Transitioning The Nation Towards

Sustainable Energy

MALAYSIA

Group CEO, SEB:

How Water Transformed Sarawak's Energy Utilities

Minister of Utilities, Sarawak:

Energy Transition for Sarawak

Chief Minister of Sarawak

ENVISIONING THE FUTURE OF ENERGY FOR THE STATE

Sustainable Energy : The Future Is Here

2018 ISES

International Sustainable Energy Summit

4TH ISES 2018

THE FUTURE IS HERE!

Co-Hosted By

MINISTRY OF ENERGY, GREEN TECHNOLOGY AND WATER (KeTTHA)

SARAWAK STATE GOVERNMENT

Jointly Organised By

seda MALAYSIA

Ministry Of Utilities SARAWAK

2018 ISES
International Sustainable Energy Summit

Sustainable Energy : The Future Is Here

WELCOME TO THE 4TH ISES 2018

in the Land of the Hornbills

CO-HOSTED BY

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SARAWAK STATE GOVERNMENT

JOINTLY ORGANISED BY

seda Sustainable Energy Development Authority MALAYSIA

Ministry Of Utilities SARAWAK

CHAIRMAN's Message

Welcome to the first issue of Sustainable Energy Malaysia (SEM) for 2018. This issue is a special edition released in conjunction with the 4th International Sustainable Energy Summit (ISES) 2018. Chances are that you are reading this issue at the Summit right now. If that is the case, then let me welcome you to the 4th ISES 2018.

Last year, we certainly witnessed another stretch of sustained momentum in the global energy transition. A recent report from Bloomberg New Energy Finance revealed that the world clean energy investment rose to US$333.5 billion in 2017, up 3% from 2016. This is also the second highest investment figure; the highest was recorded in 2015. The global solar investment also peaked at US$160.8 billion in 2017, up 18% from the previous year.

For 2018, predictions from an energy analyst include the increasing dominance of solar and wind in the renewable space, accompanied by increasing shares of energy storage that will enable these variable renewables to provide a firm supply of electricity. The digitisation of electricity will continue to underpin the energy transition, thanks to the emergence of the internet of things (IoT), blockchain technology, big data analytics, and artificial intelligence (AI).

The 4th ISES 2018 promises to be a melting pot of knowledge as we continue to shape the future of energy. In line with global predictions for 2018, during this Summit we will introduce two new topics: energy storage systems and blockchain technologies. I acknowledge that we are racing against the climate clock and this makes the Summit ever more urgent than before, to channel the knowledge and messages into implementable and doable actions.

You will probably also notice that a strong theme prevails in this special issue. It is that of a shield, complete with traditionally-inspired motifs. The shield is native to the State of Sarawak. I discussed this theme with Catherine Ridu, CEO of SEDA Malaysia, and she explained that it depicts the role of sustainable energy in shielding our future against climate change and energy depletion. That is a powerful portrayal of sustainable energy and its role in preserving our environment!

I hope you have gained much from this Summit; the success of the 4th ISES 2018 is attributed largely to the commitment of Sarawak, which is the first State to host the Summit outside of the Klang Valley. Thank you to the Chief Minister of Sarawak, the Minister of Energy, Green Technology and Water, thought leaders who contributed as speakers and chairs, sponsors, media partners, various government agencies, investors, financial institutions, technology providers, academicians, and power utilities for making this Summit a success.

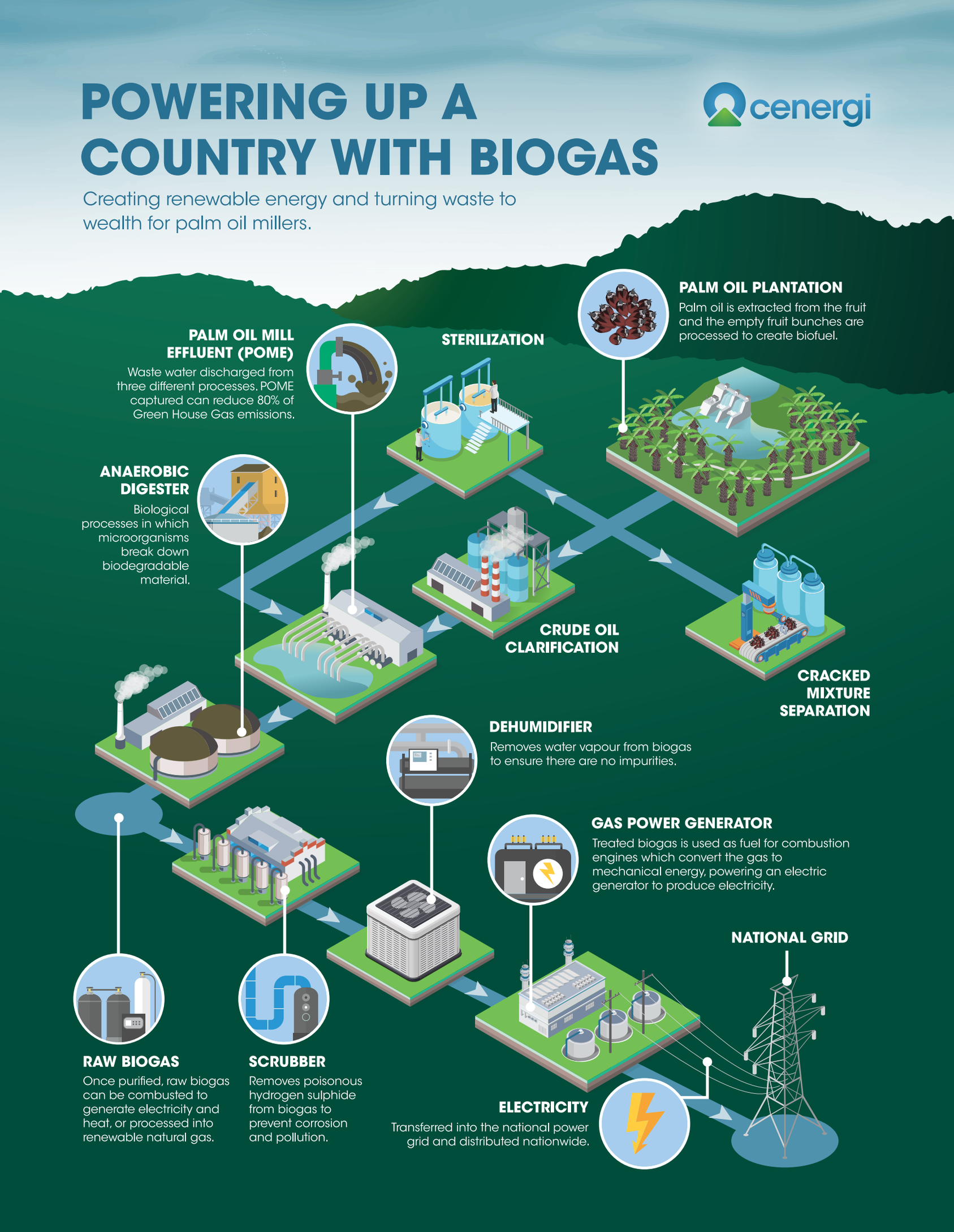
Special acknowledgement goes to the Ministry of Energy, Green Technology and Water (KeTTHA), the Ministry of Utilities, Sarawak, and the Sarawak State Government for the actualisation of the 4th ISES 2018.

DR. YEE MOH CHAI
Sustainable Energy Development Authority (SEDA) Malaysia.

POWERING UP A COUNTRY WITH BIOGAS

cenergi

Creating renewable energy and turning waste to wealth for palm oil millers.



PALM OIL PLANTATION
Palm oil is extracted from the fruit and the empty fruit bunches are processed to create biofuel.

PALM OIL MILL EFFLUENT (POME)
Waste water discharged from three different processes. POME captured can reduce 80% of Green House Gas emissions.

STERILIZATION

ANAEROBIC DIGESTER
Biological processes in which microorganisms break down biodegradable material.

CRUDE OIL CLARIFICATION

CRACKED MIXTURE SEPARATION

DEHUMIDIFIER
Removes water vapour from biogas to ensure there are no impurities.

GAS POWER GENERATOR
Treated biogas is used as fuel for combustion engines which convert the gas to mechanical energy, powering an electric generator to produce electricity.

NATIONAL GRID

RAW BIOGAS
Once purified, raw biogas can be combusted to generate electricity and heat, or processed into renewable natural gas.

SCRUBBER
Removes poisonous hydrogen sulphide from biogas to prevent corrosion and pollution.

ELECTRICITY
Transferred into the national power grid and distributed nationwide.

sarawak energy

Energy for Sarawak & Beyond

Sustainable Energy Development and a Reliable, Secure Power System for Sarawak

Kuching City powered by Sarawak Energy

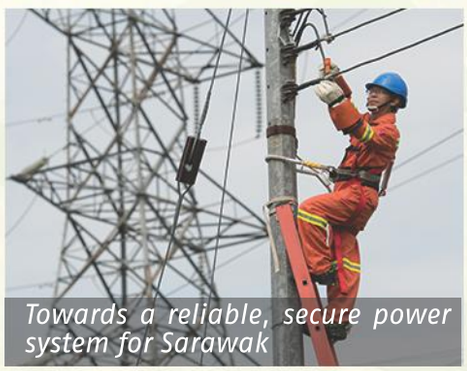
Sarawak Energy is an energy development group and a vertically integrated power utility with a vision to achieve sustainable growth and prosperity for Sarawak by meeting the region's need for reliable, renewable energy.

With a generation mix that is predominantly renewable hydropower, complemented by thermal energy for security of supply, Sarawak Energy is on track to providing reliable 24-hour electricity supply for all Sarawak, and meeting the bulk power demand of our industrial and export customers.

In advancing our ambition to become a regional powerhouse, Sarawak Energy is driven by a strong commitment to sustainable development.

Menara Sarawak Energy - the state's first Green Building in Sarawak

Bakun HEP (2400MW) - the largest hydropower plant in South East Asia



Towards a reliable, secure power system for Sarawak

Bintulu Gas Combined Cycle Plant (317MW) - the largest Clean Development Mechanism (CDM) Plant in Malaysia

Sustainability in Practice

Murum Hydroelectric Plant

Balancing the need for development with conservation, Sarawak Energy has made sustainability a priority in our projects and operations.

In striving to be a socially responsible corporate citizen, Sarawak Energy is committed to partnerships that emphasise conservation of the natural environment and the rich biodiversity found in Sarawak – 'environmental management and conservation' is one of four key pillars in our corporate social responsibility undertakings.

We are powering Sarawak everyday, providing energy to 650,000 customers throughout the state and lighting up communities through social investments in education and sustainable livelihood programmes.

'WiMoR' activities to rescue and relocate animals prior to impoundment in Murum HEP.

Releasing indigenous fish fry at Sungai Lekasi, Murum.

Social investments in education and sustainable livelihood programmes expand opportunities in the Murum Resettlement area.

SPOTLIGHT ON SARAWAK

The 4th ISES 2018 Steering Committee paid a courtesy visit to the Chief Minister of Sarawak, YAB Datuk Patinggi (Dr.) Abang Haji Abdul Rahman Zohari Tun Datuk Abang Haji Openg and his esteemed delegation on February 21. The Committee was led by Minister of Utilities, Sarawak YB Dato' Sri Dr. Stephen Rundi Anak Utom; accompanying him were Assistant Minister YB Dr. Haji Abdul Rahman Haji Junaidi and ISES Organising Chair cum SEDA Malaysia CEO Catherine Ridu.

On the same day, the Minister of Utilities held a press conference to announce that the Sarawak State Government is co-hosting the 4th ISES 2018 with the Ministry of Energy, Green Technology and Water (KeTTHA) that will held in Kuching, Sarawak, 10-11 April 2018. According to the Minister, this year's theme "Sustainable Energy: The Future Is Here" is most appropriate given the global priority on climate agenda and the need to achieve energy sustainability and security.

The Chief Minister of Sarawak will officiate the Summit, in addition to delivering his keynote address.

Before the press conference, on February 20 the Minister of Utilities chaired a fruitful steering committee meeting for the 4th ISES 2018. In attendance were the Assistant Minister, Permanent Secretary Dato' Ir. Alice Jawan, and other state leaders.

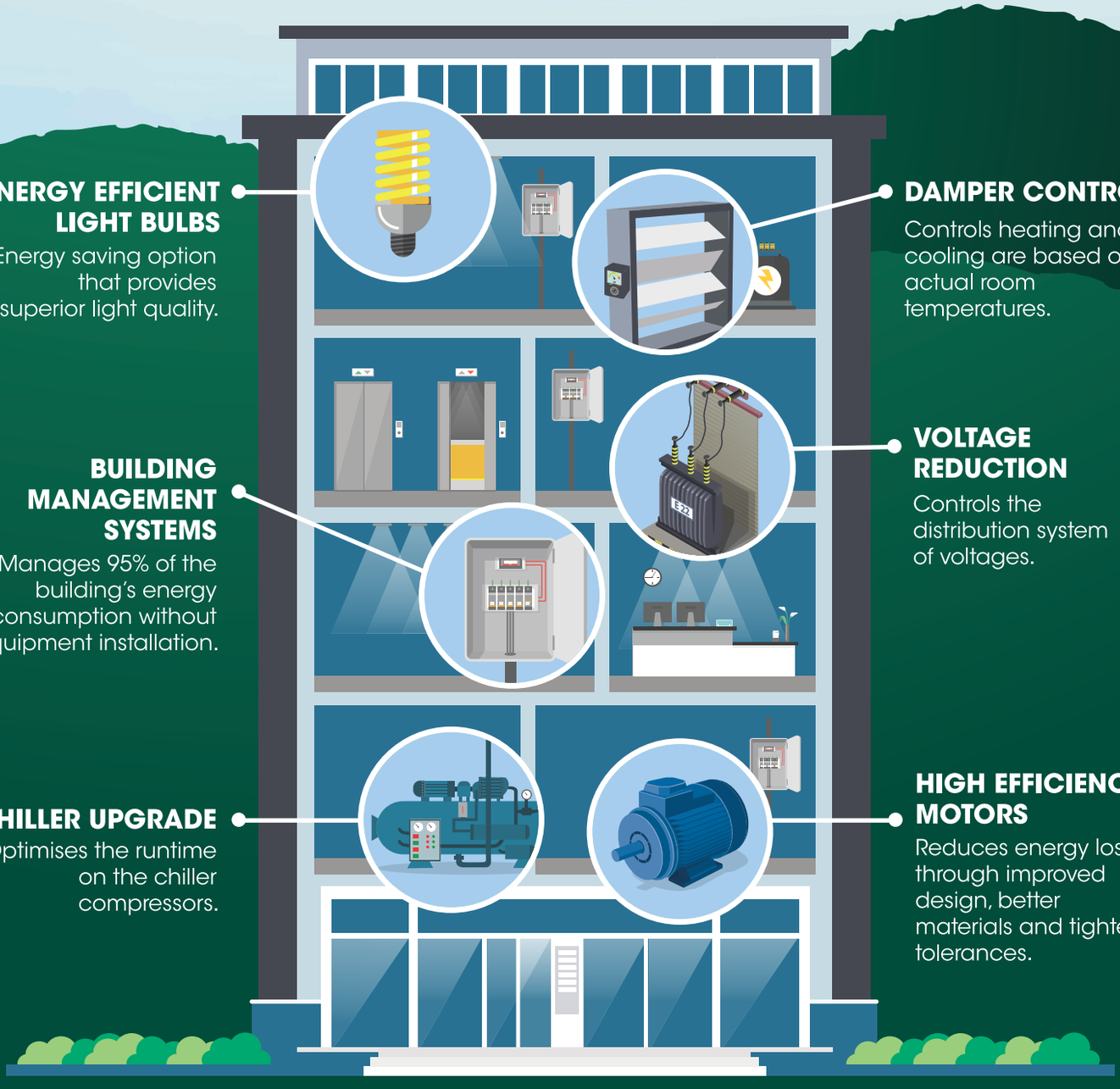
Sarawak is a State exemplary in renewable energy efforts, having more than 70% of hydropower in its electricity mix. Hydropower is also widely utilised in the State's rural applications. Due to such initiatives, it is very fitting that Sarawak hosts a sustainable energy summit of international significance.

Following the Sarawak State Government's strategic vision of digitising the electricity system and acknowledging the global trend of sustainable energy efforts, the Summit will introduce two new topics: 'The Future Role of Blockchain in the Energy Market' and 'The Emergence of Energy Storage Systems.'

The 4th ISES 2018 will feature nearly 80 local and international thought leaders as speakers and chairs, some of whom will be representing international organisations such as UNESCAP, USAID, ACE, UNIDO, NREL, and ADB. Around 700 participants from various countries are expected. There will also be a business networking session available to stakeholders, to promote commercial activities.

REDUCING CARBON FOOTPRINT FOR A SUSTAINABLE FUTURE

Energy efficiency improvements available today decrease carbon emissions instantly. To promote a sustainable future, Cenergi offers two approaches under its energy efficiency arm, the Energy Savings Performance Agreement (ESPA) and Energy and Resource Management. With ESPA, Cenergi helps Building Operators by financing energy efficiency projects that reduce the total utility bill and most importantly, carbon footprint. On the other hand, its Energy and Resource Management comprises of energy audits that offer sustainable energy efficiency solutions.



ENERGY EFFICIENT LIGHT BULBS
Energy saving option that provides superior light quality.

DAMPER CONTROL
Controls heating and cooling are based on actual room temperatures.

BUILDING MANAGEMENT SYSTEMS
Manages 95% of the building's energy consumption without equipment installation.

VOLTAGE REDUCTION
Controls the distribution system of voltages.

CHILLER UPGRADE
Optimises the runtime on the chiller compressors.

HIGH EFFICIENCY MOTORS
Reduces energy losses through improved design, better materials and tighter tolerances.

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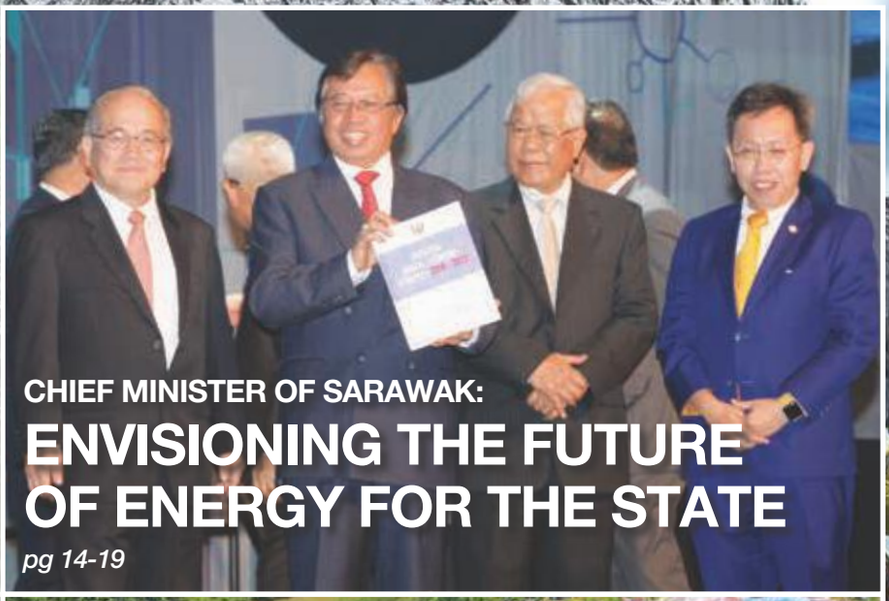

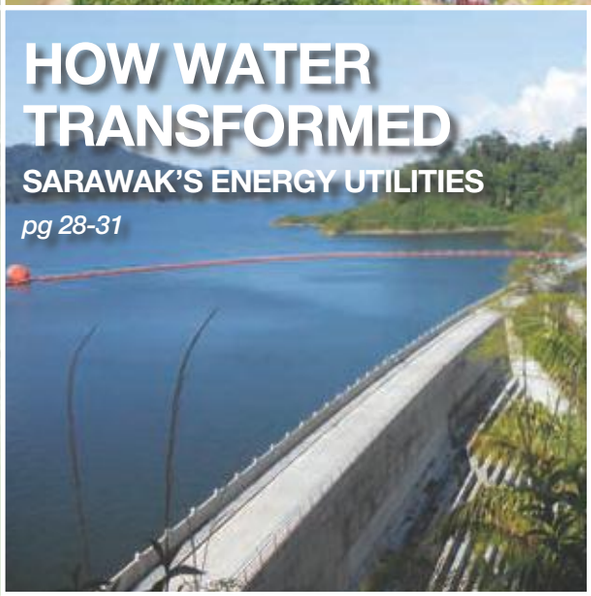

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"Join SEDA in building a Better Future. Sign up for our Training Programmes"

1. **Grid-Connected Photovoltaic (GCPV) Systems Design Course**

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

3. **Grid-Connected Photovoltaic (GCPV) Installation and Maintenance Course**

4. **Introduction to Grid-Connected Photovoltaic (GCPV) Systems Design for Non-Engineers**

5. **Off-Grid Photovoltaic (OGPV) Systems Design Course**

For more Information, please visit our website:
www.seda.gov.my

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"... Malaysia intends to reduce its greenhouse gas (GHG) emissions intensity of GDP 45% by 2030 relative to the emissions intensity of GDP in 2005."

GREEN TECHNOLOGY APPLICATIONS FOR THE DEVELOPMENT OF LOW CARBON CITIES (GTALCC)

WHAT is GTALCC?

GTALCC is a 5-year project, facilitating the implementation of low carbon initiatives and to showcase a clear and integrated approach to low carbon development in Malaysia.

WHO are involved?

PERBADANAN PUTRAJAYA

SEPANG MAJLIS PERBANDARAN SEPANG

MBPJ

MPHT Majlis Perbandaran Hang Tuah Jaya

ISKANDAR MALAYSIA

OBJECTIVES

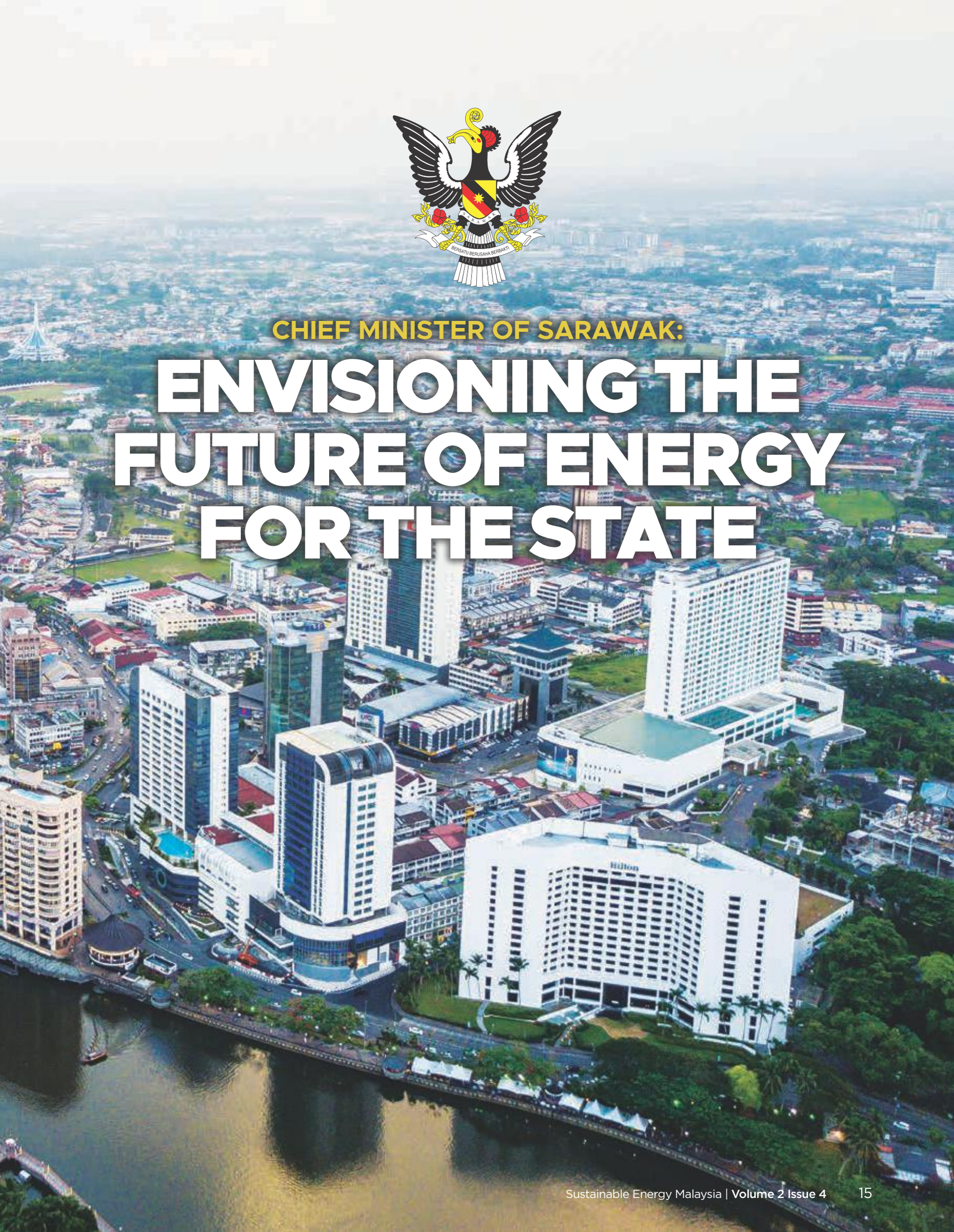
- To support the low carbon cities program.
- To remove all barriers to integrate low carbon urban planning and development.
- To generate GHG emission reductions of 346,442 ton CO_2eq by the end of project.

MINISTRY OF ENERGY, GREEN TECHNOLOGY AND WATER

UNDP

gef GLOBAL ENVIRONMENT FACILITY INVESTING IN OUR PLANET

seda Sustainable Energy Development Authority MALAYSIA



CHIEF MINISTER OF SARAWAK:

ENVISIONING THE FUTURE OF ENERGY FOR THE STATE

The Right Honourable Chief Minister launching the Sarawak Digital Economy Strategy (2018-2022).

The Right Honorable Chief Minister studying a poster that details how a hydrogen refueling station works.

Sarawak, Land of the Hornbills, is a large part of East Malaysia with a population of about three million that aims to be one of the fastest developing States in the country. Well-endowed with some 124,450km^2 of land mass and an abundance of natural renewable resources, chiefly hydropower and solar energy, the State has tremendous potential to grow further economically.

The Right Honourable Chief Minister of Sarawak, Datuk Patinggi (Dr.) Abang Haji Abdul Rahman Zohari Bin Tun Datuk Abang Haji Openg, envisions that the State's development needs to diversify from an over-reliance on non-renewable resources in order to ensure sustainable long-term economic growth. Taking cognisance of this, the State has embarked on the Digital Economy Transformation programme by formulating the five-year Sarawak Digital Economy Strategy (2018-2022).

The Digital Economy Strategy charts out a mission to leapfrog the State's development through a digital economy powered by digital technologies in place of conventional economy. The understanding and application of new and emerging technologies like big data, cloud computing, gaming, animation, blockchain technologies, artificial intelligence, autonomous vehicles, and renewable energy (RE) are very much in order for Sarawak to effect the digitalisation of its economy.

Among the 47 Strategic Actions of the Sarawak Digital Economy Transformation, five are related to energy, namely:

- **Strategic Action 5: Explore various opportunities for alternative energy**

Sarawak plans for other alternative energy rather than relying heavily on the traditional fossil resources. Although hydro energy is the main contributor of RE in Sarawak, a Sarawak Research Council has been formed by the State Government to oversee research and development (R&D) on, among others, various energy-related technologies such as alternative energy potential and hydrogen and fuel cells research. Sarawak Energy Berhad (SEB) has been entrusted to spearhead energy-related research, starting with a feasibility study on hydrogen production and the application of hydrogen and fuel cells in the State.

The abundance of water resources in Sarawak provides an ideal setting for the future development of an economy centred on hydrogen production and its applications. The research in hydrogen and fuel cells technology will form an integral part of the Government's new emphasis to develop the State, leveraging on R&D in order to achieve the goal of turning Sarawak into a developed and high income economy by 2030.

- **Strategic Action 10: Provide clean, reliable and cost-efficient energy using smart technologies**

This strategy calls for clean, reliable, and cost-efficient energy leveraging on smart technologies. As members of society are becoming more environmentally conscious, they are beginning to demand for clean and cost-efficient energy as well as quality services and flexibility in energy generation and storage. Hence, utility services have to engage smart technologies to maximise performance by increasing supply reliability, in addition to increasing efficiency and resilience when dealing with energy generation, and the transmission and distribution systems.

As for energy efficiency, building efficiency standards and guidelines will also be developed or adopted in order to increase public awareness on the importance of conserving energy.

Under this Strategic Action, various smart technologies such as real-time monitoring apps, sensor technologies, smart utility meters, e-portals for customer-related management, and the Integrated Smart Development Planning will be employed.

The Right Honourable Chief Minister officiating the launch of the International Energy Week 2018 Exhibition & Conference.

The Right Honourable Chief Minister inspecting a hydrogen-powered bus.

The Right Honourable Chief Minister at the launch of a solar energy project in Sarawak.

The Right Honourable Chief Minister trying out a hydrogen refuelling facility that was on display at an exposition in China.

The Right Honourable Chief Minister holding a press conference on 'Hydrogen and Fuel Cells Research Set Up' at Sarawak Energy Berhad.

- **Strategic Action 15: Ensure efficient development of sustainable housing and enhance convenience, safety, and comfort for city dwellers**

Digital technologies are making the energy system more connected, reliable, and sustainable. Digitalisation is transforming energy systems. From the connected devices at home to the automated industrial production processes and smart mobility, digital technologies are increasingly changing how, where, and when energy is consumed.

With smart meters and connected devices, households and smart appliances can participate in interconnected electricity systems. With the help of smart sensing and measuring systems, households can determine the amount of energy consumption by using real-time data to improve operational and consumption efficiency.

Through this digital transformation, the livelihood of city dwellers will be enhanced in terms of convenience, safety, and comfort. Under this Strategic Action, apart from implementing a smart housing design platform, the Government intends to establish an automated surveillance system for crime monitoring and prevention using big data analytics, centralised infrastructure and utility mapping, free public WiFi hotspots, and smart systems for development planning, including strata housing management.

- **Strategic Action 16: Implement the Green Building Index (GBI) in new government and private non-residential buildings in major cities and towns**

Under this Strategic Action, the Sarawak Government is developing an Internet of Things (IoT) evaluation platform of GBI in terms of policy support, as well as the development and management of professionals in the green building design.

Eventually, GBI will be implemented in new government and private non-residential buildings in major cities and towns in Sarawak.

- **Strategic Action 17: Establish comfortable and safe mobility for commuters using smart technologies**

Within three years electric-powered buses will ply the streets of Sarawak cities, starting with Kuching. The State plans for all buses to be powered by electricity instead of diesel. To show its commitment to a clean environment and clean public transportation, the State is willing to accept the reduced number of such buses in the initial fleet due to the higher capital cost of acquiring electric-powered buses over diesel-powered buses. Charging these electric-powered buses should not be a problem given that the battery technology is capable of high capacity fast-charging. Sarawak has the lowest average electricity tariff within ASEAN and this adds to the advantages of using electric-powered buses.

Additionally, a project to employ hydrogen-powered buses on the streets of Kuching is expected to materialise soon, which would make Kuching the first city in the country to use such buses. Besides the need for necessary infrastructure such as hydrogen refueling stations, the State has also provided allocations to conduct research on hydrogen production and hydrogen applications, including the setting up of a plant with foreign expertise to produce hydrogen gas needed to power the buses.

The proposed Light Railway Transit (LRT) route connecting Kuching with Serian, Samarahan, and Damai would also be powered by hydrogen. If the technology is proven affordable, similar LRT systems will be implemented in other major cities in the State.

These electric-powered buses and hydrogen-powered buses and LRT, together with an integrated transportation system, intelligent route selection, digital asset management, smart traffic light, smart parking, digital information signage, and bus information system would ensure comfortable and safe mobility for commuters.

The future of energy is RE and this includes alternative energy. It shall be clean, reliable, cost-efficient, and digitalised to power smart devices and enhance the livelihood of Sarawakians.

The digital energy journey has begun in Sarawak!

“The abundance of water resources in Sarawak provides an ideal setting for the future development of an economy centred on hydrogen production and its applications.”

Concord Green Energy Sdn Bhd (CGESB)

is established for the purpose of undertaking Renewable Energy (RE) initiatives in Malaysia. The RE initiative involves undertaking the development of biogas plants for power generation purpose in palm oil mills.

The Concord Group is a 1-stop Project Integration Provider in palm oil market. The Group provides complete packages to develop biogas plant to our valued business partners, namely:

- Project funding
- Engineering design
- Project procurement
- Plant operation & maintenances
- Process improvement to existing biogas plant

In May 2015, CGESB had sucessfully signed a Master Agreement with FELDA Global Ventures Holdings Bhd (FGV) to build, operate and maintain FGV's biogas plants complete with power generation facilities at selected FGV's palm oil mills.

Subsequently, in July 2016, CGESB signed the Build, Operate and Own Agreement (BOO) with FGV to immediately start engineering design and project construction at four greenfield mills.

In addition, another wholly-owned subsidiary company, Concord Biotech Sdn Bhd (CBSB) has just signed a BOOT agreement with TDM Berhad for developing biogas plants. These come with power generation facilities at TDM Plantation Sdn Bhd's mills: Kemaman Palm Oil Mill and Sungai Tong Palm Oil Mill, both located in Terengganu.

Another wholly-owned subsidiary, Concord Renewable Energy Sdn Bhd (CRE), focuses on Engineering Design, Procurement, Construction and Commissioning (EPCC) work in the biogas industry for the palm oil market, offering services such as:

- Project planning and consultation
- Effective costing and pricing
- Knowledge in engineering the designs of biogas plants
- Knowledge in operating successful and profitable biogas plants
- Project execution

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Tel No: (+603) 7733 3374 | Fax No: (+603) 7733 3347 | Email: info@cge.com.my

www.concord.com.my

OBJECTIVES

To undertake the biogas plants development for renewable energy production at palm oil mills in Malaysia.

To treat Palm Oil Mill Effluent (POME) and capture its biogas to power generation as green energy.

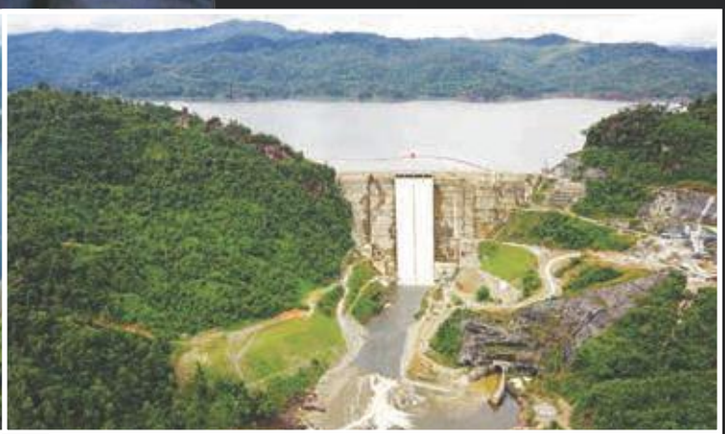
To generate revenue by selling the green energy to Tenaga Nasional Berhad (TNB) under the Renewable Energy Power Purchase Agreement (REPPA) at a rate under the Feed-in-Tariff (FiT) mechanism issued by the Sustainable Energy Development Authority (SEDA) Malaysia.

To provide a sustainable solution for palm oil mill industry waste management by reducing carbon emission through a controlled methane capture system.

To implement the green agenda and to be aligned with the National Renewable Energy Policy.

CONCORD GROUP

The 2400-MW Bakun Hydroelectric Power Plant.



The 944-MW Murum Hydroelectric Power Plant.

ENERGY TRANSITION FOR SARAWAK

The Honourable Dato' Sri Dr. Stephen Rundi Anak Utom
Minister of Utilities, Sarawak

The Sarawak State Government's plan and intention is to narrow the gap between our urban and rural populace so that every Sarawakian can enjoy mainstream development. Energy development is undertaken holistically in Sarawak, balancing energy security, sustainability, and affordability to meet current and forecast demands.

The State Government-owned Sarawak Energy Berhad and its subsidiaries are responsible for delivering electricity and are entrusted with securing upstream resources. These include planning and building the infrastructure required for the overall generation, transmission, distribution, and retail of electricity under the policy guidance of the State Government and within the regulatory framework of the Ministry of Utilities, Sarawak.

We would quantum leap Sarawak's development and secure the future of the State's economy by developing hydropower to:

- Lower the electricity generation cost so that residents throughout Sarawak can benefit from lower electricity tariffs - Sarawakians now enjoy the lowest tariffs in Southeast Asia;
- Attract investors to set up plants in Sarawak through competitively priced tariffs;
- Speed up development in rural areas by establishing the infrastructure needed to build hydropower stations as demonstrated by Bakun and Murum - and subsequently Baleh - such as roads, water, telecommunications and power lines, as well as Sarawak Energy's social investment projects.

ENERGY MIX FOR SUSTAINABLE DEVELOPMENT

Sarawak is blessed with abundant indigenous resources, enabling it to meet the growing demand by harnessing the State's own bountiful hydro, coal, and gas resources, guided by international best practices.

Our State has a hydro potential of 20,000MW. Hydropower plants currently under operation are Batang Ai (108MW), Bakun (2,400MW), and Murum (944MW). With the completion of the 1,200-MW Baleh hydropower plant in 2025, Sarawak will have a generation capacity of 7,000MW of electrical power compared to the present 4,500MW, of which ~60% will be hydro.

Even though the Sarawak Government has a foresighted focus on renewable and affordable hydropower as the predominant part of Sarawak's generation mix, thermal sources continue to form part of the generation mix through the harnessing of Sarawak's indigenous coal and gas resources which provide security of supply.

ACCELERATING RURAL DEVELOPMENT

Sarawak is targeting for 100% of its population to have access to 24-hour electricity supply by 2025. The State's domestic coverage was at 95% in 2017, while rural coverage was at 90%.

Despite geographical challenges, Sarawak is blessed with many rivers. Through the collaborative efforts between all possible parties, rural communities can enjoy access to electricity with the implementation of micro-hydro systems in suitable rivers.

The Honourable Minister witnesses the handing-over of a completed SARES project.

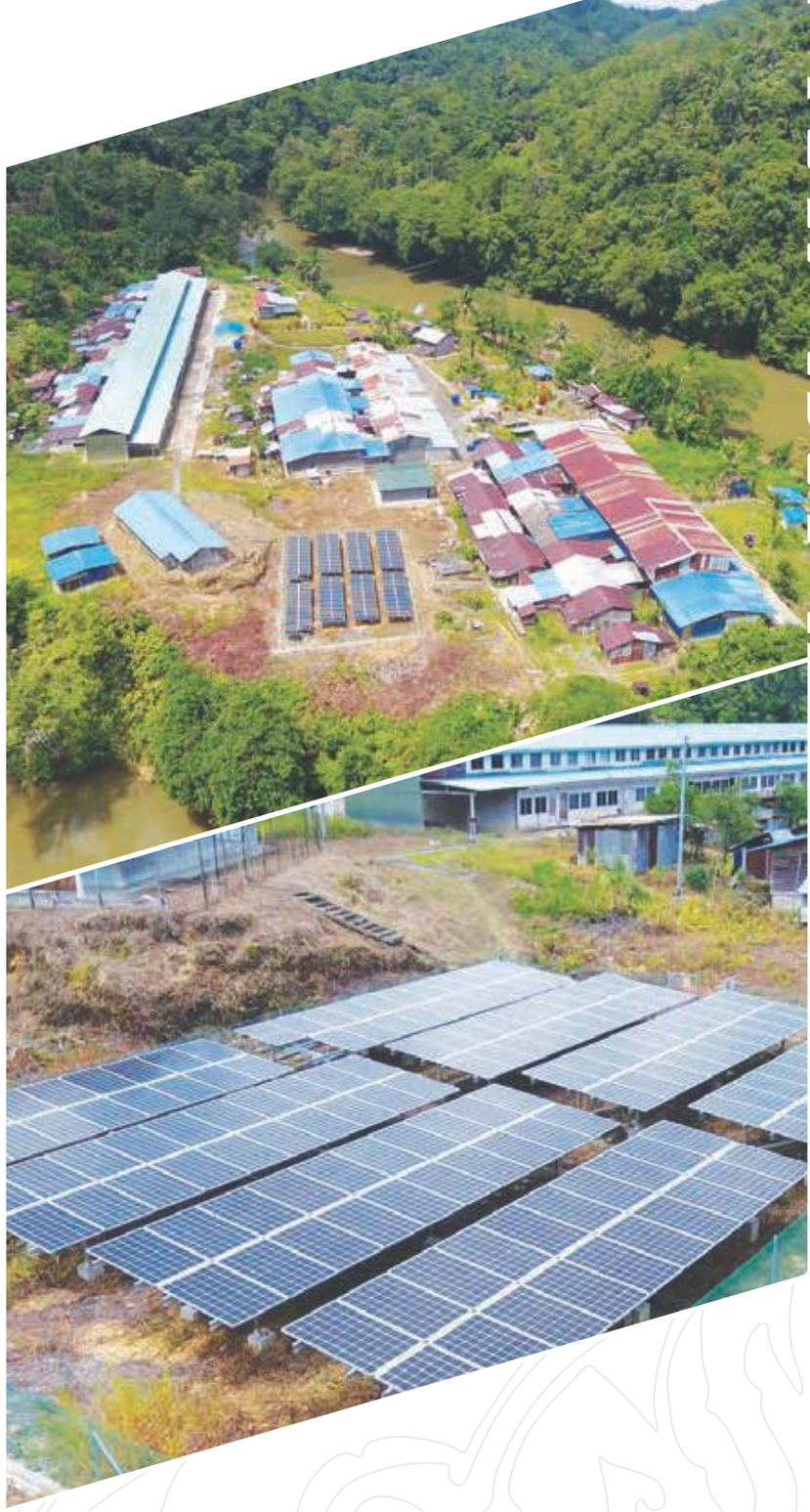
In addition, solar energy has also been identified as an alternative energy supply for Sarawak. The mini/micro-hydro and solar generation systems for remote communities under the Sarawak Alternative Rural Electrical Scheme (SARES) will ensure full 24-hour power supply coverage by 2025.

SARES is an innovative government-community partnership model, harnessing the small renewable technologies of solar and mini-hydro to provide 24-hour electricity supply to remote communities where it is not feasible for connection to the State Power Grid. When fully completed in 2020, about 320 of our most remote villages with 8,478 households will enjoy 24-hour electricity supply.

This Scheme won an Award from the global Alliance for Rural Electrification (ARE) under Category 5: Government in Africa, Asia & Latin-America, for being an effective government initiative based upon the criteria of effectiveness to new energy access, engagement with project beneficiaries, positive socio-economic impact, and contribution towards CO_2 reduction.

The systems under SARES cater to the remotest rural household's basic electricity needs such as for lighting, fans, a television, a freezer, a cooker; they are simple in design without compromising the household's safety. SARES alleviates a burden on villagers by eliminating the dependency on costly diesel generators which only provide limited hours of supply.

The remaining 29,457 rural households, which can be connected to the State Grid System, will be supplied with power through the distribution supply grid extension under the Rural Electrification Scheme (RES) and the transmission extension under the Rural Power Supply Scheme (RPSS).



A standard Centralised Solar System under SARES.

Aerial view of a typical SARES setup in a remote area.

Setup of individual home solar systems under SARES.

The Honourable Minister inspects the battery and control system for a SARES Solar System.

INTERCONNECTION PROJECT

With the commissioning of the 275-kV interconnection linking Mambong in Sarawak with Bengkayang in West Kalimantan, Indonesia in January 2016, the first phase of the Borneo Grid was realised.

This flagship project is the first power interconnection between two member countries of the Brunei-Indonesia-Malaysia-Philippines East Asean Growth Area (BIMP-EAGA), and facilitates the transmission and sale of electricity between them. The project was undertaken by Sarawak Energy for Sarawak's side and PT PLN (Persero) represented Indonesia, along with the strong support and backing of both Governments.

The link builds a foundation for the realisation of the Borneo Grid which can potentially be the catalyst for the expansion of socio-economic activities for both sides. This could also initiate a harmonisation of environment policies and contribute towards materialising the greater ASEAN Power Grid Masterplan.

With this, the two BIMP-EAGA members can chart future plans on how they can work together in other areas for the mutual benefit of Sarawak and West Kalimantan - not just for power With this, the two BIMP-EAGA members can chart future plans on how they can work together in other areas for the mutual benefit of Sarawak and West Kalimantan - not just for power export activities but also in the telecommunications sector, as well as for the exchange of knowledge in similarly-faced challenges such as rural electricity. This project has also led to economic improvements in various sectors especially those relying on electricity power.

The successful pioneering of the Sarawak-West Kalimantan interconnection has established and implemented a power trading regime and provides a model for future power grid interconnections. Other potential connections beyond Sarawak's borders include the enclave connection to the neighbouring State of Sabah and an interconnection to Brunei Darussalam. These cross-border connections provide opportunities for the realisation of the Borneo Grid and for Sarawak to become a regional power hub for ASEAN.

THE LARGEST ELECTRICITY UTILITY IN MALAYSIA
WITH AN ASSET BASE TOTALLING
RM142.0 BILLION

ABOUT US

Tenaga Nasional Berhad (TNB) is the largest electricity utility in Malaysia and one of the largest in the region, with an asset base totalling RM132.9 billion. With a history spanning 68 years, TNB is also the most experienced energy player in the country, responsible in keeping the lights on for all residents of Peninsular Malaysia, Sabah and Labuan.

Our core businesses span the entire value chain of electricity production and supply encompassing Generation, Transmission and Distribution. Our Generation Division operates and maintains six thermal power stations and three major hydroelectric power generating schemes in addition to supporting the operations and maintenance of two Independent Power Producers (IPPs). Our Transmission Division connects power generated by TNB and IPPs throughout Peninsular Malaysia with Distribution Divison's network as well as directly to large industrial customers via the National Grid. Our Distribution Division supplies end users, with a keen focus on delivering a world-class customer experience.

In recent years, TNB has become a champion of Renewable Energy (RE) as part of our commitment to promote a greener and more sustainable energy sector. We are responsible for signing Renewable Energy Purchase Agreements (REPPAs) with RE producers and for the administration of the Feed-in Tariff which funds the supply of RE onto the National Grid.

We aspire to grow our presence within the region, lending our expertise to Nations experiencing a surge in power demand as a result of rapid socio-economic development. Towards this end, Energy Ventures, has been established with the mandate to explore possible ventures for us to participate in within Southeast Asia and the Middle East.

Our first foreign acquisition was a purchase of 30% interest in Turkish power company, GAMA Enerji AS for US$225 million. This has been expanded to other countries including 50% equity ownership in a UK Solar Portfolio via Vortex Solar Investment S.A.R.L, United Kindom and another 30% owned GMR Energy Limited, India.

TNB has been a key contributor to the Nation's social and economic development over the years. We are committed to maintaining our position as Malaysia's leading electricity provider, even as we transform into a more efficient and effective organisation that is able to create a Better. Brighter. future for the Nation and its people.

** Figure as at Financial Year 2016*

As Malaysia's leading electricity company, we understand that it takes energy to power progress. That's why we're reaching further than ever to innovate and advance communities around the world. By making strides in solar, biogas, and biomass energy development, we're not just growing as a corporation, but growing with communities, ensuring a brighter and sustainable future for generations to come.

www.tnb.com.my

TENAGA NASIONAL
Better. Brighter.


sarawak energy
sarawak energy

HOW WATER TRANSFORMED

SARAWAK'S ENERGY UTILITIES

Sarawak Energy Berhad's staying power shows in its latest remodeling by becoming a modern and agile corporation from a traditional utility company, making good on its commitment to support Sarawak's vision of becoming a developed and high-income State by 2030.

The Sarawak Energy Group has been expanding the generation, transmission, distribution and retail of electricity in the State while also supporting some key State initiatives. Sarawak Energy has regional and international ambitions, part of which sees it striving to be a good corporate citizen.

Power is generated mainly through hydro in addition to thermal resources such as gas and coal. Today, Sarawak Energy has 5,000 staff serving about 650,000 customers, covering domestic, commercial, industrial, and export customers through an extensive transmission and distribution network. Its customers enjoy the lowest electricity tariff in Malaysia, a rate that is among the lowest in Southeast Asia - about 38% lower than Peninsular Malaysia and more than 100% lower than Singapore.

It has been a decade of "disruption" for energy utilities, driven by climate change and environmental challenges, policy and regulations, and innovation in technologies. Among the key changes have been a shift in the energy mix, growth in renewables, the mobility revolution, and the rise of energy storage.

"We aspire to be a top quartile benchmark utility. Sarawak Energy has been monitoring these developments closely, adopting new technologies and adapting our organisation to ensure we are ready to take advantage of the new opportunities and face the inevitable challenges," said Sharbini Suhaili, Sarawak Energy Group CEO.

While renewables are advancing rapidly, many countries still need traditional sources of energy, including coal, to meet their growing demands. For Sarawak, renewable hydropower has powered the energy sector - especially in the last decade - providing affordable and sustainable energy for the State's growth and development.

Hydropower currently offers the lowest Levelised Cost of Energy (LCoE) among the varied fuel technologies available today. Although solar prices are rapidly plummeting, there are still a number of issues particularly for the tropics such as thick cloud cover and rainy seasons.

"Our strong focus on hydropower development is based on the realisation that large hydro offers the lowest LCoE. This is what enables our sustainable, competitive advantage, allowing us to transfer these savings to our domestic customers and attract energy-intensive industries by offering very competitive bulk power rates," Sharbini explained.

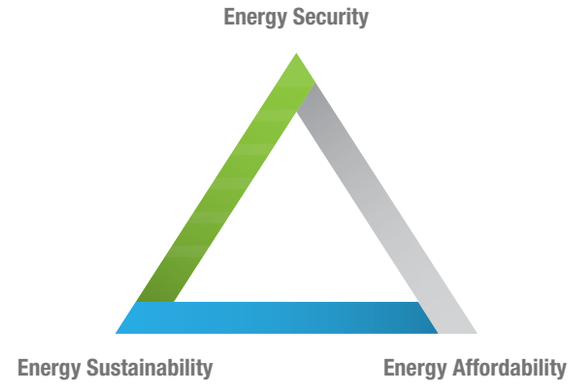
A study that was carried out in the 80s and 90s on the hydro potential in Sarawak, with the support of the German Government, revealed that the State has a total of 20,000MW in potential hydropower. From that amount, 14 sites were identified for their high potential adding up to a total capacity of ~8,000MW. Three of these have been developed, and two are ongoing projects. It is estimated that 2% of Sarawak's total land area would be utilised if all the identified hydro projects are executed.

Carbon intensity for electricity supply decreased by

72% **since 2009**

In line with being a good corporate citizen, environmental impact is a crucial aspect for consideration in the planning of Sarawak Energy's projects. These are developed in accordance with the International Hydropower Association's (IHA) Hydropower Sustainability Assessment Protocol (HSAP) and the International Commission on Large Dams (ICOLD) Guideline.

Between 2004 and 2005, Sarawak had become increasingly concerned about its finite resources, and so looked for a model of sustainable economic growth driven by hydropower development. The Sarawak Corridor of Renewable Energy (SCORE) was then catalysed by Sarawak Energy and developed as a proactive strategy, reflecting the Government's determination to provide security for the futures of its economy and the generations to come.



In 2000, 74% of Sarawak's power generation came from hydrocarbons. Today, hydropower represents 75% of the State's generation mix, made possible by the abundance of rainfall, rivers, and the right terrain in the State. Hydropower will remain the predominant renewable generation source, but to ensure security of supply thermal plants will be incorporated into the generation mix by harnessing Sarawak's indigenous coal and gas resources.

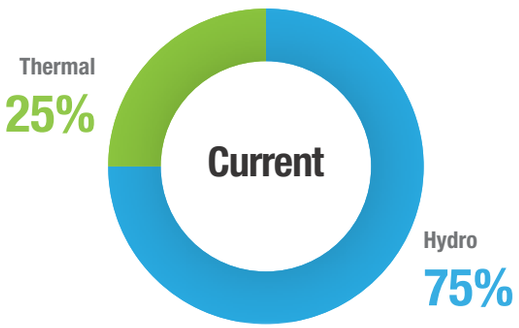
"Currently, the three hydropower plants we have in operation are Batang Ai, Murum, and Bakun which have a combined generation capacity of 3,452MW. We are building on the experience from these three to further improve our processes in the next hydropower development, the 1,285-MW Baleh project which will be completed in 2025," the GCEO shared.

Also by 2025, alternative energy such as solar and biomass will enter the generation mix. Last year, 9MW of solar power had been jump started into the mix, most notably through the Sarawak Alternative Rural Electrification Scheme (SARES) which is an integrated initiative of the State Government from 2016 to 2020. SARES aims to provide 24-hour electricity supply to communities that are too remote for connection to the State Grid.

Due to hydropower development and the competitively priced tariffs, the State has successfully attracted a number of international energy-intensive investors, advancing the SCORE agenda. Presently, Sarawak Energy has a committed demand of more than 2,000MW from industrial customers in Samalaju Industrial Park.

Since embarking on SCORE and focusing on hydropower development, the higher percentage of hydropower in Sarawak's generation mix has reduced its carbon generation intensity by 72% since 2010. This is a significant contribution towards Malaysia's drive in achieving its Paris COP21 target.

A balanced generation mix



Being a wholly government-owned corporation, some of the fruits of Sarawak Energy's partnership with the State in its development agenda can be seen in the initiatives spearheaded by the corporation, under the State's aspiration to build a digital economy in tandem with a hydrogen economy.

"We have been entrusted to lead energy-related research, starting with a feasibility study on hydrogen and fuel cells applications in the State. We recently went on educational visits to China and Japan where the building blocks for a hydrogen economy are being laid. In fact, many other players around the world are also looking at hydrogen and fuel cells research," Sharbini shared.

Aspiring to be ahead of the curve, Sarawak Energy is applying key technologies towards pursuing various initiatives for its customers and in its operations. These include e-commerce, Sarawak Pay, hydrogen trains and vehicles, electric vehicles, and digital infrastructure.

"Energy drives development, thus hydropower in Sarawak is the driver for transforming the economy and providing positive livelihood opportunities to communities in a sustainable manner. Sarawak Energy will continue to supply affordable, reliable, and renewable energy to energise Sarawak for an even brighter future," he concluded.

SUSTAINABLE ENERGY:

A CLIMATE SHIELD FOR OUR FUTURE

A few of my treasured moments pertain to the times when I visited the longhouses and communal villages of relatives during the festive seasons. On one of these occasions, I casually glanced at some native Sarawakian shields which graced the walls of these longhouses. In that moment it occurred to me that, yes, that is precisely what sustainable energy is doing. Sustainable energy acts as a shield against **worsening climate change** and **energy depletion**. It is a shield that will help protect the environment for our children, and the many generations to come after.

Shields come in all sizes, and size does matter. Obviously, large shields offer greater protection than small ones. To combat climate change, the need to achieve rapid decarbonisation is essential. Studies have shown that currently, the global carbon emission is around 40 billion tonnes per annum and in another 15 years, we have to decrease this to just 600 million tonnes per annum in order to prevent a global average temperature increase of above 2°C. While many countries have initiated their climate shields, the urgency lies with increasing these shields to not tip over the critical 2°C threshold. In fact, 2050 has been earmarked as a year for global carbon neutrality. While this seems like a tall order, to reach such a goal we must have ambitious targets for sustainable energy and development as a whole.

Different shields have different functions. As my mind delved into the concept, I started reading more about the different types of shields. During medieval times, there were a variety of shields for different purposes e.g. Viking, bouche, buckler, targe, heater, kite, and pavise shields. This reminded me that sustainable energy comes in various forms. In the 4th International Sustainable Energy Summit (ISES) 2018, the sustainable energy platform encompasses renewable energy (RE) and energy efficiency and conservation. In Malaysia, RE is dominated by solar and hydro resources. Solar and hydro form important symbiotic relationships in stabilising the electricity supply from RE. Nevertheless, other forms of available RE include biomass and biogas, and these forms of renewables are important as they also contribute to the energy balancing market. RE is complemented by energy demand management; the latter ensures energy is efficiently utilised with minimal wastage. Energy intensity is highest in cities, and at the Summit, a deep dive workshop (DDW) is dedicated to the low-carbon cities development programme, since SEDA Malaysia has been implementing the Green Technology Applications for the Development of Low Carbon Cities (GTALCC) project which is meant to reduce energy intensity and carbon emissions in Malaysia.

Shields need to work together. Have you seen warriors forming a wall with their shields for protection, in movies? Although a shield can function on its own, multiple shields are fortified in function when they work together. This is also true for sustainable energy. When distributed RE systems are treated as an aggregate whole, a virtual power plant is formed. When variable renewable resources integrate with other renewable resources that can function as flexible resources, the issue of variability is reduced and we can secure a firm supply of electricity. This is further enhanced with the introduction of energy storage systems, and that brings me to teamwork and *esprit de corps* as no man is an island.

Shields need to work with other tools. In a battle, shields are not the only weapons used. Similarly, sustainable energy works in synergy with other solutions such as energy storage systems, smart grids, and the digitisation of the electricity system. Even when it comes to energy storage, there are a myriad of solutions - for instance, lithium-ion batteries, hydrogen fuel cells, pumped storage, and others. For the 4th ISES 2018, a DDW has been committed to energy storage systems, of which each plays its role in addressing intraday, intermediate, and long-haul energy gaps. Interestingly, this Summit will see the introduction of expired and on-going mining reservoirs that are being utilised as pumped storage. Digitisation also plays a key role in underpinning the new electricity framework. In the past year, blockchain technologies have risen to fame thanks to cryptocurrencies such as the Bitcoin. But far from just being in vogue, the energy sector has been increasing its use of blockchain technologies for the trust, transparency, efficiency, and security of its data. At the 4th ISES 2018, we have experts from the blockchain domain that will share more on the future role of this technology in the future electricity market. In one such discussion, an expert will cover one of the more compelling utilisations of this technology in the aggregation and fractionalising of energy assets in energy trading platforms. Energy assets refer to distributed RE and energy storage systems. This sounds really exciting, and it goes to show that our climate shield needs to work with other solutions in order to increase its overall climate effectiveness.

"...global carbon emission is around 40 billion tonnes per annum and in another 15 years, we have to decrease this to just 600 million tonnes per annum..."

A shield is nothing unless it is being utilised. When I was a child, I was always reminded that actions speak louder than words, similarly to a photograph which shows more than words! Today, we can have the most impressive roadmaps, master plans, and blueprints on sustainable energy and climate deals, but unless these strategies are implemented the global energy transition will go nowhere. Unless there is true commitment and strong will from all key stakeholders to implement these strategies, the climate shield remains a mere decoration on the wall. Commitment needs to come in the form of disbursing scarce resources such as skilled manpower, financing schemes, and time. In the 4th ISES 2018, we are honoured to have nearly 80 thought leaders as speakers and chairs spanning the various sectors of sustainable energy, including policymakers, industry technology providers, financial institutions, investors, and power utilities. I believe that the knowledge culminated and bench marked from these experts will enhance the effective use of the climate shield.

The climate shield for our future. The world is inundated with issues of all sorts. According to the Global Risks Report 2018 of the World Economic Forum (WEF), extreme weather events (EWE) are the most likely and most severe threat facing humanity this year. As a result of the climate crisis, we have climate refugees, threats to humanity as a result of decreasing water, food, and energy security, and rising health issues due to increasing pollution. The climate shield preserves the balance among ecosystems needed for human survival - that includes your children and mine, and the many generations to come.

Sarawak, an exemplary climate shield. I am proud of my State for being a model for upholding the climate shield. Sarawak is a State that is powered by more than 70% hydropower. It is a State with the lowest carbon footprint and has the lowest electricity tariff in the country. Sarawak is truly an exemplary State in its role as a climate shield. There is no surprise with Sarawak being the ideal location to host the first International Sustainable Energy Summit (ISES) outside of the Klang Valley.

Hence, I sincerely urge each and every one of us here to pick up our own shields and walk the talk.

CATHERINE RIDU
CEO, SEDA Malaysia
Organising Chair, 4th ISES 2018

4TH ISES 2018 PROGRAMME

DAY 1

10TH APRIL 2018

8.30 am
Registration

9.00 am
Opening Ceremony

10.00 am
Networking Break/
VVIP visit booths/
Press Conference

10.30 am
PLENARY SESSION 1:
Envisioning the Future of Electricity Market: Transformation Towards a Greener Electricity Sector

In this session, the panellists, comprising of Government and international sectors will discuss what the future electricity market will be like, the countries' aspirations on sustainable energy, and their targets to meet their climate obligations as pledged under the Paris Agreement. They will address the existential challenges of scaling up sustainable energy in their electricity mix, the effective intervening policies, and the role of regional cooperation to achieve the common goal of decarbonising the electricity sector.

11.45 am
PLENARY SESSION 2:
Capital Planning: Reinventing the Business Model for Power Utilities in the Future Electricity Market

Globally, the process of energy transition from fossil fuels to renewable energy is shaping the future electricity market such that power utilities are required to change their business model to prevent falling into victims of the utility death spiral. In some countries, power utilities are starting to invest in sustainable energy and e-mobility infrastructure. This session will discuss the impact of energy transition to the business of power utilities and how the utilities are reinventing the business models to remain relevant in the future electricity market. The discussion will include the measures for utilities to adopt in order to avoid stranded carbon assets and the relevance of baseload in the future electricity market.

1.00 pm
Networking Lunch

2.15 pm
DDW 1: Integrating Large Scale Distributed Solar PV Systems to the Grid

DDW 2: Bioenergy: Outlook for Bioenergy Market and Developing Sustainable Business Models

3.45 pm
Networking Break

4.00 pm
DDW 3: Global PV Market and Industry Outlook for 2018

DDW 4: Sustainable Hydropower: Harnessing the Future Now

5.30 pm
Business Networking Session

7.00 pm
4th ISES Gala Dinner 2018

DAY 2

11TH APRIL 2018

9.00 am
PLENARY SESSION 3:
National and State Electricity Market Transformation Roadmap

In this session, the panellists will discuss at the national and state levels, the strategies to achieve energy balance and security, affordable electricity, and institutionalising the climate agenda in electricity transformation. Discussion will include developing policy frameworks that will decouple economic growth from increasing GHG emissions and resource constraint, and the technical and entrepreneurial skills required for the new energy paradigm.

10.30 am
Networking Break

11.00 am
DDW 5: Best Practice on Auctioning of Large Scale Renewable Energy Projects and Designing Eective Sustainable Energy Policies

DDW 6: The Future Role of Blockchain Technologies in the Energy Market

12.30 pm
Networking Lunch

1.30 pm
DDW 7: Low Carbon Cities Development Programme

DDW 8: Final Frontier: Ensuring Sustainable and Equitable Energy for All

3.00 pm
Networking Break

3.30 pm
DDW 9: Unlocking Aordable Financing for Sustainable Energy Investments: The Role of International Donors and Financial Institutions

DDW 10: The Emergence of Energy Storage Systems: Opportunities & challenges

5.00 pm
Closing Session

2018 ISES International Sustainable Energy Summit

Sustainable Energy : The Future Is Here

KEYNOTE SPEAKERS & ADVISORS

YAB DATUK PATINGGI (DR) ABANG HAJI ABDUL RAHMAN ZOHARI TUN DATUK ABANG HAJI OPENG

Chief Minister of Sarawak

Abang Zohari is the youngest son of the first Governor of Sarawak, the late Tun Datuk Abang Haji Openg Abang Sapiee. He entered politics in 1977 as a United Bumiputera Heritage Party (PBB) youth leader and was first elected to the State Legislative Assembly when he won the Satok seat in 1981. He has been a Member of the State Legislative Assembly for Satok for nine consecutive terms. In 2008, he was bestowed the State Award of Darjah Utama Yang Amat Mulia Bintang Kenyalang Sarawak (DA) which carries the title "Datuk Amar." Abang Zohari has also been President of SABERKAS since 2009.

YB DATO SRI DR. STEPHEN RUNDI ANAK UTOM

Minister of Utilities Sarawak

Rundi was the Minister of Public Utilities before the last cabinet reshuffle in 2017. He was Secretary-General of the United Bumiputera Heritage Party (PBB) until February 2018, and he still serves as Secretary-General of the Sarawak National Front (BN). He is also a Member of the Supreme Council of BN Malaysia and PBB, and a Kemena Assemblyman. Other capacities which Rundi has served in include Assistant Minister of Public Health (2009-2011) and Assistant Minister of Youth Development, Rural Areas (2011-2016). In 2016, he was honoured with the Panglima Negara Bintang Sarawak state order.

YBHG DATO' IR. ALICE JAWAN EMPALING

Permanent Secretary, Ministry of Utilities, Sarawak

Alice is a professional engineer with a Civil Engineering degree from the University of Tennessee-Knoxville, USA. She earned her Executive Master of Business Administration from the University of Ohio, USA. Alice served in the water industry for 26 years; she has experiences in areas such as project management, water treatment processes, and Non-Revenue Water (NRW) management (which she specialises in). She has presented papers on topics such as NRW management, women development, energy, and hydropower at various national and international conferences.

YB DATUK SERI PANGLIMA DR. MAXIMUS JOHNITY ONGKILI

Minister of Energy, Green Technology and Water, Malaysia (KeTTHA)

At age 10, Ongkili's capabilities, discipline, and determination saw him winning the prestigious Colombo Plan Scholarship to study in Australia. He started his career as a lecturer with Universiti Pertanian Malaysia (now known as Universiti Putra Malaysia) and later held senior research positions with the Institute of Strategic and International Studies (ISIS) Malaysia (1985-1987). His foray into politics began in 1994 when he was nominated to stand as a United Sabah Party (PBS) candidate. After retaining his Kota Marudu parliamentary seat in the 2013 General Election, Ongkili was then appointed KeTTHA Minister where he has been diligently serving.

YBHG DATUK DR. YEE MOH CHAI

Chairman of SEDA Malaysia

Yee was appointed Chairman on 1 September 2013. He is also the Deputy President of PBS, a post he has held since 1994. Yee began his career with the Medical Practitioners Defence Society and Medical Protection Society of London, United Kingdom. His career in civil service began as the Minister of Resource Development and Information Technology, Sabah (2004-2013). From April 2011 to May 2013, Yee was the Deputy Chief Minister of Sabah. He was also a State Assemblyman for Api-Api N.15 from 1999 to 2013.

YBHG DATO' SERI IR. DR. ZAINI UJANG

Secretary-General, Ministry of Energy, Green Technology and Water, Malaysia (KeTTHA)

Zaini has written more than 250 scientific papers published in leading academic journals and proceedings, and 33 books on environmental engineering, water sustainability, higher education, and learning innovation. From October 2008 to May 2013, he was the fifth Vice-Chancellor of University Technology Malaysia. He was also the first recipient of the prestigious Merdeka Award for the category of Outstanding Scholastics Achievement in 2009. Zaini previously served as Secretary-General in the Ministry of Higher Education and Secretary-General II in the Ministry of Education Malaysia before KeTTHA.

SPEAKER PROFILES

H.E. DR. KHAMMANY INTHILATH
Minister of Energy and Mines,
Laos

H.E. DAG JUHLIN-DANNFELT
The Ambassador of Sweden
to Malaysia,
Embassy of Sweden

H.E. MARIA CASTILLO FERNANDEZ
Ambassador & Head of the
EU Delegation to Malaysia

H.E. KARIN MÖSSENLECHNER
The Ambassador of the
Netherlands to Malaysia,
Embassy of the Netherlands

MR. RIDA MULYANA
Director General of New and
Renewable Energy, and Energy
Conservation,
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All information on ISES 2018 speakers stated here is correct at time of printing.

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MS. JULIA HAMM
President & Chief Executive Officer,
Smart Electric Power Alliance (SEPA)

IR. DR. SANJAYAN VELAUTHAM
Executive Director,
ASEAN Centre for Energy (ACE)

MR. SHARBINI SUHAILI
Group Chief Executive Officer,
Sarawak Energy Berhad

IR. JAMES UNG SING KWONG
Chief Executive Officer,
SEB Power,
Sarawak Energy Berhad

To read the full bios of speakers, please scan this QR code.

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Malaysian Green Technology Corporation (MGTC)

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YBHG DATO' IR. DR. ALI ASKAR SHER MOHAMAD
Managing Director,
Sher Engineering & Consultancy

DR. WEI-NEE CHEN
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To read the full bios of speakers, please scan this QR code.

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MR. AHMAD FARID MOHAMMED
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MS. WAN HASHIMAH WAN SALLEH
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NEM
Net Energy Metering

"Solar Energy, Empowering the Consumers"

Concept of NEM

UNDERSTANDING NET METERING

The energy generated by PV is consumed in situ and any excess energy generated is exported to the grid.

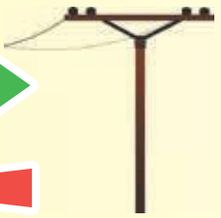
Excess energy not used by your home goes back to the electricity grid

Energy used by your home from the electricity grid

Solar PV array converts energy from sunlight into electricity

- The inverter converts the electricity produced by the solar array from direct current (DC) to alternating current (AC).
- PV meter measures the energy generated by the solar PV system.

- The Bidirectional Meter.
- Indicates energy usage and excess energy produced



- Utility pole / distribution line

For more information regarding NEM or how to apply, please visit:
www.seda.gov.my

MINISTRY OF ENERGY, GREEN TECHNOLOGY AND WATER (KeTTHA)

Suruhanjaya Tenaga
Energy Commission

Sustainable Energy Development Authority • MALAYSIA • seda

TENAGA NASIONAL
Better. Brighter.

SABAH ELECTRICITY SDN. BHD. (462872-W)

BACKGROUND

The NEM is a solar photovoltaic (PV) programme announced by the YAB Prime Minister under the 2016 budget.

This is to complement the current Feed-in Tariff (FiT) mechanism and encourage the deployment of renewable energy (RE) as meted out in Eleventh Malaysia Plan (RMK-11).

NEM is executed by the Ministry of Energy, Green Technology & Water (KeTTHA), regulated by the Energy Commission(EC), with Sustainable Energy Development Authority (SEDA) Malaysia as the implementing agency.

Malaysia is implementing its 500MW capacity under the Net Energy Metering (NEM) programme commencing 1st November 2016 until 2020 with 100MW capacity limit a year for both Peninsular Malaysia and Sabah.

WHAT IS NEM ?

The concept of NEM is that the energy produced from the solar PV system installed will be consumed first, and any excess to be exported and sold to the distribution licensee (such as TNB /SESB) at the prevailing Displaced Cost prescribed by the Energy Commission.

This scheme is applicable to all domestic, commercial and industrial sectors as long as they are the customers of TNB(Peninsular Malaysia) and SESB (Sabah and FT Labuan).

WHAT ARE THE BENEFITS OF NEM ?

Encourages consumers to play an active role in renewable energy (RE) generation, which addresses climate agenda and national energy security.

The more energy generated from the solar PV system is self-consumed; the more NEM consumers can save their electricity bills (by reducing the electricity imported from the utility).

Reduction in greenhouse gas emissions

Hedge against any possibility of future electricity tariff increase

FOR FURTHER INQUIRIES

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HOMEGROWN COLLABORATION

Faces of the Concord Group, L-R: CEO Datuk Khairuddin Mohd Hussin, Executive Chairman Tan Sri Datuk Seri Mohd Hussin Abd Hamid, and Deputy CEO Abdul Malik Mohd Hussin.

At the Terengganu Expo 2018 in Kuala Terengganu in February, a signing ceremony was held for the collaboration project for biogas production and power generation through a Build-Own-Operate-Transfer (BOOT) arrangement between Concord Alliance Sdn. Bhd. and TDM Berhad.

TDM is the first government-linked company (GLC) in Terengganu to introduce biogas capturing for power generation, concerning the concept of "waste to wealth" in which the generated electricity will be sold to Tenaga Nasional Berhad (TNB) under the Feed-in Tariff (FiT) quota. This quota will be applied with the Sustainable Energy Development Authority (SEDA) Malaysia. In addition, the biogas plant prioritises green technology to ensure environmental protection and to help strengthen the existing palm oil mill effluent (POME) treatment system in minimising pollution.

"The BOOT agreement is for two locations at TDM Plantation Sdn. Bhd. palm oil mills in Kemaman and Sungai Tong, Terengganu. Although the cost of the entire biogas plant project for the two plants is around RM 38 million, the BOOT arrangement sees that all construction costs are fully borne by the developer and that a percentage of the revenue is allocated to TDM annually in accordance with the agreement. The concession will operate for 16 years, and then the whole biogas assets will be transferred to TDM at no additional cost." explained Dato' Haji Mohamat Muda, Group CEO of TDM.

The agreement was signed by Mohamat Muda and Datuk Khairuddin Mohd Hussin, Executive Director of Concord Alliance. The signing ceremony was witnessed by the Chief Minister of Terengganu YAB Dato' Seri Haji Ahmad Razif Abdul Rahman, the Chairman of TDM Berhad Dato' Haji Wan Nawawi Haji Wan Ismail, and the Executive Chairman of Concord Alliance Tan Sri Datuk Seri Mohd Hussin Abd Hamid.

"TDM has outlined a comprehensive long-term business plan in order to become one of the major players or institutions in the plantation sector. As a committed RSPO and MSPO certificate holder, TDM has approved the construction of this biogas plant. In addition to conserving the environment, the plant is also capable of generating income by delivering electricity to the TNB grid," Wan Nawawi shared.

Both the palm oil mills in Kemaman and Sungai Tong are capable of processing more than 600,000mt of oil palm annually. Of this, 390,000mt of POME will be produced, sufficient for supplying methane gas to the biogas plant to generate more than 4MW of electricity.

Apart from the aforementioned benefits, these projects will create employment opportunities for the local community and supply feedstock to TDM's bio-organic fertiliser plant.

"We are delighted that TDM has chosen Concord Alliance for this collaboration. We are committed to TDM and other stakeholders, and we can do and deliver what we promised. By doing so, Concord will be a major contributor to facilitating other stakeholders in achieving Malaysia's Green Agenda," Mohd Hussin affirmed.

He continued: "Besides TDM, we wish to also express our appreciation to SEDA Malaysia, TNB, Bioeconomy Corporation, Unit Peneraju Agenda Bumiputera (TERAJU), MIDA, our financial institutions Malaysia Debt Ventures Berhad (MDV) and Hong Leong Bank, Malaysia Green Technology Corporation (MGTC), the Energy Commission, and CGC Malaysia for their support and trust in Concord throughout our involvement in biogas projects. We hope our collaborations can continue within the current TDM projects."

Biogas opportunities in Malaysia are at their greatest now that the Government requires all palm oil mills in Malaysia be equipped with biogas facilities by 2020. Currently, there are more than 500 mills in Malaysia and only around 20% of those are installed with biogas capture facilities.

Malaysia is blessed with oil palms. Hence, **Concord Green Energy Sdn. Bhd.** (CGESB) believes that biogas generated from oil palm sources presents the greatest opportunity to us and the industry as compared to other feedstock sources. This blessing helps us to promote biogas from oil palm as well as advance the Green Agenda in the country by harnessing and capturing biogas from palm oil mill effluent (POME).

We are pleased to announce that we are currently developing biogas to electricity power generation projects at four Felda Global Ventures Holdings Berhad (FGV) mills, power which will then be sold to Tenaga Nasional Berhad (TNB) under the Feed-in Tariff (FiT) quota, issued by the Sustainable Energy Development Authority (SEDA) Malaysia. We expect to complete and commission all four by October. In addition, just last month our Concord Group of Companies (Concord Group) signed another agreement with TDM Berhad, a Terengganu State Government company, to develop and generate biogas to electricity power generation projects at their two mills in Terengganu.

We are also setting our sights beyond the Malaysian horizon to expand our regional market - we have now ventured into Indonesia. Just like Malaysia, Indonesia is now looking at expanding their renewable energy (RE) sector as a source of power generation for their country. With a numerous number of mills nationwide, there are many opportunities on offer for the Concord Group and other biogas players to be involved in the biogas industry in that country.

Unlike in Malaysia, where our role consists of mainly developing biogas projects under Build, Own and Operate (BOO) or Build, Own, Operate and Transfer (BOOT) arrangements, in Indonesia we primarily undertake projects as an Engineering, Procurement, Construction and Commissioning (EPCC) contractor. In general, for a foreign industry player like us, there are challenges that need to be addressed when entering a new country: current government regulations, political stability, types and sources of financing available, and the availability of reliable local partners and credible project owners.

We believe that having local partners is essential for assimilating and localising ourselves to the local environment. We have local equity and strategic partners for our current projects in Indonesia. Besides the requirements imposed by federal and local government, having a local strategic partner(s) helps give credibility and comfort to our prospective clients, project owners, suppliers, and contractors. The local partner can also assist with managing our responsibilities to all stakeholders. For financing purposes, we may stand better chances of obtaining funds from local institutions if we have a strong and credible local equity partner. For the project itself, we can generate better synergies through common shared resources during the development, operation, and procurement processes of the projects.

Presently, the Concord Group is involved in two EPCC projects in Indonesia, one in Kalimantan Tengah and the other in Sumatera Utara. These are two regions with the highest concentrations of oil palm plantations in Indonesia. While we are currently working with FGV in Malaysia, there may be potential for us to work together in Indonesia, too, as FGV owns and operates large acres of oil palm plantations there.

Even though the potential return for biogas development in the region is attractive, on our part, we need to set ourselves to be an exemplary corporate citizen in the promotion of the green agenda of the relevant country and in accordance with the ASEAN spirit, to share and transfer economic and technological benefits to the local economies.

As our business model is specialised in the very niche market of harnessing biogas from POME sources, the possibilities for us to venture into certain Southeast Asian countries are limited as these countries have limited oil palm plantation areas to be begin with. However, the three countries which present the greatest opportunities at this point in time for a POME biogas player like us would be Malaysia, Thailand, and Indonesia. We are currently operational in and focused on Malaysia and Indonesia.

At the end of the day, our priority will always be with Malaysia. Compared to other countries in the region, we are blessed with an RE agenda here that is very structured. At the forefront of all this, managing the direction and implementation of RE projects in the country is SEDA Malaysia. It plays the most prominent role in implementing and expanding the RE agenda in the country.

SEDA Malaysia's team is very dynamic with sound technical personnel coming from diverse backgrounds in the industry. As such, the people at SEDA Malaysia understand the issues and problems that may be faced by developers and FiT quota holders when developing and managing FiT projects. A good example is SEDA Malaysia's engagement process held with regular industry players through consistent workshops, open days, and Q&A sessions - not to mention the globally recognised biennial International Sustainable Energy Summit (ISES).

On top of that, in Malaysia we have various financial assistance and government incentives to guide and assist industry players, especially start-up companies in the RE industry. Such aid has come from agencies and government linked companies/authorities/bodies such as TNB, Bioeconomy Corporation, Unit Peneraju Agenda Bumiputera (TERAJU), Malaysian Investment Development Authority (MIDA), Malaysian Green Technology Corporation (MGTC), CGC Malaysia, and the Energy Commission.

We hope to serve the country - and the region - for years to come.

DATUK KHAIRUDDIN MOHD HUSSIN
Chief Executive Officer
Concord Green Energy Sdn. Bhd.

"...we need to set ourselves to be an exemplary corporate citizen in the promotion of the green agenda of the relevant country and in accordance with the ASEAN spirit..."

EXPANDING OUR HORIZONS

CLEAN ENERGY,
CONSCIENTIOUS COMMUNITIES

MERGING EXPERTISE AND PASSION TO ADVANCE THE BIOGAS INDUSTRY

Cenergi's plant and HQ staff work closely together to fulfill Cenergi's missions.

The demand for electricity is expected to increase as society progresses and industries across all sectors continue to develop. Malaysians use over 12,000MW of energy every day, and more than 100,000GWh of electricity every year. In October 2017, the country recorded an all-time high in daily electricity usage as the maximum demand rose to 17,790MW. While the present supply of electricity is adequate for current times, how do we ensure that there is a stable and reliable supply of electricity, one that is matched to the needs of the future?

Cenergi recognises the impact clean energy has on communities. In doing so, it invests in biogas and other clean energy projects that increases the quality of life while contributing to a sustainable future. With the significant contribution of the oil palm industry to the country's economy (making up over 40% of the agriculture sector's contribution to our nation's GDP for 2016), it is crucial that we also look at ways to maximise the use of biogas obtained from the anaerobic digestion of palm oil mill effluent (POME) for electricity generation.

As the nation's largest grid-connected POME biogas provider, Cenergi has been exporting electricity to the national grid for the past four years. A stable and functioning biogas plant is both a secure investment and an environmentally responsible asset. To date, the company has four plants around Peninsular Malaysia that have a combined generation capacity of 5.5MW with another 1.5MW under construction. On top of producing clean and renewable energy sources, these plants simultaneously reduce greenhouse gas (GHG) emissions.

In promoting better use of renewable energy, the Havys Biogas Power Plant by Cenergi is the first biogas project that operates under a 13-year Build-Own-Operate-Transfer (BOOT) agreement. Havys is celebrating its fifth anniversary of operations this coming August and is located in the state of Pahang. Throughout the contractual BOOT period, the mill owner provides sufficient POME feedstock free-of-charge. Then, once operational, the plant generates revenue from the sale of electricity to the grid. This revenue-sharing model will further provide the mill owner a portion of the power and carbon sales.

An aerial view of Cheekah Biogas Plant that can generate 1MW of power.

Sri Jelutung's Biogas Power Plant utilises two scrubbers; one for main operations and the other serves as backup.

In transforming climate change liabilities into revenue-generating assets, all of Cenergi's biogas plants namely Sawira Biogas Power Plant, Cheekah-Kemayan Biogas Power Plant, Sri Jelutong Biogas Power Plant, Havys Biogas Power Plant, and Pantai Remis Biogas Power Plant (under construction) are known for their key features. These include higher alkalinity which results in a more robust digestion process, longer wastewater retention time for better stabilisation, lower energy requirements which reduces overall costs, and lower methane emissions. Cenergi's biogas plants are able to reduce carbon emissions in addition to turning waste to wealth for palm oil millers.

With 36 employees at its plants throughout Peninsular Malaysia, Cenergi sets itself apart from other players in the industry. United by a passion for a sustainable future, the team at Cenergi has proven technical, commercial, financial, and operational capabilities in reducing carbon footprint whilst contributing to a sustainable future for communities at large. With decades of in-house expertise, Cenergi is assisting countries throughout the region to grow sustainably. The expanding team is committed to delivering impactful projects across Southeast Asia with an aim to create a society that is conscious of our future environment. Cenergi believes in the collective effort and aspires to impact a sustainable future where communities realise the need to function in harmony with the environment.

Cenergi with some of the community members near Sawira Biogas Plant.

Cenergi does its best to incorporate sustainable values in all of its CSR programmes.

A CONSCIENTIOUS SOCIETY FOR A GREENER TOMORROW

Worries about climate change are increasing as greenhouse gas (GHG) emissions hits a new high. Reports published last September indicate that countries such as Malaysia, Indonesia, and the Philippines saw a significant increase in carbon emissions throughout 2016. Recent research also revealed that the world collectively emits about 40 billion tonnes of carbon emissions into the atmosphere every year. After stalling for three years, world carbon emissions rose by 2% in 2017. With human activity being the main cause of this situation, society needs to take immediate action to reduce the deteriorating environmental conditions.

Combatting this issue goes beyond producing renewable energy (RE) and implementing energy efficiency solutions. We are in need of a more conscientious society that realises the importance of functioning in harmony with the environment. With sustainability being central in everything it does, Cenergi aims to ensure that both industry and society realise the need to reduce the negative impact humans have on the environment.

Developing a Cleaner Tomorrow.

Cenergi stands firm in believing that behavioral change and conscious use of energy is key to a sustainable future. By being aware of our energy usage, we can look at measures to eliminate wasteful and non-productive patterns of energy consumption. Encouraging society to save energy is challenging as many consider it a disruption to their routines. However, most changes that save energy are relatively simple, such as increasing the air-conditioning temperature by a few degrees. By making these simple changes, we ensure a sustainable future that does not compromise the quality of life for the future generation. For this, education at the grassroots level needs to be solidified and policies around energy conservation need to be reinforced.

As Malaysia pledges to reduce GHG emissions by 45% by 2030, many initiatives across numerous sectors have been implemented by the Government including the Green Technology Master Plan (GTMP) 2017-2030 that aims to transform Malaysia into a low-carbon and resource-efficient economy; the Energy Efficiency Action Plan that seeks to reduce 13.113 million tonnes of carbon emissions within the next 12 years; and the launching of the Mass Rapid Transit (MRT) to remove approximately 89 million cars on the road by 2030.

In identifying energy-saving strategies, Cenergi recognises the positive impact clean energy has on the communities around us. The company invests in clean energy projects that contribute to a sustainable future and encourages an impactful outcome to better our current environmental condition through collective efforts by society and industry decision makers. In 2017 alone, Cenergi reduced the reliance on fossil fuels by generating a total of 24,000MWh of energy that year. The electricity obtained from this was fed back to the national grid and is equivalent to the energy that is able to power up 1,000 average Malaysian households for eight years.

With its cutting edge innovation in green technology and aim to reduce carbon footprint, Cenergi is committed to taking the Southeast Asian region towards a more sustainable future whilst growing its flagship biogas, energy efficiency projects and other clean energy solutions.

Environmental, Social, and Governance (ESG) is an integral part of Cenergi's culture. The company integrates sustainability into every stage of its business and project execution to cultivate an environmentally-conscious society. This practice is also upheld by its employees where the team leads by example with ESG practices, such as on-site recycling and waste management, educational partnerships with local universities to offer internships to prospective graduates, and employing and developing local talents to manage and operate their plants.

Cenergi's plant workers undergoing a safety training.

Green is the new GOLD

How CIMB contributes to the sustainability cause

The Anchor

For centuries the world has relied on gold as more than just a unit of measurement of value - a unit for measuring life itself as life seemed to revolve around gold for nearly 5000 years. In a way, gold has united humans by its luster, awe, and unique qualities.

The 20th century witnessed the abandonment of the gold standard as a monetary system by all countries. The financial system as a result, according to many economists, lost its anchor, not just in terms of a value benchmark but more importantly, the financial system lost that point of reference that for centuries captivated our minds and souls.

"In the absence of the gold standard, there is no way to protect savings from confiscation through inflation. There is no safe store of value." - Alan Greenspan

Energy Replaces Gold

Energy, in this new era of advanced technology, plays a role similar to that which was held by gold for millennia. Not only does energy affect our economies and financial systems and powers our daily lives to such an extent that life is unimaginable without energy, but also our future is designed, planned, and envisioned to be even more dependent on energy. Now, our lives seem to revolve around energy.

Why Green Energy

The problem with energy is that we have extracted it since the industrial revolution from the Earth's finite resources, and at the current economic growth rates there will come a day when there will be none left. Furthermore, the effects of relying on oil- and gas-based energy on the Earth's climate and its rising temperatures are evident.

Therefore, balancing the needs of our energy-dependent societies and energy-intensive economies, while at the same time preserving our planet for future generations (in a way that does not harm our planet) implies finding new and more efficient means of converting and utilising energy - the new gold.

Climate change is referred to by leading economists as the greatest market failure in human history, with potentially disruptive implications on the social well-being, economic development, and financial stability of current and future generations: conservative estimates see unabated climate change leading to global costs equivalent to losing between 5-20% of the global gross domestic product (GDP) each year.

Doing nothing about the sustainability challenges is not an option anymore. Therefore, the need for new global standards is imperative if we hope to positively impact the development of Green Standards.

Powering the ambitions of ASEAN's leading corporates.

Growing a business into an industry champion not only takes tenacity and foresight. It also means surrounding yourself with the right people. That includes finding a banking partner, equipped with the right expertise, to give you the advice you need.

As a leading ASEAN wholesale bank, CIMB has an estabilished track record in enabling regional corporates across key sectors and geographies, enabling you to unlock value and access the best opportunities the region has to offer.

For more information on how we can turn your ambitions into reality, call **+603-2261-8888** or visit **www.cimb.com**.

FORWARD Your Vision

- **Most Innovative Investment Bank, Asia Pacific** (The Banker Investment Banking Awards 2016)
- **Best Bank, Best DCM House and Best Investment Bank, Malaysia** (FinanceAsia Country Awards 2017)
- **Best Investment Bank, Sukuk House of the Year, Asia Pacific** (The Asset Triple A Islamic Finance Awards 2017)

CIMB

CIMB Bank Berhad (13491-P)

The Role of Banks

Banks and financial institutions in general play a central role in the transformation towards green and sustainable economies. It is not an exaggeration to say that the role of banks and financial institutions is second only to that of governments, for a number of reasons, including but not limited to:

- Banks evaluate and price the risks associated with sustainability and hence influence the decisions made by businesses that will have direct impact on the environment and society in general;
- Banks raise funds for, invest in, and in many cases, are directly involved in the management of large infrastructure projects that shape local and regional economies for decades. The transformation to a low-carbon economy is estimated to require close to USD 100 trillion of fresh infrastructure investments by 2030;
- Banks raise awareness and influence the behavior of corporates through stakeholder engagement and partnership;
- Banks are also negatively impacted by the climate change phenomenon through loss of businesses and bad loans, as extreme weather conditions have affected businesses in many areas around the world.

Banks, therefore, are key players in facilitating the shift needed towards the new era of Green Standards. This is not just about complying with international standards or capturing business opportunities; this has become a moral duty to do the right thing.

It is noteworthy to mention here also the role of central banks in leading this shift towards conscious financial systems. Research has shown that the quality of regulation has a significant bearing on the successful transformation towards sustainable banking models; it also showed correlation between the quality of regulation and the environmental performance in any particular country.

In 2017 Bank Negara Malaysia (BNM), in collaboration with the Islamic finance industry, released a Strategy Paper on Value-based Intermediation (VBI), an initiative that aims to promote the application of VBI practices which will lead to an improved suite of products and services offered by Islamic banks.

What CIMB is Doing

At CIMB, we are taking a long-term approach towards creating shared sustainability value for our diverse stakeholders. As a leading regional bank, it is our aim to add value by designing and promoting our quality financial products and enhancing access to finance.

To that end, in 2017, we led the issuance of Quantum Solar Park (Semenanjung) Sdn Bhd's ("QSPSemananjung") RM 1 billion Green SRI Sukuk to partially fund three solar photovoltaic plants in Malaysia. The projects are expected to be instrumental in helping Malaysia achieve sustainable electricity supply and the reduction in carbon emissions, in line with the National Renewable Energy Policy and the National Green Technology Policy of Malaysia. QSPSemananjung's Green Bond Framework received a Dark Green shading - which entails zero emission solutions and governance structures that integrate environmental concerns into all activities - from the Centre for International Climate Research (CICERO). Our contribution towards sustainability however is not limited to only Malaysia. Through CIMB Thai, we also disbursed loans and working capital worth THB 450 million for financing renewable energy businesses which will include biogas, biomass, solar, and energy power plants. These examples, we believe, will strengthen our environmental stewardship even more.

In incorporating ESG considerations into our existing operational framework, one project we have also embarked on is to develop sustainable performance indicators to guide future financing, investment, and procurement decisions, to address the various risks associated with climate change. We will pilot this project through selected industries, involving active engagement with staff and clients to raise awareness on how sustainable financing could contribute to a greener world.

As for industry-wide collaboration, CIMB Islamic is one of the founding members of the Community of Practitioners of BNM's VBI initiative. As strong proponents of VBI, going forward, we will support efforts aimed at developing sustainable and responsible investments and green technology financing, in addition to other VBI initiatives. We are exploring several strategies to implement VBI within CIMB Group and are engaging a number of experts in this field.

Conclusion

Going green isn't just a utopian goal anymore. It is a human necessity, and it is here to stay because "Green is the new gold," in the sense that it will provide the global economy with the much needed anchor that has been missing since the abandonment of the gold standard. While gold has been phased out as the dominant economic factor, energy dependency is swiftly taking its place. To ensure that there is longevity and sustainability in everything that we do, Green Standards become imperative.

For CIMB as a financial institution, it is not just our role to recognise the needs of our times, but we are also duty-bound to pave the way for a more sustainable future. However, the reality is that many of the initiatives and financing projects that CIMB has embarked on or that we have completed have required an entire ecosystem of players and their involvement, be it our clients, regulators, or industry experts. We are ready for the sustainability journey, and look forward to more of these business collaboration opportunities.

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Next 20,000.01 to 100,000	1.80%
Next 100,000.01 to 500,000	2.25%
Next 500,000.01 to 1,000,000	2.50%
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Cypark

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SUSTAINABLE FUTURE

RENEWABLE ENERGY

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Produces Renewable Energy: From Solar, Biomass, Biogas, Municipal Solid Waste, and Organic Waste.

Experienced Team: In Financing, Engineering and Developing Renewable Energy projects offered by the Sustainable Energy Development Authority (SEDA) Malaysia and the Energy Commission (EC) for the Company's own projects and its customers'.

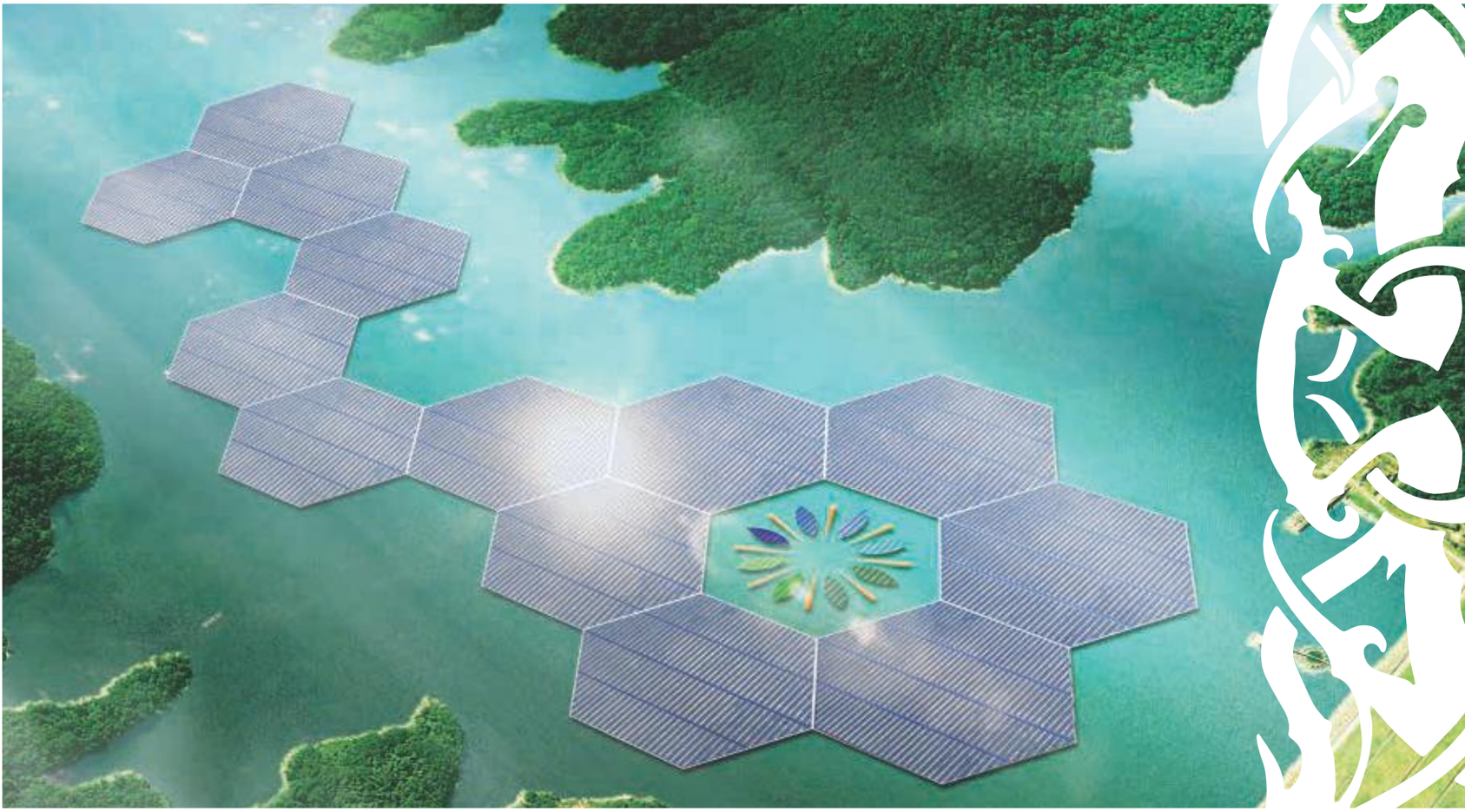
Most Innovative and Largest Developer of Renewable Energy Projects in Malaysia: Ground Mounted, Roof Mounted, Building Integrated Photovoltaic (BIPV), Agriculture Integrated Photovoltaic (AIPV), Floating Solar, Biogas to Energy Project, Waste-to-Energy Projects, and Biomass to Energy Projects.

Accolades: Won numerous awards locally and internationally.

Continuous Innovations: Focus on unconventional development of renewable energy projects through the utilisation of non-productive, abandoned, and degraded land areas.

Contribution: Less consumption of fossil fuels and reduced greenhouse gas (GHG) emissions.

Floating solar.



Artist's impression of Cypark's Floating Solar project at Empangan Terip in Negeri Sembilan.

GREEN TECHNOLOGY

Cypark's Latest Strategic Focus: Develop new and pioneering technology and solutions.

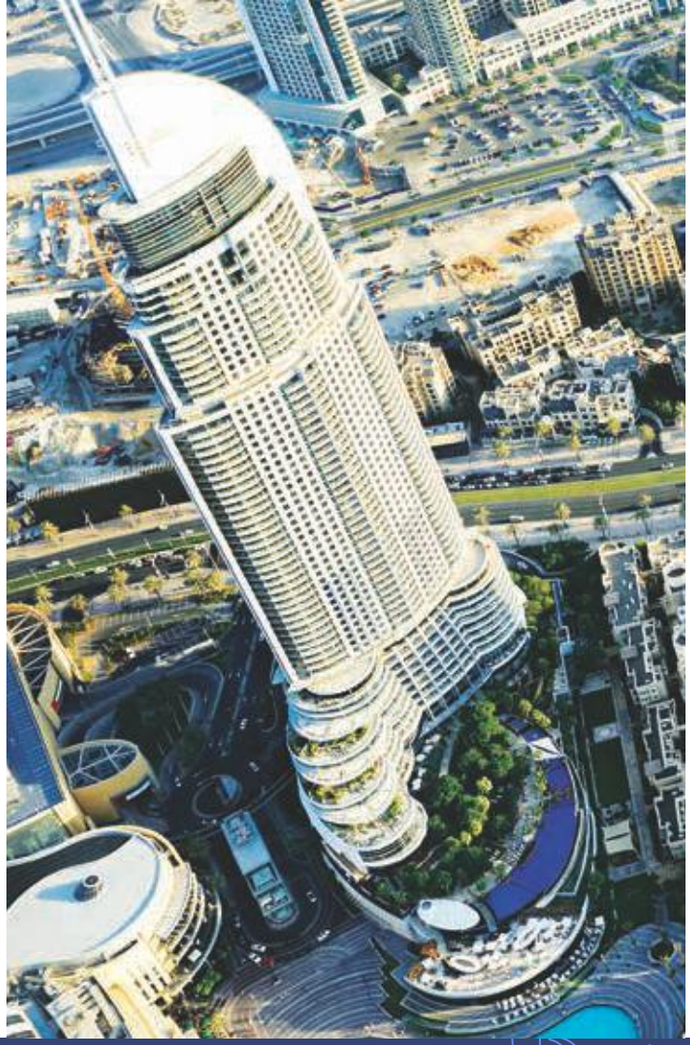
Driver: Expected World Population increase leading to the rise of energy needs which calls for efforts in efficient energy and energy storage.

Solid Biomass Fuel.

Opportunities Identified: Develop Net Energy Metering (NEM) Projects as offered by SEDA Malaysia, Energy Efficiency Projects, and Energy Storage Technology to manage supply of electricity.

With its strong financial position, Cypark is able to offer its customers Project Finance Initiative (PFI) Leasing Programmes with the aim to provide Zero Cost Entry for participation in Renewable Energy Projects and Green Technology Projects.

Manufactured and Exported Biomass Solid Fuel (BSF): From Empty Fruit Bunches (EFB) replacing fossil fuels such as coal to produce electricity.



Landscape.

CONSTRUCTION ENGINEERING

Registered with the Construction Industry Development Board (CIDB) as a Grade 7 construction company.

Nation's leading expert in the construction of wastewater treatment plants, sanitary landfills, waste management facilities, waste-to- energy plants, and large-scale solar farms.

Involved as EPCC turnkey contractors for more than 200MW green power projects.

Experience: A wide scope of services ranging from construction of infrastructure, waterfronts, parks, landscaping, residential and commercial buildings, schools and colleges, to resorts and specialist hospitals.

Team: Highly capable and professional management, engineering, and construction teams led by qualified heads of departments with vast experiences, supported by a full force of devoted engineers and other professionals.

Successfully Delivered Projects: Among others are the SILK highway in Putrajaya, Fairview International School in Johor Bahru, KPJ Johor Specialist Hospital in Johor Bahru, Palm Jumeirah Marina in Dubai, UAE, Hamad Asian Games Village in Doha, Qatar, and several housing projects in Johor Bahru under Johor Land Berhad.

ENVIRONMENTAL ENGINEERING & SOLUTIONS

Services: Provides services in contaminated ground assessment, remediation, restoration, and information system. Cypark undertakes the effort to minimise or avoid the impact of climate change to the local and global environments by offering s broad range of integrated services which include preservation, prevention, containment, and treatment procedures and technologies, with the proper application of scientific and engineering principles of the Best Available Techniques Not Entailing Excessive Cost (BATNEEC) Approach.

Sustainable Engineered Restoration.

Develops Holistic and Innovative Approaches: Offers solutions in sanitary landfills, inert landfills, secured landfills, waste management facilities, safe closure of dump sites, wastewater treatment, and upgrading of existing landfills and other waste management facilities.
Integrated Services: Technical and Financial Solutions to ensure project feasibility and fast-tracking.

Provides Opportunity: For Remediation and Restoration of land from contaminated or degraded sites into renewable energy parks and green technology projects.

Experience: Completed more than 600 acres of remediation and restoration work of contaminated ground spanning 20 landfill projects across the country.

Innovative and Cutting-edge Solutions: The overall end goal is to provide solutions to challenging environmental problems and impacts, reduce health and safety hazards to the public, safeguard the natural environment, and subsequently minimising the inherent risks of contaminants released into the surrounding from contaminated land.

HongLeong Bank

INTERNATIONAL Banker | 2017 BANKING AWARDS

BEST INNOVATION IN RETAIL BANKING MALAYSIA

Redefining Our Future

We are honoured to be awarded **'Best Innovation in Retail Banking Malaysia'** by International Banker 2017 Banking Awards.

Built on decades of heritage and trust, we remain at the forefront of Malaysian banking through our constant drive for customer-focused products and service innovation, bringing you state-of-the-art banking solutions.

We are investing for the future by reaching out to you through digital innovation and a community banking focused branch network, continuing to earn your trust and valued relationships.

Thank you for the trust shown in us.

Hong Leong Bank | Hong Leong Islamic Bank

CASH MANAGEMENT 2017 CLIENT SATISFACTION RATINGS
ASIAMONEY

Hong Leong Bank named Best Bank in Malaysia for Asiamoney Cash Management Customer Satisfaction Award

Hong Leong ConnectFirst

HL ConnectFirst features

Electronic Invoice Presentment & Payment

Receivables Management: Issuance of e-Invoice
Collection Management: Payment and Reconciliation

Treasury

Forex Contract Management
Money Market Placement

Virtual Account

Account number for easy identification of collection and payment transactions

Liquidity Management

Sweeping
Notional Pooling
Investment Sweep and Inter-Company Loan

e-Investment

Online investment management allows corporates to place and withdraw term deposits.

Supply Chain Financing

Trade Supply Chain profiling, documentation, financing monitoring, statistics, message centre & audit trail.

Trade Application

Access to company's latest trade transactions and facilities details online

HongLeong Bank | HongLeong Islamic Bank

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Business Transactions Made Easy

Manage your business liquidity efficiently

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HongLeong Bank HongLeong Islamic Bank

ACCOUNT MANAGEMENT Take Control of Your Account

Take charge of your business's finances. Track your cashflow with our online Account Management services, check your MT 940 or MT 942 statements and view your corporation's latest account activity 24-hours a day.

Manage your business's cheques information online.

e-FIXED DEPOSIT/-i Better Management of Your e-Fixed Deposit/-i

A simplified standardized direct online placement and withdrawal process.

PAYMENTS Streamline Your Cash Flow with Better Payment Management

Enjoy a full range of payment services with enhanced safety and security features to pay suppliers, employees and bills confidently.

- Effortless fund transfer with instant email notification.
- Option to perform your loan/financing and bill payments via online template.
- Perform forward dated payments and transfers up to 30 days in advance.
- Pay GST, tax, and option to pay utilities and other bills online via JomPAY.
- Initiate money transfer locally or to overseas easily.
- Set up payments via standing instruction
- Handle payroll and statutory bodies payments with ease (EPF, SOCSO, Income Tax & Lembaga Tabung Haji).
- Option to perform your fund transfers, payroll and statutory payments via file upload.
- Pay HLB credit card bill directly.
- Financial Processing Exchange (FPX) is a secure online payment that allows real-time debiting of your customer's internet banking account of multiple banks.
- Option to transfer fund instantly to other bank via Instant Transfer.
- Able to perform e-Share and e-Dividend.

COLLECTIONS Accelerate Your Receivables

Discover a variety of customized options to help accelerate receivables and improve collection management.

- Speed up your receivables by allowing issuance of e-invoice to your customers.
- Discover the secure and interactive system that allows you to reduce cost and deliver significant efficiencies to the financial supply chain.
- Quicken your collection management with an easy payment and reconciliation solution.
- View all payable and receivable transactions at a glance so you can view, query, approve and manage the payment with just a click.

LIQUIDITY MANAGEMENT Make Your Funds Work Harder

Optimise fund management processes and increase your treasury efficiency with a customised liquidity management solution.

TRADE Trade Information at Your Fingertips

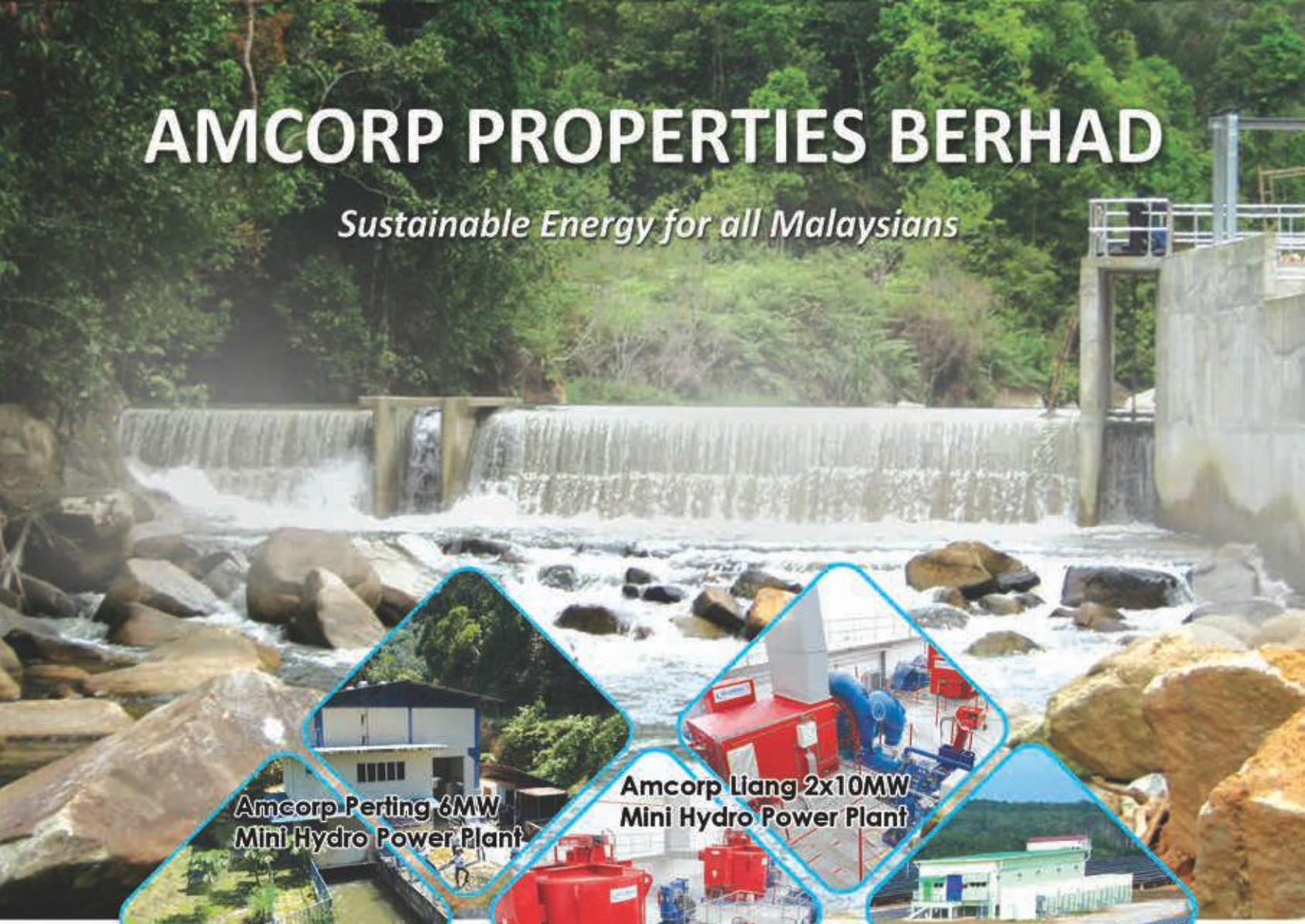
Access to your company's latest trade transactions and facilities details online.

TREASURY Rates Information Easily Available

Check the latest FOREX rates, inquire about Money Market information and access treasury information with just a click.

AMCORP PROPERTIES BERHAD

Sustainable Energy for all Malaysians



AMCORP

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Website :
www.amcorpproperties.com

Accreditations :

Amcorp Perting 6MW Mini Hydro Power Plant

ACEM Silver Award of Merit 2013

ASEAN Energy Award 2012

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Frost & Sullivan Best Practices Award 2015 Malaysia Solar Systems Company of the Year

Malaysia Book of Records 2014 Largest Grid Connected Solar Farm

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First Solar believes that clean, affordable solar electricity is not only viable, but essential. That is why we have been leading the change to intergrate reliable and affordable solar electricity into the energy mix on a global scale since our founding in 1999.

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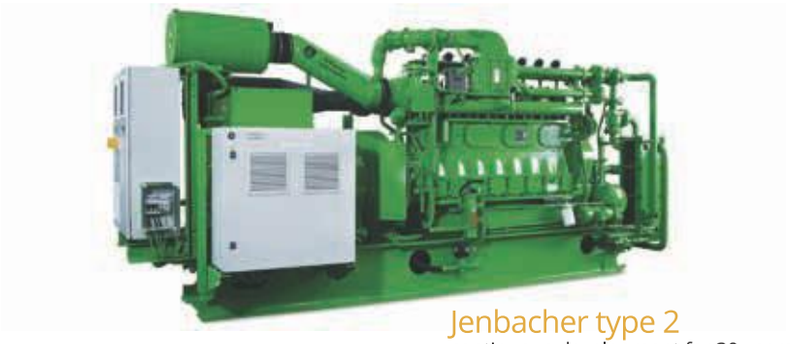
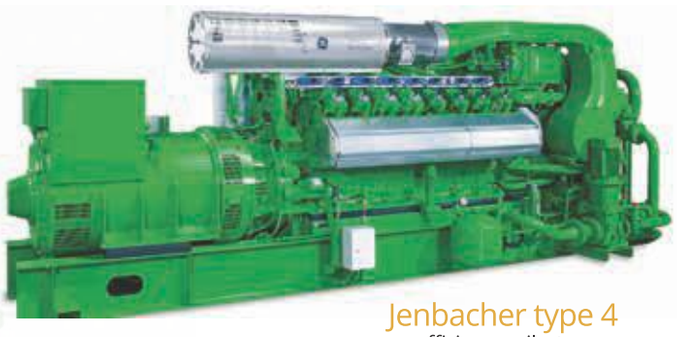
Gas Engines

Dana Engineering Sdn. Bhd. (DANA) is an established Malaysian Engineering Company that collaborates with GE Gas Engines under GE Power. DANA distributes the product portfolio of GE, the Waukesha and Jenbacher engines and is responsible for sales, after-sales, and spare parts supply. Jenbacher engines are renowned for their high efficiency and fuel flexibility, being able to run on almost any kind of gas. Waukesha engines are oil and gas applications eminent for their robustness and operational reliability in any site-condition. With these state-of-the-art engines synergising with our prompt and efficient services, DANA envisions becoming a solution provider for the power industry in Malaysia.

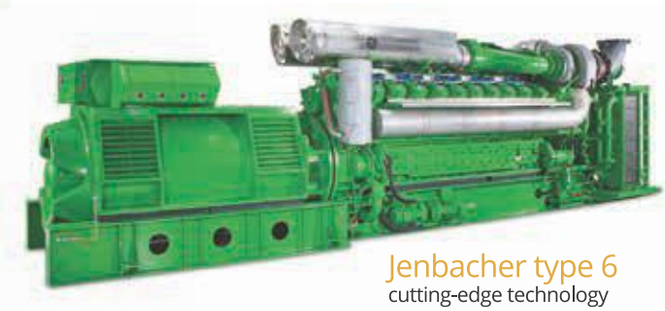


Jenbacher type 2
continuous development for 30 years

Jenbacher type 3
efficient, durable, reliable

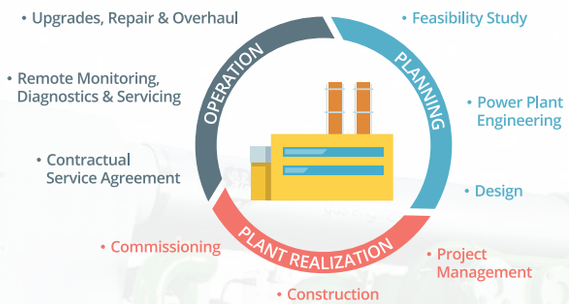


Jenbacher type 4
an efficiency milestone



Jenbacher type 6
cutting-edge technology

Performance to Lifecycle Services: GE's All-in-One Solution



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With 11 years of experience in solar renewable energy, **Pekat Solar Sdn Bhd** is Malaysia's leading EPCC company specializing in solar Photovoltaic on-grid and off-grid solutions for residential, commercial and large scale solar farm. Its spectrum of services ranges from design, consultancy to project execution and commissioning of system.

Kompleks Kerja Raya 2 (KKR2), *- 108kWp*

*We do the **Best**,*
*We give the **Best** !*

We are committed to leading-class quality, collaborating only with top-tier and reputable brands such as **JA Solar** & **Jinko Solar**. For inverters, we represent **SUNGROW**, Asia's biggest inverter company and we also partnered **Solar-Log**, the world's reputable solar monitoring system.

We only hire the best and certified engineers and professional engineers to be part of our team. In addition, we also provide the comprehensive operation and maintenance services support to ensure our customers' investments are protected.

Government Lead by Example (GLBE) *- 670kWp*

Protect, Conserve and Renew.

As of 2017, Pekat Solar Sdn Bhd has successfully completed over 20MWp solar PV system under Feed-in Tariff and self-consumption. We are proud to have completed some of the more notable commercial construction and industrial infrastructure across Malaysia which are **25 blocks of Government Lead by Example (GLBE) - 670kWp, Ministry of International Trade and Industry (MITI) - 100kWp, Kompleks Kerja Raya 2 (KKR2) - 108kWp, KL Sentral Malaysia's First Green Office Campus - 168kWP, UOA Bangsar South, Gold GBI - 128kWp,** and etc.

Moreover, in an effort to inculcate the habit of efficient energy usage and raise awareness on renewable energy, Pekat had sponsored a few 4kWp Solar Photovoltaic system for six schools and one orphanage house, 4kWp solar off-grid system at Tele-Centre Kampong Bario, Sarawak under its **Corporate Social Responsibility (CSR)** program.

Our ambition and value are beyond business profits and gains, but ultimately to **Protect, Conserve** and **Renew** for a brighter and sustainable future.

Tel: 603 2300 8010/ 6157 3939 **Email:** helpdesk.solar@pekatgroup.com www.pekat.com.my

• Solar Developer • IPP (Independent Power Producer)
• EPC (Engineering Procurement Construction)
• Rooftop & LSS (Large Scale Solar)

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

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

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Greenplus SOCIETY

Calendar of events

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

The activities cover local awareness programmes that include engagement with stakeholders through seminars/workshops, open days, exhibitions, collaboration with NGO partners as well as international liaisons through meetings and seminars attended.

11-17 january 2018

Abu Dhabi, United Arab Emirates

8th IRENA Assembly & World Future Energy Summit

A few representatives from SEDA Malaysia participated in the 8th Session of the IRENA Assembly and the World Future Energy Summit in January, These took place in Abu Dhabi, United Arab Emirates.

18 january 2018

Putrajaya

National Low Carbon City Policy Roadmap Workshop

The National Low Carbon City Policy Roadmap Workshop was held in January at Le Méridien Hotel Putrajaya. It acts as a guide at the national level and is for adoption by the state governments and local authorities i.e. City, Municipal, District, and Island. Among the objectives of this Workshop are to consolidate the existing national and sub-national policy and regulatory frameworks which are related to low carbon urban planning and development in Malaysia, and to develop projections of GHG emission trends up to 2050 in line with the government's National Transformation 2050 (TN50) aspirations.

22 january 2018

Kota Kinabalu, Sabah

Hari Terbuka Bekalan Elektrik Sabah

CEO Catherine Ridu represented SEDA Malaysia at "Hari Terbuka Bekalan Elektrik Sabah," together with YB Datuk Seri Panglima Dr. Maximus Johnity Ongkili, Minister of KeTTHA. The Open Day at Suria Sabah Mall, Kota Kinabalu saw some discussion on issues related to the electricity supply in Sabah.

24
january 2018

Kuala Lumpur

SEDA Malaysia paid a courtesy visit to H.E. Dag Juhlin-Dannfelt, Ambassador of Sweden, for a cross promotion of summits between the Swedish Embassy and SEDA Malaysia. They discussed the urgency for nations to address energy sustainability for the purpose of the climate agenda.

26
january 2018

Kuala Lumpur

Dr. Wei-nee Chen, CCO of SEDA Malaysia, led a fruitful discussion with Wan Hashimah Wan Salleh, Director of the Green Technology Division at the Malaysian Investment Development Authority (MIDA). Both teams are mobilising the business matching session at the 4th ISES 2018 for investment opportunities.

30
january 2018

Shah Alam, Selangor

Bengkel Kesedaran dan Fasiliti Pengurusan Tenaga di Bangunan Kerajaan Negeri Selangor

"Bengkel Kesedaran dan Fasiliti Pengurusan Tenaga di Bangunan Kerajaan Negeri Selangor," a Workshop, was held in collaboration with *Unit Perancang Ekonomi Negeri* (UPEN) Selangor to provide awareness on and facilitation with energy management to the state government, including local authorities. The Workshop took place at Concorde Hotel, Shah Alam, Selangor. Catherine Ridu, CEO of SEDA Malaysia, was present to commemorate the Workshop.

30-31 january 2018

Manila, Philippines

20th ACE Governing Council Meeting (AGC)
SEDA Malaysia attended and participated in the Special Senior Officials' Meeting On Energy (SPECIAL SOME) and the 20th ACE Governing Council Meeting (AGC) which took place in Manila, the Philippines.

10 february 2018

Kuching, Sarawak

Pusat Latihan Proaktif
Catherine Ridu led the SEDA Malaysia team on a site visit to "Pusat Latihan Proaktif" in Kuching, Sarawak. This PV training centre is very prominent in the State.

14 february 2018

Kuala Lumpur

SEDA Malaysia made a courtesy call to the Ambassador of Germany, H.E. Nikolaus Graf Lambsdorff, to invite him and the German delegation to the 4th ISES 2018 as Germany is at the forefront in terms of driving the renewable energy agenda.

14
february 2018

Kuala Lumpur

National Regulatory Sandbox
SEDA Malaysia actively participated in the National Regulatory Sandbox brainstorming session under the energy category. The session was organised jointly by the Ministry of Finance (MoF) and the Malaysian Global Innovation & Creativity Centre (MaGIC).

12
march 2018

Nilai, Negeri Sembilan

Transformasi Nasional 2050 (TN50) Dialogue Session
The National Transformation 2050 (TN50) dialogue session and Green Technology Master Plan (GTMP) Malaysia (2017-2030) presentation was delivered by YBhg Dato' Seri Ir. Dr. Zaini Ujang, Secretary General of the Ministry of Energy, Green Technology and Water (KeTTHA). YBhg Datuk Ir. Ahmad Fauzi Hassan, Authority Member of SEDA Malaysia, was the Moderator for the session. The dialogue at Dewan Tuanku Canselor, Universiti Sains Islam Malaysia (USIM) was attended by 1000 people.

21-22
february 2018

Putrajaya

Energy Management & Energy Audit in Building Training
A session for Energy Management and Energy Audit in Building Training under the Energy Audit Conditional Grant (EACG) Programme (RMK-11) was held in February at the SEDA Malaysia office. Training is exclusively for EACG Recipients, consisting of commercial building owners and their appointed Energy Service Company as the energy auditor for their buildings.

Transitioning The Nation Towards

Sustainable Energy
MALAYSIA

ADVERTISING RATE CARD 2018

ADVERTISING RATE

PAGINATION

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

DEADLINES

Booking Deadline
6 weeks before the publication date

Material Deadline
4 weeks before the publication date

Cancellation
No cancellations once booking is confirmed

TERMS AND CONDITIONS

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

PAYMENT TERMS

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

All final decisions on magazine artwork lie with SEDA Malaysia.

WHY SUSTAINABLE ENERGY MAGAZINE?

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

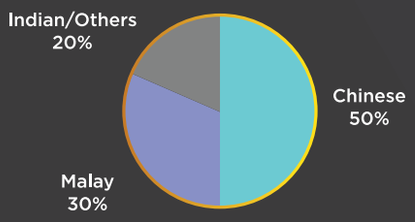
A vast majority of our magazine's audience consist of executives or managers working at the top line of various organisations in the country. It serves as a platform for investment which enables your newest innovations to reach the right target groups and support lead generation. Apart from helping to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

SUSTAINABLE ENERGY MAGAZINE PUBLICATION DETAILS

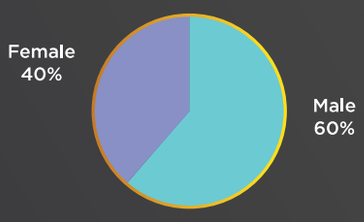
Publisher	SEDA Malaysia
Category	Industry Professionals & Enterprises
Target Audience	20 years old and above
Frequency	3 times a year
Number of Pages	Min 48 pages (Including cover)
Size	29.7cm (H) x 23cm (W)
Circulation	5,000 print run
Distribution	Government bodies and Agencies Financial Institutions Industry Professionals and Investors

READERSHIP PROFILES

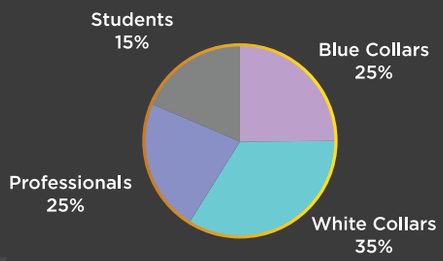
RACE



GENDER



OCCUPATION



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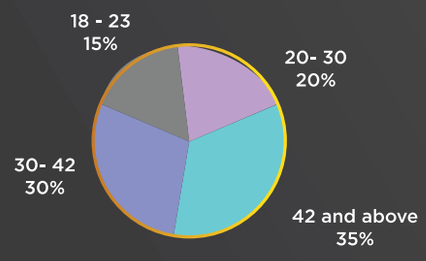

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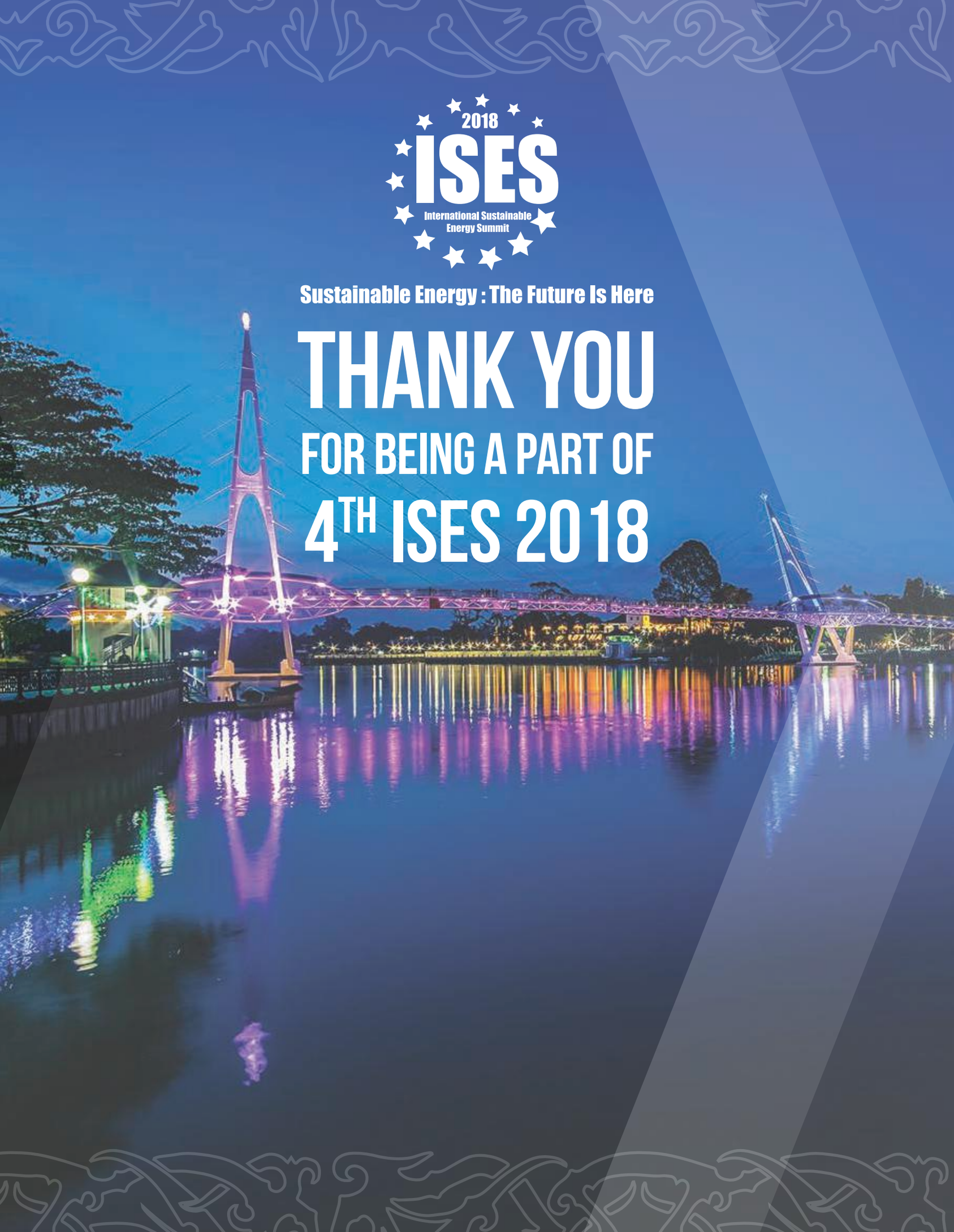
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