating building into a Net Zero Energy Building by 2025 using the Zero Capex business model. This initiative aligns with Malaysia's target to reduce the overall greenhouse gas emissions intensity to GDP up to 45% by 2030, compared to 2005. The Zero Capex business model adopted as this project's main criteria is designed for easy replication by other Malaysian buildings or businesses.

The plan includes the installation of rooftop solar through Net Energy Metering (NEM 2.0), an advanced building cooling system through COLDGROW, a solar-powered EV charger, a virtual energy management system and other potential emerging technologies such as micro-CHP for small buildings, hydrogen fuel cell, battery energy storage system (BESS), indoor air quality management and rainwater harvesting.

These projects are aimed to be completed in stages within five years. Its application would improve buildings' energy efficiency and reduce operation costs through total control of electricity supply. The importance of sustainability and circular economy has never been more pressing. As such, MIGHT's vision is to be at the forefront of environmental management, helping businesses save energy, money and the ecosystem.

The Breakthrough Agenda: Mights's Decarbonisation Initiative

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Global Trends on the Implementation of Environmental, Social and Governance (ESG) by the Rare Earth Industry Players:

Midstream and Downstream Perspectives

Do the Environmental, Social and Governance (ESG) factors matter in Business Strategy?

Recently, ESG factors played important roles in companies' business strategies in penetrating to certain market segments at the global level. In addition, financial institutions are also putting some requirements for businesses to commit with the ESG factors as part of the sustainable agenda. Moreover, in some developing countries, ESG reporting is a mandatory requirement for these businesses to declare their activities to the national authorities. From a global perspective, there are various ESG guidelines available which has different reporting matrices.

Some of the ESG best practices & reporting matrix to date.

For the rare earth industry, the ESG is a significant matter. Producing rare earth products and technologies at the downstream level are essential efforts of decarbonisation and achieving net zero, such as for electric vehicles and renewable energy. However, the mining activities of rare earth materials at the upstream level are regularly implicated with negative perceptions due to environmental damages and deforestation.

In addition, the midstream sector is also impacted by improper waste management. The companies are doing various initiatives to comply with the ESG and ensure the sustainability agenda. Currently, a number of companies are taking initiatives to respond to ESG requirements by launching and executing ESG strategies. The global trends of ESG practices by the companies involved in the downstream rare earth industry are deliberated in this article.

ESG Initiatives Taken by the Global Rare Earth Industry Players

Lynas is committed to the ESG agenda while producing essential materials for sustainable industry applications such as electric vehicles, wind turbines and green technology for automotive parts, i.e. catalytic converters. In support of the Paris Agreement on Greenhouse Gas (GHG), Lynas introduced the Lynas Greenhouse Gas (GHG) Policy as part of the climate change initiative by performing Life Cycle Assessments according to the ISO standards 14040 and 14044. Lynas also monitors energy consumption and GHG emissions at the Mount Weld, Kalgoorlie, and Lynas Advanced Materials Plant (LAMP) in Kuantan, Pahang. The main motivations are to put transition efforts from a diesel power station into a gas-renewable hybrid power station and usage of renewable energy and natural gas-based resource for the facility and machinery instead of diesel-based.

The GHG level is monitored at all three plants comprising of Scope 1 and Scope 2. LAMP is also currently using an electric forklift for their operation. Alongside this, a few environmental programmes such as the Environmental Radiological Monitoring Programme (ERMP) and Environmental Management Plan are developed. The ERMP is a programme to detect radiation that covers areas of 1km, 5km, 10km and 20km respectively, monitoring that there is no increase in background radiation level for over 9 years of operation.

LAMP is also implementing water recycling activity at the capacity of 73,949 m^3 and conducting ambient and stack release measurements. In addition, the scheduled waste generated, is collected, and managed by the authorised waste contractor appointed by the Department of Environment, Malaysia (DOE). To manage solid residues, LAMP has put in place a Water Leached Purification (WLP) management, where Lynas is in the process of constructing the Permanent Deposit Facility (PDF) near the LAMP as part of the condition of their operating license in Malaysia.

In addition, Lynas is also organising numbers of community-based programmes, establishing collaborations with universities and research institutions in exploring the R&D activities in process and product development.

The United Kingdom-based PENSANA PLC (PENSANA), for example, is embedding the low carbon design in its project towards net zero, such as electrifying the energy-intensive activities at the plant level and establishing the manufacturing plant located nearby the port and railway lines to reduce the emission from transportation. Focusing on rare earth exploration and development, the Company's flagship assets are the Saltend rare earth refinery project in the United Kingdom and the Longonjo neodymium and praseodymium (NdPr) Project in Angola. The Longonjo operations are located near the Benguela railway line, thus, material can be transported to the port. This will, therefore, displace the need for diesel-intensive road travel.

The kiln operation is electrified and prevents the usage of diesel consumption. PENSANA also declares and provides information on reliable and sustainable source of the separated rare earth metals and compounds. PENSANA also reuses and recycles chemical reagents within its process, replacing the need for the production of chemical products.

Furthermore, PENSANA is also aiming to protect the natural environment by committing to sending zero waste into landfills by 2035. To embrace the circular economy practices, PENSANA integrates the rare earth recycling scheme, displacing some of the need for mining and reducing the landfill. This also reduces the quantity of used magnets that go into the landfill and the need for virgin feedstock from mining. The Saltened Refinery is powered by the offshore wind energy supplied by the Yorkshire Energy Park, while the Longonjo utilises hydropower as a source of energy.

The US-based company, Essex Furukawa, is another company focusing on the manufacturing of magnet and winding wire and is committed to green production by implementing zero waste to landfill operations, utilising renewable energy, reducing energy consumption via energy efficiency and reducing carbon emissions. In the long term, Essex Furukawa aims to for 20% carbon reduction, energy reduction at 10% and plans to utilise 32% of renewable energy source.

As a benchmark of circular economy initiatives, few companies in North America achieve close to zero waste to landfills, such as Franklin, Indiana (USA) Magnet Wire Plant and Torreon (Mexico) Magnet Wire Plant. For the energy reduction initiatives, Essex Furukawa aims to prioritise substantial initiatives at the Scope 1 and Scope 2 (fuels and electricity). Other initiatives are also in place, such as disruptive innovation, agile digitisation such as green information and operational technologies, sustainable automation and bringing social value to the communities, aligning with the United Nations Sustainable Development

Goals (UN SDGs). To manage the environmental impacts, Essex Furukawa is implementing the Carbon Disclosure Project (CDP) and adopting the sustainability assessment tool via EcoVadis. The Copper Mark is applied as an assurance framework to promote responsible production. Essex Furukawa also conducts supply chain transparency and responsible sourcing.

The Japan-based Shin-Etsu is one of the big players that produce rare earth magnets for eco-friendly cars and apply them to electric vehicle parts such as drive motors and generators, starters and generators as the power control units. To put this into perspective, the company declared that the usage of the neodymium magnets in eco-friendly cars reduced CO_2 emissions to an approximate value of 1.9 million tonnes in 2020 and can contribute towards 19 million tonnes over ten years of the life span of the vehicles. Nevertheless, Shin-Etsu also highlights several future issues and challenges, such as a stable supply of raw materials and the need to have recycling technologies. Shin-Etsu developed their own process technology to recycle the rare earths from the recovered power-saving air conditioners and hybrid cars.

In addition, there are a few organisations that are involved in recycling activities such as REEcycle Inc. (US), Heraeus Amloy Technologies GmbH (Germany) and The Valomag Project (the Netherlands) who owns the recycling process patent. Having recycling activities will help the manufacturers implement Extended Producer Responsibility (EPR) as part of the Circular Economy and accelerate ESG practices. HyProMag (UK) is one of the companies that is embarking into recycled magnet manufacturing via Hydrogen Processing of Magnet Scrap (HPMS) by using hydrogen instead of chemicals. This process will break down and demagnetise the newdymium (NdFeB) magnet embedded in a component, in a more efficient way by introducing short-loop magnet recycling with less carbon footprint. This recycling activity can provide a secure supply and diversity in the supply chain.

On the other hand, the electrical motors segment industry made by rare earth-based materials has substantial opportunities to comply with ESG as the electric motor-driven system accounts for about 40% of global electricity consumption and 70% of industrial electricity consumption. During the operational stage, disposal and recycling activities of the electrical motors, the products are responsible for the environmental impacts based on the overall life cycle of the electrical motors. Therefore, the design and manufacturing stage of electrical motors is critical to ensure that it is friendly with environmental concerns, while enhancing the performance of the electrical motors themselves. The standard of EN 50598 - Ecodesign for power drive systems, motor starters, power electronics and their driven applications are being adopted by European electrical motors manufacturers as this is aligned with the European 2030 strategy to reduce 40% of CO_2 emission, increase renewable energy up to 27% and increase the energy efficiency into 27%. As manufacturers need to prove how much environmental impact of their product causes over the entire life cycle to the consumer, this standard will provide a guideline to the manufacturers to comply with Ecodesign motors since it goes beyond a single motor and considers the entire motor system. This includes such things as frequency converters, motor starter equipment, gears, etc. The manufacturers also need to consider on improving the efficiency by having a higher power-to-weight ratio, such as by downscaling the size of motors. For example, Siemens is one of the companies involved in producing efficient electric motors for industry applications, which can reduce 70% of electricity costs via efficient dive technology.

Essen Magnetic Magnet Manufacturing Facility

Enlightens the Potential Rare Earth Industry Players to Malaysia on the ESG Practices

In the Malaysian context, the Ministry of Investment, Trade and Industry (MITI) introduced The National Industry Environmental, Social and Governance Framework (i-ESG Framework) as a guideline to promote the ESG implementation for the manufacturing sectors as elaborated in the New Industrial Master Plan (NIMP) and deliberated in the i-ESG Phase 1.0: "Just Transition" scheduled from 2024-2026. Furthermore, The NIMP highlighted on several mission, strategies and mission-based projects that promote the development of the rare earth industry such as the Mission Based Projects 1.4 Groom champions in 4 game changing of advanced materials including the rare earth under the Mission 1: Advanced Economic Complexity and Strategy 4.1.3: Downstream processing of critical minerals under the Mission 4: Safeguard economic security and inclusivity.

To put this into perspective, this i-ESG framework can serve as a guideline for any foreign and domestic investment focusing on the manufacturing of rare-earth-based products such as super magnets, electric motors, catalysts, etc. The framework highlights the components of ESG and how it can be integrated with the SDG targets. Apparently, the existing players in Malaysia focusing on this business are also implementing ESG initiatives. However, the i-ESG framework will support and facilitate the manufacturing firms to adopt ESG practices aligned with the local context based on the key components of standards, financing, capacity building and market mechanisms towards achieving net-zero GHG emissions. To emphasise, the most important thing is to ensure that all these initiatives are governed by the management sustainability committee on the board of directors to monitor matters related to sustainability governance. Besides, there is a need to have a proper third-party verifier and strong enforcement by the government to ensure transparency on the ESG reporting.

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Sharing Economy:
Empowering Community through Innovative Collaborative Digital Platforms for Wealth Creation in Malaysia

The sharing economy is not merely a buzzword but a transformative force that will reshape how we live, construct industries, build economies and even develop societies. Sharing and collaborative platforms, which are the main components of the sharing economy, have revolutionised and disrupted the way we live, work and interact with the world around us.

The sharing economy concept is familiar to the Malaysian culture. From the practices of giving and sharing through *"sedekah"* and *"wakaf"*, to the spirit of lending time and resources during cultural and community events, like a *"kenduri"* and *"gotong-royong"*, to helping out during a crisis, like the flood - exemplify the spirit of the sharing economy we are already accustomed to.

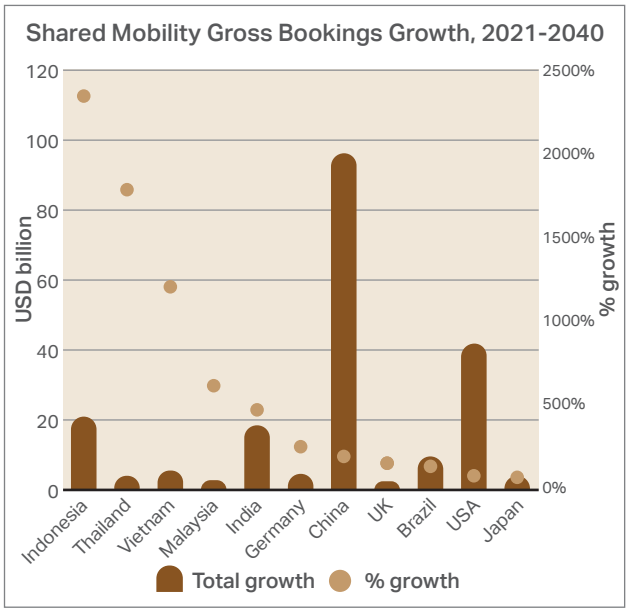
In the modern and digital context, the sharing economy has given rise to an abundance of gig work opportunities where individuals now have greater flexibility in deciding when and where to work. The sharing economy has also lowered the barriers to entrepreneurship, allowing individuals to start their small businesses on sharing platforms with relatively low upfront costs. This encourages people to become micro-entrepreneurs and exercise creative control over their work. Local talents too, can now access the global market through freelancing platforms, thus further expanding work opportunities for both workers and businesses.

Global Trends

In recent years, the sharing economy has emerged as a transformative force globally and locally as it disrupts and redefines traditional businesses and economic structures. The sharing economy is characterised as a collaborative, underutilised resource sharing via digital platforms.

Southeast Asia is projected to be one of the growth markets for the sharing economy in mobility and transportation, which is also called the shared mobility sector. Home to over 670 million people in 2021, the region is projected to be the fastest-growing based on shared mobility bookings over 2021-2040 among 29 economies.

Growth of the Shared Mobility Sector in Asia and developed market



Source: Euromonitor International from trade sources / national statistics

Across its five key markets – Indonesia, Malaysia, Singapore, Thailand and Vietnam – Grab controlled 37% of gross bookings, followed by Gojek with 8.6% in 2021 (Euromonitor International 2021).

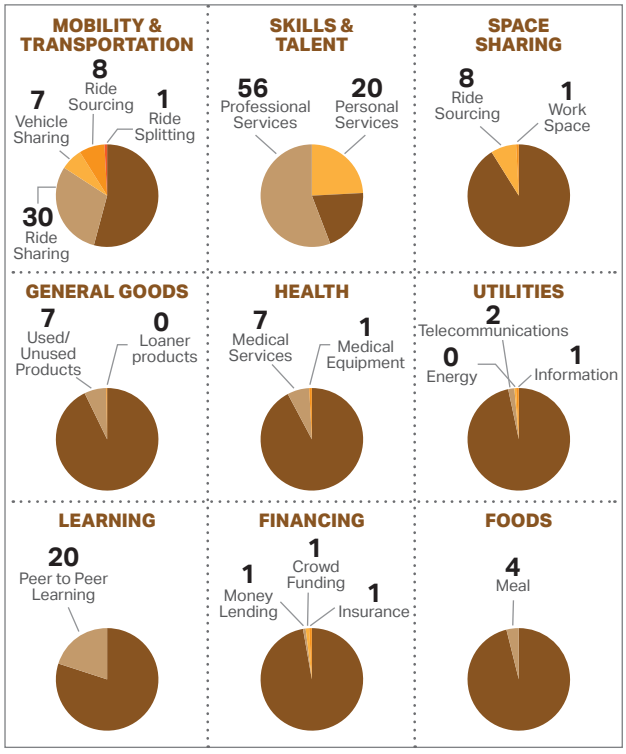
This growth is supported by the increase in population, digitalisation and growing consumer incomes. The increased adoption of and demand for collaborative platforms by consumers have also accelerated the growth of other emerging technologies.

Local Trends

In Malaysia, sharing economy has gained momentum due to the COVID-19 pandemic. It also provided the catalyst for a change in consumer behaviour in using digital platforms for purchases and revenue generation. These platforms have grown rapidly in Malaysia from only 15 operators in 2016 to 141 in 2022.

The industry sectors partaking in this sharing economy have also grown from just the mobility and transportation sector, to more diverse sectors such as the healthcare and utilities sectors. This rapid growth shows the promising growth of this economic area, which will continue to grow rapidly in Malaysia in the coming years. Below shows the number of sharing economy players in Malaysia based Malaysia Digital Economy Corporation's (MDEC) data on 9 key sectors – Mobility and Transportation, Skills and Talent, Space Sharing, General Goods, Health, Utilities, Learning, Financing and Foods Sectors.

Sharing economy platform operators in Malaysia



Source: MIGHT Analytics MDEC 2022

Issues and Challenges

With the advent of growth in Malaysia's sharing economy platforms, issues and challenges are bound to arise. Some of the key issues and challenges that are still faced by the sectors in the sharing economy are as follows:

1. Unsafe working conditions due to vague and inconsistent safety and working guidelines by the operators and statutory bodies. Eg. e-hailing drivers
2. Unstable gig worker income, leading to other issues like difficulty in getting loans from financial institutions
3. Lack of career growth due to short-term plans and lack of skill and knowledge development among Service Providers and Gig workers
4. Lack of legal or official service documentations, governing the relationship between Service Providers and the Platform Operators. This gives further rise to issues of liabilities in the event of dispute either between the Service Providers and the Platform Operators, or Service Providers and Consumers
5. Lack of a central database to monitor registration for identifying and regulating Service Providers/gig workers as well as Platform Operators
6. Lack awareness among Platform Operators of legislation and guidelines imposed by the relevant government bodies/agencies
7. These critical issues and challenges need to be addressed by the relevant government bodies and key stakeholders if we are serious in accelerating the growth of Malaysia's sharing economy within the country and beyond our borders.

Community Economic Empowerment in Malaysia through Sharing Economy

Beyond economic aspects, sharing economy has profound social implications. Some case studies in Malaysia have shown that digital collaborative consumption has fostered community building, social connections and inclusivity in communities. A collaborative digital platform enables shared resources among members within a community, thus contributing to the overall well-being of vulnerable minority groups in the community, such as disabled individuals or senior citizens.

One of the primary benefits of the sharing economy is its potential to empower marginalised and vulnerable groups economically. An example of this is the MyDesa platform that has been developed by Akla Services Sdn. Bhd. The platform has enabled vulnerable community groups, such as single mothers and hardcore poor in rural areas, to generate income.

Currently, there are around 40,000 subscribers on the MyDesa platform. Most are from Kelantan, Sabah and Terengganu rural areas across 2000 villages. Through the utilisation of collaborative digital platforms, the technology can connect individuals and promote collaborative support among members of the community. This new business concept can help to improve the well-being of underserved people by bridging gaps, providing opportunities and enhancing the general well-being of society at large.

Other major platforms in Malaysia, such as Grab, empower vulnerable communities, such as the deaf, to become driver-partners in their platform as a way for the disabled community to generate income and participate in the economy. In 2018, Grab, in partnership with the Malaysia Federation of the Deaf (MFD), onboarded 100 deaf driver-partners as a means to generate income. Grab also has the intention to include various forms of disabilities to participate in their platform in the future.

These case studies illustrate how digital platform innovation in the sharing economy can directly impact the lives of individuals in vulnerable communities, in particular the B40 and hardcore poor segment in the country.

Conclusion

In conclusion, this article provides an overview of the sharing economy in Malaysia. Through sharing platforms, vulnerable communities can be empowered and included in the economy, where they were normally shunned in the traditional markets. Addressing economic, social and cultural dimensions sheds light on the transformative potential of collaborative consumption in fostering inclusivity and resilience across society. As Malaysia navigates this new economic landscape, understanding and optimising the impact of the sharing economy on vulnerable communities will be vital for a more sustainable, holistic and equitable economic development.

The government plays an even more crucial role in supporting and regulating the sharing economy. Governmental support is necessary to ensure that vulnerable communities benefit equitably from the sharing economy and that no one is left behind in the development of the nation's economy.

The service providers/gig workers in Rantau Panjang registered on the MyDesa platform

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TechnoMart Malaysia: Building and Strengthening of the High-Tech Ecosystem

TECHNOMART Malaysia

The Bigger Picture

In an era where technology is the cornerstone of innovation and progress, fostering a robust ecosystem for high-tech development is paramount. In recent years, Malaysia has been actively enhancing its innovation ecosystem through various efforts aimed at strengthening research and development, fortifying entrepreneurship, and strengthening digital infrastructure. This is evident with various major policy supports such the New Industrial Masterplan 2030 (NIMP), Malaysia Startup Ecosystem Roadmap (SUPER) 2021 – 2030, Twelfth Malaysia Plan etc.

In view of global developments and overcoming grand challenges, it is important to acknowledge, understand and strengthen the pillars and critical points of the high-tech ecosystem. While different countries may have varying drivers, but we can sum up to the drivers as illustrated in figure below:

High Tech ecosystem drivers

- Market demands
- Funding/ Incentives/ Investments
- Policy support
- Infra/ infostructure
- R&D
- Collaborations
- Skills & Talents

The advent of 4IR and COVID-19 had been catalytic to the increasing number of tech startups in Malaysia. In response, the Government has further formulated various incentive packages and other kind of facilitations and assistance to help the growth of these startups. So much so that Malaysia aspired to be in the Top 20 Global Startup Ecosystem by 2030, the one (1) Vision as transpired in SUPER 2030. While it is a long positive journey, there challenges to face to further promote growth of these tech companies. It was reported that the key obstacles areas faced by Malaysian companies are namely Funding, Talent, Innovation, Policies and Regulations, and Market Environment as explained by figure below:

The challenges and gaps in Malysia's startup ecosystem

Market:
Lack of validation and support; lack of access to cross border market penetration

Funding:
Lack of private sector driven funding

Policy support:
Lack of robust policies and regulations to provide sustainable startup environments

Talents:
Lack of local and foreign talent with the required technical and digital skills

R&D:
Lack of clear paths from ideation to commercialisation for startups

Source: Malaysia Startup Ecosystem Roadmap (SUPER) 2021 – 2030

Other glaring challenges that often faced by entrepreneurs/ tech companies are visibility and awareness of available facilitations offered by Government. The industry players, especially startups are often unaware of various initiatives by the Government which can truly assist them in increasing productivity and growth. Besides that, the unlevelled competition with other far more established companies especially MNCs affects their visibility to the potential clients and users.

Introduction to TechnoMart Malaysia

In upholding MIGHT's mandate to prospect for business opportunities for Malaysia through strategic exploitation of technology and to support Malaysia's aspiration to become High Tech and High-Income Nation, enter TechnoMart Malaysia, a dynamic initiative aimed at not building structures, but nurturing a thriving environment for technological advancement. It is one of MIGHT's flagship programmes that provides a platform to facilitate business opportunities through business matching for high-tech industry players in Malaysia. The participating organisation can promote innovative products or capacities through the programme.

TechnoMart Malaysia was introduced by MIGHT back in circa 2008 and largely focuses on business matching activities. Later in 2018, TechnoMart Malaysia re-entered the high-tech landscape with expanded roles. This interactive platform promotes the visibility of local players and their strengths, also as an avenue to form partnerships among domestic as well as international players, and government entities. The objectives are achieved through panel sessions and dialogues, talk series, showcases, business meetings and pitching, and high-level stakeholder engagements.

TechnoMart Malaysia comprises of activities that promote visibility and connect the local tech players with the necessary stakeholders as described in figure below:

Activities within TechnoMart

EXPERT BRIEFINGS/ TALKS

is a series of technology related talks by experts, policy makers, ACADEMIA, technopreneurs, NGOs

DIALOGUES & NETWORKING

for those who strive to support local industrial development for the benefit of the nation

TECHNOLOGY SHOWCASES

promote business opportunities through technology showcase for SMEs, entrepreneurs and stakeholders

BUSINESS MATCHING

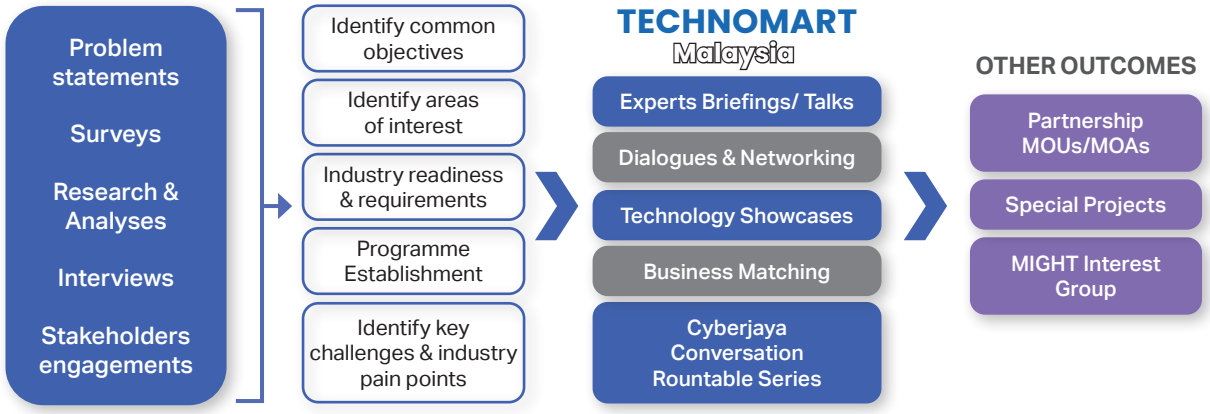
promotes development of industry collaboration & ecosystem in the high technology sectors

PARTNERSHIP MOUs/MOAs

Highlight on mutual collaboration between stakeholders

Implementation of TechnoMart Malaysia involves a network of processes that will lead towards fulfilling the desired objectives and beyond. Each TechnoMart Malaysia held will depend on the needs of the industry players and the type of industry. Thus, the outcomes will be different. At TechnoMart Malaysia, we strive to facilitate industry players addressing their challenges and needs. Certain sectors require policy and government support; hence the involvement may focus more on government machineries via Roundtable sessions and high-level meetings. In a nutshell, the overall framework of TechnoMart is a illustrated in figure below:

The overall framework of TechnoMart



For example, back in 2018, the local rail industry players have very specific challenge in securing for projects due to lack of visibility and confidence among stakeholders on their capacities and capabilities. TechnoMart activities were design to promote visibility and to provide avenue for them to meet high level policy makers. Almost a week-long programme was designed which include high level meeting with the key ministries such as MOT and MEDAC, extensive exhibitions by the rail players, pocket talks and business meetings.

Since 2018, TechnoMart has covered various sectors including the following:

1. Rail Industry
2. Shipbuilding and Ship Repairs (SBSR)
3. Blockchain
4. IOT – Social Healthcare
5. Smart Manufacturing
6. Drone
7. Digital Education
8. Smart Mobility
9. Smart Manufacturing, etc

Examples of previous TechnoMart activities

TechnoMart Malaysia 2024 is envisioned as a comprehensive series of thematic activities that will serve as a platform for industry leaders, innovators, and professionals to converge and exchange ideas, showcase cutting-edge technologies, and foster collaboration. Among the continued key objectives are:

- To promote collaboration among stakeholders in the field of high tech.
- To assist high-tech industries with their international ventures
- To showcase products and services to potential investors or partners.
- To establish a shared interest in technologies with stakeholders for commercial objectives and to promote local technology.

Everything begins with a Conversation

The creation of great ideas usually spurred by meaningful discourse and conversations. The conversations among the industry players, guided by esteemed leaders to share experiences and pain points will generate impactful inputs that can be crafted into recommendations for the policy makers. Thus, this is where The Cyberjaya Conversation (CC) Roundtable series, as building blocks of TechnoMart Malaysia comes in to initiate discussions on hot topics that affect our country.

The CC Roundtable Series shall be one of the avenues to trigger new and innovative ideas for the actions by the government (public sector), business (private sector) and communities in enhancing the ecosystem through more intensive and extensive deployment of emerging technologies in making Malaysia as the preferred regional technology hub.

The recently held CC Roundtable Series on Powering a Sustainable Market-centric Food Ecosystem

Fostering Collaboration

One of TechnoMart's core principles is collaboration. By bringing together startups, established companies, researchers, government and investors under one roof, it catalyses synergies that drive innovation forward. Shared spaces and networking events cultivate a culture of cooperation, where ideas can flourish and partnerships can blossom. The gathering becomes more meaningful in the presence of key stakeholders and policy makers.

We are keen to move forward with more sectors, involving more present leaders. In 2024, TechnoMart Malaysia aims to explore more areas such as Space, E&E, Food/Agriculture, and Cybersecurity while continuing existing areas such as Rail and SBSR.

Gathering of industry players and country premier

Supporting Emerging Technologies

TechnoMart isn't just about the present; it's about the future. By supporting and providing platform to techno players of emerging technologies such as AI, biotech, IOT and renewable energy, it ensures that tomorrow's innovations have a nurturing environment in which to grow. Whether through establishing special programmes, linkage to investors or potential end users, TechnoMart empowers pioneers to push the boundaries of what's possible.

As mentioned earlier the key raison d'etre of TechnoMart is championing the local technology industries by facilitation in addressing the issues and challenges faced on various fronts. Hence the implementation of TechnoMart shall involve several categories of organisation/partners which are:

1. Established tech players
2. Startups
3. Investors/financial institutions
4. Government entities (Ministries and agencies)
5. End users (MNCs/GLCs etc)
6. Industrial associations etc

Connecting Globally

In today's interconnected world, success often hinges on global connectivity. TechnoMart serves as a gateway to international markets, fostering connections with tech hubs around the globe. Through partnerships, trade missions, and exchange programs, it opens doors for collaboration on a global scale, amplifying the impact of local innovations. The first international TechnoMart was held under the existing Malaysia-Turkiye (MYTR) Technology Collaboration Programmes that has heavy focus in areas such as Aerospace in July, 2023. Among the expectations and intended outcomes are as follows:

1. To facilitate the exchange of ideas and information
2. To facilitate building of relationships and partnerships between technology organisations;
3. To promote collaboration on technology projects and initiatives
4. To identify opportunities for technology integration and joint development
5. Improving technology transfer and commercialisation opportunities through shared resources/knowledge
6. Enhancing cross-industry innovation whilst enabling increased market reach and access to new markets.

Conclusion

In an age defined by rapid technological advancement, initiatives like TechnoMart are indispensable. By not structures, but facilitating entire ecosystems, we lay the foundation for a future driven by innovation, collaboration, and co-creation that leads to progress. As we look towards tomorrow, let us remember that the seeds we plant today will shape the world of generations to come.

TECHNOMART
Malaysia

Collaborating with our partners from government institutions, small industries, multinational corporations, associations, universities, investors, and various stakeholders committed to sustainable development, we prioritise on not only fostering industrial growth but also ensure environmental responsibility and social equity. By integrating sustainable practices into our endeavours, we aim to promote economic prosperity while safeguarding natural resources, reducing carbon emissions, and enhancing community well-being. Together, we strive to create a thriving business environment that prioritises the long-term productivity and resilience of our planet and its inhabitants.

INFOGRAPHICS

Global City Megatrends ...Urbanisations?

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Cities are turning into centres of employment, learning, business, and the arts, forming a self-sustaining cycle. But there are also concerns regarding housing, infrastructure, and smart cities raised by this movement. There aren't enough dwelling places for everyone as it is, and there are already too many automobiles on the streets. Either cities must expand, or the provinces must offer comparable possibilities, to guarantee equitable access to city living. By doing this, a vicious cycle of only the wealthy and highly educated being able to reside in cities where they can keep growing will be broken. The urbanisation trend is essential to enabling individuals to live the lives they desire.

3 recognised notions related to urbanisation
Mega Cities, Mega Regions and Mega Corridors.

MEGA CITIES
Integration of a core city with suburbs; and housing over 10 million people

MEGA REGION
Integration of two or more cities; or expansion of a city to link with adjoining daughter cities; and housing over 15 million people

MEGA CORRIDOR
Urbanisation corridors connecting two or more mega cities; or mega regions. These can span 100 km and have populations of over 25 million.

Trends in City Evolution

In the coming years, urbanisation will accelerate even further due to the growing global population, particularly in developing nations.

ADVANTAGES OF URBANISATION

LIVE
Providing better housing, infrastructure and utility development

WORK
Creating hubs for employment, learning, business and arts

PLAY
Expanding provinces for similar or better opportunities, and more equitable access

SMART CITIES is the heart of Urbanisation. With it comes the demand for new technologies across various industries, creating opportunities for technology innovation and calls for new skills development. Modern technology has improved entertainment, shopping and transportation options, but has also changed skills and competencies for success.

Major concepts that will change the smart city sector include carbon-neutral buildings, the digital revolution, augmented reality, densification, healthy buildings and the battle for food. These concepts present both advantages and challenges and need innovations to boost productivity and sustainability, as well as maintain or improve quality of life.

MALAYSIA'S SMART CITY AGENDA
requires digital talents, upskilling, educational programmes and international collaboration

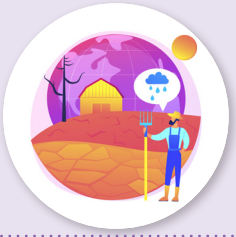
MEGATREND 1

SHIFTING ECONOMIC POWER

- Population growth is central to the shift in economic power
- Influence of emerging and developing economies means huge changes for business, society and the way we invest
- Emerging economies are now the growth markets
- Asia will be the new global superpower
- Global demographics will change

Implications
- Power shift from west to east
- Chinese business growth is relentless
- Time to learn from the East

MEGATREND 2



RESOURCE SCARCITY

- Global warming has impacted crop yields, causing food prices to surge
- Coastal areas are increasingly susceptible and there is a growing strain on the planet's resources
- Increasing carbon emissions drive global warming

Implications
- More produce, less inputs
- Shift from oil to clean energy
- Decline of carbon-based mobility

MEGATREND 3

TECHNOLOGICAL BREAKTHROUGH

- The rapid advancement of technology, especially that of artificial intelligence and machine learning, is arguably at the centre of all megatrends
- The pace of change is exponential
- Data is the new oil
- Automation of humanity

Implications
- More connected living driven by IoT
- Improved standards of living through robotics and AI
- Improved healthcare

MEGATREND 4

SOCIAL CHANGE

- By 2042, there will be more ageing people (over 65) in Asia
- Changes in world population, density, ethnicity, education level and other aspects of human population will bring significant social change
- This underpins other structural shifts, such as technological development and shifting economic power
- Population will continue to grow
- There will be more older people across the world
- Families will have fewer children

Implications
- Healthcare spending and behavioural change
- Robots will become our best friend
- Consumer behaviour is changing the food industry

MEGATREND 5

RAPID URBANISATION

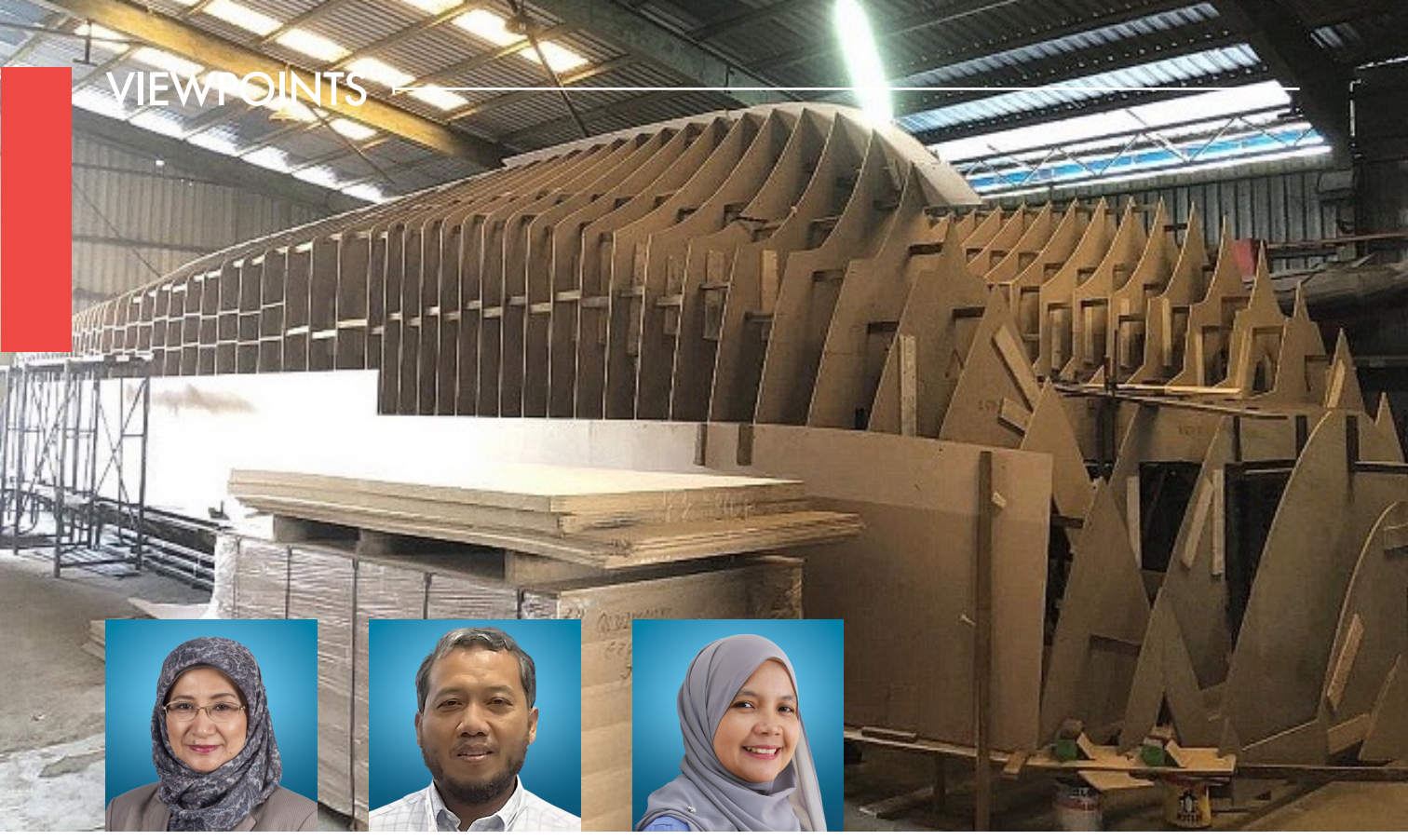
- World population is increasingly concentrated in cities and large urban areas
- This will further drive technological advancement, impact climate change and influence other megatrends
- Future urban populations demands connectivity to everything – every device, every entity and every object
- Wireless connectivity will be paramount to improving quality of life in cities
- Migration to the cities will increase
- City living provide better quality lifestyle

Implications
- Demand for smart cities and new infrastructure increases
- Healthcare and security issues are vital
- Consumer behavioral change

Conclusion

These megatrends are inevitable, and as Malaysia embarks on developing smart cities, we must take into consideration and prepare to mitigate the impact of these megatrends.

Hence, we must prepare our people, by producing talents that are digitally skillful, by upskilling the current workforce, preparing the future workforce through educational programmes and continuously establish and implement international collaborations.



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The modern catamaran fishing vessel construction is currently in progress

Navigating Tomorrow's Seas:

Modernising Fishing Vessels Through Practical Technology Solutions

Universiti Malaysia Terengganu (UMT) is a Malaysian public institution founded in 2007 that has become a notable success in the field of Marine Sciences and Aquatic Resources. Situated by the South China Sea, it utilises its location to advance research and education in marine life, conservation, and sustainable practices.

Regarding future planning, UMT likely prioritises foreseeing challenges and opportunities in marine sectors, such as climate change effects on marine environments, responsible fisheries oversight, and innovative ocean exploration technologies. By engaging in strategic foresight and partnerships with stakeholders, UMT aims to equip its students, scholars, and communities for the evolving realm of marine sciences and industries.

Marine aquatic resources are critically declining globally, primarily due to unsustainable fishing practices and Illegal, Unreported and Unregulated (IUU) fishing. This poses a significant threat to the delicate balance of marine ecosystems and compromises the sustainability of vital resources. Encroachments, "Ghost Fishing" and "By-Catch" not only violate international laws and increase geo-political tensions, but also undermine the World Health Organisation's (WHO) and UN Food and Agriculture Organisation's (FAO) efforts to ensure the sustainability of marine resources. The environmental impact of IUU fishing, including overfishing and habitat destruction, is responsible for production decline, eroding marine life diversity, and jeopardising food security, thus compromising the health and income of coastal communities. Urgent global and regional actions are needed to salvage marine resources in line with WHO and FAO policies and prevent irreversible damage to both ecosystems and human well-being.

In line with the 1984 National Agricultural Policy (NAP), recognising fish as Malaysia's primary protein source and emphasising fleet modernisation for marine fishery resource utilisation, Universiti Malaysia Terengganu (UMT) actively addresses challenges in this field. Specialising in marine and aquatic resources, UMT secured RM 3.1 million from Malaysia's Ministry of Science, Technology and Innovation (MOSTI) for the research project, entitled "Transforming Coastal Fisheries through Model Prototype Design and Development of an Innovative Fishing Vessel." Several government agencies, including the Department of Fishery (DOF), the Malaysian Space Agency (MySA), and the Malaysian Industry-Government Group for High Technology (MIGHT), collaborated on this project through a Memorandum of Understanding (MoU) – a Collaborative Agreement. This underscores UMT's commitment to revolutionising fishing practices for sustainable coastal fisheries. Through the modernisation of fishing vessels for artisanal Malaysian fishermen, the project aims to improve socio-economic conditions while ensuring the sustainable management of aquatic resources. It integrates a unique design concept of a catamaran equipped with modern facilities and advanced technologies, innovative fishing gears and aggregating devices to enhance efficiency, reduce costs and promote quality sustainable fishing practices, fostering interests for both economic development and environmental preservation in coastal fisheries.

Designed by UMT with local and international experts from J N Sham Sdn Bhd, a modern fishing vessel with a length of 17.0 meters (39.19 GT) is currently under construction in collaboration with local ship construction experts and builders from MSETIC Sdn Bhd in Kuala Terengganu. The Engineering Division of the Department of Fisheries (DOF) and the Ship Classification of Malaysia (SCM) approve the fishing vessel's design. This catamaran-type fishing vessel is made from fiberglass, a composite material, offering various advantages over typical traditional boats, as seen in the figure above, the illustration of the design of a modern fishing vessel.

In addition, numerous innovative features characterise this modern fishing vessel, including the incorporation of artificial intelligence in the design process, the utilisation of solar power for on-board electricity and notably, as well as the implementation of eco-friendly fishing gear designs proven to reduce by-catch by up to 95%. This approach contributes to the comfort and safety at sea while preserving marine aquatic resources and protecting the marine ecosystem. This fishing vessel has the capacity for eight crew members to operate at ten knots, with a prolonged operational endurance lasting up to 5 days in fishing zone B.

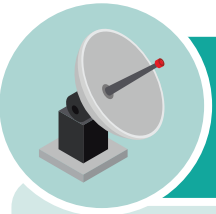
Illustration design of a modern fishing vessel from UMT

Professor Dato Dr. Nor Aieni binti Haji Mokhtar, the project's principal investigator and her team, including the ship's designer Associate Professor Dr Ahmad Fitriadhy anticipate its completion and operational readiness by the end of the first quarter of 2025. Currently, the construction is advancing as it works towards creating the plug and mould. The research project team, incorporating members from sustainable fisheries and socio-economic groups, is optimistic that this prototype will serve as a model, aims to promote equitable benefits and opportunities for youth social enterprises, amongst others. Furthermore, they see it as a proof of concept for enhancing shipbuilding design and construction and energy production, particularly for zones B and C within Malaysian waters in the near future.

Photo of some team members with the frame of the Plug and Mould of the catamaran

The future of fisheries vessel technologies holds immense promise as advancements continue to reshape the landscape of sustainable and efficient marine resource management. Embracing cutting-edge technologies is essential for addressing the fisheries industry's evolving challenges. From precision navigation systems to data-driven analytics, the integration of technology offers a pathway towards enhanced operational efficiency, improved resource conservation and increased safety at sea.

Technologies such as artificial intelligence, automation, networks and sensors are helping to monitor fish activities, fish catch volume and fish trade data. This creates "smart vessels" that can move data through satellites and cellular networks, and generate an unprecedented new level of information about fisheries in real time.



TECHNOLOGY TREND 1
Fish Detection Technologies

Sonars

Sonar includes devices used to detect fish in the water. It uses sound waves to reflect them off objects in the water. Then, later, the sonar will receive sound reflections to determine the location of the fish. It is extremely helpful, especially during winter when the catch moves deeper into the sea.

Global Positioning System (GPS)

GPS is a technology used to determine fish locations accurately. Modern fishermen use GPS to pinpoint exact areas for fishing, often saving time and effort.

TECHNOLOGY TREND 2
Fish Catch Technologies

Fishing Drones

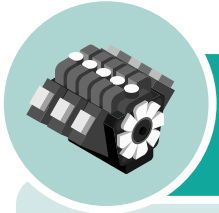
Fishing drones are new equipment that modern fishermen increasingly use. They have cameras and nets that can be thrown into the sea to catch fish. Modern fishermen can operate drones from boats to monitor sea conditions and fish movements more accurately. This equipment can catch fish efficiently and minimise damage to the marine environment.

Fish Aggregating Device (FAD)

Fish Aggregating Device (FAD) refers to a device installed in the sea to attract fish to a particular area. FADs are usually made of materials that float effortlessly and are equipped with lights and sounds that attract fish.

TECHNOLOGY TREND 3
Fish Processing Equipment Technologies

Seafood processing involves different machinery, such as freezing machines, with automated loading and unloading systems; or roller graders, that sort fish based on their size. Such machines help reduce unproductive time and enhance the working environment.



TECHNOLOGY TREND 4
Green Engine

The International Maritime Organisation (IMO) regulations strive to decrease detrimental exhaust gas emissions from trawlers, ships and freighters equipped with internal combustion engines. Accessible fishing vessel technology involves using hybrid ships, incorporating both fuel-powered and electric engines. An illustrative example suitable for Malaysia entails employing a small combustion engine powered by renewable fuel together with a set of lithium batteries. Additionally, alternative technologies encompass connectivity to onboard solar panels.

TECHNOLOGY TREND 5
Crew Accommodation and Welfare

While not a new trend, ensuring a better future for fisheries in Malaysia is crucial. As of 2022, there were over 116 thousand fishermen in Malaysia, and they deserve a safe and fair work environment that includes decent working conditions and fair remuneration for their work. This is also essential to attract a new generation to the sector.

Among the basics of crew living conditions and accommodations:

- Provide lifesaving appliances in the event of a collision or fire
- Provide ventilation and insulation, and separate from work areas
- Appropriate sanitation and washing areas
- Access to a confidential communication link, mitigating the risk of isolation

Conclusion

As we look towards the future, the synergy of innovation, connectivity and responsible practices will pave the way for more resilient and sustainable prospects for fisheries. The potential of fisheries vessel technologies in Malaysia holds great promise for bolstering both the ecological integrity of its waters and the socio-economic well-being of its coastal communities. By embracing and tailoring technological advancements to the unique needs of the Malaysian fisheries sector, the nation can position itself as sustainable and responsible fisheries management in the region.

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Tomorrow's Commute:

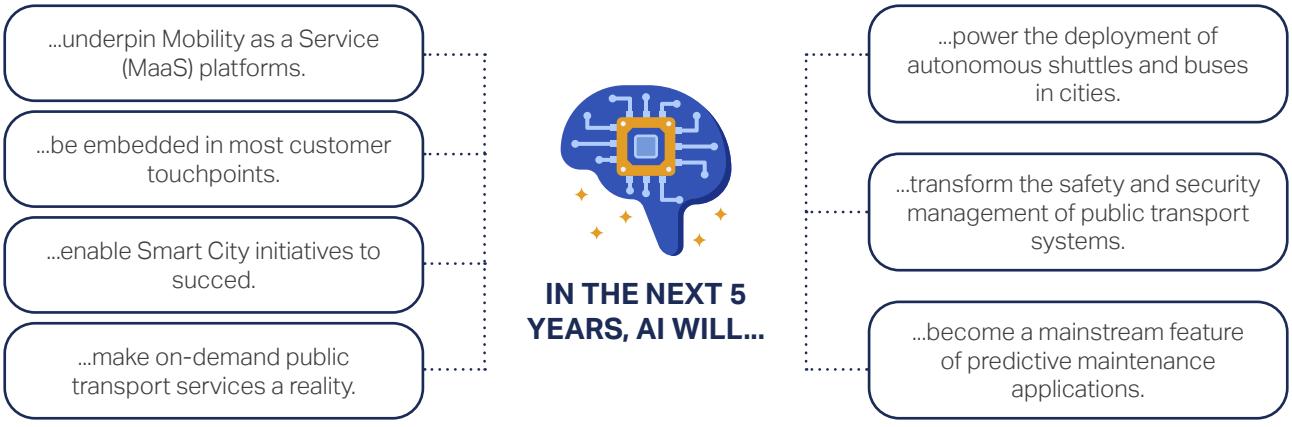
Demographic Dynamics in Shaping Sustainable Mobility and technology trends

Shift in demographic pattern and population size directly influence the demand for transportation services. Growing populations often lead to increased traffic congestion and greater demand for public transportation. Conversely, declining populations may result in reduced traffic congestion but could also lead to decreased public transportation services as they become less financially viable with reduced demand. According to the World Health Organisation (WHO), the population of adults aged 60 and above is expected to reach 2.1 billion by 2050, doubling from the recorded 1.4 billion in 2020. Changes in the age distribution of a population can impact mobility in several ways. For instance, aging populations may require more accessible transportation options, such as paratransit services or transportation for seniors, due to decreased mobility or disabilities.

Transforming mobility through AI

The present trends have seen Artificial Intelligence (AI) significantly influence choice and preference of transport in particular with regards to demographic shift and environmental consciousness of the society, AI-powered systems can analyse individual preferences, travel patterns, and environmental concerns to offer personalised recommendations for transportation modes. For instance, AI algorithms can suggest eco-friendly options like public transit, biking, or carpooling based on location, destination, and time preferences. Additionally, AI can optimise route planning and navigation by considering real-time traffic data, weather conditions, and emissions levels, thereby reducing congestion and pollution. Furthermore, AI-enabled demand-responsive transportation services, such as ride-sharing and microtransit, can cater to changing demographic needs and preferences, offering flexible and sustainable mobility solutions tailored to specific groups like older adults or individuals with disabilities. These services not only enhance convenience but also promote

sustainability through shared rides and efficient vehicle usage. Such AI-driven analytics can provide valuable insights into travel behavior and mode choice preferences across different demographic groups. By analysing large datasets and social media activity, AI algorithms can identify patterns and trends in transportation preferences, helping policymakers and transportation providers tailor services and incentives to promote sustainable modes of transport. AI can drive the development of innovative mobility solutions that cater to changing demographic needs and environmental priorities. For example, autonomous electric vehicles (AEVs) and mobility-as-a-service (MaaS) platforms powered by AI technology could offer convenient and environmentally friendly transportation options for urban residents, reducing reliance on private car ownership and promoting shared mobility.



Source : Artificial Intelligence (AI) in Mass Public Transport, UITP AsiaPacific Centre for Transport Excellence (AP CTE) under a joint-funded research programme between International Association of Public Transport (UITP) and Land Transport Authority (LTA)

Overall, demographic changes interact with various social, economic, and technological factors may shape mobility patterns in complex ways. Understanding these dynamics is crucial for policymakers, urban planners, and transportation providers to effectively plan for future transportation needs and mitigate potential challenges such as congestion, environmental degradation, and inequitable access to transportation services. AI has the potential to revolutionises the transportation landscape by providing personalised, efficient, and sustainable mobility solutions that align with environmental consciousness and demographic changes. By leveraging AI technologies, policymakers, urban planners, and transportation providers can create a more inclusive, accessible, and environmentally sustainable transportation system for all.

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6. Trends in Malaysian poverty and income dynamics: do regional inequalities trump ethnic disparities? March 25, 2021,World Bank, Kuala Lumpur Research Seminar Series (https://www.worldbank.org/en/events/2021/03/18/EAPCE210325 poverty)
7. M'sians spend too much on transport, ministry wants to address that (Published: Oct 17, 2019 3:45 PM https://www.malaysiakini.com/news/496270)

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Melaka Smart City Story
A Policy Perspective on Smart Grid

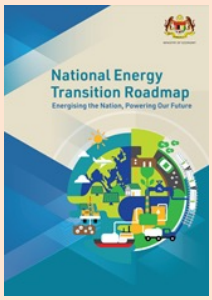
The global energy crisis and geopolitical volatilities have added new urgency to accelerating the energy transition towards clean and sustainable economic growth, particularly for industries and nations worldwide. Conversely, the unforeseen impact due to unexpected events, such as pandemics or natural catastrophes, may adversely affect the network equipment, such as substations, distributions, transformers and protection equipment, because of the limitation in anticipating future events and promptly responding to abnormal occurrences.

The shift towards low carbon and zero emissions technology signifies a trajectory that will revolutionise the worldwide energy sector from being primarily dependent on fossil fuels. Transition to renewables in the energy sector needs immediate global effort, and although the global energy transition is now just beginning, further action is necessary to cut carbon emissions and ameliorate the consequences of climate change. Renewable energy and energy efficiency initiatives could reduce 90% of the necessary carbon emissions, and this might be accomplished by using Smart Grid, a smarter electricity technology.

Over the years, Malaysia has developed and implemented substantial energy policies and regulations to re-shape its energy landscape to be a more resource-efficient economy that protects its irreplaceable environment. The Twelfth Malaysia Plan (2021-2025) articulates Malaysia's unwavering aspiration to become a carbon-neutral nation by 2050. This bold commitment signifies a concerted effort by the government to define its strategy for the energy sector to drive the country to embrace the energy transition megatrend and reap its future rewards.

NATIONAL POLICIES RELATED TO SMART GRID

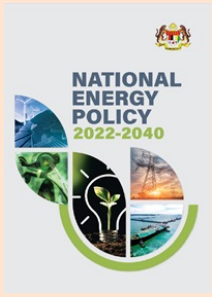
The establishment of the national strategic and policy document has been developed both explicitly and implicitly, to incorporate the implementation of smart grids in various phases. This involves the shift from managing energy efficiency to facilitating a transition towards green energy at all implementation levels, towards net-zero emissions, improved well-being, and enhanced competitiveness.



National Energy Transition Roadmap (NETR)

NETR is a national effort encompassing the national energy mix, GHG emission reduction, and energy transition initiatives towards net-zero emissions by 2050. This commitment contributing 0.8% to global GHG and 32% reduction in GHG emissions for the energy sector compared to the 2019 baseline, reaching 4.3 MtCO2eq emissions per capita.

The government is conscious of the necessity to shore up the national power grid to accommodate higher RE integration by introducing smart grid attributes and enabling third-party access to the grid. This plan committed under Renewable Energy – 'Develop plan for accelerated investments of transmission and distribution' which categorised as commercially feasible or market-driven returns.



National Energy Policy (DTN) 2022-2040

The DTN 2022-2040 serves as the primary policy reference for the energy sector. It has been formulated to empower Malaysia to progressively address challenges and reap the benefits of the energy transition.

Smart Grid initiative is enshrined in DTN's target for short-term action (2021-2025) which aim to optimise the mix of energy generation sources across the renewable energy value chain. This involves implementing both physical and regulatory enablers to accommodate advancements in the power system.

Malaysia Renewable Energy Roadmap (MyRER)

MyRER aligns with Malaysia's pledge to decrease GHG emissions as part of the Paris Agreement, spearheaded by the United Nations Framework Convention on Climate Change (UNFCCC), in response to the threats posed by climate change. Malaysia has set a target of achieving a 45% reduction in carbon intensity against GDP by 2030.

Two (2) initiatives distinctly prioritise raising public awareness and preparedness for future-proofing of the energy transition; 1) Leveraging the digitalisation of the power sector involves deploying distributed energy systems, advanced metering infrastructure, automated distribution, virtual energy trading and smart grids, and 2) Strengthening the grid through smart grid initiatives to enhance functionality, stability and flexibility of systems.

Green Technology Master Plan Malaysia (GTMPM) 2017-2030

The GTMPM inspired by the government's goal of 30% increase in energy efficiency (EE) by 2030. It focuses on the significant sector (EE) by introducing smart grid technology and communication strategy designed for its intended audience. The aim is to promote efficient use of electricity, increased share of RE mix in the future, and effective management of electricity supply and consumption.

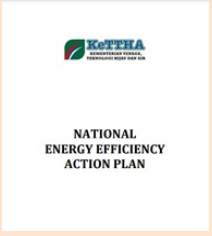
Also, the R&D&C (Research-Development-Commercialisation) initiatives on smart grids in Malaysia to fully realise the benefits of smart grid technology.

NATIONAL POLICIES RELATED TO SMART GRID

National Low Carbon Cities Masterplan (NLCCM)

Under Develop Sectoral Development Strategy on Low Carbon, provide guidance to be translated at the local development plan level and incorporated into any low-carbon city action plans to enhance implementation and effectiveness.

For energy sector, the integration of strategies involves the implementation of green technology and smart city application to optimise energy usage. This includes introducing the establishment of a smart grid system at city level to substantially diminishing energy consumption and greenhouse gas (GHG) emissions.



National Energy Efficiency Action Plan (NEEAP) 2015-2025

NEEAP strives to foster energy efficiency to guarantee the efficient utilisation of energy and reduce wastage and contribute to sustainable development and enhanced well-being and competitiveness.

This 10-years term, government is exploring the into smart grids implementation, smart meters usage and effective energy consumptions tariffs, advancement in transmission and distribution systems.

Malaysia Smart City Framework (MSCF) (2019-2025)

One of the key directives of the MSCF is to advocate for sustainable and intelligent environmental practices in the evolution of all smart cities. This emphasis has led to the formulation of three primary strategies concerning the implementation of smart grid systems:

This focus has formulated 3 main strategies related to smart grid system implementation;
a) Smart Environment - 1) To increase energy efficiency and promote renewable energy sources, 2) To strengthen the integrated and sustainable solid waste management, and
b) Smart Digital Infrastructure - To enhance internet speed and connectivity.

In view of these energy transition initiatives, support is needed to realise that a Smart Grid is required in the country. The realisation of a Smart Grid, can empower utilities to anticipate, act quickly and adapt to ever-changing conditions in the future.

A Smart Grid can be defined as "an electricity network that integrates electrical, information and communication technologies through digital and other advanced technologies to improve the efficiency and effectiveness of the generation, transmission and distribution, and usage of power."

Historically, Malaysia embarked on the Smart Grid initiatives in 2016. The chronological of the Smart Grid initiatives is as shown as the infographic below:

Over the past decades, electricity markets and technologies have experienced rapid growth and development, with an increasing focus on sustainability, affordability and security. While numerous smart grid technologies are currently available, their widespread deployment remains limited. Therefore, it is necessary to streamline existing policies and provide a comprehensive solution to address the key deployment challenges. Policies should also be crafted to capitalise on the factors that drive investments and foster the adoption of smart grid technologies.

Hence, it is essential to identify the key driving factors to ensure the Smart Grid implementation succeeds and benefits all stakeholders and consumers.

- Smart Grid drivers in Malaysia are benchmarked on international best practices and further deliberated and endorsed by key stakeholders: Efficient operation of the national electric grid.
- Greater deployment of clean energy.
- Improved quality, reliability, continuity, safety, and sustainability.
- Increase market participation.
- Increased customer involvement in system management.
- Increased energy efficiency.
- Integration of Distributed Energy Resources.
- IOT-based platform.
- Security of supply-operational improvement.
- Wide-Area Measurement System Platform.

These formulations of Smart Grid drivers can be emulated in Melaka. The State has made significant strides in transforming itself into a smart, green, clean and liveable urban area. The state of Melaka started the path towards a sustainable future over two decades ago. Several efforts, including government-led policies, programmes and projects, have been formalised to serve as a strong foundation for accelerating sustainable development in Melaka.

MELAKA SUSTAINABILITY PATHWAY

Melaka Green Technology City State Blueprint 2011 – 2022

To formalise a vision to transform Melaka into a Green City State by 2020

2011

Melaka Green Technology Corporation

To oversee efforts in achieving the vision and adopt the United Nations Urban Environmental Accords ratings method to assess green city performance

2013

Melaka Green City Action Plan

To guide Melaka to become a Green Technology City by 2020

2014

The Smart Melaka Blueprint 2035 (SMB2035)

Serves as a strategic roadmap devised by Melaka State to navigate the city's digital transformation while preserving its rich cultural heritage.

2022

Pelan Strategik Melakaku Maju Jaya 2035 (PSMJ2035)

A reference document with a comprehensive and holistic development roadmap for the state until 2035.

2021

A POLICY PERSPECTIVE ON SMART GRID

These Melaka's strategic documents are designed to be more inclusive and targeted, aligning with current needs by engaging all community groups. It acknowledges the preparedness of the state of Melaka to meet the needs of its people, tourists, and investors, promoting increased competitiveness in tandem with the pace of current digitalisation and technology. The overarching objective is to ensure the sustainability of world heritage, preserve the environment, and enhance the overall well-being of the people.

Pelan Strategik Melakaku Maju Jaya 2035 (PSMJ 2035)

PSMJ 2035 is a dynamic reference document embodies the aspirations of the Melaka State Government, reflecting its commitment to the economic development, competitiveness, and investment for its people. Positioned as a key initiative under the Melaka State Digital Council, Digital Melaka focuses on expanding smart initiatives and fostering data empowerment through the development of pilot projects, particularly in Smart Grid development.

This project entails the comprehensive implementation of the Smart Meter within the building management system, solar farm, and electricity grid. Continuous monitoring and evaluation of this initiative are conducted to ensure the well-being of both the people and the state.

GEF6 Sustainable Cities Integrated Approach Pilot Programme

The implementation of Sustainable Cities Programme in Melaka, funded by Global Environmental Facilities (GEF)

Sustainable Development Goals (SDG)

Adoption of the UN Sustainable Development Goals (SDGs) to achieve the 2030 Agenda

2015

GEF6 Smart Grid Demonstration Project

Development of Smart Grid by integrating low carbon and zero energy technologies.

2020

Resilient Melaka 2035

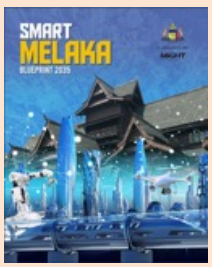
Highlighting complementary actions to enhance the City's resilience against climate change.

2019

Melaka State Structure Plan (2016-2035)

To promote economic growth and manage traffic improvement, physical living environment and connectivity in the Melaka State

2017



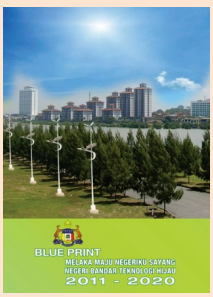
Smart Melaka Blueprint (SMB 2035)

The SMB 2035 signifies a pivotal step within Flagship 7 (PSMJ 2035), establishing Melaka as a pioneer in the digital economy and a trailblazer for digital states in Malaysia. The execution of this smart grid project sets a benchmark, fostering a low-carbon society through decarbonisation programs at all levels of development.

This initiative also emphasises optimal resource utilisation and the promotion of sustainable, clean energy. The tangible outcomes include a notable increase in the number of government buildings equipped with solar roofs and a significant enhancement in renewable energy generation capacity.

Green City Action Plan (GCAP)

GCAP aims to guide Melaka to become a Green Technology City by 2020. This action plan reflects Melaka's long-term commitment to pursue low carbon growth, improve environmental quality and strengthen economic competitiveness.



Green Technology City State Blueprint (GTCSB) 2011-2020

GTCSB 2011-2020 aims to guide Melaka towards a cleaner, sustainable, and developed 'City-State' in promoting the use of alternate energy sources, environment-friendly public transport, promote low environmental impact development, better efficiency of resource utilisation, and the implementation of environment-friendly policies.

Technically, by implementing a Smart Grid technology, the electric system can operate at higher reliability by reducing interruptions, power quality disturbances, and the probability of widespread emergencies and blackouts. The efficiency of power generation, distribution and consumption can be improved with AMI, enabling consumers to actively manage their daily electricity demand. In terms of security, this technology can potentially mitigate the impact of manmade attacks and natural disasters. Besides, the full value of renewable sources can be entirely harvested efficiently. Despite numerous benefits, various obstacles hinder Smart Grid development. The underlined key issues and challenges have been identified in Melaka and segmented as follows:

GOVERNMENT
- Redundant policy executions and project implementations.
- Inadequacy of monitoring body to streamline processes.
- Limited integrated data sharing and open data platform.
- Insufficient integrated data sharing among different agencies limits their efficiency in understanding city dynamics and addressing root causes of specific issues.

ECONOMY
- Few economic competitiveness and investment opportunities.
- Inadequate talented workers with digital competency.
- Need coordination in tourism development planning.

DIGITAL INFRASTRUCTURE
- Limited connectivity and coverage for high-speed internet.
- Need improvement in cyber threat protection mechanism.
- Limited technical expertise in IT.

MOBILITY
- Need a comprehensive transportation system.
- Inadequate preventive maintenance of infrastructure.
- High carbon emission from traffic congestion.

COMMUNITY
- Shortage of facilities and services for marginalised groups.
- Limited programme and platform on life-long learning.
- Lower average of technology literacy among the community.

LIVING
- Limited access to quality services (health, education and lifestyle), especially in remote areas.
- Inadequate security surveillance for safety monitoring.

ENVIRONMENT
- Inadequate mechanism for resource protection and mitigation of environmental issues.
- Insufficient programmes to achieve carbon reduction targets.

In a nutshell, Melaka has paved the way for the building of a more connected and comfortable urban environment, drawn from much-improved climate plans. Echoing the national commitment to a 45% reduction of Greenhouse Gas (GHG) intensity based on 2030 Gross Domestic Product (GDP), Melaka has achieved a remarkable feat. This attainment is also part of the State's aspiration to achieve carbon neutrality by 2050 to stimulate economic growth, encourage investment, upgrade infrastructure and develop human capital.

Ultimately, it is crucial for the Melaka State Government to prioritise investments in Smart Grid technology to address the upcoming challenges of urbanisation and transform Melaka into a dynamic, interconnected environment that operates at optimum efficiency. Effective inter-agency coordination in open data and data sharing, formulation of new policy and regulation, strong enforcement of existing policies, empowerment and capacity building for future skills and local talents, transparent and efficient administrative system, as well as strategic investments through partnerships, must be integrated and well-coordinated.

The Melaka State Government has crafted a range of initiatives and strategies to identify new opportunities for climate change adaptation and incorporate disaster risk management into the city's development.

Subsequently, the implementation of the Smart Grid in Melaka is currently underway under the GEF6 Smart Grid Demonstration Project. Melaka was selected as the strategic implementation site because it was the first state to deploy Smart Meters in residential areas. This key factor aligns with the Smart Grid's essential prerequisites for fostering a two-way communication system between energy providers and consumers, ultimately enhancing energy efficiency practices within the local population.

At Ever Delicious Food Industry Sdn Bhd, we formulated and manufactured 45 varieties of high-quality biscuits and export our product mainly to Japan, Indonesia, and Hong Kong. Our team constantly undertake product research and development to innovate new and exciting products by studying market demands and preferences. Not only that, we do factor-in variety of sustainability aspect to strive for long term business growth. For instance, to minimize water usage, we have installed rainwater harvesting tank with capacity of 13,640L for cleaning purposes. We practice recycling for packaging materials such as plastic bag, sack, and carton, we encourage healthy food intake every Monday to all staff and promote paperless practice to take steps towards a greener future which able to streamline the operations, increase efficiency and productivity.

Besides, within our facility, we have installed 180.2 KWp FIT Solar PV Rooftop, 5000L Solar Thermal which 1000L was installed through GEF6 Smart Grid Demonstration Project fund. All these technologies are integrated into one-platform known as the Smart Grid Dashboard. I believe that the Smart Grid technology has empower us, as a part of the food industry to effectively monitor, track and manage energy consumption in our business facility and offer us valuable awareness of energy usage. Most importantly, we manage to monitor and trace our premises' energy consumption patterns and generation in real-time. Moreover, with the data analytics and visualisation features, we managed to reduce our daily energy consumptions and contribute to bigger commitments in reducing Greenhouse Gas (GHG) emissions

"Sustainability can't happen without technology enablement and, therefore, this initiatives, awareness, and green practices at my facility might support the nation's aspiration to combat environmental challenges."

Mdm. Yo Bee Kiow,
Founder & Managing Director,
Ever Delicious Food Industries

Conclusion

In conclusion, the on-ground Smart Grid development has effectively incorporated various sustainable energy sources and technologies. To date, this project has successfully integrated four (4) large-scale solar farms, sixty thousand two hundred and sixty-one (60,261) smart meters, ninety-eight (98) commercial buildings, five (5) Electric Vehicle charging stations, one (1) 1000L solar thermal system, one (1) integration of 4000L solar thermal system, one (1) 30kW rooftop solar PV, and one (1) 100kW rooftop solar PV. As a result, the project has surpassed its initial target of reducing 11,000 tCO^2eq carbon emissions and successfully reduced approximately 19,000 tCO^2eq. This reduction is equivalent to the environmental benefit of planting around 287,000 trees over a 10-year period, and it would not have been achieved without the collaborative spirit of all stakeholders, particularly those from Melaka.

Overall, implementing a Smart Grid is crucial in accelerating the transition to a net-zero carbon emissions future. Achieving net-zero carbon emission requires integrating renewable energy sources, enabling demand response, enhancing grid monitoring, integrating battery energy storage and electric vehicles, supporting microgrids, implementing advanced metering infrastructure, and ensuring robust cybersecurity measures. The Smart Grid optimises energy consumption, reduces GHG emissions and enhances the overall resilience and sustainability of electricity grids, contributing significantly to achieving net-zero carbon emissions.

As a recommendation, it is vital to replicate and scale-up the on-ground Smart Grid Demonstration Project to catalyse energy transition and align with Sustainable Development Goal 7 (SDG7) calls, mainly aiming for "affordable, reliable, sustainable and modern energy for all" by 2030. Besides, the Smart Grid technology implementation will be streamlined with Malaysia's commitment on the 27th meeting of the Conference of the Parties (COP27) to increase the RE capacity mix in its' electricity supply from the current 23% to 31% in 2025, as stated in Malaysia Energy Roadmap (MyRER), and at 28th meeting of the Conference of the Parties (COP28), Malaysia aims to prioritise on energy transition and the reduction of GHG emissions.

United Nation's Sustainable Development Goal 7 (SDG7)

SKILLS FOR PROSPERITY PROGRAMME IN MALAYSIA CLOSING SEMINAR: ENHANCING EQUITY, QUALITY AND RELEVANCE OF MALAYSIA'S TVET SYSTEM

Intercontinental Hotel, Kuala Lumpur — **29 September 2023**

On 29th September 2023, Mr. Azmil Mohd Amin, representing MIGHT, had the opportunity to share insights on the 'Future of Work, Workplace, and Workforce' in conjunction with the Skills for Prosperity Programme in Malaysia Closing Seminar: Enhancing Equity, Quality and Relevance of Malaysia's TVET System. The event was jointly organised by ILO Malaysia and the British High Commission, Kuala Lumpur. In his session, he emphasised the importance of the workforce of the future being adaptable, with individuals capable of recreating themselves and their capabilities. Additionally, he highlighted the pivotal role of stakeholders, noting that policymakers and implementors should focus on the 3Cs – engaging in constructive conversation, fostering collaboration and prioritising co-creation.

SCENARIO PLANNING BRIEFING – MINISTRY OF AGRICULTURE AND COMMODITIES

Ministry of Agriculture and Commodities — **31 October 2023**

On June 10th, MIGHT's participation in the Technology Management and Innovation for Defence & Security (TMIDS) event for the MSc International Technology Management for Defence & Security (MITMDS) programme for the 2023/2024 academic year, was proudly represented by Mr. Rushdi Abdul Rahim.

The 6-day event was hosted by the NDUM Institute of Executive Education (NIEEd) at Universiti Pertahanan Nasional Malaysia (UPNM) in partnership with Warwick University.

SCENARIO PLANNING WORKSHOP SERIES

Ministry of Health Malaysia, Petronas — **28-29 November 2023, 7-8 December 2023**

MIGHT has been at the forefront of fostering foresight and innovation through a series of engaging scenario planning workshops providing participants with hands-on experience in anticipating and preparing for the future. These workshops have empowered attendees to explore and navigate the complexities of strategic foresight, emphasising the development of actionable strategies in the face of uncertainty. MIGHT's dedication to nurturing a culture of foresight and innovation shines through in this ongoing series, where participants from various sectors gain valuable insights and tools to shape more resilient and forward-thinking futures.

DEVELOPMENT OF A FORESIGHT REPORT ON CLIMATE AND DEMOGRAPHIC TRANSITION IN MALAYSIA AND GOVERNANCE IMPLICATIONS

Focus Group Discussion :
Central @ MIGHT Partnership Hub
Regional workshop: **22 November 2023**
Central @ MIGHT Partnership Hub **12 December 2023**

MIGHT and UNDP have joined forces to launch a project titled "Development of a Foresight Report on Climate and Demographic Transition in Malaysia and Governance Implications." The project focuses on megatrends and drivers related to climate transition and demographic transition, specifically addressing economic structures, the labor market, and the well-being of the elderly and their families in Malaysia. To conduct this study, the myForesight® and UNDP teams have organised several workshops and stakeholder engagements across regions in Malaysia.

FOSTERING PARTNERSHIP BETWEEN MIGHT AND QATAR RESEARCH, DEVELOPMENT AND INNOVATION (QRDI) COUNCIL

QRDI, Qatar **13 December 2023**

On 11 December, MIGHT and Qatar Research, Development and Innovation (QRDI) Council forged a strategic partnership to advance science, technology and innovation. This collaboration aims to strengthen and promote the exchange of ideas, information, skills and expertise, as well as support cooperative activities in various fields of Science, Technology and Innovation. The partnership will facilitate knowledge-sharing sessions on foresight and future studies for policy, cross-promotion of innovation opportunities, and joint meetings, conferences and workshops.

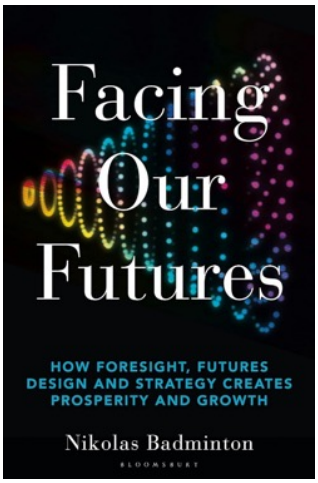
UNIVERSITY OF MALAYA'S CENTRE FOR LEADERSHIP AND PROFESSIONAL DEVELOPMENT (UM LEAD) PPYL PROGRAMME VISIT

MIGHT Partnership Hub, Cyberjaya **19 December 2023**

MIGHT welcomes the University of Malaya's Centre for Leadership and Professional Development (UM LEAD) PPYL Programme. The visit brings together 13 undergraduate students from the University of Sharjah, U.A.E., along with their supervisors.

Today's visit centers around the theme 'Foresighting: Navigating an Unpredictable Future.' MIGHT showcases Malaysia's success in fostering collaboration between the public and private sectors, ultimately paving the way for the development of emerging industries. This interactive session aims to provide students with insights into Malaysia's experience using MIGHT's approaches and tools for navigating uncertainties.

The students also received an overview of MIGHT's operation via representatives from various divisions. The visit also includes visits to Wasavé's Coldgrow & Smart Farming Facility and the Green Data Centre, showcasing MIGHT's dedication to sustainability and innovation and highlighting MIGHT's goal of achieving Net Zero Carbon Emission by 2050..



Facing Our Futures: How foresight, futures design and strategy creates prosperity and growth

Author : Nikolas Badminton
ISBN-10: 1399400231
ISBN-13: 978-1399400237
Publisher : Bloomsbury Business (February 14, 2023)

An intriguing exploration of how professionals and businesses can enhance their ability to anticipate and strategise for an uncertain future.

Businesses, organisations and society often face unforeseeable events that can profoundly affect their success and viability. While it is impossible to predict these specific events, business leaders and executive teams can proactively adapt by fostering innovation, strategic planning and a flexible mindset. By reimagining organisational structures and practices, they can minimise or even leverage the impacts of such events. In "Facing Our Futures," Nikolas Badminton leverages his extensive experience as a consultant and futurist to equip readers with the mindset and skills necessary to prepare themselves, their teams and their organisations for the challenges of tomorrow. CEOs, executive teams, government officials and policymakers must broaden their perspective and deepen their understanding of how their industries, societies or communities are evolving. Armed with this foresight, they can then develop robust strategies that are both resilient and adaptable.

"Facing Our Futures" serves as a guide to the importance of envisioning worst-case scenarios and the potential benefits of doing so. It also introduces a practical strategic planning and foresight methodology – the Positive Dystopia Canvas (PDC) – that empowers leaders to inspire their teams to create compelling visions of the future, informing present-day planning efforts.

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Leader in Halal Pharmaceuticals

Duopharma Biotech Group ("Duopharma Biotech") began with the establishment of Duopharma (M) Sendirian Berhad in 1978. Duopharma Biotech was incorporated in 2000 and is today one of Malaysia's leading pharmaceutical companies listed on the Main Market of Bursa Malaysia Berhad.

Duopharma Biotech has core competencies in the pharmaceutical industry inclusive of Manufacturing, Research & Development and Commercialisation & Marketing of over 300 generic drugs such as Crystorvas, Prelica and Omesec as well as Consumer Healthcare ("CHC") products including CHAMPS®, FLAVETTS®, PROVITON® and Uphamol, wich are well-recognised and accepted by consumers in Malaysia, regionally and globally. The Company has also diversified into the biosimilars space with technology and commercialisation collaborations with credible and strong international partners. ERYSAA®, Basalog One®, and Zuhera are a few commercialised biosimilar brands.

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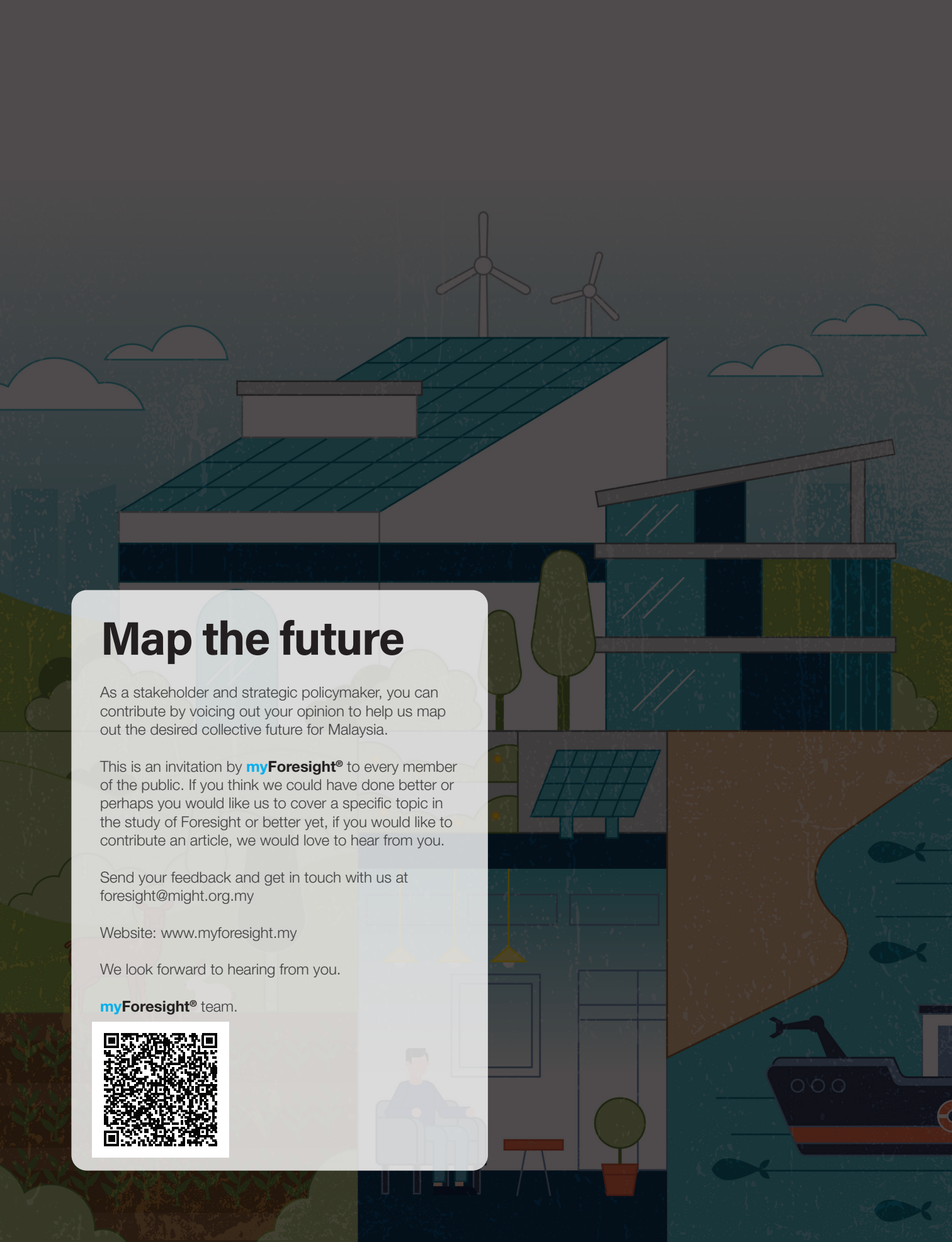

Map the future

As a stakeholder and strategic policymaker, you can contribute by voicing out your opinion to help us map out the desired collective future for Malaysia.

This is an invitation by **myForesight®** to every member of the public. If you think we could have done better or perhaps you would like us to cover a specific topic in the study of Foresight or better yet, if you would like to contribute an article, we would love to hear from you.

Send your feedback and get in touch with us at foresight@might.org.my

Website: www.myforesight.my

We look forward to hearing from you.

myForesight® team.