

Transitioning The Nation Towards

Sustainable Energy

MALAYSIA



TRANSITIONING TO RE:
PATH TOWARDS THE FUTURE

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**FGV'S BIOGAS POWER PLANT
POWERS UP TRIANG COMMUNITY
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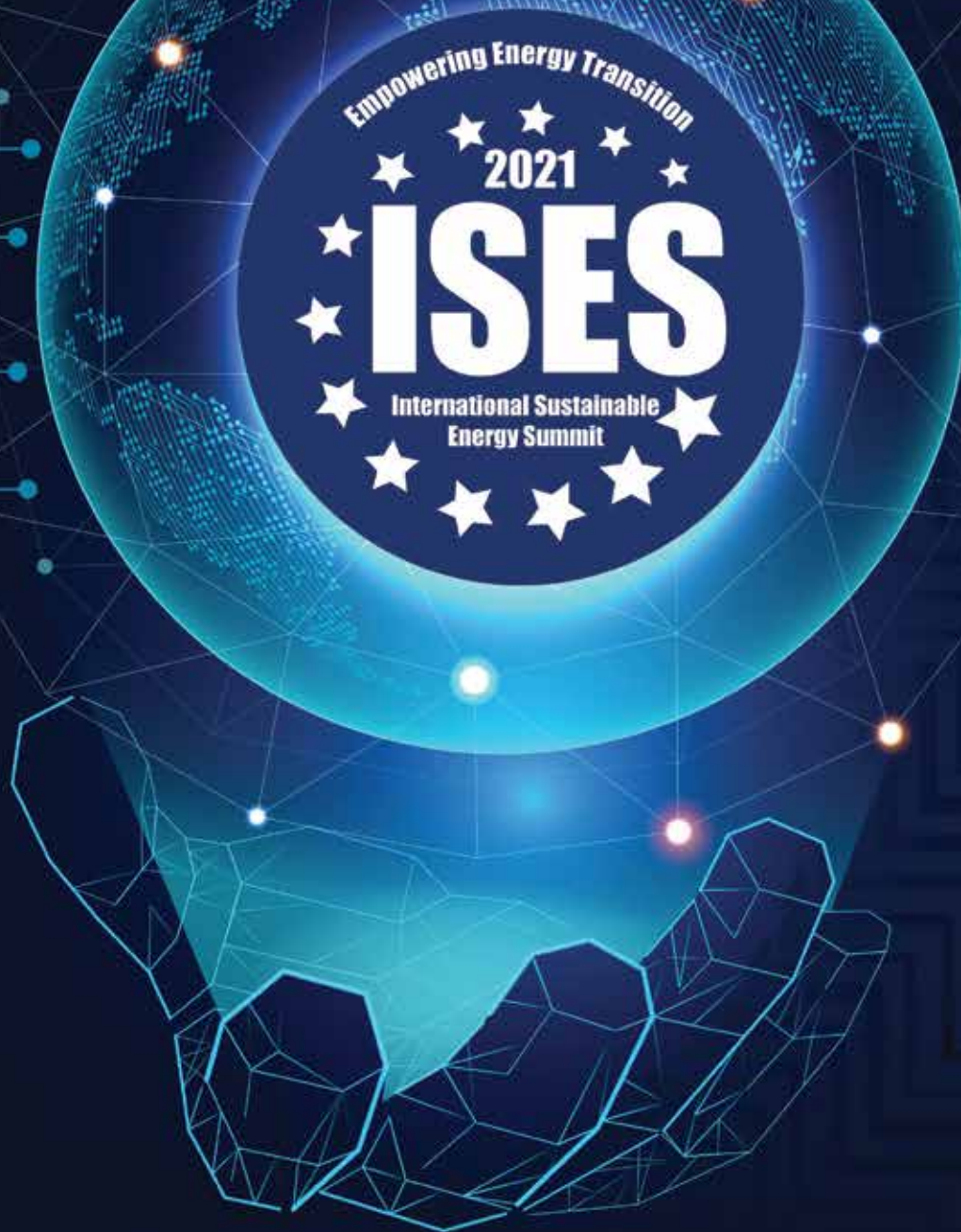
**HUMAN CAPITAL
DEVELOPMENT FOR RE SECTOR**

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EMPOWERING ENERGY TRANSITION



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CHAIRMAN'S MESSAGE

ASEAN has set a new target in its renewable energy (RE) agenda. By 2025, the grouping aims for a 35% RE in installed power capacity. This pledge was made at the virtually-held 14th East Asia Summit Energy Ministers Meeting hosted by Vietnam on 20th November 2020.

At the meeting, Malaysia as the Chairman of the Renewable Energy Sub-Sector Network (RE-SSN) made the proposal and ASEAN energy ministers agreed. Malaysia holds the chairmanship from 2018 to 2020. Minister of Energy and Natural Resources YB Datuk Dr Shamsul Anuar Nasarah, when announcing this in November, had said Malaysia believed that the move would contribute to achieving ASEAN's target of 23% of RE in Total Primary Energy Supply in 2025. The commitment was made under the ASEAN Plan of Action for Energy Cooperation (APAEC) Phase 2 which would be implemented during the period of 2021 until 2025. As a key member state of ASEAN, Malaysia has even registered its interest to continue assuming the Chairmanship of RE-SSN for the duration of APAEC Phase 2 from 2021 to 2025.

Embracing RE transition has long been Malaysia's tradition. Malaysia's RE policies and programmes have been in existence for more than 30 years. In the 1980's, stand alone and solar photovoltaic systems for electricity supply to rural communities and remote areas in Malaysia had been actively pursued.

The utilisation of RE as the fifth fuel was incorporated in the 8th Malaysia Plan. The efforts to promote RE continued into the 9th Malaysia Plan and extended to the other succeeding Plans. The 12th Malaysia Plan will start

from 2021. It will span for a period of five years, and will be aligned with the shared prosperity initiative encompassing three dimensions, namely economic empowerment, environmental sustainability, and social re-engineering. The RE development falls under the environmental sustainability dimension which also includes the blue economy, green technology, and adaptation, as well as mitigation of climate change.

Various programmes, perks, and regulations are implemented to ensure the RE sector in Malaysia continues to grow and contribute to the country's economy. The Feed-in Tariff (FiT) and the Net Energy Metering (NEM) programmes, administered by the Sustainable Energy Development Authority (SEDA) Malaysia, are making the RE sector attractive to investors. Entrepreneurs seeking to take advantage of our RE resources or company owners who want to lower their electricity consumption costs are drawn to these schemes hence giving Malaysia's RE energy transition agenda the desired boost. It is also an effective vehicle in generating employment for the country.

The enthusiasm towards RE, particularly solar PV, is reflected on the overwhelming take-up rate of the NEM quota. The 500MW quota up to year 2020 under the NEM 2.0 has been fully taken up even before the 31st December 2020 deadline. Exciting times lie ahead for the RE sector as the Government draws out more long-term plans and programmes to further develop the industry. The Renewable Energy Transition Roadmap (RETR) 2035 is definitely one of them. It is anticipated that the roadmap will balance the energy trilemma of economic growth, energy security, and environmental sustainability. We strongly believe that the RETR can contribute meaningfully to social economic development by providing green jobs and releasing

private capital liquidity, particularly during and after the recovery period of the COVID-19 pandemic.

In a few weeks we will close the year 2020. It has been a very challenging year for Malaysia and the rest of the world as we struggle to keep the virus in check while also carrying out our responsibilities as the workforce in the country. We embrace the new normal and prepare ourselves for a better year in 2021. The RE sector will remain an important part of Malaysia's economy as its contributions will help the country to achieve its various sustainability agenda.

Happy New Year to All!

YB TUAN LUKANISMAN AWANG SAUNI
Chairman
SEDA Malaysia





NOT ALL HEROES WEAR CAPES

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





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OPPORTUNITIES TO
IMPROVE



Malaysia's progressive policies on nurturing its renewable energy (RE) sector, which were put in place in stages since 2001, have brought significant achievements, but opportunities still exist to raise the bar higher.

Sustainable Energy Development Authority (SEDA) Malaysia Chief Executive Officer, Ir. Dr. Sanjayan Velautham, said that while Malaysia has performed very well in specific attributes such as energy access and security, there are still opportunities to improve.

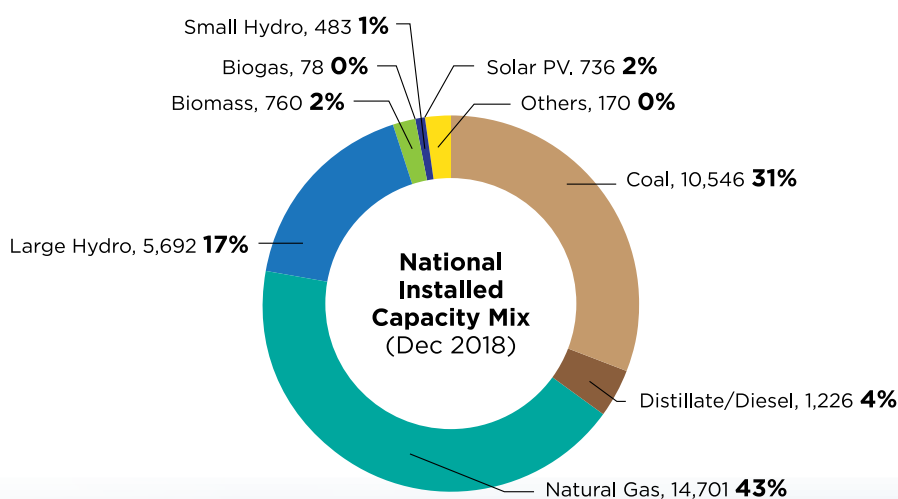
He noted that Malaysia can improve in increasing the share of renewables while decreasing the share of coal in the energy mix; reducing pollution-related to conventional energy production; introducing the price of pollution; and rescinding subsidies for fossil fuel.

TRANSITION

Malaysia introduced RE as the 5th fuel strategy in the energy-mix under the National Energy Policy in 2001. A target of having 500MW grid-connected power generations by 2005 from RE sources was set. To support the initiative, fiscal incentives under the Small Renewable Energy Power (SREP) programme were offered. The target was revised in 2006 to 350MW by 2010. By 2011, the Renewable Energy Act 2010 was enacted with the provision of the Feed-in Tariff (FiT) Feed-in Tariff (FiT) programme, providing more attractive incentives to spur the implementation of grid-connected power generation from RE resources.

Renewables in Malaysia represented 22.5% of the national installed capacity mix as of the end of 2018. Sarawak makes a significant contribution with its large hydropower capability. With the FiT scheme implemented since end-2011, other renewables like solar PV, bioenergy, and small hydropower are raising their shares in the national installed capacity mix.

Ir. Dr. Sanjayan Velautham
Chief Executive Officer
SEDA Malaysia



The FiT scheme was outlined in the National Renewable Energy Policy and Action Plan (NREPAP), which was approved by the Cabinet in April 2010. Hence, the NREPAP underpins the establishment of SEDA Malaysia and its core functions which include advising the minister and government entities on matters concerning sustainable energy and implementing the FiT scheme.

The FiT is a mechanism that allows electricity produced from indigenous renewable resources to be sold to Distribution Licensees (DLs) at a fixed premium price for a specific duration. It is envisaged that this trajectory will grow over the next years to come in order to ensure Malaysia meets its target in RE penetration.





Tremendous uptake of the NEM quota has been observed from the year 2016 to 2020 on approved NEM applications.

Dr. Sanjayan said SEDA Malaysia continues to ensure robust management of the RE fund to ensure there is continuous balance quota allocated and funding required to incentivize the small RE programmes.

“From the year 2011, we have seen progressive growth of the FiT programme. As of the end of 2019, the cumulative approved capacity of renewables under the FiT was 1,243.60MW. This represented a year-on-year (YoY) growth of 15.60% from 2012 to 2019,” he added.

The FiT programme has continuously evolved to ensure a conducive environment for the industries e.g. change from fixed price to the e-bidding mechanism. By 2020, SEDA has conducted 3 successful biogas e-biddings, 2 successful small hydro e-biddings, and in the future, biomass shall be included in the e-bidding mechanism. SEDA Malaysia will continuously upgrade the FiT system to meet the market requirement and provide better services; transparencies; and price discoveries.

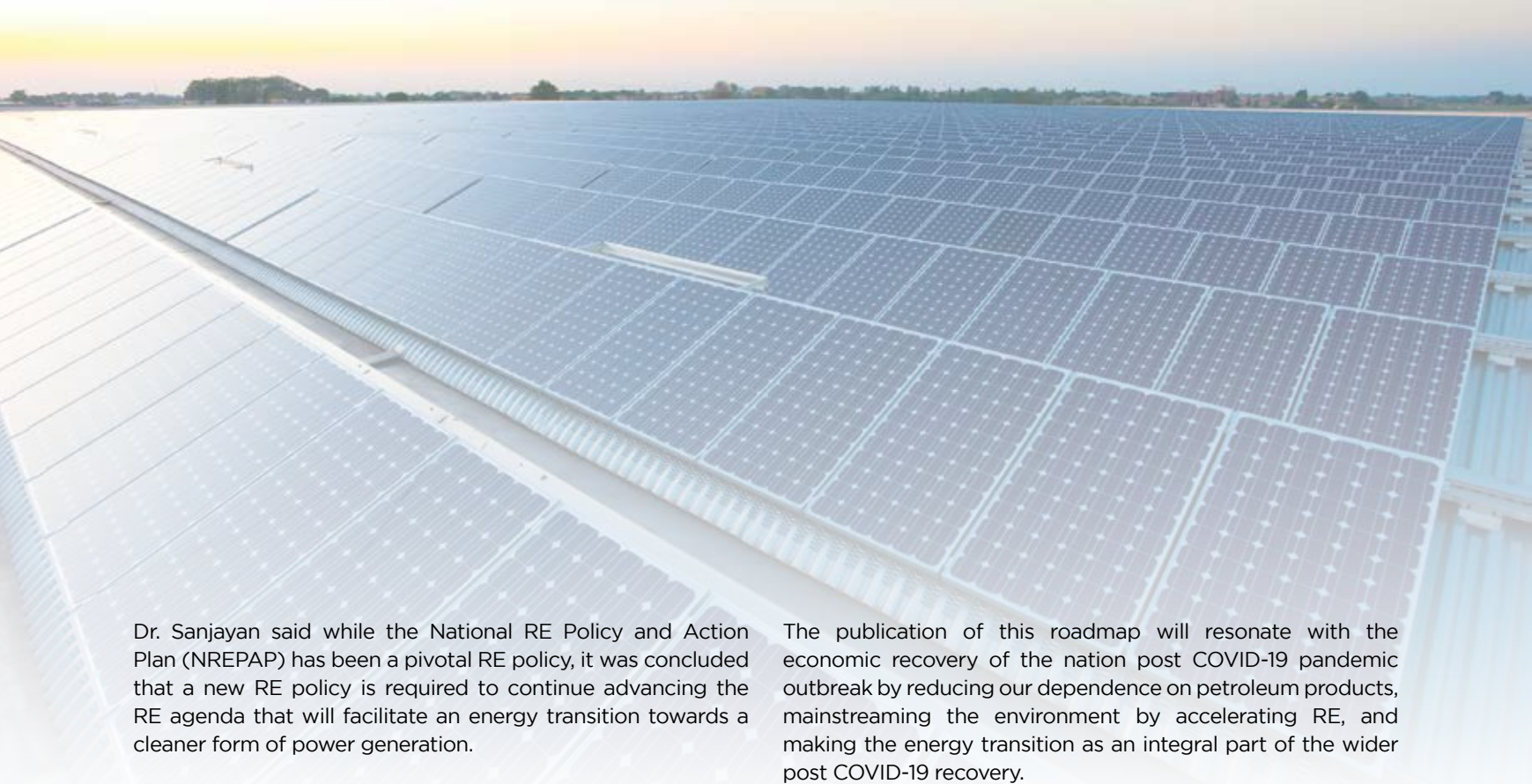
With the exhaustion of quota for solar PV under the FiT scheme, the government introduced the Net Energy Metering (NEM) as an option for the growing sector. Under the NEM 1.0 scheme (2016-2018), it was based on the prevailing displaced costs which are much lower than the regulated electricity retail tariff. The take-up rate was very low among the electricity consumers with only 27.8 MW approved as of the end of 2018. After a review of the NEM 1.0 in 2019, the mechanism was improved to a “1-on-1” energy offset mechanism, meaning that each 1kWh of energy generated can be used to offset 1kWh of energy consumed. Tremendous uptake of the NEM quota has been observed from the year 2019 to 2020 on approved NEM applications.

2.5MW Solar PV System installed on Goodyear Malaysia Berhad - one of the largest rooftop solar PV project under the Net Energy Metering (NEM) programme.



Numerous programmes undertaken by SEDA Malaysia to promote NEM 2.0 have ensured that the quota for 2020 has been taken up well beyond its targeted date. These include awareness programmes, roadshows, advertisement campaigns, stakeholder engagements, dedicated NEM microsite, the NEM calculator coupled with a list of online Registered Solar PV Investor (RPVI), and Registered PV Service Providers (RPVSP).

Malaysia is also committed in its contribution to the RE targets set by ASEAN. This year, SEDA Malaysia chaired the ASEAN Renewable Energy Subsector Network (RE-SSN) in promoting the further deployment of RE in the ASEAN region via the ASEAN Plan of Action for Energy Cooperation (APAEC). SEDA Malaysia is also fully-aware that a new renewable energy roadmap is needed; one that is relevant in its time to shape the future of energy in the country.



Dr. Sanjayan said while the National RE Policy and Action Plan (NREPAP) has been a pivotal RE policy, it was concluded that a new RE policy is required to continue advancing the RE agenda that will facilitate an energy transition towards a cleaner form of power generation.

“This requirement is timely given that the NREPAP was approved by the Cabinet back in April 2010,” he added.

In March 2018, SEDA Malaysia was mandated by the Ministry to develop a Renewable Energy Transition Roadmap. In 2019, SEDA Malaysia undertook this study to establish the Renewable Energy Transition Roadmap (RETR) up to year 2035.

SEDA Malaysia believes the publication of the RETR 2035 will be most timely to demonstrate a socially justified energy transition towards a more environmentally sustainable future. When an energy transition is socially justified, it embodies inclusivity and ensures wealth is equitably distributed.

The RETR 2035 supports global trends of renewables such as the deployment of smaller and distributed RE generations, which will in turn provide opportunities for participation by individuals and small to medium enterprises (SMEs). It is expected to be launched once it has been approved by the Ministry. The outcomes of the roadmap are expected to resonate with the objectives of the government’s Shared Prosperity Vision 2030. It also provided inputs to the 12th Malaysia Plan and the National Energy Policy that is expected to be launched in the first quarter of 2021.

The roadmap represents a cohesive strategic plan for the country to reach a committed RE target by the milestone years of 2025 and 2035. It will also address the energy trilemma of economic growth, energy security, and environmental sustainability. Its strategic framework includes specific pillars on technologies that addresses solar, bioenergy, and hydro, as well as innovative solutions coupled with the enabling initiative leverages on electricity market reform, access to finance, future readiness, and system flexibilities.

The publication of this roadmap will resonate with the economic recovery of the nation post COVID-19 pandemic outbreak by reducing our dependence on petroleum products, mainstreaming the environment by accelerating RE, and making the energy transition as an integral part of the wider post COVID-19 recovery.

Dr. Sanjayan said despite the loom and gloom brought by the COVID-19 pandemic, there is a positive side.

According to a recent journal by the Nature Climate Change (May 2020), the daily greenhouse gas (GHG) emissions in April 2020 were comparable to 2006 level, and this marked a decrease of 17% in emissions compared to 2019.

“The more pertinent question we should ask from this costly pandemic outbreak is what have we learned that we could apply within the energy sector? Understanding this is crucial as most economies are still strongly coupled with energy consumption,” he added.

The International Energy Agency (IEA) said in its Renewables 2020 report released in November 2020 that renewables used for generating electricity would grow by almost 7% in 2020. The IEA acknowledged that renewables have so far shown impressive resilience and may achieve full recovery to the same level as 2019 as early as 2021. This recovery can be catalysed by the government’s allocation of resources which creates a deliberate paradigm shift towards a greener economy.

“The COVID-19 pandemic represents a timely opportunity to reset the priority of government policies, especially energy policies to accelerate energy transition before the window of opportunity to address the 1.5°C global average temperature increase closes,” he said.

This sentiment is echoed by the WEF’s ETI 2020 report which emphasised that the “rapidly unfolding repercussions of the COVID-19 pandemic across the energy system illustrate the need for resilience – not just in physical infrastructure and cyberspace – but also in energy transition policies, roadmaps, and international cooperation mechanism.”

Dr. Sanjayan said as part of the on-going improvements in office operations, SEDA Malaysia has digitised major parts of the office operations. These include hosting critical applications in the cloud, having an internal video conference facility, and fine tuning its business continuity plan (BCP).



6 MW Amcorp Perting Small Hydro site in Bentong, Pahang



The 1.5 MW Sri Jelutong, Biogas Power Plant, Pahang

Such efforts expended in 2019 bore results as it became a lifeline during the Movement Control Order (MCO) period. As a result of SEDA Malaysia's earlier efforts, there were minimal disruptions in its office operations even though SEDA Malaysia operates remotely.

During the MCO period, SEDA Malaysia reached out to the various RE sectors via virtual meetings to understand their points of concern which was by this partial lockdown, and how SEDA could assist them. SEDA Malaysia has also engaged with numerous focus group discussions with key stakeholders such as the relevant Ministries and government agencies during the MCO period. SEDA Malaysia also contributed to the frontliners and the less fortunate communities in its Corporate Social Responsibilities (CSR) exercises.

In place of physical events, SEDA Malaysia conducted two webinars during this MCO and CMCO period. Training related to renewable energy, energy efficiency, and low-carbon programme also went virtual during this time.

It was business-as-usual for SEDA Malaysia even though SEDA Malaysia operates from home. SEDA Malaysia continues in reaching out to its stakeholders and various RE sectors

via virtual meetings and discussions including establishing business continuity plans such that it supports business-as-usual concept with the least amount of disruptions.

SEDA Malaysia is also embracing digitalisation IR 4.0, namely; the usage of Microsoft Teams for virtual conferences, Microsoft Exchange Cloud which reduces the operational expenses and increasing the reliability of SEDA Malaysia's email system, Microsoft Sharepoint – a knowledge depository that can be shared among SEDA Malaysia's staff throughout the organisation, and Integration e-FiT System which is the e-cash flow (moving towards e-system for digitalisation).



A 7 MW Biomass plant at Tenaga Sulpom Sdn. Bhd., Dengkil, Selangor

The Authority continues to engage with international bodies namely International Renewable Energy Agency (IRENA), International Energy Agency (IEA), and other bodies to enhance its presence and understanding of best practises that can give impact to RE in Malaysia (like new trends and technologies including the Peer-to-Peer Energy Trading and green hydrogen economy).

SEDA Malaysia also conducted online training related to RE, energy efficiency, and low-carbon programme. The Government has also appointed SEDA Malaysia as the implementing agency for a three-year Energy Management Programme.

The Authority has also developed the Petaling Jaya City Council (MBPJ) Energy Management Policy and Building Energy Data Online System (BEDOS), which supported the implementation of Malaysian Standards (MS) 1525 and Low-Carbon Buildings (2020-2023) by Petaling Jaya City Council (MBPJ). The Council became the first local authority to fully adopt the BEDOS system to monitor the management of MBPJ. The BEDOS system provided free energy monitoring system to building owners to promote energy management and efficiency.

PEER-TO-PEER ELECTRICITY TRADING CONCEPT

Peer-to-peer (P2P) electricity trading model was born as a consequence of the increasing deployment of distributed energy resources, increasingly owned by the end consumers. P2P electricity trading is based on an interconnected platform, that serves as an online marketplace where consumers and producers “meet” to trade electricity directly, without the need for an intermediary. P2P electricity trading is also known as the “Uber” or “Airbnb” of energy, as it is a platform that allows local distributed energy generators to sell their electricity at an optimal price to consumers.

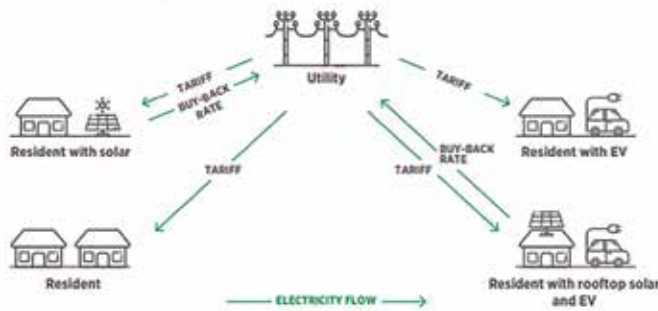
Conventionally, consumers purchase electricity from utilities or retailers through fixed tariffs or, for example, through time-of-use tariffs. Prosumers (consumers that also produce electricity) may sell surplus electricity back to the grid at a “buy-back rate”, as shown in Figure 1 (Schematic representation of the P2P business model). However, consumer tariffs for electricity supply are generally much higher than the buy-back rates that prosumers can obtain from selling electricity to the utility. Therefore, the new P2P business model may have monetary benefits for both consumers and producers, comparing to the other business models.

PEER-TO-PEER ELECTRICITY TRADING AND BLOCKCHAIN: PIECES OF THE SAME PUZZLE FOR DECENTRALISED RENEWABLE SOLUTIONS

By
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Director of Digital Services, SEDA Malaysia
cum Technical Lead for Pilot Run of P2P Energy Trading
Article is jointly authored by Arina Anisie, Francisco Boshell,
Elena Ocenic (IRENA) and Dr. Wei-nee Chen

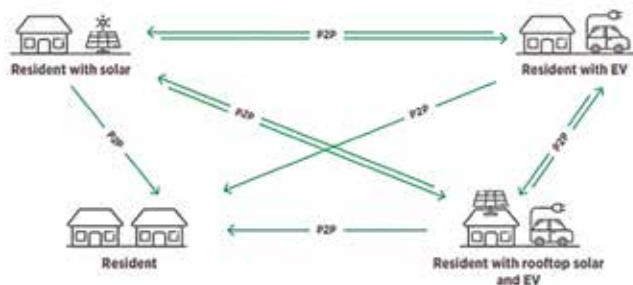
Figure 1: Schematic representation of the P2P business model

Diagram 1 Traditional trading model of residential consumers and prosumers with utilities



Source: Adapted from Liu et al., 2019

Diagram 2 Structure of P2P electricity trading model



Source: Liu et al., 2019

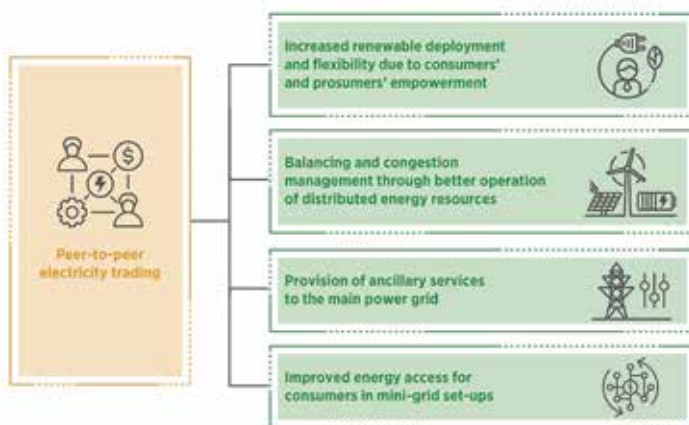
Note: The direction of the arrow indicates the accounting and transactions flow directions.

PEER-TO-PEER ELECTRICITY TRADING BENEFITS GO BEYOND PEERS

Besides the potential financial benefits for individual consumers and prosumers, the P2P electricity trading model makes renewable energy more accessible, empowers consumers while making better use of their distributed energy resources. It also keeps the community resilient to outages in emergencies, and it can improve the energy access in some cases.

Figure 2: Key contributions of P2P electricity trading to power sector transformation

Diagram 3 Key contributions of P2P electricity trading to power sector transformation



Creating localised electricity markets is about helping the grid as well. P2P trading platforms enable better management of decentralised generators by matching local electricity demand and supply at all times.

Reverse flows of electricity are therefore minimized. Surplus electricity production that is not consumed locally can be stored in a battery and then provide stabilisation services to the grid. Prosumers and consumers will actively adjust their supply and demand to optimize the energy trading.

In a well-functioning P2P electricity trading scheme, it will encourage consumption of electricity at the right time of the day from the power system perspective, therefore decreasing the peak load. P2P electricity trading can also help reduce investments related to the generation capacity and grid infrastructure needed to meet peak demand. The distribution system operator can potentially discount on the network charges for the consumers or prosumers that help reduce grid congestion, once they become aware of the system benefits of the P2P trading mechanism, i.e. reducing distribution system congestion and reducing the peak demand. Moreover, apart from enabling P2P transactions, the P2P platform operator can also enable peers to provide ancillary services to the main grid, as the P2P electricity trading platform can serve as a virtual power plant by coordinating with the decentralised generators to match with the local electricity demand.

In the context of an isolated renewable mini-grid, P2P trading could improve the energy access and the reliability of local electricity generating sources. In such mini-grids, users are generally supplied electricity through solar home systems, which often cannot store the electricity surplus. By enabling P2P trading and connecting several solar home systems to each other as well as with other homes without access to electricity supply, energy access of these citizens can be improved.

MALAYSIAN P2P ELECTRICITY TRADING PILOT

The Sustainable Energy Development Authority (SEDA) Malaysia has conducted and completed a P2P electricity trading pilot project between November 2019 and June 2020. Prosumers can trade electricity with consumers or sell their excess solar photovoltaic electricity to the utility TNB. Exchanges are tracked via a blockchain platform, developed by Power Ledger, an Australian-based company. Findings of the pilot project show that there was an important interest from the solar PV industry including local governments to have P2P electricity trading implemented. The pilot showed that the greatest motivation for prosumers and consumers to take part in this 'regulatory sandbox' was the opportunity for energy arbitraging.

For the prosumers, it meant a fast mode of recovering their solar PV investment and for the consumers, it meant an avenue to save on electricity bills. The solar PV industry and local authorities see this as an opportunity to scale up the solar PV rooftop market, while optimizing the rooftop spaces and consumption needs of building assets owned by single entities. With P2P trading available, the amount of electricity sold back to the grid is very small compared to the amount of electricity traded in the community (SEDA Malaysia, 2019).

During the webinar of August 2020[1], SEDA Malaysia shared their P2P energy trading pilot project experience under the recently completed 'regulatory sandbox'. A significant achievement of this pilot project was to resolve the technical integration for P2P implementation from technical assessment to infrastructure readiness.

Figure 3: Key challenges and mitigation to address the various technical areas include:

Areas	Challenges	Mitigations
Infrastructure	Setting up infrastructure to run the P2P energy trading platform (meter, data and communication)	Develop a data aggregator to process the meter data and submit to P2P energy trading platform
Recruitment	Identifying suitable prosumers and consumers to match the supply and demand	Conduct simulation of participants based on historical meter data
P2P trading platform	Formulating the trading algorithm, processing meter data, defining the P2P price, network charges	Conduct simulation and testing
Regulation	Under the regulated electricity market, prosumers and consumers are not allowed to trade energy	The utility (TNB) assumes the clearing house role during the regulatory sandbox period

Source: SEDA Malaysia

An important finding from the Malaysian pilot run is the role of the retailers in the P2P electricity trading. The retailer provided integrated services which incorporated the P2P billing into their regular billing. In this regard, counter party risks arising from consumers not paying the prosumers for the solar electricity traded was minimised through the integrated billing mechanism. Additionally, for live deployment, the retailer was also be the buyer-of-last-resort for untraded solar electricity from the prosumers.

Nevertheless, SEDA Malaysia acknowledges there are gaps that deserve further studies before the P2P can be implemented. Gaps such as impact of the P2P energy trading on the grid, identifying sustainable business models for P2P, capital investment, and legal provision for live implementation, among others. Further, a conducive regulatory framework to reap all the benefits of P2P electricity trading is needed. Regulators would need to ensure a level playing field for platform-based businesses vis-à-vis traditional utilities and retailers. In the same time the regulations should support and promote the innovations in the electricity market.

BLOCKCHAIN, ENABLING TECHNOLOGY OF P2P ELECTRICITY TRADING

In addition to the physical layer of P2P electricity trading for which a network is needed (e.g., renewable minigrids, micro-grids, distribution network capacity, etc.), another layer that is needed refers to a virtual, digital layer. P2P trading is facilitated by digital platforms where a large number of peers can interact. Data from both producers and consumers need to be collected and analysed to check the reliability of the power system. Smart meters, broadband communication infrastructure, network remote control, and automation systems (network digitalisation) are thus fundamental enablers of P2P electricity trading model.

The P2P trading platform can work efficiently with the help of blockchain technology. Blockchain can facilitate trading, being a reliable source of truth where consumers could trust the measurements of power electricity sold and the amount of which should be paid. Blockchain technology could reduce the transaction costs for electricity trading, ensuring instant settlements with no intermediary. Another benefit is given by the functionality of smart contracts, which can optimise and expedite the interaction of actors on the platform and facilitate the trading and financial settlements with the help of determined trading algorithms.

For example, the P2P blockchain developer LO3 Energy operates the Brooklyn Microgrid (USA), which augments the traditional energy grid letting participants tap into community resources to generate, store, consume (i.e., buy and sell) energy at the local distribution level. Another example of P2P trading using blockchain technology is the Power Ledger platform in Australia, which records the generation and consumption of all peers in real time. The P2P project piloted in Malaysia is built on the Power Ledger platform, which is also running trials in Australia, China, India, France, Japan, Thailand, and the United States (US) (Ledger Insights, 2019).

P2P electricity trading pilots show that, if innovation in technology is accompanied by innovation in business models, regulation and system operation, distributed energy resources can provide cost-effective support to renewable-based power systems, bringing benefits to all consumers, prosumers and the entire power system. IRENA's report "Innovation Landscape for a renewable powered future" identifies 30 key innovations that can reduce the cost of integrating large shares of renewables in today's power systems, with P2P trading being among them (IRENA, 2019).

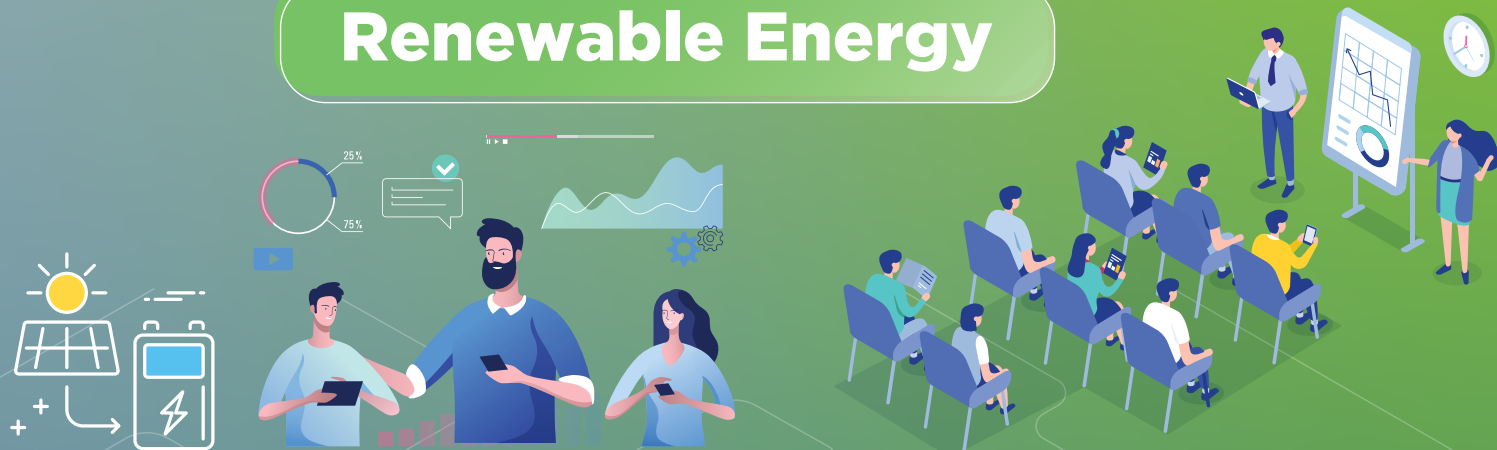




SEDA MALAYSIA

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- Off-Grid Photovoltaic (OGPV) System Design
- Grid-Connected Photovoltaic (GCPV) for Wireman & Chargeman
- Grid-Connected Photovoltaic (GCPV) Installation and Maintenance
- Operation and Maintenance of Biogas Power Plant
- Continuous Development Programme for Continuous Development Programme (CDP) for SEDA Malaysia Grid-Connected Solar PV Systems Design Qualified Persons (QPs)

Awareness Trainings:

- Introductory Training on Grid-Connected Photovoltaic (GCPV) System for Non-Technical Persons

For more information, please visit our website
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HUMAN CAPITAL DEVELOPMENT FOR RE SECTOR

The growing global energy demand makes the prospects for the renewable energy (RE) sector bright, always. As RE resources give clean energies, it makes the RE sector the go-to option for future world energy expansion. As the world strives to address climate change, the growth of the RE sector is unstoppable.

The RE sector must be complemented by committed human resources with the necessary expertise. As such, human capital development for the RE industry is critical.

The Sustainable Energy Development Authority (SEDA) Malaysia is tasked to intensify human capital development in RE industry under the Strategic Thrust 3 of the National Renewable Energy Policy and Action Plan (2010).

As of November 2020, the Authority has issued Qualified Certificates to 1,584 persons in solar PV and 60 persons in biogas.

The courses offered by SEDA Malaysia include:

Grid-Connected Photovoltaic (GCPV) Systems Design Course

Grid-Connected Photovoltaic (GCPV) Systems Course for Wireman & Chargeman

Grid-Connected Photovoltaic (GCPV) Installation & Maintenance Course

Off-Grid Photovoltaic (OGPV) Systems Design Course

Operation & Maintenance of Biogas Power Plant Course

GCPV SYSTEMS DESIGN COURSE

To those who want to design, learn and knowledge grid-connected PV systems that include solar PV modules, inverters & associated equipment, which are suitable for Malaysia's climate.

The course covers information about grid-connected solar PV systems; design of grid-connected PV systems that is suitable for Malaysia/regional's climate condition; and the relevant Malaysian requirements and standards for a grid-connected PV system.

The course is based on the complete the course, each participant must show their competency in all skills and tasks as defined by this training course.

Training institutions: Universiti Teknologi MARA (UiTM) and Selangor Human Resource Development Centre (SHRDC), both located in Shah Alam, Selangor.

GRID-CONNECTED PHOTOVOLTAIC (GCPV) SYSTEMS COURSE FOR WIREMAN & CHARGEMAN

The 5-day course is structured to intensify human capital development in Malaysia RE industry especially in solar PV. Among the objective of the course is to expose the wireman and chargeman in Malaysia with regards to solar PV installation dealing with direct current (DC) side and components. The training will encompass both theoretical and practical sessions, ending with a competency examination. The training provides fundamental/ functional of PV system and safety aspects in installations and operations of the system.

The course covers the introduction of GCPV systems that include solar PV modules, inverters and associated equipment; the installation & maintenance of the GCPV systems that need to be emphasized to the wireman & chargeman.

The course is based on the Grid-Connected Solar PV (GCPV) Systems Course for Wireman & Chargeman manual.

To successfully complete the course, each participant must show their competency in all skills and tasks as defined by this training course. All participants are required to obtain and use only original copies of the training materials.

The course is conducted by these training institutes:

- Universiti Kuala Lumpur - British Malaysia Institute (UniKL BMI);
- Universiti Teknikal Malaysia Melaka (UTeM);
- Akademi Binaan Malaysia (Wilayah Utara);
- Institut Kemahiran MARA, Kota Kinabalu;
- Kolej Kemahiran Tinggi MARA, Pasir Mas; and
- TNB Integrated Learning Solution (ILSAS)

For the 2012-2019 period, a total of 830 participants attended the course. In 2020, there are 59 participants.



GRID-CONNECTED PHOTOVOLTAIC (GCPV) INSTALLATION & MAINTENANCE COURSE

This is a 4-month training programme consisting of two months theory (classroom and practical) and two months industrial/on the job training.

The course covers methods for installation and maintenance of solar PV systems; occupational health and safety guidance; and best practices that should be emphasized at work.

The course is based on the Grid-Connected Photovoltaic (GCPV) Installation & Maintenance Course manual:

Venues where the training are held are:

- Akademi Binaan Malaysia (ABM) Wilayah Utara;
- Selangor Human Resource Development Centre (SHRDC);
- Kedah Industrial Skills & Management Industrial Centre (KISMEC);
- Terengganu Skills Development Centre (TESDEC); and
- German - Malaysian Institute (GMI).



OFF-GRID PHOTOVOLTAIC (OGPV) SYSTEMS DESIGN COURSE

This 10-day course is offered to those who want to design, learn and enhance their knowledge about Off-Grid PV System Design. The course covers information about Off-Grid Solar PV systems; design an Off-Grid PV system that is suitable for Malaysia/ regional's climate condition; and relevant Malaysian requirements and standards for an Off-Grid PV system

The course is based on the Off-Grid Photovoltaic (OGPV) Systems Design Course manual. The electrical connection between the inverter to the electricity supply (AC side) can only be undertaken by licensed electricians as issued by the Energy Commission (ST).

Venues for the training are:

- Universiti Teknologi MARA (UiTM), Shah Alam; and
- Pusat Latihan Proaktif (PLP), Kuching.

OPERATION & MAINTENANCE OF BIOGAS POWER PLANT COURSE

The 5-day course is specifically designed for Operator and Supervisor level. It encompasses both theoretical and practical sessions with assessment, covering both written examination and Workplace Assignment (WPA).

The course covers fundamentals of biogas plant principle and technology; plant monitoring based on Malaysian scenario and experience; operation, maintenance, inspection and troubleshooting procedures; laboratory theory and exercise; and safety aspects in Biogas Power Plant operation.

The training course is held at the Universiti Tenaga Nasional (UNITEN). The course was introduced in 2018. Between 2018 and 2019, a total of 70 participants attended the training course which has a total of 20 participants in 2020.



PVMS

PV MONITORING SYSTEM



MALAYSIA'S LEADING PV MONITORING & PERFORMANCE DATABASE

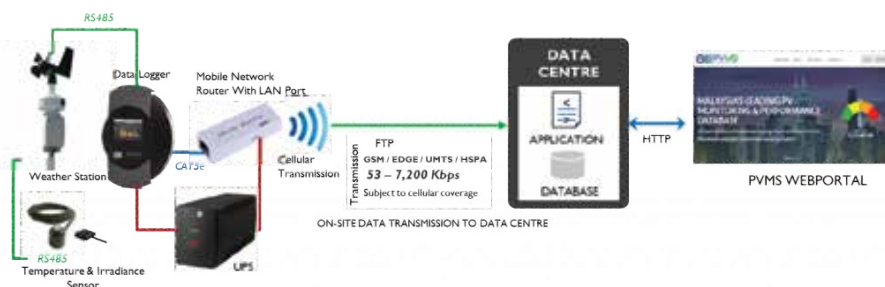
Up-to-date information, real-time monitoring, and reports on solar photovoltaic (PV) in Malaysia. Harness and energise tomorrow's energy, today.



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) and 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

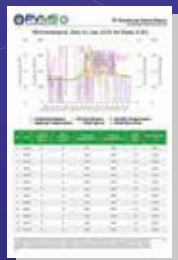
What's included?



Summary
Energy Generation



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



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



Irradiation Data
Daily Irradiation

SUBSCRIBE NOW
pvms.seda.gov.my



SEDA MALAYSIA OFFERS E-LEARNING DEVELOPMENT PROGRAMME ON RE

The Sustainable Energy Development Authority (SEDA) Malaysia has started an online renewable energy (RE) digital programme to create greater awareness on the importance of RE among the younger generation and the general public.

Dubbed as SEDASEED2020, a short call sign for Sustainable Energy e-Learning Development Programme, it was a hit at the recent Selangor-level National Science Week (MSN) 2020, attracting a total of 24,297 participants and 92,810 viewers.

The online programme is a combination of educational video series, quizzes, mini RE seminars with students as Speakers and tutorial sessions on RE projects. It engages teachers and parents in promoting RE initiatives and help inspire students to create science, technology, engineering, and math (STEM) Projects during the COVID-19 pandemic.



In addition, SEDASEED2020 provides a platform for the Authority to collaborate with relevant NGOs and small enterprises that are involved in providing STEM educational programmes.

SEDASEED2020 programme is made available to the public via SEDA Malaysia's website.

From there, they have the options to continue by clicking the various links that are also SEDASEED2020 modules, namely Online Quizzes on Renewable Energy; Virtual Reality Game; and Debate & Webinar.

Generally, SEDASEED2020 programme is strategically divided into four key sections to ensure effective utilisation of the available modules. Due to CMCO, SEDA Malaysia changed the programmes list for SEDA SEED.

- 5 series of Online Quizzes on Renewable Energy themes
- Debate Webinar Session
- Future Career in STEM Fields
- RE DIY Project

ONLINE QUIZZES ON RENEWABLE ENERGY THEMES

Five series online quizzes on RE themes

Spread over 5-week period with each week having a dedicated RE theme

Participation by over **50** schools in Selangor

Average of **50** students per school or **2,500** students per series

Weekly winners will win cash prizes

Digital certifications to all successful participants

Survey and feedback from participants

Engagement with university students as facilitators

Engagement with teachers and parents (PIBG).

FUTURE CAREER IN STEM FIELDS

20 school students and subject matter experts as moderator

4 series of videos on each topic session

Hosting of four forums on specific themes – **3,000** participants per session

Spread over 4 days period with each week having a dedicated theme

Live broadcast to participating school and public

STEM AND RENEWABLE ENERGY DIY PROJECTS

A monthly series of an online DIY project with a RE theme

A monthly project with each month having a dedicated Solar PV theme.

Digital certifications to all successful participants

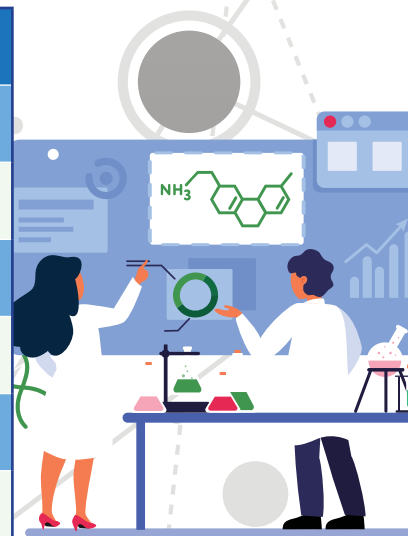
Survey and feedback from participants

Engagement with university students as facilitators

Engagement with teachers and parents (PIBG)

DEBATE WEBINAR SESSION : RENEWABLE ENERGY OPTIONS FOR THE NATION

Debate and discussion sessions among students on RE and their aspiration for the future generation



Malaysia presented its Budget 2021 on 6th November 2020. It is the biggest budget ever by the country set to ease the burden of the rakyat, local companies, and industries as well as to stimulate the economy which was ravaged by the COVID-19 pandemic.

Finance Minister Tengku Dato' Sri Zafrul Tengku Abdul Aziz, who presented the budget in Dewan Rakyat, said the allocation for Budget 2021 is RM322.5 billion, of which RM236.5 billion for expenditure, RM69 billion for development, and RM17 billion to deal with the virus pandemic.

The Budget 2021 was formulated based on three integral goals, namely Rakyat's Well-being; Business Continuity; and Economic Resilience. Each goal has its own set of strategies that include driving investments; strengthening key sectors; enhancing access to financing; ensuring resource sustainability; and prioritising automation and digitalisation.

Tengku Zafrul said for the first time the annual budget is aligned with the United Nations' Sustainable Development Goals (SDGs) so that Malaysians can move towards a more prosperous, sustainable, and inclusive future.



*Tengku Dato' Sri Zafrul Tengku Abdul Aziz
Finance Minister*

RE, SUSTAINABILITY AND BUDGET 2021

Malaysia's continuous commitment to nurture the green economy agenda is also reflected in the Budget 2021.

Under one measure to promote sustainable finance, the Government will continue its Green Technology Financing Scheme 3.0 (GTFS) with a fund size of RM2 billion for two years up to 2022, which will be guaranteed by Danajamin Nasional Berhad to encourage the issue of Sustainable and Responsible Investment (SRI) sukuk.

The GTFS was first proposed in the Budget 2010, with a total financing amount of RM1.5 billion. Under Budget 2013, the fund of the scheme was then increased to RM2 billion and the application period extended for another three years. During Budget 2016, the implementation period of GTFS was extended until 31st December 2017. GTFS 2.0 came into the picture in April 2018 with an earmarked financing amount of up to RM5 billion. It was launched on 3rd May 2018. After the 14th General Election in May 2018, GTFS 2.0 was discontinued. It was reinstated in 2019 with the allocation of RM2 billion for the period of January 2019 until end-2020.

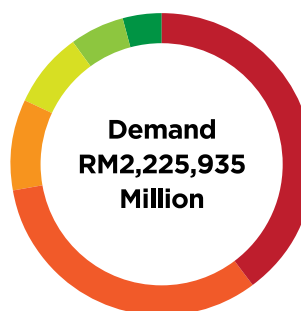
Tengku Zafrul also said the Government will continue to formulate its long-term efforts towards creating a Sustainable Financial Hub, and positioning Malaysia as a regional hub for a sustainable lifestyle.

"For this purpose, last August, the Government has issued its first digital sukuk online, the Sukuk Prihatin, where the subscription has exceeded the target at RM666 million. The Government will now issue its first Sustainability Bond in Malaysia for environmental and social initiatives in 2021."

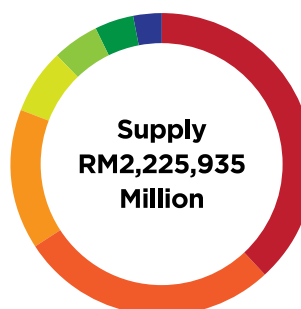
"In addition, to further encourage the issuance of SRI products and bonds that achieve green, social and sustainable standards in Malaysia, the existing income tax exemption for SRI green sukuk grant is extended to all types of sukuk and bonds and this exemption is extended until 2025," he added.

THE ECONOMY 2021

in constant 2015 prices
(share to total in %)



- Private Consumption **39.9%**
- Exports of Goods **32.5%**
- Private Investment¹ **9.1%**
- Public Consumption **8.0%**
- Exports of Services **5.8%**
- Public Investment **4.1%**

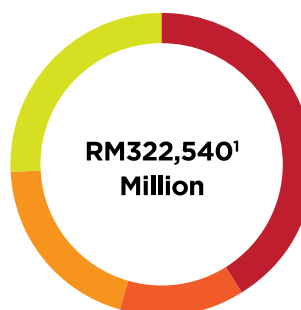


- Services **38.3%**
- Import of Goods **27.8%**
- Manufacturing **14.9%**
- Import of Services **7.0%**
- Agriculture **4.8%**
- Mining **4.4%**
- Construction **2.8%**

¹ Includes change in stocks
Source: Ministry of Finance, Malaysia

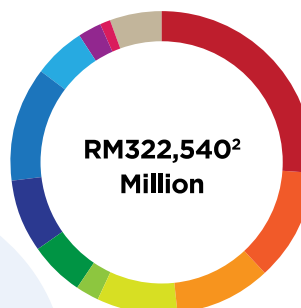
THE 2021 FEDERAL GOVERNMENT BUDGET

WHERE IT COMES FROM



- Direct Tax **40.9%**
- Indirect Tax **13.2%**
- Non-Tax Revenue **19.4%**
- Borrowing and use of Government's Assets **26.5%**

WHERE IT GOES



- Emoluments **26.2%**
- Debt Service Charges **12.1%**
- Supplies and Services **10.2%**
- Retirement Charges **8.6%**
- Grants and Transfer to State Government's **2.4%**
- Subsidies and Social Assistance **5.8%**
- Others **8.0%**
- Economic **12.1%**
- Social **5.7%**
- Security **2.4%**
- General Administration **1.2%**
- Covid-19 Fund **5.3%**


¹ Consist of revenue and borrowings

² Excludes contingency reserves

³ COVID-19 Fund under the Temporary Measures for Government Financing (Coronavirus Disease 2019 (COVID-19)) Act 2020

Source: Ministry of Finance, Malaysia





SARAWAK ENERGY - PETRONAS ON HYDROGEN PRODUCTION VENTURE

Land of the Hornbills is upping the ante on its hydrogen venture and shaping Bumi Kenyalang to be the central hub for the hydrogen value chain in Asia.

To effect the move, state-owned Sarawak Energy Berhad is collaborating with Petroliaam Nasional Berhad (PETRONAS) to capitalise on each other's comparative advantages.

A memorandum of understanding (MoU) to formalise a collaboration to explore the commercial production of green hydrogen and its value supply chain in Asia was signed by Sarawak Energy and PETRONAS on 10th November 2020.

The signing marks a significant milestone in Sarawak's effort to scale up and venture into the energy export, with hydrogen as an energy carrier, to meet global clean energy demand and position Sarawak as the hub for the hydrogen value chain.

The virtual signing ceremony of the MoU, which would initiate a joint techno-commercial evaluation of a large-scale hydrogen production facility, was witnessed by Sarawak Chief Minister Datuk Patinggi (Dr) Abang Haji Abdul Rahman Johari Al-Marhum Tun Abang Haji Openg. Also present were Datuk Amar Abdul Hamed Sepawi, Sarawak Energy Chairman, and Dato Haji Ibrahim Bin Haji Baki, PETRONAS Board of Directors.

The evaluation covers the possibility of utilising Sarawak's renewable hydropower in the electrolysis process to produce green hydrogen. In doing this, it generates Renewable Energy Certificates in support of the renewable energy (RE) market. Data sharing from this collaboration is expected to provide measures and insights to the potential of a hydrogen supply chain in Asia.

Signing for Sarawak Energy was Datu Haji Sharbini Suhaili, Group Chief Executive Officer, witnessed by Ting Ching Zung, Executive Vice-President for Strategy and Corporate Development.

Signing for PETRONAS was Adnan Zainal Abidin, Executive Vice-President and Chief Executive Officer for Gas & New Energy, witnessed by Adlan Ahmad, Head of Hydrogen Business at PETRONAS.

Commenting on the memorandum of understanding, the Chief Minister said the Sarawak Government was always supportive of hydrogen-related collaborations and research as it firmly believes in the future of hydrogen as a competitive fuel source.

"As you know, we have started with Sarawak Energy and the relevant parties to explore the potential of hydrogen and how to produce hydrogen based on the renewable energy resources available in Sarawak. I am confident hydrogen has a key role in a sustainable energy for the future although the production cost is currently high. Over time and with more efficient production technology, there is a possibility that the (hydrogen) production cost will reduce so that it is competitive with other available fuels of the world," he said.



Over time and with more efficient production technology, there is a possibility that the (hydrogen) production cost will reduce so that it is competitive with other available fuels of the world.



Commending Sarawak Energy and PETRONAS for collaborating to undertake the commercial study and identify the direction of hydrogen production and its significant role in the new economy that emphasises clean energy and the environment, the Chief Minister added, "It is my hope therefore that clean energy becomes our main target in our process to transform our economy and from Sarawak's perspective, add value to the resources that we have. We can exploit its potential based on the world's need and as a green approach."

Meanwhile, Sharbini described the collaboration as another significant milestone in line with Sarawak's aspiration to venture into hydrogen production and utilization across the various industries.

"Sarawak Energy believes strategic collaborations like this will benefit all of us in many ways including strengthening our research capabilities and broaden our knowledge in hydrogen-related technology and development as we adapt to the inevitable shift to renewables in the global energy landscape," he said.

PETRONAS' venture into the hydrogen business forms a part of the Company's newly declared aspiration of achieving Net Zero Carbon Emissions by 2050, in support of the energy transition towards cleaner energy sources and as part of the company's approach to sustainability, which balances Environment, Social, and Governance (ESG) considerations.

PETRONAS President and Group Chief Executive Officer Tengku Muhammad Taufik spoke at the event and highlighted that the partnership with Sarawak Energy further elevates a four-decade long energy partnership with Sarawak that will now include hydrogen as a clean energy carrier.

Tengku Taufik added, "We are indeed privileged to begin a new chapter of our growth journey together with Sarawak that will transform the energy landscape in the state beyond hydrocarbon resources. PETRONAS has observed that hydrogen demand continues to gain pace due to its versatility as a near-zero emission fuel which can be used as industrial feedstock, energy carrier, transportation fuel, as well as power and heat production."

"On the back of our experience in producing blue hydrogen, which we currently extract from by-products at our facilities in the country, we are excited to explore further infrastructure development to produce blue and green hydrogen to provide reliable supply of clean energy moving forward."

With the strategic locations of its facilities across East and West Malaysia, PETRONAS has proximity advantage to key hydrogen demand markets such as Japan and Korea. PETRONAS hydrogen business joins the Liquefied Natural Gas, Gas & Power, and New Energy businesses under the company's Gas and New Energy (GNE) division, which is the Company's one-stop centre for cleaner energy solutions.





GREEN LIBRARY IN A GARDEN

Nestled beautifully within the Sultan Abdul Aziz Shah Golf & Country Club in Shah Alam, Selangor, with a view of a calming lake, the Selangor Public Library Corporation's (PPAS) Pustaka Raja Tun Uda has the serenity that raises the pleasure of reading.

Built under a library-in-a-garden concept in August 2005, Pustaka Raja Tun Uda is a modern 6-floor library with well-equipped facilities including spacious and comfortable workstations, a cafeteria, and a children's zone.

There is more to the library apart from its modern facilities. It is the first library to utilise solar photovoltaic (PV) panels to generate its own electricity needs.

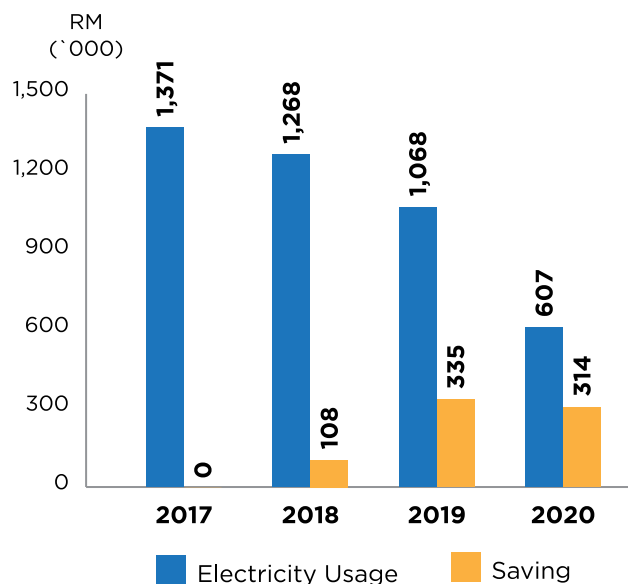


The idea was mooted by the DYMM Sultan of Selangor, Sultan Sharafuddin Idris Shah Alhaj Ibni Almarhum Sultan Salahuddin Abdul Aziz Shah Alhaj. In 2017, PPAS decided to utilise the library's parking lot rooftop for solar PV installations.

"The use of solar PV has helped us to save a lot in our electricity bills. We made an average savings of 22.15% in our electricity consumption with the solar PV installed," PPAS Director YBhg. Datin Paduka Mastura Hj. Muhamad, D.S./I.S. told SEM in an interview recently.

For the first 11 months of 2020, the solar PV units of the library generated 617,005 kWh of electricity or a saving of RM314,056 in value.

As a result of the Sustainable Energy Development Authority (SEDA) Malaysia's Net-Energy Metering (NEM) programme and due to PPAS's solar PV capability, the library electricity bill for 11 months of 2020 is only RM607,965.



Note:
 2017 : Operation without Solar PV installation
 2018 : Solar PV commencement in September 2018
 2019 : Full year operation of Solar PV
 2020 : With Solar PV but lower electricity usage attributable to the closure of library during the period of Movement Control Order (MCO)



Datin Paduka Mastura said PPAS is looking into expanding the library's solar venture and will be installing additional PV panels on the roof of the library. The expansion plan is done via state-owned Worldwide Holdings Bhd.

PPAS is also looking at several state-owned libraries to be recipients of the rooftop solar PV venture. At present, the corporation has a total of 103 public libraries under its wing in the state of Selangor.

Datin Paduka Mastura said harnessing the power of the Sun to generate electricity for PPAS's libraries is the way to go in order to promote the utilisation of green energy in the country.

Datin Paduka Mastura
 Hj. Muhamad
 Director
 PPAS





The new building comes with new features and services to attract more visitors to the library. Among the new services are XD Theater, 3D Teater, Virtual Reality (VR), Life Sketch Book (LSB), and LEGO games. Wi-fi is free at the library and multimedia services are available at every floor.

Pustaka Raja Tun Uda becomes a great attraction of Shah Alam. The number of visitors frequenting the library increases every year. Since its opening on 22nd July 2011, the Pustaka Raja Tun Uda has attracted a recorded number of 4,962,795 visitors cumulatively within seven years (2011-2017). In 2017, it received a total of 991,773 visitors.

Mastura said PPAS is transforming the public's perception of what a library is. "We are making the library function as a second home; a learning centre; a meeting point; a recreational centre; and a human development centre," she added.

The use of solar PV has helped us to save a lot in our electricity bills. We made an average savings of 22.15% in our electricity consumption with the solar PV installed

The road to set up a public library in Selangor began with the formation of the PPAS Board of Directors in 1971. It started with the acquisition of Kuala Lumpur Book Club on 20th October 1971 to transform it into a Central Library. It was then relocated to Shah Alam on 16th November 1986. On 15th March 1988, the library was officially launched by Almarhum Sultan Salahuddin Abdul Aziz Shah Alhaj.

As time went by, the library was in need of a new base. On 27th August 2005, a ground-breaking ceremony was held for Pustaka Raja Tun Uda's new building. It was officiated by DYMM Sultan of Selangor, Sultan Sharafuddin Idris Shah Alhaj Ibni Almarhum Sultan Salahuddin Abdul Aziz Shah Alhaj. The moving day to the new building started on 15th April 2011. The library services were opened to the public on 22nd July 2011.

The new 6-storey library stands on 18,921 square metres area and can house 2,500 visitors and 400,000 books at any time. The official opening ceremony of the new building was graced by DYMM Sultan of Selangor, Sultan Sharafuddin Idris Shah Alhaj Ibni Almarhum Sultan Salahuddin Abdul Aziz Shah Alhaj on 10th December 2011.



NEM

makes solar PV renewable attractive to all

The Net Energy Metering (NEM), apart from promoting power generation from renewables, particularly solar photovoltaic (PV), allows the public to participate in the effort to address climate change. It promotes clean energy generation. It reduces the need to generate electricity from fossil fuel-based generators.

The first NEM (NEM 1.0) programme made its debut in Malaysia in 2016. After the exhaustion of solar PV electricity quota for national grid connection under a Feed-in Tariff (FiT) scheme, NEM 1.0 has to be introduced. At present, for on-grid arrangement, RE resources, namely bio-wastes and mini hydro, are under the FiT scheme, while solar PV has NEM 1.0.

The NEM 1.0 scheme (2016-2018) was based on the prevailing displaced costs which were lower than the regulated electricity retail tariff. Subsequently, the take-up rate was low among the electricity consumers with only 27.8 MW approved as of the end of 2018.

The NEM 2.0 programme came into effect on 1st January 2019. It utilises the true net energy metering concept, allowing excess solar PV generated energy to be exported back to the national grid on a “one-on-one” offset basis. Under the NEM 2.0, every 1kWh exported to the grid will be offset against 1kWh consumed from the grid instead of at the previous Displaced Cost.

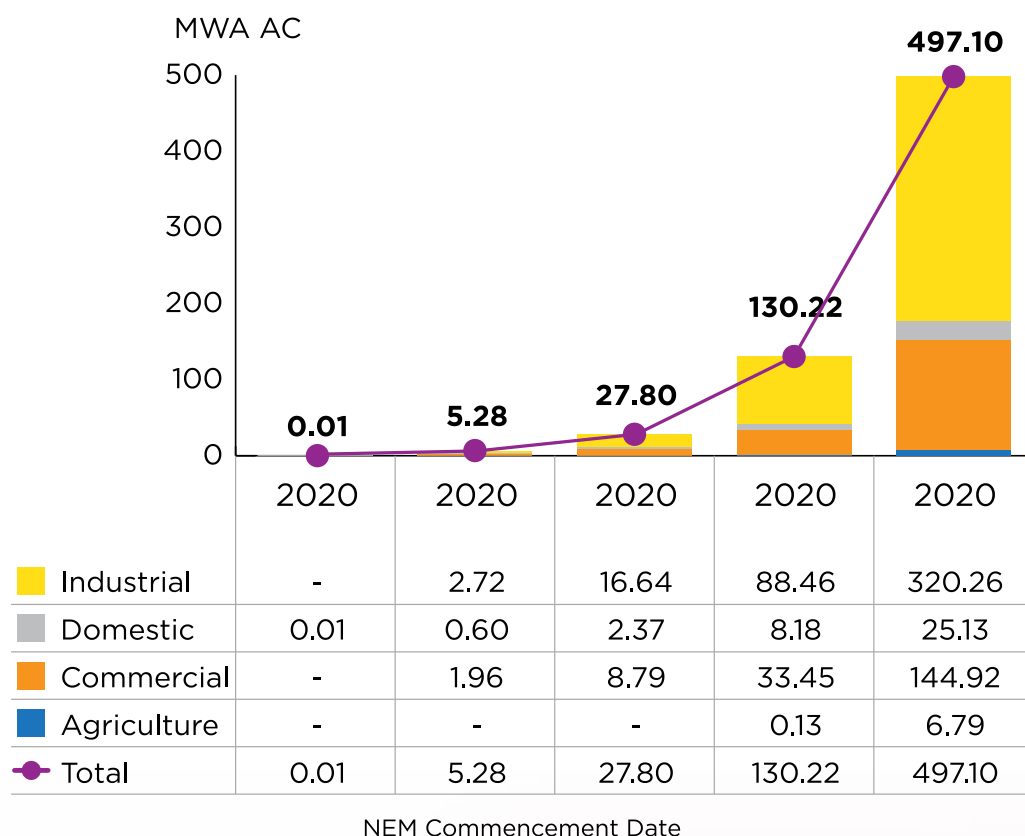
The quota allocation for NEM 2.0 is 500MW up to year 2020. This quota allocation is divided into domestic and non-domestic categories. The NEM categories are classified into four: Residential, Commercial, Industrial, and Agriculture.

NEM 2.0 scheme is only applicable to Peninsular Malaysia and applicants must be a registered Tenaga Nasional Berhad (TNB) customer. NEM is executed by the Ministry of Energy and Natural Resources (KeTSA), regulated by the Energy Commission (EC), with the Sustainable Energy Development Authority (SEDA) Malaysia remaining as the implementing agency.

For the 2016-2020 period, there has been tremendous uptake of the NEM quota based on the approved NEM applications from the PV industry players. The NEM 2.0 quota was well exhausted ahead of its closing date at the end of 2020.



CUMULATIVE ACTIVE APPLICATIONS AS OF NOVEMBER 2020



Apart from the better perks from the NEM 2.0 scheme, SEDA Malaysia's efforts, including awareness programmes, roadshows, advertisement campaigns, stakeholder engagements, dedicated NEM microsite, the NEM calculator coupled with list of online Registered Solar PV Investor (RPVI), and Registered PV Service Providers (RPVSP), are also another contributing factors for the favourable performance.

As the global and domestic business environment are changing dramatically as a result of the COVID-19 pandemic outbreak, a revamped NEM 2.0 is in the making to take the changes in business climate into consideration.

During the winding up of the debate on the 2021 Supply Bill at the Dewan Rakyat, Minister of Energy and Natural Resources, Datuk Dr. Shamsul Anuar Nasarah, told the Lower House that the Ministry will make an official announcement on the future NEM.

The solar PV industry players eagerly await the future NEM programme and what is in store for them under the programme that sets to put the local RE industry, particularly the solar PV segment, to greater heights.





FGV's BIOGAS POWER PLANT

POWERS UP TRIANG COMMUNITY

and Its Surroundings

*Dato' Haris Fadzilah Hassan
FGV Group Chief Executive Officer*



FGV Holdings Berhad has its biggest renewable energy (RE) power generator in the form of a biogas power plant at its Triang palm oil mill in Bera, Pahang, with an installed capacity of 2.4MW.

The plant was successfully commissioned and is fully-operational after receiving the Feed-in-Tariff (FiT) Completion Date from the Sustainable Energy Development Authority (SEDA) Malaysia on 20th October 2020.

Through SEDA Malaysia, FGV secures a quota for 2.0MW of export capacity to Tenaga Nasional Berhad's (TNB) national grid to distribute electricity to 15,000 homes in Felda Triang, Felda Sebertak, Felda Purun, Felda Bukit Kepayang, and Felda Tementi, which are all located within a 30km radius from the biogas power plant.



FGV's Triang biogas power plant

Other surrounding areas include neighbouring towns, clinics, mosques, offices, and small shops.

FGV Group Chief Executive Officer, Dato' Haris Fadzilah Hassan, said that the electrical power support provided by FGV's Triang biogas power plant acts as an alternative form of green energy for TNB, which reduces the risk of outage to ensure a better and steadier stream of electricity.

"In line with the government's renewable energy agenda, the power plant offers an efficient form of RE through biogas from its Palm Oil Mill Effluent (POME), which reduces the need to burn more coal or natural gas that could potentially harm the environment," he said in a media statement.

The POME also produces enough biogas to generate power transmitted to the TNB electrical substation, which is connected to the national grid.

In line with the government's renewable energy agenda, the power plant offers an efficient form of RE through biogas from its Palm Oil Mill Effluent (POME) which reduces the need to burn more coal or natural gas that could potentially harm the environment.

During peak transmission, the biogas power plant can produce up to 10 million kilowatt-hours (kWh) per year, which translates into a revenue of RM5 million per year for the palm oil mill (POM).

The installation of the biogas power plant also enhances the POM's water treatment capacity, thus greatly improving its discharge quality to the nearby river. The POM is also equipped with a POME polishing plant to further increase the water discharge quality.

Apart from the Triang biogas power plant, FGV currently owns four other existing FiT biogas plants to export electricity to the national grid located in Mersing with 1.6 MW capacity, as well as in Maokil, Segamat, and Tenggaroh, with 1.2 MW capacity respectively.

In addition to FiT biogas power plants, FGV also contributes to rural electrification for townships without access to the national grid, such as Felda Umas and Felda Baiduri Ayu in Sabah.

This is done through injecting electrical power to the local grid owned by Felda Investment Corporation (FIC) that traditionally uses diesel generators, which enable the local population to enjoy clean renewable electricity with a lower cost of energy generation.

FGV is currently the world's only palm plantation company that owns 28 biogas power plants while also being the first to develop a palm-based commercial-scale Bio-Compressed Natural Gas (Bio-CNG) plant in Malaysia.

With sustainability embedded and ingrained in all aspects of its operations, FGV is fully committed to ensuring consistent efforts and initiatives are carried out to improve our carbon emission footprint, utilisation of green resources, compliance with regulations, and contribution to society as well as the environment.



FGV's Triang biogas power plant building



FGV's Triang biogas engine



GreenplusTM asia

LEADING ASIA TOWARDS GREATER SUSTAINABILITY

brand with the elite

Greenplus, Malaysia's Premier Eco-friendly, Sustainable Lifestyle and Green Business Magazine, is published to meet the specific needs of professionals at the forefront of green sustainability in the country.

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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Malaysia's biomass industry has a unique place in the country's economic sectors. It is an enabler to four distinctive sub-industries, namely bio-energy; bio-agriculture; high-value chemicals; and eco-products.

Electricity generation from renewable energy (RE) resources by the local biomass industry falls under the bio-energy segment. The electricity is generated via direct combustion. The biomass is used as fuel for boilers in high-pressure steam production. The steam rotates the generator's turbine blades to generate electricity.

In addition to this, the palm oil mill effluent (POME) can be harnessed to produce combustible gas to co-fire the boilers to generate electricity. The local biomass industry players are also tapping into this biofuel, making them one of the RE industry players in Malaysia.

Malaysian Biomass Industries Confederation President Datuk Leong Kin Mun said that the prospects of the biomass industry for power or electricity generation remains bright but not without its own set of challenges.

He noted that when it comes to electricity generation for the biomass sector, there are two key segments in the industry, namely on-grid and off-grid capability. This means that the power generated is either connected to the national power grid network or merely for the generator's internal use.

Leong said the challenges are greater for the on-grid segment as it relies on the quota provided by the Government via the Sustainable Energy Development Authority (SEDA) Malaysia.

POWERING THE BIOMASS INDUSTRY TO **GREATER HEIGHTS**

“As the industry’s output capacity is way higher than the quota, it is a challenge for the on-grid business model. For the off-grid, it is a different scenario,” he told SEM in an interview recently.



*Datuk Leong Kin Mun
President
Malaysian Biomass Industries
Confederation*

Malaysia gazetted the Renewable Energy Act in 2011 [Act 725] and introduced the Feed-in Tariff (FiT) mechanism in late 2011 to make the RE sector attractive to investors and RE energy developers. Currently, it is funded by a 1.6% levy on most electricity bills in Peninsular Malaysia and Sabah.

The biomass industry players benefit from SEDA Malaysia’s FiT mechanism. Under this mechanism, electricity produced from RE resources by Feed-In Approval Holders (FIAHs) is purchased by Distribution Licensees (DLs), namely Tenaga Nasional Berhad, Sabah Electricity Sdn Bhd, and NUR Distribution. The mechanism then sets the FiT rate. The DLs will pay for the RE supplied to the electricity grid for a specific duration.

The FiT duration for biomass, biogas, small hydropower, and solar photovoltaic (PV) electricity generation is 21 years respectively.

A total of 51 FIA applications for RE were approved in 2019, for a total cumulative capacity of 258.95MW. This also includes one FIAH application that was successfully approved for biomass, with an allowable capacity of 10MW. The applications were approved after a series of detailed evaluation of the applicants’ proposed project, including an evaluation of their cash flow models and technical reports.

Leong said the bio-energy segment of the biomass industry has somewhat harvested the low-hanging fruits of the sector, making the prospects for the on-grid business more challenging than its alternatives.

He suggested the setting up of a very comprehensive task force, comprising industry players, relevant authorities, and raw material suppliers as members to work out a variety of solutions that could assist the biomass sector for continuous growth.

Location has been a sticky issue for the biomass industry in terms of sourcing for raw materials. The remote locations of many of the palm oil mills are one of the main contributors to the high cost of transportation. Moreover, the oil palm biomass has high moisture content, low density, and rapid decomposition, which makes the task of transporting them more challenging.



Nevertheless, the availability of different types of biomass in Malaysia offers the industry many opportunities to utilise the feedstock for high value creation. The biomass availability in Malaysia can be categorized into three different sectors: biomass from agriculture, forestry, and municipal waste.

At present, Malaysia is the world’s second largest producer of palm oil. Subsequently, the country has volumes of palm-based biomass in the forms of empty fruit bunches; oil palm fronds; palm kernel shells; mesocarp fibres; and palm trunks.

Another important agricultural biomass resource in Malaysia is rice husk. The rice husk has a very good energy potential for biomass co-generation.

Municipal solid wastes (MSW) whose volume jumps in line with the growing population are also a source of raw materials for the biomass sector. MSW is primarily waste which is produced by the household including industrial, commercial, and institutional waste that is similar in nature to household waste. Only a small percentage of this waste goes to the biomass sector while most of it is disposed of.

Leong reiterated that the biomass industry remains blessed with a good supply of raw resources but there needs to be a concerted intervention from the authorities and industry stakeholders for better utilisation of this economic advantage.

Local financial institutions remained cautious on financing grid-connected biomass power plant unless the feedstock access and its price fluctuation issue have been addressed accordingly through proper risk management plan.

On the impact of COVID-19 towards the industry, Leong said the confederation had suggested to the Government to encourage industries that excel during the pandemic to extend their support.

Glove companies have been using biomass-powered boilers as a proven energy efficiency model compared to the ones using fossil fuel.



2020 will be remembered as a year of adverse disruption to many industries due to the COVID-19 pandemic.

In the biogas sector, operations were not severely affected although many parties had to adapt to the disruptions caused by the pandemic.

The industry players faced challenges that affected supply chain of products and services from overseas. Workforce mobility posed a major hindrance due to the Movement Control Order (MCO) measures implemented by the Government.

The greatest risk faced by the sector was the unexpected shutdowns caused by COVID-19 cases at offices and worksites. However, industry leaders are soldiering on to pave the way forward for the generation and usage of renewable energy (RE).

With the Malaysian government launching the Malaysia Energy Supply Industry 2.0 (MESI 2.0) plan in 2019, and a new target of 35% RE in installed power capacity by 2025 announced at the recent '38th ASEAN Ministers on Energy Meeting' in November, the sector is steadfast to achieve the target to increase Malaysia's RE capacity to 20% by 2025.

THE 2021 BIOGAS OUTLOOK

The biogas movement in Malaysia advances into the New Year with SEDA Malaysia initiatives

“We welcome the MESI 2.0 plan and the new ASEAN RE mix target because it gives the industry the much-needed support to enhance and spur further growth,” said Asia Pacific Biogas Alliance (APBA) Chairman, Datuk Khairuddin Tan Sri Mohd Hussin, in a recent interview with SEM. “MESI 2.0 will further catalyse the achievement of Malaysian RE target and strengthen the promotion of public-private partnership and private financing involvement in RE projects.”

He added: “In Malaysia, the government bodies under the purview of the Ministry of Energy and Natural Resources, namely Sustainable Energy Development Authority (SEDA) Malaysia and Energy Commission (ST) are committed to this target. This is evidenced by programmes such as the Large-Scale Solar (LSS), Feed-in Tariff (FiT), and Net Energy Metering (NEM).

Khairuddin also said that beginning in 2018, SEDA Malaysia initialised a 30MW of FiT quota per tender bidding exercise, which was initially intended to be held twice a year. This exercise he said attracted private investors to the biogas business due to a transparent e-bidding mechanism in place.

“The Malaysian Green Technology and Climate Change Centre (MGTC) also supports green technology projects including RE, under the Green Technology Financing Scheme (GTFS) programme, which provides an interest rebate of 2% on project financing. Additionally, the Credit Guarantee Company (CGC) provides 60% government guarantee to the GTFS-approved project loan. Both of these facilities help Small and Medium Enterprises (SMEs) to venture into the RE sector, including biogas,” said Khairuddin who believes that the target of 20% RE in the capacity mix by 2025 in Malaysia will be achieved.

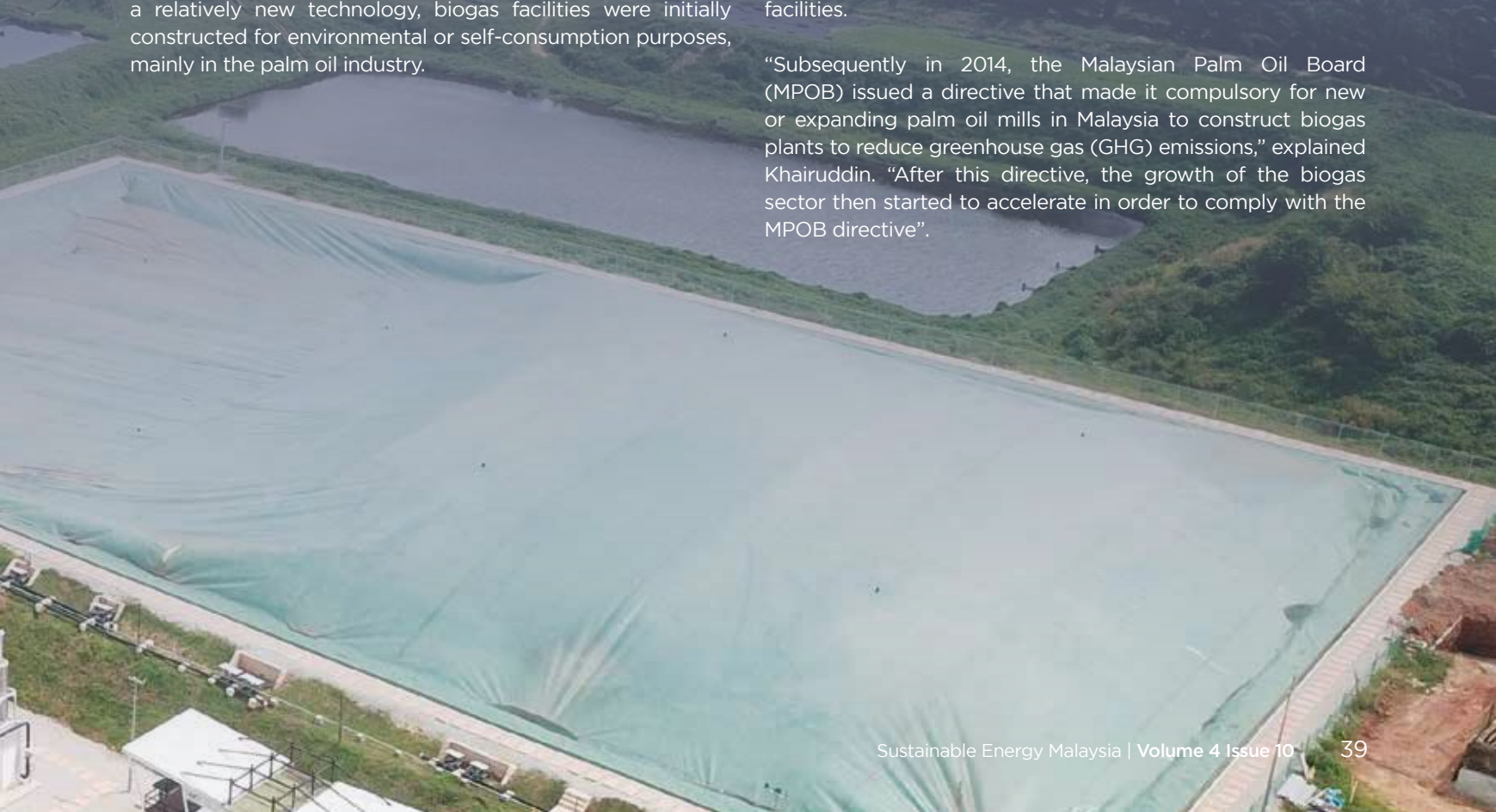
The FiT mechanism for the biogas industry received a timely boost with the enactment of the RE & SEDA Act 2011. Being a relatively new technology, biogas facilities were initially constructed for environmental or self-consumption purposes, mainly in the palm oil industry.



*Datuk Khairuddin bin Tan Sri Mohd Hussin
Chairman
Asia Pacific Biogas Alliance (APBA)*

However, not many palm oil milling companies ventured into the programme due to the significant upfront investment required. However, the perception is expected to shift in the future once the leaders of the palm oil industry, and other industries as well, see the positive results of investing in biogas production to benefit the operations at their respective facilities.

“Subsequently in 2014, the Malaysian Palm Oil Board (MPOB) issued a directive that made it compulsory for new or expanding palm oil mills in Malaysia to construct biogas plants to reduce greenhouse gas (GHG) emissions,” explained Khairuddin. “After this directive, the growth of the biogas sector then started to accelerate in order to comply with the MPOB directive”.



“As millers prefer to remain focused on their core business, which is the production of crude palm oil (CPO), developers started to enter the FiT biogas sector under the Build, Own, Operate, and Transfer (BOOT) model which is a win-win concept for both the millers and the developers. Under this model, the investment in biogas plants is borne by developers who operate and sell the electricity generated from the biogas at a fixed tariff to the national grid, and the millers stand to benefit from a share of the revenue,” added Khairuddin.

He advised investors in biogas technology to be prepared for new changes if the FiT programme ceases.

“The biogas industry is already looking into the alternative utilisation of biogas, such as bio-compressed natural gas (bio-CNG) for example. Currently, not all palm oil mills are able to utilize the FiT scheme due to the limitations of the national grid,” Khairuddin said. “Bio-CNG can be supplied to industrial natural gas users or vehicles via the current gas pipeline or a virtual pipeline. In some areas where fossil fuel costs are high due to logistics, bio-CNG can be competitive. Therefore, biogas for bio-CNG is now actively being explored even though the FiT programme still exists.”

Currently, Malaysia has approximately 450 palm oil mills that each release about 5 to 7 million Nm³ of biogas annually from POME degradation. Only 25% of palm oil mills are equipped with biogas plants.



The advantage of producing biogas yields many financial benefits to operators. Its production process is able to operate 24 hours a day for the whole year and can be stored and used to generate electricity or converted to bio-CNG that can be utilised as a diesel substitute in generators, or as fuel for vehicles and machinery.

Commercial agricultural farms, animal husbandry, municipal wastewater treatment plants, and landfills with organic wastes have ample by-products to produce biogas as a fuel source for biogas plants. The operations of these facilities increase yearly and is expected to be boosted by the growth of economic activities, an increase in global demand, and the human population overall.

Bio-CNG can be supplied to industrial natural gas users or vehicles via the current gas pipeline or a virtual pipeline. In some areas where fossil fuel costs are high due to logistics, bio-CNG can be competitive.

Since 2018, the RE sector boasts large hydro, solar photovoltaic (PV), small hydro, biomass and biogas production operations. This contributes approximately 6% (RE excluding large hydro) as of end of 2018.

The Government is committed to reduce its GHG emissions intensity of Gross Domestic Product by 45% by 2030 as compared to intensity in 2005 at the 2015 United Nations Climate Change Conference (COP 21).

“Malaysia’s sources of GHG emissions comprise mainly of conventional power plants and vehicles. In order to achieve the COP 21 target, Malaysia is actively pursuing initiatives on developing sustainable energy (EE and RE), substitution to cleaner fossil fuels (natural gas), and adoption of electric vehicle technologies, all under the purview of specific-purpose government agencies such as SEDA Malaysia, ST, and MGTC,” Khairuddin said.

“For RE, SEDA Malaysia is actively promoting the NEM scheme for domestic and non-domestic solar PV users while concurrently managing the FiT scheme for the small hydro, biomass, and biogas sectors.”

Looking forward, Khairuddin is optimistic that biogas will contribute greatly to the RE movement.

“For 2021, the outlook for the biogas industry is that it will continue to grow in line with the aspirations of the respective governments in the Asia Pacific region in order to achieve and comply with the respective commitments and targets agreed at the 38th ASEAN Ministers on Energy Meeting,” he said.

“APBA hopes that in the years ahead, the respective governments and stakeholders in APBA countries will continue to help the industry grow further by supporting and providing the necessary mechanisms and infrastructure to promote diversification, such as Bio-CNG for use in industries and motor vehicles. Bio-CNG can be a promising alternative biogas business model in conditions where FiT is not feasible. In Malaysia for example, we have seen a move towards market liberalisation of the gas supply market with the introduction of Third Party Access (TPA) framework. APBA will therefore continue its effort in promoting this business model.”

SMALL HYDROPOWER BRINGS BENEFITS TO **RURAL AREAS**

Generating electricity from small hydropower (SHP) plants is not new to Malaysia. The capability has always been around, even in the pre-Independence era. The first SHP scheme was implemented in Sungai Gombak, Selangor back in 1905 with a generating capacity of 700kW. The Sungai Sempan SHP in Raub, Pahang was installed in 1927 with power generating capacity of 1.2MW.

"It is still running, albeit with some upgrading works," said Malaysian Small Hydro Industry Association (MASHIA) President, Ir. Shan Suleiman.



He noted that the blessed geography and climate conditions in Malaysia have allowed SHP to have an early start in the country's electrification efforts.

"Every State has its own policies on both water rights and land use. The states that have high potential in SHP are Perak, Pahang, Terengganu, Kelantan, Sabah, and Sarawak. To some extent, the policies adopted and implemented would dictate the SHP development," he told SEM in an email interview recently.

Generally, the SHP developments are well received by the states. However, SHP development does require numerous local authority approvals. At times, the long gestation time to obtain approvals may be one of the main factors why SHP projects could not take off as smoothly as it should.

"As the water and land resources are state matters, the Sustainable Energy Development Authority (SEDA) Malaysia and other Federal authorities have limited influence on these decision-makings and approvals.

"MASHIA, together with SEDA Malaysia and Tenaga Nasional Berhad (TNB), are actively meeting with all the State's stakeholders to create awareness and understanding of SHP, as well as its implementation," Shan said.

He acknowledged that the long duration required for getting the many authorities' and/or agencies' approval is quite daunting, and this may put off some investors from considering SHP projects for investment.

Due to the long gestation period, the Financial Institution (FI) will only commence their technical and financial evaluation once these approvals are obtained.

"If the FI approves the financing too early, it may suffer in the sense that funds are already allocated but the Concessionaire is unable to start physical work and commence drawdown. There are instances that the FI has to terminate the financing agreement resulting in the Concessionaire suffering the loss of paid stamp duties and other preliminary charges," he lamented.

In addition, the SHP projects are sometimes deemed to be slightly risky by FIs. The Large-scale Solar (LSS) schemes are considered to have a lower risk compared to small hydro, but they are both quite comparable in actuality. Despite this however, FI is more willing to finance LSS as it is considered "plug and play".

Apart from the funding obtained from FIs, there are also Government funding that the SHP industry players can take advantage of. The Green Investment Tax Allowances (GITA) and Green Technology Financial Schemes (GTFS) are overall highly applicable for all types of RE.

Shan said MASHIA is encouraged to note that these incentives are still being supported and maintained. The Small Hydro industry needs the Government's assistance in encouraging more FIs to be involved in financing SHP Small projects.

*Ir. Shan Suleiman
President
Malaysian Small Hydro Industry
Association (MASHIA)*



While funding concerns do exist, the SHP scheme has its own advantages. The SHP component/scheme could last for more than 50 years. There are numerous SHP schemes throughout the world running for more than 50 years.

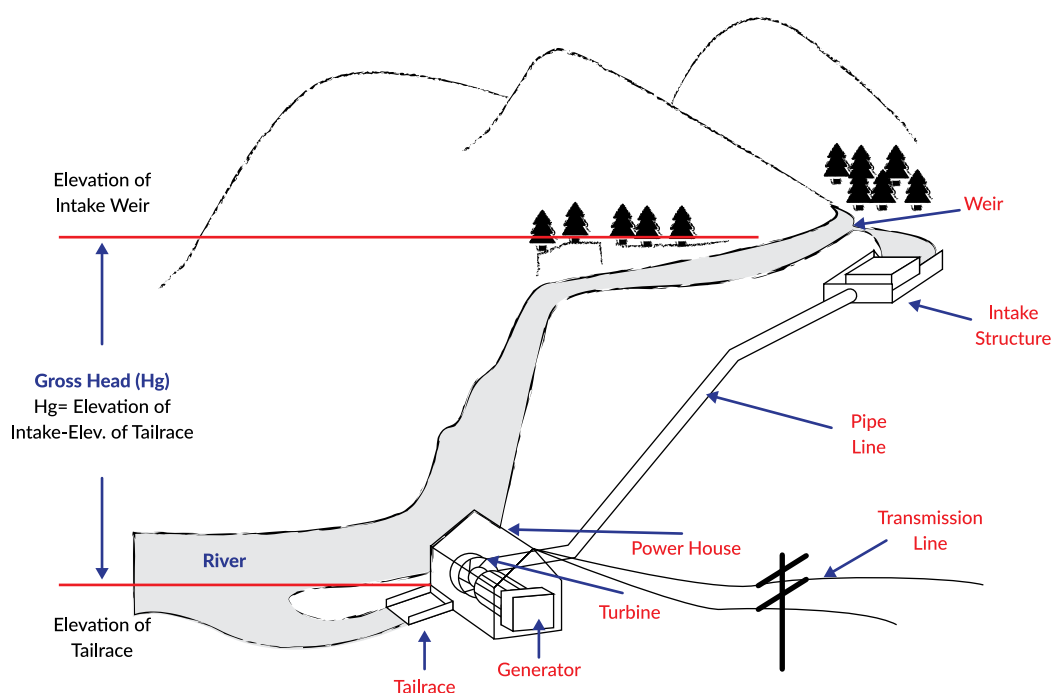
Furthermore, SHP schemes are concentrated in rural areas and have higher local contents. As such, the surrounding communities can readily benefit from such installation in terms of economic activities and supply of electricity.

The clear advantage of SHP is that it can still generate power and revenue after 50 years, which gives it an edge in terms of longevity.

In terms of providing electricity supply and economic activities to the rural area, the SHP is the best option considering its key characteristics. The SHP are usually located in deep rural areas where there are, usually, rural communities.

“Unlike large hydropower schemes, SHP projects do not displace the rural settlements. SHP projects are mainly run-off rivers with no dams and occupies a very small footprint for the intake, waterway, and powerhouse. The penstock is buried underground as well. Hence, the environmental impacts are quite small and minimal.

THE OPERATION OF SMALL HYDRO SYSTEM



Source: SEDA Malaysia: Guideline for Testing and Commissioning of Small Hydro Plant in Malaysia

“SHP projects could offer employment opportunity, training, and exposure to both rural folks in addition to the electrification of deep rural areas. SHP has large local contents/inputs and hence, can greatly benefit the surrounding areas,” he said.

To garner stronger support from the state authorities towards SHP, Shan pointed out that MASHIA could provide awareness dialogues and talks to the rural folks in the states with SHP potential including Perak, Pahang, Terengganu, and Kelantan.

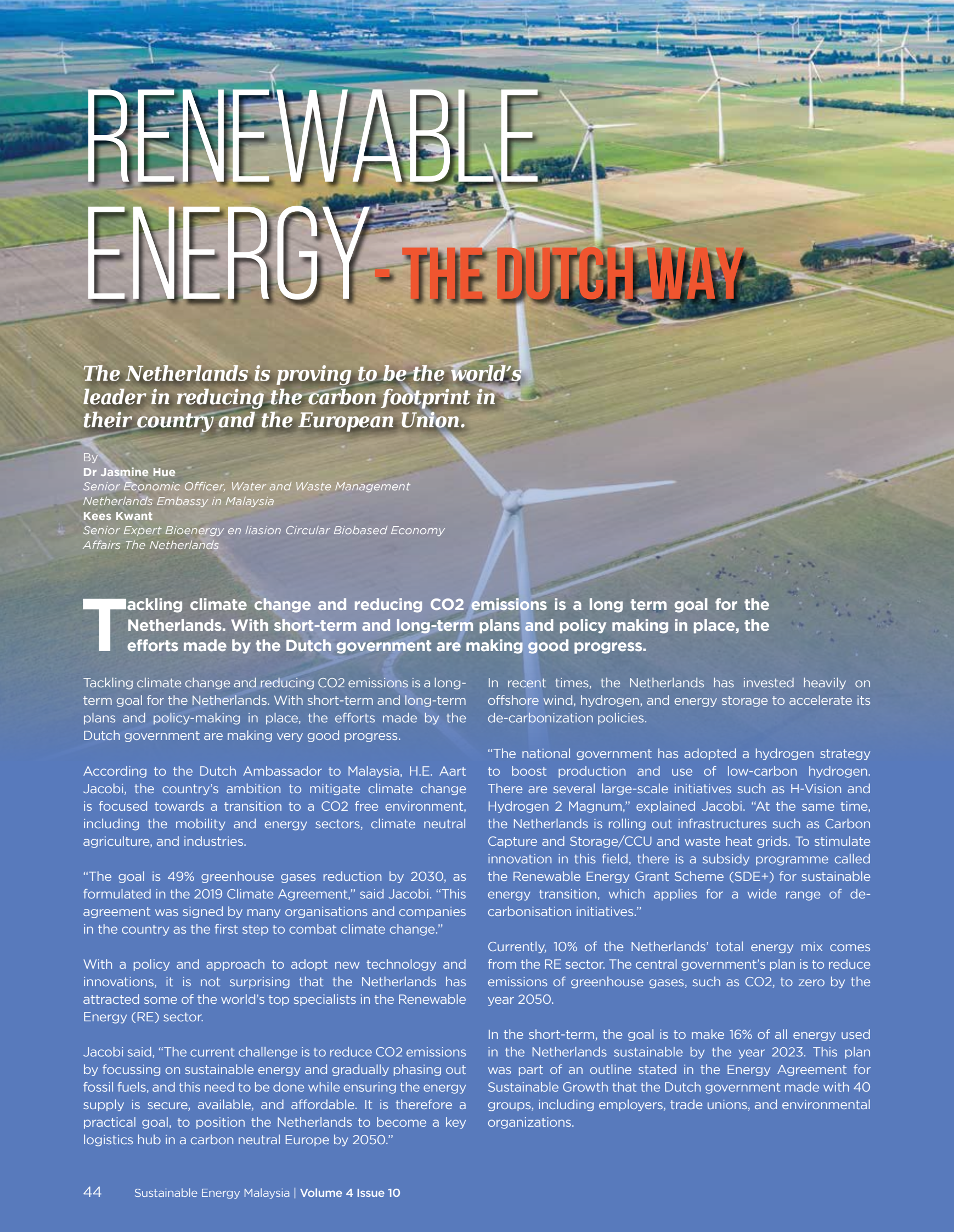
“For this exercise, the programme shall be organised jointly with the States, Department of Orang Asli Development (JAKOA), SEDA Malaysia, and TNB,” he added.

According to SEDA Malaysia, the national electricity generation capacity in 2019 stood at 35,622.51MW. The percentage of RE in the generation capacity mix was about 7%, excluding large hydropower schemes.

MASHIA estimates the SHP potential capacity is about 1,500MW of which 530MW are in various stages of implementation. Other areas under research is the SHP Pump Storage Technology together with Off-River Storage System. This could complement the plans for RE energy storage.

Set up four years ago, MASHIA is a non-profit organisation established to address the issues and impediments faced by the industry stakeholders. It also promotes the development of SHP schemes in Malaysia in a sustainable manner. This is done through engagements with various stakeholders of the industry, including developers, consultants, contractors, suppliers, operators, off-takers, academia, government agencies, and the public.





RENEWABLE ENERGY - THE DUTCH WAY

The Netherlands is proving to be the world's leader in reducing the carbon footprint in their country and the European Union.

By

Dr Jasmine Hue

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Tackling climate change and reducing CO₂ emissions is a long term goal for the Netherlands. With short-term and long-term plans and policy making in place, the efforts made by the Dutch government are making good progress.

Tackling climate change and reducing CO₂ emissions is a long-term goal for the Netherlands. With short-term and long-term plans and policy-making in place, the efforts made by the Dutch government are making very good progress.

According to the Dutch Ambassador to Malaysia, H.E. Aart Jacobi, the country's ambition to mitigate climate change is focused towards a transition to a CO₂ free environment, including the mobility and energy sectors, climate neutral agriculture, and industries.

"The goal is 49% greenhouse gases reduction by 2030, as formulated in the 2019 Climate Agreement," said Jacobi. "This agreement was signed by many organisations and companies in the country as the first step to combat climate change."

With a policy and approach to adopt new technology and innovations, it is not surprising that the Netherlands has attracted some of the world's top specialists in the Renewable Energy (RE) sector.

Jacobi said, "The current challenge is to reduce CO₂ emissions by focussing on sustainable energy and gradually phasing out fossil fuels, and this need to be done while ensuring the energy supply is secure, available, and affordable. It is therefore a practical goal, to position the Netherlands to become a key logistics hub in a carbon neutral Europe by 2050."

In recent times, the Netherlands has invested heavily on offshore wind, hydrogen, and energy storage to accelerate its de-carbonization policies.

"The national government has adopted a hydrogen strategy to boost production and use of low-carbon hydrogen. There are several large-scale initiatives such as H-Vision and Hydrogen 2 Magnum," explained Jacobi. "At the same time, the Netherlands is rolling out infrastructures such as Carbon Capture and Storage/CCU and waste heat grids. To stimulate innovation in this field, there is a subsidy programme called the Renewable Energy Grant Scheme (SDE+) for sustainable energy transition, which applies for a wide range of de-carbonisation initiatives."

Currently, 10% of the Netherlands' total energy mix comes from the RE sector. The central government's plan is to reduce emissions of greenhouse gases, such as CO₂, to zero by the year 2050.

In the short-term, the goal is to make 16% of all energy used in the Netherlands sustainable by the year 2023. This plan was part of an outline stated in the Energy Agreement for Sustainable Growth that the Dutch government made with 40 groups, including employers, trade unions, and environmental organizations.



*H.E. Aart Jacobi
Netherlands Ambassador to Malaysia*

“This Energy Agenda sets a roadmap towards sustainable energy up to year 2050. This transition to sustainable energy will happen in stages: 14% sustainable energy by 2020, gradually increased to 16% by 2023, and almost 100% sustainable energy by 2050. The CO₂ emissions is aimed to be 80% to 95% lower compared to in 1990,” Jacobi told SEM.

He added that the government is working on low-carbon energy sources that will be safe, reliable, and made affordable for all. Some of the energy forms that are low in CO₂ emissions include solar energy, onshore wind energy, offshore wind energy, biomass energy, geothermal heat, and hydropower.

“As of now, bioenergy has been the main contributor, but in the future, the other energy sources mentioned above will play a crucial role to shape the industry as well,” said Jacobi.

To create awareness and to start the wheel turning, the Dutch government has been actively encouraging and supporting industry collaborations and public-private partnerships, including technological field labs and long-running joint innovation programmes. Furthermore, there are incentives in place for business investment in the sustainable energy sector to stimulate innovation.

This transition to sustainable energy will happen in stages: 14% sustainable energy by 2020, gradually increased to 16% by 2023, and almost 100% sustainable energy by 2050. The CO₂ emissions is aim to be 80% to 95% lower compared to in 1990.

Some of the available grants in the Netherlands are: The Renewable Energy Grant Scheme (SDE+) for large energy projects using geothermal heat and solar parks, renewable energy (RE) grants for smart technologies that combine production and storage or contribute to smart grids, Energy Investment Tax Credit for a range of energy-efficient, environmentally friendly technologies, and Sustainable Energy Investment grants (ISDE) for heat pumps, solar water heating systems, biomass boilers, and pellet stoves.

Being a member of the European Union (EU), the Netherlands has worked closely with its counterparts from other member states.

“Delegates of Member States of the EU meet up routinely to discuss on the European climate and energy measures, as well as the common ground for EU positions in the global context,” explained Jacobi. “The “20-20-20” targets, set for year 2020, includes a 20% reduction in EU greenhouse gas emissions (from 1990 levels); an increase in the percentage of EU energy consumption produced from renewable resources to 20%; and a 20 % percent improvement in the EU’s energy efficiency.”

Jacobi said that the Netherlands holds a non-Emissions Trading System share of 16 % (binding); 14 % renewable energy (binding); with a 1.5 % savings per year. RE made up 10% in the transport sector (mainly biofuels) and 14% of the final energy consumption to date this year.

He said, “In October 2014, the EU government leaders have committed themselves to the following goals in a new climate package for 2030: 40% reduction of greenhouse gas emissions; increase the share of RE to at least 32%; and reducing the total energy use in the EU with at least 32.5%.”

The Netherlands has a goal to raise the EU ambition for 2030 from 40% to 55% emission reduction and to translate this into a robust and effective legislative framework. By advocating the development of an internal EU energy market, the Dutch government considers that it is vital in order to fully integrate the growth and supply of RE into the EU energy system.

“On the 11th of December 2019, the President of the European Commission, Ursula von der Leyen, presented the European Green Deal focusing on the growth strategy to transform the EU into a climate neutral and circular economy. This includes a focus on offshore RE from different sources that are abundant, natural, and clean, such as wind, wave, and tidal energy,” Jacobi said.

With the national government’s adoption of a hydrogen strategy to boost production and use of low-carbon hydrogen, large scale initiatives such as the H-Vision and Hydrogen 2 Magnum have certainly set an industry benchmark on a global scale.

These projects in the Netherlands have caught the eye of international energy companies (Orsted, Siemens Gamesa, and DNV GL) that are innovating the country’s energy ecosystem.

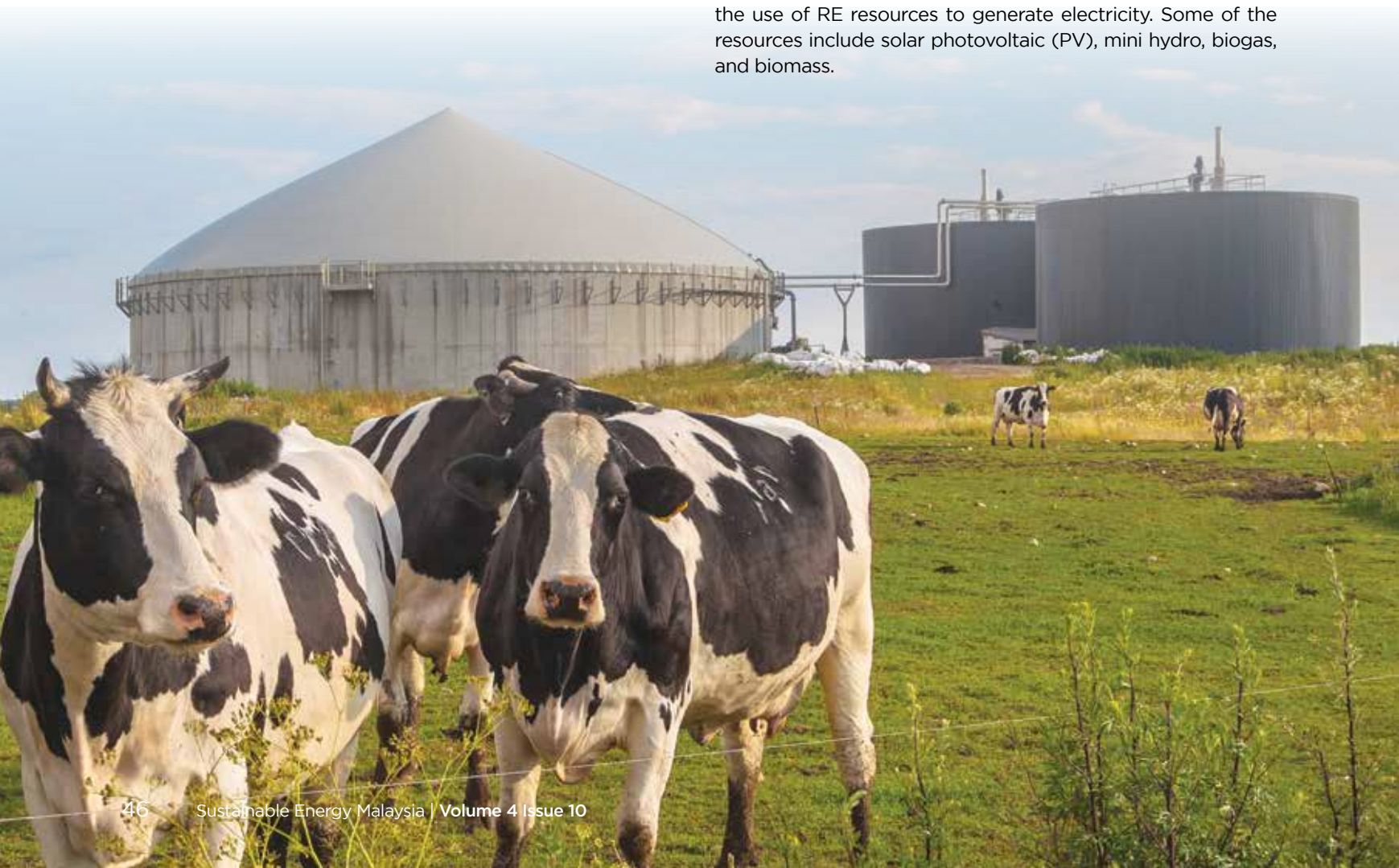
A company called Air Liquide has invested in RE in the Netherlands. The company is building the first world-scale air separation unit, which facilitates RE on an electricity grid.

The Netherlands is home to various major international offshore wind energy initiatives, including Orsted Borssele I en 2 and Vattenfall Hollandse Kust Zuid. In the north, a group of companies including Northland Power and Siemens, have partnered in the Gemini Offshore Wind Park, one of the largest offshore wind parks in the world.

Energypark Eemshaven produces a third of all the energy in the Netherlands while Eneco’s Sunport Delfzijl is the largest solar park in the Netherlands. The region is an important European connection for sustainable energy sources, ranging from offshore wind farms to hydroelectric power plants to solar energy parks.

Offshore wind park installation and maintenance is concentrated in various high quality ports such as Eemshaven, IJmuiden and Vlissingen. Meanwhile, the Port of Rotterdam and its man-made extension, Maasvlakte 2, have established Europe’s first Offshore Centre for wind energy, where an international group of businesses are working together in the offshore and maritime industry.

In recent times, the Malaysian government has worked with the Dutch to activate and nurture its RE industry to promote the use of RE resources to generate electricity. Some of the resources include solar photovoltaic (PV), mini hydro, biogas, and biomass.



“Great results cannot be achieved alone and hence partnership is a crucial aspect in the Dutch economy. The ‘triple helix approach’ in the Netherlands, in which government, research institutes, and industry work together, helps to create a setting of institutional collaboration in which all parties work together to innovate for bigger and better ideas,” said Jacobi. “Malaysia and the Netherlands have a strong relationship and are already collaborating on multiple levels. One of the recent projects in this area was the setting up of a BioHub Port in Sarawak, of which the official launch took place on the 26th of August 2020.

“The joint collaboration between the Malaysia Innovation Agency, Port of Rotterdam, and other stakeholders is an initiative to achieve an inclusive Sustainable Circular Bio-based Economy Business in the Land of Hornbills. This project is expected to help nurture new local and frontier technologies, attract entrepreneurs (SMEs and MTCs), and have massive spill-over effects for the local communities and rural development of Sarawak.”

Jacobi noted that transitioning to a bio-based economy requires reliable supply chains and huge amounts of consistent quality biomass.

“The challenge is not only to identify genuine excess volumes of biomass residue, but also to develop technologies that can process these into affordable and versatile commodities. Sarawak, being the largest state in Malaysia with a strong hold in the agriculture sector, is a promising biomass supplier for the RE industry,” he said. “The Netherlands has been leading in the field of bio-based technology, and companies with complementary expertise have formed ‘bio-based clusters’ by collaborating with universities and research institutes. The strong partnership between industry, government, and tertiary institutions make the Netherlands a good candidate for innovative RE projects.”

While the central government of the Netherlands is on a positive track to innovate and implement RE technology, it also had to adapt its policy-making around the impact affected by the COVID-19 pandemic.



“This pandemic, although it had an incredible impact globally, will not nearly have as much impact as a climate crisis will have. The rebuilding of the economy for all sectors as a result of COVID-19 will provide an opportunity to build back a better, greener, and more sustainable business. We always believe that out of crisis comes opportunity,” Jacobi observed.

“The governments have a unique preposition which is to ensure sustainable and future proof growth. This can be achieved through communication and provision of incentives to encourage the right behaviour. The involvement of governments is critical in the post pandemic period. There is a need to balance the juggling acts to help the affected companies and organisations as much as possible with their survival, and on the other hand, also ensure that longer term concerns are addressed within those sectors. In short, recovery and renewable energy targets go hand-in-hand.”

For the long term, on-going research and development work by the Dutch companies and research institutes has seen a fruitful collaboration with foreign companies. Scientists and engineers are working together to develop new energy technologies, such as food production based on plants versus animals, photonic IT solutions that reduce power consumption, and synthetic fuel and EV charging infrastructure for the transportation sector.

Other projects include creating technologies that drastically improve the energy efficiency of industrial processes, infrastructure, and buildings. This certainly offers endless possibilities and opportunities in energy-related fields for international innovation in the Netherlands.



THE RESILIENT RENEWABLE POWER MARKETS

The COVID-19 pandemic may have taken a big chunk of toll from the economic sectors, but the renewable power markets somehow have displayed unexpected resilience towards the pandemic outrage.

According to the International Energy Agency (IEA) in its recently released *Renewables 2020* report, the renewable power markets are more resilient than previously thought.

In its main case scenario, the IEA forecast that the year 2020 will see the net renewable electricity capacity adding some 4% more than what it did in 2019. In other words, the world may see over 198GW of renewable capacity installed this year.

This would be another record-breaker where renewable electricity accounts for almost 90% of the increase in total power capacity. Major additions are expected from wind (+8%) and hydropower (43%) for the year. Solar photovoltaic (PV) growth in 2020 is seen to be stable.

The IEA noted that the economic crisis due to the pandemic will see individuals and companies re-prioritising their investments leading to the growth in distributed PV systems to decline by almost 8%. However, more utility-scale PV plants will be installed.

The first six months of 2020 saw supply chain disruptions and construction delays, which slowed the progress of RE projects. The impact however fell short of bringing the construction and manufacturing activities in many countries to a grinding halt, even during full and partial lockdowns. Logistical challenges were resolved with the easing of cross-border restrictions in mid-May.

“Monthly capacity additions through September have exceeded previous expectations, pointing to a faster recovery in Europe, the United States, and China. As a result, the forecast for 2020 has been revised upwards by over 18% from our previous update in May,” said the report.

Under accelerated case conditions, it is noted that the renewable capacity additions might reach almost 234MW in 2020 depending on the ongoing uncertainties caused by the COVID-19 crisis.

The report expects renewables will achieve a record expansion in 2021, with almost 218GW becoming operational, a 10% increase from 2020. The rebound is attributed to two factors, namely the commissioning of delayed projects; and growth in markets where the pre-pandemic project pipeline was robust.

India is expected to be the largest contributor to the renewables rebound in 2021, with its annual additions doubling from 2020. In the European Union, capacity additions are expected to rise in 2021, mainly due to the commissioning of delayed utility-scale PV and wind projects in France and Germany. In the Middle East and North Africa (MENA) region, renewable capacity additions are set to recover in 2021, led by the commissioning of major independent power producer (IPP) projects awarded in competitive auctions in the United Arab Emirates, Qatar, and Oman. A similar increase will happen in Latin America as Brazil's delayed wind projects from previous auctions become operational.

The report cited five reasons why financing activity for utility-scale renewables is expected to increase in the second half of 2020 (and beyond). These are:

- Monetary policies announced in most key renewables growth markets in the first half of the year support low interest rates in the foreseeable future, offering favourable conditions for wind and PV projects, which require high upfront investments;
- RE projects provide a “safe haven” for certain institutional investors confronting the emerging economic slowdown because they often come with long-term fixed-price contracts;
- Countries worldwide have awarded a record 100GW of renewable electricity projects since June 2019, with the majority expected to close financing in 2020;
- So far, the COVID 19 crisis has not prompted governments in major markets to abandon or cancel already-announced policies ensuring investors that policy support will continue despite the economic turbulence. In addition, long-term net-zero goals in the EU and China, the two largest renewable energy markets, provide investors with long-range visibility;
- Stimulus packages have maintained the solvency of major utilities and, to some extent, small businesses investing in renewable projects (i.e. independent power producers [IPPs]) in both emerging markets and advanced economies. These relief measures have been crucial to improve their cash flow and allow them to finance planned projects in the second half of this year.

For 2022, the report said that it expects the resilience of the renewables to be retested. The expiration of incentives and consequent policy uncertainties in key markets plus the upcoming financing challenges and limited stimulus targeting renewable electricity will lead to a small decline in capacity additions in 2022 compared with 2021.

China's onshore wind and PV subsidies will expire this year. Its offshore wind support will end in 2021. The republic's policy framework, covering 2021-2025, will be announced at the end of 2021, while financing challenges remain for unsubsidised projects.

Similar developments are taking shape in the United States. Its onshore wind production tax credit expires at the end of 2020 hence hampering wind capacity growth. In Latin America, the delayed auctions in Chile, Brazil, and Argentina, as well as the policy uncertainty concerning electricity market reforms in Mexico, remain key variables for 2022.

For Asia and Oceania, there are sporadic concerns. Australia may see the acceleration of its renewable additions slowed down in 2022 due to federal policy uncertainty and grid connection delays. The precarious financial health of Indian distribution companies (DISCOMs) is another factor. However, renewable capacity additions in Europe, the Middle East, and Africa are forecast to continue expanding in 2022.

As for the European Union (EU), an USD 840 billion recovery fund, pledged in July 2020 with at least 30% dedicated to climate change adaptation and mitigation, is expected to raise the liquidity of RE projects already planned under member countries in the short term. EU member nations had submitted plans to achieve a 32% share of RE by 2030 prior to the pandemic crisis.

In the Middle East and Africa, capacity additions are expected to double in 2022 from 2019 as going solar becomes cheaper. The competitive auctions for utility-scale PV makes the technology more economically attractive to meet the growing electricity demand.

CALENDAR OF EVENTS

One of SEDA Malaysia's roles is to implement measures to promote public participation and to improve public awareness on matters relating to sustainable energy [Section 15(i) of SEDA Act 2011]. In this regard, SEDA Malaysia endeavours to develop and implement strategic communication programmes to reach our stakeholders.

The primary objective of such programmes is to raise greater acceptance and participation by the general public as well as the private sector in the sustainable energy initiatives administered by SEDA Malaysia.

In addition to the awareness programmes, the initiatives include stakeholders' engagements via seminars/workshops, open days, exhibitions, and collaboration with NGO partners as well as international liaisons.

SEPTEMBER 2020

10 SELANGOR



MPIA'S SOLAR NATIONAL ROADSHOW

SEDA Malaysia participated in the Malaysian Photovoltaic Industry Association's (MPIA) Solar National Roadshow at Hilton, Petaling Jaya. Participants took the opportunity from the roadshow to seek more information on renewable energy (RE) programmes, particularly the Net Energy Metering (NEM) programme, from SEDA Malaysia's representatives.

15 PUTRAJAYA



DR. CHEN WEI NEE'S FAREWELL

SEDA Malaysia holds a farewell ceremony for its outgoing Chief Strategic Officer Dr. Chen Wei-nee. Dr. Chen has contributed significantly to SEDA Malaysia since the Authority's inception in 2011. SEDA Malaysia wishes Dr. Chen all the best in all of her future endeavours.

15 PUTRAJAYA



TRAINING ON ENERGY EFFICIENCY AND USE OF RE FOR NON-RESIDENTIAL BUILDINGS

SEDA Malaysia conducted a two-day training on the 14th and 15th of September 2020 on the Principle and Application to Comply MS1525: Code of Practice on Energy Efficiency and use of RE for non-residential building. The training aims to support capacity building in sustainable energy in Malaysia. MS1525 is an important guideline in sustainable building design and operation that will give a positive and direct impact to the sustainable energy and energy security.

The participants were exposed to theories in detail on the features present in the Code of Practice and how they can apply it in building design and operation.

OCTOBER 2020

MPIA'S SOLAR NATIONAL ROADSHOW IN PERAK
SEDA Malaysia once again joined MPIA's Solar National Roadshow held at the Weil Hotel in Ipoh, Perak. Participants were briefed by SEDA Malaysia's representatives on the available RE programmes in the country and the NEM scheme.



6

PERAK

DECEMBER 2020

ZERO ENERGY BUILDING (ZEB) ONLINE TRAINING

The first Zero Energy Building (ZEB) online training in collaboration with JASE-W, ECCJ, and AOTS has been held on 14th December via virtual platform. The online workshop was attended by 18 participants from various background (industries, local authorities, academicians, and associations). Several experts, including some from Japan, have also been invited to share their knowledge on ZEB with the attendees.

Back in 2018, SEDA Malaysia signed the MoU with the Energy Conservation Center Japan (ECCJ) and its partner the Japanese Business Alliances of Smart Energy Worldwide (JASE-W). The MoU is a collaboration between the two parties that focuses on the development and promotion of super energy efficient building / Zero Energy Building (ZEB) in Malaysia.

14

PUTRAJAYA

8

PUTRAJAYA



NEM PROGRAMME DISCUSSION WITH SOLAR PV INDUSTRY PLAYERS

SEDA Malaysia, as the implementing agency for the NEM programme, held a discussion session with solar PV industry players. This session aims to obtain relevant input and feedback on rooftop solar PV programme in driving the growth of the RE industry in Malaysia.



23

KUALA LUMPUR

BFM RADIO INTERVIEWS SEDA MALAYSIA CEO

SEDA Malaysia CEO Ir. Dr. Sanjayan Velautham appeared as a guest of The Breakfast Grille talk show broadcasted on BFM 89.9. The live show saw Dr. Sanjayan explaining to the show listeners on the latest developments of Malaysia's RE industry and the NEM programme.



Transitioning The Nation Towards Sustainable Energy MALAYSIA

ADVERTISING RATE CARD 2021

ADVERTISING RATE

PAGINATION

<input type="checkbox"/> Run On Page (ROP)		RM 10,000
<input type="checkbox"/> Premium Position		
Inside Front Cover Spread (IFCS)		25,000
Inside Front Cover (IFC)		15,000
Outside Back Cover (OBC)		18,000
Inside Back Cover (IBC)		15,000
Facing Editor's Note (FEN)		13,000
Facing Content Page (FCP)		13,000
Facing Inside Front Cover Page (FIFCP)		13,000
<input type="checkbox"/> 1 Issue Package		
- Two-page write-up	Normal rate (3 pgs X 10k)	30,000
- One-page ROP advertisement		
- 1X Facebook banner posting	Package rate	25,000
<input type="checkbox"/> 3 Issues Package		
- Six-page write-up	Normal rate (9 pgs X 10k)	90,000
- Three pages of ROP advertisement		
- 3X Facebook banner posting	Package rate	60,000

DEADLINES

Booking Deadline
6 weeks before the publication date

Material Deadline
4 weeks before the publication date

Cancellation
No cancellations once booking is confirmed

TERMS AND CONDITIONS

Prime positions are non-cancellable.
All confirmed bookings must be published within the agreed calendar year.
A surcharge based on the normal rate will be levied for unutilised insertions.

PAYMENT TERMS

The advertiser is required to make the payment before the publication date.
Payment is due within thirty (30) calendar days following the date of invoice.

All final decisions on magazine artwork lie with SEDA Malaysia.



WHY SUSTAINABLE ENERGY MAGAZINE?

Sustainable Energy Malaysia Magazine is the country's premier source of sustainable energy (SE) content for white collar professionals as it covers extensively on SE development, policies, and market outlooks for all SE industry players in Malaysia.

A vast majority of our magazine's audience consist of executives or managers working at the top line of various organisations in the country. It serves as a platform for investment which enables your newest innovations to reach the right target groups and support lead generation. Apart from helping to improve local customer sentiment, the magazine aims to provide a global perspective on the deployment of SE developments in tandem with the nation's efforts in advocating the global climate agenda.

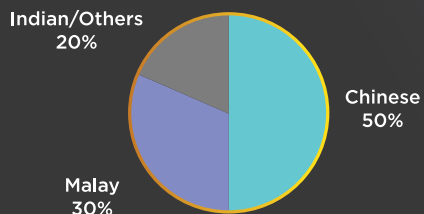
SUSTAINABLE ENERGY MAGAZINE PUBLICATION DETAILS

Publisher	SEDA Malaysia
Category	Industry Professionals & Enterprises
Target Audience	20 years old and above
Frequency	3 times a year
Number of Pages	Min 48 pages (Including cover)
Size	29.7cm (H) x 23cm (W)
Circulation	2,000 print run
Distribution	Government bodies and Agencies Financial Institutions Industry Professionals and Investors

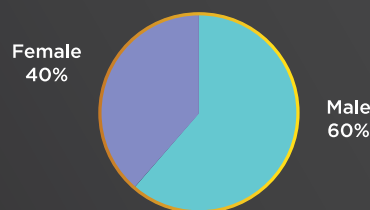


READERSHIP PROFILES

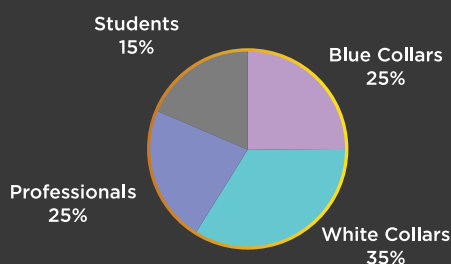
RACE



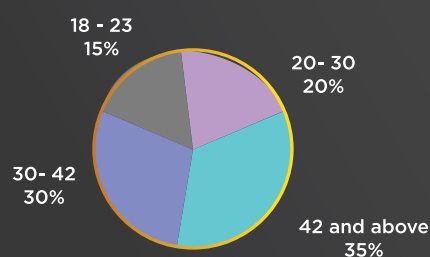
GENDER



OCCUPATION



AGE






nature as our sustainability of **HOPE**


Season's Greetings and
Happy New Year


2021


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