Transitioning The Nation Towards

Sustainable Energy

MALAYSIA

SEDA IN THE EYES OF MALAYSIA

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LEADING THE NATION TOWARDS SUSTAINABLE ENERGY

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Sustainable Energy Development Authority
MALAYSIA

Chairman's Message

This past year has been a busy yet exciting for SEDA Malaysia. The date 1st September 2021 was the most significant one for SEDA Malaysia as it marked the Authority's first decade of operations as a statutory body under the Ministry of Energy and Natural Resources (KeTSA) with the task to develop the sustainable energy (SE) industry in Malaysia.

As we continue to celebrate this momentous milestone, this edition of Sustainable Energy Malaysia (SEM) Magazine will showcase the Authority's achievements over the past decade, and its contributions to the SE industry, the Rakyat, and Malaysia.

The magazine will also highlight several key programmes and initiatives deployed throughout the year such as the SEDA SEED Student Ambassadors 2021 programme and the Sustainable Energy Awareness Poster and Short Video Challenge. The objective of these programmes was to create greater awareness and participation by the general public on the importance of sustainable energy for future generations of Malaysia.

In the spirit of knowledge sharing, we have invited His Excellency Chainarong Keratiyutwong, Ambassador of Thailand to Malaysia, to share his valuable insights on the development of sustainable energy in Thailand. Thank you for your contribution, Your Excellency.

As we close the final chapter of 2021, SEDA Malaysia looks forward to what awaits us in the coming new year. One notable highlight is the much-anticipated International Sustainable Energy Summit (ISES), which has become the key knowledge and networking platform for the SE industry and investors. The 5th ISES 2022 is expected to take place in the Q3 of next year, so be sure to mark your calendar!

During the tabling of the Twelfth Malaysia Plan (RMK-12) recently, the Government has reaffirmed its commitment to reduce the country's greenhouse gas (GHG) emissions intensity of Gross Domestic Product (GDP) by 45% by the year 2030 relative to 2005 levels. It was also announced that carbon pricing and a carbon tax would be introduced to support this vision, as well as a Comprehensive National Energy Policy to provide long-term strategic direction to support national aspiration of reducing its carbon emissions to net-zero. To further accelerate the country's SE industry growth, the contribution of solar, biomass and biogas in its installed capacity mix is targeted to increase to 31%.

I am also pleased to share that our Net Energy Metering (NEM) programme has been well-received once again. The third edition, NEM 3.0, launched earlier this year has generated positive results as 4,523 applications with total capacity of 284.91MW have been approved across the three initiatives as of November 2021. Further, KeTSA's decision to release an additional 300MW of solar quota under NEM NOVA will indeed attract more participants to apply for the programme, which will be available via SEDA Malaysia's eNEM system starting from 15th November 2021. The additional quota is expected to benefit up to 300 commercial and industrial customers and create new business opportunities for over 100 local solar players. Further, it will create an estimated value of RM1.2 billion and provide 3,600 job opportunities, contributing greatly towards Malaysia's post-COVID-19 pandemic recovery.

In view of things to come in 2022, SEDA Malaysia will continue playing its role as the leading agency in spearheading the Malaysia's SE agenda, and to help achieve the country's ambition in becoming a net-zero nation by 2050.

Lastly, on behalf of the Authority Members, management and staff at SEDA Malaysia, I would like to express my sincerest gratitude to all stakeholders and readers of SEM magazine for your continuous support over the decade. Happy New Year, and see you in the year 2022.

YB. TUAN LUKANISMAN AWANG SAUNI
Chairman
SEDA Malaysia

SEDA MALAYSIA
TRAINING PROGRAMMES

Energy Management & Energy Efficiency

Awareness & Technical Trainings:

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

- **Principles and Applications of Malaysia Standard MS1525: Code of Practice on Energy Efficiency and Use of Renewable Energy for Non-Residential Buildings;**
  Eligible for 8 Hours CDP for Registered Electrical Energy Manager (REEM) by Energy Commission

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

- **Energy Audit in Building;**
  Eligible for 10 Hours CDP for Registered Electrical Energy Manager (REEM) by Energy Commission

- **Customise training in any combination of the above**

For more information, please visit our website

www.seda.gov.my

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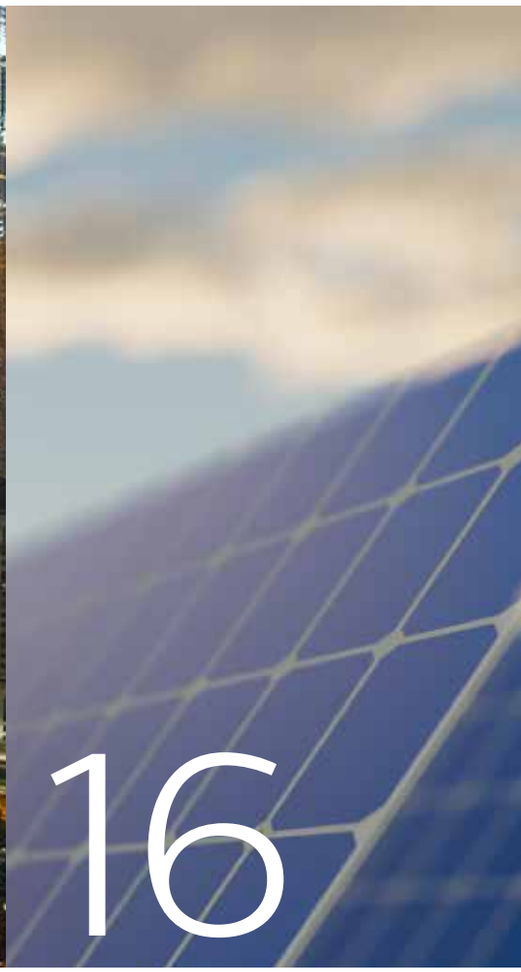
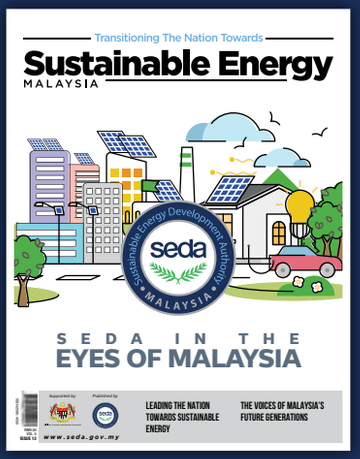


SUSTAINABLE ENERGY DEVELOPMENT AUTHORITY (SEDA) MALAYSIA

The Sustainable Energy Development Authority (SEDA) Malaysia is a statutory body formed under the Sustainable Energy Development Authority Act 2011 [Act 726]. The key role of SEDA is to administer and manage the implementation of the feed-in tariff mechanism which is mandated under the Renewable Energy Act 2011 [Act 725].



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LEADING THE NATION TOWARDS SUSTAINABLE ENERGY

Over the past decade, we have seen strong efforts by the Malaysian Government in accelerating the country's energy transition towards sustainable energy. With the enactment of National Renewable Energy Policy and Action Plan (NREPAP) in 2010, it has set clear target on renewable energy pathway for Malaysia up to horizon years of 2050. Several initiatives including Feed-in Tariff (FiT), Large Scale Solar (LSS) auction exercises and Net Energy Metering (NEM) have been in placed to support this target, a translation on the Government's commitment towards addressing the climate change needs. This is more evident when Malaysia became one of the signatories of the Paris Agreement at the 21st Conference of the Parties (COP21) to the United Nations Framework Convention on Climate Change (UNFCCC) on 12th December 2015, which entered into force on 4th November 2016.

Under the Paris Agreement, Malaysia's Nationally Determined Contribution (NDC) is to reduce the country's greenhouse gas (GHG) emissions intensity of Gross Domestic Product (GDP) by 45% by the year 2030 relative to 2005 levels. Most recently, the Government reaffirmed its commitment and has pledged to achieve Net Zero Carbon Emissions (NZCE) earliest by 2050.

Be that as it may, it is a challenging feat for any growing economy to satisfy rising energy demands and achieve energy sustainability at the same time. Malaysia's journey towards sustainable energy has been a rewarding albeit a long one, more so with the establishment of Sustainable Energy Development Authority (SEDA) Malaysia as the leading agency in spearheading the country's sustainable energy (SE) agenda since 2011.

MALAYSIA'S ENERGY LANDSCAPE IN THE EARLY YEARS

Historically, Malaysia has been a fossil fuel exporter of crude oil and natural gas (in both piped and liquefied) since 1975. It should be noted that while Malaysia thrived on abundant fossil resources, there are projections indicating that the country's crude oil and natural gas reserves will be exhausted by 2051 and 2061, respectively.

Further, just like most Southeast Asian countries, Malaysia relies heavily on petroleum, natural gas and coal for primary and secondary energy consumption. Coal, being the cheapest primary energy source, is still used extensively across the country (and around the world) even though it contributes to global warming. The fact that Malaysia is not a coal-producing country also meant that we are highly dependent on imported resources to meet our growing energy needs. The Government had also spent billions of dollars on rising oil imports and energy subsidies in an effort to improve living standards and maintain electricity and gasoline at affordable prices to the public.

These areas of concern, coupled with rising distress on global warming and the urgent need to protect Mother Earth served as a wake up call for Malaysia to re-evaluate the way we generate and consume energy, and the need for an implementing agency to ensure that the nation stays on track towards a clean energy future. With the current policy development within the electricity supply industry, the Government has committed for low-carbon energy system prior to setting further direction in supporting the NZCE commitment.

A coal power plant.

TRANSITIONING FROM FOSSIL FUEL TO SUSTAINABLE ENERGY

Malaysia's energy transition from fossil fuel to sustainable energy began with the Fifth Fuel Policy initiated under the Eight Malaysia Plan (2001- 2005), which identified renewable energy (RE) resources as the fifth fuel to be included into the national energy mix. The policy served as a launching pad for Malaysia's SE agenda as it pushed for optimizing the use of RE resources as a way to achieve maximum reduction of carbon emissions in the atmosphere.

With the Fifth Fuel Policy in placed, the Government began rolling out several RE-related programmes over the next few years such as the Small Renewable Energy Power Programme (SREP); the Biogen Full-Scale Model Demonstration Project (Biogen FSM); the Malaysia Building Integrated Photovoltaic Project (MBIPV); and the Centre for Education and Training in Renewable Energy and Energy Efficiency (CETREE).

On 2nd April 2010, the then Cabinet approved the National Renewable Energy Policy and Action Plan (NREPAP) to overcome the main barriers to renewable energy deployment in Malaysia: market failure, policies inconsistencies, mixed signals to investors, as well as the lack of a robust and long term sustainable growth.

From NREPAP came the Renewable Energy Act 2011 [Act 725], which provides for the establishment and implementation of the Feed-in Tarff (FiT) mechanism to accelerate the generation of renewable energy from solar photovoltaic, biogas, biomass and small hydropower, and to provide for related matters. The FiT mechanism enables the Distribution Licensees (DLs) to buy RE from Feed-in Approval Holders (FiAHs) for a duration between 10 to 21 years and at the FiT rates set out in the Schedule of the RE Act 2011.

The FiT mechanism has become the most widely used policy instrument to promote renewable energy deployment around the world due to its effectiveness and efficiency. By guaranteeing access to the grid and setting a favourable price per unit of energy generated, it ensures that RE becomes a viable long-term investment for companies, industries and even individuals.

The RE Fund was also established under Section 23 of the RE Act 2011, whereby costs of the system are transferred onto electricity consumers who are required to pay an additional surcharge on top of their electricity bills collected by the distribution licensees and deposited into the fund. Domestic electricity customers who consume less than 300 kWh/month will be exempted from contributing to the RE Fund.

In the same year, SEDA Malaysia was established as a statutory body mandated under the Sustainable Energy Development Authority Act 2011 [Act 726] and has been entrusted with a key role to administer and manage the implementation of the FiT mechanism. The Authority operates under the five thrusts under NREPAP, which are:

- To increase RE contribution in the national power generation mix;
- To facilitate the growth of the RE industry;
- To ensure reasonable RE generation costs;
- To conserve the environment for future generations; and
- To enhance awareness on the role and importance of RE.

1. *Mistral Engineering Sdn. Bhd. 4.0MW biogas plant.*
2. *One of the trainings conducted by SEDA Malaysia that contributes to the human capital development in the SE industry.*
3. *The aerial view of the solar PV system installed on the rooftop of "The Walkway" linking both the National Cancer Institute and Hospital Putrajaya under Phase 2 of GLBE project.*

CURRENT SUSTAINABLE ENERGY LANDSCAPE

Malaysia's sustainable energy landscape has grown exponentially over the past decade. More SE initiatives and programmes have been established and deployed by SEDA Malaysia, their benefits reaped by the industry, the country and the Rakyat.

.: FEED-IN TARIFF (FiT)

In the early years of its implementation, the Feed-in Tariff (FiT) scheme caters to four RE sectors – solar, biomass, biogas and small hydro. The first quota of FiT was released via an e-FiT online system on 1st December 2011 at 12:01am with a total of 505MW quotas offered from the point of launch until the first half of 2014. The allocation of quota made was 190MW for year 2011/2012 and 2013, and 125MW for 1H 2014, respectively. The allocation of quota by sector is as shown in Table 1:

The first quota of FiT was released via an e-FiT online system on 1st December 2011 at 12:01am with a total of 505MW quotas offered from the point of launch until the first half of 2014.

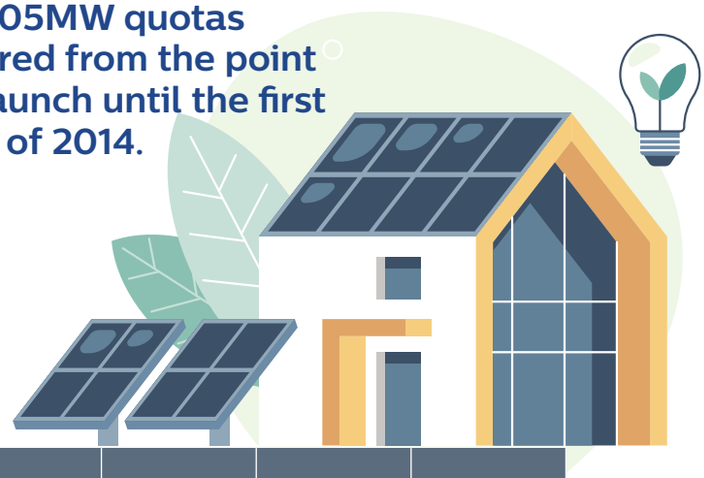


Table 1: FiT Quota 2011 - 2014

Year	Biogas Sewage	Biogas	Biomass	Biomass - Solid Waste	Small Hydro	Solar PV < 1MW	Solar PV > 1MW	Total (MW)
	MW	MW	MW	MW	MW	MW	MW	
2011/2012	20	10	60	20	30	10	40	**190**
2013	20	10	50	30	30	10	40	**190**
H1 2014	10	5	25	15	45	5	20	**125**

Biomass

Between 2011 and 2014, SEDA Malaysia has received 25 Feed-in Approval (FiA) applications, of which 13 applications were accepted for a combined capacity of 131.8MW. From year 2012 to 2016, the biomass sector recorded the highest volume in terms of energy generation from RE projects that have achieved commercial operations; the total combined energy generation throughout the five-year was 974.40GWh. During the e-bidding exercise held in June 2021, a total quota of 30MW from 187.805MW was allocated for biomass sector. As of November 2021, a total capacity of 70.65MW of biomass plants have been commissioned throughout Malaysia with another 70MW in construction.

Biogas

A total of 60MW quotas were allocated to the biogas sector between 2011 and 2014. Until December 2016, a total of 6,855 FiT projects with a total capacity of 420.94MW had achieved commercial operations, of which 30.89MW was from the biogas sector. As of end-2017, a total of cumulative 30 biogas projects have achieved commercial operations with installed capacity of 55.83MW. In the fourth e-bidding held from 1st to 15th June 2021, 24 companies have successfully submitted their bids for various capacities from the total quota of 31.805MW. The projects that received the offered quota are expected to achieve commercial operations by second half of 2024. As of November 2021, 60 biogas projects have been commissioning with a combined capacity of 119.74MW with another 95.58MW in construction.

Small Hydro

Small hydro power (SHP) project developers were previously incentivised via the Small Renewable Energy Power (SREP) that was implemented between 2001 to 2010. When the FiT scheme came into force, the small hydro sector was allocated with 30MW for 2011/2012 and 2013, and 45MW for 1H 2014. SEDA Malaysia received nine SHP Feed-in Approval (FiA) applications for the 2011-2014 quota; six were approved but only four were accepted with a combined capacity of 11.70MW. In the first five years of implementation, 3,825 SHP FiA applications have been approved with a combined capacity of 232.0434MW. As of November 2021, a combined capacity of 83.8MW has started commissioning with another 505.68MW in construction.

Solar PV

SEDA Malaysia has seen strong uptake of quotas offered under the FiT scheme by the solar PV sector. At the end of 2012, the total capacity of FiT applications for solar sector was 51.45MW from 479 applications. A year later, the Authority noted the total installed capacity applications shot up by 82% to 162.88MW.

Due to the overwhelming response received from the solar PV sector, a new community category was added to FiT's solar PV application in 2014. SEDA Malaysia continued to see encouraging uptake of quotas allocated for solar PV over the next two years. By 2016, the total installed capacity applications for solar PV has increased to 90.27MW. As of November 2021, 10,270 solar PV projects have commissioned for FiT with a combined capacity of 387.03MW.

.: NET ENERGY METERING (NEM)

The Net Energy Metering (NEM) mechanism was launched on 1st November 2016 following the strong uptake of FiT quotas offered to the solar PV sector. Despite a low uptake rate of only 27.8MW installed capacity by the end 2018, a revision in the programme's mechanism (relaunched as NEM 2.0) saw renewed interest as the response received for year 2019 alone was astounding; 1,252 applications representing 102.41MW of the total capacity were approved in that year alone, bringing the cumulative approved capacity of NEM to 130.21MW. This translated to an increase of nearly 3.68 times the total capacity approved from 2016 to 2018. The 500MW quota allocated for NEM 2.0 was fully taken up ahead of its closing date that was set at the end of 2020.

The NEM 3.0 programme was launched on 29th December 2020 with a fresh 500MW quota, which will be carried out in phases from 1st February 2021 until 31st December 2023. NEM 3.0 is categorised into three programmes:

a) **NEM Rakyat** – open to residential users who have installed solar PV panels on the rooftop of their homes whereby they can enjoy an offset rate of "one-to-one" from the prevailing gazetted tariff for a period of 10 years. The programme is expected to between about 10,000 to 25,000 TNB domestic account holders / households in Peninsular Malaysia.

b) **NEM Government Ministries and Entities (GoMEn)** – open to government premises with installed solar PV system where they can enjoy similar offset rate of "one-to-one" under commercial tariff for a period of 10 years. About 100 government buildings in Peninsular Malaysia are expected a reduction of RM6 million in their monthly electricity bill; and

c) **Net Offset Virtual Aggregation (NOVA)** – open to commercial, industrial, agriculture and mining establishments whereby the excess energy generated from their solar PV system can be exported to the national grid to offset their electricity bills based on the Average System Marginal Price (SMP), or distributed to up to three wholly-owned subsidiary companies.

On 22nd October 2021, the Ministry of Energy and Natural Resources (KeTSA) announced that the Government has allocated an additional 300MW quota under the NOVA, which can be applied through SEDA Malaysia's eNEM system starting from 15th November 2021. The additional NOVA quota is expected to benefit over 300 commercial and industrial customers, create new business opportunities for over 100 local solar players, generate an estimated investment value of RM1.2 billion and provide 3,600 job opportunities for the Rakyat.

SEDA Malaysia has also seen more applications for its PV Industry Directories. To date, there are 195 Registered PV Service Providers (RPVSPs) and 211 Registered Solar PV Investors (RPVIs).

.: ENERGY EFFICIENCY

While the deployment of Feed-in Tariff (FiT) scheme and Net Energy Metering (NEM) programme have become the catalyst to Malaysia's energy transition towards SE, more must be done to boost the country's SE growth. The supply and demand for SE must be balanced and therefore, it requires the involvement of the entire population including both private and public sectors, and the Rakyat. To put this concept into action, SEDA Malaysia is entrusted to implement energy efficiency (EE) projects and programmes mandated and authorised by the Government.

Government Lead By Example

Among the first projects undertaken by SEDA Malaysia is the Government Lead By Example (GLBE) to promote the practice in efficient use of energy in Government-owned buildings, which include ministries, department agencies, universities and hospitals. In 2011, SEDA Malaysia has identified 105 buildings as intensive electricity users under the Efficient Management of Electrical Energy Regulations 2008 (EMEER 2008). By end of 2012, 93 buildings have selected for the programme of which 48 had successfully achieved the 3% electricity savings target, which translated to 122 million kWh saving and a reduction of 83,000 tonnes of CO_2 emission. Further, 12 ministry buildings in Putrajaya had successfully achieved 10.4% savings in electricity consumption or 11 million kWh and a reduction of 7,800 tonnes of CO_2 emission. In 2015, SEDA Malaysia has completed its GLBE-GCPV Systems Installation at selected 25 Government-buildings in Putrajaya. An energy audit for four buildings under KeTSA has been carried in 2021.

Sustainable Low Carbon Building Facilitation and Assessment (LCB GreenPASS)

In 2016, SEDA Malaysia's has introduced the Sustainable Low Carbon Building Facilitation and Assessment (LCB GreenPASS), which is a voluntary and industry-driven programme targeted at building owners, developers, local authorities, private sector, Government, and any EE building projects (new or retrofit). The programme focuses on actual energy consumption and reduction in buildings, thus making an accurate reflection of the emissions and reduction contributed to the environment. As of November 2021, SEDA Malaysia has received 135 applications for GreenPASS, which translated to 1,218.8GWh in savings, and a reduction of 84,173 tonnes of CO_2 emission. The Authority also recorded that five buildings have been awarded the Low Carbon Building (LCB) 1-Diamond rating under GreenPASS, 67 buildings awarded LCB 2-Diamond rating, nine buildings awarded LCB 3-Diamond rating, and two awarded the 4-Diamond rating.

Energy Audit Conditional Grant (EACG)

The Energy Audit Conditional Grant (EACG) under the Eleventh Malaysia Plan was part of the Government strategy to create awareness on energy management and the importance of having energy audit, and subsequently help commercial building owners to reduce their electricity consumption. Given the positive response by the public throughout its implementation from 2016 to 2020, and its impact to the country's overall SE agenda, EACG is continued under the Twelfth Malaysia Plan 2021 – 2025 (RMK-12). RM86.73 million has been allocated for EACG under RMK-12.

Sustainability Achieved Via Energy Efficiency (SAVE)

The SAVE programme was first deployed on 7th July 2011 with the objectives to stimulate the sale of 5-star energy efficient-rated home appliances while promoting a culture of efficiency energy use among business entities and the Rakyat. Under SAVE 1.0, a total of 165,000 rebate vouchers were offered for the purchase of 5-star energy efficient-rated refrigerators and air-conditioners, from which 164,648 vouchers or 99.78% have been claimed. The programme also offered rebate to businesses that have completed the replacement of existing inefficient chillers to new efficient ones. For this, SEDA Malaysia received 52 applications with 61,980RT (Refrigeration Tonnes) or 86.06% of the allocated capacity.

Additionally, the Government has announced a new edition of SAVE programme during the Budget 2021 with an allocation of RM30 million. The updated programme, SAVE 2.0, offers an e-rebate of RM200 for the purchase of 4-star and 5-star energy efficient-rated refrigerators and air-conditions from selected retailers or e-commerce platforms. The programme once again received overwhelming response from the Rakyat and as of November 2021, 114,955 out of 150,000 e-rebates have been claimed, which translated to more than RM20 millions in savings.

.: HUMAN CAPITAL DEVELOPMENT

Since the year 2012, SEDA Malaysia has collaborated with various agencies, higher learning institutions and research institutes in an effort to raise the level of competency within the RE industry, and to further promote the EE culture among Government agencies, Malaysian companies and consumers. For instance, SEDA Malaysia has organised numerous EE-related and low carbon building facilitation programmes; advisory, training and capacity building programmes as well as awareness promotional programmes. Authority has also published various training modules related to Grid-Connected Photovoltaic (GCPV) Design Systems, EE and Energy Management in 2013. Between 2011 and 2019, RE-related training programmes under SEDA Malaysia have attracted 2,312 participants. Meanwhile, EE-related training programmes have attracted a total of 2,770 participants between 2016 and 2021.

1st September 2021 was a momentous landmark for SEDA Malaysia as it reached the first decade of operations. Over the past decade, the Authority had played a crucial role as the implementing agency overseeing the FiT and NEM programmes, and it intends to play its part the fullest in supporting the Government's efforts to further nurture the development of the nation's SE industry.

1. Balloting event for Solar PV application for the non-individuals on 18th June 2014.
2. EACG Training Session 6/2018 held on 9th and 10th October 2018 by SEDA Malaysia.

SHAPING MALAYSIA'S SE AGENDA

Over the past decade, SEDA Malaysia has become a leading agency in championing the country's sustainable energy transition. The Authority strives to continue playing a crucial role in spearheading RE development in the Malaysia, and to continuously support the Government in achieving SE aspirations.

The National RE Capacity Target

2025 31%

2035 40%

Malaysia's Nationally Determined Contribution (NDC) for Greenhouse Gas (GHG) Emissions

-45% reduced

2005
0.096 $kgCO_2$ / MYR emission intensity of GDP

2030
0.053 $kgCO_2$ / MYR emission intensity of GDP

CONTRIBUTIONS TO THE COUNTRY

Cumulative investment (MYR bn)

2021-2025
21.64

Employment impact (# of Jobs)

2025
30,799

SEDA Malaysia strives to further contribute to the national GDP, by attracting potential investment and providing more employment through FiT and NEM, as well as other initiatives and programmes mandated and authorised by the Government.

HUMAN CAPITAL DEVELOPMENT

RE Training Programmes
2,312
no. of participants from 2011 - 2019

EE Training Programmes
2,770
no. of participants from 2016 - 2021

SEDA Malaysia has conducted various RE and EE training programmes to raise the competency levels within the SE industry.

CONTRIBUTIONS TO THE INDUSTRY

Capacity of FiT projects currently in operations
596.71MW

Solar PV	Biogas	Biomass	Hydro	WTE
323MW	120MW	58MW	84MW	13MW

Committed capacity FiT projects
667.32MW

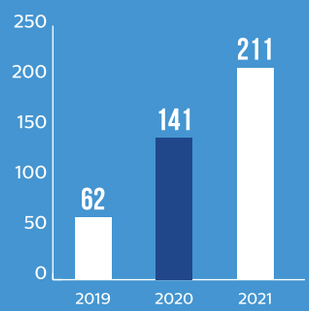
Solar PV	Biogas	Biomass	Hydro	WTE
0.35MW	91.20MW	48MW	506MW	23MW

Estimated job creations based on the quota

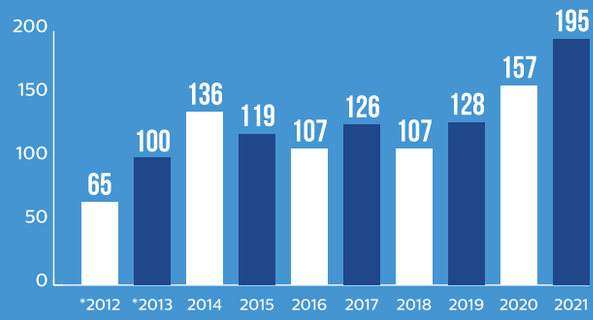
Solar PV	Biogas	Biomass	Hydro	WTE
1,410	423	566	938	142

Total RE capacity approved under FiT scheme as of November 2021.

No. of Registered
PV INVESTORS (RPVI)



No. of Registered
PV SERVICE PROVIDERS (RPVSP)



CONTRIBUTIONS TO THE ENVIRONMENT

LCB GreenPass

1,218.8
GWh
in savings

84,173
tonnes CO_2 emissions
has been reduced

135 applications approved for LCB GreenPASS

LCB GreenPASS programme's performance as of November 2021.

SAVE 2.0 Programme

39,164
tonnes CO_2
reduction
every year

RM22.26
million
saving on
electricity bills

Based on estimated projection.

DISCOVERING SE POTENTIAL AT EXPO 2020 DUBAI

The Expo 2020 Dubai is much-anticipated World Expo hosted by Dubai in the United Arab Emirates from 1st October 2021 to 31st March 2022, after nearly a year of postponement due to the COVID-19 pandemic, participated by 192 countries and 10 organisations.

Malaysia Pavilion, also known as the Rainforest Canopy, is located in the Sustainability District and it is considered as the only net-zero carbon structure at the Expo. Themed 'Energising Sustainability', the Pavilion is a testament to Malaysia's strong commitment to balance socio-economic progress with environmental concerns to ensure a secure and sustainable future. This is showcased through 26 weekly thematic trade and business programmes covering 10 key industries. SEDA Malaysia was appointed as the Lead Consultant for the Green Technology Application for the Development of Low Carbon (GTALCC) programme. During the 5th Week: Low Carbon Cities, SEDA Malaysia was the joint secretariat alongside the Ministry of Environment and Water (KASA) to promote National Policy - National Low Carbon Cities Masterplan among other activities and involvements.

Representatives from SEDA Malaysia had participated in the networking and low carbon city technical visit sessions, which took place between 1st and 6th November 2021. The delegates were involved in numerous activities including seminars and forums, business matching and stakeholder engagements, technical visits, engaged in talks for potential collaboration with various organisations, and a guided tour around the Expo 2020 Dubai.

1 NOVEMBER 2021

The Climate Change Conversation (CCC) on Global Sustainable Cities, and Seminar on Accelerating Low Carbon Cities Towards a Sustainable Future by GTALCC

SEDA Malaysia had organised two seminars on low carbon cities, covering aspects of sustainable energy (SE). Other key highlights include an introduction of SEDA Malaysia and its role in the implementation of SE initiatives in Malaysia and globally; to promote the National Low Carbon Cities Masterplan developed by the Authority; a preliminary discussion with the Kuala Lumpur City Hall (DBKL) on implementing a low carbon building programme at the city council; and, to call on government agencies and local authorities to be more involved in low carbon citites initiatives.

1

1. *The seminar organised by SEDA Malaysia on low carbon cities.*
2. *SEDA Malaysia delegates with YBhg. Datuk Seri Hj. Mahadi bin Che Ngah, Mayor of Kuala Lumpur.*
3. *Part of the SEDA Malaysia entourage went to the Sustainable City in Dubai for a technical visit.*
4. *Mr. Mohammad Nazri Mizayauddin, Chief Strategic Officer of SEDA Malaysia with Dr. Sgouris, the Director of Research Development.*
5. *Low Carbon Cities Appreciation Dinner co-hosted by SEDA Malaysia.*
6. *192 countries and 10 organisations are participating in Expo 2020 Dubai, which is on-going from 1st October 2021 to 31st March 2022.*

2-3 NOVEMBER 2021

Business Matching and Pocket Talks

Over the two days, SEDA Malaysia had attended a business matching event hosted by MIDA and MATRADE, as well as several Pocket Talks. These programmes aimed at seeking potential implementation and collaboration between private companies and local authorities as well as providing a platform for knowledge-sharing exercise between local authorities and the participants on matters related to low carbon cities, particularly on aspects of SE.


2

4 NOVEMBER 2021

Technical Visits to The Sustainable City, Dubai, and Dubai Electricity and Water Authority (DEWA) Research and Development Centre

SEDA Malaysia had the opportunity to explore The Sustainable City, the first net-zero energy development in Dubai. During the technical visit, the delegates were able to learn more on the implementation of the project as well as exchanging thoughts and general knowledge with the developer and local authorities.

The objective of the visit to the Dubai Electricity and Water Authority (DEWA) Research and Development Centre was to explore potential collaboration between SEDA Malaysia and DEWA. The visit was a success as DEWA has agreed to collaborate with SEDA Malaysia. Programmes expected to be covered under the collaboration include conducting site-practical trainings; sharing of facilities for research and performance testing on solar-related products; co-organising knowledge transfer sessions on SE including hydrogen technology; co-hosting an international training programme on SE including dispatch of experts between the two agencies; and, to further develop and update existing training modules under SEDA Malaysia.


3


4

4 NOVEMBER 2021

Low Carbon Cities Appreciation Dinner

SEDA Malaysia also co-hosted the Low Carbon Cities Appreciation Dinner, which was held as a form of gratitude shown to the Ministry, the Malaysian Consulate in the UAE, local authorities, and various companies for their involvement in the low carbon cities initiatives as well as a chance for business networking on a global scale.

5

4-6 NOVEMBER 2021

Official visits to pavilions at Expo 2020 Dubai

In addition to Malaysia's Pavilion, SEDA Malaysia had visited numerous pavilions at the Expo 2020 Dubai. These include Thailand Pavilion; Slovak Pavilion; Slovenia Pavilion; Austria Pavilion; Sweden Pavilion; Mobility Pavilion; Sustainability Pavilion, and others. SEDA Malaysia had also participated in bilateral meetings at the New Zealand Pavilion and Canada Pavilion.

6

BOOSTING THE RE SECTOR WITH SOLAR

A thriving renewable energy (RE) sector is a good indicator of how serious is a country in its attempt to address the concerns of greenhouse gas (GHG) emissions, the main contributor to global climate change.

A designated official agency for RE is crucial for the sector to continue growing as well as compiling the necessary official data to track the industry's developments and progress.

In the case of Malaysia, there is the Sustainable Energy Development Authority (SEDA) Malaysia. Statistics compiled by SEDA Malaysia are important as proof that Malaysia is doing what it claims.

Kompleks Hijau Solar in Melaka, one of the most resource-efficient solar farms in the world.

Before SEDA Malaysia was set up via the Renewable Energy Act 2011, the Malaysian Energy Centre was the body dealing with RE and Energy Efficiency (EE). With the setting up of SEDA Malaysia, the industry is more regulated with the standards for solar PV systems having been established. SEDA Malaysia became the one-centre reference for the RE industry players.

The standards also ensure that quality systems are delivered to the users, and this is very important for the growth of the industry. To monitor the growth and achievements of the RE sector, one regulatory agency is crucial.

SEDA Malaysia also establishes training syllabus for solar PV designers and installers. Only Certified Designers and Installers are allowed to do the job. This ensures that only qualified persons can do the job and not just anyone who claims that they are qualified.

One local company that has prospered with the presence of SEDA Malaysia is Gading Kencana Sdn. Bhd., one of the leading players of Malaysia's solar PV sector.

Dato' Ir Guntor Tobeng,
Founder and Managing Director of Gading Kencana Sdn. Bhd.

Gading Kencana noted that prior to the setting up of SEDA Malaysia, training of staff in the solar PV field is very expensive, as they have to be sent abroad for their required courses and exams.

It noted that SEDA Malaysia has established the needed training syllabus and standards, and training centres such as Selangor Human Resource Development Centre, Construction Industry Development Board, Universiti Kuala Lumpur were commissioned to carry out the training. This has greatly reduced the costs of training.

When SEDA Malaysia was set up in 2011, and subsequently, the roll out of the Feed-in Tariff (FiT) scheme, Gading Kencana was actively bidding for quotas, and has successfully installed solar PV rooftop systems for its clients.

In 2012, SEDA Malaysia called for bids for small-scale solar farms with each solar farm licence issued at the maximum capacity of 5MW. Gading Kencana won two licences, one for 5MW and the other 3MW. This solar farm that was built in Ayer Keroh, Melaka was commissioned in 2014.

In the year 2016, the Energy Commission (ST) called for bids for the first batch of Large Scale Solar farms (LSS1). Gading Kencana won the bid and its second solar farm of 30MW in Bidor, Perak was commissioned in 2018.

Gading Kencana started its business retailing solar powered garden lights as early as the year 2000. From solar garden lights, the company moved on to solar powered street lightings. It soon acquired the knowledge and skills through the training of staff in Germany to enable them to design and construct Stand-alone (off-grid) Solar PV systems. The solar PV systems were installed at Orang Asal villages and remote settlements and schools in Sabah and Sarawak.

Additionally, Gading Kencana has participated in the Suria 1000 programme and the biggest rooftop solar PV system that the company installed was for the Tesco building in Kulim, Kedah. This project was followed up by the 564kW rooftop system for Bosch factory in Bayan Lepas, Pulau Pinang.

Gading Kencana has initiated the solar PV industry by retailing solar garden lights manufactured in Malaysia but sold to overseas market as very little is known about solar PV technology. At that time when people mention “solar”, it is fully equated with solar water heater.

The company had, at its own expense, promoted the technology through trade exhibitions and mass media advertisements.

From solar garden lights, the company moved on to solar streetlights. It promoted the idea to the Public Works Department and Local Councils, whereby it was cheaper and faster to light up accident-prone and dangerous junctions and stretches of road where no grid supply were available.

With the building of the Malaysian Energy Centre’s headquarters LEO building (now known as the Malaysian Green Technology and Climate Change Corporation, MGTC) in Bangi, the SURIA 1000 was also introduced where subsidized solar PV systems were installed by individuals and businesses.

At that time, the training of personnel for solar PV were only found in countries like Germany and Australia. Gading Kencana has dedicated a significant operating budget to send its staff for solar PV systems design and installation training.

SIGNATURE PROJECTS

Gading Kencana has two signature projects, namely the SURIAku and the Wakaf Solar Masjid.

The SURIAku was the pilot project for a later larger scale MySURIA. SURIAKu was a special allocation by SEDA Malaysia to install 4KWp solar PV systems at the houses of 20 poor families in the district of Arau, Perlis under the Feed-in Tariff (FiT) scheme.

Gading Kencana started its business retailing solar powered garden lights as early as the year 2000. From solar garden lights, the company moved on to solar powered street lightings. It soon acquired the knowledge and skills through the training of staff in Germany to enable them to design and construct Stand-alone (off-grid) Solar PV systems. The solar PV systems were installed at Orang Asal villages and remote settlements and schools in Sabah and Sarawak.

The families from then on have regular income compared to their meagre and irregular income. The programme was initiated in 2012 as a joint effort by Gading Kencana and the Northern Corridor Economic Region (NCER). The programme was completed in 2014. The project won the National Energy Awards and ASEAN Energy Awards in the First Runner-up placings.

Wakaf Solar Masjid was a joint effort by the office of the Member of Parliament of Johor Bahru and Gading Kencana. About 25 mosques and suraus were fitted with solar roof top PV systems of varying capacities under the Feed-in Tariff (FiT) scheme. This project ensures that the prayer houses have a regular income to maintain their premises instead of the irregular contributions from their congregation.

The company noted that solar PV electric vehicle (EV) charging stations are expected to be the next wave in the solar PV domain. In addition, the generation and self-consumption of solar power for factories, data centres and other users who wish to reduce their energy bills are also having potential in Malaysia.

This could open doors for mini/community grids, said Gading Kencana.

1. Gading Kencana 8MW Solar Farm, sprawling 17.17 acres in Melaka.
2. Visitors are given a guided tour around Gading Kencana's solar farm.
3. Gading Kencana LSS Farm at Bidor, Perak.
4. Gading Kencana participating in a trade exhibition.
5. Dato' Ir Guntor Tobeng at one of the solar farms under Gading Kencana Sdn. Bhd.

ECONOMIC SPILLOVER FROM BIOGAS SECTOR

Since its inception in 2011, the Sustainable Energy Development Authority (SEDA) Malaysia has contributed enormously in promoting and developing the growth of sustainable energy in the form of Renewable Energy (RE) and energy efficiency (EE) in Malaysia.

The RE Act 2011 established the Feed-in Tariff (FiT) mechanism, an essential policy framework that accelerated RE growth in the last decade and this was solely implemented by SEDA Malaysia. The FiT has been a catalyst in enhancing Malaysia's RE agenda towards the target of 31% RE contribution in the national energy mix by 2025. Prior to FiT, the biogas industry exhibited sparse growth, mainly for compliance with Malaysian Palm Oil Board (MPOB) regulations at palm oil mill owners' expense.

The Concord Group, one of the main players of Malaysia's biogas industry, has done well from the Feed-in Tariff (FiT) quotas it secured from SEDA Malaysia. From the FiT quotas, the Concord Group has managed to establish several biogas plants in Pahang, Johor and Terengganu for the benefit of Malaysians and the nation's sustainable energy (SE) initiatives.

From the FiT quotas, the Concord Group has managed to establish several biogas plants in Pahang, Johor and Terengganu for the benefits of Malaysians and the nation's sustainable energy (SE) initiatives.

A project under FiT, a Biogas Plant at Kemaman Mill of TDM Plantation Sdn. Bhd. Terengganu, Malaysia.

At present, the Concord Group's biogas plants and locations are:

- Lepar Hilir Biogas Plant, Pahang (commissioned in December 2018);
- Keratong 2 Biogas Plant, Pahang (commissioned in February 2019);
- Lok Heng Biogas Plant, Johor (commissioned in June 2019);
- Adela Biogas Plant, Johor (commissioned in June 2019);
- Kemaman Biogas Plant, Terengganu (expected initial operation date (IOD) December 2021);
- Sungai Tong Biogas Plant, Terengganu (expected IOD December 2021); and
- Ulu Keratong Biogas Plant, Pahang 9 (expected IOD August 2022).

Through its activities, the Concord Group has successfully created jobs in rural areas e.g. FELDA estates and Kuala Lumpur (HQ). Around 90% of operation site staff are recruited from the local plantation communities, who previously were doing odd jobs in the vicinity but later hired as Concord Group staff, upon training and job exposure.

Breakdown of total job opportunities created by the Concord Group as of October 2021 at its sites and HQ are:

- Operation Team: 66
- Project Team: 14
- Management & administrative staff (KL HQ): 16
- Interns (all locations): 20

The Concord Group even offers career progression. For example, since the start of operations in 2019, 17 personnel from the operation team have been promoted and/or transferred to other sites. The transfer to other sites and states provides exposure for their career progression and personal development.

In addition, the Concord Group supports upskilling via training with certified bodies and sponsorship of further education for all staff. Examples of trainings attended are:

- Certified Chargeman Competency training by the Energy Commission and Tenaga Nasional Berhad;
- Occupational Safety & Health by the National Institute of Occupational Safety and Health; and
- Operation & Maintenance of Biogas Power Plant by SEDA Malaysia.

Interns from local universities are regularly taken in for periods of three to seven months, and are also given the opportunity to visit the Concord Group's biogas plants for a hands-on learning experience.

For the local SMEs, those from within the local community are given sub-contract works for certain work scopes, which contributes continuous local economic activity. This is done during construction and operation of a project. Some SMEs that are beneficiaries of the Concord Group's activities in the biogas sector are Dyna Power Electrical Engineering & Supply, Asri Teguh Enterprise, Setia Bumi Hijau Sdn. Bhd., MDF Jaya Enterprise and JNZ Permata Engineering.

The Concord Group's presence works out to be a blessing in disguise for local farmers as its operations yield anaerobic digester sludge that is suitable for use as liquid bio-fertilizer for cash crops or oil palm. The sludge is rich in nutrients and up to 40 cubic metres (fertilizer value equivalent to RM2,000) is obtained per day per site, with a total quantity of approximately 150 cubic metres per day for the four operational sites. This form of fertilizer is given complimentary to local farmers.

In addition, a greenhouse in Adela biogas plant is set up, utilising anaerobic digester sludge as fertiliser for vegetables and harvested by the staff at the site. The produce is given to surrounding communities or families of staff.

In human capital development, the Concord Group continuously engages with local universities e.g. University of Nottingham, Universiti Teknologi Petronas, Universiti Malaysia Pahang, and Universiti Tuanku Abdul Rahman to organise workshops/webinars to promote knowledge of the RE industry and potential career opportunities. It is collaborating with Universiti Malaysia Terengganu (UMT) to develop a course on RE. Agreement with UMT is being developed for a period of five years starting 2022 for:

- Developing a course on RE and waste management, ultimately to be endorsed by Malaysia Board of Technologists and the Department of Environment;
- Organising mutual knowledge transfer programmes;
- Internships for UMT students;
- Industrial attachments for UMT staff;
- Under- or postgraduate placements in UMT for Concord Group's staff; and
- Joint R&D on waste treatment technology.

As part of R&D, the Concord Group has developed its own in-house biogas hydrogen sulphide (H2S) scrubber based on experience gained from constructing and operating the plants. It is one of the homegrown biogas scrubbers in Malaysia and developed by a team of Malaysian engineers.

The Concord Group is also undertaking R&D on decanter cake (residue from an oil palm extraction process) from the palm oil mill to increase biogas production. The Concord Group has also successfully undertaken R&D on the cooling process of POME in the mixing tank that preserves the microbes in the digester from deteriorating.

To promote RE awareness among the surrounding communities, the Concord Group is planning an annual outreach programme for youths (aged 10 to 17 years old) of rural communities during school semester break to increase awareness on the career prospects in the biogas/renewable industry. Each session will comprise 10 participants at each site, namely Adela, Keratong 2, Lepar Hilir and Lok Heng.

To increase safety for road users (staff and settlers) at night, the Concord Group has installed a solar lighting system for common roads around its plants at Lepar Hilir and Lok Heng.

To summarize, the biogas industry is one of the main components of Malaysia's sustainable energy sector. It brings a host of economic spillover effects to the environment, the community and the country while contributing to the nation's aspiration to achieve 31% RE in the national energy mix by 2025.

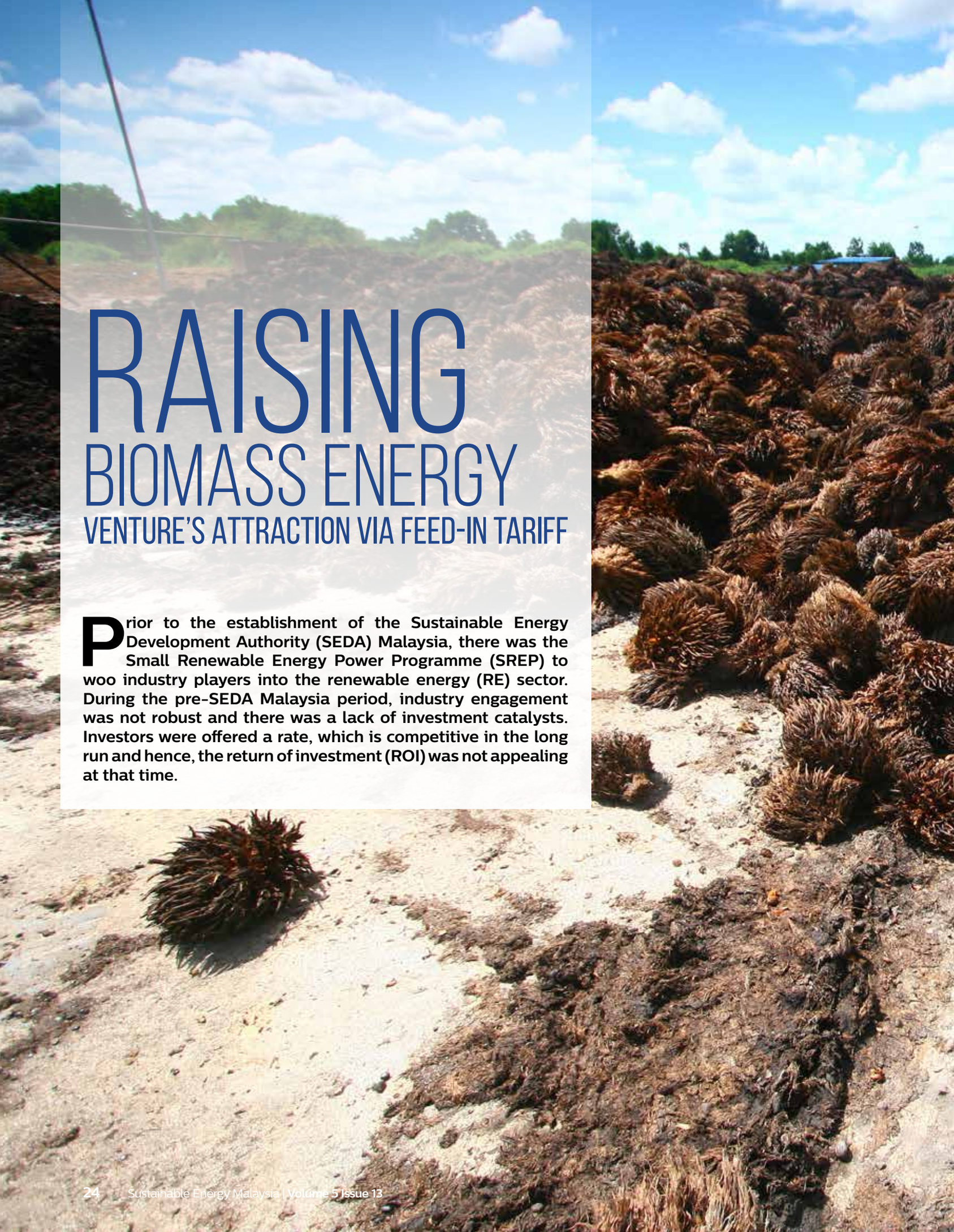
Being one of the pioneer project developers in Malaysia, Concord Group has benefitted from the FiT scheme carried out by SEDA Malaysia, attributed to its well-defined framework, which is accessible and business feasible. The framework remains tried-and-true for the past decade, which has attracted more project developers and financial institutions to venture into the biogas industry in Malaysia.

The Concord Group has won numerous industry awards over the years. For instance, the Concord FGV Lepar Hilir Biogas Plant and the Concord FGV Adela Biogas Plant were recognised as the winner for Category 2: Renewable Energy - On-Grid (National Grid) at the National Energy Awards (NEA) 2020 and NEA 2021, respectively. The Concord FGV Lepar Hilir Biogas Plant was also awarded 2nd Runner-up place for the Renewable Energy: On-Grid (National Grid) category at the ASEAN Energy Awards 2020.

"On the occasion of the 10th anniversary, we would like to extend our congratulations to SEDA Malaysia and to thank them for spearheading the RE and biogas growth in Malaysia, which has been a great benefit to us. We wish SEDA Malaysia greater success in the years ahead in their endeavour to implement more RE initiatives as one of the key drivers for climate change agenda in Malaysia and the region," said the Concord Group.

The Concord Group is also undertaking R&D on decanter cake (residue from an oil palm extraction process) from the palm oil mill to increase biogas production. The Group has also successfully undertaken R&D on the cooling process of POME in the mixing tank that preserves the microbes in the digester from deteriorating.

1. *Biogas Plant at PKS4 of PT Dharma Satya Nusantara, Muara Wahau, Kalimantan Timur, Indonesia.*
2. *Concord FGV Lepar Hilir Biogas Plant in Pahang was recognised as the winner of National Energy Awards (NEA) 2020 under the category "Renewable Energy - On Grid (National Grid)".*
3. *Concord FGV Adela Biogas Plant, Johor.*
4. *Concord Scrubber at Kemaman Biogas Plant.*



RAISING BIOMASS ENERGY

VENTURE'S ATTRACTION VIA FEED-IN TARIFF

Prior to the establishment of the Sustainable Energy Development Authority (SEDA) Malaysia, there was the Small Renewable Energy Power Programme (SREP) to woo industry players into the renewable energy (RE) sector. During the pre-SEDA Malaysia period, industry engagement was not robust and there was a lack of investment catalysts. Investors were offered a rate, which is competitive in the long run and hence, the return of investment (ROI) was not appealing at that time.

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

Financing institutions were not keen to finance the development of biomass power plants due to the lack of investment attractiveness and low ROI. Thus, the biomass power plant project did not capture the attention of industry players, and most of the biomass wastes are used for other purposes.

Previously established policy was renewed by The Renewable Energy Act 2011, which witnessed the establishment of SEDA Malaysia as an implementing agency to manage and administer all RE Feed-in Tariff (FiT) related matters.

The introduction of FiT overcame the various limitations of SREP and catalysed a rapid growth of RE. It lowers the investment risk with the insistence that RE developers will have access to the electricity grid network and gain long-term power supply contracts with the power utility company. A higher and profitable margin among the new FiT tariffs has also raised stakeholders' interests.

With the inception of SEDA Malaysia, strategic policy changes are made to steer the RE industry with various stakeholders involved in the process. These included Tenaga Nasional Berhad (TNB), Energy Commission (ST), Malaysian Green Technology and Climate Change Corporation (MGTC), Credit Guarantee Corporation Malaysia Berhad, Malaysian Investment Development Authority (MIDA) and financial institutions.

With the collaborations from the various stakeholders, the opportunity to invest in the FiT scheme became more attractive. Furthermore, the Green Technology Financing Scheme (GTFS) helps in many ways to subsidize funding from the financing institution, which makes such RE an enticing venture. In addition, CGC offers corporate guarantees for RE investment that enhance the benefit of RE projects. MIDA came up with the option of a pioneer status programme to any institutional investor who invests in the RE industry to promote and build up more activity in the industry to create more investment and employment opportunities.

All the above catalysts are built during the policy changes, and many saw the opportunity to invest with attractive ROI and investment in the RE industry taken off easily. On the back of this new bullish background, Tenaga Sulpom Sdn. Bhd. came into the picture to develop a biomass power plant headed by Mr. HS Yap, Director of TSSB and the team.

Tenaga Sulpom Sdn. Bhd. is a developer in the RE industry and currently operates an integrated 7MW biomass power plant under SEDA Malaysia's FiT scheme. Its pioneer team members are actively engaged in various projects and work closely with various stakeholders to develop the RE industry into a sizeable market in Malaysia. They also advise and work together with government agencies to steer ideas in industry innovation while supporting government and private development in the RE operation.

Project Lead Mr. CC Lim said, "We experience renewed interest in the biomass sector after the policy changes as many institutions are looking to venture into the industry. Primarily, we projected the project investment would be reasonably workable and the risk is considerably manageable. With the options of financing assistance from the government-related agencies, the biomass project was able to be explored with various financial setup in the market, thus various factors such as interconnection facility, geographical location and technology efficiency can be overcome,"

"So, with these reasonable investment criteria from the project evaluation options to convert biomass wastes from the mill into electricity, it also does help the palm oil milling industry to solve the handling of biomass wastes as this usually incur additional cost to the miller. Besides, with the investment of RE biomass power plant from the same palm oil mill operator, it will increase additional revenue to the cash flow and help in cost reduction. Therefore, the overall incentives developed during the policy changes effectively changes the outlook of the industry and investors are keener to explore such project".

Tenaga Sulpom has been operating the biomass power plant for the past five years. At the same time, it builds a strong team of technical know-how key personnel in the organisation. The team employ local employees and we train them to operate the plant. RE development plays an important role in growing RE investment and helps human capital development as if more RE projects will be implemented, more employment and expertise are needed in this area.

Other than biomass, the team also collaborates with private companies in the development of solar and biogas power plants. Their group's subsidiary Biogas Sulpom Sdn. Bhd. has a 2.4MW biogas plant next to the palm oil mill that utilizes POME waste as fuel. Up to date, the biogas power plant has been operating at its optimum capacity to convert available POME waste from palm oil mill into electricity.

Furthermore, the team are planning to develop an integrated solar electricity generation for their facility consumption that is in the planning prototype. They will continue to derive more ideas and projects that suit their business model in the coming years and prioritize significantly on environmental concerns.

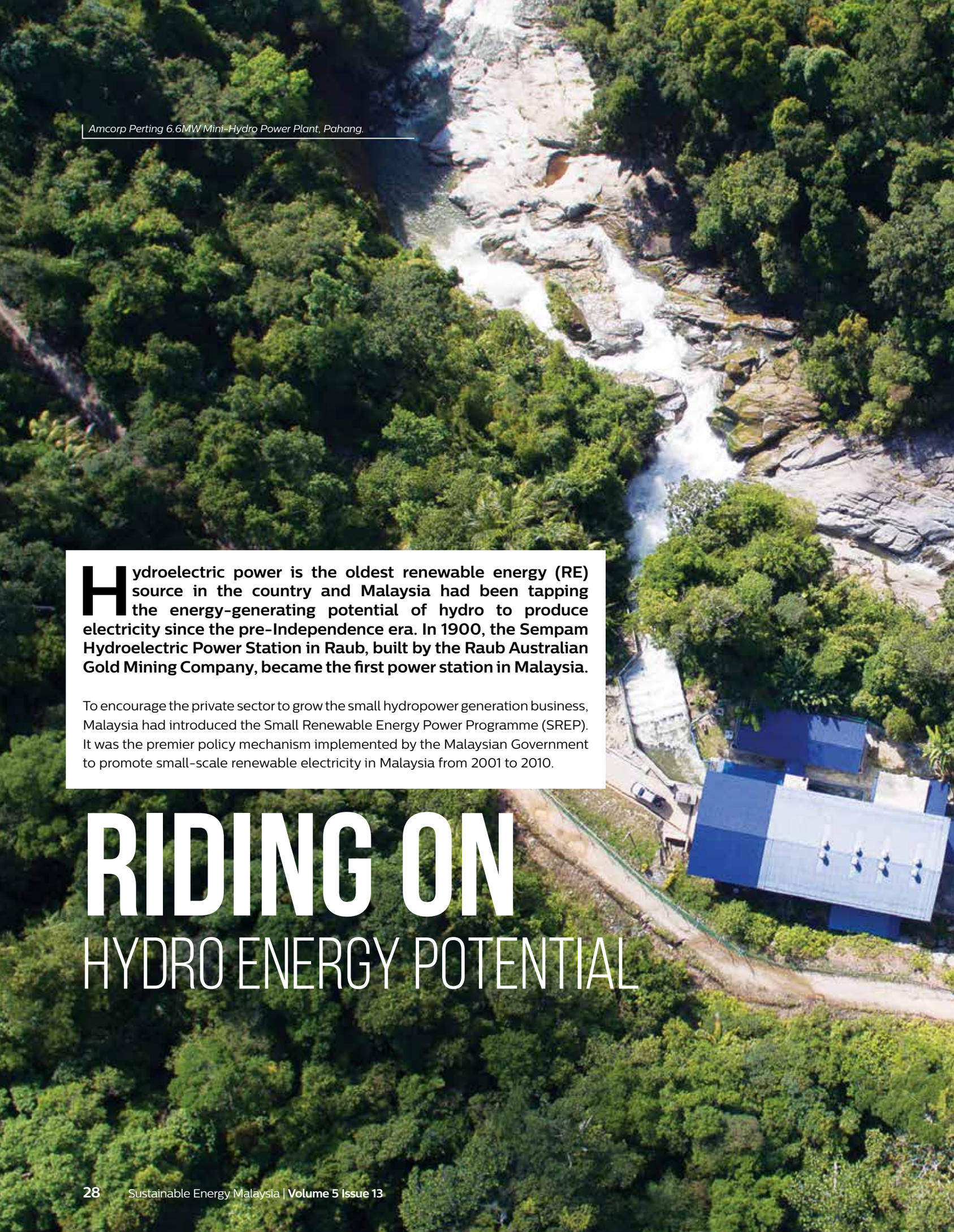
Tenaga Sulpom has been operating the biomass power plant for the past five years. At the same time, it builds a strong team of technical know-how key personnel in the organisation.

The team also actively provides support on the initiatives developed by SEDA Malaysia on various occasions and events such as:

- Roundtable Discussion – Advancing the biomass power generation sector in Malaysia
- Stakeholder Discussion – FiT progress
- Biomass Forum in Nanning, China
- Inaugural Town Hall Session RE Industry
- Sustainable Committee Discussion

All initiatives and programmes implemented by SEDA Malaysia have been instrumental in the development of SE in the country. They are the strategic solutions for RE industry players need to grow their business, and subsequently attract new investments.

1. Biogas production facility.
2. A worker overseeing plant operation at Tenaga Sulpom's biomass plant.
3. Biomass fuel for energy production.
4. Control room facility for biomass energy production plant.
5. Overall outlook of biomass power plant.



Amcorp Perting 6.6MW Mini-Hydro Power Plant, Pahang.

Hydroelectric power is the oldest renewable energy (RE) source in the country and Malaysia had been tapping the energy-generating potential of hydro to produce electricity since the pre-Independence era. In 1900, the Sempam Hydroelectric Power Station in Raub, built by the Raub Australian Gold Mining Company, became the first power station in Malaysia.

To encourage the private sector to grow the small hydropower generation business, Malaysia had introduced the Small Renewable Energy Power Programme (SREP). It was the premier policy mechanism implemented by the Malaysian Government to promote small-scale renewable electricity in Malaysia from 2001 to 2010.

RIDING ON HYDRO ENERGY POTENTIAL

The SREP was an initiative launched by the Government (through the then Ministry of Energy, Green Technology and Water), which aimed to achieve the Government's strategy to intensify the development of RE source as the fifth fuel resource. The SREP's primary focus is to facilitate the expeditious implementation of grid-connected renewable energy resource-based small power plants.

Amcorp Power Sdn. Bhd. (Amcorp) started its pioneer RE project in the SREP scheme where Tenaga Nasional Berhad (TNB) would purchase the RE generated at a fixed tariff of RM0.167/kWh for a concession period of 21 year. Then in 2011, SREP migrated to the Feed-in Tariff (FiT) scheme with the formation of Sustainable Energy Development Authority (SEDA) Malaysia, which saw the tariff increased to RM0.24/kWh. This had accelerated the growth of small hydro power sector in Malaysia. To date, there are about 53 hydro plants with a combined capacity of 589MW that have been awarded under SEDA Malaysia's FiT scheme.

With the transition from SREP to FiT scheme resulting in the increased tariff, Amcorp had undertook a few RE expansion including upgrading its 4MW mini hydro power plant in Bentong, Pahang by an additional 2MW to 6.6MW and a 20MW mini hydro power plant in Raub, Pahang.

Amcorp is a wholly-owned subsidiary of Amcorp Properties Berhad (Amprop) which is a privately owned company incorporated and domiciled in Malaysia. Amcorp's pioneer RE project was in 2009 and had accumulated a RE installed capacity of 36MW in small hydropower and solar power plants.

1. *Amcorp Liang 20MW Mini-Hydro Power Plant, Raub, Pahang.*
2. *Upper Power House Francis Turbine at Amcorp Liang 20MW Mini-Hydro Power Plant, Raub, Pahang.*
3. *A discussion with SEDA Malaysia's staff in progress during Lower Liang IOD on 28th September 2018.*

ACHIEVEMENTS IN SMALL HYDRO SECTOR

Amcorp Perting 6.6MW Mini-Hydro Power Plant

In December 2009, Amcorp successfully commissioned one of the first mini-hydro power plants in the country under the SREP initiated by the Malaysian Government. Amcorp is the developer and operator of the 4MW RE power plant located in Perting River, Pahang, Malaysia. It has a 21-year concession agreement to supply electricity to TNB.

The 4MW Sungai Perting Mini Hydro Power Station was selected as winner for the "On-Grid" category at the ASEAN Energy Awards 2012, Silver Award of Merit for Category 4 - RE at the Engineering Award 2013 and Merit Award for Category 2 - National Grid at the National Energy Awards (NEA) 2019. In April 2015, the 4MW hydro power plant was successfully upgraded to 6.6MW.

Amcorp Liang 20MW Mini-Hydro Power Plant

Amcorp Liang 20MW Mini-Hydro Power Plant is located in Raub, in the state of Pahang, Malaysia. This project is segregated into two schemes at Sungai Liang, Raub where 10MW hydro power plant is located upstream or Upper Scheme and another 10MW hydro power plant is located downstream of the river or Lower Scheme with a combined generation estimated at 85GWh a year.

The 20MW Sungai Liang Mini Hydro Power Station was selected as winner in the "On-Grid" category in the ASEAN Energy Awards 2020 and first runner up in "On-Grid (National Grid)" category in the National Energy Awards 2020.

1. *Amcorp noted that the small hydro sector has grown exponentially since the implementation of FiT scheme under SEDA Malaysia.*
2. *Power Intake at Amcorp Perting 6.6MW Mini Hydro Power Plant.*
3. *Amcorp's Sungai Perting Mini Hydro Power Station has received numerous recognitions including the Engineering Award 2012 and NEA 2019.*
4. *Through FiT, Amcorp has undertaken a few RE expansion including upgrading its 4MW mini hydro power plant to 6.6MW, and a 20MW mini hydro plant in Raub, Pahang.*

SAVE 2.0

SAVE 2.0
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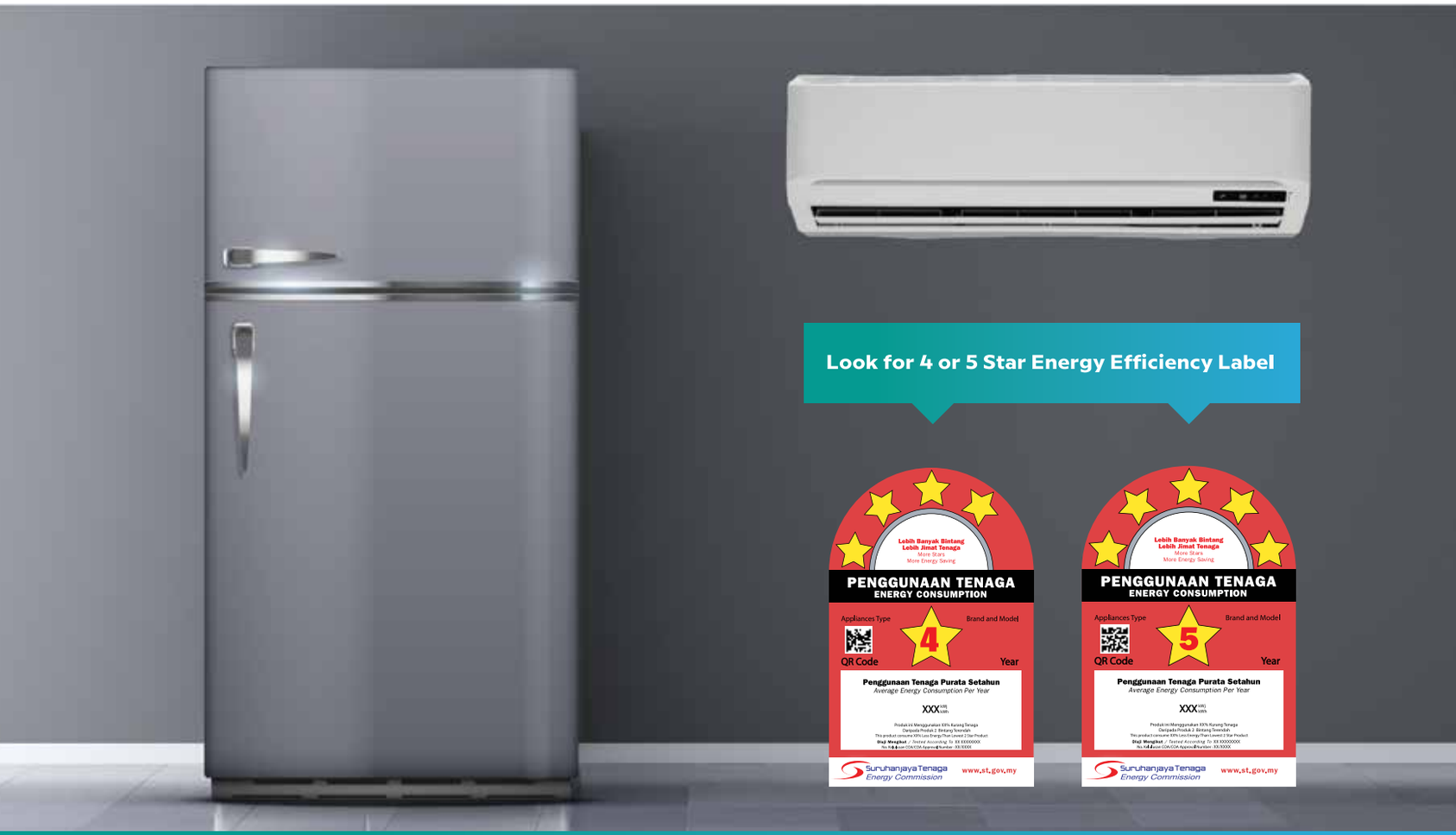

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Shopee

PGMALL

Solar, as a renewable energy (RE) resource, has great potential in Malaysia. Given our prime location close to the Equatorial line as well as the hot and humid climate we are blessed with all year round, it is only logical in the business sense, that we continue to nurture the solar photovoltaic (PV) industry as one of the RE resources in the country.

Malaysia's solar PV industry has shown strong growth in recent years, even more so with the implementation of the Net Energy Metering (NEM) 3.0 programme. NEM 3.0 was launched on 29th December 2020 following the overwhelming response received from the previous version of the programme, and to provide more opportunities for building owners to install a solar PV system on the rooftop of their premises to save on their monthly electricity bill.

The NEM 3.0 programme offers a fresh 500MW quota and it will be carried out in phases starting from 1st February 2021 until 31st December 2023. While the previous NEM 2.0 was divided into four categories: Residential, Commercial, Industrial and Agriculture, NEM 3.0 is categorised into three programmes:

NEM 3.0 SHINES BRIGHTER LIGHT ON SOLAR GROWTH

The NEM 3.0 programme offers a fresh 500MW quota and it will be carried out in phases starting from 1st February 2021 until 31st December 2023.

- **NEM Rakyat** is applicable for residential users who have installed a solar PV system on the rooftop of their homes whereby they can enjoy an offset rate of "one-to-one" from the prevailing gazetted tariff for a period of 10 years, after which they will practice the concept of self-consumption. Each applicant is entitled to a maximum capacity of 4kWac for Single Phase power supply units and 10kWac for Three Phase power supply units. About 10,000 to 25,000 TNB domestic account holders or households in Peninsular Malaysia are expected to benefit from this programme.

- **NEM Government Ministries and Entities (GoMEn)** is applicable for government premises with installed solar PV systems. This programme offers similar offset rate of "one-to-one" under commercial tariff for a period of 10 years, after which they will practice the concept of self-consumption. Each applicant is entitled to a maximum capacity of 1MWac. About 100 government buildings in Peninsular Malaysia are expected to enjoy a reduction in electricity bills amounting to RM6 million a month.

- **Net Offset Virtual Aggregation (NOVA)** is applicable for commercial, industrial, agriculture and mining establishments, whereby the excess energy generated from their solar PV system can be exported to the national grid to offset their electricity bills based on the Average System Marginal Price (SMP), or distributed to the wholly-owned subsidiary companies (up to three companies). Each applicant is entitled to a maximum capacity of 1MWac (Nett offset) and 5MWac (Nett offset and Virtual Aggregation).

The promotion for the NEM 3.0 started as early as 31st January 2021 through social media posting to build up on the programme's official launch in February. The post, which was posted on SEDA Malaysia's Facebook, did well whereby it received 87 likes and 39 shares, with 4,451 reach.

In addition to social media postings, various promotions via TV Interviews, Magazine, Online Ads, and Newspaper were also carried out to further promote NEM 3.0 and to ensure the Government's green energy agenda is delivered to the public.

More promotions are in the pipeline, including radio ads and appointing local celebrity influencer as NEM 3.0 ambassador to spread more awareness about the programme.

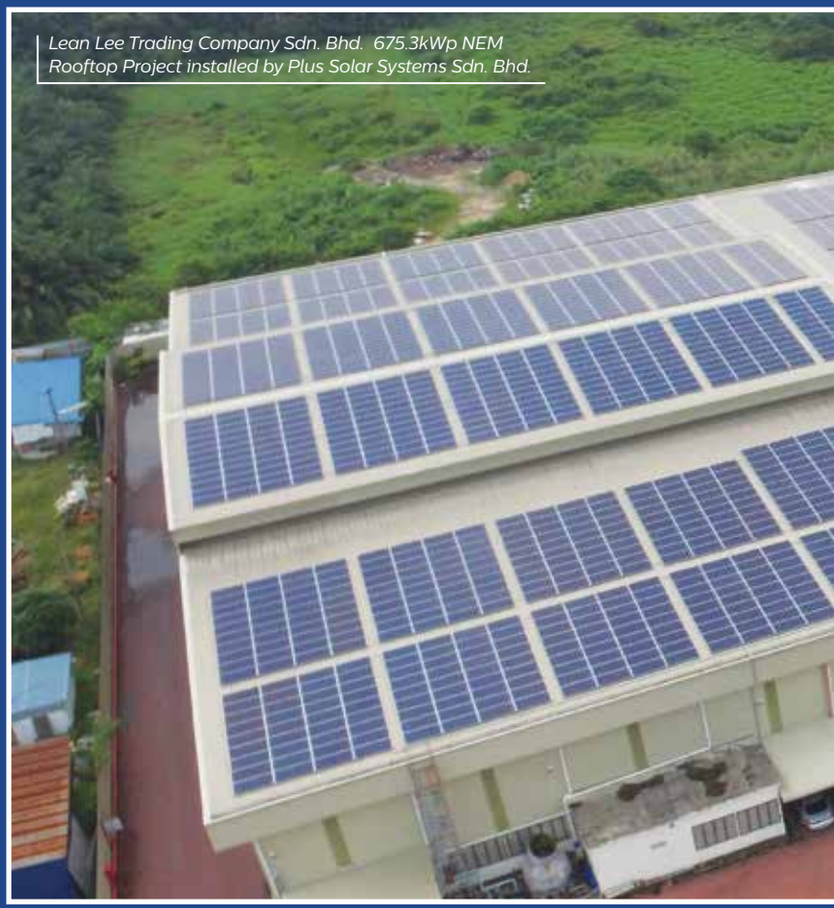
The strong promotion efforts by SEDA Malaysia, coupled with the success of the previous NEM programme, kickstarted NEM 3.0 to an encouraging result. As of November 2021, 4,523 applications with total capacity of 284.91MW have been approved across the three initiatives. NOVA received an astounding response as 1,522 applications were approved representing total capacity of 249.058MW from the 300MW quota allocated. Meanwhile, 2,904 applications representing total capacity of 19.981MW were approved for NEM Rakyat while 97 applications representing total capacity of 15.872MW were approved for NEM GoMEN. Overall, 284.91MW of total capacity has been approved for NEM 3.0.

The social media posting promoting the additional 300MW quota for NOVA

Social Media As of 15th September 2021		Impression **63k**
TV Interview As of 30th November 2021		Impression **1.3m**
Magazine As of 30th November 2021		Total Circulation **324k** Total Readership **1.1m**
Online Ads As of 30th November 2021		Impression **1.0m**
Newspaper As of 30th November 2021		Total Circulation **29k** Total Readership **120k**
Radio Ads As of 31st December 2021		Unique listenership **2.1m**

On 22nd October 2021, the Ministry of Energy and Natural Resources (KeTSA) announced that the Government has allocated an additional 300MW quota under the NOVA programme, which can be applied through SEDA Malaysia's eNEM system starting from 15th November 2021. The additional NOVA quota is expected to benefit over 300 commercial and industrial customers, while creating new business opportunities for over 100 local solar players. The decision made by the Government will not only increase solar capacity within the national grid system, but also contributes towards Malaysia's post-COVID-19 pandemic recovery by generating an estimated investment value of RM1.2 billion and providing 3,600 job opportunities for the Rakyat.

On 22nd October 2021, the Ministry of Energy and Natural Resources (KeTSA) announced that the Government has allocated an additional 300MW quota under the NOVA programme.



Lean Lee Trading Company Sdn. Bhd. 675.3kWp NEM Rooftop Project installed by Plus Solar Systems Sdn. Bhd.

SEDA Malaysia also saw an increase of Registered PV Service Providers (RPVSP) and Registered Solar PV Investor (RPVI) in its PV Industry Directories. Currently, there are 195 RPVSPs and 211 RPVIs in the country.

The NEM 3.0 also carries the Behind-the-Meter (BTM) schemes introduced in the previous version of the programme, which are:

- Solar Leasing whereby eligible customers will pay a fixed amount monthly in return for the use of the solar PV solar system and the system will be owned by them after the leasing period ends;
- Solar Power Purchase Agreement (PPA) whereby eligible customers will pay based on per kWh for energy generated from the solar PV system; and,
- Supply Agreement for Renewable Energy (SARE), which is a tripartite agreement between an investor and/or asset owner, a billing agent (TNB) and the customer. Through SARE, eligible customers from the commercial and industrial sectors can enjoy zero upfront cost when installing a solar PV system at their premises, immediate electricity cost savings as well as zero maintenance work including monitoring and repairing during contract period.

The NEM programme was first introduced on 1st November 2016 with SEDA Malaysia as the implementing agency. NEM is designed to complement the Feed-in Tariff (FiT) scheme to encourage the deployment of renewable energy (RE) as outlined in the Eleventh Malaysia Plan 2016-2020. The concept of NEM is that energy produced from the solar PV installation will be consumed first by the building owners, and any excess will be exported to the Distribution Licensees at the prevailing displaced cost rate as prescribed by the Energy Commission (EC).

The first NEM programme performed fairly throughout its deployment from 2016 until 2018. Be that as it may, a new version of the programme was launched on 1st January 2019. Taking into account the hiccups faced during the first-ever NEM, NEM 2.0 saw a change in the programme's mechanism whereby the surplus solar-generated energy can now be exported back to the grid on a one-on-one offset basis. Supporting services like the NEM Calculator, RPVSP and RPVI Directories were also introduced to further promote NEM 2.0. Additionally, SEDA Malaysia had carried out numerous promotional and awareness campaigns to increase uptake of the quota allocated for the programme.

The revision on the programme's mechanism as well as the promotional efforts by SEDA Malaysia have indeed paid off as more NEM applications began pouring in. There were 1,252 applications representing 102.41MW of the total capacity approved in 2019, bringing the cumulative approved capacity of NEM to 130.21MW. The response for NEM 2.0 that year alone saw an increase of nearly 3.68 times the total capacity approved from 2016 to 2018. This has led to a sharp increase in the installed capacity from 103.22MW in 2019 to 295.85MW in September 2020. The 500MW quota allocated for NEM 2.0 was fully subscribed way ahead of its closing date, which was end of 2020.

Solar has the biggest advantage to grow to even greater heights as the main RE resource in Malaysia. The country's urban landscape will continue to change as we prosper; new buildings are erected everyday and thus, there will be more potential sites for solar PV installations. The progress made so far is just the beginning. SEDA Malaysia believes that government agencies, businesses and the Rakyat should partake in NEM as the rewarding programme is packaged to deliver a greener future for all, and subsequently everyone can play an active role in realising the country's sustainable energy agenda.

AMBITION TO ACTION:

THE KINGDOM OF THAILAND GEARS UP TOWARDS 'CARBON NEUTRALITY'

By Royal Thai Embassy, Kuala Lumpur

All photos courtesy of Ministry of Energy, Thailand

His Excellency Chainarong Keratiyutwong, Ambassador of Thailand to Malaysia.

Energy security has long been a top priority for the Kingdom of Thailand. Over the past four decades, Thailand relied heavily on imported fuels to meet more than half of its energy demand. It reached a record high of 90% dependence in the 1970s before the discovery and extraction of indigenous oil and natural gas resources, while expenditure on energy imports peaked 21% of the country's GDP in 2008 attributed to the oil and price surge[1]. These statistics have decreased significantly in recent years as Thailand began diversifying its energy mix while maximising the use of domestic energy resources, especially renewables.

Present-day Thailand has been recognised as a frontrunner in ASEAN in promoting alternative energy development via government policies and investment incentives. Thailand's current renewable energy (RE) installed capacity is around 11 gigawatts (GW), approximately 22% of the total installed capacity (49GW), which is generated by Electricity Generating Authority of Thailand (EGAT), independent power producers (IPPs), small power producers (SPPs), very small power producers (VSPPs), and imports.

In a recent interview, His Excellency Chainarong Keratiyutwong, Ambassador of Thailand to Malaysia explained that due to the continuing growth in energy demand and depleting natural gas reserves, Thailand has been focusing on RE as means to increase its electricity generation capacity, in addition to power plant construction and power purchases from IPPs.

Keratiyutwong mentioned that in 2019, the National Science and Technology Development Agency (NSTDA) of Thailand and the ASEAN Centre for Energy (ACE) have signed a Memorandum of Understanding (MoU) to support higher utilization of bioenergy, human resource capacity development, and efforts in the establishment of an ASEAN Bioenergy Research and Development (R&D) Network Centre in the region.

1. IRENA (2017), Renewable Energy Outlook: Thailand, International Renewable Energy Agency, Abu Dhabi.

The Thai Ambassador then shared that he looks forward to the early commencement of the Lao PDR-Thailand-Malaysia-Singapore Power Integration Project (LTMS-PIP) in 2022. This will follow the first Lao PDR-Thailand-Malaysia (LTM)-PIP, which was implemented in January 2018 and seen as a pathfinder to complement existing efforts towards realizing the ASEAN Power Grid (APG) and the ASEAN Economic Community (AEC), by creating opportunities for electricity trading beyond neighbouring borders.

"LTMS-PIP will contribute greatly towards energy security by strengthening the power integration network and enhancing the economic prosperity of the region. The project is also expected to help identify and resolve issues affecting cross-border electricity trading in ASEAN," Keratiyutwong elaborated.

Aside from LTMS-PIP, Keratiyutwong noted there is potential cooperation between Thailand and Malaysia, particularly in the production of biofuel from palm oil that is abundant and of which industries have long been established in both countries.

"Thailand has an ambition of becoming a 'carbon neutrality' country by the year of 2050, as recently announced by the Thai Government at the 2021 United Nations Climate Change Conference (COP26) in Glasgow, Scotland," said Keratiyutwong before adding that "by forecast, Thailand's carbon emissions would reach its peak in 2030 before sliding down towards the country's intended zero-carbon goal."

The Thai Ambassador then provided insights on the Alternative Energy Development Plan 2018 (2018-2037), revised and approved by the National Energy Policy Council in January 2019, which outlines Thailand's future energy strategy as well as reflecting on the country's continuous efforts and progress in the adoption of RE.

"Under the AEDP 2018 (2018-2037), Thailand targets to increase the proportion of RE (including solar, wind, biomass, biofuel, hydro, and waste-to-energy) from the current 16% to 30% of total final energy consumption in the forms of electricity, heat and biofuels by 2037," said Keratiyutwong.

Figure 1: Thailand's Performance on Alternative Energy Policy (October 2017 – August 2021)

Target Year 2037	Performance				unit	Alternative Energy
	2018 (Oct 2017 - Sep 2018)	2019 (Oct 2018 - Sep 2019)	2020 (Oct 2019 - Sep 2020)	2021 (Oct 2020 - Aug 2021)		
29,411	**10,783.00**	**11,840.83**	**11,969.26**	**12,320.99**	**MW**	**Electricity[1/2/]**
7,298	**2,824**	**3,194**	**2,903**	**2,895**	**ktoe**	
5.75	**3.39**	**3.71**	**3.65**	**4.38**	**%**	**Percentage of Final Energy Consumption**
12,139	2,715.21	2,982.43	2,979.30	2,982.28	MW	1. Solar Energy[3/]
2,725	-	-	-	-	MW	2. Solar Powered Buoys
5,790	3,266.98	3,400.24	3,501.18	3,763.77	MW	3. Biomass[3/]
2,989	927.82	1,506.82	1,506.73	1,546.32	MW	4. Wind Energy
1,565	500.15	528.92	547.26	569.79	MW	5. Biogas[4/]
900	273.40	314.67	324.44	348.48	MW	6. MSW
75	-	-	-	-	MW	7. Industrial Waste
308	187.72	187.79	190.39	190.39	MW	8. Small Hydro Power[5/]
2,920	2,911.41	2,919.66	2,919.66	2,919.66	MW	9. Large Hydro Power[6/]
-	0.30	0.30	0.30	0.30	MW	10. Other Alternative Energy (Geothermal Power)
26,901	**7,712**	**8,719**	**6,717**	**4,827**	**ktoe**	**Heat**
21.20	**9.26**	**10.14**	**8.45**	**7.30**	**%**	**Percentage of Final Energy Consumption**
100	9.98	10.11	10.57	9.92	ktoe	1. Solar Energy[7/]
23,000	6,958	7,961	5,903	4,067	ktoe	2. Biomass
1,283	634	634	687	630	ktoe	3. Biogas
495	110	114	116	120	ktoe	4. MSW
2,023	-	-	-	-	ktoe	5. Bio Methane
4,085	**2,085**	**2,287**	**2,377**	**2,039**	**ktoe**	**Biofuels**
3.22	**2.50**	**2.66**	**2.99**	**3.08**	**%**	**Percentage of Final Energy Consumption**
7.50	4.10	4.41	4.10	3.78	million litre/ day	1. Ethanol
8.00	4.20	4.66	5.11	4.82	million litre/ day	2. Biodiesel
0.53	-	-	-	-	million litre/ day	3 Pyrolysis oil
38,284	**12,621**	**14,200**	**11,997**	**9,761**	**Alternative Energy Consumption (ktoe)**	
126,867	**83,327**	**86,026**	**79,519**	**66,098**	**Final Energy Consumption (ktoe)**	
30	**15.15**	**16.51**	**15.09**	**14.77**	**Percentage of Alternative Energy Consumption (%)**	

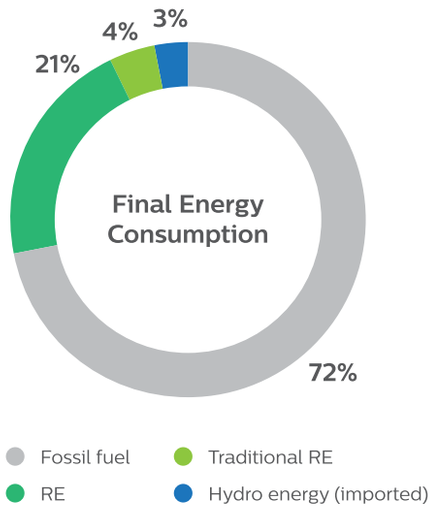
Sources : EGAT, MEA, PEA, ERC, DEDE, and DOEB

Notes :
1/ Including off grid power generation.
2/ Including on grid power generation with capacity ≤ 1 MW & ≥ 1 MW.
3/ Including the community power plants.
4/ Including waste water / waste dumping and energy crops.
5/ Including hydro power plants ≤ 12 MW & hydro power plant using the water downstream.
6/ The existing installed capacity.
7/ Based on M2 installed from solar collector.

As of 31st August 2021
Source: Department of Alternative Energy Development and Efficiency

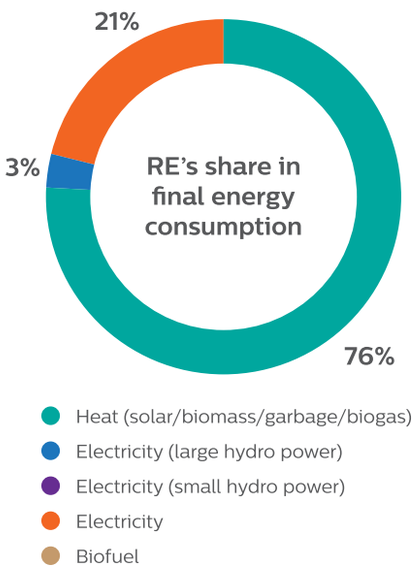
He also revealed that during the first quarter of 2021, Thailand's proportion of RE accounts for 20.95% or approximately 4,115ktoe of final energy consumption, as illustrated in Figure 2 and Figure 3 below.

Figure 2: Thailand's final energy consumption during Q1 2021



Source: Department of Alternative Energy Development and Efficiency, July 2021

Figure 3: Thailand's share of RE in final energy consumption during Q1 2021



Source: Department of Alternative Energy Development and Efficiency, July 2021

According to Keratiyutwong, the Department of Alternative Energy Development and Efficiency (DEDE) under Thailand's Ministry of Energy is responsible for the promotion of renewable and alternative energy, energy conservation, as well as spearheading the implementation of the AEDP 2018 (2018-2037). Since its inception, DEDE and its partners have undertaken various initiatives that greatly contributed towards the growth of RE in Thailand.

In terms of solar, Keratiyutwong explained: "The Thai Government realizes the high potential of solar energy as the country's main source of electricity and heat, and it aims to generate 12,139MW of electricity and 100ktoe of heat from solar energy by 2037. To achieve this target, the Government has introduced measures to purchase solar-generated electricity from numerous sources such as the general households (excess solar), academic institutions and hospitals (rooftop solar), in addition to that generated by Electricity Generating Authority of Thailand – EGAT (solar floating)".

Thailand also has total installed capacity of 3,110.05MW in hydropower, of which 2,919.66MW are from large hydropower plants and 190.39MW from small hydropower plants. "We have 127 hydropower projects with combined total installed capacity of 67.55MW. These include 23 small hydropower plant projects (61.71MW), and 104 very small hydropower plant projects (5.84MW) located at the village and community areas and national parks, which are operated by DEDE," said Keratiyutwong.

For seamless operation, in addition to addressing delay and inaccuracy issues in reporting the electricity generation and distribution, which have been communicated via paper and phone calls, DEDE is currently planning to bring new system and technology such as Distributed Control System (DCS) and Supervisory Control and Data Acquisition (SCADA) to compile, report and share data among its centres all over the country.

The development of biofuel in Thailand started as early as 1985 with the goal to reduce the country's reliance on imported crude oil and to promote more sustainable, locally produced energy. Through studies conducted to determine the potential of biofuel, it is discovered that ethanol produced from molasses, sugar cane bagasse and cassava pulp, and biodiesel – E10(91), E10(95), E20, E85, B10 and B20 – produced from palm oil are the most promising sources to generate biofuel.

"To date, Thailand has succeeded in increasing its generation of biofuel blended with gasoline at a maximum level of 85% (by volume) for gasoline engines, and about 20% (by volume) for diesel engines," said Keratiyutwong.

In an effort adjust its biofuel development strategy, the Ministry of Energy of Thailand has launched a campaign to encourage car users to switch to E20 biofuel

"In terms of production capacity, we are currently able to produce 5.97 million litres of ethanol and 8.53 million litres of biodiesel daily, from 26 and 13 factories, respectively. It is expected that with this progress, the production of ethanol and biodiesel will reach their respective target of 7.50 and 8.00 million litres daily by 2037 as outlined in the AEDP 2018."

With regard to biomass, Keratiyutwong highlighted that from 2015 to 2018, DEDE has provided financial and technical support for 10 selected community enterprises in the North East of Thailand to establish pioneer Distributed Green Generation (DGG) stations that will generate biomass from chopped wood. "Within the first six months of operations, the participating community enterprises and suppliers of materials have managed to earn on average THB806,476 and THB1,344 monthly, respectively," he said.

Keratiyutwong also shared two notable achievements in 2018, the first being the launch of Thailand's first peer-to-peer (P2P) solar-generated electricity trading pilot project using a blockchain platform through a partnership between Power Ledge (Australian blockchain company), BCPG (a Thai RE business) and EGAT. This blockchain platform is intended to minimise transfer costs as excess RE is sold directly within the community (without state utilities) while providing real-time power supply. Later that year, the Asian Development Bank (ADB) has invested in Thailand's first green bonds worth US$155 million, issued by B. Grimm, one of Thailand's leading private power producers, which will provide financial support for RE projects in the country.

When commenting on the challenges brought on by COVID-19, the Thai Ambassador shared that the pandemic had greatly impacted the country's overall domestic consumption.

"The Bank of Thailand's economic report for the first quarter of 2021 indicated a drastic decline in the final energy consumption across all economic sectors. These include agriculture (-10.5%), industry (-11.4%), residential sources (-13.6%), commercial sources (-8.1%), and transport (-13.4%), as compared to those of the preceding year (y-o-y)," said Keratiyutwong.

It should be noted that Thailand's industrial sector accounts for 41.3% of the final energy consumption, followed by transport (36.2%), housing and accommodation (11.7%), businesses (7.8%) and agriculture (3%) sectors.

Despite the slight drop in the overall domestic consumption, following disruptions in domestic travels and transport of goods, Keratiyutwong said the level of biofuel consumption remained relatively constant. The average consumption of ethanol stood at 3.95 million litres/day while biodiesel stood at 5.07 million litres/day in the first quarter of 2021, reflecting a small decline from the first quarter of 2020 (3.66% and 0.78%, respectively).

1. *From October 2020 to August 2021, Thailand has generated 1,546.32MW of wind energy.*
2. *The Thai Government has carried out numerous pilot projects involving community participation in power generation.*

"As a result, the Ministry of Energy is now faced with the challenge of adjusting its biofuel development strategy according to the current circumstances in order to attain the specified goals. The solutions considered to address this challenge include the use of price mechanism as an incentive for biofuel users, increasing biofuel blend ratio, discontinuing the use of E10 biofuel with an octane rating of 91 while maintaining the use of E10 biofuel with an octane rating of 95 as an encouragement for car users to switch to E20 biofuel instead," he elaborated.

"The pandemic also triggered other issues such as a delay in the manufacturing of RE-generating equipment and machinery like solar panels and inverters due to disrupted supply chain and closure of factories. Fortunately, the Thai Government's initiatives in RE development, namely the Community Power Plant for Local Economy Programme can be sustained despite the pandemic," added Keratiyutwong.

Moving forward, Thailand's energy industry is now leading towards "prosumers" where the electricity users can be consumers, producers and sellers of electricity, and other energy sources at the same time.

"This is in line with the Ministry of Energy's "Energy for All" scheme under the Power Development Plan (PDP) (2018 Revision 1) and AEDP 2018 (2018-2037). The scheme's ultimate goal is to generate additional income and employment for the local communities, especially those in the remote areas,

Thailand has been recognised as a frontrunner in ASEAN in promoting alternative energy development via government policies and investment incentives.

which consequently help boost the growth of Community Power Plant for Local Economy Programme in Thailand," said Keratiyutwong.

In March 2021, the Thai Government has announced the guidelines and related regulations for the pilot projects carried out throughout the year, with an emphasis on community participation in power generation and the return of benefits to the community itself. Keratiyutwong elaborated that "one of the criteria is that the power generators/sellers of these pilot projects must be in a form of a joint venture, whereby 90% of shares will be owned by VSPP (very small power producer) while the remaining 10% belongs to either community enterprises or network of the community enterprises. Proof of the contract farming as a guarantee of fuel purchase price is also mandatory."

In preparation of energy transition, the Thai Government through the Ministry of Energy has established the 4D and 1E policies to help boost the country's economic recovery, which are:

- **Digitalisation** by developing smart grid, energy storage and building stability for community power plants and large power plants;
- **Decarbonization** by promoting RE - generation and consumption - of solar energy, biomass, and et cetera;
- **Decentralisation** by supporting power distribution via the grid and outside of the grid as well as building electricity balance across the country;
- **Deregulation** by promoting energy related start-ups, revising regulations related to Energy Conservation and Promotion Fund to support local communities' energy businesses; and,
- **Electrification** by expanding the electric vehicle network and electric vehicles (EV).

"The Thai Government has now adopted the Bio-Circular-Green (BCG) Economy Model as part of the national agenda to 'build-back-better' and greener Thailand towards a more sustainable and inclusive future," said Keratiyutwong.

Keratiyutwong reiterated that a government plays a crucial role in the society's transition to RE, especially in regard to continuously raise awareness, provide favourable policies and incentives in support of RE development and investment by the public and private entities alike.

"The BCG Model applies a whole-of-society approach and aims to adopt advanced technologies and innovations throughout the supply chains to boost the country's competitiveness while enhancing resource efficiency, transforming waste into wealth, reintegrating biodiversity, and mitigating environmental impacts."

Apart from the pandemic, the Thai Ambassador believes that the increasingly severe consequences of climate change and its impacts across the globe called for greener and more resilient societies, and ways of doing business.

"To this end, the role of RE is becoming increasingly paramount as the world's population grows, and hence energy demand and consumption will continue to rise. We should urge everyone to be onboard and work together in reducing our carbon footprint to stop global warming," said Keratiyutwong.

Keratiyutwong reiterated that a government plays a crucial role in the society's transition to RE, especially in regard to continuously raise awareness, provide favourable policies and incentives in support of RE development and investment by the public and private entities alike.

"In addition, regional and global cooperation including public-private-partnership (PPP) in the sharing of best practices, know-how and advanced technologies will significantly help facilitate this transition."

In recent years, Thailand has been diversifying its energy mix while maximising the use of domestic energy resources, especially renewables.

PVMS
PV MONITORING SYSTEM

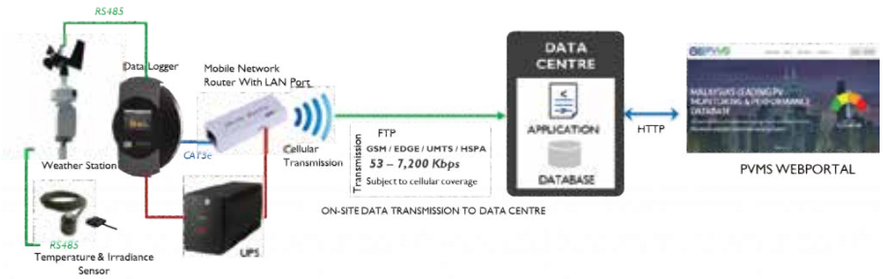
MALAYSIA'S LEADING PV MONITORING & PERFORMANCE DATABASE

UP-TO-DATE INFORMATION, REAL-TIME MONITORING AND REPORTS ON SOLAR PHOTOVOLTAIC (PV) IN MALAYSIA. HARNESS AND ENERGISE TOMORROW'S ENERGY, TODAY.

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

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

THE PVMS SYSTEM ARCHITECTURE



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THE VOICES OF MALAYSIA'S FUTURE GENERATIONS

According to the United Nations estimates, as of December 2021, the current world population is 7.9 billion. And from this statistic, about 1.8 billion or 22.78% are young people between the ages of 10 to 24 years old – the largest generation of youth in history – some of whom have made a strong presence in the fight against climate change.

Greta Thunberg, Sophia Kianni, Lesein Mutunkei, Xiuhtezcatl Martinez, Hanna Herbst, Jackson Hinkle, and John Paul Jose, are some of the outspoken youth activists of today. These outstanding youths have been actively involved in advocating for climate action by leading numerous projects that promotes sustainability within their respective communities, finding greener energy solutions, among other efforts, which contribute to the global efforts in reducing greenhouse gas (GHG) emissions and provide better protection for the environment.

Realising the impact of youth in advocating for sustainable energy and climate action, SEDA Malaysia has initiated several programmes to educate today's youth on the importance of sustainable energy for future generations of Malaysia.

The programmes are aligned with one of the tasks mandated to SEDA Malaysia under the five strategic thrusts of NREPAP; to develop an action plan to create greater acceptance and participation by the general public and private sector towards the sustainable energy programmes administered by the Authority.

What better way to instil sustainable practices and environmental responsibility than from young?

1

2

SEDA SEED PROGRAMME 2021 STUDENT AMBASSADORS

The Sustainable Energy E-Leaning Development (SEDA SEED) was introduced in 2020 as a dedicated online Sustainable Energy (SE) educational digital programme with a combination of educational video series, quizzes, mini RE seminars with students as Speakers and tutorial sessions on RE projects. SEDA SEED programme was organized by SEDA Malaysia, in association with Malaysian Association of Creativity & Innovation (MACRI) and STEM 4 All Makerspace Malaysia.

For the year 2020, SEDA Malaysia has combined both SEDA SEED 2020 activities together with the National Science Week (NSW) activities with the objectives:

- To create greater awareness of the importance of SE among the younger generation and public;
- To engage teachers and parents in promoting SE initiatives and help inspire students to create Science, Technology, Engineering, Mathematics (STEM) Projects during the COVID-19 pandemic period; and
- To collaborate with relevant NGOs and small enterprises involved in providing STEM educational programmes.

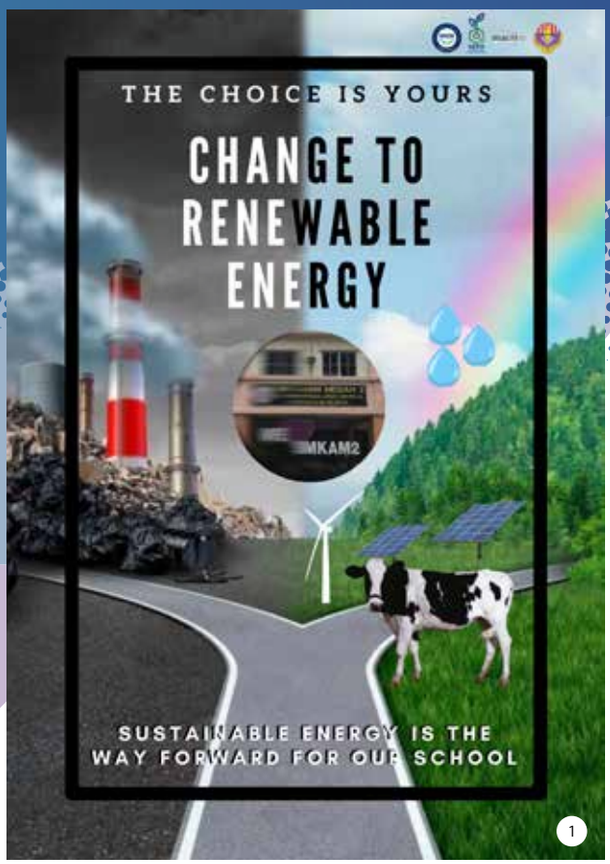
1. The first place winner of the first assignment for the SEDA SEED Student Ambassador programme - SMK (P) Taman Petaling.

The SEDA SEED programme is continued in year 2021 with the aim to reach out to more students on the importance of SE, grooming and empowering them to advocate SE within their schools, communities and public.

For this year's edition of SEDA SEED, SEDA Malaysia has appointed 24 students from 12 secondary schools from Central Region Kuala Lumpur, Putrajaya, Cyberjaya and Selangor as SEDA SEED Student Ambassadors. These SEDA SEED Student Ambassadors will represent SEDA Malaysia and create greater awareness on SE in their schools and among the peers.

The participating schools are:

- SMK Raja Mahadi Klang.
- SMK (P) Taman Petaling.
- SMK Seri Bukit Bintang Utara.
- SMK Alam Megah 2.
- Sekolah Agama Menengah Bandar Baru Salak Tinggi.
- SMK Convent Peel Road.
- SMK USJ4.
- SMK Bandar Sg. Buloh.
- SMK Pulau Indah.
- Sekolah Berasrama Penuh Integrasi Gombak (INTEGOMB).
- SM Sains Alam Shah.
- Sekolah Integrasi Seri Puteri.



The programme will be carried out from end of August until 31st December 2021, during which the SEDA SEED Student Ambassadors are tasked to:

- Participate in webinars, quizzes, and workshops to understand the importance of SE and the role of SEDA Malaysia.
- Participate in monthly online meetings and sharing sessions by SEDA Malaysia officials and SE experts.
- Promote awareness of SE within the school & public by getting more students involved.
- Promote SEDA Malaysia's SE awareness initiatives via their own social media platforms.
- Present a report on their learning outcome and role as SEDA SEED Student Ambassador.
- Develop a proposal for SE programmes or projects for their respective schools.

In addition to receiving a Certificate of Appointment as SEDA SEED Student Ambassadors, the selected students also stand a chance to win numerous prizes for their contributions including a cash prize for best proposal for Sustainable Energy Project for their school. The cash prize will then be used to develop the proposed SE project.

The first assignment for the SEDA SEED Student Ambassadors was held from 1st to 14th October 2021. The Ambassadors were tasked to create a poster for digital media content with the theme 'Sustainable Energy is The Way Forward for Our School'. Each of the 12 participating schools submitted an artwork where they were required to present and explain the posters to the panel of judges.

SMK (P) Taman Petaling won first place with their design, followed by SMK Alam Megah 2, and SMK Pulau Indah, Port Klang.

The SEDA SEED Ambassadors will have to complete a total of three assignments before the programme concludes in December 2021. These are:

Assignment I : Create digital media contents;

Assignment II : Create a social media campaign; and

Assignment III : Propose an idea for Sustainable Energy Project for their school.

The SEDA SEED Student Ambassadors serves as a pilot programme under SEDA Malaysia's corporate social responsibility (CSR) activities for 2021. The programme will be reviewed and further enhanced for potential nationwide implementation in year 2022.

1. Second Place -SMK Alam Megah 2.
2. Third Place - SMK Pulau Indah, Port Klang.

THE SUSTAINABLE ENERGY AWARENESS POSTER AND SHORT VIDEO CHALLENGE

The Sustainable Energy Awareness Poster and Short Video Challenge is a collaboration programme between SEDA Malaysia and Multimedia University (MMU), which was launched on 18th September 2021 in conjunction with the Authority's 10th anniversary celebration. The programme aims to increase the awareness of SE amongst the young generation and the public while providing a platform for participants to channel their creativity in delivering the intended messages.

Chairman of SEDA Malaysia YB. Tuan Lukanisman Awang Sauni in his opening remark stated: "I hope this session will help to spark interest among young participants who will be our future leaders to venture in the area of sustainable energy."

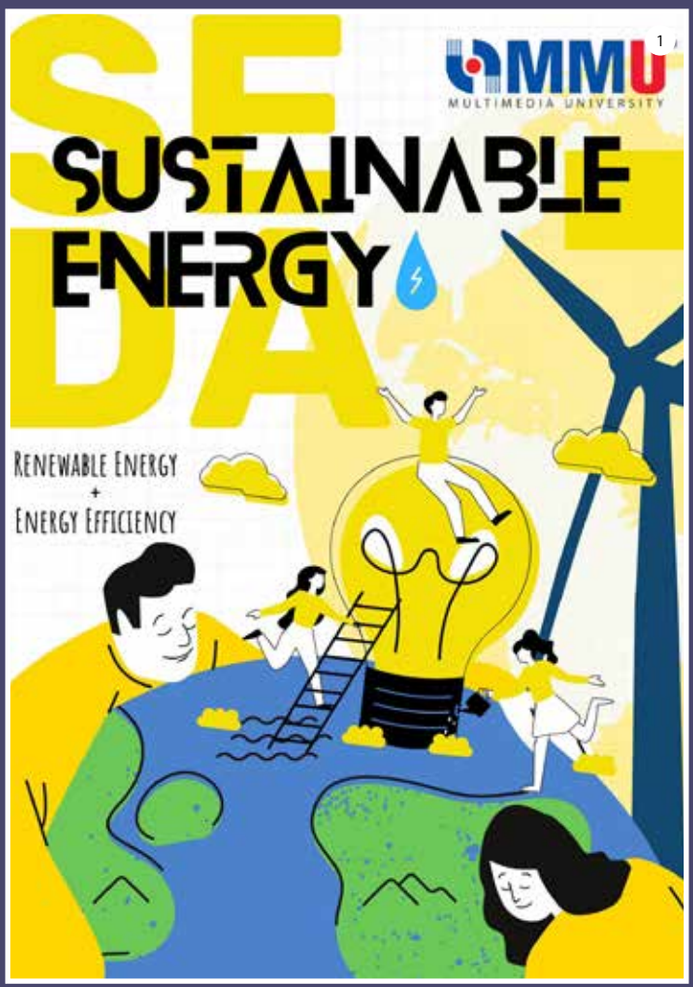
The programme also included four online workshops conducted on 25th and 26th September 2021 to provide additional know-how on poster-making and video production. In-depth information on sustainable energy was also shared by SEDA Malaysia's representatives during the workshops to increase the participants' awareness and understanding of SE.

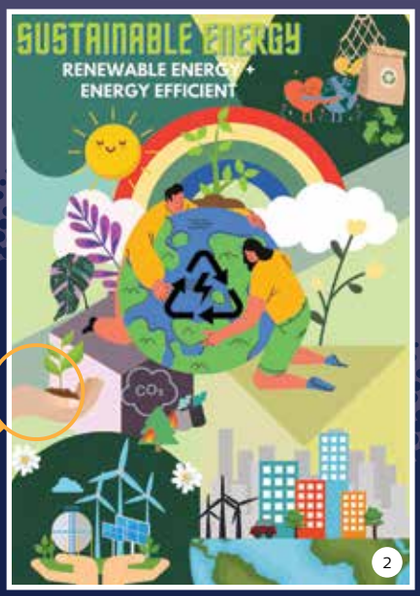
The Sustainable Energy Awareness Poster and Short Video Challenge garnered overwhelming responses as it received nearly 300 entries across three categories – primary school, high school, and higher education institution. The submissions were filtered through two rounds of judging, the first by the technical trainers involved in the online workshops and the second by industry experts and experts from MMU's Faculty of Creative Multimedia. 60 winners are selected to win cash prizes sponsored by SEDA Malaysia.

The participants also had the opportunity to compete in the Popularity Awards by uploading their entries on various social media platforms with the hashtags #sedamalaysia, #mmumalaysia, and #sedammuchallenge2021 to gain as many 'LIKE' and 'SHARE' as possible while creating awareness on the importance of SE.

Another special category, Most Entries Awards, is also offered for the primary school, high school and higher education institution with the most submissions.

The Sustainable Energy Awareness Poster and Short Video Challenge marked the second collaboration between SEDA Malaysia and MMU. The Authority had previously collaborated with the university in one of its activities during the National Science Week 2020, which attracted over 24,297 participants via physical and virtual presences. The activity had proven to convey the message, especially to the youth, on the importance of science and technology in everyday life, which significantly impacts environmental sustainability and society.





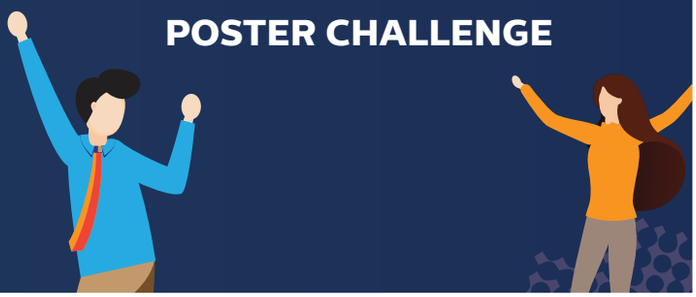
The posters submitted by the participants with the theme Sustainable Energy:

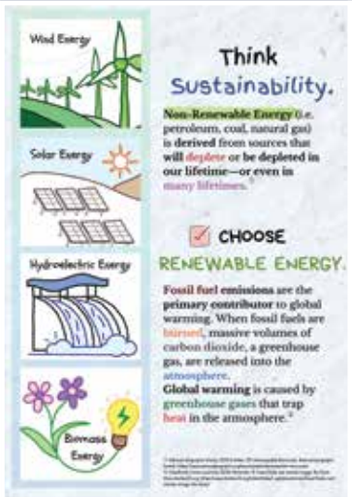
1. *The second place winners from the Secondary School category - Lau Ying Xin and Ong Wei Ji.*
2. *The consolation prize winner from the Secondary School category - Lee Chian Ye and Natalie Chan Xi Qing.*
3. *The winners of the Popularity Awards for Secondary School category - Athirah Muhlis.*

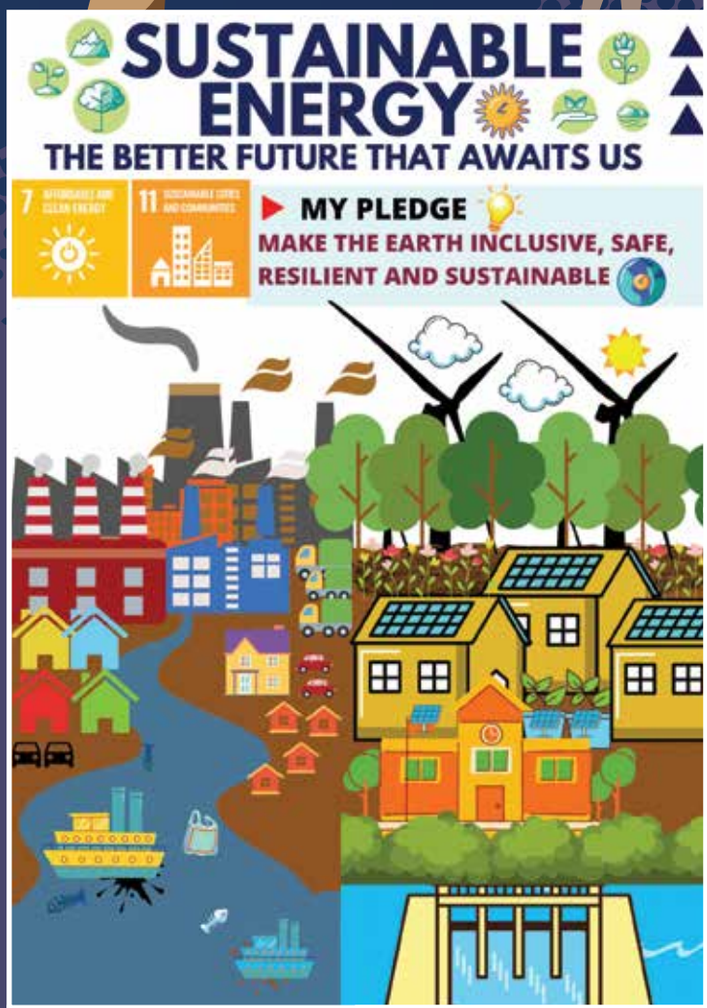
POSTERS GALLERY FOR

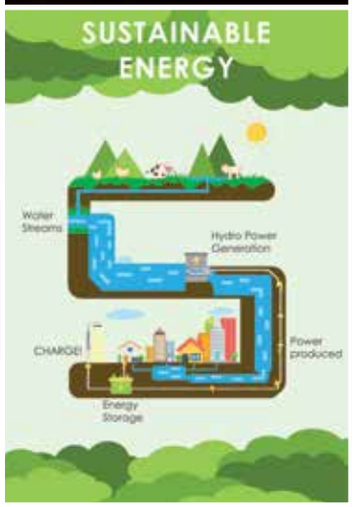
SEDAxMMU

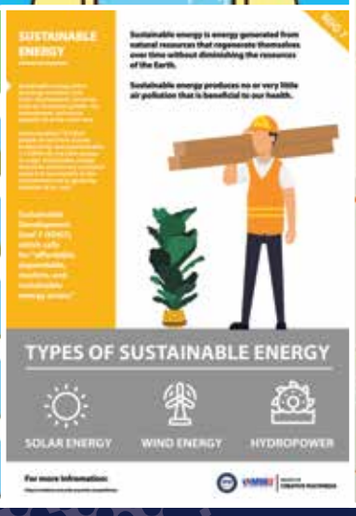
POSTER CHALLENGE





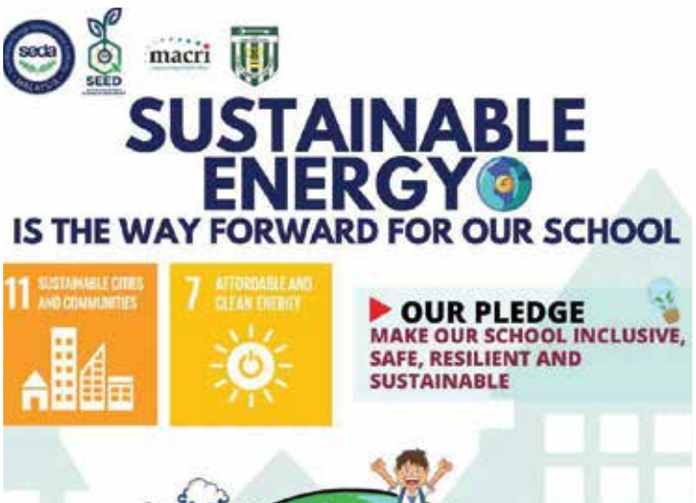






SEDA SEED

STUDENT AMBASSADOR ASSIGNMENT



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.

19 & 23 SEPTEMBER 2021

Tautan Kasih CSR: Rumah Kebajikan Ray of Hope & Pusat Kebajikan Pertubuhan Thangam Illam

The CSR activity is part of the Authority's efforts to help ease the burden faced by the welfare homes in times of COVID-19 pandemic. Authority Member YBrs. Puan Usha Nandhini Jayaram helped distribute dried food items, reading materials and stationaries, including furniture donated to the homes.

25-26 SEPTEMBER 2021

The Sustainable Energy Awareness Poster & Short Video Challenge Online Workshop

The Sustainable Energy Awareness Poster and Short Video Challenge Online Workshop took place over the weekend where participants learned the know-how of poster and video making as well as exposure on Sustainable Energy topics by SEDA Malaysia representatives.

11 OCTOBER 2021

Tautan Kasih CSR: Pusat Jagaan Orang Tua Noble Care Malaysia

Authority Member YBrs. Puan Usha Nandhini Jayaram led the distribution of daily essential items and food to Pusat Jagaan Orang Tua Noble Care Malaysia, Ampang.

The visit was one of the programmes held by SEDA Malaysia in conjunction with the Authority's 10th anniversary celebration.

6 OCTOBER 2021

An engagement session with the US embassy

SEDA Malaysia, represented by the Chief Strategic Officer (CSO) Mr. Mohammad Nazri Mizayauddin and the Strategic Planning and Communications division, had the opportunity to exchange ideas on the sustainable energy initiatives and other topics with Mr. Sean Brennan, Economic Officer (Energy Portfolio) and the US embassy team.

12 OCTOBER 2021
A Dialogue on Technology: Save Energy, Save the Environment

The dialogue brought together SEDA Malaysia's officers to discuss on NEM 3.0 and SAVE 2.0 programmes.

13 OCTOBER 2021
Bowling competition by SEDA Malaysia Sports Club (SEDAxtive)

Warga SEDA stayed active and fit by participating in a bowling competition organised by SEDA Malaysia Sports (SEDAxtive). 16 teams competed in the competition, which was held in conjunction with the National Sports Day 2021. The event concluded with the presentation of prizes by SEDA Malaysia CEO YBhg. Dato' Hamzah Bin Hussin.

20 OCTOBER 2021
The Sustainable Energy and Entrepreneurship Webinar

Mr. Ibrahim Ariffin, SEDA Malaysia Director of Strategic Planning (Energy Analyst), explored the topic of sustainable energy and the opportunities within the industry for entrepreneurs. The webinar, jointly organised by SEDA Malaysia and Young Professional Bureau, concluded with a Q&A session.

28-29 OCTOBER 2021
Site visits by CEO of SEDA Malaysia

SEDA Malaysia CEO YBhg. Dato' Hamzah Bin Hussin paid a special visit to GLT Eco Sdn. Bhd. biogas power plant and Majunaka Eco Energy Sdn. Bhd. biomass power plant in Kedah. Dato' Hamzah also visited the NUR Power Sdn. Bhd., Kulim Hi-Tech.

15 OCTOBER 2021
Donation distribution to PPV SMK Gunung Rapat and Klinik Kesihatan Simpang Pulai

Authority Member YBhg. Datuk Hang Tuah Bin Din @ Mohamed Din helped distribute furniture and food items donated to PPV SMK Gunung Rapat and Klinik Kesihatan Simpang Pulai.

1 NOVEMBER 2021
A courtesy visit from Pahang Skills Development Centre

SEDA Malaysia received a courtesy visit from the Pahang Skills Development Centre led by Executive Director Lt. Col. (CD) Mohd Yusri bin Mohd Nor. The visit was to discuss on a collaboration opportunity in technology and human capital development, as well as the establishment of the Renewable Energy Centre of Excellence.

8 NOVEMBER 2021
Research and study visit to Dubai Electricity and Water Authority (DEWA) Research and Development Centre

SEDA Malaysia had the privilege to visit the Dubai Research Development and Innovation Centre. Led by Mr. Mohammad Nazri Mizayauddin, CSO of SEDA Malaysia, the delegates were welcomed by Dr. Sgouris, the Director of DEWA Research and Development Centre. It is an opportunity for the team to explore the activities around the R&D centre, exchange ideas, and learn more about future aspiration of sustainable energy in Dubai.

10 NOVEMBER 2021
Guest speaker at Environmental Management Webinar 2021

SEDA Malaysia was invited to give a talk on Green Building and Sustainable Energy Low Carbon Building by MRT Corp Sdn. Bhd. during their Environmental Management Webinar 2021. The Authority was represented by Ts. Steve Anthony Lojuntin, Director of Technical Development & Facilitation (TECH) Division.

24-26 NOVEMBER 2021
SEDA Malaysia Team Building 2021, Pangkor Island, Perak

SEDA Malaysia Team Building 2021 was held for 3 days and 2 nights with the objective to further instil the core value of SEDA Malaysia and to strengthen the bond amongst Warga SEDA.

23 NOVEMBER 2021
The official launch of GET programme

KeTSA Minister YB. Datuk Seri Takiyuddin Hassan officiated the launching of the Green Electricity Tariff (GET) programme, which allows consumers to obtain electricity from RE sources. The ceremony was held at Hilton Hotel, KL, and was attended by YBhg. Datuk Zurinah Pawanteh, Secretary General of KeTSA, YBrs. Puan Noor Afifah Abdul Razak, Deputy Secretary General (Energy) of KeTSA, YBrs. Mr. Abdul Razib Dawood, CEO of the Energy Commission, YBhg. Dato' Hamzah Bin Hussin, CEO of SEDA Malaysia, and YBhg. Datuk Megat Jalaluddin Megat Hassan, CRO of TNB.

At the event, SEDA Malaysia also pledged its participation in the GET programme to support green energy development and the country's aspiration to achieve the target of zero net GHG emissions.

2 DECEMBER 2021
SEDA Malaysia Blood Donation Programme 2021

The programme was organised by the SEDA Malaysia's Occupational Safety, Health and Energy Management Committee (JKKPPT) and the National Blood Centre (PDN). PBPTL member YBhg. Datin Setia Nik Roslini Raja Ismail and SEDA Malaysia CEO YBhg. Dato' Hamzah Bin Hussin were also present to support the programme, which was held at Level G Foyer, Galeria PjH, Putrajaya. The public also had the opportunity to visit the SEDA Malaysia's exhibition site to learn more about the programmes under the Authority.

7 DECEMBER 2021
Energy Management and Audit in buildings training programme with MBPJ

SEDA Malaysia served as a speaker and facilitator for the second series of the Energy Management and Audit Training in Buildings under the Energy Management Programme, the Implementation of Malaysian Standards (MS) 1525 and Low Carbon Buildings with Petaling Jaya City Council (MBPJ) (2020-2023), which was carried out at MBPJ Headquarters and MBPJ Tower.

MBPJ staff had the opportunity to operate the Energy Audit equipment used for measuring readings of lighting, humidity, temperature and carbon dioxide in office spaces to identify the actual readings and make comparisons against the readings recommended in the MS 1525.

2, 16, 30 NOVEMBER & 8 DECEMBER 2021
MPIA Solar Roadshow 2021

SEDA Malaysia had participated as an exhibitor and speaker at the recent MPIA Solar Roadshow 2021, which was held Melaka, Pahang, Johor, and Pulau Pinang. During the Roadshow, the Authority gave a brief talk on NEM 3.0 programme and current updates related to SE, in addition to promoting its latest programmes at the exhibition booth.

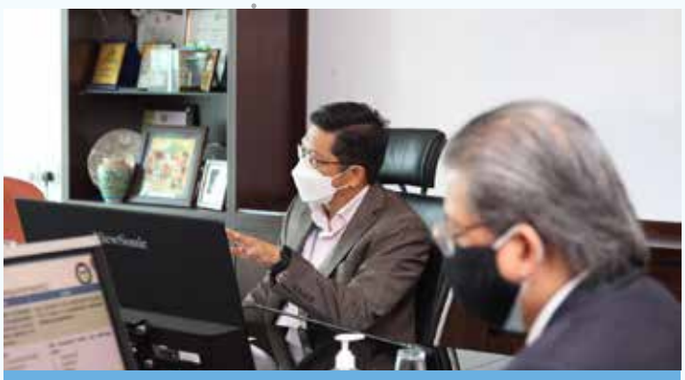
8 DECEMBER 2021
The launch of UOB U-Energy Programme

SEDA Malaysia CSO Mr. Mohammad Nazri Mizayauddin delivered a keynote address during the launching of U-Energy Programme by UOB. The programme is the first integrated financing platform in Asia to drive the development and adoption of energy efficiency projects for buildings and homes.

9 DECEMBER 2021
100-Day 'Aspirasi Keluarga Malaysia'

KeTSA Minister YB. Datuk Seri Takiyuddin Hassan visited the KeTSA's booth at the 100-Day 'Aspirasi Keluarga Malaysia' exhibition that took place from 9th to 12th December 2021 at the KL Convention Centre, KLCC. The Minister was accompanied by YBrs. Puan Noor Afifah Abdul Razak, Deputy Secretary-General (Energy) of KeTSA, YBrs. Mr. Abdul Razib Dawood, CEO of the Energy Commission, and YBhg. Dato' Hamzah Bin Hussin, CEO of SEDA Malaysia.

SEDA Malaysia also promoted SE programmes such as NEM 3.0 and SAVE 2.0 alongside other agencies under KeTSA.



13 DECEMBER 2021
LPKtn Visit to SEDA Malaysia

SEDA Malaysia received a visit from the Kuantan Port Authority (LPKtn) led by YBhg. Dato' Asmawi Bin Nordin, Senior Manager of LPKtn Operations and Regulation. LPKtn was warmly welcomed by Mr. Mohammad Nazri Mizayauddin, CSO of SEDA Malaysia.

The purpose of the visit was to discuss LPKtn's plans in adopting SE programmes to reduce carbon emissions in line with the Green Port Policy.

16 DECEMBER 2021
The SEDA Malaysia Food Basket Project

SEDA Malaysia successfully distributed food baskets and cash donations to 334 families affected by the COVID-19 pandemic. The project is part of the Authority's CSR programme, which has been carried out together with Warga SEDA since August 2021.

15 DECEMBER 2021
CEO and Warga SEDA monthly gathering

YBhg. Dato' Hamzah Bin Hussin had a monthly meeting with Warga SEDA to discuss various topics that include a year-end reflection as we approach the final days of 2021, and upcoming activities planned for 2022.

14 DECEMBER 2021
The launch of Energy Transition Week

YBrs. Puan Noor Afifah Abdul Razak, Deputy Secretary-General (Energy) of KeTSA officiated the Energy Transition Week, which was organised by TNB Distribution Network (DN) from 14th to 16th December 2021. The event aimed to address Malaysia's 2050 net-zero emissions target through guided gallery walk, webinars and panel discussions.

Energy Commission CEO YBrs. Mr. Abdul Razib Dawood, SEDA Malaysia CEO YBhg. Dato' Hamzah Bin Hussin, and TNB DN Chief Distribution Network Officer YBrs. Mr. Wan Nazmy Wan Mahmood were also present during the ceremony.

SEDA MALAYSIA
TRAINING PROGRAMMES

Renewable Energy

Trainings for Qualified Person/Technical

- Grid-Connected Photovoltaic (GCPV) System Design
- 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

www.seda.gov.my

FUTURE

of sustainable energy

SEASON'S GREETINGS AND HAPPY NEW YEAR

2022

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Sustainable Energy Development Authority - SEDA Malaysia

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