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Solar power as a renewable source of energy in Malaysia. **p15**



Need for clear government policy

Industry players come out with policy recommendations on climate action for government to consider. **p12-13**



MONTHS OF SEPTEMBER-OCTOBER 2021



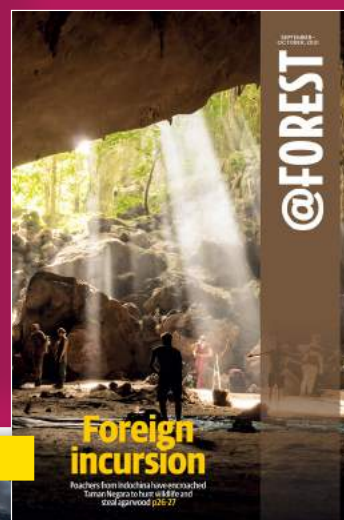
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@green



A greener Pharma sector

Leonard Ariff Abdul Shatar, the Group Managing Director of Duopharma Biotech Bhd, believes there is growing demand for environment-friendly drugs as per capita consumption of pharmaceuticals is increasing globally. **p06-08**





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@green Says...

Medicines for the environment

GETTING access to affordable quality healthcare is one of the privileges that people should not take for granted. This access enables them to get treated whenever they are sick. And most of the time, after the treatment, these people will be given medicines to boost their immune systems.

However, how do these prescribed medicines and other pharmaceutical products for humans boost the environment's immune system? Is there a medicine to treat and cure the environment?

Whilst pharmaceutical players may be striving to improve the quality of their pharmaceutical products, they should also be game-changers and provide quality medicines to better the environment.

The latest Intergovernmental Panel on Climate Change (IPCC) report shows that the world will probably reach or exceed 1.5 degrees Celsius of

warming within the next two decades. There is no better time than now for these players to embrace sustainability.

The growing demand for medicines due to the pandemic, coupled with the need to address climate change, will keep pharmaceutical manufacturers on their toes. However, no effort goes in vain. Addressing these climate issues and adopting sustainable practices as quickly as possible will benefit the pharmaceutical players in the long run.

With more and more people becoming more aware of the climate crisis, there's a high possibility that green pharmaceuticals will be in high demand. Therefore, in providing quality, effective medicines to the people, pharmaceutical manufacturers can also be the leading examples in taking care of the environment. It will be ironic to have healthy people live in a sick environment.



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Redefining sustainability

IGEM 2021 targets RM5 billion in business leads to boost Green economy



THE 12TH International GreenTech & Eco Products Exhibition & Conference Malaysia (IGEM 2021) was officiated virtually on July 22, 2021, by then Malaysian Prime Minister Tan Sri Muhyiddin Yassin.

Southeast Asia's largest trade event for green technologies and eco-solutions announced a target of RM5 billion in business leads to spur the green economy, which is the engine for growth as the world prepares to build back.

Organised by the Ministry of Environment and Water (KASA) and co-organised by the Malaysian Green Technology and Climate Change Centre (MGTC), IGEM 2021 goes virtual for the second consecutive year on www.virtual.igem.my with "Redefining Sustainability" theme.

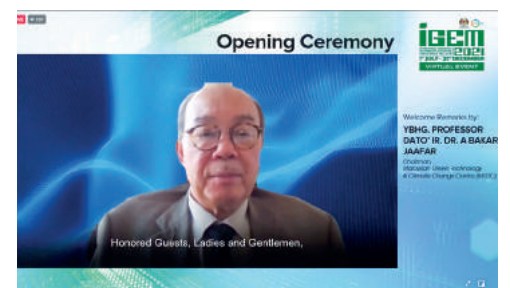
It is the 12th straight edition of the event. It expects 300 exhibitor booths from 50 countries and 30,000 registered visitors over the six-month duration.

In his virtual keynote address, Muhyiddin believed the unprecedented and rapid changes due to the pandemic had forced continuous realignment to the sustainability aspect of one's life.

He said: "As we wade through the pandemic, I would like to re-emphasise that we should not lose sight of the challenges that climate change poses. Climate change shows signs that could have a long-lasting impact and threats on social well-being, economic development and global health."

"Redefining Sustainability" has been picked as the theme for IGEM 2021, where the focus is on climate change and green technology amid addressing the impacts of Covid-19 pandemic.

"We need to find ways collectively to pursue economic and social well-being in an environmental-friendly manner. I believe IGEM fits such purpose as an important catalyst to chart our way forward."



essential role and deliver on KASA's mandate of leading Malaysia's sustainable environmental and water conservation efforts with all sessions and activities planned in the coming months.

He said IGEM would continue to inspire impactful climate action not only in Malaysia but internationally.

More exhibitors expected to join

In the upcoming weeks, IGEM 2021 will be organising several important events, including the launch of Green Pages Malaysia 6th Edition: Green Products, Green Technology by the Malaysia Green Building Council (malaysiaGBC), as well as a Roundtable on Advancing Malaysia's Green and Circular Economy by Capital Markets Malaysia (CM2).

In his welcome remarks, MGTC Chairman Professor Dato' Ir Dr A Bakar Jaafar said: "We at MGTC remain committed to playing an essential role in supporting and driving the nation's green agenda."

"We unveiled our new corporate logo today. We reaffirm our mandate to mainstream green technology, economy and low carbon development through green product and service expansion programmes. We also adopt green lifestyles through publicity and awareness programmes."

To date, IGEM 2021 featured close to 100 booths on its website, with more exhibitors expected to join in the coming months.

Some participating exhibitors include international companies from the High Commission of Canada and the Wallonia Foreign Trade and Investment Agency (AWEX) from Belgium and local companies such as Solarvest Holdings Bhd., SIRIM Berhad, CIMB Group, 3E Works Sdn Bhd, Nextgreen Global Berhad and i2energy Sdn. Bhd. – @green

With a specific thematic monthly approach encompassing various areas within the sustainability sector such as Green Technology, Water, Climate Change & Environment, Sustainability, Green Financing and Energy & E-Mobility, IGEM 2021 will be hosting more than 100 conference sessions, webinars, and pocket talks, in addition to launches and signing of Memorandum of Understandings (MoUs).

Virtual business matching sessions

IGEM's long-standing strategic partner, the Malaysian Investment Development Authority (MIDA) and business matching partner, the Malaysia External Trade Development Corporation (MATRADE), will also organise virtual business matching sessions between leading and emerging organisations on the IGEM website.

Dato' Sri Tuan Ibrahim Tuan Man, Minister of Environment and Water, said: "The extended duration of six months gives IGEM's exhibitors, conferences and business matching partners greater opportunities to further cultivate a greener post-pandemic economy by eliciting the participation of a wider spectrum of industry leaders, green entrepreneurs, and delegates".

He believed IGEM would play an influ-

jung Karang and Hospital Yan, emerged winners for the Energy Management for Building and Industry in the small and medium buildings category.

Universiti Teknikal Malaysia Melaka took home the first prize for the large buildings category. Malaysia also won the Off-Grid Thermal category with the participation from Ramatex Textiles Industrial Sdn Bhd.

The country also topped the Biofuel category with the Integrated Palm Waste Management Facility by Reviva Sdn. Bhd.

A total of 17 Malaysian winners were among the winners and placed.

The Awards is expected to be the instrument to promote clean coal technology (CCT), energy efficiency, and renewable energy development. – @green



Four Malaysian winners

ASEAN Energy Awards (AEA) is the highest reward and recognition for the participation and contribution of the Southeast Asian private and public companies in clean energy development.

Malaysian companies and individuals were among the winners for AEA 2021, which was hosted by Brunei virtually.

Two Malaysian hospitals, Hospital Tan-

Water security is national security

Engagement and partnership are the way forward for sustainable water management

BY FATIHAH MANAF

B EING seen as an unlimited resource, access to clean water is often taken for granted by many people. While the earth may not run out of water, it is hard to guarantee that future generations will have sufficient potable water access.

Global Environment Centre (GEC), during the International Greentech & Eco Products Exhibition & Conference Malaysia (IGEM) 2021, held a virtual discussion titled 'Water resources management: Redefining sustainability', which sought to enhance Malaysians' understanding of local water resources and sustainable water management practices.

"We hope it sheds light on how businesses can integrate sustainable water management within their operations while engaging meaningfully to fulfil their social and environmental obligations," said Faizal Parish, GEC Director and the moderator of the session.

The discussion featured Dr Kalithasan Kailasam (Manager of GEC's River Care Programme), Dato' Ir. Nor Hisham Mohd Ghazali (Director-General of the Department of Irrigation and Drainage Malaysia) and Renuka Indarajah (Trustee Member of SPARK Foundation and Corporate Affairs & Legal Director of Heineken Malaysia Berhad).

A new perspective of water

Kalithasan highlighted that water problems were usually caused by economic activities, climate change, population, competition & conflicts, water use and pollution. He said in 11 years, people might not have clean water due to these activities.

He then talked about Integrated Water Resources Management (IWRM), a process that promotes the coordinated development and management of water, land and related resources.

IWRM is done to maximise economic and social welfare equitably without compromising the sustainability of vital ecosystems. It requires a cross-sectoral, multi-level approach within each river basin.

Kalithasan believed Malaysians needed to see water from a new perspective.

"First, water is infinite, but potable water is not. Second, when we're talking about water, we're talking about Gross Domestic Product (GDP) because water also contributes significantly to the country's GDP.

"Third, water is a social commodity. Then, water is fundamental for all 17 Sustainable Development Goals (SDGs), and we're also talking about Malaysia's obligation to global (sustainability) reporting.

"The most important thing is we need to treat water as a national security."

He then shared about the National Agenda on Water Sector Transformation 2040 (WST 2040), which aimed to transform the national water sector from one that empowered the economy to one that was dynamic and able to contribute

significantly to the country's GDP.

The plan would directly enhance the employment opportunities in the water sector and forge the nation's science, technology, and innovation development.

The programme manager then acknowledged the efforts done by stakeholders but emphasised the need for a more coordinated work in sustainable water management.

Addressing Malaysia's water challenges through IRBM

Nor Hisham explained water security was an acceptable quantity and quality of water that can sustain society's livelihoods, well-being and socio-economic development.

"In water security, we are trying to ensure that we are protected from water-borne pollution and water-related disasters, ensuring that the ecosystems are preserved or conserved, and lead us to a peaceful society and a better living environment"

He then emphasised that a sustainable water resources management strategy is vital to minimise potential conflicts in economic development, social well-being, and ecosystems conservation.

Speaking on the interconnectivity of water resources, economy and people, Nor Hisham said the demand and importance of these three elements must be balanced in the water management strategy.

"Despite the rainfall that we get, we still need to be careful in managing water resources to meet future water challenges," said Nor Hisham, further adding that Malaysia as a developing nation is facing numerous issues and challenges to build a water-secure country.

The director-general then laid out some of Malaysia's water challenges, which are:

- Poor enforcement in handling pollution.
- Weak and non-uniform State Laws.
- Non-integrated management and planning.
- Water is not the top priority in development.
- Inadequate knowledge and skills in water management.
- Absence of water policy commitments by agencies and local government.

He said these challenges must be addressed with proper water management tools.

He then shared one of the solutions for the water management issue, the Integrated River Basin Management (IRBM). According to Nor Hisham, IRBM involved many components such as planning, financing, institution, legislation, enforcement, preventive, curative, and awareness.

"IRBM lays the foundation for connectivity between resources, economy and people. IRBM must be owned by all. Everyone has a role to play in it, be it a private or public entity."

Sustainable water use from a corporate's perspective

Renuka then shared Heineken's experience in its sustainable water management journey. She revealed that the company is moving towards healthy watersheds globally by setting four targets.

These targets include fully balance



Faizal Parish

water used of Heineken's products in water-stressed areas by 2030, maximise, reuse and recycle in water-stressed areas by 2030, treat 100 per cent of wastewater of all breweries by 2023 and reducing average water intake to 2.6 hl/hl in water-stressed regions and 2.9 hl/hl worldwide by 2030.

"I'm pleased to share with you that Heineken Malaysia Berhad has already achieved two out of these four global targets well ahead of time," said Renuka.

She shared Heineken's water strategy called 'Every Drop', which includes water stewardship, water circularity and water efficiency.

"These three principles combined in this pyramid to ensure that we move towards a healthy watershed. Water efficiency is all about minimising the water used in our production. Water circularity is about maximising, reusing and recycling of treated water and water stewardship to balance the water use in our products fully."

One of Heineken's critical initiatives regarding water efficiency is reusing treated wastewater for non-potable use. As for water circularity, the organisation's wastewater is treated beyond the standards of the Department of Environment.

"We aim to maximise water circularity through recovery, reuse and recycling."

She then explained that water stewardship is the water use that considered social, environmental and economic benefits. It was achieved through a stakeholder-inclusive process that involves site and catchment-based actions.

Renuka emphasised that the success factors for the organisation were the awareness creation effort which changed the mindset of people, the empowered local communities who took charge of their water source and Heineken's collaborations with multiple stakeholders.

"Water is a finite resource. There are water shortages felt across the globe and every one of us, corporates in Malaysia, needs to take care of our watersheds.

"There's much work to be done to preserve our watersheds, to ensure the long-term supply of water to our industries, to minimise destruction in supply and to ensure continued smooth operations of all our businesses." – @green



Dato' Ir. Nor Hisham Mohd Ghazali



Renuka Indarajah



Dr Kalithasan Kailasam



Protecting people and the environment

Duopharma Biotech aims to lead Malaysia's green pharmaceutical initiative

BY FATIHAH MANAF

THE Covid-19 pandemic has kept the pharmaceutical industry as busy as a bee. However, the rising concern on climate change has made it clear that no sector is too busy to become green and sustainable.

The climate issue has led consumers and investors to become more aware of the importance of sustainability. It then urges stakeholders of all sectors to take necessary sustainable measures in their organisations.

Being a giant pharmaceutical manufacturer in the country, Duopharma Biotech Berhad showed no exception as it expressed its determination to champion sustainability.

"Sustainability is something that Duopharma has pushed for quite a long time now," said Leonard Ariff Abdul Shatar, the Group Managing Director of Duopharma Biotech Bhd, adding the initiative at the company started 30 years ago by ensuring that it provided a safe workplace for employees.

"It then evolved into looking at how we fit as a member of the community and the contribution made towards it. It was before the UN Global Compact etc., and before it was fashionable. So, in a way, Duopharma had a headstart to a certain degree because

of our historical background."

Duopharma Biotech's commitment to sustainability has been acknowledged by many. As a result of its resilience in the area, the company has been included in the FTSE4Good Bursa Malaysia Index since June 2020 and awarded the Prime Minister's Hibiscus Award for Notable Achievement in its environmental performance.

"Our ESG rating has improved from 2.9 in 2020 to 3.2 in 2021," added Leonard Ariff.

In going green, Leonard revealed Duopharma Biotech never compromised its priority in providing safe, quality healthcare. He mentioned the preference in providing such services was also part of Duopharma Biotech's commitment to sustainability.

"In Malaysia, we refer and adhere to the Current Good Manufacturing Practice (cGMP) and Good Distribution Practice (GDP) guidelines. These are advocated by the Pharmaceutical Inspection, Co-operation Scheme (PIC/S), International Council on Harmonisation (ICH) Guidelines for Pharmaceuticals, National Pharmaceutical Regulatory Agency (NPRA) GMP/GDP Guidelines and Eudralex to ensure the quality, safety and efficacy of our pharmaceuticals.

"We also actively seek cGMP certification by the relevant authorities in our international markets. Thus, we continu-



ously strive for ISO 9001 certifications, ISO 13485 certifications, GMP certifications from NPRA and ISO 17025 accreditation. The reason we maintain all these practices is because we want to provide the best quality products to our customers.”

In an interview with @green, Leonard Ariff talked about Duopharma Biotech’s sustainability practices, the misconception on sustainability, its continual improvement initiatives, green initiatives, energy, resources and waste management, and its inclusion in the FTSE4Good Bursa Malaysia Index.

Sustainability at Duopharma Biotech

According to Leonard, all sustainability initiatives at Duopharma Biotech are led by the Board of Directors, who are ultimately accountable for the company’s strategic direction.

“As far as sustainability is concerned, we’ve elevated it into the board level. So, there’s a committee at the board called the Risk Management and Sustainability Committee. Here, we have an element of top-down, and at the same time, we have a sustainability department within the organisation that reports to the chief manufacturing officer.

“This ensures our sustainability values are instilled in our business operations as our governance tone is directed from the top.

“We have also crafted a sustainability policy based on stakeholder engagements and advocate for our sustainability culture within our business operations. Moreover, we have integrated sustainability-related risks into our Enterprise Risk Management (ERM).”

He shared the company also conducted sustainability training for staff of various departments. The training, led by sustainability specialists, aimed to enhance staff’s awareness and knowledge on sustainability and apply it in their daily operations where applicable.

The misconception on sustainability

In pursuing the green pharmaceutical route, Leonard Ariff said: “We’ve been monitoring our energy usage and also water usage for several years. At the moment, we have specific targets in terms of intensity of use.

“The intensity of use means when you produce a litre of product, a certain amount of water is used. The higher the demand for the product, obviously, the more water you’re going to use.

“When we say intensity, it’s not the absolute amount of water we’re using. It’s more to do with the fact that for every bottle you produce, you don’t create additional wastage.”

He believed the intensity concept had

to be correctly understood by people who opted for sustainability. He highlighted that sustainability did not mean manufacturers would have to use less electricity but more optimally.

“If your sales for next year double your sales this year, then you want to make sure your electricity usage doesn’t exceed double the amount. The intensity should be the same. So, this concept is what many people are confused about when they talk about sustainability.

“It’s not about using less, but making sure what you use you’re using it optimally.”

Continual improvement initiatives by OE team

He highlighted the core business for Duopharma Biotech was manufacturing and supply chain. Therefore, he believed it was essential to drive optimal efficiency in all related processes to underline sustainability.

“Operational excellence is driven by continual improvement (CI) activities covering our entire supply chain, from our manufacturing plants to our warehouses and up to our customers’ premises. Our Operation Excellence (OE) team uses LEAN methodology to lead these CI initiatives under the sustainability department.

“Duopharma Biotech has committed to reducing our electricity consumption intensity by five per cent every year by implementing energy efficiency initiatives such as replacing old fluorescent tubes and metal halide high bay lights with similar versions using light-emitting diodes (LED).

“We even have various water recycling initiatives implemented to minimise water waste, such as rainwater harvesting.

“Lastly, in a bid to reduce plastic pollution, we embarked on a pilot project to switch from using non-biodegradable plastic to biodegradable plastic for storing materials to prevent contact and contamination.

“We even conduct recycling in our operations by applying the 3Rs (reduce, reuse, recycle) for non-scheduled wastes.”

Duopharma Biotech’s green initiatives

With regards to waste management, Leonard Ariff said Duopharma Biotech accepted goods returned by customers. These can’t be resold. They would be written off and disposed of in incinerators in a legal manner.

“As I mentioned previously, we have also embarked on a pilot project to switch from using non-biodegradable plastic in storing materials (to prevent contact and contamination) to using biodegradable plastic, in a bid to reduce plastic pollution.”



SBA 2020/2021

Duopharma and ArtMatrik declared winners

DUOPHARMA BIOTECH BHD and ArtMatrix Technology Sdn Bhd were selected overall winners in the SME and Large Enterprises categories.

Global Initiatives Communications Pte Ltd, a Singapore-based firm that employs sustainability and data science expertise to assist businesses in becoming more sustainable, organised the awards presentation.

The SBA, which began in 2012 and now spans five countries: Singapore, Malaysia, Indonesia, the Philippines, and Thailand, is the region’s foremost sustainable awards programme.

PriceWaterhouseCoopers (PwC), the knowledge partner in evaluating submissions, assisted in the assessment process, and the results were submitted to an independent National Advisory Panel (NAP) for each country.

PwC Malaysia, the World Business Council for Sustainable Development and BCSD Malaysia, the Malaysian Industry-Government Group for High Technology (MIGHT), Novafusion, Thought for Food, The Malaysian Reserve, and the Green Growth Asia Foundation supported the third edition of the awards in Malaysia.

The winners were picked based on their consistently good performance in 12 different areas.

On the other hand, Heineken (M) Bhd got a Highly Commended Award for the quality of its overall sustainability programmes. Heineken addressed water management, responsible consumption, and sustainable sourcing challenges with robust sustainability governance in place.

Their track record reflected modest gains over time and lofty long-term ambitions.

Shefali Chaddha, ED and COO of Global Initiatives, said that while a considerable number of SMEs applied for the prizes, only a tiny percentage of them successfully completed the process.

“This demonstrates that, while SMEs are engaged in improving their sustainability efforts, they still have a long way to go and want further help and encouragement.

“We discovered that huge organisations are at different phases of their sustainability journey. However, the victors of today are an example to others,” he stated in a statement.

The SBA procedure has been greatly improved this year. Each participant, for example, received an Individual Insights Report that provided a full overview of their sustainability readiness and compared it to global reporting standards.



We are involved in an early phase of a pilot project on Dual Condensing System for our air conditioning units. It is to improve energy efficiency and reduce CO2 at the same time."

He revealed the pilot project started in 2020 as part of their efforts to manage its plastic waste better.

"This initiative is undergoing constant evaluation regarding the efficiency of the project," he explained.

"Moreover, we have a three per cent annual reduction target for our scheduled waste intensity, which we achieved by efficiently using our materials to minimise waste. We also fully monitor the volume of non-scheduled waste produced and recycled at our sites.

"As one of the biggest pharmaceutical manufacturers in Malaysia, it is vital to ensure our products are available and accessible to patients. Thus, our products are distributed to more than 4,000 government healthcare facilities nationwide via the government-appointed logistics and distribution concession holder and delivered to more than 600 relevant purchasing points.

"As for the private sector, our sales team visits these customers and takes orders from them. In addition to in-person visits and engagement, our newly-formed telesales team communicates and keeps in touch with customers over the phone and online. These efforts contributed to our penetration rate of 85 per cent for the private sector?"

He highlighted the telesales initiative, which was initiated to reduce the company's mileages and carbon footprints, which was helpful during the movement control order (MCO).

Ensuring optimal use of energy and resources

"To ensure we use our energy optimally, we implemented several energy-saving initiatives. We switched to LEDs and solar panel-powered streetlighting at our manufacturing sites.

"We also upgraded and replaced inefficient machinery such as chillers and installed motion detectors to turn off lights," explained Leonard Ariff.

He said, in 2020, the company also installed an energy monitoring device (EMD) at its Bangi-based plant to monitor energy usage. He revealed in 2021, Duopharma Biotech planned to carry out energy and water audits at its manufacturing sites to develop effective carbon footprint strategies.

It included the implementation strategy for solar photovoltaic systems. He said these energy and water audits would be aligned with Sustainable Development Goals (SDGs).

"Furthermore, we are involved in an early phase of a pilot project on Dual Condensing System for our air conditioning units. It is to improve energy efficiency and reduce CO2 at the same time.

"The data from this pilot study will be used for the full implementation of this Dual Condensing System at our manufacturing sites in 2021.

"This is very much aligned with indicators for SDG 7, which is 'Affordable and Clean Energy'. Lastly, we recognise that we cannot take water for granted. Thus, various recycling initiatives are implemented to minimise water waste such as rainwater harvesting."

On the issue of waste management

Wastes from Duopharma Biotech's manufacturing activities are classified into scheduled and non-scheduled waste, whereby the recycling of non-scheduled waste such as paper, plastics and aluminium is promoted.

"Any non-scheduled waste that cannot be recycled will be disposed of in municipal landfills according to the Department of Environment (DOE) regulations. As for scheduled waste, we cannot recycle them as DOE regulations do not permit this. Thus, the scheduled wastes such as unused and expired products, lights and many more are either disposed of in landfills, recovered or incinerated.

"Our objective is to reduce all waste produced group-wide and to dispose of our scheduled waste responsibly, according to the relevant regulations and guidelines such as DOE regulations and requirements of the Environmental Quality (Industrial Effluent) Regulations 2009.

"Moreover, we have been encouraging recycling practices among our employees for several years, and there is a strong

culture of recycling within the group."

Since the waste is managed legally, Leonard Ariff argued that there's still room for improvement for the company's sustainability journey as the legal and permissible way does not guarantee that it is sustainable.

He said: "The issue for us is sustainable does not equate to being legal. Being legal doesn't mean that you're sustainable. So, that's where we have to improve our performance to make sure that we look at our carbon footprints in a way that is more sustainable, which may mean that it has to be higher than the legal requirements imposed on us."

Minimising wastage of medicines

To reduce the wastage of medicines in its production and vendors, he highlighted Duopharma Biotech's CI activities which cover its entire supply chain, from the manufacturing plants to warehouses and up to its customers' premises, used LEAN methodology.

"This is how we drive optimal efficiency in all related processes to minimise wastage of medicines," he added.

"Moreover, we ensure On Time in Full (OTIF) performance meets our 24-hour goal at least 85 per cent of the time. The target OTIF performance for our warehouses is even higher, at 97 per cent.

"It means our warehouses cannot be responsible for more than three per cent of delivery delays. It ensures our goods arrive to our customers on time to reduce rejection from customers, thus preventing our medicines from going to waste."

He said shared as part of Duopharma Biotech's quality assurance, the company would audit its vendors or suppliers under a vendor management programme to meet the GMP standards. Under its Purchasing Vendor Management System, the company would conduct a Vendor Performance Evaluation (VPE) yearly for open feedback.

"From this programme, we can help our vendors address any challenges they may face in terms of meeting Duopharma Biotech's expectations on timely supply, product quality and after-sales support.

"The evaluation also draws attention to underperforming vendors. They may be removed from our network if they are unable to rectify and improve in relevant metrics. This reduces wastage of medicines as they are made of high-quality materials that do not spoil easily."

– @green

Joining Bursa's FTSE4-Good Index

DUOPHARMA BIOTECH BERHAD had been producing its sustainability report for the last four to five years. Group Managing Director Leonard Ariff Abdul Shatar said the report outlined everything the company had been doing to track the safety of its workers, waste management, energy management, etc.

"There's a lot that we've done, but I suppose that's just us blowing our own horn.

"But in 2019, we were approached by Bursa Malaysia about the possibility of Duopharma Biotech being assessed for potential entrance into the FTSE4Good Index.

"This is Bursa Malaysia's initiative where you're assessed, hit a specific benchmark, and go into the FTSE4Good Index. This is because there is a lot of global funding that only invests ethically or sustainably.

"In other words, when they're looking for shares, they don't have to look through all the shares in the stock market and audit each one. So, Bursa Malaysia has created a sub-index, FTSE4Good, where all these companies have been assessed from an ESG perspective.

"So, last year Duopharma was for the first time included in the FTSE4Good Index," shared Leonard Ariff, adding the company's performance and scoring for the FTSE4Good assessment have improved in 2021."

He explained the FTSE4Good Index included environmental, social, and governance aspects, covering a broader sustainability segment. This assessment showed Duopharma Biotech's performance had improved in totality, and the company had remained on the FTSE4Good Index until now.

"Early this year, we brought in Lloyd's Register to audit the numbers we claimed in our sustainability report. The sustainability reports are voluntary, but we wanted to ensure that nobody could question the presented numbers.

"So, we brought in Lloyd's Register to do a third-party verification and also to evaluate where else we could improve. These are some of the activities that we've done to ensure that the numbers we're presenting are credible and the action plans we're doing are acceptable.

It's something that we'll continue doing in the future.

"For the second half of 2021, we try to establish our Greenhouse gas (GHG) baseline plus a plan for reduction of the greenhouse impact. By the first quarter of 2022, we want to be in a position to be able to publicly declare what our either nett-zero or carbon-neutral target will be by 2035 or 2040."

Moving forward, Leonard Ariff shared that the group strived to be a sustainability leader in the country among its peers. This objective was one of the reasons behind the company's continual improvement of its sustainability initiatives, especially in energy, water and waste management, as Duopharma Biotech is an energy and water-intensive company.

"Through our sustainability efforts, we also hope to maintain or improve our FTSE4Good Bursa Malaysia Index scoring. Moreover, we hope to be able to align all our sustainability initiatives with the SDGs and the UN's 10 principles, which will propel us to be a sustainability leader in the country," he said.



Ensuring quality pharmaceutical products

SIRIM's IBRC offers pharmaceutical companies a range of services



BY FATIHAH MANAF

WHILST embracing technology and upholding sustainability, pharmaceutical manufacturers still need to ensure their products are safe for consumers. The commitment to serve the people by providing quality and affordable healthcare would remain the top priority.

This is because ensuring healthy lives and promoting well-being at all ages is essential to sustainable development.

In doing so, these manufacturers might need external assistance like SIRIM to help them with the facilities, services and standard validation.

Dr Ahmad Hazri Ab Rashid, General Manager of SIRIM's Industrial Biotechnology Research Centre (IBRC), said three different types of facilities at the centre might be helpful to pharmaceutical manufacturers in general.

"The first one is the analytical and testing facilities. The testing areas are in biological, chemical and physical analysis or testing. The biological analysis can be broken down further into toxicology, microbiology, molecular biology, biological assays. The chemical analysis and testing include chromatographic techniques (liquid and gas), mass spectrometry and titration techniques," said Ahmad Hazri.

"The second one is in "open lab" collaboration where we invite the pharmaceutical companies to use our labs in collaborative work to perform research activities in the development of pharmaceutical processes and products, be they chemical or biological.

"The third one is our piloting facilities where the companies can use to optimise their process be they upstream or downstream processes and may also include the heart of the process, which is the reaction process.

"We invite the pharmaceutical companies to meet us and discuss how we can formulate solutions for challenges faced by the industry?"

Commitment to provide safe pharmaceutical products

IBRC is in a synergistic relationship with the local pharmaceutical manufacturers and committed to assisting pharmaceutical companies in manufacturing safe, modern drugs for consumers.

In ensuring the safety of these pharmaceutical products, Ahmad Hazri highlighted that the centre would perform the identification tests and the quantification and limit of impurities to ensure the product meets the required specifications and is free from any substances that affect the safety of the product.

"For example, nitrosamines are organic compounds that we are exposed to in our everyday lives. They are formed from chemical reactions or in low levels in our water and foods (meat, vegetables and dairy).

"Some nitrosamines may increase cancer risk if people are exposed to them above the acceptable levels and over long periods. At IBRC, we frequently performed the analysis



Dr Ahmad Hazri Ab Rashid



for detection and quantification of nitrosamines for the pharmaceutical companies to meet regulatory requirements both locally and overseas.

"We are also able to perform toxicity and microbiology testing on production samples as part of quality controls or in development samples for registration purposes. Some examples of tests are abnormal toxicity, pyrogen test, sterility test and endotoxin test," said Ahmad Hazri.

Validation of Active Pharmaceutical Ingredients

Besides providing safety assessment, IBRC also offers pharmaceutical manufacturers the service to validate their Active Pharmaceutical Ingredients (APIs).

APIs are the main ingredients in medicines, and due to the different manufacturers, these APIs might have other qualities and strengths. Therefore, the validation of APIs is essential for pharmaceutical companies to ensure quality healthcare products.

According to Ahmad Hazri, the determination of APIs are governed by the standards described in the International Conference on Harmonisation of Technical Requirements for Registration of Pharmaceuticals for Human Use (ICH) or Food and Drug Administration (FDA). The determination can be performed on production samples or samples from R&D activities.

The general manager said: "The discussion of the validation of analytical procedures is directed to the most common types of analytical procedures."

These types of procedures include:

- Identification tests to ensure the identity of API by comparison of a property of the API (e.g., spectrum, chromatographic behaviour, chemical reactivity, etc.) to that of a reference standard
 - Quantitative tests or limit tests for control of impurities' content
 - Quantitative tests of the active moiety in samples of drug substance or drug product or other selected component(s) in the drug product
- "At IBRC, we perform method validation of our analytical procedures to ensure our analysis meets the relevant standards applied by the relevant regulators. It includes the following validation parameters: analytical procedure, specificity, accuracy, precision, detection limit, quantitation limit, linearity,

range and robustness."

Ahmad Hazri then explained the meaning of each parameter involved in the validation process.

"The analytical procedure refers to the way of performing the analysis. Specificity is the ability to assess the analyte unequivocally in the presence of components expected to be present.

"The accuracy of an analytical procedure expresses the closeness of agreement between the value which is accepted either as an actual conventional value or an accepted reference value and the value found.

"The precision of an analytical procedure expresses the closeness of agreement (degree of scatter) between a series of measurements obtained from multiple sampling of the same homogeneous sample under the prescribed condition," said Ahmad Hazri.

He then mentioned that the precision might be considered at three levels: repeatability, intermediate precision and reproducibility.

"The detection limit of an individual analytical procedure is the lowest amount of analyte in a sample which can be detected but not necessarily quantitated as an exact value.

"The quantitation limit of an individual analytical procedure is the lowest amount of analyte in a sample which can be quantitatively determined with suitable precision and accuracy."

He explained the linearity of an analytical procedure referred to its ability (within a given range) to obtain test results directly proportional to the concentration (amount) of analyte in the sample.

Meanwhile, the range is the interval between the upper and lower concentration (amounts) of analyte in the sample (including these concentrations).

"Finally, the robustness of an analytical procedure is a measure of its capacity to remain unaffected by small, but deliberate variations in method parameters and provides an indication of its reliability during normal usage."

SIRIM's IBRC is home to the nation's premier industrial biotechnology R&D and technical service provider.

The centre offers a wide range of product testings to fulfil industry's demands for safe, high-quality products that comply with regulatory requirements. – @green

At IBRC, we perform method validation of our analytical procedures to ensure our analysis meets the relevant standards applied by the relevant regulators. It includes the following validation parameters: analytical procedure, specificity, accuracy, precision, detection limit, quantitation limit, linearity, range and robustness."



Bridging the gap

Indonesia, Malaysia and the Philippines discuss challenges and opportunities in energy sector



Ir. Rida Mulyana



Mario C. Marasigan



Nurhafiza Mohamed Hasan



Sarah Fairhurst



BY FATIHAH MANAF

BRUNEI Darussalam, Indonesia, Malaysia, and the Philippines created the East ASEAN Growth Area to shift economic activities from resource extraction to higher processing and value-added production levels.

The BIMP-EAGA cooperation initiative, launched in 1994, spurred trade, investments, and tourism growth among the BIMP members.

The issue of climate change has prompted stakeholders in these four countries to adopt green technology and tap into renewable energy (RE) sources. There is a need for a proper discussion on the opportunities and challenges in the energy sector across the regions to ensure a secure energy supply for long term economic growth.

The BIMP-EAGA Energy Online Conference and Exhibition (BECE) 2021 was held to spearhead further discussions among these four countries.

Day 2 of the conference witnessed a discussion on 'Power & Energy Infrastructure: Opportunities & Challenges' among speakers from the governments of Indonesia, Malaysia and the Philippines.

Moderating the session was Sarah Fairhurst, Vice-Chair of IPPF Issues and Policies Committee of Independent Power Producers Forum (IPPF) Hong Kong.



Indonesia's renewable energy plan

Ir Rida Mulyana, Director-General of Electricity, Ministry of Energy and Mineral Resource of the Republic of Indonesia, shared that the general principles of electricity in his country were sufficiency, reliability, sustainability, affordability and equality. As of December 2020, he revealed that the national installed power generation capacity stood at 72.8 GW, with the majority coming from coal.

Mulyana shared Indonesia's Electricity Development Planning (DRUPTL PT PLN 2021-2030), in which the government is targeting 100 per cent of the electrification ratio in 2022.

"The government also (wants to) maintain the energy balance for every system to ensure supply availability," said Mulyana.

"To achieve 23 per cent of renewable energy by 2025, the government prioritises RE generation without production cost increment. We also encourage Solar PV due to declining prices and utilise stranded assets such as dams and abandoned land to be converted into solar plants."

He emphasised there would be no other coal-fired power plants except those already under construction. The Indonesian government also mandated that the RE portion in the draft plan should be more significant than fossil fuel, and the next project would be greener.

Regarding the RE development, he shared that the government would convert the primary fossil fuel energy through the de-dieselisation programme and increase the use of biodiesel.

"Then, co-firing coal-fired power plants with biomass. The next step is to increase RE capacity by focusing on massive solar power development.

"We also plan to develop geothermal power through government drilling (programme)."

The energy trilemma in Malaysia

"The Malaysian government recently announced its 31 per cent renewable energy target by 2025," shared Nurhafiza Mohamed Hasan, the Director of Industry Planning and Development at Energy Commission Malaysia.

Even with the positive growth of RE development, Nurhafiza stated that Malaysia still faced the energy trilemma regarding energy security, energy sustainability, and energy affordability. She highlighted that all these three elements need to be balanced to guarantee a sustainable and affordable energy supply.

Regarding energy security, she revealed the challenges were the over-dependency on fossil fuels, regulatory constraints, disruptive technology and demand forecasting difficulties.

For energy sustainability, Nurhafiza said: "There's some limitation in solar penetration. In Malaysia, we capped the penetration at 24 per cent of peak demand to maintain grid stability. Next, the public pressure. We still have to remember that there's an intermittency issue, and we still need an ultimate plan for a stable generation."

She then explained some other challenges to energy sustainability in Malaysia, including financing, site availability, stringent environmental assessment, grid accessibility, and feedstocks for biomass. As for energy affordability, the director said that the challenges reside in the regulatory, infrastructure, financing and fuel price.

"Fuel price is a hot topic. Uncertainties in long term projection may affect optimised plant up options," said Nurhafiza.

Impacts of the pandemic on the Philippines' energy sector

Mario C. Marasigan, the Director of the Electric Power Industry Management Bureau (EPIMB) at the Department of Energy, Republic of the Philippines, shared the challenges faced by the power sector during the pandemic in terms of generation, distribution and transmission.

"For generation, many projects have been delayed. This is primarily because of the difficulties in allowing foreign nationals who are the experts and the advisors. This limited movement also hinders the fulfilment of necessary materials for the generation facilities," said Marasigan.

"Similar to Indonesia, we have more than 7100 islands, and that makes it difficult for us to travel from one island to another, particularly in doing business and implementing projects"

In terms of the distribution system, he emphasised the challenge was in the limitation in the movement of both local workers and foreign nationals. He shared that the meter reading was an issue for the Philippines in 2020 due to the restriction.

"But, primarily, the most significant impact that we have is in terms of our Competitive Selection Process (CSP), the procurement process of power supply by distribution utilities (DUs) for their captive consumers. This was delayed.

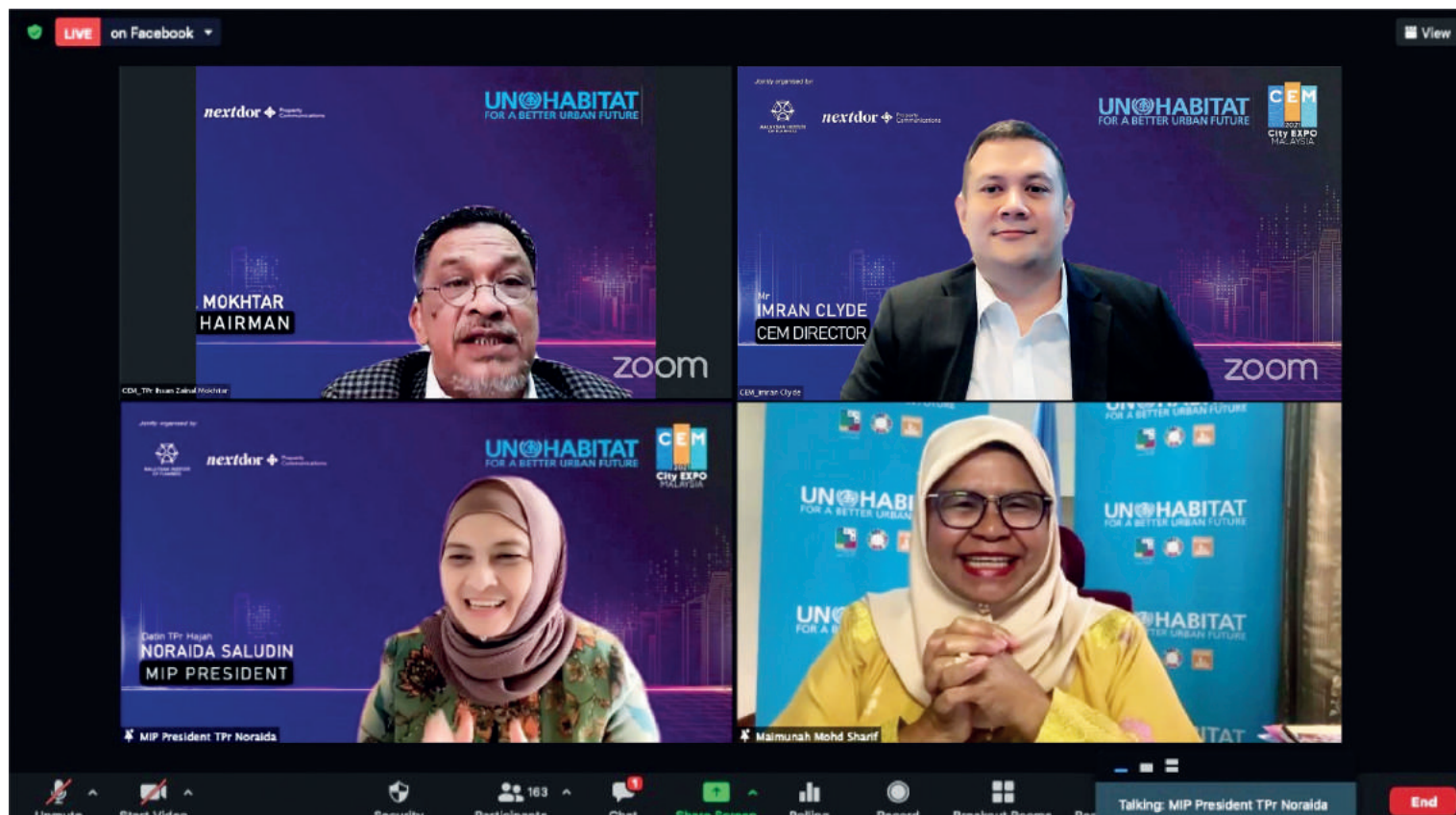
"So, the delay of this means the lack of contracts and lack of generation projects," said the director, adding that the government, however, has modified its role to cater to the issue and adopt the online method to carry out the process.

"We also have concerns on the transmission projects. This is particularly the interconnection projects."

He explained that the transmission projects were also impacted by the foreign nationals' difficulty to enter the country. In addition, the pandemic had also led to challenges in the approval of right-of-way (ROW) and the acquisition of lands.

— @green





Datuk Seri Paduka Maimunah Head Executive Director of the United Nations Human Settlements Programme (UN – Habitat) (Bottom right) with Chairman of City Expo Malaysia 2021, TPr. Hj. Ihsan Zainal Mokhta (Top left), Datin TPr. Noraida Saludin, President of the Malaysian Institute of Planners (MIP) (Bottom left) and Imran Clyde, Director of City Expo Malaysia 2021 (Top right) at the CEM soft launch.

Addressing city issues

City Expo Malaysia 2021 to drive deep conversations on what makes for great places

CITIES feature endless opportunities for the people in the country. In recent years, more and more people have moved to cities to find a better standard of living. The increase in city population, however, has led to several city issues. Therefore, an open discussion about cities by the stakeholders is essential towards creating a better future.

City Expo Malaysia 2021 (CEM 2021), on Nov 8-Dec 8, 2021, aims to be the platform that gathers these like-minded stakeholders and city makers to come up with their solutions for these city issues. Organised by the Malaysian Institute of Planners (MIP) and Nextdor Property Communications, the virtual expo drives the debate, ideas, and solutions around cities.

The soft launch of CEM 2021 was officiated by Datuk Seri Maimunah Mohd Sharif, Executive Director of the United Nations Human Settlements Programme (UN-Habitat) on Aug. 25.

“Today, Malaysia is one of the most urbanised countries in Asia, experiencing significant cumulative growth in the last two decades, transforming the country from 34 per cent urban in 1980 with estimates of growing to 80 per cent by 2030,” said Maimunah.

“Recognised challenges associated with this rapid urbanisation include the urban-rural divide, increased urban sprawl, increased urban poor and lack of affordable and adequate housing, as well as green and open spaces, poor urban mobility and connectivity, traffic congestion and other social ills.”

However, she believed that by analysing and assessing all possible imaginative but realistic scenarios, well-planned and well-managed cities could be the source of solutions rather than challenges.

Following the soft launch, Maimunah delivered a talk titled ‘World In Pandemic



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Crisis: UN-Habitat’s Strategies in Handling It’ as part of the CEM 2021 Star Talk session, moderated by MIP President, Datin Noraida Saludin.

In her talk, Maimunah stated that the unprecedented Covid-19 pandemic had reversed the UN’s sustainable development goals (SDGs), especially SDG 3, as the virus shortens the life expectancy. She highlighted that the pandemic changed the world’s progress in healthcare, poverty and education.

“Covid-19 is a wake-up call. It also magnifies and shows proof of the deeply rooted problems and the failure of the system, especially the insufficient social protection, weak public health, inadequate health coverage, structural inequalities, not only in cities but also in rural areas.

“To recover, we need people to be at the centre of the response,” added Maimunah.

Lessons from the pandemic

“For the past two years, the Covid-19 pandemic did not discriminate between developed and developing countries. No single country was prepared, emphasizing foresight and preparedness.

“By mid-2020, UN-Habitat has come up with a study. It was stated that 90 per cent of (Covid-19) cases were in cities. We had the data from 1500 cities in urban areas. So, what we observed and learned is the importance of proximity and the network of connectivity.”

She then explained that this connectivity refers to a broader segment such as enhancing the economies of scale, transforming public places, looking at the critical investment in essential services

like water sanitation, health services, and planning. She mentioned that although many argue that high density (in cities) is not good, the UN Habitat’s study noted that high density with proper planning shows the opposite result.

“It is not the densely populated that is the problem. The overcrowding is the problem,” said Maimunah.

She said the pandemic had shown that most city problems were caused by densely populated, congested, unplanned areas.

Highlighting the rapid growth of the global population, she said: “By 2050, around 66 per cent of the worldwide people will be in cities, and 75 per cent of the infrastructure will not be built yet.

“So now, we need to look into the innovation, creativity, guidelines, planning, economics or social, what type of infrastructure that is 75 per cent not built yet by 2050 that we want to do.

“We talk about green infrastructure, zero-carbon etc. But, we have to show proof, to implement (those things). We have enough talking. We want to see the impact on the ground.”

Maimunah mentioned that the pandemic had shown people the weaknesses and strengths of certain cities, organisations and countries. In mitigating related city issues, she said it was important to list these weaknesses and strengths and identify the weak spots of the cities and organisations.

“I believe we have to go back to the data. Without the information and data, we cannot do a comprehensive, resilient and sustainable plan,” she added.

– @green



Need for clear government policy

Industry players come out with policy recommendations on climate action for government to consider



Dato' Seri Johan Raslan

BY FATIHAH MANAF

PRIVATE stakeholders have called for clear government policies on climate change to effectively play their part in achieving net zero emissions by 2050.

Climate Governance Malaysia (CGM) and CEO Action Network (CAN) organised roundtable discussions involving the property and construction sector in July 2021 to address this issue.

The first session discussed the strategies for embodied carbon reduction in the built environment, while the second session focused on reducing operational carbon in the built environment.

In his welcome note, Dato' Seri Johan Raslan, the founding member of CGM and the steering committee member of CAN stated that companies need clear and predictable government policies in effectively moving the industry forward on climate action.

The first roundtable discussion was held on July 12, 2021, moderated by Gregers Reimann, the managing director of IEN consultants, a pioneering green building consultancy in Malaysia.

The first session participants were then engaged with insightful presentations from four panellists, namely Darshan Joshi, Ir M Ramuseren, Ir Yasotha Chetty and Dr Foo Chee Hung.

Carbon pricing as climate action toolkit

Darshan, an analyst from the Institute of Strategic and International Studies (ISIS) Malaysia, argued: "Carbon pricing is a fundamental enabling policy within the climate action toolkit."

On carbon pricing rates, Darshan said: "The first best global policy would be a uniform global price on carbon."

He said, for starters, countries could adopt prices that trend towards this global



CLIMATE GOVERNANCE MALAYSIA

price of carbon.

"Get accustomed to functioning in the presence of carbon tax, and that'll make any future shift to a global price, if it were to happen, any smoother," said the analyst.

He also highlighted that the carbon price couldn't be too high as it would be politically infeasible and cause economic harm. It couldn't be too low as it would not incentivise decarbonisation.

GHG emissions in Malaysian construction industry

Ramuseren, general manager at Construction Industry Development Board (CIDB) Malaysia, then shared the study conducted by the organisation to estimate GHG emissions in the construction industry.

From the study, Ramuseren shared the average GHG emissions per year from the construction process in Malaysia was about 76 million tCO₂eq, 90 per cent coming from manufacturing, three per cent from transportation and only seven per cent from the construction activities.

"If we don't do anything, if the status quo remains, no change, no further action on new policies or incentives such as tax, you can expect in the next 30 years, in 2050, it's going to increase to 92 per cent," said Ramuseren.

According to the study, the embodied carbon would contribute to about 89 per cent of the total number.

The study also came out with recommendations on incentives and

disincentives for the consideration of the Malaysian government. Some of the incentives are tax incentives for GHG reporting, low carbon funds and incentives for construction materials.

Meanwhile, the disincentives are carbon tax, mandatory GHG reporting, cap-and-trade system and mandating the use of low carbon building materials.

Structural engineer Yasotha, who is also the founder of OHR Engineering, shared that 38 per cent of global CO₂ emissions came from the buildings industry, of which 26 per cent was embodied carbon.

"This is an average figure. Depending on the type of buildings, the value could vary from 30 to 70 per cent."

She elaborated that Malaysia consumed 21.65 megatons of cement in 2016, which produced 19.5 MTCO₂Eq, almost 10 per cent of Malaysia's carbon emissions.

Yasotha then laid out some considerations for reducing embodied carbon impacts of structural building materials, such as reusing materials, selecting lower embodied carbon and adopting leaner designs.

Challenges in IBS adoption

Foo, a professional technologist who is also a manager at MKH Berhad, shared that developers faced some challenges in reducing the embodied carbon.

Developers need to consider regulatory compliance, consumers' perception and acceptance level, and cost in using alternative building materials. In addition, there were also some issues of inefficient Industrialised Building System (IBS) ecosystem and mismatch of incentives.

He shared developers were not keen on using IBS because of the cost issues. Until this was fixed, developers would continue to opt for conventional construction.

He then recommended that policy-makers revise building code and bylaws and introduce tax deduction and non-monetary incentives for projects with an IBS score of more than 70.

EE initiatives to reduce operational carbon

The second roundtable discussion then convened on July 16, 2021. The session was moderated by Ar Serina Hijjas, the Vice President of Malaysia Green Building Council (MGBC). It featured four panellists – Zulkiflee Umar, Ar Zulkifli Zahari, Davis Chong and Ong Pang Yen.

As mentioned in the first roundtable discussion, the building and construction sector is responsible for 38 per cent of global carbon emissions. The 28 per cent comes from operational carbon whilst 10 per cent comes from embodied carbon.

"Covering 28 per cent of this operational carbon is energy efficiency (EE) and renewable energy (RE)," said Serena.

She shared that in reducing carbon emissions of buildings, the way forward was to lower the energy first and then add

Roundtable 1; Reducing embodied carbon in built environment.





Roundtable 2: Reducing operational carbon in the built environment.

renewable energy.

Zulkiflee from Energy Commission Malaysia shared some EE initiatives in Malaysia. The first one was the Efficient Management of Electrical Energy Regulations (EMEER) 2008. He stated that 1,500 out of 25,000 industrial installations were subjected to EMEER 2008, consuming about 80 per cent of total industry consumption.

“In terms of number, it is low. In terms of consumption, it is very high,” Zulkiflee commented.

He then shared another EE initiative, the Minimum Energy Performance Standard (MEPS), used to regulate the energy efficiency of some electrical appliances.

Aside from the two regulations was the National Energy Efficiency Action Plan (NEEAP) 2016-2025. There were four strategic thrusts under this policy: to implement EE plan, strengthen institutional framework & capacity development, establish sustainable funding mechanisms, and promote private sector investment in EE initiatives.

“We’re currently in the process of drafting a new Energy Efficiency and Conservation (EE&C) Act in Malaysia, which will include electricity and thermal,” said Zulkifli, an architect who is also the president of Malaysia Association of Energy Service Companies (MAESCO).

“The number of registered energy managers is almost 1,500, but the truth is only about 30 per cent are practising.

“And after 12 years of the EE regulations, there’s only 60 per cent of compliance may be due to the difficulty of enforcement.”

Zulkifli then shared about the gen-

eral EE strategies for new buildings, consisting of the mandatory adoption of MS1525 or a selected Green Building Rating Tool, financial and tax incentives, enhancement of capacity building, public awareness programmes and awards and recognition.

He said the same strategies applied to the existing buildings with the additional plans, such as introducing the availability of high-performance EE technology to the building owners and boosting the quality of EE retrofits.

Zulkifli shared three components that MAESCO wanted to promote in the country were building EE policies, promoting of business models and finance mechanism. He also highlighted the need for a dedicated energy efficiency regulation in the building sector.

“The most important thing that we need to emphasise now is to establish the EE&C Act. It has been years overdue.

“Hopefully, there will be a liberalisation of this energy supply sector,” said Zulkifli.

Carbon neutrality by 2050

In increasing RE adoption, Chong, the president of Malaysian Photovoltaic Industry Association (MPIA), said: “We do Feed-in tariff (Fit), Large Scale Solar (LSS), Nett Energy Metering (NEM) and Self-consumption programme (SELCO).”

He said Malaysia could catch up with more advanced countries in terms of RE adoption with existing policies. Chong mentioned some challenges to the acceleration of RE adoption in Malaysia, which included the limitation of the TNB grid, the government’s restrictions regarding

Number one is to reduce carbon emission. The second way is to substitute the dirtier energy source with a cleaner energy source. You will also need to have carbon capture and sequestration of CO2.”
— Chong

solar installation, and the costly energy storage.

Ong, the executive director of Sunway Group, then spoke about carbon neutrality in terms of township infrastructure. Ong said there were three ways to help to reduce the dangerous situation of accumulated carbon intensity: reduction, substitution, and sequestration of CO2.

“Number one is to reduce carbon emission. The second way is to substitute the dirtier energy source with a cleaner energy source. You will also need to have carbon capture and sequestration of CO2,” said the director.

In Sunway City, these three mentioned approaches were made by providing walkways, adopting solar panels on elevated walkways and buildings, and planting more trees. — @green

About CEO Action Network

“CEO Action Network (CAN) is a loose network of CEOs,” said Dato’ Seri Johan Raslan.

He said CAN, chaired by Tengku Muhammad Taufik, President and Group Chief Executive Officer of PETRONAS, consisted of CEOs who cared about the country, companies and climate change.

While it was joined mainly by larger companies like CIMB Group and Sime Darby Property, Johan stated that CAN was keen to bring Small and Medium Enterprises (SMEs) into the network as they were the backbone of the economy.

Even though SMEs might have

more significant financial restraints than larger companies, he believed that the younger generation of CEOs was more eco-conscious.

Johan shared that CAN had two different workstreams. One was capacity building, which aimed to build eco-friendly businesses within industries and raise awareness.

“Another is, I am compiling a list of requests that we are going to make to the government. For example, to make changes in the regulation that can encourage the development of sustainable businesses.

“To ask the government to coordinate all the efforts of climate

change and to work together. So, CAN is trying to help each other (companies) to be sustainable and also trying to help the governments to push sustainability.”

He believed with precise coordination and political will, Malaysia could achieve nett zero emissions by 2050. He also highlighted that sustainability requires a collective effort, and everyone has their parts to play.

Initiated at The Cooler Earth Sustainability Summit 2019, CAN, focusing on sustainability advocacy, capacity building, action and performance, aims to influence policy, mobilise support, inspire action and deliver positive impact.

Pathway for Malaysia

Shell paves the way for carbon neutrality by 2065



Ivan Tan

SHELL MALAYSIA and the Netherlands Embassy recently hosted a virtual forum in conjunction with the launch of Shell Malaysia's "The Tree, The Sky, The Sun: A Pathway towards Malaysia's Carbon Neutral Future".

The launch event was attended by Dato' Sri Tuan Ibrahim Tuan Man, (former) Minister of Environment and Water and Aart Jacobi, Ambassador of The Netherlands to Malaysia.

The event also featured a roundtable discussion held in collaboration with the Malaysian Dutch Business Council (MDBC), CEO Action Network, and Climate Governance Malaysia.

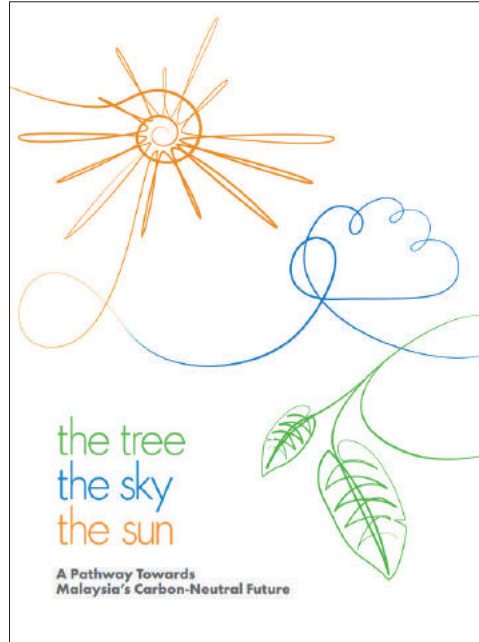
The Tree, The Sky, The Sun tells the story of how Malaysia could reach for the sky – carbon-neutral by 2065 – with its unique advantages of tree and sun. Shell's story illustrates a technically possible yet challenging pathway for Malaysia to meet the goal of the Paris Agreement to keep the rise in global average temperature to well below 2°C above pre-industrial levels, with a stretch goal of 1.5°C.

Developed by Shell in consultation with key local stakeholders, Shell's pathway was launched at a virtual forum gathering more than 1500 participants and stakeholders from the government, private sector, media, academia, non-governmental organisations, and energy consumers.

Roundtable discussion

The launch also saw a roundtable discussion by the CEO Action Network, featuring energy leaders and representatives from Shell, The Ministry of Environment and Water, Climate Governance Malaysia, and Boston Consulting Group.

"It is exciting to see Malaysia having open and more transparent discussions on the true scale of the climate challenge



and the actions needed for achieving carbon-neutrality," said Ivan Tan, Chairman of Shell Malaysia.

"By publishing The Tree, The Sky, The Sun, Shell hopes to contribute to the national conversation about Malaysia's energy transition and the framing of the nation's priorities in the run-up to COP26 and beyond. This is in line with the global ambition embodied in Shell's Powering Progress strategy to become a net-zero emissions⁴ energy business by 2050."

Added Marco Winter, Executive Director of MDBC: "The Tree, The Sky, The Sun combines policymaking with science-based targets to help us all see the benefits and opportunities of a sustainable future more clearly.

"The support of everyone – from energy producers to energy consumers – will be critical for achieving the milestones described by Shell's aspirational pathway.

"We hope the gathering will spur more

informed conversations about how we can all contribute towards building a carbon-neutral energy system for Malaysia and the world."

The pathway described by The Tree, The Sky, The Sun highlights five critical "increase levers" that are likely to have the greatest influence on moderating carbon emissions in Malaysia.

These levers are:

- Increase in forest acreage and density.
- Introduction and gradual increase in the carbon price.
- Emphasis on energy efficiency.
- Greater push for electrification.
- More widespread use of renewables, especially solar energy.

Shell's aspirational pathway revealed the Malaysian energy system of 2065 would look significantly different from today.

The economy-wide transformation required to achieve a carbon-neutral state would be underpinned by carbon pricing or the external cost of carbon, which is phased in starting from 2026. It will coincide with the start of the 13th Malaysia Plan (2026 – 2030). This drives the reallocation of capital and resources toward low-carbon and energy-efficient choices.

Renewable sources of energy

By 2065, renewable sources of energy will dominate a deeply electrified energy system. Solar has become the country's single largest source of energy, coal has been phased out, while the remaining natural gas in the energy mix acts primarily as a means of supporting the use of renewable energy sources.

Biofuel has displaced oil as the preferred liquid fuel for transportation and is used increasingly to meet the demand of difficult-to-electrify sectors such as aviation and shipping.

Gains in energy efficiency lead to a marginal increase in the country's final energy demand, despite healthy economic growth during this period.

Any remaining emissions from the energy system are removed by nature or technology – reforestation of an additional 5.8 per cent of Malaysia's landmass can capture up to 29 million tonnes of CO₂ per year, effectively bringing forward Malaysia's carbon-neutral date by 15 years to 2065.

Ultimately, the point at which Malaysia achieves carbon-neutrality depends on how aggressively these levers discussed were pursued in steering the economy towards a more sustainable post-pandemic recovery.

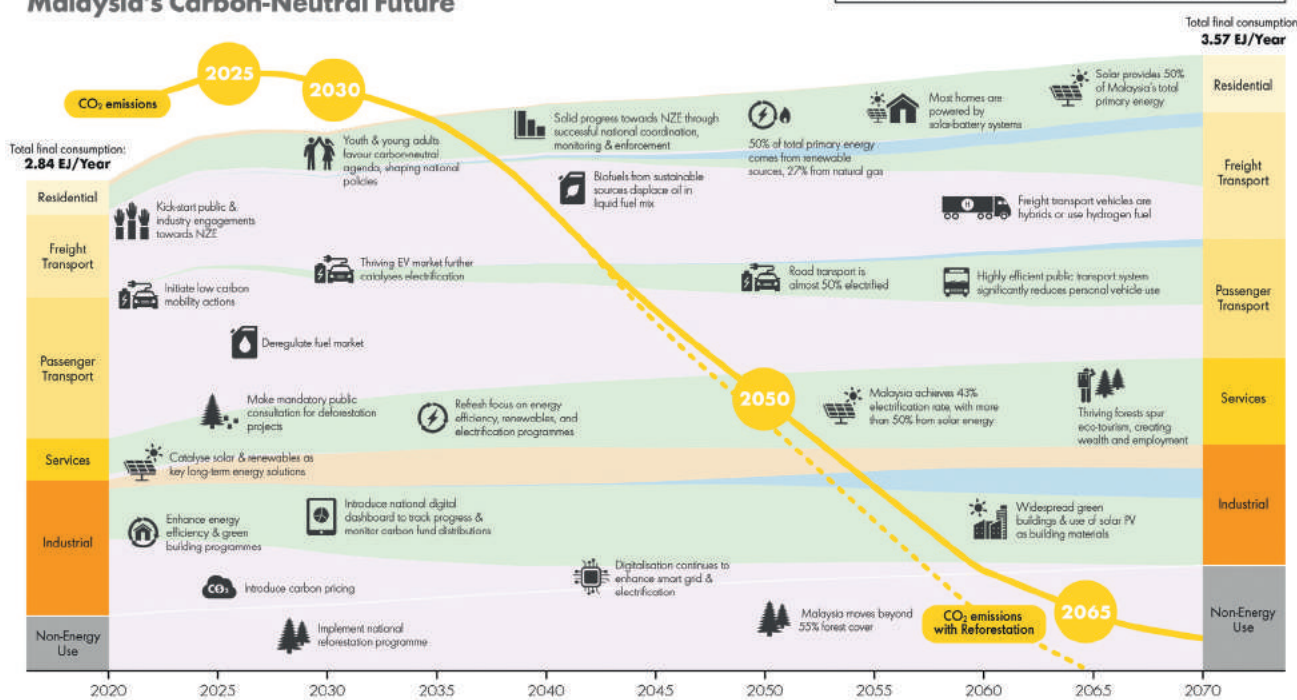
Other pathways are possible and depend on societal and policy preferences. Still, a significant shift in how society produces and consumes energy is required to limit the rise in global temperature and address the risks of climate change.

Crucially, it will take robust policy frameworks and more open public engagement to create societal support for action and enable the development of lower-carbon solutions and green technologies.

Strong collaboration across government, business, and society will be crucial to progress at the pace required for Malaysia's energy system to be carbon-neutral by 2065. – @green

the tree, the sky, the sun

A Pathway Towards Malaysia's Carbon-Neutral Future



To find out more, please visit: www.shell.com.my/treeskysun

Scenarios describe possible future worlds to help stretch how we all think about and plan for the future – so we can make better decisions today. This scenario starts with data from Shell's Sky scenario and uses additional data from Shell's World Energy Model. We assumed the Malaysia energy system reaches net-zero emissions by 2065 and then worked back to see how this could occur. While there are other possible paths for Malaysia to achieve a net-zero emissions energy system, we believe this scenario is technically and economically possible. Nevertheless, it will be highly challenging and action must begin immediately. Our scenarios are not predictions. Shell strategy or business plans. Our scenarios present possible pathways for society to meet the goals of the Paris Agreement. Accordingly, when developing Shell's strategy, our scenarios are one variable among many that we consider. Ultimately, whether society meets the goals of Paris, is not within Shell's control. While we intend to travel this journey in step with society, only governments can create the framework for success.

Reducing CO₂ emissions for future sustainability

Solar power as a renewable source of energy in Malaysia



BY FATIHAH MANAF

THE RENEWABLE energy sector is growing at an exponential rate. Even though solar energy is the cheapest electricity in history, and while the capacity for the renewable energy sector is strengthening, renewables still only account for 11 per cent of the world's primary energy.

With the United Nations expecting an overshoot of the Paris Agreement 2030 targets, the transition to renewables needs to be accelerated.

There are many barriers to the renewable energy transition in Malaysia, such as economic obstacles and social barriers. However, international pressure and awareness on the negative impacts of fossil fuel-based energy are catalysing government action to decarbonise the energy sector.

In conjunction with the Circular Economy Conference 2021, Star Media Group organised a webinar discussing solar power as Malaysia's renewable energy source.

Ng Wei Wei, Deputy Chief Executive Officer of the United Overseas Bank (UOB) Malaysia, in her keynote address, shared the bank was keen to champion sustainability and solar energy in combating climate change.

Ng said: "As an ASEAN bank, UOB is committed to playing our role. We initially aimed to build a sustainable finance portfolio of US\$15 billion by 2025. Given the increasing demand by businesses for such opportunities, we have already hit US\$13 billion as of June 2021. The market for clean, renewable energy, such as solar is only going to grow, and Malaysian companies can benefit from that."

The webinar also featured Jasper Wong, Yusrizal Yusoff and Ibrahim Ariffin. Dr Chen Wei-Nee, Vice President at New Energy Ventures of Hibiscus Petroleum Bhd, moderated the session.

RE development in Malaysia

Ibrahim, the Director of Strategic Planning Division of Sustainable Energy Development Authority (SEDA) Malaysia, mentioned that Malaysia's electricity supply industry was undergoing an exciting time during this energy transition phase.

"Towards the end of last year, Malaysia revised renewable energy targets from 20 per cent of the capacity mix by 2025 to 31 per cent by 2025 and 40 per cent by 2035," said Ibrahim.

The newly-revised target has made Malaysia the country with the highest RE targets in the ASEAN region.

As of December 2020, Ibrahim revealed Malaysia had realised 8.4 GW of RE capacity in operations, with solar capacity as the second-highest resource.

He said: "Looking at where we are today, we can see significant growth. Progressive, in terms of the addition of renewable energy into our capacity mix."

Acknowledging the economic and climate change crisis, Ibrahim said there was no better time than tough economic times for companies or individuals to invest in solar PV systems.

He said the investments would positively impact the environment, and investors would experience reductions in electricity bills.

He then mentioned some incentives provided by the government in support of solar development, such as the Green Investment Tax Allowance (GITA) by the Malaysian Investment Development Authority (MIDA).

TNB facilitates the energy transition

Yusrizal, the Managing Director of TNB Renewables, said it was unfair for him to speak on behalf of TNB Group but shared that the group had entered the Vietnam solar power market under the subsidiary.

He stated the function of TNB Renewables had always been to grow renewable energy and solar business development through investments.

He emphasised that although the approaches used in Malaysia were different from those in Vietnam, the key was to ensure the grids get solar power input.

He shared that TNB, together with regulators such as the Energy Commission and SEDA, took a more cautious approach in Malaysia than Vietnam, which has less stringent requirements.

"They would rather specify a very stringent requirement for the interconnection, rather than let loose and let everyone come in one go. And look at what we have now in Malaysia. All plants connected can be dispatched fully, and reduce the risk of revenue recovery."

Yusrizal said strong backings from financial institutions, authority, and rules and regulations had facilitated the market growth.

He said: "As an investor, number one, we need to make sure that whatever money that we put in, we should be able to recover the amount. We should be able to pay the

financier and at the same time make sure that the system can cater for the large penetration."

UOB's ESG journey

To drive the environmental, social and governance (ESG) agenda, Ng said UOB has integrated ESG considerations into its lending policies and implemented responsible financing.

This integration prohibits the bank from financing activities or projects that are high risk, such as the new coal-fired plant projects.

She said: "The UN Sustainable Development Goals guide our policies."

Ng revealed UOB had rolled out three sustainable financing frameworks: Smart City Sustainable Finance Framework, Real Estate Sustainable Finance Framework, Green Circular Economy Framework, and the upcoming Green Trade Finance Framework.

"You'll be heavily invested in an education and building awareness piece. We share best practices, green solutions with our customers and ecosystem partners, and more importantly, develop actionable plans to help them in their progress on the ESG journey."

Ng stated that strong government push with conducive policies, supported by various green incentives and green technology financing schemes, was the critical impetus for businesses to adopt solar energy.

The adoption also allows customers to reduce operating costs for reducing carbon footprints and helps build their ESG credentials.

UOB's role in the green circular economy

Wong, Head of Construction & Infrastructure, Group Wholesale Banking of UOB, said that the bank provides financing support for recycling and upcycling solar panels.

He said this issue of recycling and upcycling would be gradually built up until the 2030s or 2040s, considering the life cycle of solar panels. Wong said UOB encouraged their clients to reduce, reuse and recycle as part of the frameworks rolled out by the bank.

He also mentioned materials of solar panels were recyclable, and there would be a considerable market for recycling by 2050.

He said: "By that time, we can truly say we can take from the cradle to the grave, and then recycle."

Touching on solar adoption, Wong said UOB offered zero per cent interest for individuals.

"Zero per cent interest, you can't get any lower than that. So, there's no discussion on the interest rate. Financing cost is not an issue."

Ng also shared UOB had launched the U-Solar Programme to help UOB's customers address their cost concerns of installing and operating solar power systems.

The programme, which is under UOB's Smart City Sustainable Finance Framework, is Asia's first integrated solar energy platform providing financial solutions to solar developers, contractors, businesses and homeowners. — @green

As an ASEAN bank, UOB is committed to playing our role. We initially aimed to build a sustainable finance portfolio of US\$15 billion by 2023. Given the increasing demand by businesses for such opportunities, we have already hit US\$13 billion as of June 2021. The market for clean, renewable energy, such as solar is only going to grow, and Malaysian companies can benefit from that.

— Ng

Impact on offshore workers

Hibiscus Petroleum creates green bubble to ensure safe and healthy environment



Dr Kenneth Gerard Pereira

THE Covid-19 pandemic has affected different sectors differently. With the stringent regulations placed by the government to curb the spread of the virus, people have to adapt to a whole new experience both personally and professionally.

Sharing the experience from the oil and gas sector was Dr Kenneth Gerard Pereira, the founding Managing Director of Hibiscus Petroleum Bhd, Malaysia's first SPAC with oil and gas assets in Malaysia, Australia and the UK. In a podcast with BFM Radio, Pereira shared the pandemic had impacted the industry in several ways.

"Oil and Gas platforms are very congested areas. So you know, all the standard operating procedures (SOPs) on physical distancing require a special kind of adaptation.

"We have maintained business continuity, mainly because our people have been very committed. When they go offshore to work, they spend 20 consecutive days offshore, most of them, and they end up having to do 14 days in quarantine.

"We create a green bubble for them before they go offshore. We test the workers a couple of times with normal testing to ensure they're not carrying the virus. Then, when they go offshore, we try to maintain a reasonably safe and healthy environment," he explained.

Pereira stated that the experience had not been easy. There were cases where people had gone offshore with infection, but the company quickly got them back onshore as soon as possible.

"From the health and safety perspective, a lot of people were impacted. People working at the coalface sacrificed a lot," said Pereira, adding many of Hibiscus Petroleum's offshore workers had not seen their families for a long time due to the inter-State travel ban.

On supply and demand

On the business side, he said the oil and



gas market, in terms of the volatility of crude prices due to the supply and demand factors, was also impacted by Covid-19.

"I would say it's an interesting phenomenon on the supply side. Everybody has been spending time at home. We've had time to reflect on what's important in life. Health has become very important for those close to us and ourselves etc. And, because of that, people have been looking at the environment. What can we do more for the environment?"

He mentioned the whole climate change movement throughout this pandemic has gone up a notch or two. People were now moving to discuss the

climate disaster and the climate emergency starting from climate change. He believed people have begun to consider how the environment could be better from a health and safety perspective.

"And because of that, a lot of oil companies, in Europe particularly, were pressured to consider if they want to be in the fossil fuels business.

"And because of that, they've been moving their investments from fossil fuel investments into renewable investments, causing maybe a tightening of supply. And oil prices now remaining a little bit stable, perhaps even trending up. So, that's happening on the supply side.

"On the demand side, of course, aeroplanes are not flying, cars are not on the road. So demand has been soft. But OPEC and their alliance partners have been very disciplined to maintain and keep to quotas.

"Because of that there is some balance in the oil and gas market, with some reasonable crude oil prices being achieved."

On transition to green energy

When asked about Hibiscus Petroleum's plan to move into a more clean energy profile, Pereira said: "On the sustainability part, going into a green energy space, we are making a lot of effort.

"We are going to do things which are complementary to our business. We're not going to pivot and go into photovoltaic solar panels or something like that. We're not going to go into wind turbines. We're not going to plant trees. We're going to do stuff that is complementary to our business to make sure that we decarbonise our own business.

"Because going on to 2050, when everybody says we're going to be net-zero and all of it, 50 per cent of the energy mix in the world is still going to be fossil fuels, oil, gas and coal. In the best scenarios, it will be 40 per cent," he said.

Pereira highlighted that the important thing was to ensure that 40 per cent of the global energy mix was also clean. He revealed Hibiscus Petroleum was focusing on that initiative and looking at technologies that will clean up its type of business. — @green





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Putting on the ESG lens

Air quality has improved significantly due to reduced industrial and socio-economic activities



CAPTAIN PLANET

BY KAVICKUMAR MURUGANATHAN

C OVID-19 could potentially cause a drop in carbon emissions never seen before. The end of World War II in 1945 resulted in an estimated reduction of 750 million tonnes of carbon emissions.

Subsequent significant drops were witnessed during the global economic recessions in 1975, 1985 and 2009, resulting in 100, 1000 and 300 tonnes of carbon emissions reduction, respectively.

Projections based on current travel, work and industry restrictions have estimated emissions to drop by 2500 million tons globally for 2020. Singapore, too, will face reductions in absolute emissions with the implementation of circuit breaker measures.

Overall, air quality has improved significantly due to reduced industrial and socio-economic activities brought about by the restrictions put in place and increased telecommuting. Singapore has recorded reduced pollutant levels in the atmosphere.

The average Nitrogen Dioxide (NO₂) level was 13µg/m³, down from 27µg/m³ in the same period last year. The average levels of Particulate Matter (PM) 10 and 2.5, carbon monoxide (CO) and sulphur dioxide had also fallen by 8-43 per cent due to the circuit breaker measures.

With this, Singapore's daily pollutant levels are now within World Health Organisation (WHO) air quality guidelines,

something it had struggled to achieve in the past.

There has been a spike in the use of disposals & packaging material, air-conditioning and dependence on food delivery services. But this has been offset and dwarfed by a reduction in commute to work and social activities.

Though experts reckon the drop in emissions and improvement in air quality may be short-lived, it offers the environment a temporary respite from the toll posed by human activity.

Much of the damage is irreversible, and more needs to be done beyond this global pandemic to mitigate climate change.

Impact on mental health

While industrial activity is expected to pick up once restrictions are relaxed, telecommuting instead of business travel can potentially become the new norm and be one strategic lever for corporates looking to decarbonise and reduce their environmental risk exposure.

At a national level, this episode will provide food for thought on long term emission mitigation measures that would contribute towards the climate goal of halving emissions from 2030 peak by 2050.

The social impact of Covid-19 on mental health and emotional wellbeing has been tremendous given the anxiety and uncertainty over the future. Calls to mental health hotlines have gone up, expressing worries about health and the economic fallout.

The suicide prevention agency Samaritans of Singapore's (SOS) received an increase of more than 22 per cent in the number of calls attended in March compared to that of the same period last year.

The invisibility of the virus has resulted in paranoia and an attitude of hypervigilance and overthinking that impacts mental health negatively.

Restrictions on movement have broken

routine and socialisation and changed lifestyle patterns, compounding existential stressors. Domestic violence and conflict also saw an increase during movement restriction measures, with 476 police reports made from April to May.

Employers have a critical role to play in addressing the mental wellbeing of their employees. The pandemic offers corporates an opportunity to restructure their approach to employee wellness and place a greater emphasis on managing mental health at workplaces.

Redesigning workplaces

This might result in redesigning workplaces to integrate more greenery and having more flexible working arrangements to embrace work-life harmony. Traditional employee benefits and reward systems can make way for more liberal systems that embrace diversity and inclusivity.

On a positive note, the pandemic has brought out the best in some corporates attempting to do good. On the pandemic onset, the Jobs Support Scheme (JSS) was launched to provide wage support for companies to retain local employees.

A total of 32 companies have returned pay-outs totalling S\$35 million and will not take future payouts. Some have decided to donate the funds to causes supporting migrant worker assistance, animal cruelty and humanitarian services.

DBS Bank has donated S\$2.5 million to help feed vulnerable groups and provide 200,000 meals to the elderly and low-income families. CITI Singapore is providing about 1,600 of its employees a S\$1,200 special compensation award.

The moral deliverable and the sense of shared responsibility and community for corporations has heightened during this period. This could be transformational in shifting the needle and witnessing the more systemic sharing of social burden between the government and corporates.

This will allow a more targeted approach for assisting groups that government social safety nets may not have picked up. This sets the path towards a more holistic approach towards nation building and caring for the community.

In place of the pandemic, corporates have found it harder to hold their Annual General Meetings (AGMs). To ensure critical business decisions, such as dividend payouts that may affect investors' cash flow, are not compromised, the Covid-19 (Temporary Measures) Bill passed amendments to allow AGMs to be held virtually.

A smaller quorum number could also be set with documents for notice of meetings sent electronically instead of hard copy. Provision for proxy voting has been made with one specific officeholder, designated as the sole proxy, as a safeguard with extension in timelines for the conduct of AGMs.

On a larger scale, travel restrictions could limit the work of external auditors, potentially leading to incomplete reports or late filings, which could, in turn, impact compliance with debt covenants and contribute to additional uncertainty to markets.

Asset and liability valuation could be affected by the need to perform additional impairment tests. With asset values under pressure, write-downs can be expected in areas such as investments and intangibles.

This will have a profound impact on current accounts, year-end results, future earnings and dividend payments. More crucially, this black swan event will force companies to return to the drawing board to revisit their contingency strategies and reinforce that business will no longer be usual again. @green

Kavickumar Muruganathan is a sustainability professional.

While industrial activity is expected to pick up once restrictions are relaxed, telecommuting instead of business travel can potentially become the new norm and be one strategic lever for corporates looking to decarbonise and reduce their environmental risk exposure."

Perspectives for debate

The world approaches the perceived ‘tipping point’ for reducing GHG



LAL'S CHAT

BY G. LALCHAND

VARIABLE climate events over the Covid-19 pandemic period have been widespread and severe globally. These include intense forest fires in drought-hit regions of North America and Europe and unprecedented floods in the same areas and Asia and Africa, with the unfortunate loss of life and property.

Malaysia has not escaped, although fortunately, our problems have been relatively less severe. Theoretically, the “climate change mitigation” impact of the pandemic imposed movement, and industrial activities should have reduced the climate variability. But this does not appear to have occurred at the anticipated intensity.

Nevertheless, the global clamour for climate change mitigation efforts by NGOs (Non-Government Organisations) and CSOs (Civil Service Organisations) worldwide continue to rise.

The world approaches the perceived “tipping point” for reducing GHG (Green House Gas) emissions by 2030 to a level that can keep the anticipated temperature rise to below 1.5oC by the year 2100.

That is still the aim, though impossible under the current global GHG emission reduction rates.

The “traditional fossil fuel bashing (particularly of coal)” of the power generating industry has appeared to wane recently as more and more countries, and even sizeable global energy consumer chains, continue to make firm commitments to escalate their “Road to Nett Zero emissions” initiatives.

Such commitments are commendable but must be seen as a relatively convenient alternative to reducing their emissions. They are often based on off-setting their emissions or purchasing RE generated electricity from off-site producers, not necessarily cutting the emissions.

Chart 1 from “the tree, the sky, the sun (A Pathway Towards Malaysia’s Carbon-Neutral Future)” by Shell, as presented recently on the document’s launch, shows the global journey towards nett-zero emission aspiration by 2070.

For Malaysia, the share of the different primary energy sources in 2020 and 2030, as shown in Chart 2, do not demonstrate a significant change for the percentage of liquid hydrocarbon fuels used predominantly for the transport sector.

The Malaysian government policy-making, regulatory and implementing agencies do not necessarily agree with the above projections. They believe that current policies and strategies can accelerate Malaysia ahead of the curve of the

predictions above.

The clamour for emission reduction strategies has transitioned to the transport sector’s emissions, particularly for land/road transport, which involves a broader spectrum of user components and technologies.

Railway transport is now predominantly electrified, whether for inter-city or intracity applications.

However, the pollution caused by transport is usually more severe in urban conurbations, where public and private vehicles using liquid hydrocarbon fuelled ICE (Internal Combustion Engine) powered transport dominates. The diversity of applications gives a wide selection of technology and policy mechanisms to help reduce emissions.

Why remove incentives for basic HEVs?

Malaysia was no slouch in adopting strategies to reduce transport-related emissions by focussing on the so-called “Low Hanging Fruits” of promoting EEVs (Energy Efficient Vehicles) and the basic HEVs (Hybrid Electric Vehicles).

The promotion of EEVs in Malaysia has been successful and substantially in line with the expected share of EEVs in the market share. It has no doubt been facilitated by the relatively affordable range of EEVs that the majority of the M40 wage earners can afford to purchase in the first place.

However, the situation for the HEVs has experienced a “roller coaster” ride for several reasons, some of which appear to defy common sense logic.

The affordable HEVs (like the Toyota Prius and the Honda Insight) had a relatively minuscule market share of the order of a few hundred units a year until actively promoted from 2010 under the incentives granted under the ETP (Economic Transformation Programme) in 2010.

The PEMANDU (Performance Management and Delivery Unit) led NKEA (National Key Economy Areas) Labs under the ETP (Economic Transformation Program) in 2010 set Malaysia on an attractive trajectory to reduce automobile emissions.

There was an “explosion” in the market share of the HEVs from a few hundred units a year to about 15,000 units. Unfortunately, these incentives were withdrawn rather too quickly.

The incentives were transferred to the upmarket PHEVs (Plug-in Hybrid Electric Vehicles) produced by manufacturers who opted to set up assembly plants for their PHEV models in Malaysia.

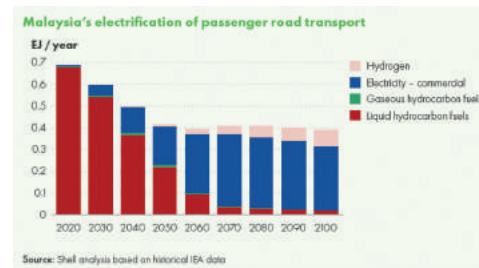
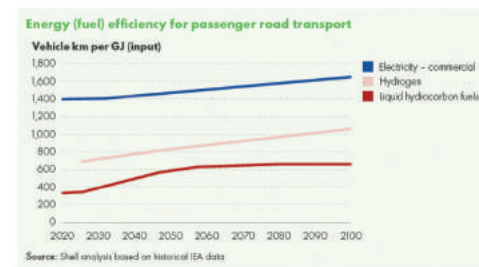
Naturally, these were rather too costly for the M40 wage earners and benefitted the high-income segment of the community. As

the PHEVs were upmarket models, their cost was also high, resulting in lucrative incentives.

The rationale for this transfer of incentives was to enhance the automotive sector’s contribution to the local economy and establish Malaysia as a hub for such vehicle assembly (and preferably manufacture) in due course.

These can be considered noble intentions, but there is little information to show how effective these incentives achieved the objectives.

EVs’ higher energy efficiency performance is undoubted, so the transition to electric mobility is really “unstoppable”. The question is, how fast do we do so.



One may wonder why the incentives were removed for the basic HEVs in the first place? Indeed they could have been retained in conjunction with those for the PHEVs to garner more significant emission reductions from the potentially larger share of HEV sales due to their affordability for the M40 wage earners.

A more recent development has been promoting BEVs, and even more recently hydrogen fuel cell electric vehicles (FCEVs), which has been spearheaded by the Sarawak government’s plans to embark on a large-scale hydrogen economy by exploiting their hydrogen generation through electrolysis using its vast hydropower capacity.

Something that seems to be forgotten (or deliberately ignored?) is that charging BEVs and PHEVs with electricity generated predominantly from fossil fuels (around 90 per cent in P. Malaysia) is not an absolute emission reduction strategy.

But this debate over the competitive advantages of BEVs versus FCEVs is a ripe topic for another session. – @green

Chart 1

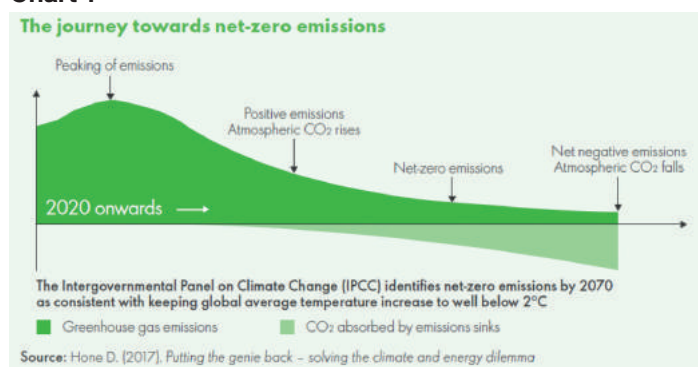
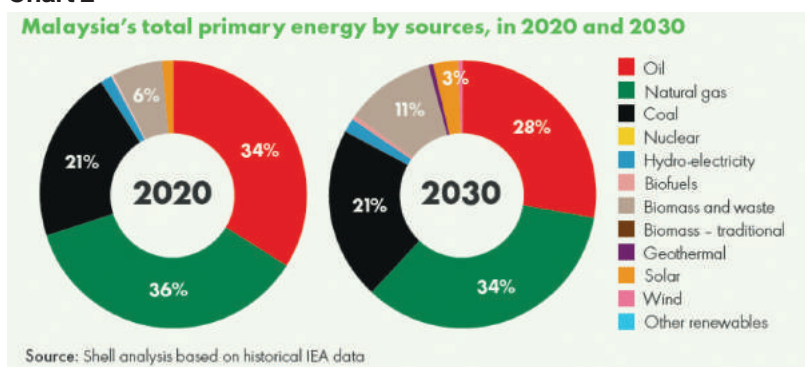


Chart 2



The rationale for this transfer of incentives was to enhance the automotive sector’s contribution to the local economy and establish Malaysia as a hub for such vehicle assembly (and preferably manufacture) in due course.”

Energy-harvesting via wind interaction

A sustainable flight is a dream for the development of modern aircraft



BY DR NUR AZAM ABDULLAH

A SUSTAINABLE flight is a dream for the development of modern aircraft. However, most existing aircraft use aviation gas (AVGAS) as an energy source and contribute to the harmful environmental issue, so-called carbon emission contribution on the sky.

Hence, it would trigger the increment of global average temperature over the year that will significantly affect climate change with air transport worldwide. The data global airline industry shows that 4,725 million passengers used air transport over the whole year before the pandemic (pre-Covid-19).

Nevertheless, the number has decreased to 1,763 million passengers during the post-Covid-19 in 2021. The number will increase drastically when the pandemic ends.

Let's look at the positive side of introducing Clean Sky Joint Undertaking (CSJU), a public-private partnership between the European Commission and the European aeronautics industry that regulates and finances research ventures to produce significantly more reserved and numerous environmentally favourable aircraft.

One of the elements in the four focus areas or subsectors outlined in the Malaysian Aerospace Industry Blueprint 2030 is the Aero-Manufacturing, where the aerostructure focuses on the employment of composite and metallic materials.

The composite would be an excellent replacement for the conventional metallic or aerospace alloys aircraft components such as fuselage, wing, tail, and engine pylon. The utilisation of composite structures in aircraft manufacturing has led to less weight and reduced the AVGAS consumption for aircraft propulsion.

But, how is this approach eachable in

the timeline? According to NASA, green aviation is a terminology adopted to represent exercises in the business that improve aircraft efficiency and reduce noise contamination and greenhouse gases, which drops carbon emissions.

On the strategic insight, this application has increased the aircraft endurance for long-range operation, especially for lowering the travelling cost in this era. Moreover, researches on multifunctional composite structures seek the advancement in combining structural-energy functions.

Thus, enabling the structural capabilities, i.e., load-bearing and energy generation/ storage application. One of the focuses in the structural-energy topics is the piezoelectric energy harvesting technology.

In another perspective, the development of UAVs has been of concern for military applications for several decades. The focus lately was on creating small UAVs, known as micro (<10 cm in length) or mini (10-30 cm in length) UAV, which can be small enough to be carried and deployed by soldiers in the battle territory.

Top strategic management

A small military UAV is specifically designed to deliver steadfast intelligence, surveillance, reconnaissance and targeting (ISRT) missions. Some people, especially at the top strategic management, may question its feasibility for this purpose.

However, they can be designed to fulfil several distinct duties. One limitation of currently available mini UAVs is their endurance or best flight conditions. In addition, mini UAVs are tiny and lightweight.

Consequently, they cannot be regulated with some large fuel payloads during the flying. Specifically, in electric-powered mini UAVs, the rechargeable batteries are

utilised to propel the aircraft, often comprise a substantial number of the overall aircraft mass, so increasing the battery size to enhance endurance is not feasible.

Additionally, an energy storage scheme with a multifunctional structural battery in the WASP pack and the Black Widow UAV would be applied for this intention.

Indeed, nature is a special gift to humankind. For instance, the air would generate a mechanical movement through this vibrational motion and trigger the structural deflection on an object depending on its shape and sizing.

The concept is straightforward; a travel freestream air carries energy that would be transferred when it interacts with a structure and, consequently, excites its particle. The design may be excited to the maximum deflection peak once its exciting frequency is near the natural frequency.

Simultaneously, the atmospheric conditions such as temperature, air density, gust flow may differ based on the altitude from the sea level. Thus, the amount of harvested energy may vary due to the exciting mechanism based on the generated aerodynamic load.

On the other hand, several wind-structure interactions would be observed in our daily life. For example, the most popular Tacoma Bridge that collapsed in 1940 would be the benchmark of this event.

The finding has revealed that the structural damping of the bridge could not resist the vibrational load inducing the flowing air, hence resulted in the bridge collapse unfortunate event.

In 2010, Erturk and his team coined piezoaeroelastic energy harvesting in their research paper entitled "*On the energy harvesting potential of piezoaeroelastic systems*".

For the first time, they elaborated on fundamental issues concerning harvesting the energy via the structural vibration exerted by an aeroelastic condition, i.e., coupling between aerodynamic loads and structural elasticity.

In a recent development, energy harvesting can be exemplified for a wing with a high aspect ratio. Frequently, high aspect ratio wings produce more extra lift and permit sustained, endurance flight, while low aspect ratio wings imply the most desirable for fast manoeuvrability.

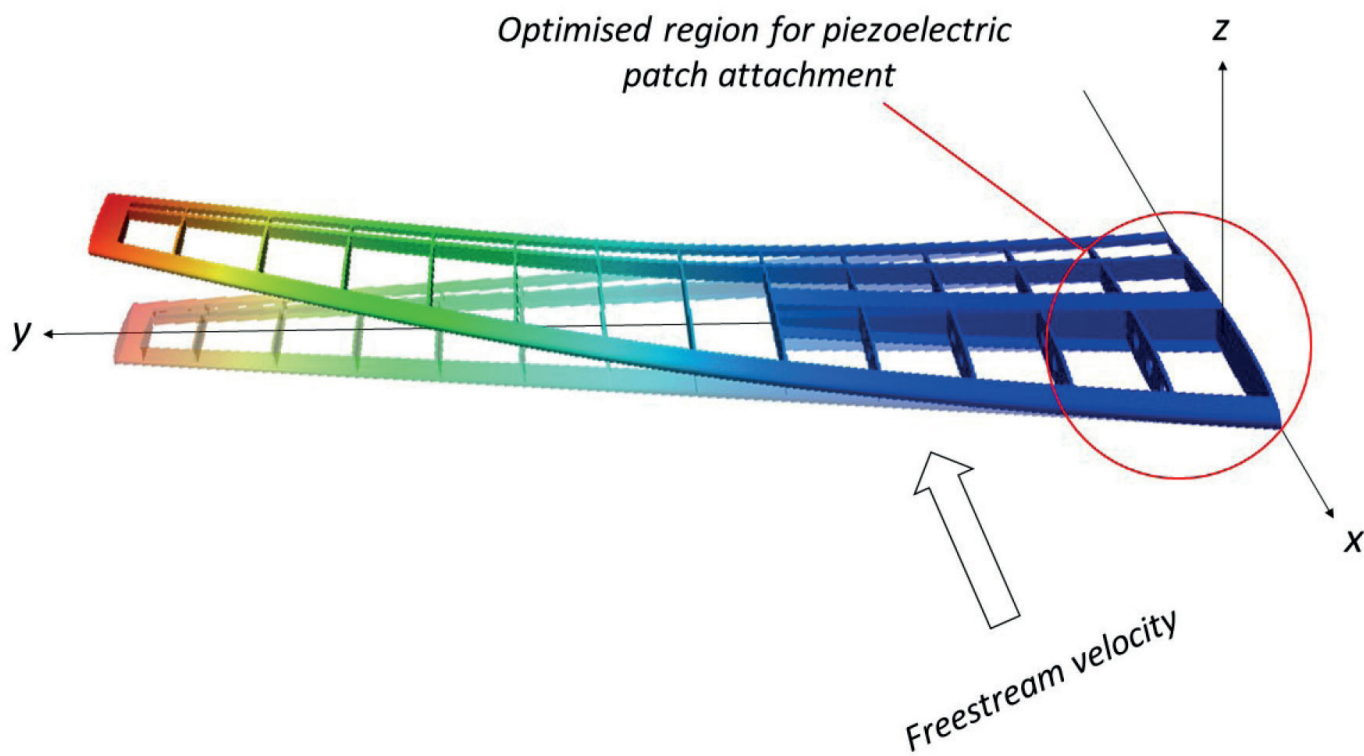
Concept of piezoelectric

Specifically, a high aspect ratio wing UAV class is called High-Altitude Long-Endurance (HALE). UAV primarily operates for 30 to 50 hours of flight between 50,000 ft and 70,000 ft of altitude. Recently, there has been some other research for solar-powered energy harvesting and control for this type of UAV.

Such aircraft may also be of advantage for surveying missions to lessen navigational hazards in extreme regions. Due to some reasons, a significant gain is an economic expense that corresponded to satellite systems and the most trivial ecological impact.

For example, the immense geographical latitudes that are of particular concern





for the operation of solar-powered HALEs, as throughout the extreme summer, solar energy is enduringly available, which outmodes the demand of spanning the night hours with battery or fuel energy.

Still, the research on HALE UAV capacity of harvesting energy through the vibration during the wind interaction via the piezoelectric is not well developed.

The first and only flight test attempt for UAV with the attachment of piezoelectric patch and solar panel for the energy harvesting was conducted by Anton & Inman as presented in their article entitled “Vibration energy harvesting for unmanned aerial vehicles” in 2008. It was through the modification of commercially available remote control (RC) aircraft.

The modified RC aircraft was flight tested, and both of the energy harvesting systems proven could be used to support the primary electrical power sources of the RC aircraft. Most importantly, they found that solar panels could supply 14 per cent capacity of a 170 mAh battery.

The piezoelectric elements could provide 70 per cent capacity of a 4.6mJ capacitor, such a remarkable division of green power generation via this approach. Since then, researches on the evaluation of piezoelectric energy harvesting potential from lifting structures, i.e., aircraft wing, have been increasing significantly.

On top of that, an investigation on the piezoaeroelastic energy harvesting concerning the augmentation on the aircraft performance was conducted by Akbar & Curiel-Sosa, researchers from The University of Sheffield, United Kingdom as described in their published article “Implementation of multiphase piezoelectric composites energy harvester on aircraft wingbox structure with fuel saving evaluation” in 2018.

Throughout the analysis, various multiphase piezoelectric-based composites were applied to a typical jet aircraft wingbox with a 14.5 m half span. An innovative approach to examine the trade-off connecting the aircraft weight, the fuel-saving and the energy harvester was developed in their research.

For instance, the results expressed that the equivalent fuel saved from the power produced by the wingbox is more than adequate for a 1 h Auxiliary Power Unit (APU) operation to be applied for the designed piezoelectric-wing platform.

Even though this research example is just one of the theoretical assumptions throughout a simulation programme,

the proposed model would be a precious benchmark to generate the required amount of electrical energy and promote the green eco-friendly flight.

Moreover, gust loads on aircraft may induce harmful impacts such as increased aerodynamic and structural loads and lead to higher structural deformation and diminished productive flight performance. Conventionally, a plane is designed to react with the gust loads at the desired airspeed.

The main reason for this idea is to allow the feasibility of confronting clear air turbulence (CAT) while in cruising flight, despite during turbulence solely. For instance, aerospace scientists have come out with several gust estimation profiles; vertical gust, lateral gust and head-on gust, where these gust load profiles will alter based on the conditions of flight; i.e. altitude density, altitude pressure, etc.

Sample of gust load profile interacts on aircraft body

Toward this aspect, it is identified that once the energy has been transferred, the structure begins to oscillate and later induce structural vibration. The design engineer could authenticate a much robust structure via the prediction through simulation and numerical study to avoid the damage of the frame while maintaining the vibrational motion.

In that thought, a complex energy conversion system is embedded by associating

an intelligent structure called piezoelectric inside the base structure, harvesting the energy to achieve the system’s robustness.

However, it may require a high cost of research on commercial aircraft in an aerospace application due to its larger size scale to test the piezoelectric capability to harvest the energy through the wind interaction.

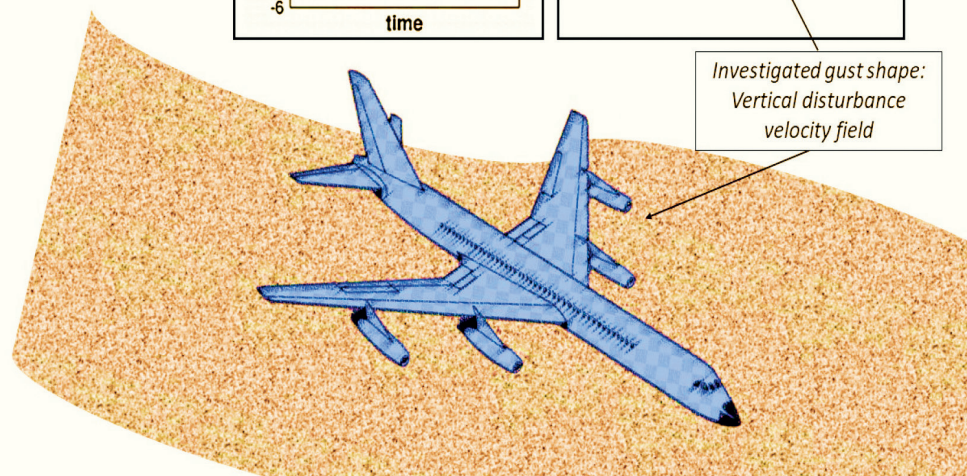
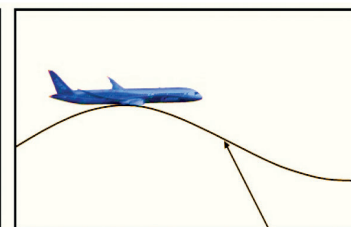
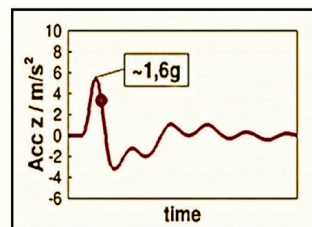
On that composition, the ideas of having energy harvester have been widely investigated on the Unmanned Aerial Vehicles (UAVs) or commonly known as drone since last 10 years. In some means, piezoelectric vibration harvesters and photovoltaic solar harvesters have included the aircraft’s design to harvest vibration and solar energy through the active method.

The knowledge of vibration via wind interaction and solar energy harvesting using innovative elements is recognised to increase the endurance of UAVs or even for any piloted aircraft without adding an amount of weight.

Most importantly, the crucial aspects in promoting our vision towards the green flight technological approach should be based on the 17 elements in Sustainable Development Goals (SDG) developed by the United Nations. – @green

Dr Nur Azam Abdullah is Assistant Professor at Department of Mechanical Engineering, Kulliyah of Engineering, International Islamic University Malaysia.

The first and only flight test attempt for UAV with the attachment of piezoelectric patch and solar panel for the energy harvesting was conducted by Anton & Inman as presented in their article entitled “Vibration energy harvesting for unmanned aerial vehicles” in 2008. It was through the modification of commercially available remote control (RC) aircraft.”





More than a pipe dream

A combination of disruptive space innovations, blockchain/libonomy, revolutionary processes and critical business considerations



BY ZULKIFLI AHMAD

SPACE, with no end in its vastness, but at the low earth orbiting sphere enables us to facilitate and enhance the related functions and services on earth. We go to space not only to explore and discover new worlds but to position ourselves to explore, study and improve our wonderful Mother Earth.

Salient features of Green Aerospace:

- Disruptive technology and sustainability-driven from the drawing board, production to launching presenting industry's and business's best practices including undertaking global small satellite network or constellation.
 - All-encompassing consideration of the business environment in full context to succeed.
 - Sustainable, less costly, more cost-effective and efficient.
- This article aims to look at Green

Aerospace as a holistic, efficient, non-wastage, multi-pronged perfect storm of cutting edge of the universe technologies, including libonomy with strategic planning and SWOT analysis acting as conduit and wealth of revolutionary knowledge.

Libonomy is the enhanced version of the blockchain, being a digital distributed ledger decentralised, immutable and highly secured. Nearly all aspects are attributed to 'green'. Problems and issues current or future plaguing the industry identified and potential suggestions for resolutions.

The revelations, postulations and suggestions here will continue to positively resonate as a quasi 'blueprint' even if the Green Aerospace complex is yet to be built. But that does not stop the Green Aerospace digital industrial complex from making its actual existence.

Considering the situation during the pandemic and beyond, there needs to be a global critical redesign for crucial progress. Key performance areas for efficacious Green Aerospace are as follows:

Business environment and considerations

It is imperative to note the disruptiveness of six global megatrends of impactful

technology, demographic change, rapid urbanisation, economic power shift, climate change and resource scarcity to make long term goals and prepare for open talent economy. Green Aerospace sees the evolution and coining of Green-wave of Things (goT).

There is a need to study the industry's strengths, weaknesses, opportunities, and threats (SWOT analysis), paving the way for strategic planning to avoid egregiously costly mistakes. Getting it wrong can be truly expensive.

Reduce long-term product cycle, which the aerospace industry is known for. Due to new technology and intense competition, Green Aerospace is compelled to see opportunity and push for faster, wiser, and less costly innovation. However, highly innovative startups face slow moving aviation certification, regulations, and international standards as obstacles.

With the multifold increase in the use of online communications and the advent of IoT, there are more opportunities for sharing and giving knowledge. The players are interconnected and interdependent.

This will naturally give rise to collaboration and the possible global network or constellation of small satellites. Ideally,



via AR and IR in product design, taking designers to complex and out of this world realms.

Many space innovations have made their way into our lives, from cellphones, LASIC to invisible braces. Green Aerospace undertakes to 'consciously carry out parallel or collateral R&D in tandem with another research on space innovation to not miss out on the opportunity to expand the invention to terrestrial use.

Operations and products

Other than doing its innovations, Green Aerospace will utilise innovations by others, including waiting for the day when rocket fuel is made from water. Among the features of Green Aerospace operations and products other than being efficacious are aimed to be less costly, cost-effective and avoid wastage.

Libonomy enabled satellites are in the smaller but compact range called cube or small satellites going into low earth orbiting (LEO). There will also be a range called 'green satellites' made of wood now still being developed in Japan.

These wooden satellites will burn themselves out upon entry once they reach expiry and avoid space junks. A company uses giant balloons to help send satellites to space, cutting down on rocket and fuel at least by 80 per cent. A rocket with a satellite will blast into space after the former 'hitched' a ride with the balloon.

Green manufacturing

It is a given that production will use renewable energy and also green hydrogen. Manufacturing in Green Aerospace industry entails using production's best practices by harnessing Green Lean project management with links with a resilient supply chain.

Follow the processes and production methods used in the automotive industry. There are nimbler methods for building satellites using libonomy and AI. This includes the unprecedented ability to take satellites out of the production line and promptly repurpose them to create a first to market advantage.

Libonomy is used to do traceability on the materials to fulfil sustainability when procurement is done. Tracking the satellite supply chain entails the transfer and trust of all suppliers during each phase of procurement, production, testing, and launch. There will be a consensus of suppliers on changes made. Hence, transparency is paramount.

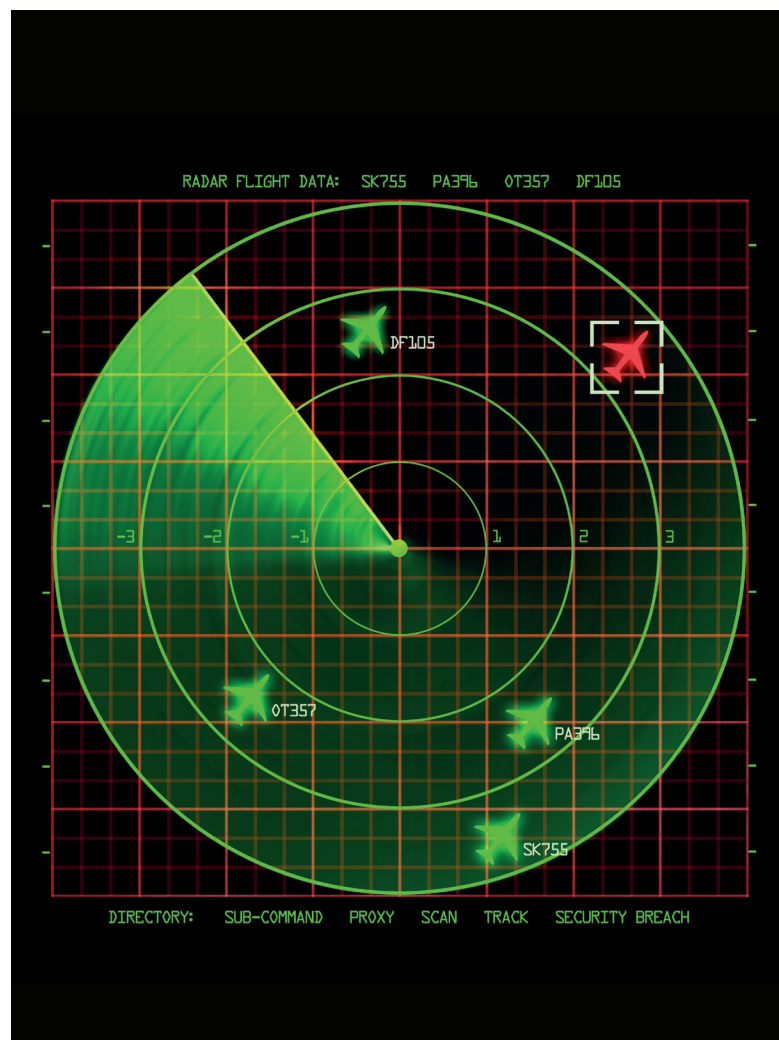
3D or additive manufacturing will help in efficacious production. The plethora of benefits includes design and print of more complex designs than traditional manufacturing processes, cost-effective, easy access, rapid prototyping, print on demand strong and lightweight parts, fast design and minimising waste.

Business model – Satellite-as-a-service

Besides applying the above best manufacturing practices for its use, Green Aerospace, through collaboration, can provide satellite-as-a-service like how we are using smartphones and top boxes for TV.

Other than the conventional use of satellites for collecting data on climate change or enhance internet connectivity and speed, a libonomy-enabled satellite that has libonomy applications in space is fertile ground for exponential growth and unprecedented new service capabilities.

Libonomy in satellites creates transparency, competency and trust in the satellite value chain. Smart contracts for the launching process, monitoring



space and satellite operations, and getting access to transparent information for insurance are among the services.

Executing governmental functions, especially with libonomy, can never be seen as a redundant payload.

Green Aerospace entry into the industry

Green Aerospace entry into the market may be seen as a disruptor in the industry with a proliferation of startups encouraged to come forth with disruptive innovations and technologies.

On the other hand, the incumbent conventional companies have the edge of being reliable in their stability and experience in the business and are much preferred by institutional customers.

Green Aerospace can make an impactful presence by going for a hybrid approach to have the agility of startups and stability of large incumbent companies.

Also to use in the long term to take measures such as using reusable launches, which cut costs to 50 per cent and balloons to help deliver satellites not only to operate cost-effectively and cut costs but also exercise sustainability.

Dr Kayyali was upbeat about the 'greening' activities happening in the various industries worldwide.

He said: "Green Technology is the future and fundamental approach to all industries, not only for aerospace. We are in future collaboration to develop a green technology to be used in our small satellite systems. It should also be launched into space using a green rocket with one of our partners in the US."

As one can deduce from this article, the Green Aerospace programme is a microcosm covering and committed to all the ideals of sustainability encapsulated in one entity. – @green

Zulkifli Ahmad is the founder of ESG Vision, a think tank advocating ideas and actions on sustainability. He is also a member of KSF Space Foundation USA and ICC's Chambers Climate Change.

there should be a worldwide network of satellites in the Asia Pacific green satellites constellation for optimum function and footprint coverage. And the constellation of satellites interdependently can work as 'nodes' for the productive operation of libonomy as part of the payload.

Dr Kayyali Mohamed, the founder of US KSF Space Foundation, added further insight on collaboration.

He said: "We usually have great channels with many countries in terms of cooperation with universities, colleges and schools to promote our space activities with affordable prices, especially for developing countries.

"This is one of the greatest things we are achieving in comparison with other aerospace companies seeking profitable business only. Because we are a non-profit organisation, we aim to expand the knowledge and know-how of the space industry to universities and schools."

The availability of investments for Green Aerospace may take it to territories not explored before because if the industry could be rated as efforts to be sustainable and ESG compliant, the industry can enjoy other types of funding. These can be ESG related funds, SRI and impact investments.

Inception processes

Green Aerospace inception processes for its products in R&D utilise the industry's best practices in its agile war room brainstorming, use of AI for product development processes, Virtual Reality

Many space innovations have made their way into our lives, from cellphones, LASIC to invisible braces. Green Aerospace undertakes to 'consciously carry out parallel or collateral R&D in tandem with another research on space innovation to not miss out on the opportunity to expand the invention to terrestrial use.'

Providing a thrust

SIRIM's Underwater Fish Attraction LED Lamp (UFAL) system improves productivity in aquaculture practices

BY FATIHAH MANAF

TECHNOLOGY creates a better living experience for people of all sectors. Within the scope of small entrepreneurs and manufacturers, an adequately utilised technology can significantly increase profit and productivity.

Noor Zalikha Mohamed Islam and Nik Mohd Azmi Nik Abdul Aziz, researchers at the Industrial Centre of Innovation in Sensor (IC-I Sensor) of SIRIM Berhad, shared with @green the Underwater Fish Attraction LED Lamp (UFAL), a system developed by SIRIM under MOSTI Social Innovation (MSI) fund. It could be introduced to the coastal fishermen as a Fish Aggregating Device (FAD) to increase daily catch.

According to the researcher, UFAL utilises the green light spectrum to attract various plankton, fish, crustaceans, and other larger species in marine or freshwater water environments.

"In the open sea, the green light spectrum is proven to be very effective in aggregating live organisms under the ocean water surface, which in turn provide abundant natural food for the pelagic fishes," said Noor Zalikha.

The SIRIM Industrial Innovation Model Fund (SIIMF) project in 2016 further improved the system based on the experiences in Langkawi, Yan and Pulau Aman.

She revealed that the field test at a floating fish farm in Kuala Muda, Kedah showed UFAL's significant benefits in the aquacultural productivity through operational cost reduction and shorter harvesting cycle.

"This technology could offer an alternative prospect in the marine aquaculture industry and help local SMEs to produce a reliable product to expand their business into new and niche markets. Based on the outcomes of field study, this promising technology could be the key to improve productivity in the marine aquaculture industry," said Noor Zalikha.

How UFAL system works

Noor Zalikha said that the lightweight 30W



Nik Mohd Azmi
Nik Abdul Aziz

output power LED lamp is made of conductive thermoplastic material for better heat dissipation in water. Depending on the availability of leading grid electricity, the system can be powered either by AC or DC power supply.

"In an isolated area, the solar power system is used to supply 24V DC for operating the system which the on/off switching, and dimming can be controlled manually or automated. The automated controller that SIRIM has developed can be used to control four units of UFAL independently for auto-scheduling and brightness level setting to eliminate worker intervention requirements.

"It is also installed with photocell sensor. If the sunlight level drops below the preset light intensity threshold, the system will be automatically on. However, the recommended operation hour for UFAL is throughout the night, normally from sunset to dawn where the lamp also provides surrounding ambient lighting for fish to see and hunt foods during their active hours."

The researcher said UFAL body casing with nano-coating material makes the cleaning process for the system much more accessible and recommends the maintenance work to be carried out every month to prolong its lifetime.

Aside from having local design, engineering, and expertise in its system, Noor Zalikha said the lamp can easily be integrated with Internet of Things (IoT) technology platforms for smart systems. The maintenance is recommended once a month to prolong its lifetime.

Advantages of UFAL in the local aquaculture practices

"Generally, the fish feed cost contributes 60 to 70 per cent of total operating cost for fish farming aquaculture," told Noor Zalikha.

In general, Nik Mohd Aziz said UFAL guides marine aquaculture entrepreneurs moving towards modern and sustainable farming, improves harvesting productivity, reduces operating cost and helps entrepreneurs to meet local and foreign demands market.

He shared that the advantages of UFAL in local aquaculture could be observed from its application at a fish cage farm in the brackish water river at Kuala Muda, Kedah.

"After 10 months of data collection for performance monitoring, the benefits can be observed from the differences in physical and growth rate of sea bass and grouper cultured between the control and under test cages," said Nik Mohd Aziz

"Under UFAL night green lighting, the growth of fish has been accelerated by 30 to 40 per cent, which indirectly shortens the harvesting cycle by around 20 per cent. For example, previously, it took at least 12 months for grouper to reach a market size of one kilogramme, whereas, with the UFAL application, the same batch of grouper reached the same weight within 10 months."

He highlighted the result reduced the

operation cost by 30 to 40 per cent on the feed cost per cycle.

"However, the duration of the harvesting cycle is very much depending on the nature of the environment, especially the natural food availability in surrounding water of the aquaculture sites," he explained, adding that the application also led to a lower mortality rate of fish larvae.

He noted that UFAL had attracted various marine fish species, with the abundance of phytoplankton and zooplankton species surrounding the lamp. Nik Mohd Aziz highlighted that at least 15 higher density population phytoplankton species had been identified under UFAL exposure, compared to only 11 species in non-UFAL cages. This scenario has then provided abundant natural food for cultured fish.

"Some species such as Limnithrix and Euglena prefer a non-UFAL condition due to their ability to grow and obtain energy under low light environments. As the phytoplankton are the food sources for zooplankton, its higher density from various species diversity has a direct impact on the higher density of zooplankton population around the lamp."

Success story in the field trial at Kuala Muda

According to Noor Zalikha, the UFAL application field test in the brackish water river of Kuala Muda was conducted for 12 months, starting from November 2017.

"This cultivation began with 3-inch larval size, where a continuous monthly monitoring and data collection on the weight, health, survivability, physical appearances, and parasite attacks was conducted and recorded. The fish in each cage were fed twice a day (morning & evening), either with commercial pellet or trash fish.

"The feeding management practise is per the recommended Feed Conversion Ratio (FCR), which is generally accepted between 0.7 to 1.5 for optimum growth. FCR is a tool for farmers to calculate the amount of feed necessary to grow a kilogramme of fish.

"After completing one harvesting cycle (12 months), the finding data has been able to convince the site owner on the benefits of UFAL application in his operation.

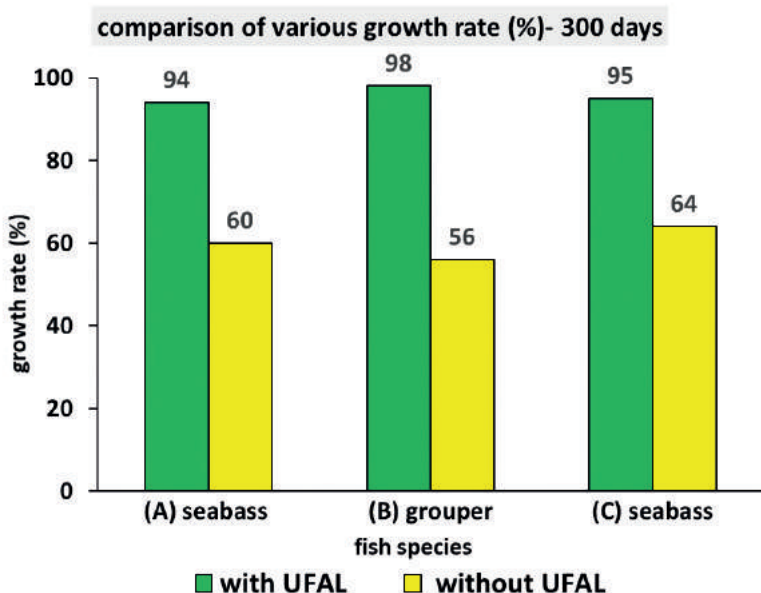
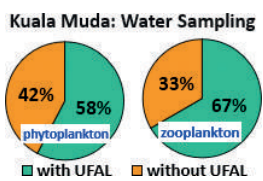
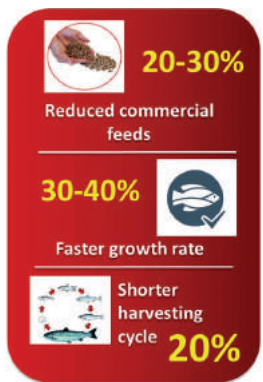
"By integrating the technology of UFAL with a suitable standard operating procedure (SOP) productivity in aquaculture can be significantly increased by reducing the feeding cost, harvesting cycle, and dependency on manual labour for cultivating a uniform growth of fish," explained Noor Zalikha.

In 2021, SIRIM Industrial Research launched the marketing and sales plan for UFAL commercialisation. It can be purchased directly from the ICI in Sensor, SIRIM. SIRIM will provide the guidelines for installation and operation for individual units. Still, for big-scale commercial projects, a consultation with SIRIM for a total technology solution is highly recommended. – @green

UFAL GREEN MAGAZINE



Noor Zalikha
Mohamed Islam



SEPTEMBER-
OCTOBER, 2021

@FOREST

Foreign incursion

Poachers from Indochina have encroached
Taman Negara to hunt wildlife and
steal agarwood **p26-27**



Mount Tahan, the highest peak in Peninsular Malaysia.



Taman Negara biodiversity challenge

Patrolling helps national park to identify hotspot areas for illegal activities

BY FATIHAH MANAF

MALAYSIA is one of the few mega biodiversity countries in the world. Due to Malaysia's rich natural resources and diverse flora and fauna, the region has attracted many poachers and greed-driven individuals to carry out illegal activities in its forests, including its national parks.

The Department of Wildlife and National Parks of Peninsular Malaysia (PERHILITAN or DWNP), a governmental organisation responsible for protecting, managing, and preserving wildlife and national parks, has come up with several measures to address this issue.

Rotary Club of Melawati, in a webinar titled 'Taman Negara biodiversity conservation and sustainability', invited Dzumie Heriman Mohd Nor, the Deputy-Superintendent of Taman Negara National Park, to share his experience in managing, planning and monitoring conservation efforts in the area.

Dzumie began by telling the participants about the history of the Taman Negara National Park.

"It's quite interesting because the early foundation of this place was set for the game reserve. That means the British officials will come here and hunt the wild animals, usually the big mammals such as elephants, Malayan gaurs and Sumatran rhinoceros," said the deputy superintendent.

However, he shared that the decrease of forest cover areas due to the demand for rubber in the 1930s had urged the

establishment of King George V National Park in 1939, which was then renamed into Taman Negara National Park after Malaya gained independence.

"Later in 1984, Taman Negara National Park was declared as Asean Heritage Park, and in 2014, it was listed under 'Tentative List' of UNESCO World Heritage."

Enforcement as the top priority

"It defeats the purpose of conservation if there's no enforcement," said Dzumie.

He said enforcement is essential to maintain the integrity of the national park from illegal activities such as poaching, forest encroachment, illegal hunting and logging. He revealed that the legislation involved in this enforcement was the Wildlife Conservation Act 2010 (Act 716) and the Pahang National Parks Enactment 1939 (Enactment 2).

"The strategy that we do is conducting regular and random patrols to increase the effectiveness of the patrols. We also concentrate the patrols in identified hotspot areas. We make sure the boundaries are properly marked to differentiate the area between the land inside and outside of the national park?"

He shared patrolling activities helped the national park to identify several hotspot areas for illegal activities.

"Regular patrol takes about three days until three weeks," he added.

"We have 118 staff members to oversee the whole national park, which is six times the size of Singapore."

Protecting agarwood trees and other species

He then included some pictures of

poachers who were arrested by the patrols in his presentation. They were arrested and charged with legal action, and the database of these arrests was then shared with the immigration to deny their future entry into the country.

"Most of them are from Vietnam, Cambodia, Thailand and Myanmar. The ones from Myanmar even wore army-like uniforms. Through our investigation, some of them even have military backgrounds."

Dzumie shared the primary purpose of these poachers coming into the Taman Negara National Park was to look for agarwood trees.

He said: "Unprocessed agarwood will cost about RM30,000 per kilogramme."

The agarwood trees in the national park would be cut down and left to decompose for several months, and these poachers would come back to take the high-value resin embedded heartwood.

He revealed the poachers would go into the jungle and stay there for three months. During the stay, they would bring along their equipment to catch wild animals.

"They're bringing snares and traps to catch wild animals for their consumption. For extra income, they're also targeting big mammals such as tigers, the Malayan gaur and Malayan sun bear," said Dzumie, before showing the webinar participants the equipment used by the poachers to extract agarwood.

"Sometimes, they bring along firearms and fish bombs."

He said the poachers usually came as tourists and extended their stay in the country.

Biodiversity conservation efforts

In terms of biodiversity conservation, Dzumie shared that Taman Negara National Park had conducted in-situ monitoring and conservation programmes focusing on wildlife species and their habitats.

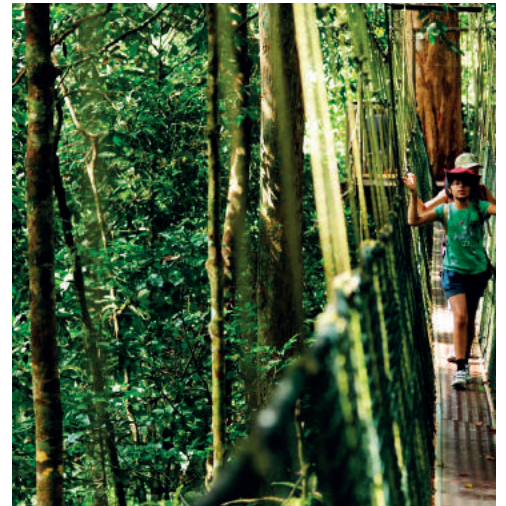
Additionally, they also collect information on wildlife and other related species for their database.

He stated that there were two units responsible for the conservation effort in the Taman Negara National Park, which are Wildlife Conservation Unit and Habitat Management & Enrichment Unit.

"In the Wildlife Conservation Unit, we are conducting the first National Tiger Survey (NTS) programme with the assistance of the Biodiversity Conservation Division of DWNP HQ, Kuala Lumpur.

"Some of the works involve area survey, installation and withdrawal of camera traps. Through camera traps, we





can get a lot of data regarding wildlife. “Our primary purpose is for the tiger, but through the installation of these camera traps in our jungle, we can get data for other species as well, such as elephants etc.

“Through these camera traps, we can also study the behaviour of these animals, even the distribution of the animals in our jungle. My staff would usually go inside the jungle on foot and spend about 20 days there.

They’ll be installing these camera traps and doing all the other stuff there,” added Dzumie, pointing out camera traps also work to capture the images of poachers and tourists who get inside the jungle.

He shared that the Wildlife Conservation Unit is also involved in managing wildlife conflicts in the areas near the national park. These conflicts usually occur due to the movement of the animals into the nearby plantations and villages.

“What we’re going to do is we’re going to survey the area and work out the solution. If the problem continuously happens, we will try to translocate the animal to the area that will minimise the conflict between wildlife and human beings.”

As for the Habitat Management & Enrichment Unit, Dzumie stated that the unit is responsible for animal surveys in some places identified as the grazing grounds inside the national park.

He explained: “What we do is we maintain the grazing grounds, and sometimes we put artificial salt lick to increase the nutrients for these ungulates.”

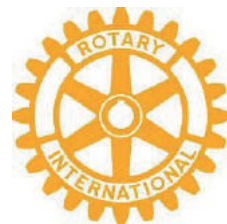
Gunung Tahan as the main attraction for hikers

According to Dzumie, the Habitat Management & Enrichment Unit also manages the Mahseer Fish Sanctuary located at Lubok Tenor and monitors all activities within the sanctuary.

“We study the behaviour of fish, the breeding cycle etc. We also encourage the local community to be involved with the tourism activities in this area.

He shared the national park also had

Taman Negara
 Biodiversity Conservation & Sustainability
 Rotary Club of Melawati
 Dzumie Heriman Mohd Nor
 Deputy Superintendant
 Taman Negara
 18 August 2021
 Wednesday, 18 Aug (GMT+8)
 ZOOM PLATFORM
 Zoom ID: 89445717565
 Passcode: Join4/50
 Biodiversity is crucial for the environment and mankind. It is of great importance in order to maintain stable ecosystems. The more diversity an area has, the healthier it is because it supports a large number of flora and fauna.



a Maintenance Unit that carried out maintenance works on the facilities in the area. The maintenance is to ensure facilities are in a satisfactory condition for the comfort of the tourists.

He revealed that these tourists come from 70 countries, with a consistently high number of international tourists coming from the Netherlands, followed by France, Germany, Spain, and the United Kingdom.

The national park maintained its tourist arrivals of around 80,000 visitors per year, but the number had dropped significantly due to the pandemic.

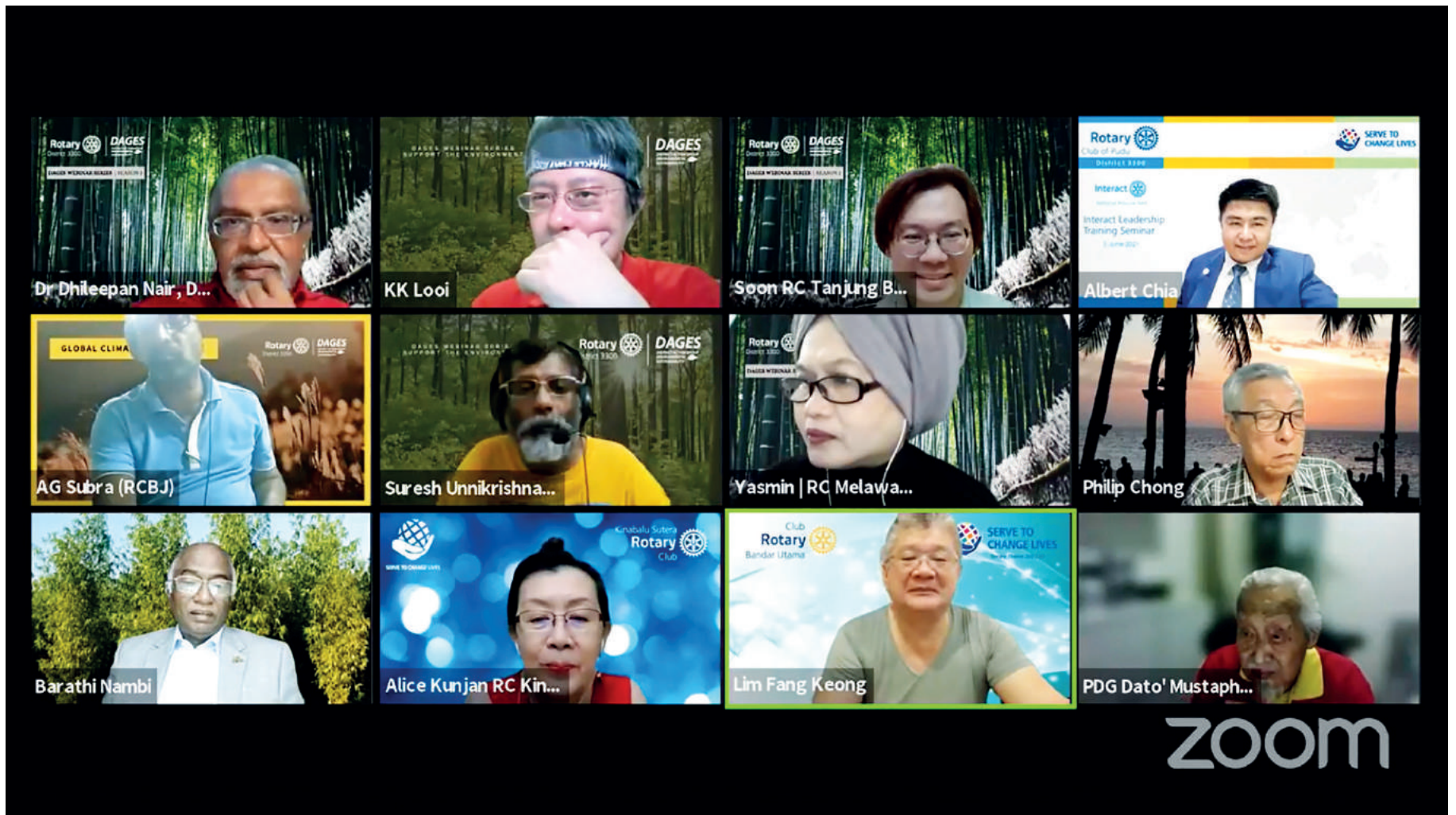
Regarding the tourism products, the national park offers its visitors various attractions and activities such as the Mahseer Fish Sanctuary, canopy walkway, wildlife observation, rapid shoot activity, jungle walk, hiking, camping, and visiting Orang Asli Batek settlement.

“One of the attractions for the hikers is climbing Mount Tahan, the highest peak in Peninsular Malaysia. The journey takes seven days from Kuala Tahan to Sungai Relau. We limit it to 48 hikers per day to minimise the impact on our nature trails. It is compulsory to hire a mountain guide for safety reasons because this is a virgin jungle, and the danger could be everywhere.

“Each mountain guide is only allowed to bring 10 hikers,” shared Dzumie. – @ **Forest**

Fish sanctuary in Lubok Tenor.





2 years old beema cut into 1 metre length from Growmore Biotech India.

Mitigating global warming through bamboo

Bamboo as a sustainable and economical solution for global warming



Oxygen park.



Wall thickness of Beema Bamboo & Regular Bamboo.



BEEMA BAMBOO GROWTH

24 Hrs

zoom

BY FATIHAH MANAF

THE efforts to reduce carbon footprints can be costly, but there is no price too high for protecting the world from climate change. Planting trees is one of the inexpensive solutions to climate change as trees play an essential role in carbon sequestration. They help to reduce the amount of carbon dioxide in the atmosphere.

In its second webinar series discussing this issue, the District Action Group on Environmental Sustainability (DAGES) organised another talk titled ‘Sustainable & Economic Solution for Mitigating Global Warming through Bamboo’.

The session’s speaker was Dr Barathi Nambi, an agricultural scientist and the Founder Director of Growmore Biotech Tamil Nadu.

According to Barathi, a new clone, Beema bamboo, has increased the average yield of bamboo to a very high level, attracting industrial investment in the cultivation of the plant.

With the rapid growth rate and high yield of bamboo, the scientist is pioneering in establishing bamboo plantation as ‘Carbon Farm’ to offset carbon footprints.

“Bamboo is like any other tree, but it grows one and a half feet a day. No other plant grows one and a half feet a day,” said the scientist.

He added that bamboo was one simple, cost-effective plant that simultaneously brings sustainability and produces other products.

Barathi revealed that one Beema bamboo could cool like a one-ton air conditioner continuously working for eight hours, absorb 6,000 litres of sewage water, clean 450kg of carbon dioxide and release 320kg of oxygen every year.

Beema bamboo takes less time to harvest

Barathi shared the average carbon produced by a person in Malaysia was 7.67 tonnes per year. In comparison to the Philippines, he said Malaysia’s carbon emissions had increased steadily since the 1960s.

“The graph keeps increasing. Can we flatten it, or can we bring it down?”

According to the scientist, to offset the CO2 emissions in Malaysia, each person needs to plant 19 Beema bamboos for the next five years. Barathi said bamboo was an excellent choice available to make the entire world carbon neutral.

He believed bamboo could help fighting global warming at a lower cost and more straightforward way.

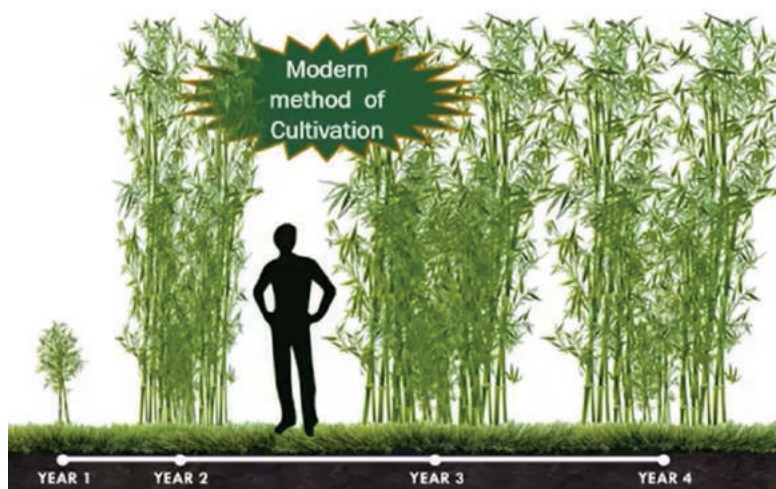
He then wondered why such an effort had not occurred in Malaysia and pointed out that Malaysia only had 0.17 million Ha of bamboos.

He said: “You have oil palm and others. They also do carbon sequestration but not to this extent.”

Barathi said if bamboos were cultivated separately, they could produce 25 tonnes of biomass per hectare. However, by adding sciences into the picture through precision farming, they could make up to 100 tonnes per hectare.

He revealed people could produce not only furniture out of those bamboos but also electricity and ethanol. This precision farming includes proper drip irrigation, tissue culture, a proper clone of the species, and calamity condition.

Barathi then revealed, in comparison to the conventional way of cultivation, which usually takes up to four years for bamboos to harvest, the modern method



Duration of modern cultivation.



of cultivation takes a shorter time. “In two years, it is ready to go.”

Bamboo helps environmental sustainability

Barathi then listed some aspects of bamboo that help with environmental sustainability, which are:

- i) It produces an excellent amount of oxygen
- ii) It stops soil erosion
- iii) It can increase water table and use sewage water
- iv) Helps tackle climate change

“It is not only good for the environment, but it is also excellent for the farmers. It gives you more money, less labour, less perishability of the product, and no more replanting.

“Bamboo can generate oxygen, and today it is coming up as oxygen parks.

“One human being is equal to one bamboo because one bamboo produces 250kg of biomass wood per year,” shared Barathi.

He revealed bamboo was able to retain water, increase humidity and reduce wind velocity. On top of that, bamboo could also produce bio-power electricity, bio-petrol, bioethanol, bio-compressed natural gas (CNG) for vehicles and bio-coal.

“It can replace coal. Coal is a big commodity with Malaysia importing it.”

The scientist said 80 hectares of bamboo could produce one MW of electricity every hour for 365 days.

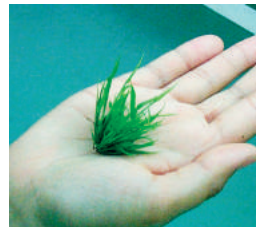
“Why? Because one kg of bamboo is sufficient to make 1KW current.

“It’s not carbon neutral technology like solar and wind, but it’s a carbon-negative technology. Every megawatt of current, every kilowatt of current produced, also produces charcoal which is good for the soil. And at the price of RM0.15, this is cheaper than solar,” shared Barathi.

He stated that 80 hectares of Beema bamboo as an energy plantation could keep on supplying continuously without



Dr Barathi Nambi



Tissue of Beema bamboo.

Bamboo for energy.

replanting through a process called pyrolysis. It would produce 8,000 MWh every year and also give a by-product called charcoal.

Future of liquid biofuels

Barathi then revealed instead of taking the gas (converted from bamboo) up to the generator and converting it into electricity, the gas could also produce crude oil.

He said: “You don’t need to dig below the ground and take it from fossil fuel.”

He then shared Shell had developed and patented a technology called IH2 Technology, which converted bamboo via a hydro-pyrolysis process. Through this process, they could produce charcoal as well as gas.

“The gas goes through the reactor to convert it to gasoline, jet fuel, diesel or kerosene. Whatever you want, it can be produced.

“And whatever emission comes is converted into hydrogen through another hydrogen plant and is put back into the biomass. So, nothing is emitted.

“Not only petrol or diesel, but it can also make even ethanol which is used for blending today,” shared him.

He said bamboo was potential lignocellulosic biomass for bioethanol production because of its high cellulose and hemicelluloses contents.

According to Barathi, 65 per cent of the material available in bamboo was fermentable.

“Which means it can produce ethanol via a process that takes one week. You initially treat the bamboo, and then you convert the bamboo into starch, starch into sugar, sugar into ethanol.

“So, four kgs of bamboo makes 1.2 litres of ethanol, which means one hectare can produce 25,000 litres of ethanol.

“Four kgs of bamboo make one kg of bio-CNG, and one hectare can make 12,500 kg of bio-CNG.”

Bamboo as an alternative to coal

He then explained that bamboo could be used directly to replace coal because coal has an energy value of 4,000 kcal/kg, similar to bamboo.

“In Malaysia, you are using 38 million tons of coal out of which you are importing 37 million of it. You are also exporting it, but then you are importing so much more coal from some other countries.”

He then further clarified that this situation could be substituted with 30 million bamboos with an area of 300,000 hectares.

He revealed that the factory in India, Dalmia Bharat Cement, had started utilising bamboo instead of coal. The factory has one of the lowest carbon footprints produced in the cement industry.

“You should have the best bamboo species, and the climatic condition as not all bamboo is going to do these 100 tons,” Barathi said.

He added that in achieving the biomass yield of 100 tonnes per hectare per year, the plantation needed the best bamboo species, best clone, best propagation tissue culture, best agronomy, high-density plantation and drip irrigation and fertigation.

He then showed the audience the growth of Beema bamboo, which could be cut down and trimmed after less than three years and ready to grow back in two weeks. Bamboo is also suitable for all types of soil.

“Bamboo is the next disruptive technology to dominate the future,” said Barathi. — @Forest



The Bukit Tabur saga

The weakness of the authorities in safeguarding our natural resources has long plagued our beautiful country

BY THE GREEN DUDE

“

It's my land, and I can do anything with it!”

How often have we heard these kinds of statements from landowners that they can do anything they want with their property?

So what if he hires tractors, bulldozers and workers to

work on the land? It's none of anyone's business.

Yes, it is your land, but you cannot abuse it! That's absolute nonsense!

We live in a community governed by an established set of rules and regulations. No one is an island, and I'm sure you must have heard of the adage “Your freedom ends where my nose begins”.

The local council laws clearly state that any development work, renovation work or agricultural and mining activities will need a permit from the local authorities because of its impact on the immediate surrounding.

Yet, the landowner of the piece of property in Bukit Tabur did not do the needful and did not bother applying for approval to work on his land. He bulldozed it with heavy equipment and clearing it extensively in a susceptible area which is also part of the water catchment area of Hulu Kelang.

The ensuing protests by residents' associations and environmental NGOs finally cost him an RM25,000 fine!

The Selangor Menteri Besar clarified the authorities did not approve the clearing works. A stop-work order had been issued, and the machinery was to be



impounded by the local authorities.

A property lawyer who is also one of the landowners in the area commented that there are no set procedures to conduct agricultural or land use activities near the Kelang Gates Quartz Ridge, where Bukit Tabur is situated. Bukit Tabur is home to the longest geological quartz formations in the world.

As a heritage site, its unique status is universally recognised and ought to be beyond compromise.

Managing our valuable resources

Herein lies another example of the weaknesses of the authorities in safeguarding our valuable natural resources, an issue that has long plagued our beautiful country.

As a nature enthusiast, I climbed

this ridge with my over 60-year-old classmates a few years back. On weekends hundreds of people climb the ridge, and if you want to experience a human traffic jam on a hill slope, this is the place.

And that is another issue that should be urgently addressed. Limiting climbers at any given time should be mandatory as it will inadvertently impact the vegetation, slope condition, fauna habitation and other relevant issues.

It shows we have failed to regulate our valuable natural resources heritage at the risk of losing it for our next generation.

Following the furore over the incident, a group of landowners in the neighbouring site came together to clarify their side of the story.

They wanted the authorities to



investigate and be transparent to prevent misunderstanding among the public. As landowners, they too wanted to develop their properties, so they needed proper and set guidelines from the authorities.

With the availability of remote sensing and drone technology, there should not be any excuse from the authorities if they claim that they are not aware of the activities on such a scale. Their job is to routinely monitor and enforce the rules and regulations as soon as infringements are detected.

The public is sick of listening to the same old excuses. And yet, even after gross violations, we keep hearing promises that it will not happen again, only to find out that a massive project has started.

This blatant disregard will have electoral consequences during the next council and even the State and general election.

The authorities need to clarify

The project at Lot 850 at the junction of Jalan Wangsa 1 and the MRR2, as highlighted in this column before, is set to proceed and advertisements are already ongoing in the media.

This is despite the absence of the Environmental Impact Assessment (EIA), Traffic Impact Assessment (TIA) and Social Impact Assessment (SIA) reports and the absence of the Advertisement Permit and Development Licence (APDL).

Coming back to the Bukit Tabur issue, specifically, the owners of Lot 758 and 759 Mukim Hulu Kelang, Gombak District have been instructed to proceed with remedial works within a specific

time frame.

The updates are also posted on the Ampang Jaya Deserves Better Facebook page, with a video showing the action taken by units of MPAJ, the Gombak Land Office and The Selangor Forestry Department in impounding the tractors and other heavy machinery from the site.

Residents and NGOs are alarmed that while hikers cannot climb the ridge due to the MCO, this machinery has cleared the forest to build a dirt road, allowing types of machinery to have access to the top of the hill.

How can the authorities say that they are not aware of this activity which has been going on for many months?

State must be transparent

Frankly, this is laughable. Indeed one cannot be faulted for wondering if there is some irregularity going on here.

This incident is one of many happening in the country that has gone out of control.

The public has made their stand clear. It is the authorities that have to buck up if public trust is to be restored.

The recent Kuala Langat North Forest Reserve issue is another case where environmental groups, notably The Malaysian Environmental NGOS (MENGO), have forced the State government to postpone the de-gazetting of the area until all issues raised have been been clarified and adequately addressed.

However, the fact remains the area has already been degazetted as notified in the State government Gazette. MENGO is calling for the State to be transparent and share the expert opinion conducted by a

Residents and NGOs are alarmed that while hikers cannot climb the ridge due to the MCO, this machinery has cleared the forest to build a dirt road, allowing types of machinery to have access to the top of the hill."

consultant that forms this rationale with the public. They wish to see the whole area gazetted again as a forest reserve.

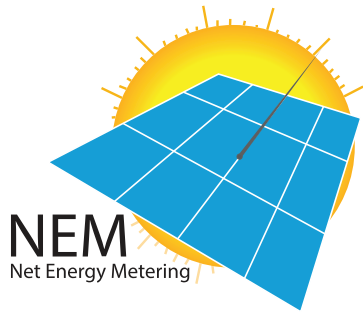
The voice of the people through organised NGOs and civil action groups, enhanced by online petitions, is both raising awareness and push back.

The public does not have to depend solely on their so-called elected representatives. It is now capable of organising itself as a force to be reckoned within the democratic parameters.

It augurs well for our citizens when we centre-stage issues impacting the future of our environment and systematically hold the feet of our elected officials to the fire of accountability.

The days are numbered for our elected representatives in Ampang and Gombak, who keep an undignified silence over these excesses. **@Forest**

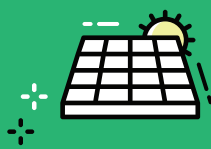
The Green Dude feels that on matters of the environment, politicians politicise the issues. There is a continued credibility deficit among the authorities unless the voice of the community is amplified through organised groups, NGOs and even NGIs (Non-Government Individuals) like himself using social media.



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Sarawak sets the trend

Sarawak Energy Group CEO Datu Sharbini Suhaili says Sarawak's Green plan is coming along, and the State's on the right track to achieve developed status by 2030. [p2-5](#)



Exporter of Energy



Hydropower has enabled Sarawak to offer competitive tariffs in Southeast Asia. [p6-8](#)

Schneider Electric's bold ambition



The global specialist in energy management and automation to be carbon neutral by 2040. [p12](#)

On target for 31 per cent RE by 2025



Power sector being heralded as one area to accelerate the economy post-pandemic. [p14-15](#)

COVER STORY



The 2,400MW Bakun Hydroelectric Plant.

Sarawak paves the way

Many industries were hit hard the past year during the global pandemic, but one of the few things which held steady and forged ahead was the rise in renewable energy

BY RITA JONG

THE EMERGENCE of renewable resources has changed world markets. The green industry is recognised as the way forward in reducing greenhouse gas emissions and energy supply. It is the era of climate investment and consumer-driven decarbonisation.

According to Forbes, despite the world coming to almost a halt during the Covid-19 pandemic, global renewable energy consumption grew by 9.7 per cent last year. Over the past decade, renewable energy consumption grew at an average annual rate of 13.4 per cent.

Hence, it is not surprising that companies are moving towards clean and renewable energy. Many corporations are recognising that it yields results in greater emphasis not only on the environment but also on a large economic scale.

While some are just beginning to make waves, State-owned Sarawak Energy Berhad, Malaysia's largest renewable energy provider, has already embarked on the energy market way before the term 'Go Green' became popular.

Group CEO Datu Sharbini Suhaili shared in a recent interview with @greenXtra how Sarawak's green plan was coming along and how the State was on the right track in achieving developed status by 2030.

On track to achieve sustainable goals

Sarawak has embarked on the renewable energy path for the past decade or so. The State's energy provider, Sarawak Energy, plays a pivotal role in meeting the demand for reliable and renewable sources through hydropower development.

Sharbini said Sarawak Energy had made tremendous strides over the past 100 years to transform from



Datu Sharbini Suhaili

a traditional utility into a modern and agile company and energy developer with regional ambition.

As a result of a decade's energy strategy focus and accelerated growth, Sarawak's power system has been decarbonised by as much as 68 per cent. It is on track to achieving its developed status by 2030.

"We provide power to light up our population of about three million across the State, in urban and rural communities, homes and

businesses through a sustainable energy mix," said Sharbini.

"We are accelerating our rural electrification programmes to support Sarawak's ambition. We want to achieve full electrification by 2025 or sooner, ahead of the United Nations Sustainable Development Goal (UN SDG) 7 target of 2030.

"In 2018, an allocation of RM2.37 billion from the Sarawak Government under the Accelerated Rural Electrification Masterplan spearheaded by the Ministry of

Utilities Sarawak and implemented by Sarawak Energy enabled the simultaneous implementation of the rural electrification strategies?"

Sharbini also said with urban areas fully electrified, rural electrification coverage in Sarawak rose to 95 per cent in 2020 compared to just 56 per cent in 2009. This is expected to reach 97 per cent in the coming months.

Generation mix

Thanks to its hydropower technology, Sarawak Energy offers the lowest average unsubsidised tariffs in Malaysia, among the lowest in the region.

"In 1921, when we were a small unit in the Public Works Department, electricity was supplied via diesel generators. In the early 1980s, before the commissioning of the 108MW Batang Ai Hydroelectric Plant (HEP), our generation mix was 65 per cent diesel and 35 per cent gas.

"Our hydropower story began in the mid-1980s when our 108MW Batang Ai Plant was commissioned."

"In the 1990s, our generation mix was 14 per cent diesel, 61 per cent gas, 12 per cent coal and 13 per cent hydropower."

"In the 2000s, there was strategic pivot to renewable energy and development of Sarawak Corridor of Renewable Energy (SCORE) to move towards industrialisation and further decarbonisation," said Sharbini.

It also saw the commissioning of the 2,400MW Bakun HEP in 2011 and 944MW Murum HEP in 2014. Hence, the generation mix eventually evolved to predominantly hydropower complemented by indigenous gas and coal for the security of supply. In 2016, hydropower in the generation mix had increased to around 75 per cent.

Sarawak Energy is also con-

COVER STORY



Artist Impression of the upcoming 1,285MW Baleh Hydropower Project.

structing the 1,285MW Baleh HEP, a concrete-faced rockfill dam with an elevation of 225m above sea level.

The renewable energy project, scheduled for completion in 2026, is located on the Baleh River, about 105km upstream from its confluence with the Rejang River in Kapit.

“Today, as a result of our renewable energy strategy and focus over the past 10 years and accelerated growth, we have decarbonised Sarawak’s power system by as much as 68 per cent from 2011 to 2019 and are on track to helping Sarawak to achieve its developed status by 2030,” he said.

It was also reported that Sarawak Chief Minister Datuk Patinggi Abang Johari Tun Openg had recently said environmental sustainability would be a critical factor in the State’s recovery effort and long-term growth.

This, he said, would pave the way for more investment inflow to Sarawak that will create solutions, more green jobs and business opportunities to drive the State’s economy sustainably.

Meeting the State’s need for reliable and renewable energy

Sarawak Energy harnesses its abundant natural resources to light up Sarawak and provide power for its growth.

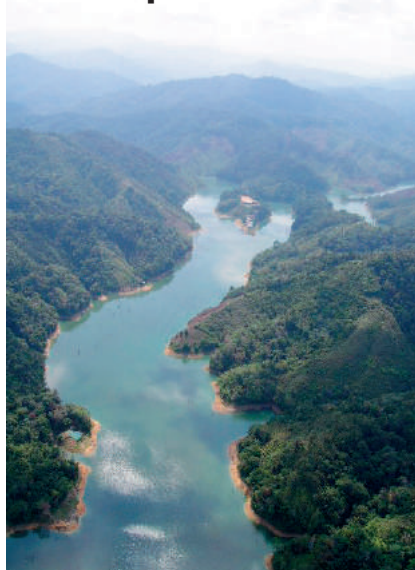
Sarawak’s geographical location and terrain is perfect for hydropower solutions because of its high volume of rainfall and elevated topography.

“These resources have enabled us to offer reliable and competitively priced electricity to our domestic, commercial, industrial and export customers.

“We aspire to be a renewable energy powerhouse and the battery of ASEAN sharing our renewable, reliable, affordable, and sustainable hydropower resources with our neighbours and growing our expertise in sustainable hydropower project development,” added Sharbini.

Sarawak had its first successful interconnection in 2016 when it began exporting energy to West Kalimantan in Indonesia through a 120km 275kV double circuit

We aspire to be a renewable energy powerhouse and the battery of ASEAN sharing our renewable, reliable, affordable, and sustainable hydropower resources with our neighbours and growing our expertise in sustainable hydropower project development.”



Sarawak’s geographical location is perfect for hydropower solutions due to the abundance of rain and elevated topography.

transmission line stretching from Mambong in Sarawak to Bengkayang, West Kalimantan.

In November 2020, Sarawak Energy also signed a memorandum of understanding with PETRONAS to collaborate on green hydrogen commercial production to venture into energy export with hydrogen as an energy carrier.

This tie-up marked a significant

milestone in Sarawak as it potentially positions the State as a critical hub for the hydrogen value chain.

In August, Sarawak and Sabah sealed a power supply deal when Sarawak Energy, through its subsidiary Syarikat SESCO Berhad, signed a Power Exchange Agreement and Interconnection Agreement with Sabah. The project is expected to commence end of 2023.

Sabah will be importing an initial 30MW to 50MW for 15 years via a 31km 275kV double circuit transmission line with a maximum design capacity of 300MW, which will run from Lawas in Sarawak to Mengalong, Sipitang in Sabah.

“We are on track to delivering on our ambition in transforming Sarawak Energy into a renewable energy powerhouse of Southeast Asia,” he added.

The role of hydropower in a sustainable future

Sarawak Energy is one of the most established hydropower players in the region. Compared to other forms of energy generation, hydropower has an advantage in eliminating the cost of fuel and contributes to reducing greenhouse gas emissions.

It offers the lowest Levelised Cost of Energy or LCOE, giving Sarawak a sustainable and competitive advantage. It allows the State to transfer savings to domestic consumers and attract energy-intensive industries by offering competitive bulk power tariffs.

“Hydropower is crucial towards meeting not just Malaysia’s goals but the world’s energy and climate goals.

“We are lucky to have rivers and the right terrain to enable us to harness our abundant renewable hydropower potential,” said Sharbini.

He said the world needed sustainable hydropower to help tackle the climate emergency. Investment over the long term in energy storage and grid resilience that hydropower provides is becoming ever more urgent to expand growth in renewables.

Malcolm Turnbull, former Australian Prime Minister, and Tony Blair, former United Kingdom

Prime Minister, on the opening day of the 2021 World Hydropower Congress (WHC), agreed the potential absence of sufficient hydropower capacity was the “ignored crisis within the climate crisis”.

Sharbini added, “Sarawak Energy is supporting and contributing towards Malaysia’s targets to the Paris Agreement by helping the country meet its Nationally Determined Contributions (NDCs) to reduce carbon emissions.”

Earlier this year, large hydropower was finally recognised by the federal government as part of renewable energy. It means Sarawak’s hydropower generation is counted in meeting the national renewable energy targets of 40 per cent by 2035.

Out of Malaysia’s total hydro generation capacity of 5,684MW, Sarawak Energy contributes 3,452MW of renewable energy from its stable of large hydropower plants.

“Our focus on renewable energy resource development has resulted in a decarbonised power system. It has also enabled us to embark on research into renewable energy alternatives including floating solar and hydrogen and launch of Sarawak’s first renewable energy certificate (REC).

“The newly-formed Green Hydrogen Organisation or GH2, chaired by Turnbull, and the International Hydropower Association (IHA), have committed to collaborate in addressing climate change issues by using sustainable hydropower to produce green hydrogen,” said Sharbini.

GH2 will promote green hydrogen production and use and establish a ‘GH2 Green Hydrogen Standard’ to ensure that green hydrogen is certified as coming only from low carbon sources.

“We are also working with global energy leaders to explore more sustainable options of renewable energy. IHA has recently been seeking public feedback on the San Jose Declaration on Sustainable Hydropower, a new manifesto for hydropower development that will identify principles and recommendations to guide new hydropower developments and enhance the sector’s contribution to the energy transition.”

“The final version of the Declaration was launched on Sept 24, 2021, at the 2021 WHC, where stakeholders were invited to express their support for the declaration,” he added.

Sarawak Energy voluntarily adopts IHA’s Hydropower Sustainability Assessment Protocol and, in 2011, formed a sustainability partnership with the IHA to ensure best practices in its hydropower development and operations, which include social issues related to project-affected communities.

The group has been a sustainability partner and platinum member of the IHA since 2010, and Sharbini was recently re-elected a member of the IHA Board.

IHA is the world’s most extensive and active hydropower network and was created under the United Nations Educational, Scientific and Cultural Organisation (UNESCO) in 1995 as the voice of sustainable hydropower. —@greenXtra



Sarawak Energy

COVER STORY

A sustainable energy future for Sarawak and beyond

Renewable energy sector expected to accelerate State's economic growth



Sharing renewable energy resources with regional neighbours: In 2016, Sarawak began exporting energy to West Kalimantan in Indonesia through a 120km 275kV double circuit transmission line stretching from Mambong in Sarawak to Bengkayang, West Kalimantan.



Sharbini with the Project Delivery team.

AS THE WORLD population grows and prospers, energy demand also increases. Instead of producing energy from non-renewable hydrocarbons such as coal, oil and gas, many stakeholders now look towards renewable energy sources for a simple reason: sustainability.

Sarawak Energy Group CEO Datu Sharbini Suhaili said that the global energy market was evolving, and there has been a clear shift in the demand for renewable energy.

"Governments play a key role in spearheading the sustainable development of renewable energy by endorsing or supporting enabling policies to accelerate the growth of sustainable renewable energy," Sharbini remarked.

In Sarawak, the renewable energy sector has been identified as one that will accelerate its economic growth. The sector aspires to achieve sustainable growth and prosperity for Sarawak by 2030 as Southeast Asia's powerhouse through affordable, reliable and renewable energy.

"We take a holistic view of

energy development - balancing energy security, sustainability and affordability - is vital to driving socio-economic transformation.

"As a result of the pivot to hydropower development about a decade ago under the Sarawak Corridor of Renewable Energy or SCORE, hydropower development has supported Sarawak's industrial growth, created job opportunities and enabled Sarawakians to enjoy lowest average power tariffs in Malaysia and amongst the lowest in the region," said Sharbini.

Sarawak's renewable energy generation capacity is 3,452MW, out of Malaysia's total large hydro generation capacity of 5,684MW, from the 108MW Batang Ai Hydroelectric Plant (HEP), 2,400MW Bakun HEP and 944MW Murum HEP.

It will increase by 1,285MW when the ongoing Baleh Hydroelectric Project is completed in 2026.

"This will eventually be counted in Malaysia's renewable energy target of 31 per cent of renewable capacity by 2025 and the ramp-up to 40 per cent by 2035," he said.

The challenge now is to attract new sources of finance into this sector.

"With the fast-paced global transition towards renewable energy, business as usual is not an option anymore. More banks are phasing out financing to fossil fuel activities and focusing on sustainable financing.

"Although Sarawak Energy is not a public-listed company, it has demonstrated its commitment to provide transparent corporate reporting for its shareholders and stakeholders by voluntarily disclosing its corporate, operational and sustainability performances through our Annual and Sustainability reports.

"Investors' demand and expectations have also shifted towards the adoption of ESG (Environmental, Social and Governance) best practices as a critical aspect and incorporating ESG considerations into their investment processes," he said, adding that transparency is key to attract lenders and investors in making informed decisions.

These are guided by local and international best practices such as Bursa Malaysia's Listing Requirements, the Malaysian Code on Corporate Governance, Global Reporting Initiative (GRI) Sustainability Reporting Standards, and incorporates recommendations from the Task Force on Climate-related Financial Disclosures.

Sharbini continued: "In 2020, we became the first corporate body in Malaysia to commit to the 'Business Ambition for 1.5°C' under United Nations Global Compact, joining another 249 companies around the world at the time."

"Signatories commit to set a science-based emission reduction target across relevant scopes per the Paris Agreement to pursue efforts to limit the global temperature increase to 1.5°C above pre-industrial levels by 2030."

In the same year, Sarawak Energy also became the first company in East Malaysia and the utility sector in Malaysia to secure a Sustainable-Linked Loan in the form of a RM100 million revolving credit facility from CIMB Bank Berhad.

He said this loan was linked to measurable sustainability performance targets. It marked another milestone in the company's ongoing sustainability journey to reaffirm commitment surrounding sustainability, mainly to keep its grid emission intensity in alignment with the Paris Agreement and light up 100 per cent of Sarawak by 2025 under the guidance of the Ministry of Utilities Sarawak.

"In the future, we intend to pursue other forms of ESG financing which extend benefits not just for the company but across the stakeholders including investors and lenders and ultimately improving the company's profile and reputation," he added.

Sarawak Energy recently marked a milestone when it signed an interconnection deal with Sabah Electricity Sdn Bhd to share its renewable energy resources and enhance connectivity and economic growth among the Borneo States.

Sharbini said the Power Exchange Agreement and Interconnection Agreement signed between Sabah Electricity Sdn Bhd and Syarikat SESCO Berhad, a subsidiary of Sarawak Energy, marked a historic achievement in the journey towards materialising the Borneo Grid and the broader ASEAN Power Grid.

"The agreements will pave the way for an initial export of 30MW for a term of 15 years via a 31km 275kV double circuit transmission line which will run from Lawas in Sarawak to Mengalong, Sipitang in Sabah and is expected to commence by end 2023."

"This collaboration brings us a step closer to a sustainable energy future for our people and beyond as we can share our renewable energy resources with our neighbours."

"It further contributes to the reduction of carbon emissions in the region, as well as ensure energy supply security and bilaterally optimised operation costs while attracting investments for economic transformation in the Borneo region," he said. — @greenXtra

COVER STORY

SARAWAK ENERGY is looking into the opportunities to commercialise low-carbon solutions, including clean energy technologies.

The strategic pivot to hydropower about a decade ago has decreased Sarawak's carbon intensity for power generation by 68 per cent from 2011 to 2019.

Group CEO Datu Sharbini Suhaili said that building upon the proven success of its renewable energy development strategy, Sarawak Energy was supporting the Sarawak government's Green Energy Agenda in the development of a low carbon economy and greener transportation system.

Solar

Sarawak Energy aims to maintain at least 60 per cent renewable energy capacity mix in Sarawak by 2030, with large scale solar contributing about four per cent of the generation mix.

"We are developing a 50MW floating solar at the reservoir of our Batang Ai HEP to take advantage of the synergy between hydropower and solar and to increase the proportion of renewable energy in Sarawak's generation mix."

Sarawak's abundant hydropower resources coupled with intermittent renewable energy like floating solar could provide reliable, renewable and affordable energy supply while further contributing to reducing carbon emissions in the region.

The initiative also contributes towards meeting regional renewable energy demand while attracting investments for economic transformation in the Borneo region.

This development is another step closer to realising the Borneo Grid and the development of the ASEAN Grid, as Sarawak's hydropower resources can serve as the battery bank in the region, allowing for higher penetration of intermittent renewable energy sources.

"The flexibility and storage capacity of hydroelectric plants make them ideal in supporting the use of intermittent sources of renewable energy, as they can store energy and generate when the other renewable resources are not available," he added.

Hydrogen

"We are exploring the production and application of green hydrogen to ensure Sarawak stays at the forefront of renewable energy leadership in this region."

Hydrogen is recognised globally as a fuel of the future for green energy, although still at the early stages of research and development. It is a versatile molecule that acts as an energy carrier and delivers a cleaner fuel in mobility and a feedstock to industrial chemical processes.

With its abundant renewable hydropower resources, Sarawak can produce green, carbon-neutral hydrogen through electrolysis.

In 2019, Sarawak Energy partnered with Linde Malaysia to commission Southeast Asia's first Integrated Hydrogen Production Plant and Refueling Station in Kuching.

This project lays the foundation for research into the commercial viability of a hydrogen economy for Sarawak through the production, delivery, storage, and utilisation of this "fuel of the future", particularly



Sarawak Chief Minister Datuk Patinggi Abang Johari (center) refuelling a hydrogen fuel cell vehicle at the launch of Southeast Asia's first integrated hydrogen production plant and refuelling station in Kuching.

Moving forward on green energy

Utility company supports Sarawak's vision to reduce reliance on fossil fuel and other nonrenewable resources



Sarawak Energy Group CEO, Datu Sharbini Suhaili (4th from right) presenting a Renewable Energy Certificate or REC to Goodwill Ambassador for United Nations Development Programme, Tan Sri Michelle Yeoh; witnessed by Sarawak Chief Minister Datuk Patinggi Abang Johari (3rd from right) and Minister for Utilities Sarawak, Dato Sri Dr Stephen Rundi Utom (2nd from right) at the launch of Sarawak's first REC at the inaugural Sustainable and Renewable Energy Forum or SAREF in 2019.

in a tropical environment.

Sarawak Energy is also forging collaborations with international corporations to collaborate on techno-commercial studies, exploring large-scale hydrogen production and export to meet the international clean energy market demand.

Mobility Electrification

The State-owned energy developer is also the first corporation in Sarawak to have both electric vehicles and hydrogen fuel-cell vehicles in its corporate fleet.

It supports Sarawak's vision of an emission-free public transportation sector and reducing their reliance on

fossil fuel and other non-renewable resources. The company is also sponsoring EV charging stations in the capital city Kuching.

Rural electrification via alternative energy

Working closely with the Sarawak government, the company is also ensuring the rural population enjoys the benefits of its focus on renewable energy and target to achieve full electricity coverage by 2025.

"In addition to grid-connected electricity that is predominantly renewable, Sarawak's rural communities enjoy off-grid access to alternative renewable energy sources

via solar and mini-hydro hybrid plants and solar PV systems," added Sharbini.

A rural electrification subsidiary arm, Sarawak Energy RES or SERES, was set up to look into Rural Electrification through a suite of grid and off-grid solutions.

"Our explorations and applications of renewable energy include innovative solutions to light up off-grid remote communities using standalone solar or mini-hydro systems until we can achieve grid-connectivity to these distant areas," Sharbini said.

Renewable energy sources, especially solar and mini-hydro, are harnessed to supply remote rural communities through the Sarawak Alternative Rural Electrification Scheme (SARES) for smaller and dispersed rural communities and Hybrid Scheme for larger remote communities.

Renewable Energy Certificate

Sarawak Energy also launched the State's first REC at the inaugural Sustainability and Renewable Energy Forum or SAREF in 2019.

Each certificate represents the environmental benefits of 1MWh of renewable energy generated in the State.

It serves as a mechanism for the credible purchase of sustainable renewable energy generated in Sarawak, allowing corporate participation in sustainable energy development and driving greater integration of sustainable renewable energy into energy supply chains for a cleaner energy landscape in the region. Sarawak has a comprehensive strategic plan to grow the renewable energy sector, and Sarawak Energy has a catalytic role as Malaysia's leading renewable energy provider.

All these enable Sarawak to play its role in addressing climate change, in line with the objectives of the Paris Accord as a platform for world economic growth powered by environmentally friendly energy. — @greenXtra



Southeast Asia's first integrated hydrogen production plant and refuelling station in Kuching.



Hyundai Nexo hydrogen fuel cell vehicle.

FOCUS



Menara Sarawak Energy.

Sustainable energy development with Sarawak Energy

Hydropower has enabled Sarawak to offer among the most competitive unsubsidised tariffs in Southeast Asia

BY GEORGETTE TAN

WITH CLIMATE Change being a global concern, Sarawak Energy remains firmly committed to delivering sustainable and clean energy through renewable hydropower and dialling down their emission in line with the Paris Agreement.

“Sustainability is key to maintaining our social license to operate and right to grow,” said James Ung, CEO of SEB Power, the generation arm of Sarawak Energy.

He told *@greenXtra* that they were focused on achieving balanced energy development to drive sustainable socio-economic transformation. It is a holistic view which balances energy Security, Sustainability and Affordability.

“We have always been focused on delivering a sustainable future for Sarawak by securing and providing renewable energy to accelerate growth. Since our venture into hydropower development, the benefits accrued have been very encouraging,” Ung said.

In line with their Borneo Power Grid ambition, Sarawak Energy currently has a Power Exchange Agreement with West Kalimantan and is pursuing interconnections with the region’s neighbours.

Hydropower, given it offers the



lowest Levelised Cost of Energy or LCOE, has also enabled Sarawak to provide among the most competitive unsubsidised tariffs in Southeast Asia, attracting significant investments from power-intensive industries to Sarawak’s shore, benefiting the people and State.

Sarawak Energy remains firmly committed to renewable hydropower development while progressing the United Nations Sustainable Development Goals (UNSDGs) for a sustainable energy future.

Sarawak Energy has been a sustainability partner and platinum member of the International Hydropower Association since 2010 and an early adopter of the association’s Hydropower Sustainability Assessment Protocol (HSAP) guidelines.

The protocol ensures best practices in its hydropower development and operations, including social issues related to project-affected communities.

Ung added they were embedding sustainability practices in their business and operations.

“Sarawak Energy also has an internal Sustainability Division that assesses our hydropower development and operations to improve sustainability strategies and performance.”

As part of the company’s commitment to transparency, Sarawak Energy’s overall corporate sustainability performance is also disclosed via its Annual & Sustainability Report, guided by Global Reporting Initiative (GRI) Standard.

“While hydropower has opened up the rural areas, spurring infrastructure development and economic opportunities, at the same time, the development of hydropower in Sarawak is based on sustainability principles, and a key focus is the effective conservation of the surrounding rainforest and its rejuvenation,” he added.

Sarawak’s first hydropower plant, Batang Ai, facilitated in the establishment of the Batang Ai National Park in 1989. The national park, which is within the HEP’s catchment area, is one of the world’s leading locations for wild Orangutan conservation and research.

The park and catchment area also protects part of the Lanjak-Entimau Wildlife Sanctuary in Sarawak and the Bentung-Kerihun National Park in Indonesia, a trans-



James Ung

boundary conservation zone crucial to the future survival of the Bornean orangutan.

These conservation efforts have made Batang Ai a preferred destination for low-impact ecotourism and rainforest research.

Similarly, these initiatives are being pursued for the islands on Bakun lake and the Baleh Hydroelectric Project, which is expected to be completed in 2026.

In 2019, Sarawak Energy signed a Memorandum of Understanding (MoU) with Sarawak’s Forest Department to collaborate on the Baleh Watershed Wildlife Connectivity Project for research and data gathering to conserve and protect the Baleh catchment area and its ecosystem.

This three-year project is part of Sarawak Energy’s integrated catchment management initiative

FOCUS



The 944MW Murum Hydroelectric Plant.



Operating for more than 30 years, the 108MW Batang Ai continues to create value and sustainability.

to support biodiversity conservation and build resilient hydropower resources through the protection of catchment areas and water resources.

The Baleh Watershed Connectivity Project is a continuation of the Heart of Borneo (HoB) scientific expedition in 2015, following which 66,721 ha of the surveyed area was officially gazetted as Baleh National Park within the Baleh HEP Catchment Area.

This effort is aligned with the international best practices of the HSAP and the UNSDGs, particularly SDG #15, which entails conserving biodiversity through the prevention of endangered species extinction and SDG #17, which calls for multi-stakeholder partnerships that mobilise shared-knowledge, expertise, technology and financial resources.

The collaboration effort also assisted the development of a long-term monitoring plan for wildlife conservation within the proposed Baleh HEP reservoir as part of the preparation for Wildlife Monitoring and Rescue (WiMOR) of Baleh HEP. Indeed with the inclusion of large hydropower in the nation's renewable energy (RE) definition, Sarawak is a primary contributor towards Malaysia's targets to the Paris Agreement by helping the country meet its Nationally Determined Contributions (NDCs) to reduce carbon emissions.

With this, the Federal government can strengthen Malaysia's COP21 commitment by revising the national RE capacity mix target from 20% to 31% by 2025.

Sarawak contributes 3,452MW of RE from its large hydropower plants of Malaysia's total large hydro generation capacity of 5,684MW. These are from the Batang Ai HEP (108MW), Bakun HEP (2400MW)



James Ung at the World Energy Council Congress in Abu Dhabi in 2019.

and Murum HEP (944MW) all operated by Sarawak Energy.

"The shift to clean and renewable energy is accelerating. It is a global shift that Sarawak Energy supports and is doing its part to contribute.

"Financiers, investors, and businesses are more inclined to forge collaboration with organisations that are socially responsible as this also reflects and affects their reputation," said Ung.

In June 2020, Sarawak Energy joined 249 companies worldwide to become Malaysia's first corporation to sign the "Business Ambition for 1.5°Celsius" with the United Nations Global Compact.

It also joined the 'We Mean Business' coalition where corporations set a science-based emission reduction target across relevant scopes, in line with the Paris Agreement to pursue efforts to limit the global temperature increase to

1.5°C above pre-industrial levels by 2030.

"We also secured an RM100 million sustainability-linked loan in the form of a revolving credit facility from CIMB Bank.

"It made Sarawak Energy the first East Malaysian company and the first utility company in Malaysia to secure a loan linked to measurable sustainability performance targets."

This loan is based upon sustainability performance targets (SPTs) to improve the environmental and social performance of Sarawak Energy from 2020 to 2023 financial years.

"And it serves as a reminder for us to keep our grid emission intensity in alignment with the Paris Agreement, and our pledge to 'Business Ambition for 1.5°Celsius' mentioned earlier," Ung explained.

Due to hydropower development, Sarawak has reduced its carbon

emission intensity from its power system by 68 per cent from 2011 to 2019.

"As the world progresses towards building a more sustainable energy future, we aim for Sarawak Energy to be a leader in RE at the national and regional levels through our role as a renewable hydropower developer and sustainability champion."

Being Malaysia's largest RE contributor and recognised amongst established global hydropower players, Sarawak Energy understands the importance of staying humble and improving how they undertake their projects and manage their power plants responsibly, learning from previous experiences.

"Our journey in pursuing renewable hydropower has been evolutionary, and we have gained so much experience-wise. We look forward to Sarawak Energy's continued growth for Sarawak and beyond." – @greenXtra

INSIGHT

INTERNATIONAL HYDROPOWER ASSOCIATION

Sarawak Energy Group CEO re-elected to IHA Board

Recognition of utility company's efforts and commitment to sustainable hydropower development

SARAWAK ENERGY'S Group Chief Executive Officer Datu Sharbini Suhaili has been re-elected to the International Hydropower Association (IHA) board.

Representing Asia, East and Pacific, Sharbini is among 18 hydropower leaders from six regions - Africa, Central & North America, South America, Europe, Central & South Asia and East & Pacific Asia - who form the new board on a two-year mandate beginning October 2021.

The board will guide IHA's work and priorities in the clean energy transition. Board members from the East & Pacific Asia region include Malcolm Turnbull, the former Prime Minister of Australia.

Sharbini has been serving on the IHA Board since 2017 after he took over as the Group CEO of Sarawak Energy, the State's primary energy developer and utility provider. In 2019, he was re-elected to continue advancing sustainable hydropower in Malaysia and Southeast Asia.

The re-election is a reaffirmation of Sarawak Energy's standing amongst established global hydropower players.

"This is a recognition of Sarawak Energy's efforts and a strong commitment to sustainable hydropower



development in meeting Sarawak and the region's need for affordable, reliable and renewable energy while progressing the United Nations Sustainability Development Goals (UNSDGs) for a sustainable energy future," Sharbini commented.

Under Sharbini's leadership, Sarawak Energy has advocated for large hydropower to be recognised as part of Malaysia's renewable energy mix. This was realised earlier this year when the federal government included large hydropower as part of the renewable energy definition for Malaysia.

Malaysia's largest renewable energy

Sarawak Energy is now Malaysia's largest renewable energy developer and provider.

"Since becoming a member of the IHA in 2010, we have been advocat-

ing for sustainable hydropower by showcasing its benefits through our active communication campaigns, in conferences and talks regionally and internationally.

"This re-election is a testament to Sarawak Energy's valued contribution and the importance of our voice on sustainable hydropower development worldwide despite being relatively a smaller organisation from the island of Borneo compared with the other hydropower development companies in the IHA. It goes to show that our brand value is visible and increasingly respected," he said.

Sarawak Energy is one of the early adopters of the guidelines in IHA's Hydropower Sustainability Assessment Protocol (HSAP) to drive responsible development and operation of its hydropower portfolio.

The renewable energy developer

is currently adopting the HSAP for its largest hydropower project to date, the ongoing 1,285MW Baleh Hydroelectric Project, to embed sustainability best practices into the project's development and operation.

Sharbini added: "It is indeed an honour and privilege to be on the Board of the IHA. Sarawak Energy looks forward to partnering IHA in helping combat climate change by advancing the role of hydropower as a significant contributor to renewable energy targets"

IHA is the world's most extensive and active hydropower network and was created under the United Nations Educational, Scientific and Cultural Organisation (UNESCO) in 1995 as the voice of sustainable hydropower.

Members of the IHA are active in more than 100 countries and include organisations engaged as hydropower owners and operators, developers, designers, suppliers and consultants.

Sharbini was also one of the speakers at the high-level opening plenary of the 2021 World Hydropower Congress (WHC), alongside Carlos Alvarado Quesada (President of Costa Rica), Executive Director for International Energy Agency, Dr Fatih Birol, Helen Clark (Former Prime Minister of New Zealand) and Roger Gill (President for IHA), among other leaders.

The WHC is a biennial forum organised by the IHA, bringing together industry, governments, international organisations, financial institutions and civil society representatives to set the course for sustainable hydropower development.

This year's WHC themed 'Renewables Working Together' took place on Sept 7-24. — @greenXtra

ACCELERATING ENERGY transitions on a path to climate safety can grow the world's economy by 2.4 per cent over the expected growth of current plans within the next decade, a new analysis from the International Renewable Energy Agency (IRENA) shows.

The Agency's 1.5°C pathway foresees the creation of up to 122 million energy-related jobs in 2050, more than double today's 58 million. Renewable energy alone will account for more than a third of all energy jobs employing 43 million people globally, supporting the post-COVID recovery and long-term economic growth.

IRENA sees renewables-based energy systems instigating profound changes that will reverberate across economies and societies. Quick adjustments in capital flows and a reorientation of investments are necessary to align energy with a positive economic and environmental trajectory.

Forward-looking policies can accelerate the transition, mitigate uncertainties, and ensure maximum benefits of the energy transition. The annual investment of US\$4.4 trillion needed on average is high. But it is feasible and equals around five per

IRENA's narrative for nett-zero world



Francesco La Camera

cent of global GDP in 2019.

"The World Energy Translation Outlook represents a concrete, practical toolbox to the total reorientation of the global energy system and writes a new and positive energy narrative as the sector undergoes a dynamic transition," said Francesco La Camera, IRENA's Director-General.

"There is consensus that an energy transition grounded in renewables and efficient technologies is the only way to give us a fighting chance of

limiting global warming by 2050 to 1.5°C. As the only realistic option for a climate-safe world, IRENA's vision has become mainstream.

"Energy transformation will drive economic change. The energy transition is a daunting task but can bring unprecedented new possibilities to revitalise economies and lift people from poverty.

Unique value

"IRENA's Outlook brings unique value as it also outlines the policy frameworks and financing structures necessary to advance a transition that is just and inclusive.

"Each country will define what the best for them is, but collectively, we must ensure that all countries and regions can realise the benefits of the global energy transition for a resilient and more equitable world. We have the know-how, we have the tools, we need to act and do so now.

"The next decade will be decisive to achieve the Paris and Sustainable Developments goals. Any delay will drive us in the direction of further

warming, with profound and irreversible economic and humanitarian consequences."

Phasing out coal, limiting investments in oil and gas to facilitate a swift decline and a managed transition, and embracing technology, policy and market solutions will put the global energy system on track for a 1.5°C pathway.

By 2050, a total of US\$33 trillion of additional investment are required into efficiency, renewables, end-use electrification, power grids, flexibility, hydrogen and innovations. The benefits, however, greatly exceed the costs of investments.

When air pollution, human health and climate change externalities are factored in, the payback is even higher with every dollar spent on the energy transition adding benefits valued at between US\$2-5.5, in cumulative terms between US\$61-164 trillion by the mid-century.

IRENA's Outlook sees energy transition as a significant business opportunity for multiple stakeholders, including the private sector,

INSIGHT

● WORLD HYDROPOWER CONGRESS

Sarawak Energy shares its story

Sustainability is key to maintaining company's social licence to operate

HYDROPOWER HAS paved the way for a sustainable energy future for Sarawak and beyond while also providing the foundation for Sarawak Energy's aspiration to be the green energy specialist of the region.

Sarawak Energy Group CEO, Datu Sharbini Suhaili, shared an overview of Sarawak's journey in sustainable hydropower development at the 2021 World Hydropower Conference.

Organised by the International Hydropower Association (IHA), the biennial congress provides a platform to share experiences showcasing examples of best practices and the guiding policies and strategies of the industry.

Held virtually for the first time, the theme for this year's congress is 'Renewables Working Together in an Interconnected World', under the patronage of the President of Costa Rica, supported by Instituto Costarricense de Electricidad (ICE).

At the opening plenary session during the launch event, Sharbini joined a panel with distinguished speakers Dr Ashok Khosla (Chairman of the Hydropower Sustainability Council) and Pavan Sukhdev (President of WWF International) to discuss "Challenges and Opportunities of Hydropower Over the Next Decade".

Sharbini highlighted the benefits

of renewable hydropower and how Sarawak Energy champions sustainability in its business and operations.

"Sustainability is key to maintaining our social licence to operate and right to grow, and everyone has a part to play in this. The global energy market is evolving and there has been a clear shift in the demand for renewable energy," Sharbini said.

"Sarawak Energy is Malaysia's largest renewable energy provider through a power generation mix that is predominantly hydropower. We aspire to be the green company of the region, sharing our renewable, reliable and affordable hydropower resources with our neighbours."

During the panel discussion, speakers shared their thoughts on various aspects of hydropower, focusing on sustainability. The discussion provided a balanced overview of the positive and negative impacts of hydropower development, concluding that sustainable hydropower development would result in more benefits, especially with the inclusion of the standards and commitment to the San Jose Declaration.

The Declaration, which delegates will debate throughout the congress, is a manifesto for change to spur more sustainable hydropower developments. It also sets out an ambitious new set of principles

and recommendations to guide new hydropower development and advance the sector's contribution to the clean energy transition.

Renewable energy sector

During the forum, Sharbini highlighted the genuine benefits of hydropower now enjoyed by Sarawak.

"Over a decade ago, the renewable energy sector was identified as one of the sectors to accelerate economic development in Sarawak.

"Hydropower offers the lowest Levelised Cost of Energy or LCOE. It gives Sarawak a sustainable and competitive advantage to transfer the savings to our domestic customers. At the same time we can attract energy intensive industries by offering competitive bulk power tariffs," added Sharbini.

Sarawak Energy offers the lowest average unsubsidised tariffs in Malaysia and among the lowest in the region. In addition to energy affordability, Sarawak's focus on hydropower has enhanced sustainability by delivering energy security and reliability and helping to power Sarawak's ambition to achieve developed status by 2030 through hydro-industrialisation from Sarawak Corridor of Renewable Energy or SCORE.

Sharbini also shared how Sarawak Energy is embedding sustainability practices in its business and operations, highlighting that its projects are developed according to the International Hydropower Association (IHA) Sustainability Assessment Protocol.

"We also have an internal Sustainability Division that assesses our hydropower development and operations to improve sustainability strategies and performance.

"Sarawak Energy's overall corporate sustainability performance is disclosed via our Annual & Sustainability Report, which is guided by Global Reporting Initiative (GRI) Standard as part of our commitment to transparency."

Hydropower Sustainability Assessment Protocol

Sarawak Energy voluntarily adopted the Hydropower Sustainability Assessment Protocol. In 2011, it formed a sustainability partnership with the IHA to ensure best hydropower development and operations practices, including social issues related to project-affected communities.

The Group is a sustainability partner and platinum member of the IHA since 2010 and Sharbini was recently re-elected as a member of the IHA Board.

Last year, Sarawak Energy became the first corporation in Malaysia to commit to the "Business Ambition for 1.5° Celsius" under United Nations Global Compact, joining another 249 companies around the world at the time.

Signatories commit to set a science-based emission reduction target across relevant scopes, in line with the Paris Agreement to pursue efforts to limit the global temperature increase to 1.5°C above pre-industrial levels by 2030.

Aside from the Declaration, the 2021 World Hydropower Congress saw a range of significant announcements and commitments made by and on behalf of the hydropower sector, including the launch of the Hydropower Sustainability Standard, a new Environmental Social, and Governance or ESG certification scheme, as well as recommendations from the International Forum on Pumped Storage Hydropower, co-chaired by the United States Department of Energy.

The congress was on Sept 7-24, 2021, with virtual sessions across multiple time zones bringing discussions to participants worldwide.

Sharbini shared an overview of Sarawak's journey in sustainable hydropower development at the opening plenary session during the launch of 2021 World Hydropower Conference. – @greenXtra



shifting funding from equity to private debt capital. The latter will grow from 44 per cent in 2019 to 57 per cent in 2050, an increase of almost 20 per cent over planned policies.

Energy transition technologies will find it easier to obtain affordable long-term debt financing in the coming years. At the same time, fossil fuel assets will increasingly be avoided by private financiers and therefore forced to rely on equity financing from retained earnings and new equity issues.

But public financing will remain crucial for a swift, just and inclusive energy transition and catalyse private finance. In 2019, the public sector provided US\$450 billion through public equity and

lending by development finance institutions.

In IRENA's 1.5°C scenarios, these investments will almost double to US\$780 billion. Public debt financing will be an essential facilitator for other lenders, especially in developing markets.

Policymakers

As markets alone are not likely to move rapidly enough, policymakers must incentivise and eliminate market distortions that favour fossil fuels and facilitate the necessary changes in funding structures.

This will involve phasing out fossil fuel subsidies and changing fiscal systems to reflect the negative environmental, health

and social costs of fossil fuels. Monetary and fiscal policies, including carbon pricing policies, will enhance competitiveness and level the playing field.

Enhanced international cooperation and a comprehensive set of policies will be critical to driving the broader structural shift towards resilient economies and societies. If not well managed, the energy transition risks inequitable outcomes, dual-track development and an overall slowdown in progress.

Just and integrated policies will remain imperative to realise the full potential of the energy transition.

Today's policies, finance and socio-economic analysis complete the outlined technological avenues for a 1.5°C-compatible energy pathway, providing policymakers with a playbook to achieve optimal results from the transition.

Launched by energy leaders at the Agency's Global High-Level Forum on Energy Transition, this Outlook aims to raise ambition towards UN High-Level Dialogue on Energy and Climate Conference COP26 later this year.

– @greenXtra

OPINION

The unequivocal case for decarbonisation

We have become the first generation who cannot say that we did not know about climate change



BY GREGERS REIMANN

FOR SEVERAL YEARS, it has been understood and widely accepted that human activity, such as burning fossil fuels, is causing climate change. But it was never affirmed as a fact, that is, until the publication on Aug 6, 2021, of the latest IPCC Climate Report approved by 195 governments.

The report states that human activity is “unequivocally” the cause of rapid changes to the climate, including sea level rises, melting polar ice and glaciers, heatwaves, floods and droughts.

At the report’s release, the United Nations secretary-general António Guterres warned it was a “code red for humanity. The alarm bells are deafening, and the evidence is irrefutable: Greenhouse gas emissions from fossil fuel burning and deforestation are choking our planet and putting billions of people at immediate risk”.

In other words, we have become the first generation who cannot say that we did not know about climate change and its existential threat to humanity.

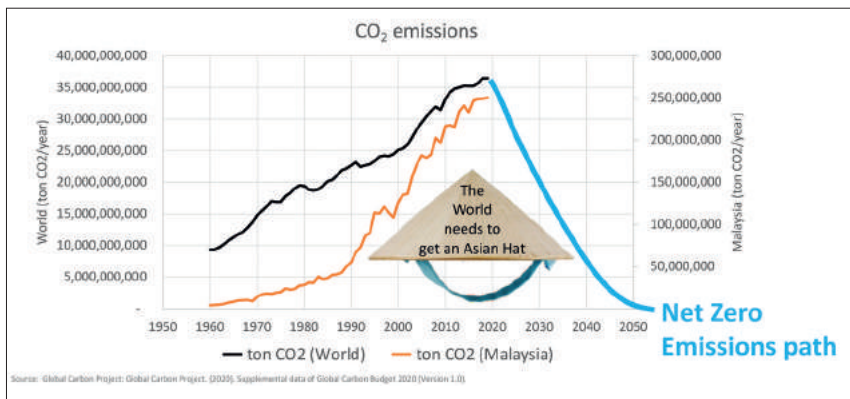
Urgent climate action is needed to avoid a climate catastrophe. It includes reducing global greenhouse emissions to half by 2050 and achieving complete decarbonisation by 2050.

The UN secretary-general is calling for an end to new coal plants and ending further fossil fuel exploration and development. He also implores governments, investors and businesses to be laser-focused on creating a low-carbon future by stating that the IPCC report should be seen as a “death knell for coal and fossil fuels before they destroy our planet”.

To what extent do these stark climate change warnings resonate with the Malaysian public? Quite a lot, judging both from a March 2021 street survey, where 95 per cent of the respondents agreed climate change was a global emergency.

During a series of private-sector roundtable discussions earlier this year, participants gave a clear mandate for the Malaysian government to set ambitious and mandatory low-carbon targets and welcomed the introduction of carbon taxation.

In one of the roundtable polls, 91



Greenhouse gas emissions – and the decarbonisation path to avoid catastrophic, irreversible climate change

Urgent climate action is needed to avoid a climate catastrophe. It includes reducing global greenhouse emissions to half by 2030 and achieving complete decarbonisation by 2050.”

per cent of the respondents thought that Malaysia should set a net zero emissions target by 2050, and 87 per cent believed that Malaysia should introduce a carbon tax.

The CEO Action Network (CAN) and Climate Governance Malaysia (CGM) organised these roundtable feedback sessions, which compiled a list of low-carbon policy recommendations for the Malaysian government.

Equally important, there is a good business case to be made for transitioning away from fossil fuels, especially when including the external costs.

For example, the air pollution from the burning of fossil fuels causes at least seven million deaths per year, or about 20 per cent of all deaths globally, which comes at an enormous cost to society.

According to the World Health Organisation (WHO), burning fossil fuels is the most significant

environmental threat to human health. Consequently, for the first time in 16 years, WHO has adjusted its recommended limits for air pollution to save millions of lives.

The Solutions Project lead by Stanford University calculates what it takes to transition to 100 per cent renewable energy, both in terms of energy planning (energy efficiency, renewable mix, energy storage and grid expansion) and economics.

Once the cost of externalities is applied, the payback time becomes economically attractive.

In Malaysia’s case, a transition to 100 per cent renewable energy is calculated to have a payback time of only 1.8 years. It saves about 10,000 lives every year and creates close to half a million jobs.

Two-thirds of this energy will come from solar energy, and the rest mostly coming from wind power.

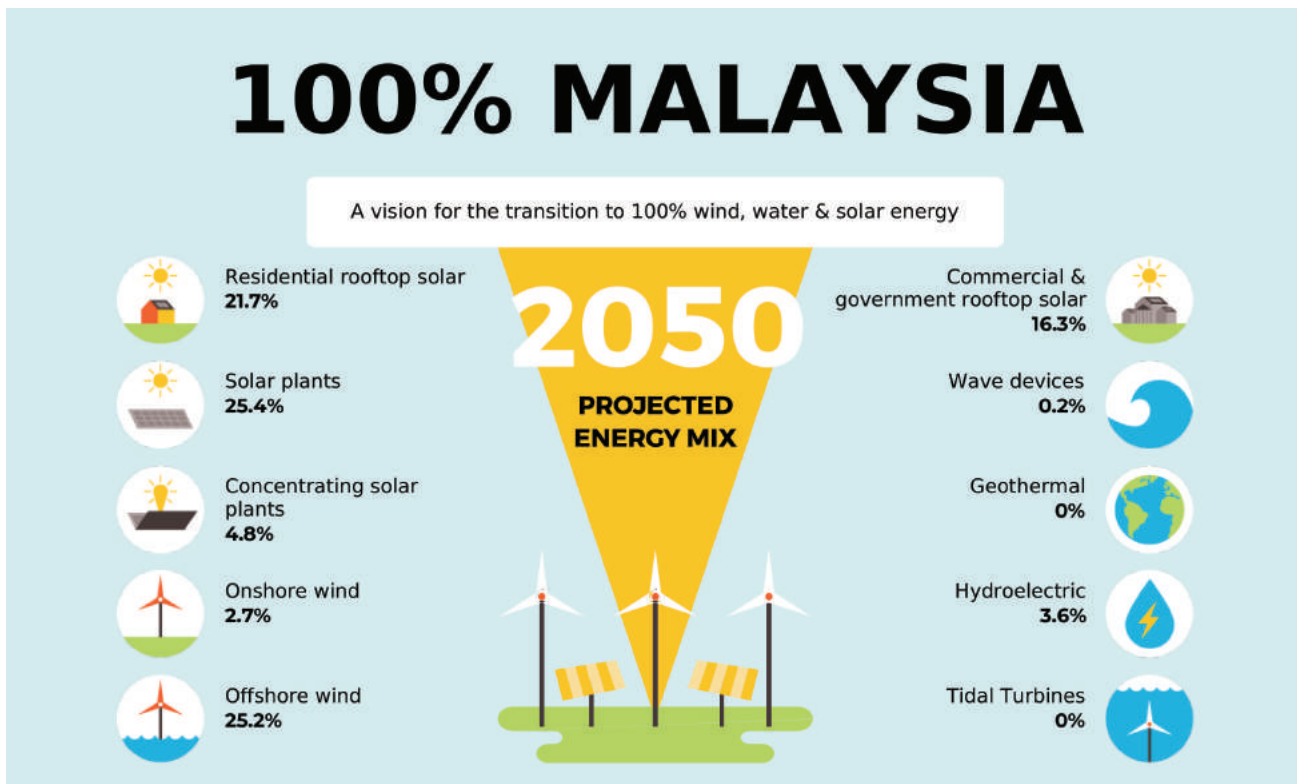
For the world to transition to 100 per cent renewable energy, a similar picture emerges with a payback time of just 1.4 years. According to The Solutions Project, energy efficiency will account for 57 per cent of the energy savings, while the remaining energy consumption will be covered by solar energy and wind power.

For decades, global and Malaysian greenhouse gas emissions have been increasing and have shown no sign of slowing down. Changing course to pursue a path of rapid decarbonisation will therefore not be easy.

Thankfully, weighty arguments for undertaking this 100 per cent renewable energy include broad public support, sound economics and the moral imperative of leaving a livable planet for our kids and future generations. And we need to get started immediately.

As of last month, we are the first generation, who cannot say that we did not know! – @greenXtra

Gregers Reimann is the managing director of IEN Consultants Sdn Bhd - a pioneering green building in Malaysia with a specialisation in efficient and healthy buildings.



Proposed energy mix for Malaysia after transitioning to 100% renewable energy.

(Source: The Solutions Project, 2021)



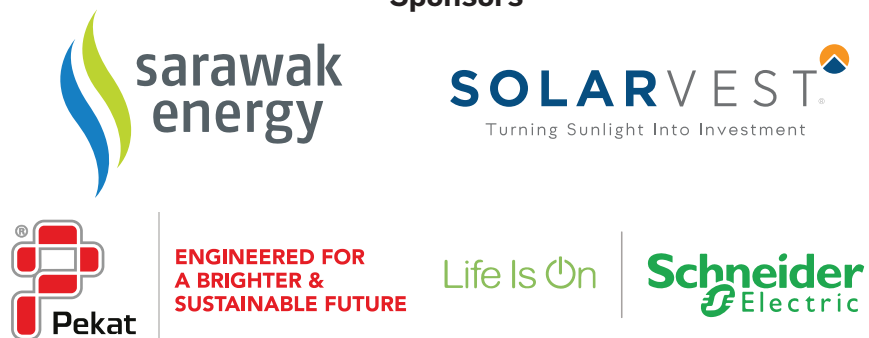
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INSIGHT

Schneider Electric's bold ambition

The global specialist in energy management and automation to be carbon neutral by 2040



BY FATIHAH MANAF

DUE TO its commitment and contribution to sustainability, Schneider Electric was voted the most sustainable corporation in 2021 by Corporate Knights Global. The company built its substantial presence in sustainable energy management by providing integrated solutions to its global customers.

Manish Pant, the Zone President for East Asia & Japan of Schneider Electric, believed the drive to limit the temperature rise to 1.5 degrees was crucial and that renewable energy was at the centre of it. He highlighted digitisation as the way forward to advance sustainability further.

“Schneider’s purpose is to empower all. We want to make the most of our energy and resources, bridging progress and sustainability for all. We call this ‘Life Is On’. It is our mission to be the partners of our customers for sustainability and efficiency,” said Pant.

He explained sustainability had been at the core of Schneider Electric’s corporate strategy.

“It’s a commitment was extended across all our business operations in buildings and the end-to-end supply chain,” he told @greenXtra.

Setting an ambitious carbon neutral goal

Pant revealed the company had set a bold ambition by setting the target to be carbon neutral by 2040, 10 years ahead of the world’s target. He also shared that Schneider Electric’s East Asia & Japan headquarters in Singapore, where he’s based, was 100 per cent solar-powered.

“It’s a 25-year-old retrofitted building. We have reduced carbon emissions by almost 1600 tonnes,” said Pant, adding Schneider Electric’s factory in Shah Alam was also fully sustainable as it generated its solar energy.

“What we do for us, we also do for our customers. We have our sustainability services doing up to 10 gigawatts of renewable energy sourcing for our clients worldwide.

“We are committed to having our energy completely moving to renewables for what we consume in Schneider Electric by 2030.”

Pant shared that, since 2018, Schneider Electric has helped customers save and avoid 302 million tons of carbon dioxide emissions through its solutions.

“One of the things that we have done in April this year is to launch our zero-carbon project, which is very ambitious, where we part-



Schneider’s purpose is to empower all. We want to make the most of our energy and resources, bridging progress and sustainability for all. We call this ‘Life Is On’. It is our mission to be the partners of our customers for sustainability and efficiency.”



Manish Pant.

ner with our top 1000 suppliers representing almost 70 per cent of Schneider’s upstream carbon emission.

“Together with them, we want to reduce the footprint by 50 per cent by 2025. It’s a very bold ambition.

Sustainability is about working on the full ecosystem. Therefore, it is important to embark with our partners on this journey.”

Implications of renewable energy growth

He believed the growth of renewable energy deployment at the centre of the Southeast Asian region would have huge implications.

He explained: “It is helping in the growth of technology. So, it is helping us to continue to innovate, to invest and to keep on making sure that this technology will become much more cost-efficient.”

Pant emphasised the growth would also lead to the advanced distribution management system, which would result in higher resiliency and reliability of energy grid and storage. He shared that Schneider Electric worked with multiple utility companies to integrate renewables into the utility system and provide automated restoration optimisation of the grid performance.

“I would say the third key implication is on employment. The higher the deployment of renewable, the higher the job prospects in the renewable sector.

“It’s also helping in terms of gender balance. In the energy sector, women account for on average 32 per cent of the jobs in renewables.”

Pant agreed the landscape of politics, social and economics had also changed following the evolution of the energy sector. He believed the deployment of renewable energy would also give significant implications to financing.

“In the world of clean energy, a

new set of winners are going to emerge. Countries that are mastering clean technology and exporting green energy are going to gain from this new system.

“We have to master the energy challenge. The increase of digital and data requires sustainable energy sources to power all the new investments.

“One of the things that we see with energy is that, as electricity grows, digitisation grows as well. The two are going together to support sustainability and decarbonisation.

“Digitisation supports electrification. And, vice-versa,” explained Pant, adding the government plays an essential role in deploying these technologies.

In the Malaysian context, Pant said the adoption of clean energy would reduce the cost of power generation, bring more investments and export activities, create job opportunities and establish Malaysia as the leader in renewable energy.

Providing cost-efficient solutions

Pant then discussed the increased deployment of microgrids and agreed that renewable energy needs to be more affordable and flexible.

“Here at Schneider, we are pioneering something called as GreenStruxure, which can offer energy as a service solution to medium-sized buildings or medium-sized installations, which can avoid the CAPEX and move to renewables by buying renewable energy as a service.

“As a consequence, they can get resilient and sustainable energy, and more importantly, a predictable cost.”

Pant stated that putting microgrids and Schneider Electric’s business model together would help customers overcome cost and mass deployment issues.

“As we talk about clean energy, we also have to talk about access to power. Let’s also recognise that many people globally, especially in emerging economies, don’t have access to electricity.

“This is something that we want to provide. We aim to provide 80 million people access to electricity by 2030,” said Pant, adding that Schneider Electric strives to provide sustainable energy solutions and develop the skills of the local people in the respective areas through its Access to Energy programme.

– @greenXtra

HOT TOPIC



It's encouraging

BCSD Malaysia assists companies to tackle climate change

BY FATIHAN MANAF

MITIGATING CLIMATE change requires collective effort. In doing so, both industry players and individuals must play their roles effectively. Collaborations between political will and companies will bring Malaysia closer to carbon neutrality.

According to Roberto Benetello, Company Director and Executive Director of Business Council for Sustainable Development (BCSD) Malaysia, Malaysia's companies are committed to climate change action.

Benetello revealed that based on a survey conducted by Ernst & Young, over 60 per cent of the 100 public listed companies (PLCs) in Malaysia reported their commitment to climate action. He said the commitment also included stepping up disclosures on climate-related risks in governance, strategy and risk management.

"For example, in October last year, PETRONAS declared that it would be carbon neutral by 2050. It is the first time for an oil and gas company to set its climate zero targets in Asia. So, it's encouraging," said the Benetello, highlighting that it is inevitable for Malaysia to embrace nett-zero carbon emission.

Policies to facilitate energy transition

Benetello opined that many policies could be implemented to facilitate Malaysia's energy transition.

"Let's look at the



energy intensity. Energy intensity is a measure that indicates how well energy is utilised to create wealth for the country.

"It is projected that Malaysia's final energy intensity will continue to rise. It is not so good. That's why there must be efforts to ensure energy efficiency is improved. If the current trend continues, Malaysia will spend more than necessary to sustain the energy needs for the economy," explained Benetello, adding that it is essential to have policies that could tackle energy efficiency issues without sacrificing public welfare.

He added Malaysia should also look into policies in electric vehicles and believed there should be more targets for their adoption. Benetello highlighted the current target for electric cars adoption was relatively low and would not directly impact the overall energy consumption in the transportation sector.

Additionally, Benetello mentioned the efficiency issue of coal-fired power plants should also be addressed at the policy level.

"Clear and effective roadmap, as well as an energy action plan, must be developed to

reduce the energy and carbon intensity," he said.

Without significant policies to facilitate the energy transition, Benetello stated Malaysia would be a bit off target in realising its pledge to reduce 45 per cent carbon intensity per unit of GDP.

"However, if we have good policies introduced, there is a good chance that Malaysia will meet this objective of CO2 reduction."

Companies are the prosumers of energy

Benetello stated companies and businesses play a significant role in the reduction of CO2 emissions.

He said: "Companies need to take this energy transition seriously. They need to look into becoming or getting to at least a nett-zero GHG emissions."

He believed the transition would not be easy as companies need to look thoroughly into what they do internally and their relation to the external environment. However, he stated the situation also allowed companies to rethink the way they sourced and consumed energy.

"Many companies right now are moving from being consumers of energy to being prosumers, a mix between producers and consumers. For example, many of them have decided to utilise the roofs of their manufacturing plants or facilities to install solar panels," shared Benetello.

Benetello then explained companies must look into the three types of CO2: Scope 1, Scope 2 and Scope 3 emissions. He mentioned that Scope 3 emission would be quite a challenge for companies as it required sophisticated approaches for companies to talk to all stakeholders in the value chain.

"That's where we come into play. As a sustainability organisation, we are a CEO-led non-profit organisation. Still, we offer a lot of education, training and events to educate and help our members in this transition."

Aside from being a platform that gathers and encourages collaboration between stakeholders, Benetello emphasised that BCSD Malaysia was affiliated to the World Business Council for Sustainable Development (WBCSD). He shared that the organisation produced many reports, methodologies, and tools that BCSD Malaysia could leverage and offer to Malaysian companies.

Carbon Border Adjustment Mechanism and COP26

Benetello then shared his opinion regarding the Carbon Border Adjustment Mechanism (CBAM), which the European Union (EU) pushed. Since CBAM was a new proposal and still at a proposal level, Benetello said he was still studying the mechanism.

"In principle, it's a nice idea. But with everything like this, the devil is in the details," he said.

He said the implementation must be done with the correct mechanisms avoiding a high level of bureaucracy, red tape, documents, and reliability of the information or else the system will become unfair. Benetello highlighted all these climate action initiatives needed to be equitable.

He then mentioned the 2021 United Nations Climate Change Conference (COP26) was an important platform that would feature essential discussions. He hoped carbon taxation and just energy transition would be discussed during the conference.

- @greenXtra



ISSUE

On target for 31 per cent RE by 2025

Power sector being heralded as one area to accelerate the economy post-pandemic

BY BRIGITTE ROZARIO

WHILE THE country was caught up in the Covid-19 pandemic, few would have noticed the advancements made in national Renewable Energy (RE). Malaysia has now upped its RE targets from 20 per cent of the capacity mix by 2025 to 31 per cent.

The new target for 2035 is now 40 per cent.

The previous target was with the development of RE resources from biomass, biogas and hydro in mind. At that time, solar resources were given a lower mark. However, the scene has changed rapidly over recent years.

Ibrahim Ariffin, Director (Energy Analyst) at SEDA Malaysia's Strategic Planning Division, attributed this to the acceleration of solar projects deployment over the past few years.

With the support from Feed-in-Tariff (FiT), Net Energy Metering (NEM) and Large Scale Solar (LSS), solar projects have become more financially viable towards materialising higher solar capacity in the capacity mix.

"Assessing other countries' experiences with higher solar penetration, Single Buyer (the sole power purchasing agency for Malaysia Electric Supply Industry (MESI)) has initiated a study to assess the grid system readiness," said Ibrahim.

"This is towards accepting more capacity from variable renewables (i.e., solar resources for Malaysia's current portfolio) while ensuring system security and the highest reliability of the electricity supply and impact on affordability.

"The study concluded at the end of 2018. It showed that Peninsular



A 7MW Biomass Plant-Tenaga Sulpom Sdn Bhd, Dengkil, Selangor under the FiT programme.



Ibrahim Ariffin

Malaysia, in particular, can take as high as 24 per cent penetration limit without imposing significant risk to the grid system.

"It provides insight to the Ministry of Energy and Natural Resources, regulators as well as utility companies in offering support to ramp up the solar capacity target in the capacity mix."

The deployment of solar in Peninsular Malaysia will increase from the current 1GW capacity to 4.4GW by 2025 and 6.6GW by 2035. This more than six-fold increment will see a sizeable injection into Malaysia's future investment from RE.

Apart from addressing the climate-change impact, the power sector is being heralded as one area to accelerate the economy post-pandemic.

The boosted national RE target also supports ASEAN's aspiration in realising 35 per cent of RE in the capacity mix while demonstrating Malaysia's good governance in managing RE projects thus far.

With large hydro being recognised as one of the RE resources, the existing extensive hydro facilities in Peninsular Malaysia and Sarawak contributed to the RE capacity mix with 5.7GW. It enabled Malaysia to pursue a higher RE target.

As of December 2020, Malaysia had realised 8.45GW of RE capacity, equivalent to 25 per cent of RE in the capacity mix. An additional 3.3GW of RE resources, with nearly 2.7GW contributed by solar projects, was committed and expected to operate by 2025. Malaysia looks to be on track towards realising the 31 per cent target by 2025.

Serving our benefit

While Malaysia's approach to solar energy implementation has been more cautious compared to other countries, this may end up serving our benefit.

"Malaysia has been able to deliver high reliability of power supply, on par with that of developed countries, while maintaining an affordable electricity tariff. This achievement is coupled with the low disruption felt by customers.

"The System Average Interruption Duration Index (SAIDI) remains on the more downside and comparable to developed countries. Higher penetration of variable generation resources, particularly solar, will impose risks to this success story.

"Other countries have taken operational measures such as solar curtailment and load shedding to ensure system security. Financial intervention such as solar tax has



SEDA personnel monitoring a 4 MW biogas plant owned by Mistral Engineering Sdn Bhd in Sandakan, Sabah.

ISSUE



Amcorp Perting Hydro 6MW, Bentong, Pahang- one of the successful project under the FiT programme.

also been imposed post-installation in some countries.

“These conditions will impact the operation of the solar projects either towards meeting its annual energy commitment or its financial commitment. While growing the RE sector, Malaysia has taken a cautious approach to ensure these conditions will not be applied here.

“We can also realise the energy transition phase without jeopardising the direct and indirect sectors involved in the electricity supply industry,” said Ibrahim.

He explained that the government’s power system and capacity planning were dynamic, considering technology breakthroughs, global trends, system readiness, and general integration costs. Therefore, the macro-level policy and target will evolve in tandem with the latest technological and socio-economic developments.

The liberalisation of the solar power industry has been a hot topic for a couple of years. While there was the demand for it, there were many factors to be considered.

According to Ibrahim, the key is striking a good balance between the energy trilemma – environmental impact, affordability and system security. While the government is currently assessing this potential, the energy trilemma must be considered to ensure RE’s sustainable development.

“In European countries, for example, the market is liberalised with the support of solid interconnection facilities among the EU countries.

“On the other hand, under the ASEAN Power Grid initiatives, Malaysia has few interconnection projects in the pipeline and the



Malaysia’s largest rooftop solar PV project under NEM 2.0 at 31 MWp by Xinyi Solar.

existing interconnection facilities with Thailand and Singapore.

“However, the development of the interconnection projects requires a long lead time and is subject to the government to government’s current directions. This initiative, alongside other enablers, including grid system enhancement, improved demand management capabilities and smart grids, will facilitate this demand and the aspirations of industry players,” he explained.

More incentives

Assisting RE’s growth are the incentives introduced by the government in support of solar development. These include the fiscal incentives by Malaysia Investment Development Authority (MIDA) and Green Tech Malaysia.

Incentives such as Green Investment Tax Incentives (GITA / GITE) and Green Technology Financing Scheme (GTFS) helped stimulate RE growth in Malaysia while benefiting investors. GTFS 3.0, launched last year, was in line with the national aspiration to accelerate RE development.

However, Ibrahim believed there was always room for improvement, especially in enabling higher take-ups of solar capacity from the domestic sector. In the ongoing NEM 3.0 programme, the 300MW capacity allocated for the commercial and industrial sector was fully subscribed within four months of the launch.

In comparison, for NEM @ Rakyat, in which 100MW of capacity was allocated, only about 13 per cent of the quota was taken up.

One of the challenges facing marketing to the public is the high upfront capital required to invest in a rooftop solar system. Ibrahim believed more fiscal incentives and support would promote solar systems to the domestic sector.

He opined the private sector’s contribution was vital in realising Malaysia’s RE target.

“A series of engagement sessions between the government and the private sector enables good insights on market demand. National giants including Petronas, Tenaga Nasional Berhad and Maybank, and private entities are committing to the Net Zero Carbon Emission target by 2050.

In supporting their aspiration, the government will at best facilitate the means. Aside from the RE programmes, a new market for Renewable Energy Certificates (RECs) and the myGreen+ tariff scheme was introduced in 2019.

Support from the private sector in Malaysia’s energy transition phase is crucial in ensuring optimal benefits to the private sector, specifically, and the rakyat in general.

While solar projects have been multiplying, biomass and biogas endeavours should not be forgotten nor neglected.

Ibrahim explains that biomass and biogas were earmarked since the early inception of RE in 2001, under the Small Renewable Energy Power (SREP) programme.

“The development of biomass and biogas is on a relatively smaller scale and distributed mainly in securing electricity supply at palm oil mills and managing its by-products.

“The growth of biomass and biogas is further supported post-2010 under the Feed-in-Tariff programme. Up to 2020, a total capacity of 594MW from biomass and 125MW from biogas was in operation.

“Moving forward, biomass and biogas have more potential in realising the energy transition phase. Projections on new RE capacity from these potentials have been identified, particularly for Sabah, which has excellent potential in by-products, including empty fruit bunch and POME.

“Biomass and biogas also have the potential to making fossil-fuels ‘cleaner’ resources by co-firing with coal or blending with natural gas. Currently, over 80 per cent of the electricity demand is met from fossil-fuels generation capacity,” explained Ibrahim. —@greenXtra



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