Transitioning The Nation Towards

Sustainable Energy

MALAYSIA

MALAYSIA PRIHATIN

SPECIAL FOCUS:

GREEN HYDROGEN

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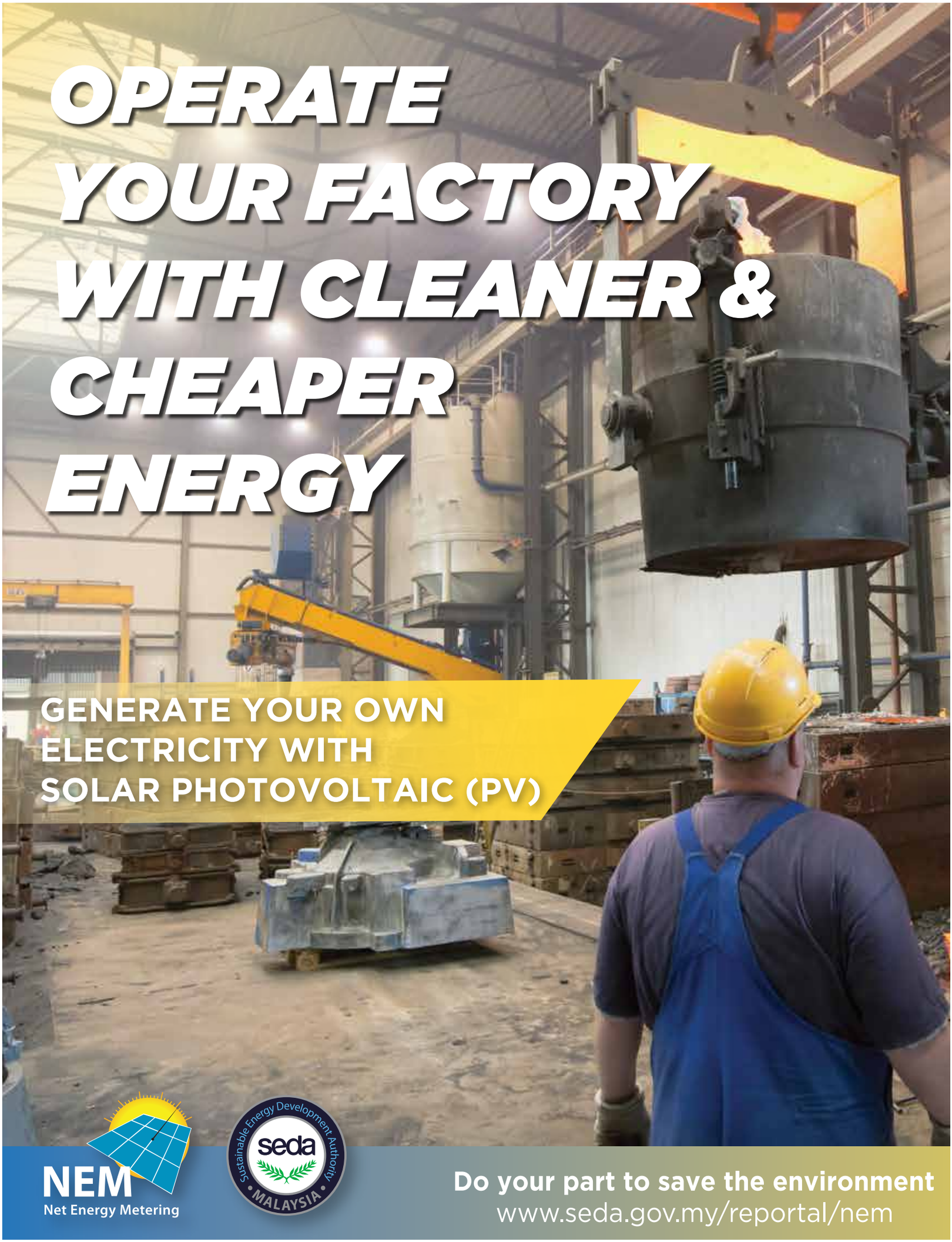
SHAPING THE FUTURE OF GREEN HYDROGEN ECONOMY

PROSPECTS SEEN FOR UAE-MALAYSIA COLLABORATIONS ON RE SECTOR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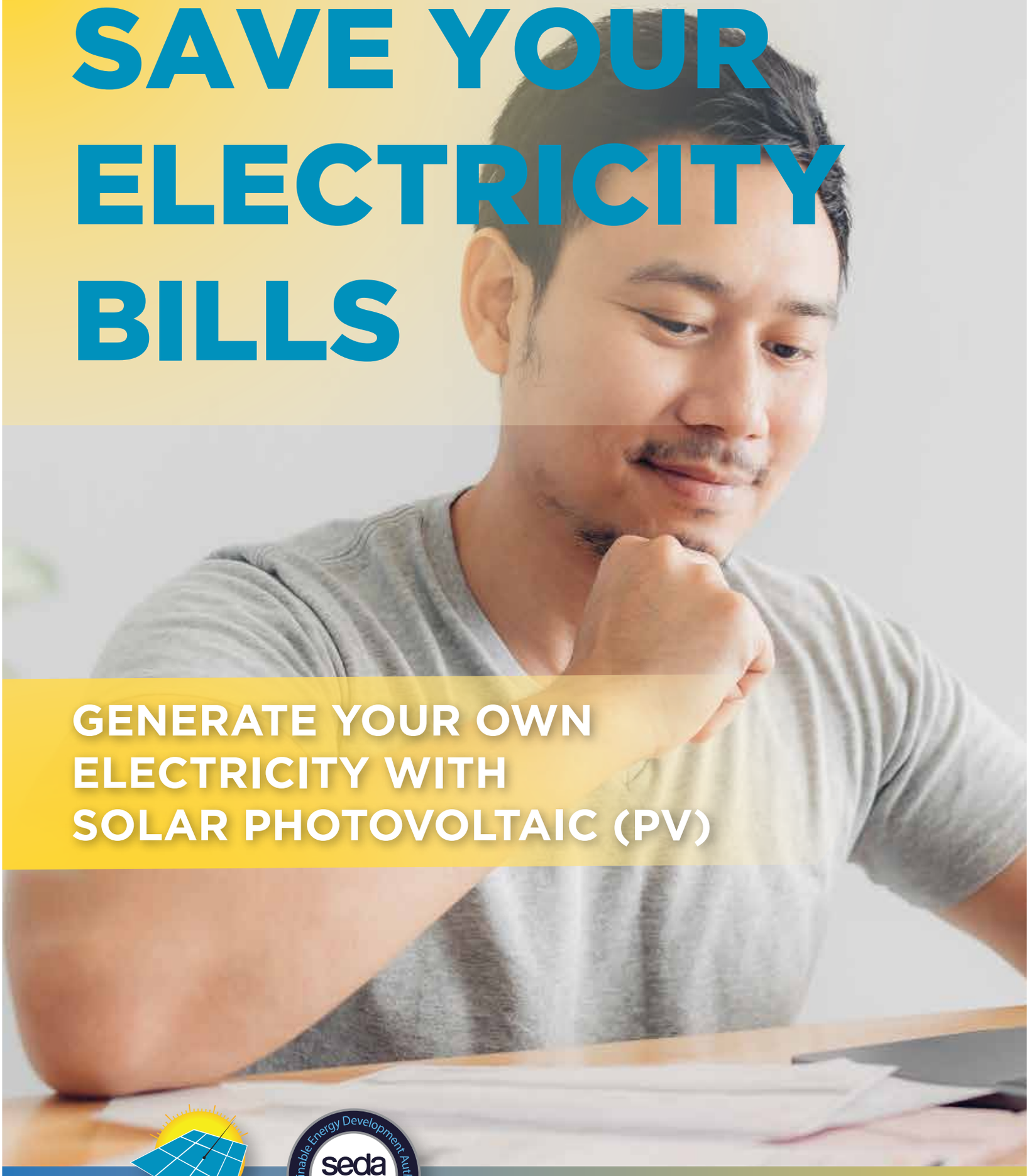

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CHAIRMAN'S MESSAGE

I would like to thank the editorial team of Sustainable Energy Malaysia (SEM) for giving me the platform to say a few words in the August edition of this magazine which has been one of the key mediums for Sustainable Energy Development Authority (SEDA) Malaysia to communicate with our stakeholders.

The month of August has always been close to the hearts of Malaysians. Throughout the month we could see owners of various vehicles flying our Stripes of Glory (Jalur Gemilang) as a symbol of pride for being Malaysians. Building owners also hoist the Jalur Gemilang during the month to show their loyalty to this great nation of ours. While we are diverse in faith and culture, we have always been united in our aspirations to make Malaysia great.

This 31st August 2020 will be Malaysia's 63rd National Day. This year's celebration will be under the theme, Malaysia Prihatin. The message is clear. Malaysia is sensitive and caring to the needs of others. The COVID-19 pandemic outbreak since late last year requires us to be more caring and sensitive to our fellow Malaysians to keep in check the viral disease. The wearing of face masks and social distancing are not merely for our own benefits. It is also to prevent us from harming others. The new norm can be troublesome, but we embrace it for the greater good of all. We are united in the objective. Malaysia Prihatin! The theme also reflects that we do not just care about our country and the people.

We are also concerned about the planet and our environment. We intend to reduce our greenhouse gas (GHG) emissions intensity of gross domestic product (GDP) by 45% by 2030 relative to 2015 numbers. Under the 11th Malaysia Plan (2016-2020), Malaysia aims to reduce the national dependency on fossil fuels while ensuring the development of reliable and affordable energy resources. The Renewable Energy Act 2011, the feed-in tariff (FiT) and Net Energy Metering (NEM) schemes are testimonies that Malaysia will continue to explore and utilise renewable energy (RE) as part of the national energy mix. The success of this hinges on the participation of the private sector while the Government continues to create a conducive environment for the RE sector to thrive.

With this in the background, SEDA Malaysia decided on 23rd July 2020 to organise a webinar under the topic, Shaping the Future of Green Hydrogen Economy. I am proud to say the event attracted a good number of participants worldwide. It may take some explaining as to why green hydrogen is all of sudden in our crosshair and the theme for the webinar. We are all aware that for Malaysia, solar may be the best resource for generating power. Solar photovoltaic (PV) is the renewable resource with the highest potential due to our geographic location within the Equator. However, solar energy comes with intermittency issues, and green hydrogen is a possible solution to the concern. Where RE electricity cannot be easily reached, the green hydrogen could just be the bridging solution. SEDA Malaysia continues to get itself involved with international seminars linked to RE issues to keep abreast with developments in the sector as well as to explain Malaysia's position on the RE agenda.

On 18th August 2020, SEDA Malaysia participated in the Second Malaysia Energy Roundtable (MER), which is part of the World Economic Forum's (WEF) Energy Programme in ASEAN, to deliberate on the priorities of Malaysia's energy transition including the high-level principles of Malaysia's National Energy Policy. We took it a step further on 25th August 2020 to jointly organise a webinar with the International Renewable Energy Agency (IRENA) to deliberate on innovations for a decentralised renewable-powered system, of which the peer-to-peer (P2P) energy trading system is one of them. We were able to share Malaysia's experience on the P2P concept at the two-hour webinar.

As for the long-term strategy, I am happy to note that we are in the final stages of completing the Renewable Energy Transition Roadmap (RETR) 2035. Under the RETR 2035, Malaysia would have developed a green hydrogen economy roadmap by the year 2025, and post 2025, we should be rolling out green hydrogen together with other RE strategies and action plans outlined in the roadmap.

It is heartening to note that when it comes to green hydrogen in Malaysia, my home state, Sarawak, plays an important role due to its experiences in demonstration projects already carried out by both the Sarawak Economic Development Corporation (SEDC) and Sarawak Energy Berhad (SEB). In his presentation at the webinar, SEDC Chairman YBhg. Tan Sri Datuk Amar Dr. Abdul Aziz Husain did mention that SEDC is looking forward to collaborating with SEDA Malaysia and other relevant agencies to include the hydrogen economy as part of the national policy objectives for RE. We are honoured by the invitation and similarly, looking forward to a strategic alliance with SEDC and SEB.

As we continue with our daily routines under the new norm, SEDA Malaysia would like to urge all Malaysian to continue adhering to the standard operating procedure (SOP) under the recovery movement control order (RMCO). We are not out of the woods yet. The risk of COVID-19 spreading remains out there. We are together in our fight against COVID-19.

Malaysia Prihatin and Selamat Hari Merdeka!

TUAN LUKANISMAN AWANG SAUNI
Chairman
SEDA Malaysia

SEDA MALAYSIA
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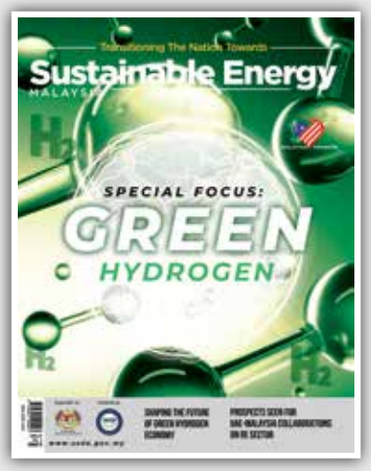

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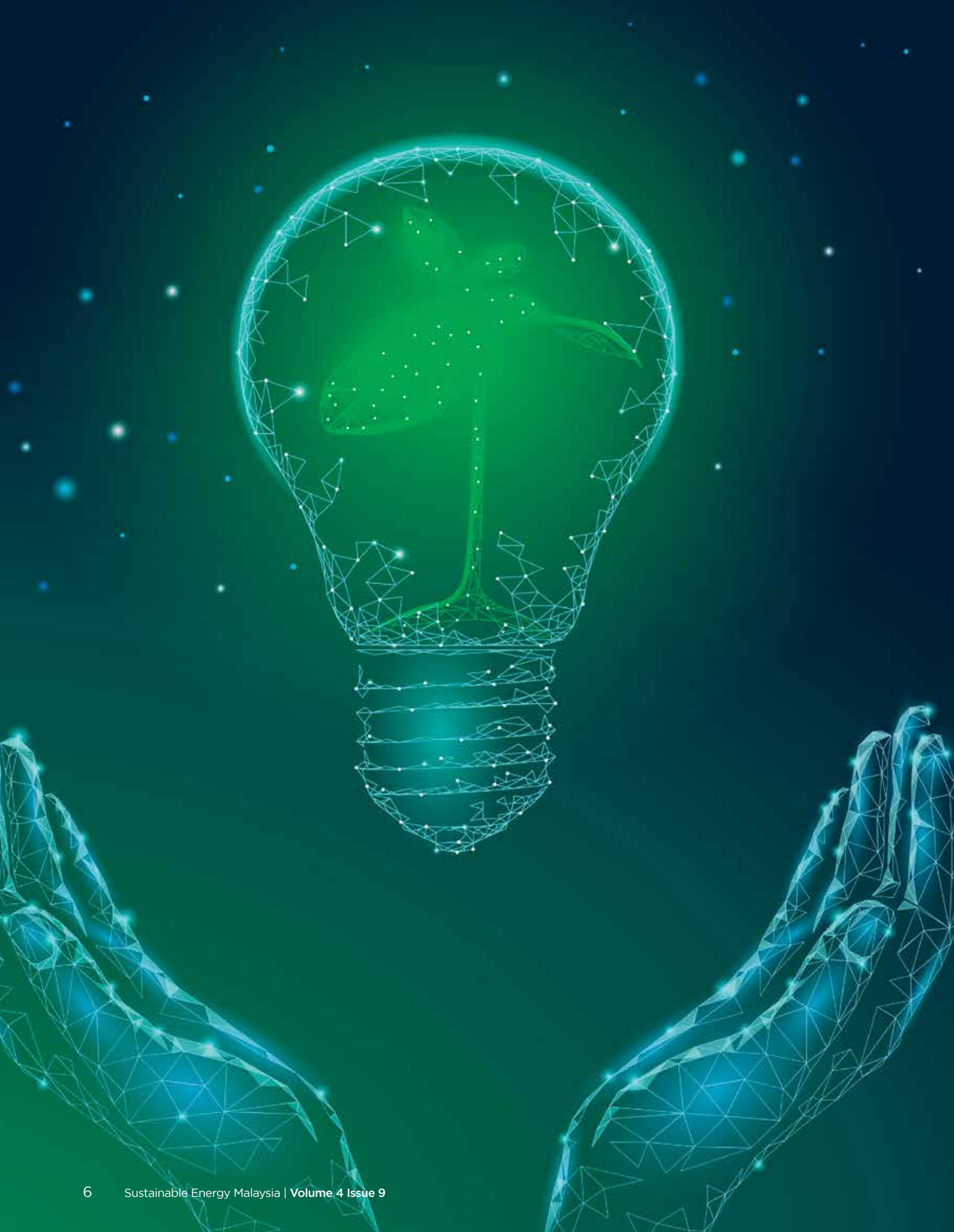


making RE relevant in ECONOMIC GROWTH

The Sustainable Energy Development Authority (SEDA) Malaysia received a new Chairman in April 2020. YB Tuan Lukanisman Awang Sauni took the helm of the Authority effective 16th April 2020. He speaks to SEM on renewable energy, SEDA Malaysia's roles and activities as well as his aspirations for Malaysia's RE.

What are your aspirations for SEDA Malaysia with regards to the national sustainable energy agenda? What sort of roles do you want SEDA Malaysia to expand to, and what would you like its achievements to be within the next five years?

The Sustainable Energy Development Authority (SEDA) Act 2011 aims to facilitate the formation of SEDA Malaysia and allows the country's RE sector to complement Malaysia's sustainable development initiatives as well as to nurture its green economy agenda.

As Malaysia pursues its sustainable development agenda as stipulated by the United Nations, Malaysia's commitment to the energy transition agenda has been recognized globally. The Energy Transition Index 2019, published by the World Economic Forum, placed Malaysia at the 38th placing among 115 countries being reviewed. Among the developing and emerging Asia region, Malaysia is ranked the highest. As part of the ASEAN block, Malaysia is committed in its contribution to the RE targets set by ASEAN. SEDA Malaysia presently chairs the ASEAN Renewable Energy Sub-Sector Network in promoting further deployment of RE in the ASEAN region via the ASEAN Plan of Action for Energy Cooperation.

Solar as RE resource has a great potential in Malaysia. Our geographical location and the availability of sunshine throughout the year make economic sense to continue nurture the solar PV sector as one of the RE resources in the country. Out of the many available RE resources like biogas, biomass and hydro, solar may have the biggest advantage in Malaysia. It is clean and easier to install. That we at present, have 4.1 million buildings with solar PV rooftop potential tips the scale in favour of solar further. As our property development sector prospers, more of such real estate will be available for rooftop solar PV installations.

As such, SEDA Malaysia will continue with its promotional and awareness campaigns on NEM to attract more Malaysians to be participants. Dialogue sessions are also frequently organised by SEDA Malaysia to further promote awareness on NEM among the stakeholders. Plans are in the pipeline to use the mainstream media as a platform to embark upon an integrated NEM awareness campaign.

As we crossed the first half of 2020 and moves closer to the end months of the year, we realised that perhaps it is time to tweak the NEM programme again. This is because our business environment has changed drastically. The global COVID-19 pandemic outbreak has changed so many things. We have to adapt and improvise. So does the business environment. We are now living in a new norm where the Internet of Things (IoT) is greatly embedded into our personal and professional lifestyles. This pushes the demand for electricity, particularly from RE resources.

Based on the current drastic changes in the business environment and our lifestyle, it is imminent that a revision of the NEM 2.0 will take place. The NEM 3.0 is on the horizon. It is bound to happen but the devil is in the details. Before it can be properly introduced, there will be a series of meetings and townhall sessions with the industry players to assess their needs and desires to keep Malaysia's RE sector growing and contribute significantly to Malaysia's sustainable energy agenda. We want NEM 3.0 to be effective in the long game and continue to nurture the rooftop solar potential in Malaysia. We want it to become an employment generator while assisting Malaysians in reducing their electricity bills while contributing positively to the environment.

> My aspirations for SEDA Malaysia is to ensure that it continues to remain relevant in the various timelines set by the Government to achieve Malaysia's sustainability development goals.

SEDA Malaysia has an instrumental role in shaping the future of Malaysia's RE sector. We have a pool of dedicated experts in the areas of energy efficiency and they have been involved in technical facilitation as well as providing training to the private sector, local authorities and state governments. Taking cognizant of the need to have an updated RE policy, SEDA Malaysia was mandated by the Government to develop a new RE roadmap. SEDA Malaysia is in the final stages of finalising the Renewable Energy Transition Roadmap (RETR) 2035. The objectives of the RETR are to formulate strategies towards achieving the Government's committed RE target by 2025 and develop possible RE scenarios for 2035. The outcomes of the roadmap are expected to resonate with the objectives of the Government's Shared Prosperity Vision 2030 and provide inputs to the 12th Malaysia Plan. The roadmap will embody a socially just energy transition in which it will be an inclusive RE policy that will address the nexus of energy affordability, security and environmental sustainability.

As you can see SEDA Malaysia's has its work cut out by its Act and the nation's numerous sustainable agenda. My aspirations for SEDA Malaysia is to ensure that it continues to remain relevant in the various timelines set by the Government to achieve Malaysia's sustainability development goals. For the immediate term, we are looking at the NEM and for the long term, we have the RETR 2035. I want SEDA Malaysia to have a prominent role in the development of Malaysia's RE sector. With the support from the Ministry of Energy and Natural Resources, I am confident that the mandate to realise the energy transition efforts for the well-being of our future generations can be achieved!

Malaysia and the rest of the world are badly affected by the COVID-19 pandemic which started late last year. Our traditional routines have to be adjusted to put a check on the deadly virus. Is there even a silver lining emerging from this unprecedented pandemic? Has the pandemic outbreak jeopardised the progress of Malaysia's RE initiatives? What was the Government's intervention - SEDA & the Ministry - to ease painful pandemic? What is the outlook for renewables in Malaysia?

The most positive outcome of this global pandemic is a significant improvement in our air quality. In Malaysia, the share of stations which recorded "good" air quality readings doubled from 28% to 57% within 2 weeks after the Movement Control Order (MCO) was implemented. The coronavirus has brought down the emissions just over a period of a few months.

On the pandemic's effect on Malaysia's RE sector, the business cycles of our RE industry players were definitely affected. SEDA Malaysia took the initiative to engage with the RE industry players in several virtual meetings just to understand their pain points. Cash flow constraints; fundraising issues and poor business environment were among the challenges faced by them. SEDA Malaysia was able to help the RE industry continues to look for a viable solution to address these challenges by providing supporting letters to developers to submit relevant authorities for permission to work, relaxing financial criteria and the timeline for submission of FiT applications and granting an extension of time for commissioning of both FiT and NEM projects.

The solar PV industry is also part of the beneficiary of the government's Economic Stimulus package which consisted of 1,400MW of solar PV to be awarded. Of this 1,400MW, 400MW will be for rooftop installations under the NEM while 1,000MW has been rolled out under the LSS4MEnTARI by the Energy Commission of Malaysia. Importantly for the rooftop installations, 300MW is for domestic, commercial, industrial and agricultural sectors of Tenaga Nasional Berhad's consumers while 100MW is allocated for government buildings. At this juncture, SEDA would like to remind that the 300MW under the NEM will only be valid until the end of 2020 and that the NEM applications must be approved by end of this year to qualify for the existing one-on-one compensation basis for surplus solar energy. We hope the members of the public and business sectors will take up this opportunity to reduce their electricity bills by installing solar PV under this NEM scheme.

> We want NEM 3.0 to be effective in the long game and continue to nurture the rooftop solar potential in Malaysia. We want it to become an employment generator while assisting Malaysians in reducing their electricity bills while contributing positively to the environment

Malaysia will celebrate its 63rd independence come 31st August 2020. In terms of RE development, where would you like it to be when Malaysia celebrates its 64th independence day? What should the RE industry players do to assist the Government in raising the component of RE in the national energy mix?

Malaysia Prihatin. That is the theme for this year's National Day as well as Malaysia Day. While the theme is linked to how Malaysians joined hands and worked in concert to fight the COVID-19 pandemic outbreak, it also implies that Malaysians are a caring society. We care about our country, our people and our environment. Malaysia intends to reduce its greenhouse gas (GHG) emissions intensity of GDP by 45% by 2030 relative to 2015 numbers. In the 11th Malaysia Plan (2016-2020), Malaysia aims to reduce the national dependency on fossil fuels while ensuring the development of reliable and affordable energy resources. The Renewable Energy Act 2011 and the FiT scheme are testimonies that Malaysia will continue to explore and utilise RE as part of the national energy mix.

The success of this hinges on the participation of the private sector while the Government continues to create a conducive environment for the RE sector to thrive. The RE industry players need to come forward and provide feedback to the Government for SEDA Malaysia to weed out any shortfalls and flaws in the RE policy and perks. From these inputs, the Government can craft new policies that will support the industry players in their RE venture. SEDA Malaysia, as a statutory body entrusted to develop the sustainable energy in the country, will remain active to enhance the NEM and FiT schemes so that Malaysia's RE industry is part of the country's economic growth.


Special Focus:
GREEN
HYDROGEN
H2

SHAPING THE FUTURE OF GREEN HYDROGEN ECONOMY

Acknowledging the importance of green hydrogen in the development of a sustainable economy, the Sustainable Energy Development Authority (SEDA) Malaysia hosted a webinar on 23rd July 2020 to deliberate on the subject.

The webinar, held under a theme - Shaping the Future of Green Hydrogen Economy - attracted a good turnout, reflecting the relevance of the green hydrogen economy in the energy transition.

SEDA Malaysia Chief Executive Officer Ir. Dr. Sanjayan Velautham said in the past year, the Government has tasked SEDA Malaysia to develop the Renewable Energy Transition Roadmap (RETR) 2035.

IR. DR. SANJAYAN VELAUTHAM
CEO SEDA Malaysia

"While renewable has a significant role in energy transition, we acknowledge that solar PV is the renewable resource with the highest technical potential in Malaysia due to our location along the Sun-Belt.

"However, having a high penetration of PV will require an energy balancing market to regulate the intermittency nature of solar energy. In this regard, green hydrogen has been touted as a possible solution to provide balancing mechanism to solar energy," he said in his keynote address at the webinar.

> ... having a high penetration of PV will require an energy balancing market to regulate the intermittency nature of solar energy. In this regard, green hydrogen has been touted as a possible solution to provide balancing mechanism to solar energy

He said green hydrogen has the ability to fill in the gaps in sectors such as aviation, maritime, and energy-intensive industries like cement, steel and aluminum whereby RE electricity cannot easily reach.

"The process of deep decarbonisation will require both green electrons and molecules to work in complementary mode. For this reason, the RETR has included the green hydrogen agenda in the roadmap. Up to 2025, Malaysia should have developed a green hydrogen economy roadmap and post 2025, we should be rolling out green hydrogen strategies and action plan meted in the roadmap," he added.

He noted that when it comes to green hydrogen in Malaysia, the state of Sarawak plays an important role due to its experiences in demonstration projects already carried out by both the Sarawak Economic Development Corporation (SEDC) and Sarawak Energy Berhad (SEB).

Dr. Sanjayan also said the post COVID-19 pandemic era saw most countries resetting their priorities in how they allocate their resources.

The European Commission (EC) has announced in May the new Green Deal of €750 billion, and on 8th July 2020, the EC announced their goal of hydrogen production facilities capacity of at least 6GW by 2024. During 2025-2030, the EC envisions an installation of at least 40 GW of green hydrogen electrolyzers and the production of green hydrogen of up to 10 million tonnes. In comparison, less than 1GW of electrolyzers are currently installed globally.

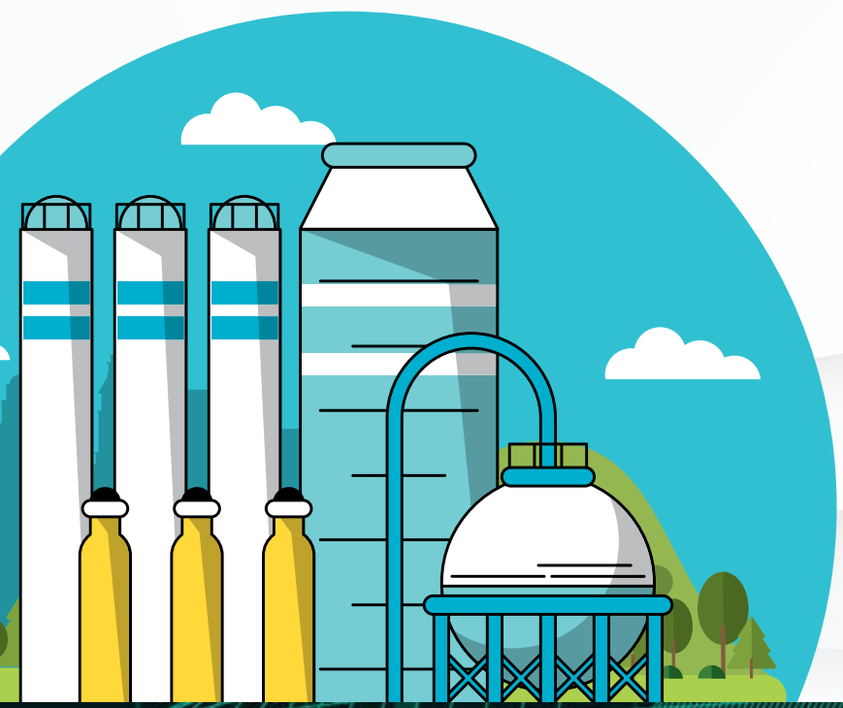
“Not only that, the EC will seek to position Europe as a global leader on hydrogen through the establishment of the European Clean Hydrogen Alliance with industry leaders from the oil and gas, and the power utility sectors,” he said.

The Alliance estimated that the total investment in green hydrogen electrolyzers by 2030 to be between €5-9 billion by 2024 and between €26-44 billion by 2030 and CO2 emission avoidance to be at least 9 million tonnes per year by 2024 and 90 million tonnes per year by 2030.

“We also acknowledge the increasing pace of energy transition in this region,” he added.

Dr. Sanjayan said hydrogen is probably the only form of gas that is expressed in a myriad of colours, namely black, brown, grey, yellow, blue, turquoise and green hydrogen.

“While blue and turquoise hydrogen are forms of low carbon hydrogen, green hydrogen from renewables is the only form that is truly emission free. I understand the trending topic is to what extent shall the energy transition accommodate the blue and turquoise hydrogen, and if such accommodation will just extend the lifeline of fossil fuel’s existence in a decarbonized future energy scape,” he added.



Speakers at the two-hour webinar are SEDC Chairman Tan Sri Datuk Amar Dr Abdul Aziz Husain; Yeungnam University of Korea’s Hydrogen Education and Research Consortium Director Prof Chinho Park; Melbourne Energy Institute’s Energy Systems Programme Leader Prof Pierluigi Mancarella; and Chiyoda Co of Japan’s Hydrogen Business Planning and Development Head Mr Osamu Ikeda. The event was moderated by SEDA Malaysia Chief Strategic Officer Dr. Wei-nee Chen.

Dr Abdul Aziz spoke on Sarawak’s green hydrogen agenda; Park on South Korea’s hydrogen economy roadmap; Mancarella on Australia’s challenges and opportunities on green hydrogen with regards to electricity and gas grids; and Ikeda on Chiyoda Corporation’s approach toward the commercialisation of liquid organic hydrogen carrier.

TAN SRI DATUK AMAR (DR.) HAJI ABDUL AZIZ BIN DATO HAJI HUSAIN
SEDC Chairman

PROF CHINHO PARK
Yeungnam University of Korea Hydrogen Education and Research Consortium Director

PROF PIERLUIGI MANCARELLA
Melbourne Energy Institute’s Energy Systems Programme Leader

MR OSAMU IKEDA
Chiyoda Co of Japan’s Hydrogen Business Planning and Development

DR WEI-NEE CHEN
Chief Strategic Officer SEDA Malaysia

SARAWAK HYDROGEN AGENDA -

BUILDING FUTURE... NOW!

TAN SRI DATUK AMAR (DR.) HAJI ABDUL AZIZ BIN DATO HAJI HUSAIN
SEDC Chairman

The Land of the Hornbills looks set to be the first state in Malaysia to have a hydrogen economy. Sarawak has an abundance of renewable energy (RE) makes the hydrogen economy agenda even more doable for the state.

In 2018, RE already accounted for 78% of Sarawak's energy mix. The ratio is set to go higher. At present, its large hydro plants' total installed capacity stands at 3,452MW. When the Baleh HEP commences operations in 2025, the state's total installed capacity will then rise to 4,737MW.

"With its abundant source of renewable energy, Sarawak is able to provide low tariffs for electricity and these two combined made the Sarawak Hydrogen Agenda an attractive proposition," said Sarawak Economic Development Corporation (SEDC) Chairman, Tan Sri Datuk Amar (Dr). Haji Abdul Aziz Bin Dato Haji Husain.

He was presenting his paper, "Sarawak Hydrogen Agenda; Building Futures...Now!" at a webinar on Shaping the Future of the Green Hydrogen Economy organised by the Sustainable Energy Development Authority (SEDA) Malaysia on 23rd July 2020.

Tan Sri Abdul Aziz pointed out that Sarawak has several key competitive advantages as a potential hydrogen producer.

Firstly, it has cheap energy resources. The electricity generation outweighs its own domestic requirement. Secondly, most of those resources, mainly hydro, are renewable. Finally, its power reserve margin between 14% and 19% of the annual peak load is either utilised or goes to waste.

"However, current technology has enabled the production of hydrogen by electrolysis from intermittent power supply, making it possible to use the reserve energy for large scale hydrogen production.

"Thus, it makes both economic and environmental sense for Sarawak to follow the electrochemical route, using green electricity from hydropower to produce green, guaranteed carbon-neutral hydrogen," he added.

The Sarawak Hydrogen Agenda was mooted by the Right Honourable Chief Minister of Sarawak, Datuk Patinggi (Dr.) Abang Haji Abdul Rahman Zohari Bin Tun Datuk Abang Haji Openg who stated that: "With abundant clean hydroelectric power resources, Sarawak provides an ideal setting for enabling the Hydrogen Economy in the State."

Tan Sri Abdul Aziz said SEDC has been actively pursuing the Sarawak Hydrogen Agenda in collaboration with other agencies such as Sarawak Energy Bhd (SEB) to explore the potential of hydrogen gas development in the state.

He noted that Sarawak needs the Federal Government's support and policies that will encourage and promote the Green Hydrogen Agenda.

"We are looking forward to collaborating and working together with SEDA Malaysia and other relevant agencies to include the hydrogen economy as part of the national policy objectives for Renewable Energy (RE)," said the SEDC Chairman.

He added that the proposed national policy objectives should also provide the budget for hydrogen R&D, subsidies for hydrogen production facilities and infrastructure and the abolition or reduction of import duties for fuel cell (FC) vehicles imported into Malaysia.

The state also seeks support from the Federal Government and the relevant agencies to promote, stimulate and facilitate the development of hydrogen as the RE of choice. In addition, it is proposing the Federal Government to formulate laws and guidelines on hydrogen standards and regulations for production, storage and distribution.

Tan Sri Abdul Aziz said hydrogen, used as an energy carrier and mobility fuel, will provide a pathway for servicing both domestic and overseas demand for green energy.

"Sarawak has the potential to become a significant exporter of green energy due to its geographical advantage, as the state is located close to existing energy-hungry markets. Markets with existing or near future demand for green energy include Japan, Korea and China.

> With its abundant source of renewable energy, Sarawak is able to provide low tariffs for electricity and these two combined made the Sarawak Hydrogen Agenda an attractive preposition

1. *The Right Honourable Chief Minister of Sarawak demonstrated hydrogen vehicle refueling to the public on 27 May 2019.*
2. *The hydrogen buses were officially flagged-off on 21 January 2020 by the Right Honourable Chief Minister of Sarawak.*

"In the longer term, Southeast Asian neighbours such as Indonesia, Thailand, Singapore, the Philippines, Vietnam and Peninsular Malaysia would be potential markets for our green hydrogen. In addition, green hydrogen may also provide a valuable boost to Sarawak's existing chemical sector through its value as an industrial feedstock," he added.

Tan Sri Abdul Aziz said Sarawak is proud to be the first in the Southeast Asian region to have an integrated hydrogen production, storage and refuelling plant to enable the state to conduct a pilot project on the operation of hydrogen buses in Kuching and provide hydrogen fuel for FCEV cars.

"Hydrogen has the potential to be not only the Fuel of the Future but provide employment and economic opportunities as well. Sarawak is on the right path to capitalize on this opportunity and become a pioneer in advocating the Green Hydrogen Agenda.

"What we need now is to establish a solid framework of policies and hydrogen infrastructure development plans, education and promotion, and capacity building to ensure that we can successfully undertake this agenda. This framework will serve as a guide for us in achieving our aspiration towards a green hydrogen economy," he added.

GREEN HYDROGEN

IN VOGUE FOR SUSTAINABILITY

This article is jointly authored by Sathappan Somasundaram and Dr. Wei-nee Chen. Sathappan was an intern from the Georgia Institute of Technology under Dr Chen's tutelage. During his tenure in SEDA Malaysia, he worked on several key trending topics on energy transition including green hydrogen.

H2, BACK IN VOGUE

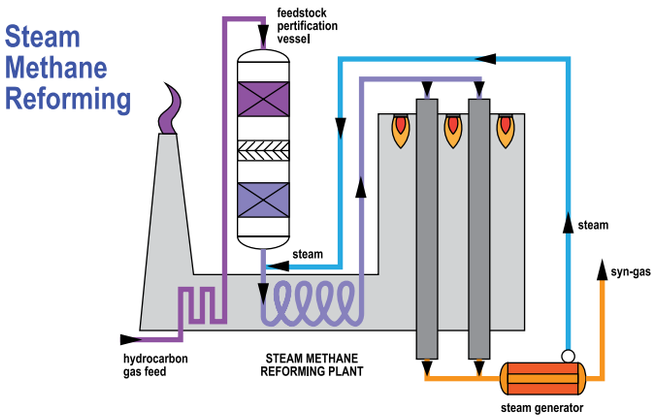
Hydrogen as a fuel is not new. However, post the coronavirus pandemic, hydrogen appears to be in vogue again, at least within the energy transition space. Admittedly the need to flatten the pandemic curve has led to a wake-up call for many countries to flatten the climate curve. Hence, the urgency to accelerate energy transition while there is still time. As at end of 2019, renewable energy contributed 33% of the global installed electricity capacity mix (IRENA) and 27.3% of the global electricity production (REN21). While renewables have gained much inroads within the power sector, there are still some hard to abate sectors such as aviation, shipping, energy-intensive industries and heavy transportation which green electrons cannot easily reach.

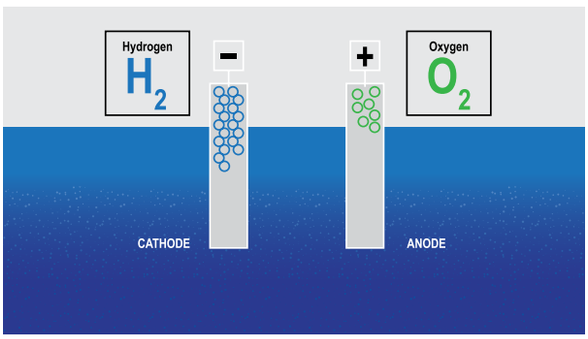
THE MANY HUES OF H2

Hydrogen is the most abundant element in the universe. It is the simplest element and yet an element with the highest energy content. Hydrogen as a fuel and hydrogen related technologies are definitely not new. Wikipedia hosts an impressive timeline of hydrogen technologies and their founders with records dated as early as in the 16th century[1].

Fast forward to the 21st century, today hydrogen is discussed in a myriad of colours – black, brown, grey, yellow, blue, turquoise and green. Why are there so many colours for hydrogen? Actually, hydrogen gas is colourless. Hydrogen gets its colour label from the type of energy source that produces it. Yes, hydrogen is not an energy source, it is an energy carrier and hydrogen hardly exists on its own.

95% of hydrogen is formed through the steam methane reforming (SMR) typically using natural gas as feedstock. In this process, methane is passed through steam at high temperature and pressure to produce (grey) hydrogen and carbon dioxide. Coal and lignite produce black and brown hydrogen respectively, while hydrogen produced from nuclear power is yellow. Blue hydrogen is formed from natural gas through SMR with carbon dioxide (CO2) being stored in carbon capture and storage (CCS) while turquoise hydrogen is also made from natural gas but via pyrolysis in which carbon is produced as a by-product.





Source credit: https://hydrogeneurope.eu/

GREEN H2

Hydrogen is also present in water. In fact, water is the most abundant source that contains hydrogen on Earth. Hydrogen can be produced from water using electrolysis, a process originally discovered back in 1789 by Jan Rudolph Deiman and Adriaan Paets van Troostwijk. Green hydrogen is formed when renewable energy is used as an electricity source for electrolysis. This form of green hydrogen produces no CO2 and when converted back to electricity through technologies such as the fuel cell, the only by-product is water. In this regard, among all colours of hydrogen, only the green hydrogen is considered truly clean. So the ongoing debate is whether blue hydrogen is necessary in the process of energy transition. During a green webinar organized by SEDA in July this year, we posted a similar question to the viewers and the outcome can be seen in Exhibit 1.

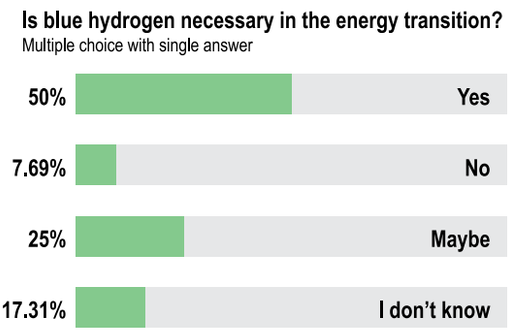


Exhibit 1: Polling on Relevance of Blue Hydrogen in Energy Transition

COST OF H2 PRODUCTION

In order for green hydrogen to be commercially viable, there are a few challenges to overcome. At the same green webinar organized by SEDA, a polling was conducted to gauge the key barrier in green hydrogen technology adoption, 37.8% of the responses point to the high investment cost (Exhibit 2).

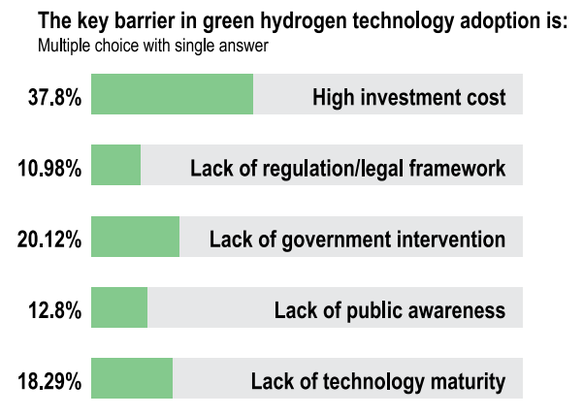


Exhibit 2: Polling on Key Barrier in Green H2 Adoption

The cost of production of green hydrogen is currently ranging from USD$2.50 – 6.80 per kg depending on the type of renewable energy used and the local weather conditions. At first glance, this may seem significantly higher than the USD$1 – 1.80 cost of grey hydrogen (IRENA 2019).

There are a few factors driving the cost of production of green hydrogen: (i) cost of input energy (ii) cost of electrolyzer and (iii) utilization rate of the electrolyzer. Typically, renewables with zero marginal cost (e.g. wind, solar, hydro) are considered for green hydrogen production. While the cost of energy from large hydropower has stabilized, the potential cost reduction of energy for green hydrogen comes mainly from solar and wind. Exhibit 3 shows the forecast cost of green hydrogen factoring these three parameters.

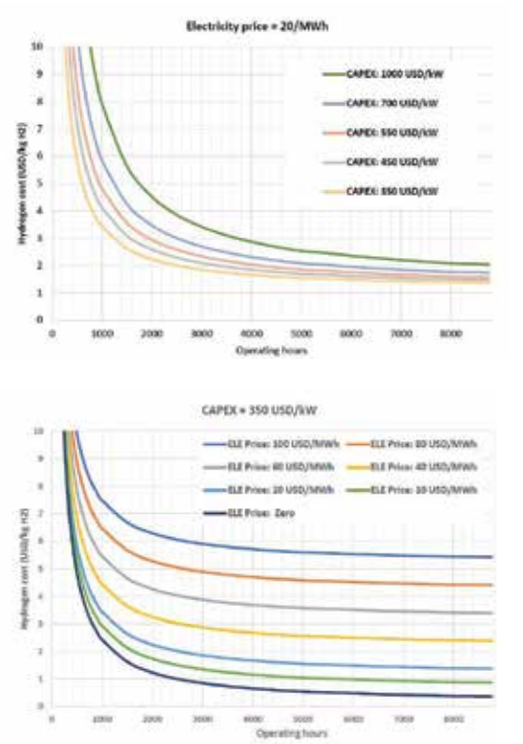


Exhibit 3: Cost of Green Hydrogen Production (IRENA Webinar, July 2020)

It can be seen that the cost of green hydrogen will drop when the cost of electricity and capital investment for electrolyzers drop, and the utilization rate of electrolyzers increases. The utilization factor is important to highlight as the factor of solar photovoltaic (PV) tends to be low and a combination of solar, wind or large hydropower is needed to increase utilization rate so as to help bring the cost of production of green hydrogen down. This also implies that channeling electricity curtailment from either solar or wind to green hydrogen production will only be financially viable if there are other measures to increase the utilization rate of the electrolyzers.

CARBON NEUTRALITY BY 2050

It is worth noting that the demand for green hydrogen is expected to rise worldwide in the coming decades. Together with the falling cost of renewables and electrolyzers, the economies of scale the cost of green hydrogen is expected to be competitive with non-green hydrogen by 2030 and even sooner in regions with an abundance of renewable resources. This forecast is sparked by the urgency to mitigate greenhouse gas emissions. According to an Intergovernmental Panel on Climate Change (IPCC) report (2018), in order to prevent global average temperature from exceeding an increase of 1.5 degrees Celsius, there is a need to reach global net zero emissions by 2050. This explains why many countries and corporations have pledged to achieve carbon neutrality by 2050.

At the national level, part of the strategies to achieve carbon neutrality is to include the hydrogen agenda. To make these green hydrogen agenda a reality, there is a need to start investing in this industry now. McKinsey estimates that a cumulative USD$20 billion will have to be invested in the next decade. Fortunately, this emerging industry has gained enormous political and business momentum globally. Multiple governments have rolled out policies and strategies to kickstart a green hydrogen economy within and around their countries.

GOVERNMENTS LEAD BY EXAMPLE

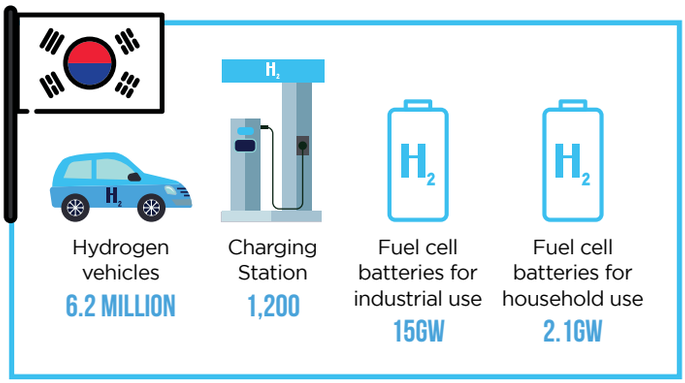
In February of this year, the United Kingdom announced their funding support for low-carbon hydrogen production to the tune of £90m package out of £500m Innovation fund. As of that time, the UK government has awarded £28m for five hydrogen projects.

Germany released their National Hydrogen Strategy in June of this year which indicates a total of €9 billion to be invested locally and abroad. The strategy states that €7 billion will be used for local development whereas the remaining €2 billion will be used to develop international partnerships. The strategy solely focuses on green hydrogen and does not consider blue hydrogen production. Despite having some local production, Germany is set to be a net importer of green hydrogen.

In July this year, the European Commission (EC) announced their New Green Deal which amounted to €750 billion and this included their goal of achieving hydrogen production facilities capacity of at least 6 GW by 2024. During this period, the EU and private sector contribution is expected to reach €1.3 billion for the fuel cell technology development. During 2025-2030, the EC envisioned an installation of at least 40 GW of green hydrogen electrolyzers and the production of green hydrogen of up to 10 million tonnes. By 2050, the EC estimated cumulative investments in hydrogen in Europe to reach between €180 - 470 billion depending if the focus is on blue or green hydrogen.

Although the hydrogen agenda appears to gain much ground in Europe, within the Asia Pacific (APAC) region, another cluster of hydrogen economies is on the rise. Australia released their national hydrogen strategy late last year. Their strategy aims at making Australia a global leader in clean hydrogen production by 2030. They have already invested AUD$146 million in hydrogen from 2015 to 2019. The Australian government has committed AUD$370m to support hydrogen technology. The strategy includes both green and blue hydrogen. Australia has conducted pilot projects with technology providers from Japan to transport the hydrogen produced in Australia to Japan.

In South Korea, their government has released their Hydrogen Economy Roadmap 2040 in January 2019 and within a year, they have passed their Hydrogen Economy Promotion and Hydrogen Safety Management Law, to facilitate their hydrogen implementation plan. South Korea will be another potential significant market within the APAC region for green hydrogen, together with countries such as Japan, Taiwan and Singapore.



CORPORATES' COMMITMENT

There has been increasing pressures on the corporate sector to reduce the carbon footprint of their business. At the point of writing this article, there were 242 companies under RE100 who have pledged to consume 100% of their electricity from renewables by 2050 (at the latest). For GHG accounting and reporting purposes, Scope 2 emissions can be mitigated by purchasing electricity from renewable resources. However, Scope 3 is not so easily addressed as it involves all indirect emissions that occur in the value chain of the reporting company, and that includes upstream and downstream activities.

Subsequently it is not surprising that most giant oil and gas companies such as Sinopec Corp, Equinor, Eni, Repsol, Total, BP and Shell have started their investments in hydrogen and most of these companies are already part of the Hydrogen Council[1]. The divestment of fossil fuel to renewables or low carbon fuel is perhaps the way for corporates to meet their environmental, social and governance (ESG) commitments. This corporate energy transition was successfully implemented by DONG Energy (short for Danish Oil and Gas) and in 2017, the company was renamed to Ørsted to commemorate the complete switch of business focus to 100% renewables.

The final poll at the green hydrogen webinar organized by SEDA was on the investment readiness of the viewers on green hydrogen. The response was a surprising 42.18% of participants whose organization will plan to make an investment decision on green hydrogen within the five years (Exhibit 4)[2]. It was surprising because it appears to be consistent with the findings from a hydrogen whitepaper recently released by DNV-GL in which they surveyed more than 1,000 senior oil and gas professionals (Exhibit 5).

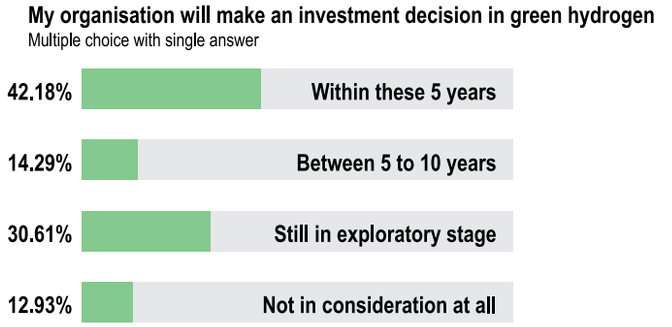


Exhibit 4: Polling on Investment Readiness on Green Hydrogen

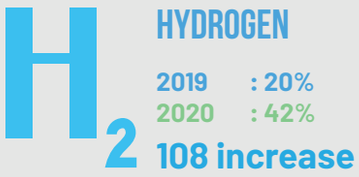


Exhibit 5: Percentage of respondents who said their organization will invest in Hydrogen Technologies (source: DNV-GL, 2020)

WHAT'S IN IT FOR MALAYSIA?

Perhaps the big question here is what's in it for Malaysia with regards to the green hydrogen economy. We thought this answer was articulated very well by Tan Sri Datuk Amar (Dr) Haji Abdul Aziz bin Dato Haji Husain, Chairman of the Sarawak Economic Development Corporation (SEDC) during his presentation at the green webinar organized by SEDA. Malaysia has always been an oil and gas producing nation. Thus, the green hydrogen represents an opportunity for Malaysia to become a major supplier within this region. According to Tan Sri Aziz, Malaysia has abundant renewable resources in this country, mainly in the form of hydroelectricity and solar PV. We have the technical knowledge and skills in the LNG industry and have invested in LNG infrastructure which could represent a lower cost of migrating to green hydrogen industry. We are also positioned strategically as we are close to future hydrogen markets like Japan, South Korea, Taiwan and Singapore.

WAY FORWARD

Hydrogen will become a major part of the world's energy mix and Malaysia should take advantage of its natural resources to adopt hydrogen fuel as a strategic asset and become an exporter of this future commodity. To achieve this, the industry, government and financial sectors need to come together and work hand-in-hand to start planning our national green hydrogen roadmap. Not tomorrow, but today.

[1] https://hydrogencouncil.com/en/

[2] The participants at the green hydrogen webinar were largely from petroleum and related companies, power utilities, consultants and government sectors.

Delivering Building Performance for Climate Change Mitigation

by Mohd Shah Hambali Arifin
Acting Deputy Director
Technical Development and Facilitation (TDF) Division
SEDA Malaysia

Climate change is one of the defining issues of our time and now affecting every country on every continent. It is disrupting national economies and affecting lives, costing people, communities and countries dearly today and even more tomorrow.

To address climate change, countries adopted the Paris Agreement, negotiated at the Conference of Parties 21 (COP21) in France on 12th December 2015, in tandem with the global calls, Malaysia renewed its climate goal by submitting a Nationally Determined Contributions (NDC) committing a 45% carbon reduction in 2030 relative to emissions level in 2005.

Paris Climate Agreement and the building sector

The Intergovernmental Panel on Climate Change (IPCC) recognised and identified buildings as a key sector for mitigating climate change, therefore playing a critical role in achieving the transition to a low-carbon economy (IPCC's Fourth Assessment Report AR4, UNEP 2007). These emissions have the potential to proportionally rise, given the long lifespan of buildings and how they lock in energy performance. Due to its significant mitigation potential and realisation, the Paris Agreement identified that the 2-degree path is not achievable without reducing emissions from buildings and construction. In short, without significant action by the buildings sector, this target will not be met. Tackling climate change requires concerted and focused action.

Building Lifecycle Emissions

In the building sector, emissions are generated throughout its lifecycle through the way they are planned, designed, constructed, operated and demolished. The total emissions are the sum of operational carbon and embodied carbon. The operational, construction, and demolition stages produce 85.4%,12.6%, and 2% of the total CO emissions, respectively*[1]. Operational carbon arose from the energy consumed in buildings during the operational stage. As a rule of thumb, at present it can be assumed that embodied carbon accounts for about ~20% of total emissions whilst ~80% occupied by operational carbon. Therefore, it is pertinent that the building performance at this life cycle stage be addressed accordingly to effectively cut down emissions.

Ensuring performance through Building Evaluation and Assessment

Buildings must adopt a multi-faceted approach to climate change to ensure that they effectively cut down emissions accordingly. In addition, there must be a sound evidence-based method to evaluate the potential contribution in emissions reductions from the building sector, and the right policies and incentives in place to ensure these reductions are achieved. Assessment of Operational Energy could provide a meaningful way in encouraging the building industry to measure their building performance. One of the first steps required to meet future emissions related targets is to ensure that a robust measurement and assessment procedure is in place.

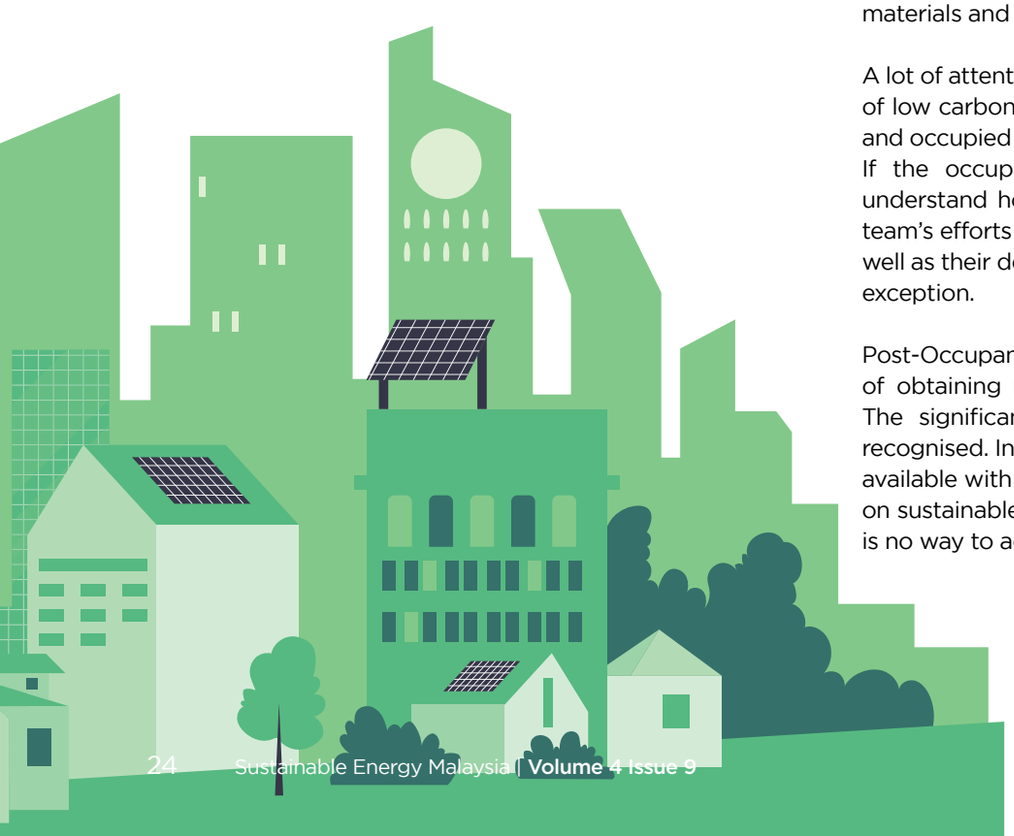
Building energy assessment involves programmes and policies that evaluate the performance of a building and its energy service systems. Assessment may focus on rating a building's operational or expected (notional) energy use and can be voluntary or mandatory for all or part of buildings sectors. The aim of energy performance assessment for buildings is to provide information to consumers about their buildings and to gradually create a market for more efficient buildings. As of 2018, 85 countries had adopted building energy performance assessment programmes*[2].

SEDA Malaysia's Voluntary Sustainable Low Carbon Building Performance Assessment - GreenPASS Programme

Achieving the greenhouse gas (GHG) emissions mitigation potential of the building sector is essential for the world, Malaysia is not excluded. However, there is still no mainstream demand for low GHG emissions in buildings. Available technical and financial resources are therefore not fully mobilized, despite the availability of many effective technologies, materials and design concepts, and proven policy measures.

A lot of attention is often given to the design and construction of low carbon buildings, but once the buildings are complete and occupied it is important that they are operated efficiently. If the occupants and managers of the building do not understand how to operate it efficiently, then all the design team's efforts are worthless. Most buildings do not perform as well as their designers intend, and low carbon buildings are no exception.

Post-Occupancy Evaluation (POE)/assessment is the process of obtaining feedback on a building's performance in use. The significance of this recognition is being increasingly recognised. In Malaysia, there are a number of building ratings available with various scopes and methods. A lot of initiatives on sustainable low carbon building have been done but there is no way to access their achievement.



*1 (Peng C, Journal of Cleaner Production, Vol.112, 2016).
*2 2019 Global Status Report for Buildings and Construction

This assessment by SEDA Malaysia can be applied to all EE and non-EE buildings at all performance levels, differing from some rating systems which only certify projects with a certain performance outcome. The non-discrimination and "affordable to all" policy approach allows building owners and facilities management teams to set building-specific carbon benchmarks from which they can improve over time. This will enhance the Government's capability to widespread its low carbon building implementations and eventually, main streaming and making carbon reduction measures more effective.

The performance-based assessment featured herein, referred SEDA Malaysia's Voluntary Sustainable Low Carbon Building Performance Assessment - GreenPASS Programme, focuses on actual energy used in buildings thereby making an accurate reflection of the emissions contributed to the environment(environmental impacts).

This assessment system complements the existing building-related low carbon initiatives by Low Carbon Cities Framework (LCCF, 2010), a city-based assessment National tool, initiative spearhead by Ministry of Environment and Water, and Malaysian Carbon Reduction and Environmental Sustainability Tool (MYCREST, 2014) owned by the Ministry of Works.

This assessment methodology is based on Common Carbon Metric developed by UNEP-SBCI (2010) and similarly was used on CIS 20: Green Performance Assessment System (GreenPASS 2013 - owned by the Construction Industry Development Board).

To realise this, SEDA Malaysia has focus its efforts in the following two areas:

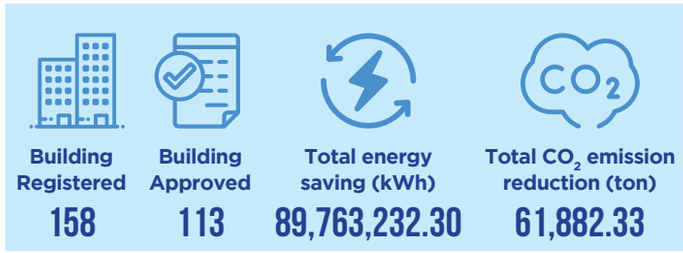
i. Making buildings a part of an active energy system by demonstrating that they can consume less power, generate their own clean energy, and help "balance" the electricity grid system through continuous capacity building programme; and
ii. Supporting building performance analysis, information, and assessment.

The performance is calculated from the carbon reduction made by the building with respect to the baseline emissions and thereafter rated using a diamond rating.

Level of achievement (% of CO_2e reduction)	Assesssment Scheme for Existing Buildings
100% Carbon Neutral	💎💎💎💎💎💎
≥ 70 to < 100	💎💎💎💎💎
≥ 50 to < 70	💎💎💎💎
≥ 30 to < 50	💎💎💎
≥ 10 to < 30	💎💎
≥ 10 to < 10	💎

SEDA Malaysia's Voluntary Sustainable Low Carbon Building Performance Assessment - GreenPASS Programme Achievement Board

As of June 2020, 158 buildings in Malaysia have been registered and 113 buildings have been rated with the SEDA Malaysia's Voluntary Sustainable Low Carbon Building Performance Assessment - GreenPASS Programme ranging from one to four diamonds. The total number of energy savings amounted to 89,763,232.30 kWh and this is equivalent to 61,882.33 tonnes of carbon emission reduction.



Way forward for building sector in Malaysia to 2030 and beyond

At COP21, Malaysia has committed to a 45% carbon emission intensity per GDP reduction in 2030 relative to 2005 levels. Defining a trajectory on carbon reduction for the building sector is vital as it can provide a roadmap for future improvements in building energy efficiency. However, despite the calls for improvements in the national carbon reduction, there is a lack of information on the trajectory to 2030 or how much emissions should be progressively reduced in time before 2030 for the building industry.

Despite all the obstacles, SEDA Malaysia will continuously support the Government initiatives on curbing the climate change issues, with innovative new technologies and expected cost reductions, climate-damaging emissions can be further cut, leading to an eventual complete decarbonisation of the building sector. In order to achieve these goals, the following key issues must be addressed:

- existing building stock will have to improve its energy performance significantly and new buildings must be made smarter, super-efficient and CO -lean;
- low-carbon technologies need to be applied to renovations and new building projects;
- policies to promote innovation and enable the transformation of building stock must be better targeted a considering the specific needs of renovation and new construction;
- there is a need to have a greater recognition of the unique opportunities for new services and products stemming from the renewable energy and energy efficiency streams in the buildings sector; and
- low-emission growth: promoting renewables and improving energy efficiency.

For further info, kindly visit SEDA Malaysia website on SEDA Malaysia's Voluntary Sustainable Low Carbon Building Performance Assessment - GreenPASS Programme.

BUILD IT, THEY WILL COME!

2MW biogas power plant developed by GLT. The plant is currently operated and maintained by another of GLT subsidiaries under the name of GLT Renewable Sdn Bhd. To date 45000MWh has been exported to grid.

The misquote, "If you build it, they will come", was famous in the early 1990s. It was from the movie Field of Dreams starring Kevin Costner who actually said, "If you build it, he will come." The phrase became embedded in daily conversation those days, and at times used to justify bold business strategies.

For biogas producer, Green Lagoon Technology Sdn Bhd (GLT), it may just have taken a similar ride.

During its early days when the biogas industry was new in the country, financial institutions were a bit coy in extending their support to the sector. The industry players persevered and sought other means of funding to build the biogas plants.

"I guess the adage that success breeds success rings true in this matter. When the industry as a whole started to show the good results in power generation, revenues and profits, the local financial institutions started to take notice, and started to want a piece of the action.

"The loans are not big by banking standards, but still the numbers don't lie, and the individual and collective successes of the various companies encouraged the institutions to delve further into this promising industry.

"It is far from perfect, especially for small companies with minimum assets like GLT, but it has since come a long way. We certainly hope that more can be done," GLT Chief Operating Officer Raymond Cheah told SEM in an interview via email.

GLT was established in 2010, back when the Feed-in-Tariff (FiT) programme in Malaysia had not been formalized. There was a gap in the biogas capture market for palm oil mills in Malaysia at that time since some of the environmental regulations were beginning to take root.

"We felt it was a good time to start up GLT. Perhaps we were a little early on the curve, but in hindsight, it did give us a very good foundation to work on when the FiT programme was finally implemented.

"It was very challenging to say the least. Who has heard about biogas? Which banks would be willing to take the risk to lend to a non-traditional business like ours? Even venture capitalists shied away from us in the beginning, but we can't really blame them. Whenever renewable energy was talked about in conversations, conferences and exhibitions, inadvertently the focus had always been on solar.

"So, yes, it was extremely challenging, but we are very thankful that Sustainable Energy Development Authority (SEDA) Malaysia continued to give the support to the biogas renewable energy industry, and today, there is traction for the industry," he added.

GLT was birthed with some seed money given by two gentlemen, who are still directors of the company till today.

"They trusted us, and we started off from a simple corner office in Taman Sungai Besi. Along the way, without the bank's support, we had to be creative in getting our funds," Cheah said.

In 2016, GLT did an equity crowdfunding exercise, which was a resounding success. Not only did the company get some financial injection from the exercise, but it also got to introduce the biogas industry to the public.

"We thought that the public exposure was so much more rewarding. Anyway, we only raised RM800,000! Still, that gave us the boldness to carry out a private fund raising exercise a year later, where we managed to pitch to friends and relatives and raised a further RM4million.

> Over the years, its one-for-one success project build rate means that GLT has garnered a lot of trust among the palm oil millers, and the company's innovative solutions have been well received.

]"Today, from our recurring revenues and profits from our construction business, we are able to further invest into new FiT projects. From the days of our corner office with just two staff, we now have more than 40 staff, not including the plant operators at our FiT project sites," he added.

GLT's strength has always been in the biogas field, particularly with the effluent from palm oil mills. Over the years, its one-for-one success project build rate means that GLT has garnered a lot of trust among the palm oil millers, and the company's innovative solutions have been well received.

"Also, the capital requirements to carry out the biogas power plants is relatively small compared to others, so we stuck on with it until now. We may consider going into biomass in the near future, since we have established good contacts with the palm oil mills, and there is a lot of biomass waste from these mills, but we know that the investment is much higher.

RAYMOND CHEAH
GLT Chief Operating Officer

"Since we are not in the business of manufacturing of solar panels, that gives us a starting disadvantage if we want to compete in this arena, while we don't have any expertise in minihydro projects. Hence, better stick to what we know!" Cheah said.

He noted that the government's support in the form of Green Technology Financing Scheme and Investment Tax Allowance for the industry are already reasonably good.

"Perhaps one thing that can be improved is the connectability for more of the palm oil mills to participate in the FiT projects. As things stand, only about 100 out of more than 400 palm oil mills in Malaysia can be connected to the grid due to various issues.

"Bearing in mind that palm oil is a precious commodity to the country, increasing the connectivity means that more palm oil mills can contribute to lowering the bad image portrayed by the western media for our palm oil," Cheah said

In terms of MWh per year, a 2MW biogas plant produces more output than a 10MW solar project due to the readily available feedstock of the palm oil mill effluent versus the sunlight availability.

"In terms of capacity, then the biogas project is disadvantaged... biogas is far and away from the rest of the RE components. We are not sure what is the percentage right now, but given that there have already been three large scale solar (LSS) tender exercises to date, biogas would be lagging very far behind," said Cheah.

GLT Bio Sdn Bhd's biogas treatment plant with 1MW export capacity.

NOT ALL HEROES WEAR CAPES

Our frontliners deserve our full cooperation in the war against COVID-19

Sustainable Energy Development Authority - SEDA Malaysia

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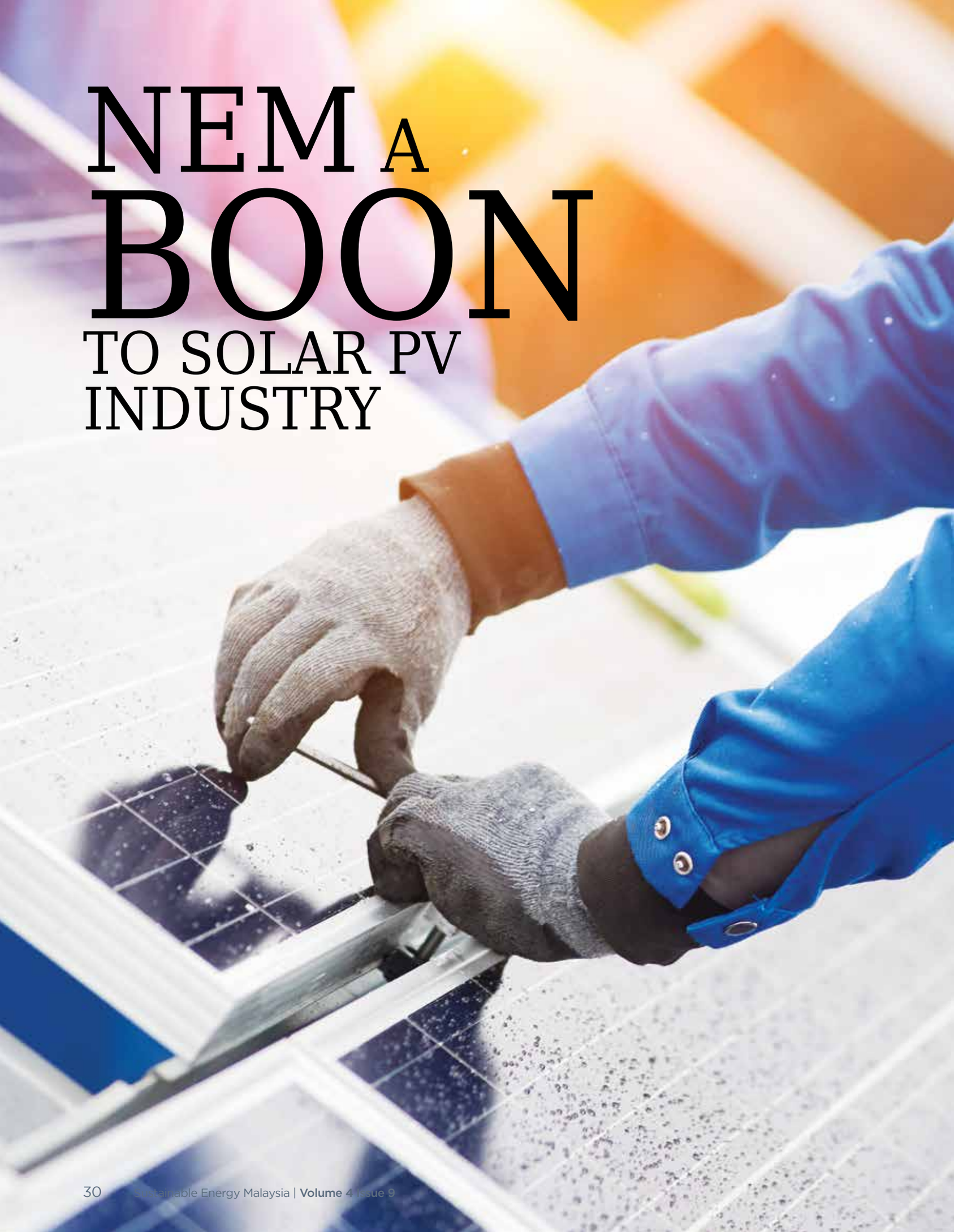
NEM A BOON TO SOLAR PV INDUSTRY



The local solar photovoltaic (PV) industry has been growing rapidly since the Net Energy Metering (NEM) scheme was improved to a one-to-one basis for any energy export to the grid effective from 1st January 2019.

Malaysian Photovoltaic Industry Association (MPIA) President Mr Chin Soo Mau said the uptake of the NEM quota has increased ever since the scheme was made more rewarding than its earlier version, and the uptake has more than doubled in 2019 compared to 2018.

The NEM scheme saw a change in policy in 2019 whereby surplus solar electricity is compensated on a one-on-one basis.

In 2019, a total of 1,252 applications representing 102.41MW of NEM was approved, bringing the cumulative approved capacity of NEM to 130.21MW. The increase of NEM 2019 alone was nearly 3.68 times the total capacity approved from 2016 to 2018.

As of 30th June 2020, 43.86% of the 500 MWac NEM quota allocated by the Government had been taken compared to 26% as of end-2019 and 5.4% as of end-2018.

Chin said the MPIA expects that at least 70% to 80% of the 500 MWac quota, which started since 2016, will be taken by the end of this year.

"It is also not surprising that if all the quota is fully taken by then. From the uptake trend, we can see that although the NEM, which was introduced in 2016, started slow, the uptake has shown significant momentum this year.

"We hope that the government could extend the NEM further to support the local solar PV industry and ensure a sustainable growth of the industry," he told SEM in an email interview.

The NEM scheme is a solar PV programme unveiled under the Budget 2016. It was introduced to complement the Feed-in Tariff (FiT) mechanism to encourage the deployment of RE as outlined in the 11th Malaysia Plan. Under the NEM, the energy produced from the solar PV system installed will be consumed first, and any excess to be exported and sold to the distribution licensee at a prevailing Displaced Cost prescribed by the Energy Commission. It was later tweaked to be implemented under a one-to-one basis from January 2019.

Chin also said the improvement in NEM coupled with price drop in solar PV system prices have resulted in a significant progress of the local solar PV industry, with the commercial and industrial sectors being the low-hanging fruits.

"Previously, the solar PV system prices were not very attractive, but thanks to the upstream efficiency which has brought down prices of major solar PV system components and our service providers who are now offering competitive prices, the adoption of renewable energy through solar PV systems has become really appealing," he added.

Chin said there are certain drivers to encourage the industry players or prosumers to exploit the country's rooftop potential for solar PV installations.

Firstly, the national renewable energy policy which has been implemented through, among others, the Net Energy Metering (NEM). Secondly, the return of investment (ROI) which generates monetary gains for those deploying the solar PV systems. Thirdly, the commitment towards environmental conservation. This can be achieved on a voluntary basis or otherwise.

"For instance, the government could require public-listed companies to have a certain percentage of their energy consumption sourced from renewable energy. All this would certainly propel the growth of the industry," Chin suggested. He acknowledged that the tax incentives related to green technology such as the Green Investment Tax Allowance (GITA) have been very conducive for the investment in solar PV systems and have benefited the MPIA members.

"We have not come across much constraint except some delay in processing the applications previously. However, the Malaysian Investment Development Authority (MIDA) has been supportive in assisting our industry in expediting the process," he added.

In the Budget 2020, the government announced that Green Income Tax Exemption (GITE) would also cover companies undertaking solar leasing or solar power purchase agreement (PPA) activities.

"We are currently waiting for details in terms of the mechanism...The measure is supportive of the local solar industry and will certainly give a boost to the adoption of renewable energy in the country," Chin said.

He noted that fundings for solar PV-related projects are available from local financial institutions, but these are somewhat focussed on large scale projects and those for commercial and industrial sectors under the NEM.

Chin wants to see efforts from the local financial institutions in funding the solar PV-related projects for the residential category under the NEM to intensify further.

MR CHIN SOO MAU
MPIA President

"The solar PV sector is big. The 500 MW quota under NEM introduced in 2016 would have generated a total investment of more than RM2 billion upon full installation of the capacity, which could happen by the end of 2021. In addition, we are expecting another RM5 billion investment in the fourth large scale solar (LSS4) programme alone.

"Moving forward, MPIA hopes that the government could extend the NEM, at the same time maintaining the support for local companies and local industry in the LSS. In terms of NEM extension, it would be good for the current one-to-one offset rate to remain; if that cannot remain, there could be changed slightly," he added.

Chin said the solar PV systems allow consumers to utilize electricity generated from sunlight and enjoy savings in their electricity bills. Consumers in the commercial and industrial are among the biggest beneficiaries due to their tariff category.

MPIA members, of whom nearly half are service providers that offer solar PV design and installation services to consumers. As an example, KIP REIT, the client of an MPIA member, has managed to save around RM1,066,630.81 per year for six locations of its KIP Mart premises.

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- **Energy Efficiency Management for Air-Conditioning and Mechanical Ventilation (ACMV) System;**
  Eligible for 8 Hours CDP for Registered Electrical Energy Manager (REEM) by Energy Commission

- **Energy Audit in Building;**
  Eligible for 12 Hours CDP for Registered Electrical Energy Manager (REEM) by Energy Commission

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信義光能控股有限公司
XINYI SOLAR HOLDINGS LIMITED

NEM, A BUILT-IN GREEN INITIATIVE

The Net Energy Metering (NEM) programme, which allows consumers to exploit the power generating potential of renewables, will encourage property developers to go for rooftop solar photovoltaic (PV) in their future real estate projects.

Xinyi Energy Smart (Malaysia) Sdn Bhd Finance Director Datuk Sin Ket Hin said the NEM acts as an enabler for more rooftop solar PV installations as property developers include this feature in their overall project designs to capitalise on the renewable energy (RE).

"It is a good enabler as the developers will start to think about RE in their pre-planning stages. With that, everybody will think green. It is already built-in in their business approaches. It will be the right time and the right place to implement this," he told SEM in an interview in Jasin, Melaka last July 2020.

The Sustainable Energy Development Authority (SEDA) Malaysia is the implementing agency of the NEM programme. It vets through the NEM applications while providing the technical support and consultancy services to the applicants in their pursuit to secure the NEM certificates. Effective on 1st January 2019, the NEM was improved and implemented under a one-on-one offset basis. Every 1kWh exported to the grid will be offset against 1kWh consumed from the grid. The NEM category has been divided into 4 categories -- Residential, Commercial, Industrial and Agriculture.

DATUK SIN KET HIN
Finance Director
Xinyi Energy Smart

Xinyi Energy Smart (Malaysia) and Xinyi Solar (Malaysia) Sdn Bhd - both subsidiaries of Xinyi Glass Holdings Limited Hong Kong - are beneficiaries of the NEM programme. From their manufacturing base in Jasin, Melaka, the two companies made significant savings in their electricity bills via a rooftop solar PV system.

The solar rooftop project for Xinyi's Melaka industrial plant was initiated in 2018, where the construction for a 12MW system started in July 2018 and completed in November 2018. Phase Two's 7MW started in May 2019 and was completed in July 2019.

Currently for the Phase Three, preparations are being made for the 12MW system, namely equipment and materials. Construction is expected to begin in August 2020 and expected to be completed by December 2020.

"Xinyi has been actively developing solar PV power plants and installing solar PV rooftops on our own facilities since 2012 for cost savings in the long run by reducing electricity bills and as an effort for environmental conservation by reducing carbon footprints.

"Solar energy poses fewer pollution risks to the environment in comparison to conventional sources of energy. Industrial and commercial owners should make an effort to adopt and invest in renewable energy where possible as an effort to combat climate change," Sin said.

The total investment for the entire 31MWp Solar Rooftop Project is approximately RM60 million with expected return on investment (RoI) of around four years.

Sin said with the current 19MW rooftop solar PV installed, the annual savings on electricity is approximately 27 million kWh which costs approximately RM9.7 million.

"When the total 31MW is completed in December 2020, annual savings on electricity is expected to be approximately 44 million kWh which costs approximately RM15.8 million. The final 12MW of the 31MWp rooftop solar PV is scheduled to be completed by December 2020," he added.

In early 2015, Xinyi Glass Holdings Limited acquired 200 acres of land in Elkay Industrial Park, Lipat Kajang, Jasin, Melaka for the purpose of building its first overseas industrial plant for the production of Photovoltaic (PV) Glass and Float Glass under Xinyi Solar (Malaysia) and Xinyi Energy Smart (Malaysia), respectively.

The construction work for Xinyi's Melaka industrial plant started in May 2015, and in November 2016 saw the completion of its first PV Glass production line which produces 900 tonnes of PV Glass per day. Subsequently from January 2017 to December 2018, a total of three Float Glass production lines under Xinyi Energy Smart (Malaysia) Sdn Bhd was completed and started operation with a total production capacity of 3,200 tonnes a day.

The latest PV Glass production line with daily production capacity of 1,000 tonnes was completed and in operation since January 2019. To date, the total production capacity of PV Glass produced by Xinyi Solar (Malaysia) Sdn Bhd is 1,900 tonnes per day.

To date, the total investment for Xinyi's industrial plant in Melaka is RM2.5 billion. Currently 100% of the PV Glass made by Xinyi Solar (Malaysia) Sdn Bhd is for the export market. Float Glass by Xinyi Energy Smart (Malaysia) Sdn Bhd, an average of 5% is made for the local market and the other 95% is for the export market.

> "...with the current 19MW rooftop solar PV installed, the annual savings on electricity is approximately 27 million kWh which costs approximately RM9.7 million"

Sin said Xinyi foresees an upward trend for the PV Glass market in Malaysia as can be seen in recent years where the Malaysian Government has been steadily stepping up its effort to reduce greenhouse gas (GHG) by promoting the use of RE.

"Programmes such as the Net Energy Metering (NEM), Large-Scale Solar (LSS), New Enhanced Dispatch Agreement (NEDA) and Green Investment Tax Allowance (GITA) are introduced to encourage additional investment and implementation of solar and renewable power generation in commercial and industrial sector.

"Furthermore, with global market leaders such as US-based market leaders First Solar and SunPower, along with South Korea-Germany's Hanwha Q Cells, China's JA Solar and Jinko Solar setting up manufacturing plants for Solar PV cells and modules here in Malaysia and with their continuous effort to research and develop better equipment with higher efficiency and competitive pricing, the demand for PV Glass will continue to see positive growth," he added.

Sin said as a PV Glass producer and Solar PV Plant owner in China with more than 2.5GW connected to the grid, Xinyi is looking forward to developing its first 100MW Solar PV Plant in Malaysia.

"Xinyi is also actively seeking a strategic location to expand our PV Glass manufacturing facility in Malaysia. Malaysia's strategic location, with its continuous improvements and developments of infrastructure and very supportive government that are pro-investments allows us to conduct our business here with ease and confidence," he added.

He noted that Xinyi will continue to make full use of the successful experience in waste heat power generation, rooftop solar PV projects, solar PV plants, and increase investment in microgrid energy storage, wind power to actively respond to national industrial policies for sustainable development for the improvement of humanity, and contribute to improving the earth's ecological environment.

PVMS
PV MONITORING SYSTEM

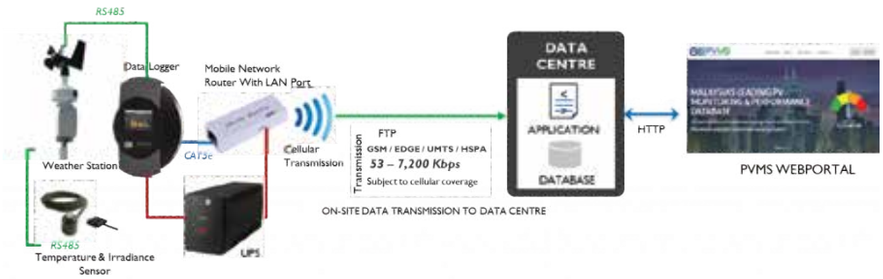
MALAYSIA'S LEADING PV MONITORING & PERFORMANCE DATABASE

Up-to-date information, real-time monitoring and reports on solar photovoltaic (PV) in Malaysia. Harness and energise tomorrow's energy, today.

The National PV Monitoring & Performance Database via the PV Monitoring System (PVMS) is an initiative to monitor selected grid-connected solar PV systems for performance and reliability. This programme is funded by Akaun Amanah Industri Bekalan Elektrik (AAIBE) or the Malaysian Electricity Supply Industries Trust Account (MESITA).

For a start, 148 grid-connected solar PV systems (up to 1MW capacity) throughout Malaysia are being monitored on a real-time basis. Both data and system performance analyses are available upon subscription. The Database will become the reference for designing national energy policies and programmes in the future.

The PVMS system architecture



PVMS REPORTS

What's included?

Summary
Energy Generation

Plant Performance
Performance Ratio, Reference Yield, Specific Yield & Final Yield

Meteorological Data
Global Irradiance, Ambient Temperature, Wind Speed, Wind Direction & PV Module Temperature

Irradiation Data
Daily Irradiation

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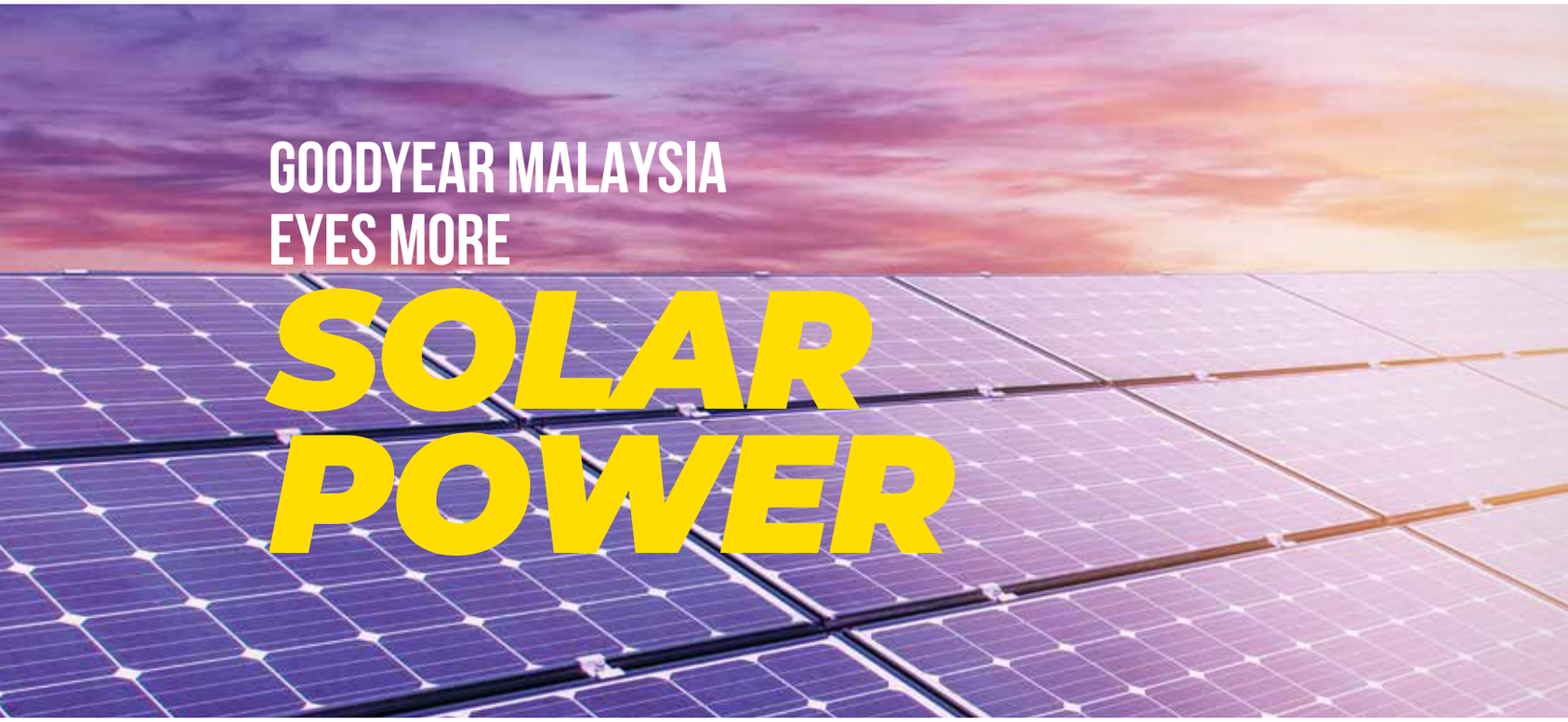

GOODYEAR MALAYSIA EYES MORE SOLAR POWER

About a year ago, Goodyear Malaysia Berhad launched one of its biggest sustainability initiatives with the installation of 6,680 solar photovoltaic (PV) panels with a total capacity of 2.5MW to power up its corporate office and Shah Alam production plant. The investment made has yielded attractive returns and the tyre manufacturer has decided to go for more.

Managing Director Alex Ng said the project was part of Goodyear's global initiative to minimize carbon footprint, the project was conceptualized with the intention of improving the environmental conditions, particularly to ensure there is long-term sustainable and responsible operations within the manufacturing grounds in Malaysia.

"The main goal is to reduce greenhouse gases and as of today, we have managed to avoid 11,209,049 lbs of carbon dioxide," he told SEM in an email interview.

Reminiscing on the early days of the project, Ng said: "We completed the project within eight months. This included concept, design, Tenaga Nasional Berhad's (TNB) approvals, procurement management, materials delivery and installation. The decision to initiate this project was decided in October 2018 and we managed to complete the project by July 2019.

"The total investment for the project was USD 2 million for the 2.5MW solar system. We faced some challenges with weather, particularly rain from time to time but we managed to be on track when the weather was better."

Ng said Goodyear Malaysia was satisfied with the direction it took to venture into solar PV as the Government was very supportive towards Goodyear Malaysia's Green Energy Projects in terms of extending tax incentives to the company.

"With the solar panel system running, Goodyear Malaysia was able to reduce its consumption of electricity from TNB. The percentage of electricity savings is around 17%. As of today, the solar plant can generate 3.15GWh. With the Government's incentives, Goodyear Malaysia expects the payback period from the investment and it could stretch to six years without the government's tax incentives," he added.

On Malaysia's RE agenda, particularly on solar PV, Ng said Goodyear Malaysia sees itself as a contributor to the effort and it is aligned with the company's global efforts to be part of the RE sector.

"Our companies have started working with a few electric car manufacturers to innovate and bring tyres to a new level to minimize wastage. We are planning to install an additional 500 kW solar system in coming years," Ng said.

The link between Goodyear and Malaysia has existed since 1908 when Goodyear Orient Company was established in Singapore. Sales of Goodyear products in Malaysia however only began in 1929 via Singapore-based Goodyear Sales Company. In 1972, Goodyear Malaysia was set up under Malaysia's New Economic Policy (NEP). Goodyear has been with Malaysia through thick and thin.

On the company's long-term plan for Malaysia, Ng said: "As the largest Original Equipment (OE) passenger tyre supplier for various car manufacturers, we continue to work together with Malaysians not just in providing jobs but also providing a safe and trustworthy product for our everyday commute.

"Our latest initiative is to widen our reach and venture into the UHP (Ultra High Performance) segment where we can expand our racing brand, the Eagle F1 series. We have already started selling UHP tyres to the market and the feedback is good."

> Goodyear Malaysia was able to reduce its consumption of electricity from TNB. The percentage of electricity savings is around 17%. As of today, the solar plant can generate 3.15GWh.

MR ALEX NG
Managing Director
Goodyear Malaysia Berhad

Greenhouse Gases Avoided

by use of renewable energy

Carbon Dioxide
11,209,049.80 lb

Nitrogen Dioxide
2,961.00 lb

Sulfur Dioxide
14.30 lb

Environment Benefits

lifetime until 2020-08013 12:40 MYT

The greenhouse gases that
1,121.00 passenger cars emit over 1 year

The energy to power
24,239.00 computers for 1 year

The energy to operate TV for
21,899,613.00 hours

BANK ISLAM ex

pands GREEN FINANCING SERVICES

Bank Islam Malaysia Berhad has expanded its green financing services to further encourage Malaysians, particularly home owners, to be part of the country's renewable energy (RE) sector.

MOHD MUAZZAM MOHAMED
CEO Bank Islam

Its partner in the venture is Tenaga Nasional Berhad's (TNB) subsidiary GSPARX Sdn Bhd whose core business is in the rooftop solar photovoltaic (PV). It also facilitates the implementation of Net Energy Metering (NEM) scheme and Supply Agreement for Renewable Energy (SARE).

The partnership is part of the Bank Islam's green financing journey that focuses on encouraging sustainable business and lifestyle practices which have always been the bank's business philosophy.

Bank Islam's Chief Executive Officer, Mohd Muazzam Mohamed said TNB has long been amongst the Bank's most valued client with a wide range of financial and banking solutions offered to them and their subsidiaries.

"This latest offering of our personal financing product to GSPARX's solar PV package customer is an extension of the symbiotic relationship between the three parties," he said in a media statement released in Kuala Lumpur last July 2020.

Through this collaboration, Bank Islam is offering up to 100% financing for the purchase of GSPARX's solar PV package or up to RM300,000 with attractive floating rate of as low as 4.67% (BR +1.90% p.a) or fixed rate 4.5% for 3 years accordingly.

GSPARX will be offering residential packages which include one year of free maintenance, product and workmanship warranty, 24/7 online monitoring, as well as after-sales services.

"These added values will not only benefit customers but also be instrumental in preserving the planet through promoting renewable energy," Mohd Muazzam added.

At present, Bank Islam's other main partners in providing green financing are Malaysia Debt Ventures Bhd, Sustainable Energy Development Authority Malaysia, Credit Guarantee Corp Malaysia Bhd and Malaysian Green Technology Corp.

Meanwhile, TNB President and Chief Executive Officer, Datuk Seri Amir Hamzah Azizan said TNB is at the forefront of renewable energy in Malaysia through its Large Scale Solar Projects in Sepang in Selangor and Bukit Selambau in Kedah, and initiatives like electric vehicle charging stations in collaboration with Malaysian Green Technology and Climate Change Centre (MGTC)

"TNB is actively promoting rooftop solar panels where at the end of last year, we had more than 100 customers – from commercial, industrial, educational, government institutions and residential homes – who have turned into 'prosumers', generating clean energy on their premises," he added.

These prosumers are now generating more than 26 megawatts of energy combined. At the same time, they also reap the benefit of potential savings from lower electricity bills, and have the opportunity to generate income by exporting excess energy to the grid under the NEM scheme.

Amir also said that rooftop solar PV is still a relatively untapped market in the renewable energy space in Malaysia. Accessing this avenue requires strategic partnerships with corporations such as Bank Islam.

The collaboration with TNB marks Bank Islam as GSPARX's first solar PV financing partner with aims to encourage the usage of solar panels at homes, subsequently increasing the number of Green Homes and production of sustainable and cost-efficient energy in the country.

Banking on the United Nations Sustainable Development Goals (SDG) 7- Affordable and Clean Energy; 11- Sustainable Cities and Communities; 13-Climate Action; 15-Life on land and 17-Partnership for the Goals; Bank Islam is committed to promote sustainable and responsible financing for all.

Bank Islam Malaysia Berhad was established in 1983 as the nation's first Islamic bank. To date, the Bank has a network of 144 branches and more than 900 self-service terminals nationwide. To meet the diversity of the public's financial needs, Bank Islam offers more than 70 Shariah-based banking products and services which cater to Muslims and non-Muslims.

TNB's core activities are in the generation, transmission, and distribution of electricity. In addition to being the nation's primary electricity generation enterprise, TNB also transmits and distributes all the electricity in Peninsular Malaysia, Sabah and Federal Territory of Labuan. As of 31 March 2020, TNB supplies electricity to approximately 9.9 million customers.

As of June 2020, GSPARX, which was established in January 2018, has secured more than 150 projects with combined capacity of 26MW.

> Bank Islam is offering up to 100% financing for the purchase of GSPARX's solar PV package or up to RM300,000 with attractive floating rate of as low as 4.67% (BR +1.90% p.a) or fixed rate 4.5% for 3 years accordingly

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brand with the elite

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Greenplus provides cutting edge information and articles on eco-friendly and sustainable developments targeted at decision makers, managers, and stakeholders in the country and expose them to the latest ideas, tools, techniques, products and outstanding green personalities and bring to their notice current trends in the industry.

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GREEN CADETS

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STEADY

GROWTH

SEEN IN

GREEN FINANCE

Malaysia has seen steady development of sustainable finance markets in the last five years with new financing instruments introduced and enabling regulatory framework sets in motion for financial institutions.

The World Bank Country Manager for Malaysia, Dr Firas Raad, said a lot has happened in green finance in Malaysia in the last five years, and the World Bank Malaysia Hub has the pleasure of supporting some of these new initiatives, including the first green sukuk issuance in July 2017, which was the first green sukuk issued globally.

"July 27, 2020, marks the three-year anniversary of the first green sukuk issuance, and there has been tremendous progress in awareness, technical capabilities, product innovation and stakeholder involvement in supporting the sustainable development agenda.

"The Sustainable and Responsible Investment Framework (SRI) by Securities Commission Malaysia (SC) provided the necessary regulatory framework and incentives to facilitate the introduction of innovation financing instruments through the capital markets," he told SEM in an interview.

DR FIRAS RAAD
World Bank Country Manager for Malaysia

Firas pointed out that Malaysia is also leading the ASEAN regional standards development for sustainable finance, where the SC has actively contributed to the drafting and issuances of ASEAN Green Bond Standards, ASEAN Sustainability Bonds Standards, ASEAN Social Bonds Standards (2017-2018), which aim to facilitate financing and investment in green and sustainable projects in ASEAN region.

"These regional standards are well recognized by investors and will facilitate future scaling up of green finance in the region," he said.

He noted that the Bank Negara Malaysia (BNM) and the SC have been very active in proving enabling legal and regulatory framework to green the financial systems.

BNM introduced the Value-based Intermediation Strategy (VBI) for Islamic banks in 2018, followed by implementation guidelines on environmental and social safeguards framework and scorecards for monitoring and evaluation. Financial institutions are working with industry associations on developing sectoral guidelines for sectors that have significant economic, social and environmental impacts to guide their future lending operations. The VBI concept is not only applicable to Islamic banks, but also other Islamic financial services such as Takaful. In essence, it complies with the global sustainable finance standards and principles and can well be applied in conventional banking and insurance services.

The central bank has also joined the Network of Central Banks and Banking Regulators for Greening the Financial System (NGFS) in 2018 to participate in global dialogues among financial sector regulators on policy and standards setting for managing climate change risks in financial system and defining the roles of regulators and financial sector in support more sustainable and resilient development.

BNM has since commissioned several technical reviews relating to climate change risks to financial system. Most recently, BNM issued a Discussion Paper on Climate Change and Principle-based Taxonomy in December 2019 with the aim to develop a common definition/glossary in identifying and classifying economic activities that could contribute to climate change objectives.

"Consultation with the industry is on-going. This is a major milestone in financial system to scaling up financing and investments that provide positive environmental benefits. Many central banks and financial sector regulators are developing their own national green taxonomy," he added. Firas said more financial institutions in Malaysia are gearing their financing and investment towards green and sustainable projects.

Besides joining the VBI initiatives in Malaysia, many local banks have started developing their own sustainable finance frameworks in accordance with international standards, he added.

CIMB has officially signed on UN Principles of Responsible Banking and was the lead advisor for several major green bond/sukuk issuances in ASEAN region. OCBC Malaysia as part of a consortium of lenders, provided a green syndicated loan for a 30MW solar power project in Perlis, the first green loan in Malaysia following the green loan principles set out by the Asia Pacific Loan Market Association (APLMA).

Institutional Investors such as the Employees Provident Fund (EPF) and Kumpulan Wang Persaraan (KWAP) have also signed on to UN Principles for Responsible Investment (PRI) and are working on their strategic investment allocation for more green investment. Bursa Malaysia has been one of the initial members of the Sustainable Stock Exchange Initiatives and have introduced the sustainability reporting for publicly listed companies.

"Looking forward, we see greater opportunities for scaling up green finance in Malaysia based on the current initiatives by financial sector regulatory authorities and financial industry," he added.

Firas said there are additional actions needed to scale up green finance in the country. These include:

Adopt a common national green taxonomy by financial institutions and government agencies for financing all public and private sector investment activities and developing a monitoring and reporting system to capture green finance activities.

Develop standard accounting methods for reporting the environmental and social benefits of green finance.

Build up local capacity of consulting and advisory services for verification of green/ sustainable projects to ensure consistency and quality.

Enhance the capacity of financial professionals on risks management for climate risks and green finance.

Enhance the collaboration and consultation with science and technology, climate change researchers, environmental and social protection experts on identifying technology risks and future prospects of technology evolutions.

Provide necessary support and incentives to improve competitiveness of SMEs by adopting greener technology, manufacturing process, transportation, and packaging.

Further review the enabling legal and regulatory frameworks and incentives to diversity investor base and allow more market participants to tap into green finance markets, eg. retail investors, charitable funds, NGOs, SMEs, state and local governments.

Integrate the climate actions into public finance planning, budgeting and auditing process.

> Additional actions needed to scale up green finance in the country

On the prospects of tapping the bond market to raise funds for green technology venture, he said the SRI Sukuk Framework and ASEAN Green Bond Standards have provided the enabling regulatory framework for corporates to tap into the green bond market for financing.

"However, smaller green technology ventures, often need a smaller amount of funding, resulting in a smaller green bond issuance, which in turn is less favoured by the larger institutional investors, who prefer large and liquid bond issuances which are easier to trade. Small bond issuances also suffer from a higher cost of issuance relative to the size of the issuance, as they don't benefit from economies of scale.

"Further diversification of financing and investment instruments and reducing the costs of funding will be needed for this type of companies. Financial technology (Fintech) solutions are being explored by both regulatory authorities and innovative financial solutions companies, " he added.

PROSPECTS SEEN FOR UAE-MALAYSIA COLLABORATIONS ON RE SECTOR

The United Arab Emirates (UAE), a titan when comes to championing renewable energy (RE) initiatives, sees a big potential of collaborating with Malaysia on promoting RE, particularly solar power.

UAE Ambassador to Malaysia, H.E. Khalid Ghanim Al Ghaith, said compared to other nations which have set their crosshairs on RE developments, Malaysia is closed to their heels.

"Malaysia is not behind with those numerous countries which are focusing on RE as part of their economic revival. Malaysia's 1GW play announced this year seems big enough for its own story," he told SEM in an email interview in August 2020.

Khalid was referring the fourth cycle Large-Scale Solar (LSS4) scheme which was announced by the Ministry of Energy and Natural Resources in early June 2020. The solar plants under the LSS4 are expected to start operating latest by 31st December 2023 as the development of each plant would take up to 18 months.

"This shows that both countries share same prosperity on relation to promoting RE and solar power in particular. Here where I can see a big potential of collaboration between our countries, and UAE is always welcoming any move towards this. And perhaps the Sustainable Energy Development Authority (SEDA) Malaysia can play an important role on this," Khalid said.

He noted that the UAE is leading global efforts to spread sustainability solutions with clean and renewable energy projects in more than 90 countries around the world. These are implemented through the Abu Dhabi Fund for Development (ADFD), and Abu Dhabi Future Energy Company (Masdar), in addition to several projects carried out by private companies.

"Our leaders assured that the UAE plays a prominent role in spreading and promoting RE solutions for many countries around the world. The UAE's contributions in the field of sustainability have become a role model for countries seeking to ensure the sustainability of sustainable development," he added.

UAE has implemented and contributed to the development of a large number of projects locally, regionally and globally, and has also been keen to promote and apply the latest RE solutions. The country has been constant in supporting all scientific and research efforts to develop practical innovations that contribute to increasing the viability of RE projects.

H.E. KHALID GHANIM AL GHAITH
UAE Ambassador to Malaysia

For example, on the sidelines of the 2020 session of the Abu Dhabi Sustainability Week held from 11th January to 18th January 2020, the ADFD announced the allocation of 384 million dirhams (USD105 million) to finance renewable energy projects in Nepal, Chad, Saint Lucia, Cuba, Burkina Faso, Saint Vincent and the Grenadines, the Maldives, Antigua and Barbuda. This is part of the seventh financing cycle, bringing the total value of projects benefiting from the initiative to 1.28 billion dirhams (USD350 million), distributed over 32 projects in 26 countries.

Meanwhile, Masdar has unveiled new projects as part of an approach to enter new markets such as Indonesia and Australia. It has announced an agreement to purchase energy with the State Electricity Company of Indonesia within the framework developed by Masdar for the first floating solar photovoltaic power plant in the republic.

Another partnership agreement has also been signed with the ADF Group to establish a company specialized in developing distributed solar energy and energy efficiency projects, and an agreement with CEPSA, a global energy and chemical company owned by Mubadala and Carlisle Group, to establish a company, jointly aimed to develop RE projects in Spain and Portugal.

"Overall, the UAE, through its cooperation with the International Renewable Energy Agency (IRENA), had a prominent role in spreading and promoting the arrival of RE solutions to many countries around the world. The UAE has since 2013 allocated one billion dollar in aid for developing countries to implement renewable energy projects. The multiple projects launched by the ADFD in cooperation with IRENA are one of the important examples of the UAE's role in spreading these solutions globally," said Khalid.

The UAE has paid close attention to the use of RE and clean energy solutions since 2006 with the establishment of Masdar; the inauguration of IRENA in Abu Dhabi in 2009 and the kick start of mega projects in UAE such as the Shams 1 Station, Noor Abu Dhabi, the Mohammed bin Rashid Solar Complex and the mega project currently underway in the Al Dhafra region.

> ...UAE has always been optimistic with RE efforts as the country pays great attention to keeping pace with developments and technology...

He noted that the UAE has always been optimistic with RE efforts as the country pays great attention to keeping pace with developments and technology in a way that ensures the country's continued growth and progress.

Currently, it has also adopted a set of policies and strategies in support of energy transformation and implementation of the green economy system, including the Emirates Energy Strategy 2050, which aims to increase the share of clean energy in the total domestic energy mix to 50%.

This energy strategy creates a mix of renewable, nuclear and fossil clean energy to ensure a balance between economic needs and environmental goals; The energy mix according to the strategy can include:

- Clean energy (44%) which consist of solar, wind and biofuels;
- Gas (38%);
- Clean coal (12%); and
- Nuclear energy (6%).

The UAE will invest USD 164 billion until 2050 to ensure that energy demand is met and sustainable growth in the UAE economy is achieved. The plan will be to raise the contribution of clean energy to achieve savings of USD190 billion until 2050. The strategy takes into account demand fulfilment by 6%, and cuts that carbon dioxide from the electricity production process by 70% over the next three decades.

> UAE plays a prominent role in spreading and promoting RE solutions for many countries around the world. The UAE's contributions in the field of sustainability have become a role model for countries seeking to ensure the sustainability of sustainable development

Khalid also said the development of large-scale solar power installations as well as RE goals reflect the UAE's ambition to move forward. Various solar power projects and organizational initiatives are under development including the world's largest concentrated solar power plant - Noor Energy 1.

Noor Energy 1 has a 950MW power capacity as it uses three technologies to produce clean energy ˇ— 700MW concentrated solar power (CSP) and 250MW photovoltaic (PV). This hybrid project generates 600MW from three parabolic trough CSP plants, 100MW from a solar tower, and 250MW will be generated from solar PV systems.

Noor Energy 1 is the fourth phase of the Mohammed Bin Rashid Al Maktoum Solar Park, and considered now as the largest single-site concentrated solar power plant in the world. The project will deliver electricity at a levelised tariff of US$7.30 cents per kilowatt-hour; a cost level that competes with fossil fuel generated electricity without subsidy for reliable and dispatchable solar energy through the night.

The expected construction duration will lasts 48 months, meaning the overall 950MW project will be completed by the end of 2022. Separately, the first parabolic trough CSP plant is planned to be operational on August 21, 2021, tower CSP plant finished on November 21, 2021 and the second and third parabolic trough plants to be completed by the end of the year of 2022.

The Noor Energy 1 solar thermal project costs approximately USD4.4 billion. The Dubai Noor Energy 1 solar complex is the fourth phase of Mohammad Bin Rashid Al Maktoum Solar Park in Dubai that which will reach a total capacity of 5,000MW by 2030. The plant will contribute to Dubai's transformation into a global clean and renewable energy hub, and accelerate its shift towards solar power.

"We are glad to reach that," Khalid said.

IRENA
International Renewable Energy Agency

INNOVATIONS
FOR A DECENTRALISED, RENEWABLE POWER SYSTEM

The Sustainable Energy Development Authority (SEDA) Malaysia and the Abu Dhabi-based International Renewable Energy Agency (IRENA) have jointly organised a webinar on 25th August 2020 to deliberate on the developments emerging from a decentralised renewable power system.

The webinar was on Innovations for a Decentralised, Renewable Power System: Peer-To-Peer Electricity Trading. It drawn some 2,007 registrations and on the day of the event was attended by 987 participants from all over the world.

SEDA Malaysia's presentation was on the experiences and lessons learnt from Malaysia's first pilot run of peer-to-peer (P2P) energy trading. It was delivered by SEDA Malaysia's Director of Digital Services Ts. Hazril Izan Bahari. SEDA Malaysia launched its pilot run of the P2P energy trading in October 2019.

MR FRANCSICO BOSHELL
IRENA's Renewable Energy Markets and Standard Analyst

IRENA gave a talk on the role of increased demand side flexibility and innovative solutions that the decentralisation brings to the integration of high shares of renewable energy (RE) resources in the power system. The talk was given by IRENA's Renewable Energy Markets and Standards Analyst, Mr Francisco Boshell.

Power Ledger, a system developer of P2P energy trading platform which is being deployed in countries like Australia, Japan, Thailand and the United States, spoke on its blockchain technology that supports P2P energy trading projects. The company was represented by its Executive Chairman and Co-Founder Dr Jemma Green and Head of Business Development and Sales, Mr Vinod Tiwari.

IR. DR. SANJAYAN VELAUTHAM
CEO SEDA Malaysia

The one-hour event was moderated by IRENA's Associate Programme Officer on Renewable Energy Innovation, Ms Arina Anisie.

In his welcoming remarks at the webinar, SEDA Malaysia CEO Ir. Dr. Sanjayan Velautham said Malaysia's Renewable Energy Transition Roadmap (RETR) 2035 has identified the P2P energy trading as one of the potential strategies to scale up rooftop photovoltaic (PV) market in the country.

"Even in the early days of evaluation, the concept of the P2P energy trading is appealing to the consumers in many ways. As in any P2P model, the concept leverages on a sharing economy underpinned by digital technologies brought about by a combination of blockchain, the IoT, smart contracts, big data, AI and cloud applications," he added.

SEDA in 2019 was tasked by the Government to develop the RETR 2035 to chart the path towards greater decarbonising of Malaysia's national power sector. Malaysia is well endowed with many renewable resources and being along the Sun-belt means it has abundant solar energy.

MS. ARINA ANISIE
Associate Programme Officer
Renewable Energy Innovation, IRENA

The RETR 2035 has identified 269GW of potential solar resources of which rooftop PV potential alone is 42GW. This represents a huge opportunity for the rooftop PV market, especially when the levelised cost of solar energy has come down nearly 80% in Malaysia in the past decade.

In his presentation, SEDA Malaysia's Ts. Hazril Izan said the pilot run of the P2P energy trading in Malaysia has helped the Authority to identify the challenges arising from undertaking the project.

He noted that the infrastructure for the system needs to be enhanced where there exist a seamless integration spanning the data collection, trading, billing and settlement process.

The meter data format has to be standardised to ease the integration with the platforms, namely the P2P energy trading, billing and settlement.

The pilot run also revealed that the drive for prosumers/consumers to participate in the P2P energy trading programme is strongly related to economic return such as savings and margin risks. As such, the process to attract participants has to be simplified.

TS. HAZRIL IZAN
Director of Digital Services
SEDA Malaysia

"The untraded energy can be a risk to the prosumers in terms of financial loss. Thus, it is important to balance by increasing more consumers or providing a compensation rate. Retailers play an important role in settlement, reducing the counter party risk and being a buyer-of-last resort," he said. The stakeholders of the P2P energy trading pilot run are:

a. Ministry of Energy and Natural Resources;
b. Energy Commission of Malaysia (regulatory sandbox provider);
c. Tenaga Nasional Berhad (provider of smart meters and integrated billing system for the P2P);
d. Power Ledger (the P2P platform provider); and
e. Participating prosumers and electricity consumers.

> ...huge opportunity for the rooftop PV market, especially when the levelised cost of solar energy has come down nearly 80% in Malaysia...

IRENA's Boshell, in his presentation titled, Renewable integration and power system decentralisation, said the transition of power systems has propelled three trends, namely electrification, decentralisation and digitalisation.

He noted that the electrification of end-use sectors is an emerging solution to maintain value and avoid curtailment of variable renewable energy (VRE) like solar and wind.

The increasing deployment of distributed energy resources (DERs) promotes decentralisation of the power system as it turns the consumer into an active participant, fostering demand-side management.

As for the trend in digitalisation, Boshell said digital technologies enable faster response, better management of assets, connecting devices, collecting data, monitor and control.

He also said decentralisation requires digitalisation as the deployment of renewables increases the power sector's complexity and the need for flexibility.

Speakers from Power Ledger - Dr Jemma Green and Mr Vinod Tiwari - spoke jointly on the various projects the company was handling in various countries including Malaysia, Thailand, Australia and France.

On the Malaysian the P2P pilot run, Power Ledger provided the energy trading system based on the blockchain technology. Both Dr Green and Vinod noted that the trial project demonstrated that P2P energy trading can encourage growth of rooftop solar in a scalable way in Malaysia.

DR JEMMA GREEN
Executive Chairman and Co-Founder
Power Ledger

MR VINOD TAWARI
Head of Business Development and Sales
Power Ledger

CALENDAR OF EVENTS

The final strategic thrust under the National Renewable Energy Policy and Action Plan (NREPAP) relates to developing an awareness programme so that there is a greater acceptance and participation by the general public and private sector in the sustainable energy programmes administered by SEDA Malaysia.

The activities cover local awareness programmes which include engagement with stakeholders through seminars/workshops, open days, exhibitions, collaboration with NGO partners as well as online engagements such as webinars and virtual roundtables and international liaisons through meetings and seminars attended.

15 MAY

PUTRAJAYA

UPDATE ON SUSTAINABLE ENERGY

SEDA Malaysia welcomed its new Board Members comprising YB Tuan Lukanisman Awang Sauni (SEDA Malaysia's Chairman), YBrs. Puan Usha Nandhini Jayaram and YB Dato' Hj. Mohd Salim Shariff @ Mohd Sharif to a briefing session on Sustainable Energy updates in Malaysia. The necessary precautionary measures were taken during the visit to ensure SEDA Malaysia abide with the Conditional Movement Control Order (CMCO).

18-21 MAY

PUTRAJAYA

EXTENDING A HELPING HAND

SEDA Malaysia continues to activate its CSR initiative. The Authority hoped its support to old folks and orphanage homes in the form of groceries will ease their burden and spread happiness during the CMCO.

29 JUNE

PUTRAJAYA

MBPP VISITS SEDA MALAYSIA

SEDA Malaysia had the honour of welcoming delegates from the Penang Island City Council (MBPP), led by its Mayor, Yang Berbahagia Dato' Ar. Yew Tung Seang. There was a useful exchange of insights and experiences from both parties.

30 JUNE

PUTRAJAYA

ENERGY MANAGEMENT COURSE FOR PJCC

SEDA Malaysia conducted a training called "Pengurusan Tenaga Tahap Pengenalan" attended by 40 Petaling Jaya City Council's (PJCC) staff. The introductory training was to give them basic knowledge on energy management as part of efforts to promote awareness on energy efficiency among the public.

1 JULY

PUTRAJAYA

COMMITTEE MEETING ON LCC DEVELOPMENT

The Green Technology Application For The Development Of Low Carbon Cities (GTALCC) has organised the GTALCC Project Technical Committee Meeting No.1&2 for the year of 2020. The meeting was conducted via a hybrid meeting platform (face-to-face and also online meetings). Representatives attended this meeting included from the Malaysia Institute of Planners (MIP), Iskandar Regional Development Authority (IRDA), Majlis Perbandaran Hang Tuah Jaya (MPHTJ), Perbadanan Putrajaya and non-governmental organisations.

22 JULY

PUTRAJAYA

RTM AND SEDA MALAYSIA CHAIRMAN ON SOLUSI LESTARI

Snippets taken during an exclusive interview with SEDA Malaysia Chairman, YB Lukanisman Awang Sauni, on a "Solusi Lestari" documentary which will be aired in RTM. YB Lukanisman explains on SEDA Malaysia's roles and the Net Energy Metering (NEM 2.0) during this exclusive interview.

24 JULY

PUTRAJAYA

KNOWLEDGE SHARING SESSION ON RE FINANCING

Affin Hwang Capital Director of Debt & Capital Markets, Pn. Juniza Zahari, and Affin Hwang Investment Bank Berhad Senior Associate Director of Debt & Capital Markets, Mr. Warren Tay Cheng Ho, gave talks on the financial institution's experience on Financing RE & EE Projects through Bank Loans and Green Sukuk.

29 JULY

PUTRAJAYA

BRIEFING ON NEDA

A knowledge sharing session on the New Enhanced Dispatch Arrangement (NEDA) was given by Pn. Hartini Kamaruzzaman, Manager (Capacity Planning), Single Buyer Department, Planning and Regulatory Economics Division of Tenaga Nasional Berhad (TNB). The Single Buyer runs the web-based system Market Participant Interface (MPI) that supports NEDA.

30 JULY

PUTRAJAYA

RE SUBSECTOR NETWORK MEETING

The 27th Annual Meeting of the Renewable Energy Sub-Sector Network (RE-SSN), which was held at the SEDA Malaysia, in session.

7 AUGUST

PUTRAJAYA

SEDA MALAYSIA CHAIRMAN'S MAIDEN TOWNHALL

Inaugural Townhall with Chairman of SEDA Malaysia, YB Lukanisman who had the honour of meeting SEDA Malaysia's staff via hybrid mode (face-to-face and also online meetings) and there were active interactions between the Chairman and SEDA Malaysia's staff during the Q&A session.

19 AUGUST

PUTRAJAYA

SHARING KNOWLEDGE SESSION WITH TNB

TNB representatives - En. Mohd Yusrizal Mohd Yusof, Managing Director, TNB Renewables Sdn. Bhd. and Ir. Nik Sofizan Nik Yusuf, Chief Engineer of Solutions for Grid of the Future, TNB - gave briefings on Grid of The Future and Renewable Energy Way Forward to SEDA Malaysia staff. This is one of the many capacity building and knowledge sharing session organised by SEDA Malaysia to empower its human resources.

24 AUGUST

PUTRAJAYA

THE 38TH ASEAN SENIOR OFFICIALS MEETING ON ENERGY (SOME)

The 38th ASEAN Senior Officials Meeting on Energy or SOME goes online to make preparations for the ASEAN Ministers on Energy Meeting. The online meeting groups representatives from ASEAN member states, the ASEAN Centre for Energy, the International Energy Agency (IEA), the International Renewable Energy Agency (IRENA), and partner countries such as China, the Republic of Korea, New Zealand, and the US.

15 JUNE

MR. AFIQ ZAMBRI (SPEAKER)

at

Energy Management in Building Online Training

organised by

SEDA Malaysia and United Nations Development Programme (UNDP)

18 JUNE

MR. MOHD SHAHAMBALI ARIFIN (SPEAKER)

at

Energy Management in Building Online Training

organised by

Putrajaya Corporation (PJC)

webinar events

STAKEHOLDERS' ENGAGEMENT

4 AUG

TS AZAH AHMAD

at

Malaysia Solar Market: Opportunities and Challenges

organised by

EQ & Urbana Media Network

10 AUG

DR WEI-NEE CHEN

at

Global Energy Utilities Digital Week (GEUDW): Flattening the Climate Curve: Monetizing the Sun

organised by

Informa Markets & MPIA

18 AUG

IR DR SANJAYAN VELAUTHAM

at

Malaysia Energy Virtual Roundtable

organised by

World Economic Forum

20 AUG

DR WEI-NEE CHEN

at

Climate-Women-Energy Nexus: Empowering Women in Renewable Energy

organised by

UiTM & UiTM Solar Energy Research Institute

WORLD ECONOMIC FORUM

23 JUNE

DR WEI-NEE CHEN

at

CIF-GDI Delivery Lab Series: The National Solar Park project, Cambodia

organised by

Global Delivery Initiative, Climate Investment Funds & Asian Development Bank

21 JULY

MR. MOHD SHAH HAMBALI ARIFIN (SPEAKER)

at

Energy Efficient Buildings/Low Carbon Building During the Development & Operation

organised by

Majlis Perbandaran Hang Tuah Jaya

23-24 JULY

MR. MOHD SHAH HAMBALI ARIFIN (SPEAKER)

at

Bengkel Penyediaan Laporan "Blueprint Implementation Document' dan Sesi Pre Audit 'Low Carbon Cities 2030 Challenge' (LCC 2030 C) Serta Penyelarasan Data Program 'SEDA Malaysia Voluntary Sustainable Energy Low Carbon Building Assessment (Greenpass) Bagi Projek Kerjasama Rakan Strategik MBSA

organised by

Majlis Bandaraya Shah Alam (MBSA)

23 JULY

- IR DR SANJAYAN VELAUTHAM
- DR WEI-NEE CHEN

at

Shaping the Future of Green Hydrogen Economy

organised by

SEDA Malaysia

25 AUG

- IR DR SANJAYAN VELAUTHAM,
- TS HAZRIL IZAN BAHARI

at

Innovations for a decentralised, renewable-powered system: Peer-to-peer electricity trading

organised by

IRENA & SEDA

4 SEPT

DR WEI-NEE CHEN

at

Navigating Oil Price Volatility" Conference: Global Wake Up Call: The Need for Renewable and Green Energy

organised by

RHB Bank

27 AUG

MR FREDERICK WONG

at

Solar Energy as COVID-19 Impact Cost Mitiga-tion and a Green Recovery

organised by

EuroCham Malaysia

9 SEPT

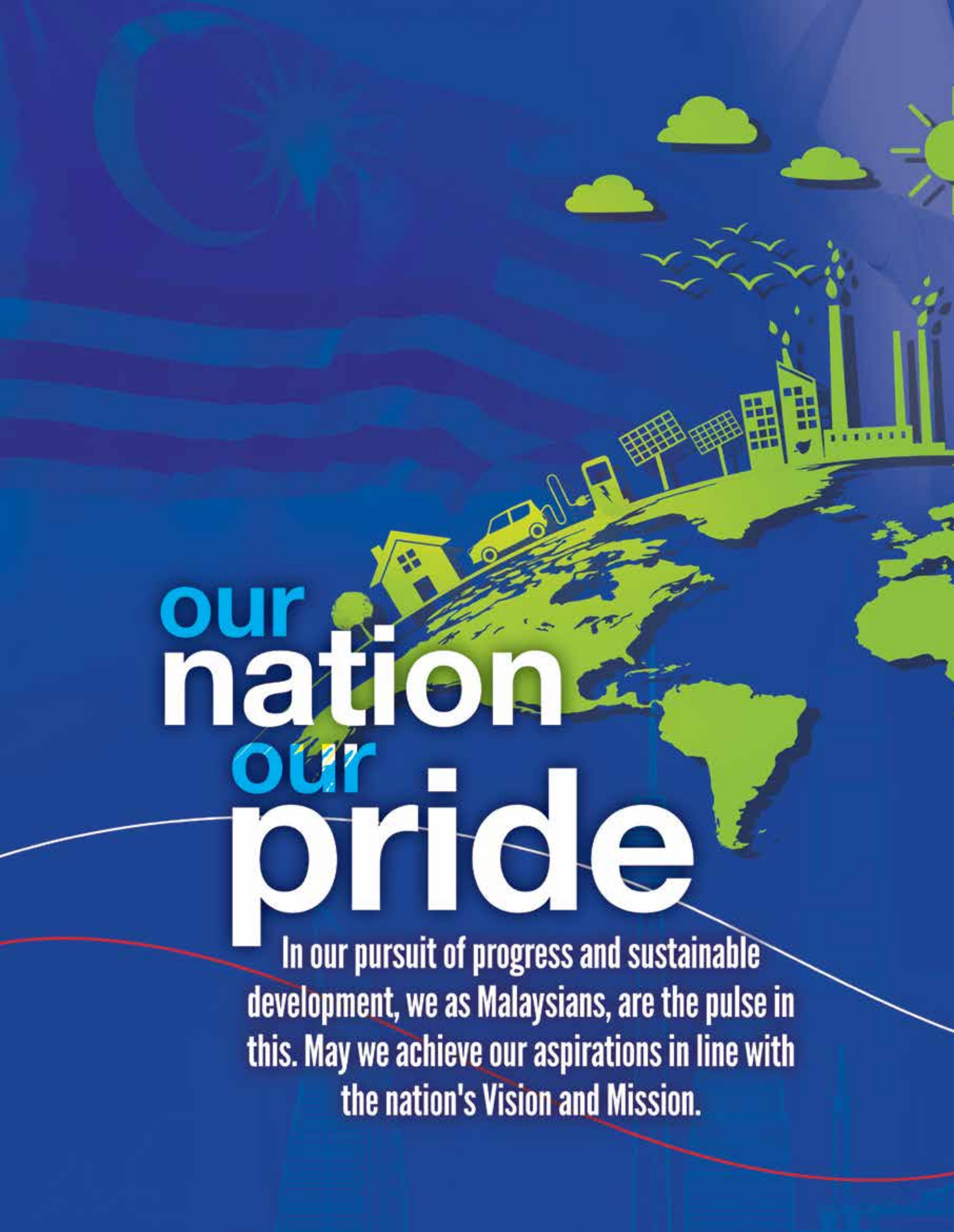
DR WEI-NEE CHEN

at

Singapore-IEA Regional Training on Sustainable Energy Policies for Smart ASEAN Cities: Malaysia: Facilitating Energy Transition through Scaling up of Distributed PV Generations

organised by

International Energy Agency (IEA)



In our pursuit of progress and sustainable development, we as Malaysians, are the pulse in this. May we achieve our aspirations in line with the nation's Vision and Mission.


MALAYSIA PRIHATIN
seda
Sustainable Energy Development Authority
MALAYSIA
HAPPY INDEPENDENCE DAY 2020
@SEDAMalaysia
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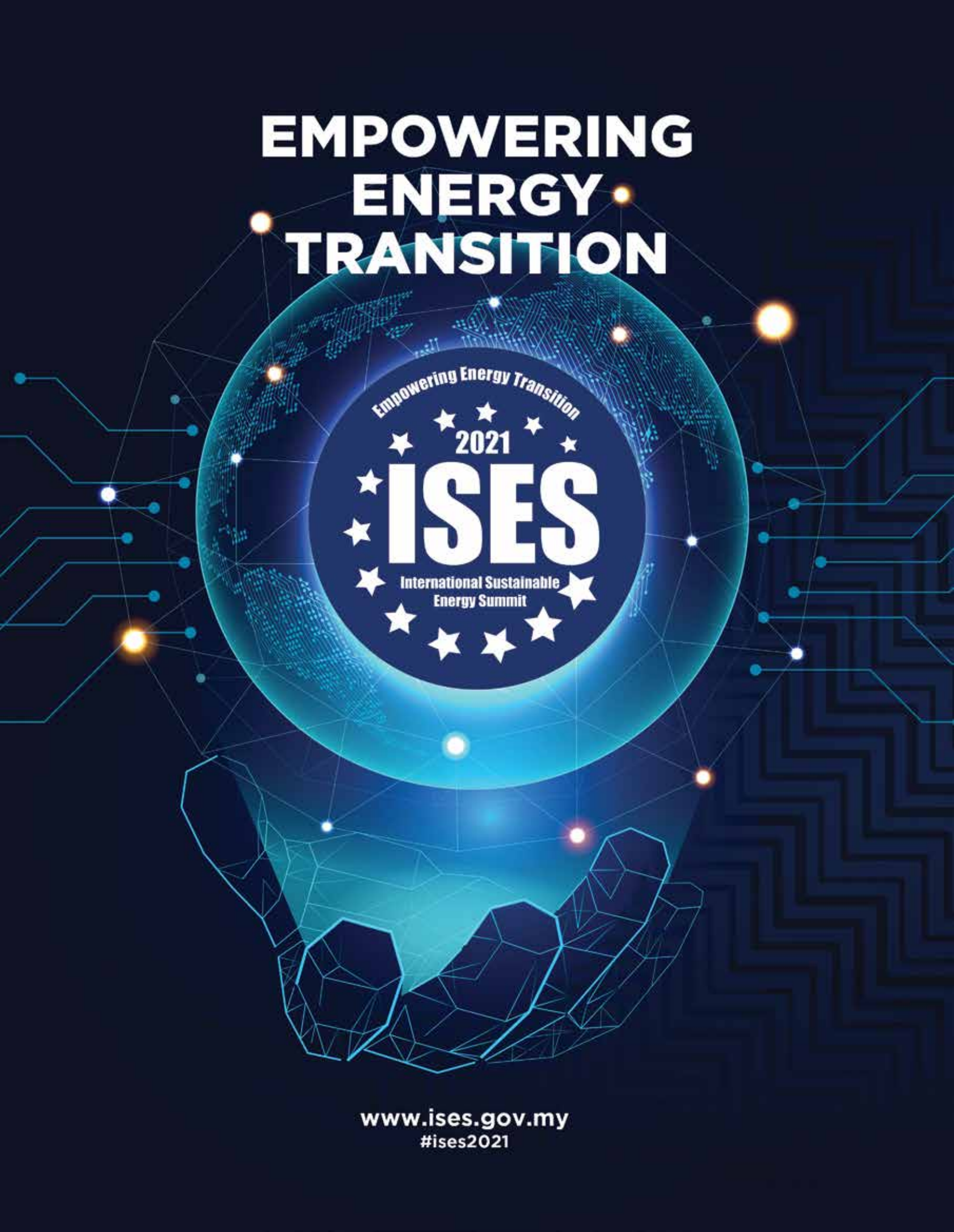
EMPOWERING ENERGY TRANSITION



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