

GREEN PUBLICATION 1.0 JULY 2020

POWERING ASEAN SUSTAINABLY & COMBATING CLIMATE CHANGE



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FOREWORD



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Nowadays, we wake up to a bluer sky and less pollution – not because we have succeeded in addressing climate change and pollution issues but because of COVID-19, a powerful virus strain, which has grounded the global economy to a halt.

The COVID-19 outbreak has changed our lives and shaped the world that we live in forever! We rejoice in the fact that the air that we breathe in is fresher and cleaner these days. It is hardly surprising that emissions of a variety of gases related to energy and transport have been reduced given the astonishing shutdown of economic activity and a drastic reduction in the use of fossil fuels as a result of the pandemic. The Environment and Water Minister, Tuan Ibrahim Tuan Man, is reported as saying that the Air Pollutant Index (“API”) levels dropped 14% to record a “clean index” while 28% of 29 automatic water monitoring stations’ readings showed a real time improvement in water quality during the Movement Control Order (MCO) during the period from 18 March 2020 to 14 April 2020. The improved API reading has been attributed to a drastic reduction in emissions from vehicles, industrial stacks and open burning. Compared with this time last year, BBC has reported that levels of pollution in New York have reduced by nearly 50% because of measures to contain the virus. In China, emissions fell 25% at the start of the year as people were instructed to stay at home, factories shuttered and coal use fell by 40% at China’s six largest power plants since the last quarter of 2019. The proportion of days with “good quality air” was up 11.4% compared with the same time last year in 337 cities across China, according to its Ministry of Ecology and Environment. In Europe, satellite images show nitrogen dioxide (NO₂) emissions

fading away over northern Italy. Similar situations were observed in Spain and the UK. Emissions of the planet-heating gas CO₂ have also fallen sharply.

While all the reductions in API and emissions is great news, the reason such reductions was achieved is not welcomed at all and we certainly hope to be just a temporary phenomenon. What we want is to live in a world where such reduction in API and emissions is permanent and is a result of the fact that we have managed our environment well and did all we could to mitigate the rise of climate change.

The International Renewable Energy Agency (“IRENA”) has reported that energy-related CO₂ emissions have risen by 1% per year over the past decade. While there may be reduced emission in 2020 due to the drastic reduction of activities across the globe, the question is whether the carbon and pollutant emissions will “bounce back” and restore the emission trends pre-COVID 19 when the pandemic eventually subsides? Could the changes we see today have a more persistent effect?

Renewable energy (“RE”) was on its way to be the next preferred source of energy for ASEAN countries with growing environmental consciousness particularly among the younger generation. ASEAN has pledged to increase the component of RE in the ASEAN energy mix to 23% by 2025, up from 9% in 2014. All of ASEAN have set targets to increase the renewable energy generation and reduce their carbon emissions with Malaysia committed to increase its RE to 20% by 2025. These targets are becoming more achievable with declining production costs and technological innovations such as better solar power efficiency and floating solar panels. With increasing public awareness of sustainable energy and willingness to pay higher rates for clean energy, ASEAN member states are being motivated and encouraged to invest more state funds into RE projects.

Prior to the pandemic, the energy sector was progressing well in transitioning into clean energy with wide adoption of policies embracing renewables and related technologies for sustainability seen across all countries. IRENA, an organisation dedicated to promoting global adoption of renewable energy and facilitating

sustainable use, reported that the progress in accelerating the transition is due to the rapid cost reductions of solar PV and wind (including offshore) and how key enabling technologies such as batteries and electric vehicles are experiencing rapid reductions in costs, and how green hydrogen is viewed as a potential game changer. However, the growth momentum for the green sector may be hindered with the recent COVID-19 outbreak and the oil price being lower than pre-COVID-19. Electricity consumption will be less efficient with cheaper energy available as people would be less motivated to save energy through projects like retrofitting homes and offices.

As noted by the International Energy Agency (“IEA”), large-scale investment to boost the development, deployment and integration of clean energy technologies – such as solar, wind, hydrogen, batteries and carbon capture (CCUS) – should be a central part of governments’ plans because it will bring the twin benefits of stimulating economies and accelerating clean energy transitions. The progress this will achieve in transforming countries’ energy infrastructure would not be temporary – it can make a lasting difference to our future.¹

Climate threats are increasing and cannot be ignored. The environment change is changing the world we live in. We must correct the course as we plan our exit strategies from the movement control order and economic recovery. First, we must tackle climate change head on. According to a RE think-tank, directing stimulus dollars to renewable energy investments not only could help tackle global climate emergency but spur massive economic gains post-COVID-19 for decades to come. IRENA says that it will cost the global economy USD95 trillion to help return things to normal. Investing USD110 trillion in renewables could, on the other hand, potentially spur an even more robust economic recovery from COVID-19 by creating massive socioeconomic gains as well as generate savings of USD50-USD142 trillion by 2050.

Beyond 2050 and over the long-term, the IRENA report identifies investments in “five key pillars of decarbonisation”, namely electrification, renewable energy generation, system flexibility, green

hydrogen, and innovation - as being necessary for the achievement of a near- or zero-carbon global economy.² To enable the global energy transformation, renewable energy and energy efficiency have been identified as the two key solutions.

IRENA's Director-General, Francesco La Camera said that COVID-19 has "... *exposed deeply embedded vulnerabilities of the current system...*" notably the fossil fuel sector which is finding itself in dire straits due to an epic collapse in demand amid a global lockdown. Francesco has opined that the world needs more than a kickstart and that accelerating renewables can potentially achieve multiple economic and social objectives that would help build a more resilient economy. This was echoed by the Executive Director of IEA, Fatih Birol, who opined that some of the stimulus packages being rolled out by governments should be invested in the renewables sector and he said that "[w]e have an important window of opportunity. Major economies around the world are preparing stimulus packages. A well-designed stimulus package could offer economic benefits and facilitate a turnover of energy capital which will have huge benefits for the clean energy transition". IRENA's recent Global Renewables Outlook found that aligning COVID-19 recovery efforts with the objectives of the Paris Agreement and the 2030 Agenda for Sustainable Development will require comprehensive policy packages, massive resource mobilisation, and enhanced international cooperation, but would result in massive socio-economic gains at the global level.

The specific challenges and opportunities in each part of the world call for local solutions. It is our hope that this Green Publication will bring to attention the serious need for us to continue to be aware of the climate change that is already happening, the necessity to promote the generation and use of

renewable energy as well as the adoption and integration of energy efficiency in the daily lives and decision making of all businesses to avert future adverse socioeconomic impacts and risks which the changing climate may cause. Our offices in Indonesia, Philippines, Thailand, Laos, Myanmar, Vietnam, Cambodia and Brunei are highlighting the regulatory updates in the RE sector and what they see as trends related to green energy in their respective jurisdictions.

To ensure that we can live sustainably and preserve this mother earth for our future generations, the pace and rate in which we adopt measures to combat and mitigate climate change and environmental issues must continue and in fact, be accelerated notwithstanding the challenges that we are currently facing arising from the COVID-19 virus as we must avoid being caught in another huge global issue like this pandemic unprepared.

Unlike the invisible COVID-19 virus which hit us suddenly unawares, we all know and are very well aware of the adverse impacts we could be facing in the future if we do not manage the climate change now. We can prevent a major disaster from hitting us like the pandemic if we diligently pursue a coordinated action across all countries and at all levels of stakeholders now to deal with climate change issues. This will enable us to be more resilient and less vulnerable to extreme climate change and hazards that may come with it. Therefore, going forward, the potential climate change impacts and effects on the environment should be taken into account when considering the development and implementation of products and projects, both in the private as well as the public sectors decision makings so that we are well prepared to handle them.

As governments around the world are embarking on the mammoth tasks

of formulating stimulus and recovery packages because of COVID-19, they should not lose sight of their focus of transitioning the world to a low or zero-carbon economy and renewables are crucial to achieve that. The current COVID-19 pandemic could either increase the gap or accelerate our aspiration of meeting the target of having 20% RE capacity by 2025 in Malaysia and increase the component of RE in the ASEAN energy mix to 23% by 2025. Much of this will depend on how the government will respond in terms of the stimulus to be rolled out. It is our hope that ensuring sustainability, strengthening resilience and improving people's health and welfare will underline the stimulus package to be formulated by the governments.

Although energy transition plans and priorities inevitably differ from country to country but as countries within a region tend to face similar challenges, it may be easier for regions to co-operate and act together on regional energy transition goals than for countries to act alone. Energy transition actions at the regional and country levels must be aligned and consistent with global climate objectives with inter-regional collaborations addressing issues of fairness and justice. Ramping up country and regional ambition and interlinking energy and climate is key for the energy transition within ASEAN.

Ultimately, the policies adopted by the government, the speed of their implementation and the level of resources committed by all stakeholders are crucial factors that will determine the success in mitigating the climate threat - this is a call for a renewable energy revolution amid and post-COVID-19 era!

I hope you will find this publication useful and enjoy reading it as much as we have enjoyed writing it.

TACKLING CLIMATE CHANGE IN ASEAN

Extreme bush fires, typhoons, and sinking islands! These are global symptoms and stark reminders of the severe and unforgiving impact of climate change on our planet.

Southeast Asia is one of the most at-risk regions in the world to the impact of climate change such as rising sea-levels and extreme weather events. The region is highly vulnerable to climate change as large populations and economic activities are centered along coast lines and there is heavy reliance on agriculture for livelihoods.

The Association of South East Asian Nations (“**ASEAN**”) has taken positive steps to address this ongoing concern. In 2019, the ASEAN Working Group on Climate Change (AWGCC) was established to:

- enhance regional cooperation and action to address the adverse impact of climate change on socio-economic developments in ASEAN member states;
- formulate the interest, concerns and priorities of the region in an ASEAN Joint Statement on Climate Change; and
- serve as a consultative forum to promote coordination and collaboration amongst the ASEAN member states to address climate change.

Member States have taken various actions to address climate change through environmental, economic and social activities and have strengthened their adaptive capacity by mainstreaming climate change adaption in their development planning.

Additionally, ASEAN countries have also responded to the call for climate change by focusing on implementing the relevant actions under the ASEAN Socio-Cultural Community (ASCC) Blueprint 2009-2015.

During the 34th ASEAN Summit in June 2019, Member States affirmed their commitment to share information and best practices to enhance the implementation of the Paris Agreement and Nationally Determined Contributions (“**NDC**”) in order to build climate resilient communities in Southeast Asia.

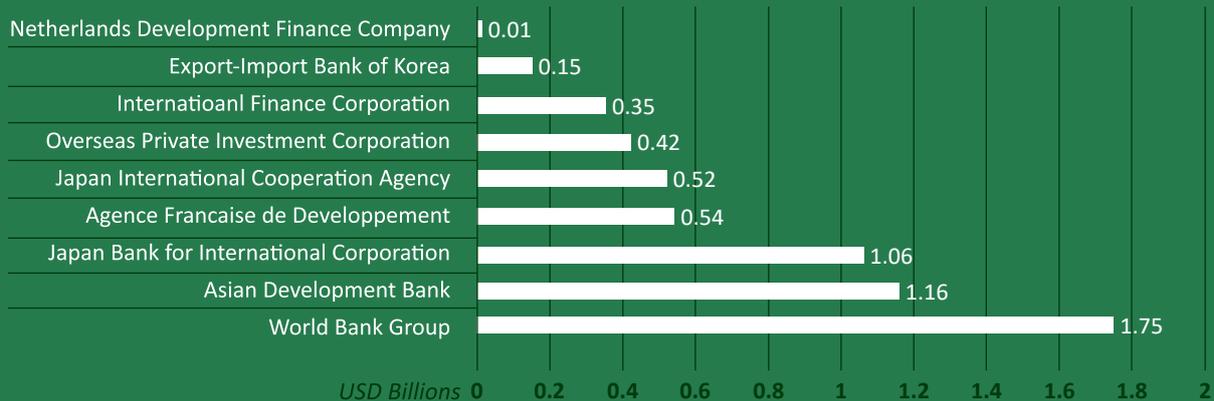
The Paris Agreement is a landmark agreement to combat climate change and intensify the actions and investments needed for a sustainable low carbon future. It brings together all nations with a common cause to undertake ambitious efforts to combat climate change.

The goal of the Paris Agreement is to keep the global temperature increases to below 2°C above pre-industrial level and limit the temperature increase to 1.5°C.

Source: United Nations Framework Convention on Climate Change

Recognising the importance of renewable energy in the pursuit of sustainability, ASEAN had set an ambitious target of 23% renewable energy in its energy mix by 2025. Huge goals require huge investments. Major banks such as the World Bank and Asian Development Bank (“**ADB**”) have shown their full support, and have led the way in promoting renewable energy in the region.

CUMULATIVE INVESTMENT IN RENEWABLE ENERGY IN SOUTHEAST ASIA



Source: ‘Renewable Energy Challenges for ASEAN’ The ASEAN Post (5 August 2018)

Energy efficiency efforts are also key to solving the energy crisis and transitioning to a sustainable energy future. Under the ASEAN Plan of Action on Energy Cooperation (APAEC) 2016-2025, ASEAN targeted a reduction of energy intensity level through energy efficiency effort of 20% by 2020 and 30% by 2025, based on 2005 levels. Energy plays a big role in climate change and with energy demand expected to grow, Member States should include climate impact when designing energy strategies towards sustainability.

In this publication, we share insights on recent developments in ASEAN on tackling climate change issues. From the increasing importance of solar and other renewable energy sources, energy efficiency efforts, and the development of supporting policies and regulatory frameworks, to the growing case for green finance and investment opportunities, we hope this publication gives you a useful and holistic overview of how ASEAN is rising to the challenge.

WHAT IS CLIMATE CHANGE?

According to the United Nations Framework Convention on Climate Change (UNFCCC), it refers to a change of climate that is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and that is in addition to natural climate variability observed over comparable time periods.

WHAT ARE GREENHOUSE GAS EMISSIONS?

Greenhouse gas emissions (from human activity) that cause climate change are usually broken down into two broad categories; energy-related emissions and land-use emissions. Energy-related emissions come from the burning of fossil fuels in the generation of electrical, mechanical or thermal energy while land-use emissions come from agricultural and forestry activities.





**LATEST
DEVELOPMENTS**

ACROSS ASEAN

MALAYSIA'S CRUSADE IN TACKLING GREENHOUSE GASES FROM ELECTRICITY GENERATION

Rising Temperatures and Rising Waters

The tail end of the last decade saw one of the worst impacts of our changing climate. The Australian bushfires that began in late July 2019 ravaged the country for months, displacing thousands of families and killing over a billion animals.¹ The fires were so extreme that they created separate weather systems with fire tornadoes and lightning that caused even more fires and destruction.² These infernos, together with recent climate tragedies such as the powerful typhoons in Japan and the slow but steady sinking of the Indonesian city of Jakarta reveal the stark reality of climate change as the most serious environmental problem facing mankind.

This article will discuss energy-related emissions particularly focusing on electrical energy, examining the efforts made by Malaysia to address climate change through policies and legislation in the electricity sector. These efforts balance the country's thirst for growth and continuously increasing demand for energy against the need to ensure sustainability to mitigate and adapt to climate change.

Charting a Path

Malaysia has experienced significant growth since the country gained independence. This growth involved the diversification of its economy from one rooted in agriculture to the provision of manufactured goods and services. This shift in the economy entailed higher energy consumption. Energy consumption increased exponentially, with electricity sales starting at 141 GWh in 1949³ to 144,024 GWh in 2017,⁴ a 1000-fold increase in less than 70 years.

Balancing the country's thirst for growth and increasing demand for energy against the need to ensure sustainability, Malaysia developed policies and legislation that had the effect of tempering greenhouse gas emissions since the late 1970s.

The government began charting a path with the National Energy Policy 1979 which promoted the efficient utilisation of energy and the elimination of its wasteful and non-productive use. This was the main policy in the sector then, coming after the government's earlier initiative to methodically administer the country's petroleum resources through PETRONAS under the **Petroleum Development Act 1974**.

Electricity Supply Act 1990

Reinforcing the importance of energy efficiency, the Five Fuel Policy 2000 announced renewable energy as the fifth and alternative fuel in power generation. The Five Fuel Policy 2000 paved the way for programmes such as the **Small Renewable Energy Programme** and **Suria 1000**. The former allowed small scale renewable energy power plants to enter into power purchase agreements with the national utility with preferential rates while the latter provided discounts for the installation of rooftop solar photovoltaic systems.⁶

Efficient Management of Electrical Energy 2008

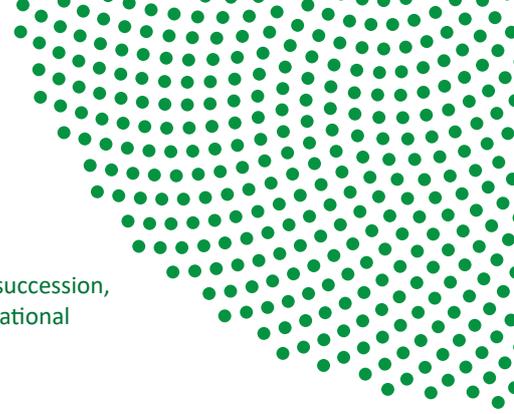
National Energy Policy 1979

This legislation facilitated the mitigation of climate change through the regulation of electrical installations. Through conditions in licences issued by the Energy Commission,⁵ owners and operators of electrical installations, such as power generating facilities, have an obligation to generate electricity efficiently and also to regularly conduct audits.

Five Fuel Policy 2000

The Efficient Management of Electrical Energy 2008 under the Electricity Supply Act 1990, requires electricity consumers using electricity beyond a given threshold to appoint a registered electrical energy manager who would advise such consumers to implement energy efficiency measures.





Steadying the Course

The government continued to steady the course towards sustainability and introduced in close succession, in 2009, the National Green Technology Policy, the National Policy on Climate Change and the National Renewable Energy Policy and Action Plan.

This introduced Malaysia to “the development and application of products, equipment and systems used to conserve the natural environment and resources, which minimises and reduces the negative impact of human activities”.⁷ The Malaysian Green Technology Corporation was established under the then Ministry of Energy, Green Technology and Water to deploy and incentivise the use of green technology. In the context of electricity, the policy encouraged the use of green technology in power generation through innovations such as co-generation.

National Policy on Climate Change 2009

This led to the establishment of the Sustainable Energy Development Authority and the introduction of feed-in tariffs in Malaysia which increased the total generation of energy from renewable resources. The Renewable Energy Act 2011 identified these renewable resources as solar photovoltaic, small hydropower, biomass, biogas and geothermal.

Malaysia’s commitment towards sustainable energy continues today with the government’s commitment to have 20% of electricity generation come from renewable energy by the year 2025. More recent initiatives on the part of the Malaysian government to increase renewable energy generation are covered in the article on [“Moving Towards A Green And Sustainably Powered Nation”](#).

On the energy efficiency front, the **National Energy Efficiency Action Plan** was released in 2017 calling for, among others, the implementation of an energy efficiency plan, the strengthening of the Energy Commission for the implementation of energy efficiency activities and the promotion of investment in energy efficiency. The government is also aiming to pass new energy efficiency legislation and more details on energy efficiency are touched on in the article on, [“Energy Efficiency: Where less is more”](#).

Running a Tighter Ship

Although it was a stated objective of the National Climate Change Policy 2009 to merge renewable energy and energy efficiency policies, it does not appear that this consolidation occurred as planned. This may be because the latter was promoted by the ministry responsible for natural resources and the environment while renewable energy and energy efficiency was under the purview of a separate ministry that was responsible for energy and green technology. There appears to have been a disconnect or a simple lack of coordination and this can be seen, for example in how the National Energy Efficiency Action Plan 2017 makes no mention of the National Policy on Climate Change 2009.

National Green Technology Policy 2009

This aimed to strengthen Malaysia’s economic competitiveness and improve the quality of life by “mainstreaming climate change through wise management of resources and enhance environmental conservation”. The policy called for the consolidation of energy policies that enhances renewable energy and energy efficiency. However, results have been unexceptional because renewable energy and energy efficiency were handled separately and unevenly for many years after.

National Renewable Energy Policy and Action Plan 2009

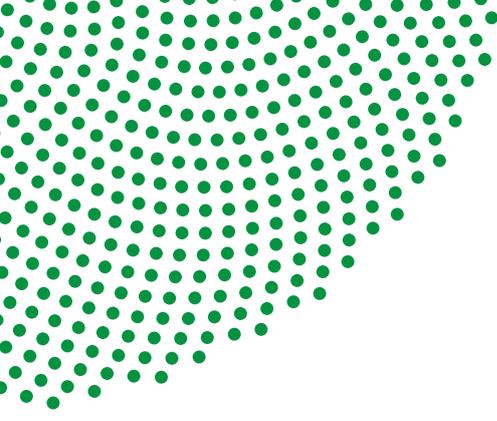
Navigating New Waters

Coordination issues notwithstanding, Malaysia’s record displays a consistent message: that the country has always treated climate change seriously and this concern will continue to be a priority in the years ahead. So it is likely that the government will have to navigate new waters and examine new policies in search of options to stem climate change or stave off its worst effects.

Obviously, there is no one single policy that successfully addresses the perils of climate change and this has been proven from experience the world over. Thus, what is required are carefully chosen tools that will be more effectively enforced.

Malaysia’s recent experience with the coronavirus (i.e. COVID-19) pandemic also directly influences the decisions that policymakers need to make. The lengthy movement control order period temporarily reduced Malaysia’s overall economic production and there will therefore be significant and relatively rapid increases in demand and power consumption which need to be carefully managed as companies return to normal operations.

An area that deserves immediate attention is the climate-proofing of existing and new electricity infrastructure in Malaysia. While the electricity sector can cause climate change from its greenhouse emissions, it is also severely impacted by it. High temperatures can increase reservoir evaporation, affecting energy generation such as at Kenyir Lake, Terengganu and Bakun, Sarawak. Cooling water that becomes warm from the surrounding environment would also decrease the efficiency of thermal plants such as those located in Kapar, Selangor and Segari, Perak. It is vital that a policy is made to impel owners and operators of



individual facilities to ensure electricity production is not adversely impacted.

One controversial policy is the introduction of a carbon tax that puts a price on carbon emissions. This addresses the market externality by raising the price of goods that have emissions associated with their production processes. Singapore introduced legislation in 2019 where all facilities producing 25,000 tonnes or more of greenhouse gas emissions in a year are liable to a carbon tax. Applying this to the current context, power generators would be imposed with tax for their production and this will be passed through to the consumer in the form of higher tariffs. There have been some discussions for some time now between ASEAN member states to introduce a uniform carbon tax across the region,⁸ but Malaysia should carefully assess the implications of this fiscal instrument before making any decisions.



A Long Way from Port

Malaysia has a credible track record of introducing policies on energy diversification, renewable energy and energy efficiency. There are a range of opportunities for investors wishing to assist Malaysia in achieving the country's aspirations for climate change mitigation.

However the escalating and extreme weather and climate events show that there is a pressing need to navigate new waters and explore new options as the country is still a long way from effectively mitigating and adapting to climate change. Some policies may be better than others, so lawmakers should be properly advised to proceed carefully and avoid icebergs - melting or otherwise!

MOVING TOWARDS A GREEN AND SUSTAINABLY POWERED NATION

SECTION ONE MALAYSIA'S JOURNEY IN RENEWABLE ENERGY

RE as the 5th fuel source

RE was declared as the fifth fuel source in the early year 2000 under the 8th Malaysian Plan as part of the national 5 fuel-policy to ensure that Malaysia does not over depend on any single fuel source. Currently Malaysia's fuel mix is dominated by coal and followed closely by gas.

Since 2018, the Malaysian government has set a target of having:

**20% RE capacity by 2025
which is equivalent to
approximately 7,838 MW**

To date, Malaysia has put in place and adopted various policies, incentives and measures to promote the growth of the RE industry.



The Malaysian Energy Commission ("EC") has highlighted in its recent Report on Peninsular Malaysia Generation Development Plan 2019 (2020-2030) ("the Report") on the need to address the trilemma issues of security, affordability and sustainability in economic and social needs, as well as sustainable environmental interests facing the country:



The focus is on solar energy to be generated by large scale solar farms while domestic and commercial consumers are being incentivised to install rooftop solar energy installations and become consumers and producers of energy at the same time. Other RE sources include hydro, wind, biomass, and biogas. Beyond 2050, although Malaysia will still be relying on coal and natural gas for power generation, RE is expected to play a bigger role in the mix. As at mid-2019, Malaysia has 69 power plants – eight coal fired/combined gas coal plants, 20 hydroelectric dams, 22 gas fired plants, five oil-fired plants, nine biomass plants and five large scale solar farms. There are also several small-scale hybrid power stations using diesel generators, solar panels and wind turbines on the islands off the East Coast of Peninsular Malaysia.¹

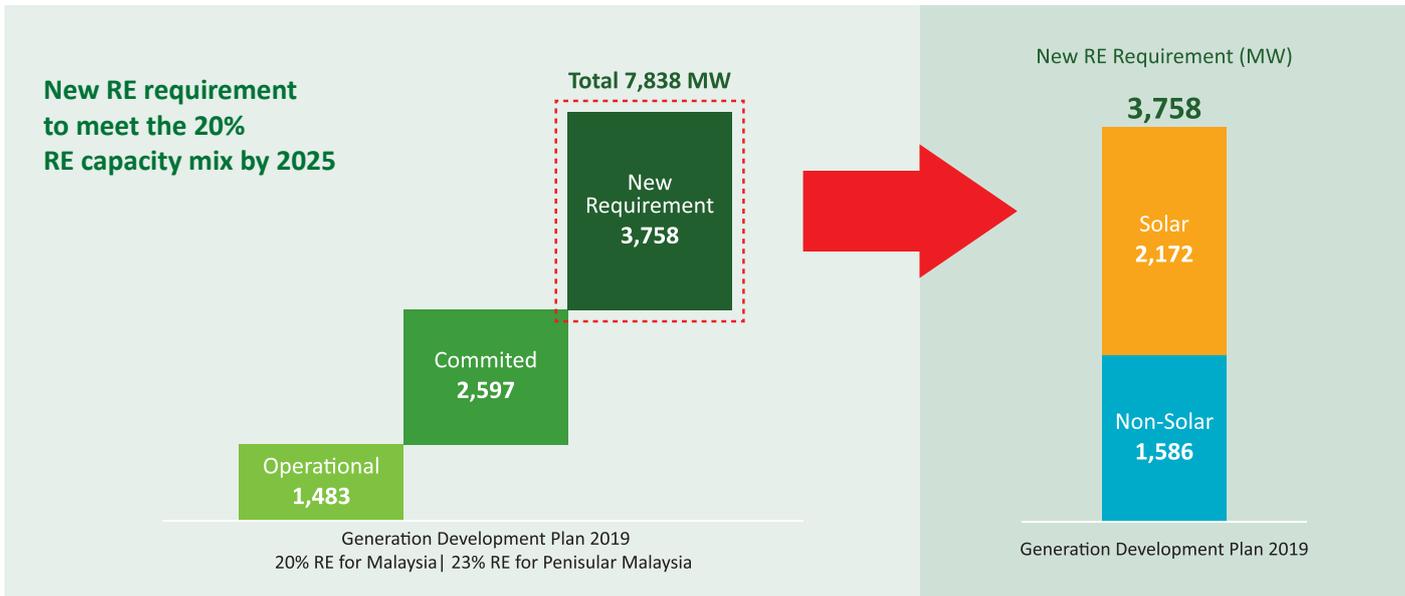
Latest RE Capacity Target

According to the Report,² only 1,483 MW are being generated from operational RE assets while 2,597 MW are being committed to come into operation.

The remaining 3,758 MW being available for development commencing 2020 which consists of 2,172MW of solar and 1,586 MW of non-solar

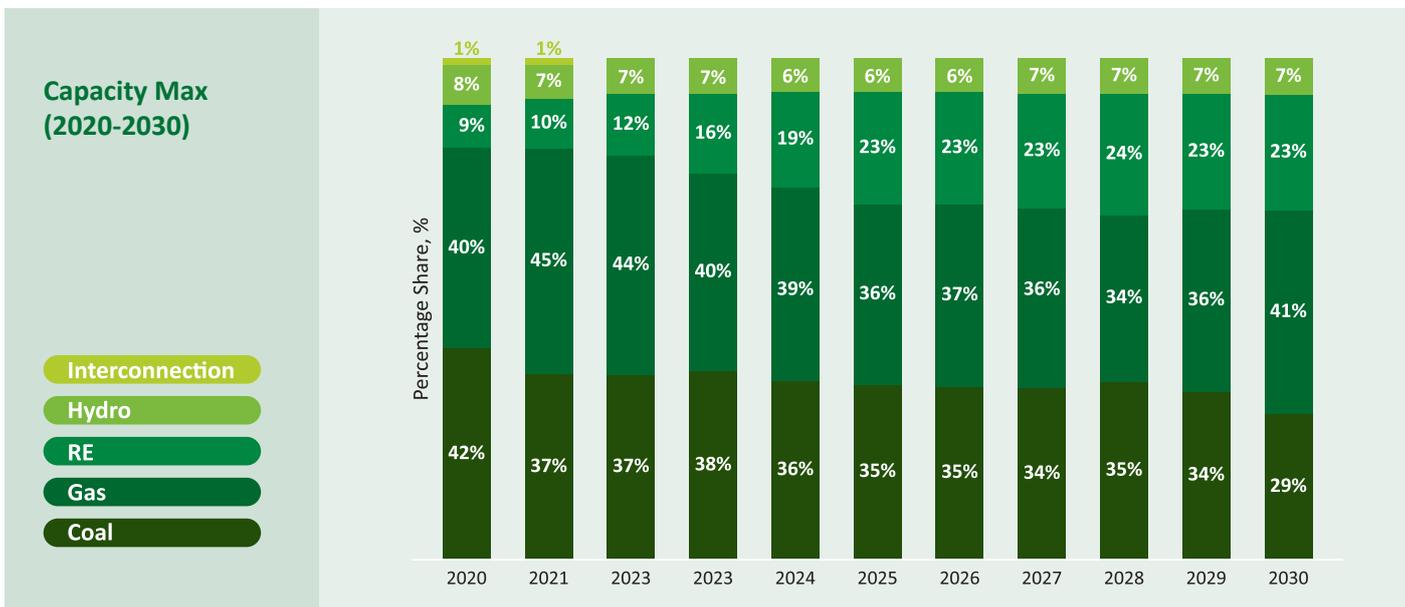


It also projected the energy demand to reduce to 1.8%p.a between years 2020 to 2030 as compared to a 2.5%p.a. growth between years 2015 to 2019. In the coming years, more RE is expected to be installed at the distribution network, which will directly cater to the increased demand for RE due to an increasing growth in more environmental conscious consumers.



Source: Energy Commission, 'Report on Peninsular Malaysia Generation Development Plan 2019 (2020-2030)' (February 2020).

The RE capacity is projected to increase from 9% to 23% between the periods of 2020 to 2030 in tandem with the reduction in thermal (gas and coal) capacity share from 82% to 70% over the same period as can be seen from the statistic below:



Source: Energy Commission, 'Report on Peninsular Malaysia Generation Development Plan 2019 (2020-2030)' (February 2020).

Evolution of RE Policies and Initiatives in Malaysia

Below is a summary of the evolution of energy-related policies and initiatives in Malaysia:



SECTION TWO ACCELERATING THE GROWTH IN RENEWABLE ENERGY GENERATION

Malaysia's Current RE Initiatives and Programmes

► FEED-IN TARIFFS (FIT) SCHEME

IMPLEMENTED PURSUANT TO RENEWABLE ENERGY ACT 2011

The enactment of the Renewable Energy Act in 2011 ("RE Act") made it compulsory for all RE generated by the FiT approval holders ("FiAHs") to be purchased by the offtakers (referred to as the Distribution Licensee under the FiT scheme). This created the biggest impact on the RE industry and essentially catalysed the generation of RE in Peninsular Malaysia and Sabah. Sarawak is regulated by a different electricity regulatory regime, thus it is not subject to the RE Act and the FiT scheme.

The RE Act provides a mechanism vide the FiT scheme for qualified individuals or non-individuals to sell electricity (up to 30 MW) generated from RE resources to distribution licensees at a fixed premium price for a prescribed duration depending on the RE source (a period of 16 years for biomass

and geothermal and a period of 21 years for biogas, small hydropower and solar PV technologies) under the Renewable Energy Power Purchase Agreement ("REPPA") regulated by SEDA, a statutory body overseeing the implementation and management of RE. The license to undertake RE projects under the FiT scheme is based on a quota determined and managed by SEDA.

**Five RE resources eligible for FiT:
biogas, biomass, small hydropower,
solar PV and geothermal.**

FUNDING BY ELECTRICITY CONSUMERS

Payments to FiAHs are guaranteed from the RE Fund, which effectively determines the quota available for the implementation of the FiT scheme. The RE Fund is funded by electricity consumers through the 1.6% surcharge on their electricity bills except for domestic customers with electricity consumption of 300kWh and below per month based on the polluters pay principle.

TARIFF SUBJECT TO GRID PARITY

FiT in Malaysia has been designed with the main objective of achieving grid parity. Grid parity occurs when the cost of generating RE is equivalent (or lower) than the cost of generating electricity from conventional fossil fuels. Once grid parity is achieved, FiAHs will be paid based on the prevailing displaced cost for the remaining effective period i.e. the remaining duration of its REPPA with its offtakers, the Distribution Licensees. With access to the grid and favourable tariff setting, the FiT scheme ensures that renewable energy becomes a viable and sound long-term investment for renewable energy investors.

POTENTIAL IN RE RESOURCES

► Small Hydro

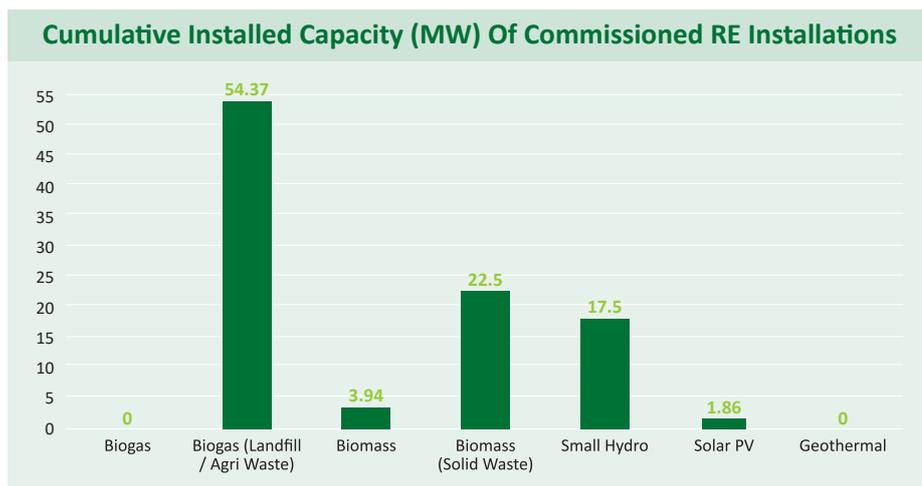
In Malaysia, most small hydro schemes are run-of-river systems that do not require large reservoirs due to the abundant potential sites. Small hydro (having capacity of up to 30 MW) is the only RE resource with remaining quota for feed-in approvals of up to 24.57 MW to be granted in 2020 (H2) and 32.84 MW in 2021 (H1).⁶ The total installed capacity for small hydro to-date is 30.30 MW.⁷ On 5 March 2020, SEDA offered a quota of 116 MW for the year 2020. The period for submission of the applications via e-bidding is from 7 April 2020 to 28 April 2020. The expected commercial operation date for the proposed small hydro plant is expected to be on the second half of 2025.⁸

► Biogas and Biomass

With its palm oil, forestry and timber residues and municipal solid waste, Malaysia has abundant biogas and biomass

resources with the potential to deliver about RM30 billion in additional gross national income, more than RM25 billion in investments, 60,000 higher value jobs, as well as help reduce the country's CO2 emissions by 12%.⁹ The total installed capacity for biomass and biogas to-date are 6.48 MW for biogas, 53.36 MW for biogas (landfill or agricultural waste), 80.90 MW for biomass and 12.85 for biomass (solid waste).¹⁰ By 2030, the biomass and biogas installed capacities are expected to meet 1,340 MW and 410 MW respectively given the vast potential.¹¹ On 5 March 2020, SEDA offered a quota of 30 MW and 20 MW for Biogas and Biomass respectively. The applications for biogas were via e-bidding from 17 March 2020 to 31 March 2020. Meanwhile for biomass, the period for submission of applications is on a first come first serve basis from 31 March 2020. The expected commercial operation date for the proposed biogas plants is at the second half of 2023, and first half of 2023 for biomass.

Below sets out the latest statistics on the total installed capacity of commissioned RE installations under the FIT scheme as at 2019:



Source: SEDA RE Installed Capacities



► NET ENERGY METERING (NEM) SCHEME

Implemented vide offset arrangement with utility provider

As the solar PV quota is reaching its limit for customers under the FIT scheme, the government introduced the NEM scheme in November 2016. The scheme allows electricity consumers to install rooftop solar PV systems and generate electricity for their own consumption and sell any excess electricity to TNB. This addresses the shortage of the FIT for solar PVs by allowing consumers with solar PVs to sell directly to TNB without needing a FIT quota. The policy shift was due to the financial constraints on the RE Fund which can no longer accommodate additional RE projects.

The maximum allowable capacity to be installed under NEM is targeted to be 500 MW (450 MW from Peninsular Malaysia and 50 MW from Sabah) with a maximum 100 MW per year from 2016 to 2020. This translates to an NEM quota of 90 MW per year for Peninsular Malaysia with 50 MW being allocated to the domestic segment and 450 MW to commercial, industrial and agriculture. In 2018, the total quota taken up is only 8.69 MW for Peninsular Malaysia and Sabah. Due to the low uptake, effective 1 January 2019, the NEM scheme offers the same tariff for selling and buying electricity for NEM participants where the true net energy metering concept is implemented to allow excess solar PV generated energy to be exported back to the grid on a “one-on-one” basis. The offset arrangement is where instead of cash, the consumer will be given credits equivalent to the amount of solar PV energy that was exported back to the grid. The credits are valid for 24 months¹² and will be used to offset any charges that may be incurred by the consumer in procuring electricity.

Options for adoption of NEM

The solar PV systems are commonly installed on available building rooftops or car porches within the premises of the consumers. The offsetting on a “one-to-one” basis under the NEM scheme promises considerable savings to consumers, especially consumers who are on commercial or industrial tariffs. However, needless to say, a significant amount of funds will need to be invested in to install the solar PV system.

Instead of directly expending large sums of money to install, operate and maintain a solar PV system, consumers can opt to finance such costs by entering into:

- (i) a solar power purchase agreement;
- or
- (ii) a solar leasing agreement.

(i) Solar Power Purchase Agreement (SPPA)

Under the SPPA, a service provider finances, owns, installs, operates and maintains the solar PV system. The costs are recovered through the sale of solar PV energy generated from the solar PV system:¹³

- firstly, to the consumer’s premise at an agreed rate for a prescribed term; and
- secondly, any unutilised excess solar PV energy are exported to the grid at an agreed rate for a prescribed term.

Put simply, a consumer enters into a SPPA with a service provider for the service provider to install the solar PV system on their premises. The amount of any upfront payment is negotiated and agreed between both parties.¹⁴ The consumer will then pay the service provider for any electricity produced by the solar PV system (“Energy Payment”). The Energy Payment is at a rate lower than the usual tariffs which the consumer would pay to TNB, the utility provider to procure electricity from the grid. The consumer is also entitled to offset the Energy Payment to the service provider with an agreed upside gained from exporting the unutilised excess Solar PV energy to the grid.

This business model is suitable for consumers who do not wish to own the Solar PV system as there are risks in having ownership of the Solar PV system. However, without ownership of the Solar PV system, the consumer would not be entitled to benefit from tax incentives offered by the government.



(ii) Solar Leasing Agreement (SLA)

The SLA refers to an agreement where a service provider finances, installs, operates and maintains the Solar PV system. The service provider recovers its costs from the consumer who pays a fixed monthly “rent” or “lease payment” in return for the use of the Solar PV system (“Lease Payment”).¹⁵ The Lease Payment is not tied to the actual generation of Solar PV energy and is usually a fixed amount throughout the term.

This business model is suitable for consumers who wish to own the Solar PV system. With ownership, the consumer would be entitled to benefit from tax incentives such as the GITA on qualifying capital expenditure incurred on green technology projects and capital allowance for wear and tear of qualifying fixed assets (i.e. Solar PV system) (“CA”).

Service providers certified by SEDA who offer solar leasing arrangements are also entitled to tax exemptions of up to 70% of its income for up to 10 years effective from 1 January 2020.¹⁶

► MAIN DIFFERENCES BETWEEN SPPA AND SLA

	SPPA	SLA
Upfront payment to the service provider	Upfront payment is payable by consumer	No upfront payment
Ownership	Customer does not own the Solar PV system	Customer owns the Solar PV system
Eligible to claim GITA and CA	No	Yes
Payment during the term	Energy Payment	Lease Payment

The SARE is a tripartite agreement between the utility provider (TNB), the service provider and the consumer aimed to reduce counter-party risk faced by PV investors/asset owner where non-payment risk faced by service providers in SPPAs or SLAs are reduced.¹⁹ In return for providing security of payment to the service provider, TNB charges a nominal fee computed on a per kilowatt hour basis. Under a direct contract situation (i.e. SPPA/SLA) in the absence of SARE, there is a potential risk that consumers will default in payments to the service providers. However, under the SARE, any non-payment of outstanding amounts, it is possible for TNB to disconnect the electricity supply to such delinquent consumers.²⁰

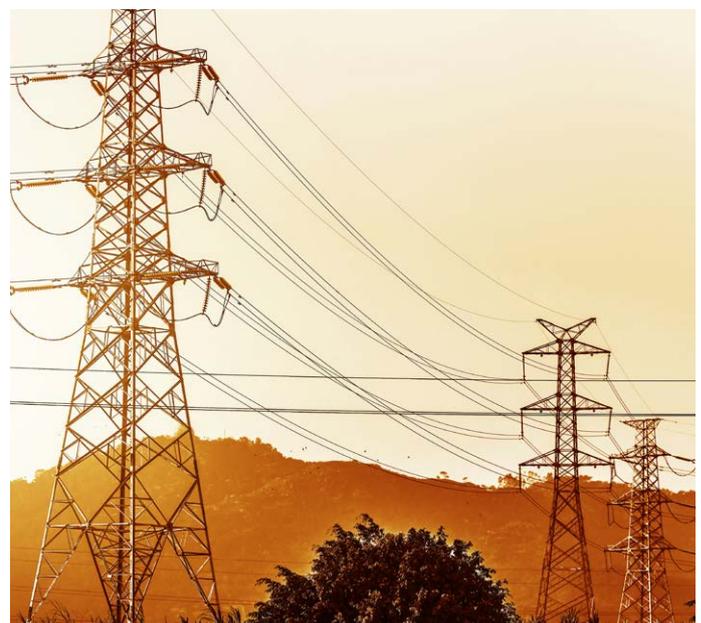
SEDA has been encouraging Malaysians to capitalise on its NEM scheme and maximise on the solar energy, which Malaysia is abundantly blessed with due to its location in the equatorial zone. As at end of November 2019, SEDA has approved a total of cumulative NEM programme quota of 108 MW. While the uptake of the NEM scheme was not as rapid as expected and there is still a balance of 300 MW of NEM 2.0 until the end of 2020 as reported by SEDA recently, the NEM is fast gaining acceptance, largely due to the newly improved NEM 2.0 programme which allows for a “one-on-one” offset basis.

The business models for both the SPPA and SLA are subject to regulations issued by the regulators. Service providers who wish to offer solutions under the NEM scheme must first be registered with SEDA as a Registered Solar PV Investor (“RPVI”).

A foreign RPVI can only provide solutions for Solar PV systems above 250 kW, must be locally incorporated, has a paid-up capital of RM10 million, and utilise 100% local contractors with a minimum of 80% local employment.¹⁷ On the other hand, there is no capacity limitation for a local RPVI, but it must be locally incorporated with a minimum paid-up capital of RM1 million. Any company offering consultancy, design, supply, installation and testing and commissioning services of a complete Solar PV system is to be registered with SEDA as a Registered PV Service Provider (“RPVSP”). Any NEM scheme applicants interested to partake in either arrangement can engage a RPVI and/or RPVSP as listed in the directory on the SEDA’s website.¹⁸

Mitigating Payment Risk through Supply Agreement for Renewable Energy (SARE) with TNB

The SPPA or SLA business models require the consumer to enter into a direct contract with the service provider. Hence, any non-payment risk of the Energy Payment or Lease Payment is borne by the service provider.



► LARGE SCALE SOLAR (LSS) PROGRAM

Competitive bidding conducted by EC

Solar seems to be the most promising RE source with the most uptake since the FIT scheme was implemented as it is the easiest to implement compared to other technologies such as biogas, biomass and others which have their challenges which will be further discussed below. As such, the government has, since 2016, rolled out a series of competitive biddings for large scale solar projects conducted by the EC to expedite the country's aim of achieving 20% RE capacity by 2025.

The EC reported that at the end of 2019, the new solar average capacity factor is at 17% compared to 14% previously due to more efficient and cost effective technologies.

Massive interests from foreign RE investors

The EC completed its third round of bidding in early 2020. All three LSS bidding exercises conducted by the EC have received considerable good participation rates from both local and foreign developers. To encourage more participation from local players, there is a restriction on foreign equity shareholding not exceeding 49% and the requirement for the main contractor for engineering, procurement and construction (“EPC”) works to be a local.

The latest LSS3 bidding saw the award of LSS projects totalled 490.88MW_{ac} to bidders mostly comprising of global renowned solar developer/EPC names, namely ib vogt GmbH from Germany, Solarpack from Spain, ENGIE Energie Services S.A. and Hanwha from South Korea in collaboration with local companies.

Driving down tariffs

The main observation that could be made from the latest LSS3 bidding is the sharp drop in the offer price submitted as released by the EC - RM0.17777/kWh in the current LSS3 bidding as compared to RM0.3398/kWh being the lowest offer price submitted at the previous LSS2 bidding under category P3 (10.00MW to 30.00MW) in Peninsular Malaysia. According to EC, the selection of the bidders are based on bids with the most competitive offer prices and meeting all the Request for Proposal (RFP) requirements.

While the main advantage of conducting biddings is generally to drive down the tariff by creating stiff competitions between bidders, the substantial drop in the tariff in the latest LSS3 bidding has caused some concerns amongst industry players and financiers. This is due to the fact that the very low offer prices submitted may not be reflective of the actual costs required to implement the projects. Such low offer prices have been deemed as “unrealistic costings” and may eventually compromise the quality of the solar plants to be built with contractors cutting corners so as to bring the costs down which will give rise to operational issues and consequently affecting the consistency of the overall RE generation capacity contribution into the grid.

Main Challenges & Barriers to RE Growth

Notwithstanding the positive prospects for RE projects in Malaysia, the future of RE projects are hindered by a number of existing challenges and constraints.

Below are some of the main obstacles faced by RE producers for the relevant RE Resources in Malaysia.

1

Lack of coordination amongst government agencies and authorities

One major hurdle faced by the RE producers in Malaysia is the lack of coordination amongst government agencies and authorities. Regulation and licensing requirements for RE development differs across federal, state and district levels – one example is the restriction on category of land use for solar projects as illustrated below. Such administrative hurdle substantially increases lead times in

obtaining authorisations necessary for the implementation of RE projects. This often results in prolonged project start-up and, for RE projects which undertake project financing, poses a major risk in achieving project financial close on time. What is urgently needed is a uniform approach between all agencies at all levels to provide certainty of time and costs to RE project developers.

2

Inconsistent requirements on category of land use in different States particularly for implementation of Large Scale Solar Program

The different approaches by the State governments in permitting agricultural lands to be used for LSS projects has caused a lot of uncertainty over the costs and timing required by the project company in developing the LSS projects. The approach varies - from requiring the LSS developers to either convert the existing category of land use from “agriculture” to “industry” (“Land Use Conversion”), obtain a waiver for

Land Use Conversion to applying for a special permit to occupy and use the agricultural land for LSS projects. Given the inconsistent approach by State governments, this has caused uncertainty to the project timeline due to the delay in getting permission and the substantial increase in the costs that may not have been accurately anticipated and captured in the financial model of the LSS projects.

3

Restriction on foreign equity shareholding caused constraints in equity funding

One major restriction for foreign investors in the LSS Programme and FIT is the foreign equity shareholding being limited to not more than 49% of the equity interest in the project company.²¹ This increases the burden on local investors to necessarily contribute at least 51% of the overall capital required for the implementation of the RE project and this has caused constraints in the equity funding for the

project company particularly when the equity share for financing has increased over time to more than 20% given the lenders' increasing reluctance to provide a higher debt funding due to lenders' perception particularly of the LSS projects being risky as most of the LSS projects face difficulties in their implementation.

4

Remoteness to grid connectivity increases the costs for small hydro

There is potential in remote areas for the installation of small hydro power plants as it allows for the economic and social development in rural areas. Having said that, one of the biggest challenges for a feasible small hydro development is to ensure that it is within reasonable distance from the nearest

grid points. The more remote the site is, the higher the costs of constructing, maintaining and operating the transmission system from the point of generation up to the substation for the entire 21-year term of the REPPA.

5

Uncertainty in securing long-term feedstock supply agreements for biogas and biomass

One of the key challenges facing bio-energy developers is securing long-term feedstock supply agreements at attractive rates for biogas and biomass resources. These resources, including palm oil mill effluent, mesocarp fiber, empty fruit bunches, and palm kernel shells which are traded on spot basis in the open market which has resulted in the fluctuation of fuel price and competing demand. Bio-energy developers utilising municipal solid waste comprising non-fossilised and biodegradable organic material ("MSW")²² as feedstocks to waste-to-energy plants face similar constraint in view that the tonnage and calorific value of MSW provided will not be guaranteed by the government

under the concession granted. Such potential shortage of MSW and fluctuations in the calorific value of the MSW may result in fluctuations or reduction in the power generated by the waste-to-energy plant which in turn translates into negative costs implications on the part of the bio-energy developers under REPPA. Equally challenging is when several biomass plants are sourcing feedstock from the same area and this ultimately causes these plants to be unable to operate due to shortage of feedstock. Biogas is also limited to palm oil millers and as such the energy generating capacity is very low and also due to the fact that the area is sparsely populated.

6

Lack of project financing support

There is a need to promote more lending for RE projects. Various delays suffered by developers in LSS1 and LSS2 were mainly due to inability to obtain local permits, specifically related to land issues to start work on time. This is because the state government and authorities are trying to come to grasp with the requirements applicable to solar power plants which are unfamiliar to them. This has dampened the financiers from lending to LSS project developers and caused stricter credit risks assessment and higher costs of financing for the RE producers in securing funds to embark on RE projects.

We note that Ministry of Energy, Science, Technology, Environment and Climate Change ("MESTECC") (as it was then known) had commissioned the Securities Commission ("SC") to look into the manner in which more financing support can be provided to RE developers. This has led to the SC issuing the Sustainable and Responsible Investment ("SRI") Roadmap for the Malaysian Capital Market in November 2019, which is further discussed in *"The Securities Commission's Roadmap to Sustainable and Responsible Investment within the Malaysian Capital Market"*.

7

Inadequate quota to spur RE participation under the FIT scheme

At the time of the publication, we note that, under the FIT scheme, small hydro is the only RE resource with remaining quota of up to 24.57 MW to be granted in 2020 (H2) and 32.84 MW in 2021 (H1).²³ There is no available FIT quota for the remaining RE resources up until 2025. The lack of quota hinders RE growth in Malaysia. Given that the quota is

dependent on the contribution made by electricity consumers from the fixed percentage imposed on the consumer's electricity bills, there is a need to find alternative ways of funding the RE quota for the FIT scheme so that it can continue to spur participation for contribution to the RE capacity.

TOP 10 Noteworthy Matters to Spur RE Growth

In ensuring that we are headed towards a successful achievement of our aspiration of meeting 20% RE capacity in the energy mix by 2025 and fulfilling our COP21 commitment, below are top 10 matters which we have identified to be noteworthy of being considered for adoption by relevant stakeholders:

1.

Having an overall policy that takes into account other sectorial strategies & long-term integrated energy planning strategies

There is a dire need to coordinate the existing fragmented national policies and implement an efficient and robust overall policy framework which addresses the shortcomings and establishes the strategies across various interconnected regimes - the biomass industry, environment and renewable energy for synergy in the achievement of the RE Mix (“Policy Framework”). Properly introduced and implemented, the Policy Framework can act as a catalyst for progressive achievement of the RE Mix and at the same time harness integrated synergy in resolving existing issues across these regimes, including the insecurity of long term biogas and biomass feedstock due to competing market demands, uncertainty in security of MSW due to non-integrated solid waste management across the states²⁴ and existing environmental issues as a result of landfilling and incineration of MSW.

There is also a strong call for the government to recognise the advantages of renewables and efficiency, ensure a just transition for everyone, and pave the way for a clean, low-carbon global

economy. Policy makers need to establish long-term integrated energy planning strategies, define targets, and adapt policies and regulations that promote and shape a climate-friendly energy system. To capture the overarching impacts of the energy transformation, an integrated energy planning approach is required that combines a holistic, energy system-wide and long-term planning perspective. Long-term energy scenarios have a multiplicity of uses that can support planning for a climate friendly energy system.

In October 2019, SEDA announced Malaysia’s first pilot run of peer-to-peer (“P2P”) energy trading which allows the buying and selling of energy between two or more grid connected parties. The pilot project is to run from November 2019 until June 2020 and is being conducted by SEDA with the objective of conducting a technical feasibility study for Malaysia

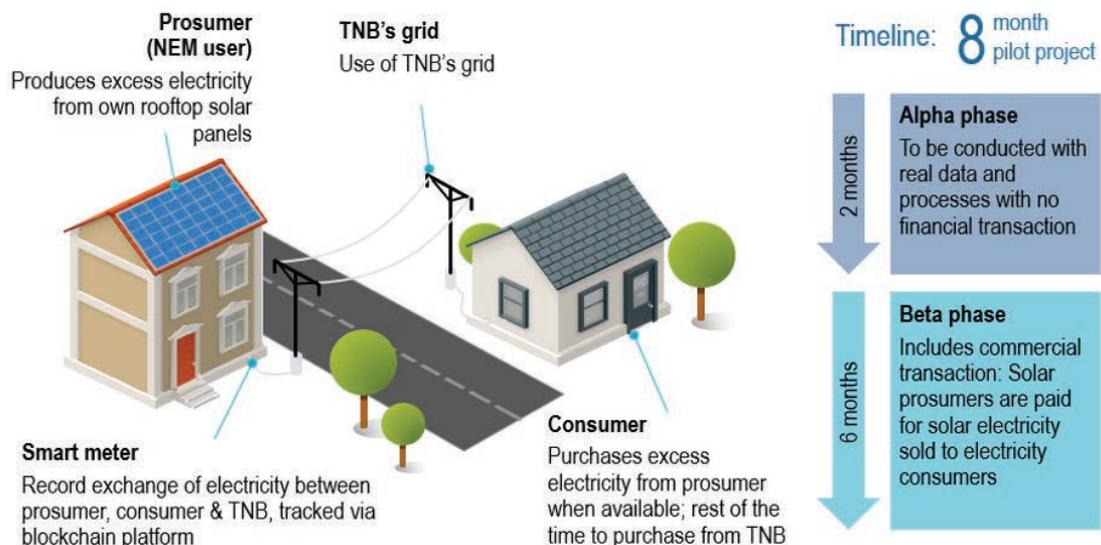
to implement the P2P energy trading in the future. This allows consumers who wish to contribute to a sustainable environment to purchase green electricity from a green energy producer (prosumer). The trading process between the prosumers and consumers uses a digital platform. This platform can also allow the consumer to buy the green energy direct from the prosumers using emerging technologies such as blockchain. The P2P energy trading has been identified as one of the initiatives to encourage the solar PV rooftop installation in Malaysia.

Over the years, a number of countries have developed platforms for P2P energy trading and this has been proven to reduce the energy price for customers up to 30% in Germany.

2.

Expedite the implementation of Peer-to-Peer (P2P) Energy Trading Program

Concept of P2P pilot project in Malaysia



Source: SEDA²⁵

The P2P energy trading program is expected to generate a lot of interest from the private sectors given its potential savings to the big electricity consumers such as manufacturing facilities. Large corporate companies such as Google has signed a 10-year deal to purchase RE from three wind farms which are being constructed in Finland. The energy from these wind farms, which is expected to be 190 MW, is to be used to power Google's data centre in the country. This is part of a growing trend where large companies sign power purchase agreements ("PPAs") to buy cheap renewable energy directly from generators.

We note a flurry of interests in corporate PPAs in the market now with many corporate customers are exploring the possibility of purchasing electricity directly from the producers and this trend will further accelerate the growth of the renewable industry. In addition, where corporations are previously only playing the role as buyers of renewables, some corporations are now becoming active stakeholders in the renewable industry and have increasingly interacted with utilities, residential customers, state governments, developers, and other stakeholders. For example, some larger corporations are working with developers and technology providers to increase renewable access for other consumers, mainly smaller corporations. In June 2019, Starbucks, in collaboration with LevelTen Energy, announced a 146 MW wind and solar aggregation deal combining three projects built by three developers across three states.

With the implementation of the P2P energy trading being expedited, customers can have a choice to buy green electricity from the market using digital technology provided by the energy trading platform particularly large corporate and manufacturing companies in Malaysia.



3.

Expedite the implementation of Third Party Access

Malaysia is also looking at implementing the Third Party Access ("TPA") as one of the government's key initiatives of MESI Reform 2.0. The intent is to establish a TPA framework and network charges for the grid to allow third party to use the grid infrastructure. This is to allow the trading of green energy and pave the way for the future export of electricity under the ASEAN Power Grid. It is also intended to facilitate the electricity buyer to acquire a minimum of 20 MW directly from the RE supplier with TNB being paid a certain network charge for renting its grid to enable the delivery of the RE from the RE generator to the electricity buyer. With ASEAN Members promoting clean energy in their country, it will reduce carbon emissions and create job opportunities in the region. With the expertise that we have gained

in implementing RE projects, particularly solar projects, our people working in this industry can share and export their expertise with other ASEAN countries. Therefore, the time is ripe for the TPA framework to be implemented expeditiously to enable the trading of green energy and pave the way for future export of electricity to other countries within ASEAN under the ASEAN Power Grid.

Given that more reliance will be placed on RE plants to contribute to the overall energy mix, there is a need to ensure that plants are built in accordance with requirements that will ensure that they are fit for its purpose and highly reliable with no operational issues. Therefore, lowest tariff offer price by bidders should not be the main parameter and measurement in awarding the LSS projects.

More stringent criteria must be adopted when awarding LSS projects to ensure that only sufficiently experienced and reliable developers who can operate the plant reliably, efficiently and safely are selected to build and operate the plants.

Given the government's ambitious plan for rapid increase in RE plants to increase RE capacity in the overall energy mix, there is a real need to ensure that all future RE plants are built in accordance with standards that would not pose any operational difficulties in the long run. An industry player has commented that there will be serious risks as well as significant gaps in the reserve margin if the RE initiatives and plant ups are not successful.

4.

More stringent selection criteria in awarding RE projects to ensure reliable RE Plants

5.

Increase local sharing in the RE construction costs

According to a local RE developer, almost 70% of the total project costs for both LSS projects and rooftop projects are equipment costs, which generally have to be imported into Malaysia and the local contractors will only earn a nominal sum normally not exceeding 15% of the total construction costs. As such,

it was lamented that the biggest beneficiaries for these projects are actually the foreign equipment manufacturers and foreign EPC Contractors.

Under the LSS3's Request for Proposal, it is a requirement that the Engineering, Procurement, Construction and Commissioning ("EPCC") contractor/main contractor must be a local contractor registered with Construction Industry Development Board (CIDB) as civil contractor/building contractor/electrical contractor or other relevant categories of contractors with the appropriate certification for the relevant works. However, in terms of the use

of local products, contractors, service providers, suppliers and labour for the Project, bidders are only required to promote local participation.

Therefore, to increase the local share in the overall project costs, the government would

need to continue to impose the requirements for local EPCC contractor to be the main contractor to undertake the works and impose the requirement for local products, contractors, service providers and suppliers to be used unless they are not available in Malaysia. With these requirements, opportunities are also created for local contractors, service providers and suppliers to build capacity so that they can expand their businesses, either as an EPCC Contractor and/or operator across the ASEAN region.

There is also a call for more transparency and clear criteria from SEDA in the allocation of the NEM quota to enable investors to have better clarity on the manner in which

the quotas are being allocated to interested investors/asset owners. Given the increase interests in the NEM scheme by the private sectors, clear criteria of selection will encourage more investors into this stream which will help spur the growth of more RE capacity

6.

Further clarity and transparency on criteria for award of NEM quotas

7.

Exploring and promoting new ways of increasing RE capacity

(i) Promoting the installation of PV systems on rooftops

In Malaysia, solar power through rooftops has gained traction due to strengthening government support, growing investor confidence and reduction in costs. Many service providers in the market have begun to offer installation, operation and maintenance solar PV systems. This is mainly marketed towards heavy electricity consumers who see great benefits in terms of costs of electricity. In September 2019, Mydin Mohammed Holdings Berhad became Malaysia's first chain retailer to install a solar PV system at its outlet in Ipoh, Perak. The 324 kW installation is expected to save up to RM3.24 million in electricity bills throughout its 25-year lifespan.²⁶



Source: Emiliano Bellini, 'Net-metered rooftop PV on the rise in Malaysia', (PV Magazine, 6 January 2020)²⁷

There is a large untapped area of rooftops for solar PV installations in Malaysia – from factories, shopping malls, covered car parks and office buildings. SEDA's CEO, Dr Sanjayan Velautham estimated that some 4.1 million buildings in Malaysia could still accommodate solar panels and they could generate about 24-gigawatt peak (GWp) of electricity. Given that such installation are undertaken on existing facilities, it substantially reduces the risk of land issues which appears to be the number one issue that plagues LSS projects.

Providing attractive tax incentives to owners of buildings including residential homes that has PV systems installed on their rooftops will bring the installation costs down and spur the growth of solar energy generation from rooftops as well as increasing the production of RE through private generation.

(ii) Exploring the potential of floating solar farms

Given the increasing scarcity of land and competition for land to be used for agriculture, industry as well as the need to cater for growing populations, floating solar farms are on the rise with worldwide capacity hitting 1.1 GW in 2018 according to the first market report on floating solar, produced by the World Bank Group and the Solar Energy Research Institute of Singapore ("SERIS").

Asia, incidentally, is leading the way with a number of major projects announced throughout 2018. Countries like Singapore and Thailand have geared up towards the implementation of floating solar farms. The floating panels are put in lakes, dams, reservoirs and the sea. Thailand state-run Electricity Generating Authority of Thailand (EGAT) will float 16 farms at nine hydroelectric dam reservoirs by 2037. In Singapore, three floating solar photovoltaic systems at Tengeh, Bedok and Lower Seletar have been deployed by the National Public Utilities Board (PUB).





The opportunity of installing the floating solar PV on the open sea are enormous but there are challenges posed by tough conditions of the sea such as impacts from strong winds, large waves and large tidal movements on the floating structures and module yield as well as the salinity factor that need to be overcome. According to SERIS, while floating panels are more expensive to install, they are up to 16% more efficient because the water's cooling effect helps reduce thermal losses and extend their life as there is an estimated loss of 0.41% power for every 1% increase in temperature.

In Malaysia, floating solar farms are still at its infancy. TNB Research Sdn. Bhd. conducted a pilot project on the development of the country's first floating solar project which spanned around 1,000 sq m over a 50ha lake in Sepang, Selangor. The pilot floating PV systems project was launched in March 2015 with a capacity of 108kWp, covering 1,000 cu m on a 50ha lake in the Sungai Labu Water Treatment Plant. If these floating solar farms are to be developed further, there will be a need for the Ministry and EC to study and put in place specific regulations on the permitting and licensing of these plants. This is as existing regulations are mainly for ground and roof mounted PV and therefore a different legal interpretation is necessary for floating solar PV systems. Furthermore, the permit requirements for floating solar system on drinking water reservoirs will be more complicated given that these reservoirs are considered national security sites.

The other innovative option which has been advocated is adding floating solar capacity to existing hydropower plants, especially in the case of large hydropower sites that can be flexibly operated. This solar capacity can be used to boost the energy yield of such assets and may help to manage periods of low water availability by allowing the hydropower plant to operate in "peaking" rather than "baseload" mode by using solar capacity first and drawing on hydropower at night or during peak demand. At some large hydropower plants, only 3-4% of the reservoir would need to be covered with floating solar panels to double the electricity generation capacity of the dam. It was also noted that the reduction of sunlight also helps prevent algae blooms, which pollute water and raises treatment costs.²⁸ Although the capital costs of floating PVs are still slightly higher compared to fixed solar PV system, owing chiefly to the need for floats, moorings and more resilient electrical components, these costs are balanced by a higher expected energy yield of floating solar PV relative to ground-mounted systems (yields are conservatively estimated to be 5% higher for floating systems, with gains potentially as high as 10-15% in hot climates, leading to a comparable Levelised Cost Of Electricity (LCOE)).²⁹

To incentivise and encourage the development of floating PV systems, the government may consider providing financial incentives to the developers. This is seen in Taiwan where the feed-in tariff for floating systems is higher than that the ground-mounted systems. In Korea, extra renewable energy certificates are given for projects that are floating while the US state of Massachusetts increases the incentive value for solar projects that use floating solar PV, as part of the state's SMART Program that was implemented in 2018.

(iii) Powering up with microgrids

Microgrid is a local energy grid that has the capacity to operate autonomously. This means that power can be generated (usually through small scale power plants such as solar power and other renewables) and distributed locally. This eases dependence on the national grid and is very useful in places that are prone to natural disasters or have little to no infrastructure. Given that remote areas of Sabah and Sarawak are prone to electrification issues, microgrids will provide a great opportunity for such areas to be electrified.

EC reported that RE is also playing a big role in government rural electrification programmes. In Malaysia, there are several small-scale hybrid power stations using solar panels and wind turbines on Pulau Tioman and other islands off the East Coast of Peninsular Malaysia that are off the national grid.³⁰

Solar energy is often lauded as an inexhaustible fuel source as it is pollution and noise free and the technology is pretty versatile.³¹ Nonetheless, it is not without pitfalls. The intermittency problem in energy production, particularly solar energy poses a major challenge faced by the RE

industry. Solar energy does not work at night without a storage device and cloudy weather makes the technology unreliable.³² The flow of energy use gets disrupted by the discontinuous nature of RE as Malaysia only receives approximately four hours of direct sun as a lot of the rays are reflected back. On a utility scale, intermittency problems potentially lead to difficulties in managing the grid and as a consequence, may raise the cost of electricity.

In order to overcome the problem of intermittency, solar PV systems have been increasingly paired with a technology known

8.

Storing the sun's energy

as the Battery Energy Storage System (“BESS”) at both the utility and domestic levels globally.

BESS refers to a rechargeable battery system that stores energy from solar PV systems or the energy grid to provide energy to a home or business. The underlying idea of the BESS is that such stored

energy can be utilised at a later time. There are various types of BESS, including lithium-ion, nickel based, sodium-based and lead-acid with the price of lithium-ion battery storage showing the greatest decline at 35% in recent period.³³ The sizes of BESS are mainly divided into two categories, large scale (utility) and small scale (domestic and businesses).

It is noteworthy to mention that while BESS has yet to penetrate the Malaysian market, Malaysia has taken its first step in introducing BESS technology. During the LSS3 bidding stage BESS was included in the proposal request.³⁴ The recent LSS4 bid also provided the option for bidders to include the use of BESS in their LSS Plant. Coupled with the fact that the electricity industry in Malaysia is heading towards liberalisation, one can naturally expect to see utility scale solar projects employ BESS to harness its capabilities to increase its efficiency in the near future particularly when the costs of BESS reduces with the development of new battery technologies.

9. Increase the fiscal incentives for RE projects

Projects or services that are related to RE, energy efficiency and green buildings currently qualify for the following incentives:

GITA	100% of qualifying capital expenditure incurred from the year of assessment 2013 until the year of assessment 2023. Purchase of green technology assets listed in MyHijau Directory also qualifies for GITA.
GITE	100% of statutory income from the year of assessment 2013 until the year of assessment 2023.

Under the Budget 2020, the incentives, namely Green Investment Tax Allowance (“GITA”) and Green Income Tax Exemption (“GITE”), have been extended to end-December 2023 to recipients who met the criteria of green technology as defined in the National Green Technology Policy.

As at the time of publication, MIDA has yet to announce the

finalised revised guidelines for the extension of GITA and GITE, including the new GITE provision for companies undertaking solar leasing activities. The government should consider providing more attractive fiscal incentives to promote the use of green energy and investments in RE as fiscal incentives forms part of the very first and main consideration for any RE investment as it generally has an overall impact on the feasibility of the investment.

Please refer to the article on [“Overview of Tax Incentives for Green Projects in Malaysia”](#) for more details.

To become a RE-powered nation, support and contribution from companies and the government are critical.

(i) Corporate support

To play a role in tackling the environmental issues and contributing to the RE sector, government-linked companies (“GLC”) and multinational corporations (“MNC”) can commit to be part of the RE100, where companies commit to the use of 100% renewable power. Google is now the world’s largest purchaser of RE and together with other US major corporations such as Amazon, Walmart Inc. and General Motors Company, they have become some of the biggest buyers of RE. Bloomberg New Energy Finance — Corporate Energy Market Outlook reported that a total of 5.4 GW of clean energy contracts were signed by 43 corporations in 43 different countries in 2017.

In October 2019, TNB has rolled out a green tariff rider scheme, named myGreen+ to allow consumers to purchase green energy generated from RE plants. The scheme is part of the government’s initiative to encourage the use of green energy by the consumers and offered to all TNB customers where the customers may opt to subscribe to the green energy in each 100 kWh block at the rate of eight cent/kWh. Customers who subscribed to the myGreen+ scheme will be given a green certificate for the subscription of the green energy.

The total green energy quota offered by TNB is 37,267,230 kWh. As at 12 June 2020, only 37,267,100 kWh have been subscribed by 149 customers with 130 kWh available for subscription.³⁵ Companies, especially GLCs and MNCs, can pursue their green agenda by participating in the myGreen+ scheme and obtain green brand image with the issuance of the green certificate by TNB. In the US, Apple, Google and Facebook have also subscribed to green tariff programmes offered by the utility companies in the relevant states for the purchase of the green energy.

10.

Close collaboration between Government and Corporates towards a RE-powered Nation

In recent years, the oil majors, being the world's largest fossil fuel producers, are also venturing into the clean energy space. For example, Shell has pledged to invest USD1 to 2 billion per year in renewables and clean technologies.³⁶ Following the footsteps of the other oil majors, Petronas has also ventured into the renewables space with the vision to become a leading global provider of clean, reliable as well as cost-effective energy solutions and contribute to the well-being of society and the environment.

In April 2019, Petronas acquired 100% interest in Amplus Energy Solutions Pte. Ltd., also known as M+, a leading Singapore-based company with a portfolio of distributed, renewable energy assets in Asia. Following such acquisition, in October 2019, Petronas launched its first solar rooftop solution in Malaysia which is a customisable and affordable solar panels for commercial and industrial use.³⁷

(ii) Government support

As mentioned above, the existing incentives provided by the government include Green Technology Financing Scheme ("GTFS"), GITA and GITE. Apart from formulating attractive fiscal incentives, the government should also consider increasing Malaysian's knowledge and awareness on the importance of RE through education as everything starts with education. Instilling such awareness in Malaysians from young would help to develop the next generation of leaders who can lead Malaysia to be a RE-powered nation.



SECTION THREE INCREASING TRENDS IN RESPONSIBLE INVESTMENT

Environmental, Social and Governance (“ESG”) factors

Fires, floods, drought, extreme weather, rising seas and other impacts of climate change will take an increasing economic, environmental and human toll – which must be borne in the end by taxpayers, governments and communities. In addition, the health costs of pollution are increasingly of major concern for many cities, particularly in the developing world. Central banks, financial institutions and insurance companies are starting to take note and to incorporate assessments of climate risk into their financial planning. Key institutions that have announced steps to incorporate climate risk include the International Monetary Fund, Blackrock Inc, Norway’s sovereign wealth fund and KfW Group.

In recent years, socially responsible investing has gradually become the norm. Investors now take into account ESG factors when making investments to generate financial returns and also measurable benefits for the environment and society. Most corporate leaders also understand that businesses have a key role to play in tackling urgent challenges such as climate change.³⁸ Increasingly, investors and companies are incorporating ESG risk and opportunities when making investment decisions and throughout the investment life-cycle in order to allocate and protect capital effectively.³⁹

The perception that sustainable investing means sacrificing some financial returns in order to make the world a better place



by generating positive societal impact is outdated. In a study conducted by Harvard Business School’s George Serafeim and colleagues found that companies that developed organisational processes to measure, manage, and communicate performance on ESG issues in the early 1990s outperformed a carefully matched control group over the next 18 years.⁴⁰ In another study,⁴¹ Serafeim and his colleagues demonstrated the positive relationship between high performance on relevant ESG issues and superior financial performance. One study also found that S&P 500 stocks with high ESG scores outperformed those with low scores by approximately three percentage points of total shareholder return (“TSR”) per year in the last three years.⁴²

The key reason that ESG has gone mainstream in the investment community is because, with the increasing environmental and social awareness across the globe, investors want to see that their investments are making the

world a better place. Not only are sophisticated investors aware that sustainable investing improves financial returns, but many of them, including high-net-worth individuals, are also focused on the non-financial outcomes.⁴³

With the increasing focus on sustainable investment and ESG being one of the key factors in making investment decisions, investors have now called for organisations to provide ESG reporting and require the underlying data in these reports to be scrutinised⁴⁴ and audited.⁴⁵ However, there are still questions on whether ESG will enhance financial returns and is a “cost free” impact investing? There is difficulty in providing a concrete answer to this as there is a lack of standardised and robust measures of ESG impact and historical data.

In this regard, the Sustainability Accounting Standards Board is developing industry-specific disclosure standards for sustainability that covers accounting metrics, technical protocols, and application in a company’s financial statements. The EU Action Plan on Sustainable Finance has proposed requirements for all EU/EEA regulated financial institutions to integrate consideration of ESG factors into client advisory relationships, product development, and disclosures.⁴⁶ It is foreseeable that investors’ focus on ESG will continue to evolve, including greater focus on the quality and relevance of data and third-party rating, as well as the connection between ESG performance data and financial results.⁴⁷



Due to investors' belief that ESG credentials help companies avoid expensive crises, credit rating agencies are increasingly evaluating risks through an ESG lens. Pushed by investors who believe that ESG credentials help companies avoid expensive crises, the three biggest agencies are working to explain how issues such as the move to a low-carbon economy and good governance inform their own decision-making. One of the major credit rating agencies is said to have announced plans to publish ESG "relevance scores", which will show how ESG factors affect individual credit-rating decisions. Another agency has acquired an ESG analytics vendor, initiating consolidation in the booming but fragmented world of ESG research and ratings.⁴⁸

Investors perceive companies with strong ESG performance to be less risky. Strong ESG performance translates into a lower cost of capital as it is associated with lower risk premium.

In other words, there are already observable benefits to corporates that have been proactive in improving how they stack up through an ESG lens. Companies sought comfort from the fact that capital allocated towards ESG initiatives are not philanthropic contribution, but strategic corporate investments expected to drive long-term shareholder value due to the potential reductions in the cost of capital achievable by taking an ESG focus.⁴⁹

Certain funds set up to specifically deploy capital towards ESG activism believe that impact investing will lead to outsized returns over the long run, either due to increased government regulation, changing consumer preferences or technological innovation. Blackrock Inc, the world's largest asset management firm, recently announced that it would place sustainability factor at the core of

its investment approach and would exit any investment that is deemed harmful to the climate.

Although ESG and impact investing are witnessing major and ongoing growth and attention, challenges remain. There is a lack of standardisation of ESG metrics, rating services and disclosure formats. For effective investment analysis, quality data about companies' ESG practices is imperative and the lack of standardisation and transparency in ESG reporting and scoring presents major obstacles and hindrance for investors.

Going forward, all companies should consider the ESG factors in making any decisions on their investments as well as their operations given the long term benefits such factors will bring to their investments and operations.

In Malaysia, as the climate change, RE and energy efficiency themes gain popularity and significance, more opportunities may come to the market for excited investors and consumers over a good cause. Sustainable investment has changed the global investment landscape and will continue to be the trend in the foreseeable future. Riding on the wave of sustainable investing, the Malaysian government should create investment environments which are favourable to both local and foreign investors in order to attract more investments into the RE sector. Turning Malaysia into a RE-powered nation would require everyone's strong support and contribution - from the government, corporates as well as consumers. Although much has been done, there is still a long way to go. If all the stakeholders come together towards a united vision, with the current resources at our disposal, it seems like it is very much an achievable task.



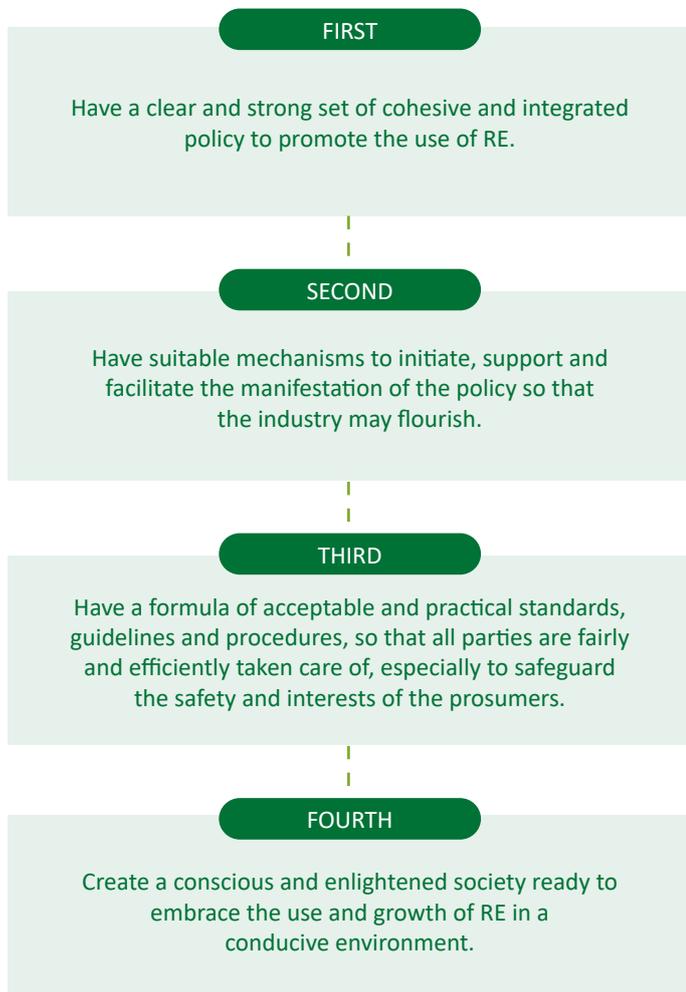
SECTION FOUR ROADMAP FOR RENEWABLE ENERGY – ARE WE HEADED IN THE RIGHT DIRECTION?

Certainly yes – Malaysia has been promoting RE since 2015, as can be seen by the three biddings for the LSS projects. MIDF Research however opined that the more likely scenario is for RE to complement rather than replace fossil fuels as Malaysia’s main energy source. There is still a long way to go for RE to replace fossil fuel, so at the moment the government plans to increase Malaysia’s RE usage.

EC reported that the Malaysian government aims to boost the growth of its green technology sector, and has a targeted revenue of RM180 billion while creating more than 200,000 green jobs by 2030. Malaysia wants to develop a skilled workforce in solar PV installation and services.

Increasing the use of RE is one of the ways to futureproof the industry. According to MIDF Research, “[t]his suggests in the near future, sector opportunities could tilt heavily towards RE project awards and a dearth of future fossil fuel plants”.

To further strengthen and proliferate the use of RE, Malaysian Photovoltaic Industry Association (MPIA) Vice President II, Prof Dr Sulaiman Shaari, identified four key foundations that must be in place:



Ultimately, the most important and highly effective step that has to be taken is to focus on creating awareness, providing education and advocating at all levels, including the public and especially the youths. Awareness campaigns by the media should be undertaken continuously, whilst at the same time, appropriate education programmes are done, not just in schools and universities, but also in government and non-governmental decision-making departments.

The RE initiatives undertaken by Malaysia since the 1970s prove that the government’s vision is in line with the global RE prospects. The RE industry is now primed to enter a new phase of growth in 2020. This is consistent with the Shared Prosperity Vision 2030 (WKB 2030) which stresses on RE and green economy as two of the 15 proposed Key Economic Growth Activities.⁵⁰ The evolution of RE policies and mechanisms show the Malaysian government’s strong commitment towards decarbonisation of the energy sector, incidentally increasing the potential for investment into the RE sector, irrespective of the government of the day.

Given that the development of renewables has not taken off as fast as expected in Malaysia and this has called for the need of a roadmap of future electricity system to spur renewables penetration. The Renewable Energy Transition Roadmap (“RETR”) 2035 is being developed by SEDA in collaboration with industry stakeholders to determine strategies, comprehensive action plans and resources that are required to transit to the future electricity system and achieve RE targets. The outcome of the roadmap is to be part of the 12th Malaysia Plan (2021-2025). The RETR 2035 aims to strike a balance between environmental targets, affordability/economic benefits and system stability.

SECTION

FIVE RENEWABLE ENERGY IS THE KEY TO SUSTAINABILITY AND IN COMBATING CLIMATE CHANGE



Economic Stimulus Package 2020

A Stimulus Package was introduced to cushion the adverse economic impact and reinvigorate the economic growth following the outbreak of COVID-19. It comprises three main strategies:

1
Mitigating the impact of the COVID-19 outbreak
2
Spurring rakyat (people) centric economic growth
3
Promoting quality investments

Among the various measures contained in the Stimulus Package, the government, through its regulatory agencies will promote public private partnership and private investments. The government will open bids in 2020, a quota of 1,400 MW of solar power generation, which is expected to translate to RM5 billion of investments and the creation of 25,000 jobs opportunities. SEDA reported that out of this 1400 MW, 400 MW will be or rooftop installations under the NEM while 1,000 MW will be for LSS projects. For the rooftop installations, 300 MW is for domestic, commercial, industrial and agricultural sectors of TNB consumers while 100 MW is allocated for government buildings.⁵² Furthermore, government linked companies will focus on accelerating capital expenditure, particularly on works with higher local content. For example, TNB has planned a capital expenditure of RM13 billion and will accelerate the implementation of works relating rooftop solar installations.

With this unprecedented levels of job cutting and breakdown in the Malaysian economy, having stimulus packages that include renewable energy investments not only could help address the climate issue but also further catalyse considerable economic gains post COVID-19 for years to come. By addressing the key risks and barriers that hinder the scale-up of renewable investment, only can the low-carbon energy transition be accelerated to promote sustainable growth. In devising the stimulus and recovery packages, it is of fervent hope that the government will use the NDCs committed by the government when Malaysia ratified the Paris Agreement as the backbone of the stimulus package.

Should COVID-19 hold us back?

Malaysia is well underway in its energy transition and has been focused on increasing the renewable energy capacity in the national energy mix and improving energy efficiency. Costs have been identified as the main barrier in the integration of renewable energy generation to existing power grids as affordability of energy generally pose political and social concerns.

EC has noted that energy efficiency and renewable energy are the main pillars of the energy transition as they can together provide over 90% of the energy-related carbon emissions reduction that is required, by using technologies that are safe, reliable, affordable and widely available.

The six key drivers in the energy transition has been identified to be the rapid decline in renewable energy costs; improvements in energy efficiency; widespread electrification; increased use of smart technologies; continuous technological breakthroughs; and well informed policy making.

Datuk Ir Ahmad Fauzi Hasan, the ex-Chairman of the EC, has said that “[t]o transition smoothly and to meet future demands of the industry, renewable energy will be a game changer in terms of leading the country away from exhaustible energy sources. Investing in renewable energy facilities will go a long way in terms of both environmental and economic progression”.⁵¹

Fourth Competitive bidding for LSS Projects (LSS4 Program or LSS @MEnTARI Program)

Pursuant to the stimulus package for RE projects announced by the government previously and in a move to revitalise and stimulate the Malaysian economy following the COVID-19 outbreak, EC had on 28 May 2020 announced the 4th competitive bidding for the LSS Program named LSS @MEnTARI Program for the Large Scale Solar Program by Malaysian Electricity Industry To Attract RE Investment. The aim is to accelerate the development of the country's electricity supply industry, particularly the RE industry.

The current bidding is for a total capacity of 1000 MWac with the solar plants expected to commence operations by 31 December 2023. The bid is divided into two packages, namely:

- **Package 1** - with a total of 500 MWac being offered for a capacity range between 10 MWac and less than 30 MWac; and
- **Package 2** - with a total of 500 MWac being offered for a capacity range between 30 MWac and 50 MWac.

This has been a long awaited bidding exercise by both local and foreign RE developers, investors and contractors. However, with the bidding being opened for participation by 100% locally owned and Malaysian incorporated or registered companies and at least 75% local shareholding for companies listed on Bursa Malaysia only, foreign developers and investors were disappointed, particularly those who have been preparing for the LSS4 Program and putting in efforts to identify suitable lands for the solar projects for participation in the LSS4 program long before the LSS4 bidding was announced. The government's rationale for limiting the current LSS4 program to local companies only is to ensure that the investment in RE industry benefits the local people and provides immediate impact to the country's economy.

Given that the current bidding is closed to foreign participants, it is to be seen if the LSS4 bidding will receive as many bids and interests from local RE players as the previous LSS3 bidding which had received overwhelming responses including major foreign global RE players. It is also noted that the bidders are only given three months to submit their bids this time around which is much shorter than the previous six months period in the LSS3 bidding. This means that bidders now have a much shorter period to prepare their bids which may pose additional challenges to local RE developers and

investors to source financing and funding for the solar projects given that foreign parties are prevented from holding equity shares in the project company that is to be set up in undertaking the solar project if awarded by the EC.

IRENA's Coalition for Action members (comprising of over 100 leading renewable energy players from around the world with the common goal of advancing the uptake of renewable energy) has set out action items for governments, in which policy makers can seek guidance on in developing immediate response measures to the COVID-19 emergency.⁵³



In considering the stimulus packages needed for rapid and sustained economic recovery, the following recommendations have been set out:

- **Prioritise renewable energy** in any stimulus measures and commit to phasing out support for fossil fuels.
- **Provide public financial support** to safeguard the industry and mobilise private investment in renewable energy.
- **Enhance the role of renewable energy** in industrial policies.
- **Revise labour and education policies** to foster a just transition and help workers make the shift into renewable energy jobs.
- **Strengthen international co-operation and action to accelerate renewable energy deployment** in line with global climate and sustainability objectives.

For a successful transition, energy policies must be mainstreamed into economic, industrial, labour, educational and social policies. There is a need to recognise the need for a holistic approach to the energy transition that simultaneously addresses economic, social and ecological problems. Alongside private sector financing, much stronger public-sector interventions and global collaborative efforts are needed to ensure the transition to a green, just and inclusive economy.

Moving forward, there is a need to integrate climate risk into decision making and that requires a change in the mindset, operating and implementation model and the use of other materials. This should form part of the risk management in the implementation of any business and project implementation processes. Coupled with COVID-19, there is a need to have a total re-look at the entire value chain and system in the way we live and do business, from risk evaluation to business implementation. There is a need for collective responsibility from all parties in making Malaysia a better place for us to live in.

Other than government bodies, energy players and private corporations, consumers are also more aware of the environment and are conscious of making their purchasing choices that have less adverse impacts to the environment. This growing trend is encouraging in shaping the energy market towards the transitioning into a low carbon country.

Although the energy trilemma is an ongoing challenge for the electricity supply industry in Malaysia, with continuous focus and commitment by the government to have efficient and judicious regulation of the RE development and strong supports from all stakeholders, Malaysia is definitely heading in the right direction in transitioning towards a low carbon economy and a nation powered sustainably for its future generations and the COVID-19 pandemic is not going to deter us!

ENERGY EFFICIENCY: WHERE LESS IS MORE

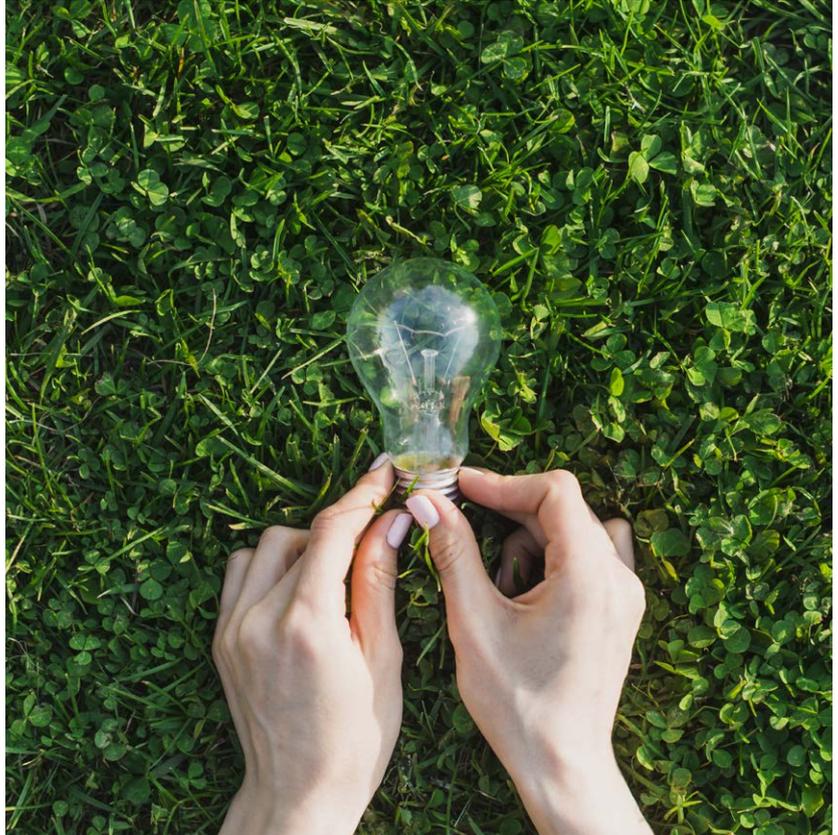
Why the need for energy efficiency

We are a nation hungry for power and as we develop, our demand for energy will grow. This will not only come at a hefty bill for the government, as constructing more power plants is a significant cost, but also at a cost to our environment, given that the two most readily available and economical fuels, coal and gas, emit substantial amounts of greenhouse gases into the air.

One way to address this issue is to increase the use of renewable resources which are less polluting, such as solar. This is essential in order for Malaysia to achieve the goals of sustainability and energy security. Nevertheless, initiatives that focus on the energy supply side alone are insufficient. It must be coupled with measures to manage the demand side, through energy efficiency (“EE”) and conservation initiatives.

What is EE?

EE means using less energy to achieve the same results or provide the same service, or to achieve better results using the same amount of energy.



Malaysia’s energy efficiency journey



EE efforts in Malaysia has been a mix of regulatory and non-regulatory measures coupled with financial incentives. Malaysia’s first foray into EE started through the 7th Malaysia Plan in 1996. Since then, there has been a greater and growing emphasis on EE and sustainability in general, as reflected by the array of green initiatives launched by the Government over the years.

One of the key plans by the Government to address the growing energy demand is through the National Energy Efficiency Action Plan (“NEEAP”), a 10-year action launched in 2014 aimed at achieving efficient electricity usage and slowing-down the electricity demand growth nationwide. A successful implementation of the plan will see estimated electricity savings of 50,594 GWh against the BaU (Business-as-Usual) scenario (totalling an 8% reduction in consumption) with a targeted demand growth reduction of 6% over the 10-year period. More recently was the issuance of the Green Technology Master Plan (2017–2030), which sets a target 10% reduction in electricity consumption by 2025 and a 15% reduction by 2030.

The main legislation in Malaysia regulating the promotion of EE is the Electricity Supply Act 1990 and two of its subsidiary legislation, the Electricity Regulations 1994 and the Efficient Management of Electrical Energy Regulations 2008 (“EMEER”), administered by the Energy Commission. However, current legislations only regulate the efficient use of *electrical energy* and does not extend to other types of energy. EMEER targets users with high energy consumption, which are typically consumers in the industrial sector such as manufacturers. The regulation provides that users that cumulatively consume more than three million kWh of electricity over a period of six months are required to appoint a registered energy manager and to generally submit information on the electrical energy improvement measures implemented by the user and estimated savings they have achieved.

EMEER was followed by the introduction of the mandatory minimum energy performance standards (“MEPS”) in 2013 for select appliances such as air conditioners, refrigerators, fans, televisions and lighting, and extended to washing machines

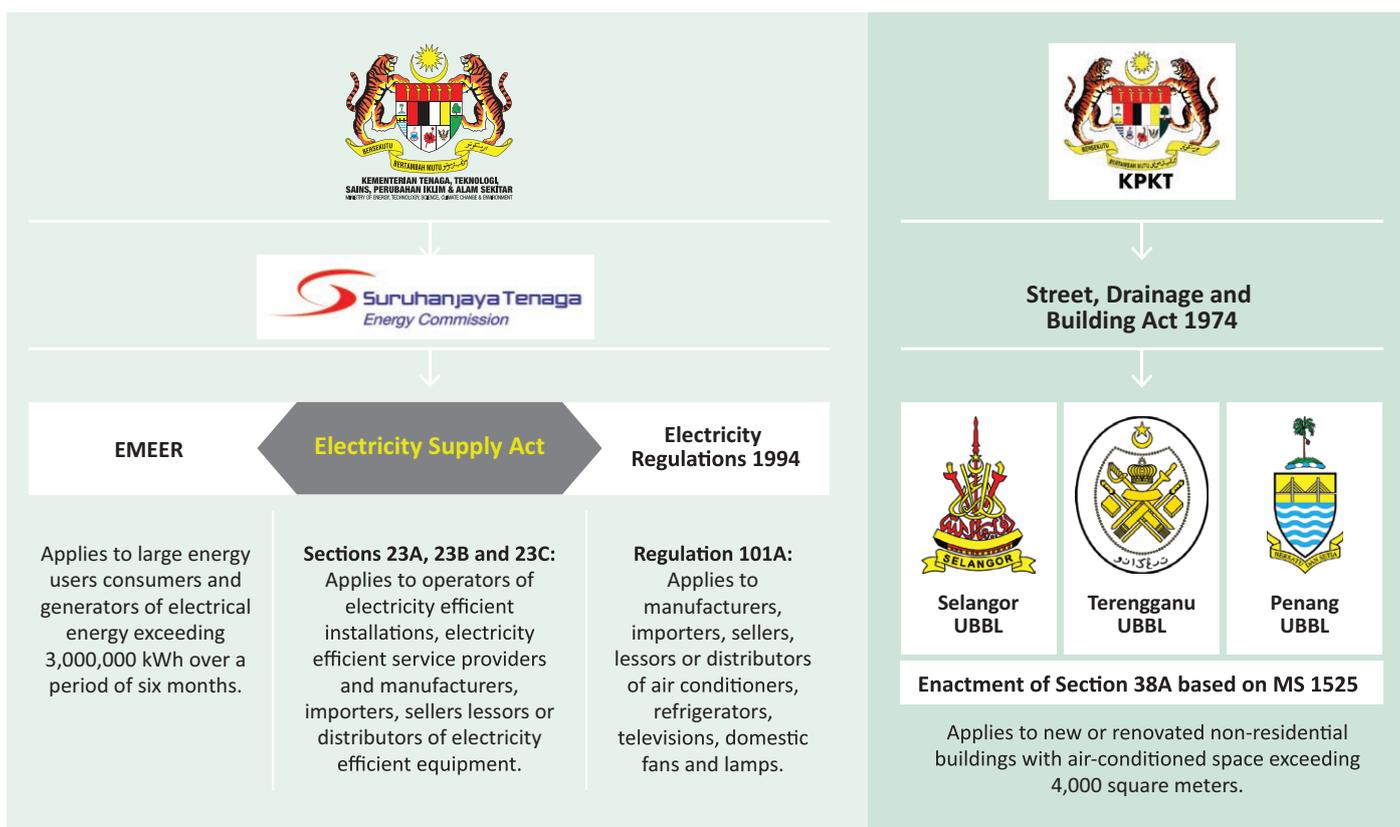
in 2018. MEPS works by prohibiting the manufacture, sale or import into Malaysia of appliances that does not meet the energy performance standards prescribed in the Electricity Regulations 1994. This ensures that less energy efficient products are kept out of the Malaysian market, therefore helping to reduce the amount of energy needed to run the regulated appliances.

Building energy efficiency standards are voluntary and they include *MS 1525:2019 Energy Efficiency and Use of Renewable Energy for Non-Residential Buildings - Code of Practice (Third Revision)*, a revision of a standard which was first introduced in 2001, and *MS 2680:2017: Code of Practice on Energy Efficiency and Use of Renewable Energy for Residential Buildings*, which was introduced in 2017 for residential buildings.

There have been efforts to give energy efficiency standards for buildings the force of law through the incorporation of certain

building requirements from MS1525 into the Uniform Building By-Laws 1984 at a federal level. These requirements stipulate that new or renovated non-residential buildings with air-conditioned space exceeding 4,000 square metres shall (a) be designed to meet the requirements of MS1525 relating to the Overall Thermal Transfer Value and the Roof Thermal Transfer Value; and (b) be provided with an energy management system.

However, due to the jurisdictional demarcation between the federal, state and local governments in relation to Malaysia's building regulatory system, the MS1525 requirements must be gazetted by the individual states before it can be adopted into their respective Uniform Building By-Laws and enforced by the local authorities. To date, only three states have gazetted it, i.e. Selangor (2012), Terengganu (2013) and Penang (2016). This has been an obstacle in reducing energy consumption in the building sector.



Generally, despite the availability of various EE measures and policies in Malaysia, effective implementation suffers from fragmented governance. This is due to the overlapping jurisdiction and roles of multiple agencies overseeing different parts of the energy sector and energy efficiency related matters.¹ Significant reduction in energy consumption has also been

limited due to the focus of efforts mainly being on electricity consumption. As such, recent key EE policies, such as NEEAP, the 11th Malaysian Plan and the Green Technology Master Plan (2017 to 2020) include the introduction of a comprehensive energy efficiency and conservation act as a way to address the above issues.

Introduction of a comprehensive energy and conservation law

The Ministry of Energy, Science, Technology, Environment and Climate Change (as the Ministry of Energy and Natural Resources was then known as), announced, in late 2018, that the ministry is proposing to introduce an Energy Efficiency and Conservation Bill (“EEC Bill”). Cabinet approval was subsequently obtained in June 2019 with the aim of tabling the bill to Parliament by the end of 2020. With the advent of COVID 19, it is likely that the tabling may be delayed to the following year.

Bill will likely include other forms of energy in addition to electricity. We expect that the proposed EEC Bill will only apply in Peninsular Malaysia and Sabah, and not Sarawak as the latter state has its own legislation governing the electricity supply industry, which is regulated by the Electrical Inspectorate Unit. In fact, in light of the recent proposal to table a bill in Parliament in 2020 to set up a Sabah State Energy Commission, it will remain to be seen whether Sabah will also be included under the EEC Bill when it comes into force.

While previous initiatives such as NEEAP focused on the reduction of electrical energy demand, this proposed EE



Residential

Energy consumption in the residential sector is mainly attributable to energy consuming household appliances and equipment. In a tropical country such as ours, a big portion of the residential electricity consumption is due to air-conditioning and like the rest of Southeast Asia, space cooling is expected to grow due to rising income and with it the demand for more cooling.² As such, the existing MEPS, which is the most effective measure to address the energy performance for the residential sector, should be maintained and enhanced through mandating the periodic review of standards and strengthening the enforcement powers of the authorities. This will ensure that Malaysia's standards are at par with or tighter than international requirements and will be able to enforce them effectively.



Buildings in the Commercial sector

Malaysia has a diverse stock of commercial buildings, from shophots to shopping malls, from service apartments to hotel, to name a few. These buildings also come in a variety of sizes, locations, operating hours and with shop lots, a variety of use. If and when an EEC Bill comes into operation, energy efficiency measures should include buildings. However, not all buildings should be regulated immediately. Instead, it would be better if classes of buildings with the highest energy consumption should be targeted first based on specific criteria, for example their floor area. Other classes of buildings can be introduced later on a staggered basis. One immediate measure that can be implemented to address the energy performance of a regulated building is the requirement to display a label which discloses the energy performance of the building. This has now become the norm in other countries and studies have shown that energy labelling is a catalyst to improve the energy performance as it leads to a measure of behavioural change when there are other buildings with better energy performance. It also provides information to the market that if they were to rent or acquire a unit within this commercial building, an advantage would be renting or owning within a more energy efficient building.



Industrial and Commercial

For consumers who use large quantities of energy, predominantly those in the industrial sector and commercial sector, the law's aim should be to bring about improved energy performance. Based on case studies of other jurisdictions such as Thailand and Singapore, this can be achieved through mandating the implementation of an energy management system and periodic energy audits conducted by persons possessing the necessary qualifications and training. More stringent and detailed reporting requirements will also help the authorities in the long run to collect and build a database for better policy making, decision making and monitoring improvement in EE.

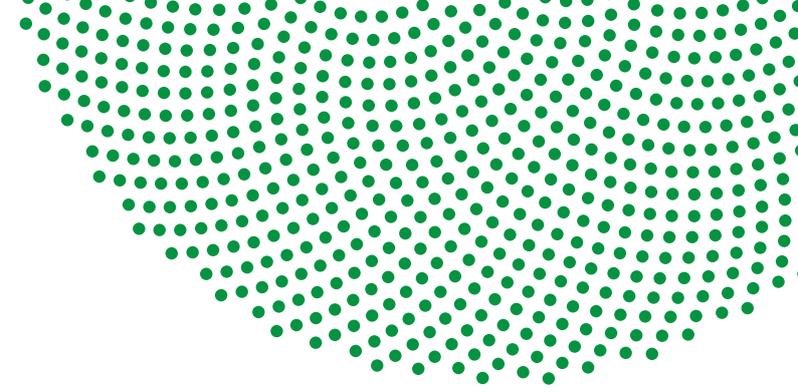
Main Challenges

One of the main hurdles to the successful implementation of EE measures is low energy prices — Malaysia has one of the lowest electricity tariffs in the world. For example, the average household electricity price in Germany is approximately the German equivalent of RM1.45 per kilowatt-hour whereas in Malaysia our current domestic tariff starts at RM0.218 and goes up to RM0.571 per kilowatt-hour as ones electricity consumption increases. At the same time, the high initial cost of purchasing a more energy efficient appliance is unattractive for most people as the benefits cannot be immediately seen. For those in the industrial and commercial sector, there are budgets to adhere to and with competing investments and priorities, capital expenditure on EE may seem like the least pressing concern. EE efforts have been further hampered by the huge financial strain faced by many sectors due to the devastating outbreak of COVID 19 globally.

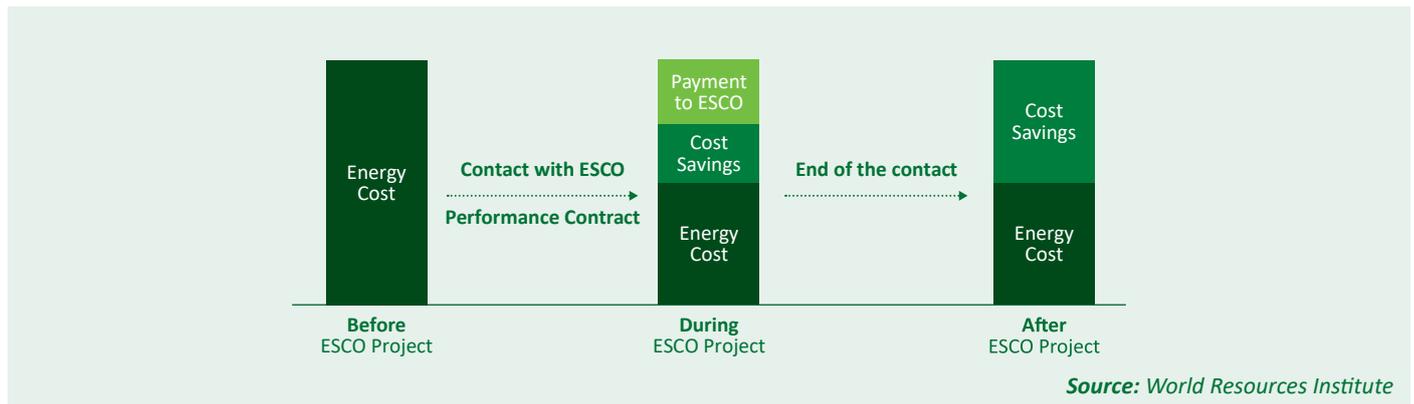
Companies will naturally be trying their best to manage their cash flow during this time by delaying any unnecessary capital expenditure while looking for ways to reduce their operating expenses. One of the ways to address the lack of access to

capital for carrying out an EE project and at the same time achieve the goal of cutting operating expenses is through energy performance contracting (“EPC”). While there are several ways an EPC arrangement can be structured, it is basically a model by which a third party energy service company, typically referred to as ESCOs, comes up with the initial investment cost for implementing energy efficiency and conservation measures at the facility, building or factory of the client and the ESCO would recoups its cost through the client sharing energy savings it enjoys from reduced utility bills. If the guaranteed savings are not achieved, there is no repayment to be made. If the guaranteed savings are not achieved, there is no repayment to be made. The advantage of the EPC model is the client does not need to come up with the initial capital cost and the risk of the effectiveness of the EE measures is passed on to the ESCO, arguably the best placed party to manage this risk as they have more skills, experience and knowledge in the area of EE and are responsible for the installation of the EE equipment.

The EPC model is widely used by governments around the world as it reduces the burden on a government's budget by



leveraging on the private sector while allowing the government to undertake necessary retrofits to improve the energy performance of government owned buildings. Introduction of the EPC model to promote EE in Malaysian government buildings commenced in January 2013. In order for an ESCO to provide EPC services or carry out EPC work for the Government, ESCO's must be registered with the Energy Commission and the Ministry of Finance. EC has issued Guidelines for the Registration of Energy Service Company which sets out the requirements and criteria in order to be registered.



The common elements of an EPC are as follows:

- (a) an energy audit of the client's facility to ascertain the current energy consumption and to identify the potential areas for savings;
- (b) agreement on the party responsible for bearing the initial capital cost, which typically would be the ESCO;
- (c) guaranteed savings of a certain level and the sharing of the savings between the parties over the agreed payback period;
- (d) adjustment or exclusions to cater for variables that may affect the energy savings such as a reduction in energy due attributable to a decrease in operations rather than due to energy saving measures;
- (e) compensation payable by the ESCO if the energy savings are less than the promised guarantee performance level.

However, while the EPC concept may seem relatively straightforward, issues may arise if there isn't a clear understanding and agreement of the risk allocation, the expectations between the parties on the savings to be achieved and how the savings are to be calculated and shared. Providing for a measurement and verification process undertaken

by a qualified independent third party, such as a certified measurement and verification professional, is also essential in order to verify that the actual savings achieved meet the guaranteed savings under the EPC agreement, which reduces the risk of any dispute with regards to the energy saving results.

Tackling the transportation sector

At the moment, the proposed EEC Bill is not expected to cover the transportation sector but at the same time, energy consumption in the transportation sector has been rapidly increasing since 1978, and takes up the largest percentage of final energy consumption at 38% as of 2017.³

While consumption of diesel or petrol in the transportation should go down with the push for more electric vehicles on the road, based on the targets set under the Electric Mobility Blueprint, the Energy Commission expects there will be a corresponding spike in electricity consumption.⁴

Final Energy Consumption By Sectors



Source:

Oil and gas companies, TNB, SESB, SEB, IPPs, cement, iron and steel manufacturers

Note (*):

Transport sector's energy consumption includes international aviation



Source: Energy Commission, National Energy Balance 2017

As such, future regulatory EE measures must include this sector in order to see significant reduction in our overall energy consumption. However, steps towards regulating this sector is hindered by the overall lack of transport data that is essential for drafting comprehensive EE policies and laws.⁵ In addition, as the transportation sector is outside the purview of the Ministry of Energy and Natural Resources, there is a need for cross-ministry collaboration and coordination, namely with the Ministry of Transport and other relevant transport related government agencies and organisations. Cross-ministry collaboration is always challenging as different ministries and agencies have their own priorities and when resources are limited, pursuing energy saving measures tend to take a back

seat to more pressing issues such as health and safety.

Common EE measures in various other countries which Malaysia can consider is the imposition of mandatory fuel efficiency standards and labelling of vehicles, which must be regularly reviewed and tightened. Setting fuel efficiency standards will keep less efficient vehicles off the roads and drive technological advancement in the area of fuel economy whereas effective fuel efficiency labelling requirements can help influence purchasers to buy a more efficient vehicle. However, further research and consultation with key stakeholders, such as local vehicle manufacturers, is required in order to gauge the feasibility of implementing such measures.

Way forward

The coming into force of the EEC Bill is just one part of the equation for achieving energy savings. In order to succeed, the EEC Bill, which is the stick to ensure compliance must be wielded together with financial incentives (the carrot) and efforts to raise public awareness (the tambourine). Changing mindsets and behaviour through education and provision of information can help dispel the myth that investing and adopting EE initiatives will stifle growth due to the high upfront cost or capital outlay that comes with buying a more energy efficient equipment, retrofitting a building to be more energy efficient or replacing or upgrading less energy efficient equipment.

Also, Malaysians must recognise that low energy prices, which makes the cost of EE look unattractive in comparison, will not last forever and steps need to be taken to manage this eventuality. The Government has already been gradually

removing its subsidies on natural gas since 2008 and introduced the Imbalance Cost Pass-Through (ICPT) mechanism in 2014 which allows for the review of the electricity tariff every six months to take into consideration the fluctuation in fuel prices. The current six months discount provided by the utility companies on monthly electricity bills to cushion the impact of COVID-19 also cannot carry on indefinitely after this initial period.

More importantly, we must acknowledge that climate change is the single greatest challenge that faces governments and societies the world over, Malaysia included. With the energy sector being responsible for some 60% of greenhouse gas emissions globally, it is clear that our hunger for energy is driving this crisis, and it is imperative that we do all we can to minimise such threats to our continued prosperity.

REALISING MALAYSIA'S POTENTIAL FOR LEADERSHIP IN SUSTAINABLE DEVELOPMENT AND SMART CITIES

In 2015, Malaysia and 192 other countries who are members of the United Nation (“UN”) unanimously adopted the UN Sustainable Development Goals (“SDGs”) with the aim to end poverty, protect the planet and ensure that all people enjoy peace and prosperity by 2030. With one of the SDGs being building sustainable cities and communities, Malaysia has adopted a target to reduce the adverse per capita environmental impact of cities by 2030.¹ Malaysia is committed to institutionalise the SDGs in its medium-term development

plans and the 17 SDGs will continue to be embedded within Malaysia’s long-term plan of Shared Prosperity Vision, 2021-2030. This new Vision will be the mainstay of Malaysia’s five-year national development plans, the 12th and 13th Malaysia Plans. Significantly, all blue-prints or roadmaps in developing Malaysia are underpinned with one common factor – sustainable development. They are Malaysia’s commitment to sustainable development and Malaysia will continue to align its policies and strategies on the same path.²



Malaysia has the potential to become a leader in sustainable development

The Brundtland report, ‘Our Common Future’, published by the World Commission on Environment and Development (“WCED”)

Defines “sustainable development” as the development that meets the needs of the present without compromising the ability of future generations to meet their own needs.

Therefore, sustainable development must necessarily take into account economic, environmental and social factors in achieving sustainability so that present and future generations may benefit from it. With 40% of the total world energy consumption being consumed by built

environment and the construction industry contributing about 20% of the carbon emissions from energy use, water and waste production, sustainable development is an important initiative towards achieving the SDGs.

Malaysia is aware of the challenges in achieving sustainable development. Private sector’s commitment and a substantial amount of funding is essential in addition to having in place robust government initiatives. There is also a need to promote coordinated action among stakeholders including the government, private sector, non-profits, academia and individuals. Malaysia was ranked 35th out of 128 countries in INSEAD’s Global Innovation Index 2016, and recognised as an “innovation achiever” for 2011-2014. Encouraged by this, Malaysia has further ramped up developing an innovative ecosystem to support new start-ups, scale up enterprises

and attract investments. To garner greater inclusivity, Malaysia has promoted innovation at the grassroots level, using a bottom-up approach to cater to local demands for sustainable ideas, products and services.

Smart Initiatives in other regions

We can see that there have been successful implementation of government initiatives on sustainable development with buy-in from the private sector in other countries. With a global movement to incorporate sustainability in developments and building operation, sustainability is quickly becoming a popular key indicator for projects.

Below are countries that have undertaken smart initiatives:



SINGAPORE

The Building and Construction Authority (“BCA”) has collaborated and partnered with key stakeholders including industry players, school community, general public, building owners and tenants to drive changes in energy consumption behaviours in the long run. They have launched the Green Partnership Initiative and Green Tenant Pledge (“the Initiatives”) to further encourage organisations to convert existing premises into green buildings with a total of six developers and nine organisation signed up.³

In a study of 40 commercial buildings, comprised of hotels, office buildings, retail buildings and mixed developments, energy savings totaling 90 Gigawatt hour or SGD24 million savings a year can be achieved once they have undergone green retrofitting, to achieve BCA Green Mark Gold, GoldPlus or Platinum status.

In a joint study, BCA and the National University of Singapore found that there is without doubt a strong business case for retrofitting existing buildings. Green office buildings can achieve an average reduction of 11.6% in total operating expenses and an increase of 2.3% capital value; with an average payback period of about 6.3 years after the retrofit.

It is clear that benefits of green buildings greatly outweigh their initial costs. BCA places great emphasis on how stakeholders can contribute to the drive for environmental sustainability. With the launching of the Initiatives, the developers can encourage tenants, building owners and corporations to join in to help sustain and accelerate the green building movement.



GERMANY

In Germany 50 cities, each in different phases, are driving forward smart city initiatives with 19 cities adopting a digital agenda whilst 29 cities are working towards developing one.⁴



JAPAN

As part of the broader Society 5.0 vision, Japan also has 229 smart city projects in 157 areas. One of the key projects is a 273-hectare site dubbed *Kashiwa-no-ha* (“Oak Leaves”).⁵ For many, a smart city begins with technology. In Japan, it starts with a person. In the Japanese sense, being smart when approaching city planning and development means finding ways for “customers” to have a better quality of life, healthier communities and strong regional values and directing future advances in ICT toward ever-changing social needs. Japan combines the best of today’s technology with a united social front.

The Oak Leaves project was designed with a long-term, multi-decade “master plan,” and everything the city has done since then has flowed from that. The smart city became the first Japanese project to win LEED-ND1 Platinum certification, the highest international standard for ecological and sustainable neighbourhood development and is among the largest Platinum-certified projects by land space.

Smart cities in Malaysia

Malaysia is not to be left behind in the race for sustainable development. In **Johor**, Iskandar Malaysia, a development corridor administered by the Iskandar Regional Development Authority (“IRDA”), is an example of a smarty city and low carbon-development adopting the Comprehensive Assessment System for Built Environment Efficiency (“CASBEE”) scheme⁶ in assessing green development. IRDA produced a set of assessment manuals called CASBEE Iskandar which has been adapted and customised based on the local requirements to encourage building owners and developers to go green. **Malacca** has introduced the Malacca Green Seal to rate green building development in the state with a focus on the UBBL and MS1525. Its pioneer project is the Malacca World Solar Valley which aims to apply solar as the main alternative

source of energy in all sectors and to develop a research and development centre for solar technology.

Other smart city projects in Malaysia include include **Cyberjaya** and **Putrajaya**,⁷ the first cities to roll out 5G technology, as well as **Kuching** and **Kota Kinabalu** under the US-ASEAN Smart Cities Partnership. Selangor has introduced the Smart Selangor Blueprint to work towards becoming a smart state where its citizens live well and prosperously by 2025.⁸ The state government plans to utilise Internet of Things (“IoT”) solutions to achieve its goals with a total of 10 pilot projects identified in the first phase. These includes establishing I-City in Shah Alam as an innovation hub for smart city technologies, rolling out State Monitoring Dashboard for smart governance, conducting public-citizen partnership through online platform, using the Waze app to manage

road maintenance, opening a Coding Academy and introducing Smart Waste Services App and Smart Transportation Information System.

Green building rating tools in other countries

Central to sustainable development is the green building rating tool used to benchmark projects based on sustainability criteria. For example, Japan uses the CASBEE developed by the Japan Sustainable Building Consortium (“JSBC”), a nongovernmental organisation comprising the Japanese government, academic partners, and industry.⁹ The Institute for Building Environment and Energy Conservation (“IBEC”) is responsible for carrying out the certification processes and dealing with training and accreditation of CASBEE auditors. In Indonesia, this role is carried

out by the Green Building Council Indonesia, which has launched the Greenship Home rating system to measure the green performance of homes. Meanwhile, Singapore has introduced the Green Mark scheme, equivalent to the Leadership in Energy and Environmental Design (“LEED”) scheme in the US, but with a focus on energy efficiency while Australia uses the Green Star rating system. In Europe, the Building Research Establishment Environmental Assessment Methodology (“BREEAM”) has become a popular choice for countries including Germany. It was developed by BRE Global, who is the national scheme operator for the UK in 1990 and is now used by more than 70 countries for independent third-party certification to assess the sustainability performance of individual buildings, communities and infrastructure projects.

Green building rating tools in Malaysia

In Malaysia, the Green Building Index (“GBI”) was the first sustainable development rating tool in the country, developed by the Malaysian Institute of Architects (“PAM”) and the Association of Consulting Engineers Malaysia (“ACEM”) in 2009. Other sustainability rating tools followed and to date, Malaysia has 10 rating tools ranging from green building, infrastructure and township. Examples of rating tools are, the Malaysia Carbon Reduction and Environmental Sustainability Tool (“MyCrest”), Sustainability Index (“SUSDEX”), MY Green Highway Index (“MyGHI”), Green Real Estate (“GreenRe”), Skim Penilaian Penarafan Hijau JKR (“PHJKR”) and Low Carbon Cities Framework and Assessment System (“LCCF”). The various rating tools focus on different sustainable factors and employ different methods of measuring sustainability. Compliance with the sustainable rating tools are usually voluntary although some local authorities in Malaysia have imposed requirements to meet certain sustainability standards such as the MS1525 Code of Practice on Energy Efficiency and Use of Renewable Energy (“MS1525”) vide the Uniform Building By-Laws 1984 (“UBBL”).

Green targets and initiatives

On the policy side, Malaysia aims to cut carbon emission intensity by 40% of its gross domestic product (GDP) from its 2005 levels before 2020. By 2015, the country has already achieved a 33% reduction. Confident that it can exceed its target, Malaysia then re-pledged to

reduce carbon emission by 45% before 2030.¹⁰

Malaysia introduced the Smart City Framework to launch five pilot projects in Kulim, Kuala Lumpur, Johor Bahru, Kota Kinabalu and Kuching. The framework encompasses smart economy, smart environment, smart living, smart mobility, smart government, smart digital infrastructure and smart people. The smart cities will feature integrated sustainable technologies such as 5G connectivity, cashless community, autonomous public transport, drone delivery, energy-efficient buildings, and smart treatment of water and waste management.¹

The construction industry can benefit from the proposed initiatives under the framework with projects such as renovating government and commercial buildings to become energy efficient, introducing low carbon city concept at local levels and implementing a smart grid system.

Other smart city projects in the pipeline include the ‘Seberang Prai Strategic Direction Towards Smart Sustainable City’ in Penang to develop a resilient, inclusive, green, competitive and technology-driven smart city by 2030.¹

The Malaysian government is also looking to foster innovation by providing incentives from existing government funding to assist enterprises in research and development (R&D), by providing technology labs and launching incubators and accelerator programmes. These initiatives are led by the MESTECC (which has been reorganised as MENR) which has set a goal of increasing renewable energy in electricity generation mix to 20% by 2025. MIDA also provides tax incentives for investment in energy efficiency, renewable energy, green technology and waste eco park.¹¹ For more information, please see the article on *“The Securities Commission’s Roadmap to Sustainable and Responsible Investment”*.

Collaboration between countries on research and development

Countries such as the US and China are investing heavily in green technology and assets as they recognise the long-term economic and environmental impacts of sustainable development. For example, Germany has introduced the Market Incentive Program for installation of solar-thermal, biomass, and heat-pump-based systems while its KfW development bank offers low-interest loans for energy-efficient construction and renovation. The green sector in Singapore has also seen tremendous growth due to the continued support from the Singapore government’s Cleantech division. In 2014, the National Research Foundation Singapore (“NRF”) provided a funding of SGD52 million for the Singapore BCA to set up the Green Buildings Innovation Cluster (“GBIC”) as a one-stop integrated R&D hub to experiment, exhibit and exchange knowledge.¹² Over the past five years, GBIC has supported a total of 32 projects, many of which have been translated into industry solutions and been adopted in actual building projects in Singapore and overseas.

We can also see collaboration between countries on the R&D side. Singapore, selected by China as the only international nation for collaboration, is working with China to turn Tianjin Eco-city into a Zero Waste City and a smart city, and the countries have undertaken a joint research to allow companies from both countries and other partners to explore such opportunities for further development.¹³

Meanwhile, Germany and India are in joint efforts through the Indo-German urbanisation partnership to help India develop three cities into sustainable Smart Cities through the sharing of German’s ideas and technology. India is also working on research and technological developments to transform several major cities that failed to meet the International Standards of Modern cities into the cities of the future.¹⁴

Malaysia may seek partnership and collaboration with other countries to further drive its efforts in growing sustainably. Partnership and collaboration will provide the opportunity to share lessons learnt in other jurisdictions and facilitate knowledge transfer.

Assessing the reality

To entrench sustainability efforts into the construction industry, the government has introduced regulations and by-laws on green building development. For example, the UBBL, which empowers local authorities to regulate building construction activities, has been amended to add requirements on energy savings, environmentally friendly building materials and sustainable architecture including the MS1525.¹⁵ As pointed out in the article on *Energy Efficiency: Where less is more*, to date, only a few states such as Selangor, Terengganu and Penang have adopted the standard.¹⁶ The government has also strengthened the regulations on the requirement for renewable energy initiatives on new development during the planning approval process. This effort is backed by the implementation of building energy automation system and remote energy metering service to track energy consumption by buildings and introduce dynamic electricity pricing. An overview of energy efficiency regulatory framework is shared in the article.

Moreover, the government is planning to pass a new **Energy Efficiency and Conservation Act** in 2020 to consolidate energy efficiency laws in Malaysia and introduce an all-encompassing energy efficiency law to accelerate adoption and implementation. Utilising the law to institutionalise sustainable development is crucial to ensure certainty and continuity as to the respective stakeholders' roles and responsibilities under the energy efficiency regulatory framework.

Looking at other jurisdictions, Japan has enacted the Act on Improvement of Energy Consumption Performance of Buildings requiring new large buildings with a floor space of 2,000 square meters or more to comply with the energy conservation standards and will gradually

expand the coverage of the requirement to include small and medium sized commercial buildings and housing by 2020.¹⁷ Meanwhile, Singapore has introduced the Building Control (Environmental Sustainability) Regulations 2008 through the Singapore Building Control Act to require new and existing buildings undergoing major renovations

to comply with a minimum environmental sustainability standard that is equivalent to the Green Mark Certified Level. Buildings with centralised cooling systems and gross floor area of greater than 5,000 square meters will also have to abide by the Singapore Building Control (Environmental Sustainability Measures for Existing Buildings) Regulations 2013.



Do we have what it takes to become a leader in sustainable development?

Malaysia is committed to implementing these strategic long-term approaches and rising with the sustainability wave. The Government has reiterated its commitment to achieve the SDGs and is continuously reviewing and improving its policies and legislations in order to fulfil these goals. We may find it necessary and opportune to move forward with the trend towards sustainability as demand grows for green buildings and smart cities in Malaysia albeit at a slower pace compared to other jurisdictions. By tapping into this growing sector, we can become pioneers in driving change in Malaysia. The industry must recognise that sustainability is not a hindrance to innovation and growth but rather the solution for the future. By embracing the call for change, we can become leaders in sustainability and dictate the future of the market to provide competitive sustainability solutions.

GREEN FINANCING GAINING MOMENTUM IN MALAYSIA

With developing countries having limited access to capital investment in sustainable infrastructure, Malaysia has intensified its efforts in scaling up the green agenda by encouraging more sustainable and green projects. Malaysia has introduced various sources of green financing, however, this article will focus on the issuance of private debt securities in the capital markets, including the offering of bonds, notes and Islamic securities (for the purposes of this article, “Notes”) and taking up loans from financial institutions.



Issuance of Debt Securities

The offering of Notes in Malaysia or for any Malaysian company issuing/offering Notes outside Malaysia, is governed by the Capital Market and Services Act 2007 (“CMSA”), and under the purview of the SC.

Generally, any offering, subscribing, invitation to subscribe or purchase of any Notes in Malaysia would require authorisation from the SC pursuant to the CMSA. The only exceptions are those listed in Schedule 5 of the CMSA, and these exceptions are not predicated solely on whether the offers are public offers or private offers.

One of the most typical exemptions that the issuers now rely on is the offering of Notes to sophisticated investors. Sophisticated investors are essentially institutional investors and high net worth individuals and are set out in Part I, Schedule 6 and 7 of the CMSA. Any offering of unlisted Notes to sophisticated investors must meet the requirements of the Guidelines on Unlisted Capital Market Products under Lodge and Launch Framework (“LOLA Guidelines”) published by the SC.

The working group for an issuance of Notes in Malaysia typically consists of the principal adviser, lead arranger, lead manager/bookrunner, facility agent, legal counsels, rating agency, Shariah adviser

(for sukuk), security agent (for secured issuance), listing agent (in the event of listing of Notes) and reporting accountant (not necessary if there is no cash flow forecast/projection). It will usually involve, amongst others, a legal due diligence exercise, obtaining Shariah endorsement from the SC’s Islamic Capital Market Development (only for sukuk), credit rating exercise and lodgement with the SC. Under the LOLA Guidelines, an issuer (through its principal adviser) is required to lodge certain documents and information together with payment of fees to the SC before a proposed offering. Lodgement of such required documents and information allows immediate offering of such Notes.

Malaysia is committed to the United Nations’ Sustainable Development Goals (“SDGs”) and seeks to establish itself as a centre for sustainable finance. As such, in line with the rising trend of green bonds and social impact bonds that allows issuers to mobilise resources for low-carbon infrastructure, energy efficiency, clean energy and community enrichment, in 2014, the SC introduced the Sustainable and Responsible Investment (SRI) Sukuk framework (“SRI Sukuk Framework”). In addition, in January 2017, the SC, together with the Central Bank of Malaysia and the World Bank established a technical working group to explore options for developing a green Islamic finance. This ultimately resulted in Tadau Energy Sdn Bhd issuing the first green sukuk to finance

a solar power plant in Sabah, Malaysia. Both local rating agencies in Malaysia, RAM Ratings and MARC, have also established methodologies for reviewing green sukuk frameworks in accordance with international best practices. The SC estimates that in the next five years, the market will require RM45 billion to finance the long-term development goals.

The SRI Sukuk Framework is an extension of the existing sukuk framework and as such, all the other requirements in the LOLA Guidelines continue to be applicable. The additional areas addressed in the SRI Sukuk Framework for the issuance of SRI sukuk include utilisation of proceeds, process for project evaluation and selection, management of proceeds, disclosure requirement, appointment of external reviewer and reporting requirement.

What is Green Sukuk?

Green Sukuk is a Shariah compliant socially responsible investment instrument for renewable energy and other environmental sustainability projects that are backed by a specific pool of assets. It is issued and traded in compliance with the principles of Shariah, which prohibits ‘riba’ (interest).

In order to complement the SRI Sukuk Framework and promote greater adoption of SRI sukuk as a fundraising channel, the SC is offering tax deduction to the SRI sukuk issuer on the issuance costs of SRI sukuk approved, authorised by or lodged with the SC under the LOLA Guidelines until the year of assessment (“YA”) 2023. The tax deduction on issuance costs of SRI sukuk is first provided from YA 2016 to YA 2020 and extended for three years from YA 2021 to YA 2023 by the Government of Malaysia, through Budget 2020, to further promote Islamic fund and SRI sukuk fund management activity. In addition, to meet the cost of offering the SRI sukuk, a Green SRI Sukuk Grant Scheme (“Grant”) of up to RM6 million has also been introduced. The Grant is administered by Capital Markets Malaysia, an entity established by the SC.

To be eligible for the above tax deductions or incentives, the issuer utilising the SRI Sukuk Framework must ensure that the proceeds raised from the SRI sukuk issuance are utilised only for the purpose of funding any activities or transactions relating to eligible SRI projects. To be eligible as a SRI project, the project has to seek to achieve any one or a combination of the following objectives:

Preserving and protecting the environment and natural resources	
Conserving the use of energy	
Promoting the use of renewable energy	
Reducing greenhouse gas emission	
Addressing or mitigating a specific social issue or seeking to achieve positive social outcomes especially but not exclusively for a target population ¹	
Improving the quality of life of the society	

According to Paragraph 7.08 of Chapter 7, Part 3, Section B of the LOLA Guidelines, the eligible SRI projects may include but not limited to the following:



Note: There can also be a combination of green and social projects.

Under the Grant, an issuer who raises funds to finance projects in compliance with the SRI Sukuk Framework is entitled to claim 90% of the actual costs incurred for an independent expert review which is subject to a maximum of RM300,000 per issuance. Such claims can be made by an issuer based on a single SRI sukuk issuance or SRI sukuk issuances under a sukuk programme and is effective until the Grant is fully utilised.

The following sets out the incentives and overview of the Grant under the SRI Sukuk Framework.

Incentives and Grant Scheme

1 TAX DEDUCTION ON SRI SUKUK ISSUANCES

- Tax deduction for the expenditure incurred on the issuance of SRI sukuk approved or authorised by or lodged with the SC until the year of assessment 2023.
- 90% of the proceeds raised are solely used for the purpose of funding SRI projects as specified in the Guidelines by the SC.

2 GREEN SRI SUKUK GRANT SCHEME (THE GRANT)

Objective
Extended to issuers to fund an external review cost relating to the green SRI sukuk issuance under the Framework.

Claim

- Issuer can claim for the Grant based on an issue or programme.
- Should there be more than one issuances requiring a separate external review, the issuer is able to claim on that review cost incurred.

Effective date of the Grant
From January 2018 until fully utilised.

Claim amount
90% of the actual external review cost subject to a maximum of RM300,000.

Effective date for green SRI sukuk issuance that qualifies for the Grant
From July 2017 onwards.

Application

- Application form is available at the Capital Markets Malaysia website - www.capitalmarketsmalaysia.com.
- The Grant will be paid on a reimbursement basis within 60 days upon complete submission.

In addition to adopting the SRI Sukuk Framework, an issuer may also consider for the sukuk to be classified as “ASEAN Green Sukuk” by complying with the ASEAN Green Bond Standards (“ASEAN GBS”). Eligible issuers of the ASEAN Green Sukuk must have a geographical or economic connection to the ASEAN region. With ASEAN GBS aligned and guided by the Green Bond Principles which requires, among others, a second party review and report on an ongoing basis, and an annual reporting to investors, the issuer would benefit from positive profiling through public awareness of its sustainable initiatives.

Loans

As an alternative to the issuance of Notes, another common form of fundraising for a green project would be through taking up loans.

For viable large scale projects, loan syndication has been a favoured mode of fundraising. With the projects typically capital intensive and requiring large financing needs, a syndicated loan allows lenders the opportunity to be exposed to credits/projects/sector which would have been too large for one individual lender's capital base. A syndicated loan is usually on a floating rate basis and at a predetermined margin over short-term interest rates under common terms and conditions including security sharing.

For companies that supply and utilise green technology, they may consider applying for a soft loan supported by the Government of Malaysia under a special financing scheme, Green Technology Financing Scheme ("GTFS"). GTFS is administered by GreenTech Malaysia and RM2 billion has been allocated for the period of January 2019 until the end of 2020. GTFS provides up to 60% government guarantee on the green component cost financed by the participating financial institutions for a particular green project, 2% per annum rebate on interest or profit rate subsidy for the first seven years and training to applicants to enhance their knowledge on green technology.

Under the GTFS, all green products, equipment and systems must meet the underlying criteria. These include minimising degradation of environment, reducing greenhouse gas emission, promoting a healthy and improved environment for all forms of life, conserving the use of energy and natural resources and promoting the use of renewable

resources, in order to be eligible for the financing scheme.

The sectors which are eligible for the GTFS are energy, waste, building, transport, water and manufacturing.

A relatively recent innovation to facilitate and support environmentally and socially sustainable economic activity and growth is the introduction of sustainability-linked loans ("SLLs"), with global volumes rising dramatically over the past few years, and is set to continue. In Malaysia, market players have recently launched its SLL initiatives for corporate borrowers who are keen to enhance their sustainability performance in alignment with any of the 17 SDGs. It is important to note that SLLs are not conditional on the proceeds being used for a particular purpose. Instead, the defining feature is that the terms of the loan incentivise the borrower to improve its performance against predetermined sustainability criteria. If the borrower is able to demonstrate that it has achieved its predetermined goals, incentives are then offered, in the form of interest rate rebates, among others. The CIMB Group is one of the first financial institutions in Malaysia to introduce its SLL propositions.



Comparison between Issuance of Bonds/Sukuk and Loans

When considering financing for a green project, the following sets out important points to consider when deciding:

Issuance of Bonds/Sukuk		Loans
Coupon rates are typically fixed, allowing the issuer to lock in favourable financing rate at issue date	Financing Rates	Floating rate and limited appetite for fixed rate for longer tenure facilities
No restrictions, subject to investor appetite and market conditions	Facility Tenure	Typically less than 10 years
Wider subscriber-base ranging from high net worth individuals to institutional investors, for instance, retirement funds, pension funds, insurance companies, and etc.	Target Investors/Lenders	Largely financial institutions
Typically, semi-annual	Principal Repayment Frequency	Monthly/Quarterly/Semi-Annually/Annually
More flexibility in operating and managing funds as the issuer sees fit	Flexibility	Loans tend to come with certain restrictions that could restrict a company's ability to operate as it sees fit
Yes <i>(only applicable for Sukuk Ijarah of up to 2020, SRI Sukuk of up to 2023 and Sukuk Wakalah of up to 2025)</i>	Tax Deducibility	No
Exempted	Stamp Duty	Applicable, 0.5% ad valorem
The issuance will typically involve, amongst others, a due diligence exercise, obtaining of Shariah endorsement from SC's Islamic Capital Market Development (only for sukuk), credit rating exercise and lodgement with the SC.	Transaction Complexity	Simpler and limited to only terms with the lenders

Potential Issues Faced By Green Project Company

One of the most common challenges faced by the project companies is the complications arising from land issues. The restrictions on interest and express conditions of use running with the land on which the project is located will be expressly stated on the issue of document of title of the land. Such conditions may include the requirement to seek approvals from the relevant state authority before any security may be created over that land, and in some cases, before the project company can commence construction. The application for such approvals involves the submission of a prescribed form to the relevant land office together with supporting documents, which may take anywhere between two to six months, and potentially longer depending on the lands' locality.

In addition, if the project involves the provision of guarantee, a Malaysian guarantor may require the prior approval of Bank Negara Malaysia to grant financial guarantee in favour of, or obtain financial

guarantees from, non-residents under certain prescribed circumstances in the Malaysian foreign exchange administration rules. The approval process usually takes approximately four to six weeks depending on the complexity of the financing and the entities involved.

Conclusion

Sustainable and green projects in Malaysia are likely to continue to grow for the foreseeable future. A key element supporting that growth is incontestably the various financing options and incentives available to the project companies which the Government of Malaysia has introduced as part of its initiatives to spur green investment and ecosystem in the country. As pointed above, a project company's right to use the relevant site for the entire duration of a project is clearly critical to the success of any project. It is also important to ascertain and obtain the proper land use rights. Having the wrong land use rights could result in delays to a project. Consulting a suitably experienced local counsel may help to avoid these issues. It is, however, equally important for the project company to also ensure that their capital (both debt and equity) is efficiently deployed to generate returns that are stable and meet targeted internal rates of return and obtain necessary government licences and permits required for sustainable and green projects.

THE SECURITIES COMMISSION'S ROADMAP TO SUSTAINABLE AND RESPONSIBLE INVESTMENT

In order to strengthen the development of green technology in Malaysia, the government has introduced a variety of financial incentives and grants to support green infrastructure projects, sustainable technologies and businesses. Corporations and business increasingly getting more motivated to adopt environmentally friendly and sustainable practices given the financial benefits and the value of being seen as a responsible and environmental friendly company which is more appealing to clients, customers and employees. In line with this, the Malaysian government and regulatory bodies have looked at introducing investment instruments that will encourage more investments in the green businesses and one of the initiatives that has gained traction is the Sustainable and Responsible Investment (“SRI”) Sukuk.

To further promote Malaysia as a regional hub for issuance of SRI Sukuk, SC has released the SRI Roadmap for the Malaysian Capital Market (“SRI Roadmap”) in November 2019. The SRI Roadmap aims to charter the strategic direction and identify recommendations in accelerating the growth of SRI to further strengthen Malaysia’s value proposition as a regional centre for SRI over the next five years. Under the SRI Roadmap, SC made 20 recommendations (“Recommendations”) which were mapped into five overarching strategies (“5 i-Strategy”).

What is the 5 i-Strategy?

Since its introduction in 2014, the 5 i-Strategy has been the overarching framework for the development of the SRI ecosystem and various related initiatives introduced in the Malaysian capital market. The 5 i-Strategy aims to drive the development of a vibrant SRI ecosystem for Malaysia as well as the region by expanding the range of SRI instruments, issuers, investors and ancillary services, while strengthening disclosure and governance by drawing synergies from Malaysia’s existing global leadership in the closely-aligned field of Islamic finance.



SC's Recommendations to develop Malaysia as a Regional SRI Centre

The Recommendations made by SC are specifically aimed at developing and enhancing each of the 5 i-Strategy. In summary, the SC made the following recommendations:

5 i-Strategy - Developing a Facilitative SRI Ecosystem in the Malaysian Capital Market



WIDENING THE RANGE OF SRI INSTRUMENTS

Facilitate the development of new SRI capital market products to widen and deepen the SRI asset classes

- Promotes alignment of SRI Instruments to international standards and principles increasing the profiling and branding of SRI Sukuk Framework internationally.
- Encourage the issuances of sovereign green, social and sustainable bonds and sukuk.
- Develop a SRI taxonomy that can be universally applied through the Joint Committee on Climate Change (JC3) so as to provide better clarity in the capital market, banking and insurance sectors.
- Facilitate the issuance of more SRI products to expand the breadth and depth of SRI products in the Malaysian capital market.



INCREASING SRI INVESTOR BASE

On the buy side, there is a need to attract institutional and individual investors to increase the SRI investor base, thus demand for SRI produces

- Enhance the role of government-linked investment companies (GLIC) and institutional investors ("II") in SRI by becoming signatories to the Principles for Responsible Investment (PRI).
- Attract international investors through strategic dialogues with identified markets, roundtable engagements with targeted investor groups and thought leadership events.
- Encourage SRI investments by retail investors by increasing understanding and awareness of SRI products.
- Enhance investment managers' SRI intermediation capabilities which will provide opportunities for investment managers to capitalise on the investors' preference or objectives that seek to achieve social II's SRI mandates.



BUILDING A STRONG SRI ISSUER BASE

On the supply side efforts need to focus on building a strong and diversified issuer base consisting of listed and unlisted companies and multilateral organisations

- Widen access to SRI through alternative funding avenues to channel funding to micro, small and medium-sized enterprises (MSME).
- Support the development of an initial public offering pipeline for green and social impact companies through close collaboration with other sectoral regulators and agencies.
- Enhance the roles of financial institutions in SRI as it is integral to the growth of sustainable investments.
- Collaborate with multilateral development institutions as they play a significant role in mobilising finance towards the Sustainable Development Goal and Paris Agreement.



INSTILLING STRONG INTERNAL GOVERNANCE CULTURE

Development of metrics and disclosures to measure sustainability in facilitating investment decisions to inculcate good governance practices in the SRI space

- Strengthen sustainability disclosures of Public-Listed Companies (PLCs). SC and Bursa Malaysia are working together to enhance the Sustainability Reporting Framework by identifying critical economic, environmental and social indicators to be included in the listed companies' annual reports.
- Promote the adoption of sustainable business practices including disclosures among small and medium enterprises.
- Enhance board governance on sustainability including climate risks and opportunities.
- Enhance risk assessment and supervisory approach on SRI through the development of new analytical tools and identify ESG risks that could pose risks to the financial markets.



DESIGNING INFORMATION ARCHITECTURE THE SRI ECOSYSTEM

Development of platforms which provide SRI data to investors, thereby enabling better assessment of investment opportunities to ensure transparency and accessibility to the SRI market

- Enhance transparency of information on SRI products through the existing Bond Information Exchange, which will incorporate a dedicated section featuring information on SRI sukuk, green, social and sustainability bonds.
- Develop ancillary services for SRI such as ESG research and ratings, external reviews for issuances of green bonds and sukuk as well as investment screenings and analysis.
- Incorporate sustainability in advisory services to ensure that investors are well-informed of available investment options and opportunities.
- Accelerate promotions and profiling of Malaysia as a regional SRI center.

Pursuant to the SRI Roadmap, SC immediately made revisions to the requirements relating to *SRI Sukuk* contained in Chapter 7 of the SC's Guidelines on Unlisted Capital Market Products under the Lodge and Launch Framework and in Chapter 20 of the SC's Guidelines on Issuance of Corporate Bonds and

Sukuk to Retail Investors which took effect on the day the SRI Roadmap was launched. These revisions include aligning the eligible SRI projects with those set out in the SRI Roadmap, and setting out the key components of the SRI Framework, namely:

 <p>Utilisation of Proceeds</p>	<p>Issuance of the SRI sukuk are utilised only for the purpose of funding any activities or transactions relating to the Eligible SRI projects which may include the following activities or transactions:</p> <ul style="list-style-type: none"> • purchase of receivables arising from the financing of an Eligible SRI project. The receivables must be Shariah compliant; • acquisition of an Eligible SRI project either directly or through a company under which the Eligible SRI project is being held; • refinancing of existing borrowings or financing facilities which have been utilised to fund an Eligible SRI project; or • other related and supporting expenditures such as research and development, and may relate to more than one Eligible SRI projects. <p><i>*Note: Activities or transactions that involve acquisition of a company which carries on the Eligible SRI projects, an issuer must ensure that the company that is to be acquired does not carry on any other business or projects except for the Eligible SRI projects.</i></p>
 <p>Process for project evaluation and selection</p>	<p>Issuer must establish internal processes for evaluation and selection of the Eligible SRI projects.</p>
 <p>Management of proceed</p>	<p>Issuer must ensure that the proceeds allocated for the Eligible SRI projects are credited into a designated account or otherwise tracked in an appropriate manner.</p>
 <p>Reporting</p>	<p>Issuer must provide the following information to the sukukholders annually through a designated website:</p> <ul style="list-style-type: none"> • the original amount allocated for the Eligible SRI projects; • the amount utilised for the Eligible SRI projects; • the unutilised amount and where such unutilised amount is placed or invested pending utilisation; and • the list of the Eligible SRI projects in which the SRI sukuk proceeds have been allocated to and a brief description of the said Eligible SRI projects and their impact or expected impact, including the key underlying methodology or assumptions used to determine the impact or expected impact. <p><i>*Note: Where an issuer is unable to make available comprehensive information as specified above due to confidentiality agreements or competitive considerations, such issuer may provide the information in generic terms or on an aggregated portfolio basis (e.g. percentage allocated to certain project categories).</i></p>

OVERVIEW OF TAX INCENTIVES FOR GREEN PROJECTS IN MALAYSIA

With the increasing demand for eco-friendly goods and more companies moving towards sustainable and green practices, the government has offered tax incentives that cover a broad scope of activities in different eco-friendly products and services to further promote and encourage the development of more green businesses in Malaysia.

The following sets out a summary of tax incentives provided by the government:

No.	Type of incentive	Responsible agency	Details of incentives and criteria
1	Green Investment Tax Allowance (GITA) Project	MIDA	<ul style="list-style-type: none"> GITA of 100% of qualifying capital expenditure incurred on a green technology project from 2013 until 2023. The allowance can be offset against 70% of statutory income in the year of assessment. Open to green technology project related to renewable energy, energy efficiency, green building, green data centre, and waste management.
2	Green Investment Tax Allowance (GITA) Assets	Malaysian Green Technology Corporation (GreenTech Malaysia)	<ul style="list-style-type: none"> GITA of 100% of qualifying capital expenditure incurred on a green technology asset from 2013 until 2020. The allowance can be offset against 70% of statutory income in the year of assessment. Open to green technology assets as listed in MyHijau Directory.
3	Green Income Tax Exemption (GITE) Services	MIDA	<ul style="list-style-type: none"> Income tax exemption of 100% of statutory income from 2013 to 2023. Open to green technology services related to renewable energy, energy efficiency, electric vehicle (EV), green building, green data centre, green certification and verification, and green township.
4	Waste Eco Park (WEP)	MIDA	<ul style="list-style-type: none"> WEP Developers can receive income tax exemption of 70% of statutory income from rental, waste receiving and separation facility, and waste water treatment facility. WEP Manager can receive income tax exemption of 70% of statutory income from services activities related to management, maintenance, supervision and marketing of the WEP from 2016 to 2025. WEP Operator can receive income tax exemption of 100% of statutory income or equivalent to 100% of ITA for five years.
5	Green Technology Financing Scheme 2.0 ¹	GreenTech Malaysia	<ul style="list-style-type: none"> To finance investment for production, utilisation of green technology and products as well as energy efficient projects and energy performance contracting by energy services companies (ESCOs). Loan size available up to RM100 million. Tenure up to 15 years. Open to Malaysian companies and businesses with at least 51% Malaysian shareholders. Rebate of 2% per annum on interest/ profit rate (limited to the first seven years only) for each loan/financing. 60% government guarantee on Green Technology Cost. The scheme will be opened until 31 December 2020 or upon approval of financing/funding issuance up to RM2 billion, whichever is earlier or any subsequent extension on the availability date.

The tax incentives cover a wide scope of green facilities in all areas of energy, transportation, building, waste management, and supporting services. According to MIDA, from 2001 until 2015, it has approved investments worth RM6.49 billion for 111 energy efficiency projects and RM9.25 billion for 430 renewable energy projects. In continuing to provide attractive tax incentives for investments in green businesses, the government has recently extended the GITA and GITE for an additional three years to 2023. The government aims to fuel the green industry further and strengthen Malaysia's position as the preferred destination for development of green technology, services, equipment and system.

**Information as at 29 June 2020*

OVERVIEW OF RENEWABLE ENERGY DEVELOPMENT IN BRUNEI DARUSSALAM



10%
in 2035

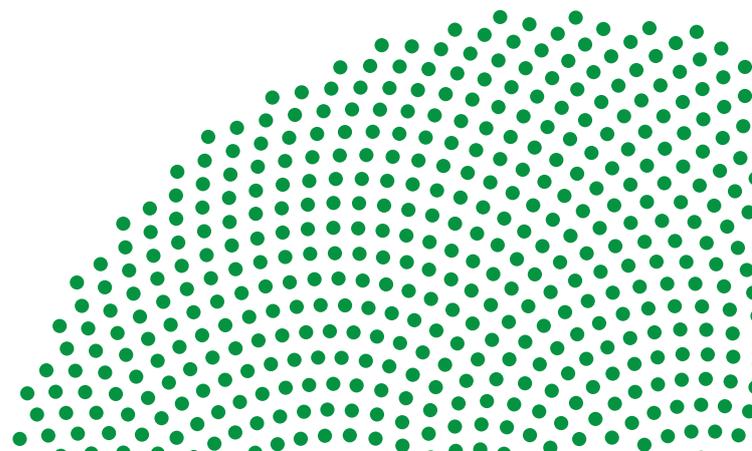
0.05%
in 2020

Brunei has been sourcing its electricity primarily from fossil fuels. In doing so, Brunei is able to cover its own energy use through oil and natural gas, which are the country's main raw material. Currently, renewable power generation stands at only 0.05%. Brunei thus aims to increase the deployment of its clean energy up to 10% in 2035 as conveyed in its Vision 2035.

On 26 May 2011, the Sultan inaugurated the first solar plant in Brunei. This photovoltaic power plant is located at Tenaga Suria Brunei. Interests in solar energy has caught not only the public's attention but also well-established energy companies in the country. Recently, the Brunei Shell Petroleum's ("BSP") Managing Director, Dr Ceri Powell announced that BSP is intending to invest millions to build a new solar park close to its headquarters. Further, to combat the environmental issues the

world is facing, BSP will soon convert its headquarters in Seria from gas to solar power.

There has also been considerable interest in the use of hydrogen gas. The Ministry of Energy established the Advanced Hydrogen Energy Chain Association for Technology Development (AHEAD) which launched a hydrogenation demo plant at Sungai Liang Industrial Park (SPARK) in Belait on 27th November 2019. The Minister of Energy, Dato Seri Setia Dr Awang Haji Mat Suny bin Haji Mohd Hussein announced that Brunei will supply over 200 MT of hydrogen to Japan by 2020. The plant therefore represents the first global supply chain of hydrogen from Brunei to Japan.



SUNSHINE AND POWER CUTS, CAMBODIA'S POTENTIAL IN RENEWABLE ENERGY



Introduction

► CAMBODIA'S GROWING ELECTRICITY NEEDS

While the Cambodian economy is growing rapidly, the demand for electricity is outpacing that growth. During the last decade, the average GDP growth has been around 7% but the demand for electricity has grown nearly 20% each year, and both are projected to continue to grow during the next decade.¹ With continuing economic and population growth, along with urbanisation, ADB predicts that the country's energy needs will double by 2030. Therefore, Cambodia must find a way to power the expected growth with new energy sources, which are not only abundant and affordable, but also green and sustainable.

The power generation landscape of the country has changed quite a bit during the last decade. There has been a huge increase in terms of accessibility to energy and a significant change of the power generation mix. For instance, from 2010 to the end of 2019, Cambodia's power source capacity increased from 584 megawatt (MW)² to 3,028 MW. During the same period, the energy delivered to Cambodian consumers increased from 2,515 Gigawatt hours (GWh)³ to 12,015 GWh. The proportion of grid connected households amongst the total number of Cambodian households increased from 23% to 75% in the past 10 years. Pursuant to the recent publication summarising Cambodia's

power development up until December 2019, prepared by the Ministry of Mines and Energy and the Electricity Authority of Cambodia, both regulators of the Cambodian energy sector, Cambodia's total power sources in 2019 (12,015 GWh) was composed of imported and domestic sources, in a proportion of 25% and 75%, respectively. The majority of the imported power came from Vietnam and Thailand, with a small proportion from Laos. Besides the spectacular growth in terms of quantity, the composition of the energy supply mix has also changed significantly. Hydropower and coal have over taken oil as the main sources of electricity generation.^{4,5} Pursuant to the statistics disclosed in the same publication, the domestic power generation comprised of the following in 2019: hydropower (45%), coal (43%), fuel (8%), renewable energy (2%) and captive power generation by licensees and consumers during the dry season (2%).⁶

The numbers clearly show the significance of hydropower amongst the power generation sources. Cambodia is geographically well located to take advantage of the abundant waters of the Mekong for power generation. However, the strong reliance on hydro power generation makes electricity supply uneven. During the wet season, the hydropower plants can run at full capacity, but are unable to during the dry season, when there is less flowing water available for power generation. Even in 2019, power cuts were quite frequent in

Phnom Penh, which affected the majority of households in the capital city. Food stored in freezers began to melt, bars and restaurants often had to shut down unless they had their own power generators.

Although Cambodia's population is urbanising at a rapid pace, it still remains the fact that, to date, more than two-thirds of the national population still resides in rural areas, millions of whom are still not connected to the national electricity grid. Instead, they are relying on car batteries, wood and other traditional fuels for energy.⁷ For instance, about two thirds of Cambodian households use a biomass stove as their primary stove to cook. Biomass stoves include three-stone, traditional, and improved cookstove, the majority of which are fuelled by firewood. The remaining third of the Cambodian households use a clean fuel stove as their primary stove. The most common clean fuel used for cooking is liquefied petroleum gas, followed by electricity and biogas,⁸ but the installation of solar home systems ("SHS") is increasing rapidly amongst off-grid households.

► CAMBODIA'S HIGH VULNERABILITY TO CLIMATE CHANGE

Cambodia is amongst the countries which are the most vulnerable to climate change. The rising temperature is expected to reduce labour productivity of sectors

such as agriculture, fisheries and forests, which are highly significant in Cambodia. The change of rainfall patterns will lead to increased storms, flooding and drought. Such extreme events will damage roads, water supply and other infrastructure. Furthermore, the rising sea levels could cause flooding and storm damage in coastal areas, affecting urban areas and natural resources. Climate change is expected to have significant costs for the economy. Studies show that, by 2050, climate change could reduce Cambodia's GDP by 10% which is higher than suggested in previous modelling for Southeast Asia.⁹

In response to the issues of the changing climate, the government has prepared the Climate Change Strategic Plan and sectoral Climate Change Action Plans. In addition, Cambodia has joined the Paris Climate Agreement and has made a commitment to reduce carbon and greenhouse gas emissions. The Ministry of Economy and Finance, with support from the National Council for Sustainable Development, has taken a further step by making Cambodia the first country to develop and apply a Climate Economic Growth Impact Model ("CEGIM"). The CEGIM offers an opportunity to identify the most critical actions to protect Cambodia's key economic sectors from the impacts of climate change and define a range of priorities which cover most of the sectors (e.g. construction, agriculture, livestock, fisheries, and forestry) affected by the changing climate.¹⁰

► THE GOVERNMENT'S GREEN ENERGY RESPONSE

The Royal Government of Cambodia traditionally sets out its objectives in its Rectangular Strategy. The Rectangular Strategy – Phase IV addresses both issues; the growing electricity demand and climate change. According to the government's strategy, in terms of electricity, challenges include high electricity costs, limited reliability of the electricity supply and that the renewable energy sources have not been used in the energy supply system to their full economic potential. The government's aims include further lowering electricity prices, expanding supply coverage and enhancing electricity reliability through the construction of additional sub-stations near major economic centres and areas with high economic potential. The government further aims to ensure environmental sustainability and readiness to tackle issues of climate change. In implementing this work, the government places priority on promoting the

agricultural sector and rural development in a sustainable way and on promoting clean energy production by using developed technologies to respond to climate change.¹¹

Renewable energy potential in Cambodia

Given its geographical location, Cambodia has strong potential in utilising renewable energy sources. Beyond hydropower, which accounts for half of the national grid's energy supply, there are further substantial opportunities in solar, wind and biomass energy. Though there is still potential in building new hydro dams along the Mekong river and on its tributaries, from an environmental perspective, it is not desirable. However, unlike hydro dams, solar, wind and biomass energy has very little to no impact on the environment. Moving toward solar, wind and biomass energy will facilitate the meeting of the growing electricity demand and greenhouse gas emission reduction targets. The diversification of energy generation sources is further desirable for the security and stability of energy supply.

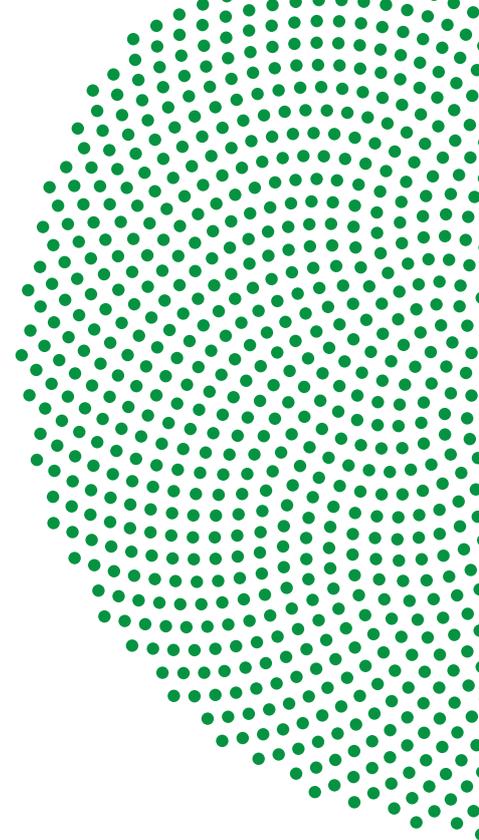
Solar

Cambodia enjoys some of the highest solar resources in the Greater Mekong Subregion.^{12,13} On average, the sun shines for eight hours a day in Cambodia throughout the entire year. Cambodia's recorded solar irradiation, which is a measurement of solar energy received over a square meter of area, is robust with daily averages of 5 kWh/m², peaking as high as 5.6 kWh/m² in the central areas of Cambodia. This is higher than both Thailand (4.9 kWh/m²) and China (4.2 kWh/m²) and significantly higher than some of the pioneering solar nations, for instance Germany (3 kWh/m²).^{14,15}

Solar panels, if well positioned, can easily and efficiently harness the sun's energy by converting sunlight into electricity. A substantial part of Cambodia's growth in day-time electricity demand could be satisfied with solar panels which produce energy when the sun is out. One great example of this is the growing use of air conditioners during the day at the hottest temperatures when the sun is out, as more Cambodians can now afford to purchase and use them. Growing temperatures due to climate change will likely further increase such demand.¹⁶

And importantly, solar energy has no direct air emissions and is well recognised as an essential component to combat climate change. In addition, air pollution, caused by burning firewood and fossil fuels, which is a power source often used in Cambodia, can be dangerous and, in extreme cases, result in premature death, asthma, and life-long damage to respiratory and cardiovascular systems. Consequently, the increase of solar in the energy mixture would contribute to keeping the air clean and the Cambodian people healthy.¹⁷

The Cambodian government has recognised the potential in solar energy generation. In early 2018, the Electricity Authority of Cambodia (EAC) adopted the first of its regulations on the general conditions of connecting solar generation sources to the national grid; the Solar Regulation. The Solar Regulation provides a regulatory framework where previous regulations were unclear or where none existed. It covers two types of solar systems, namely solar system projects that are a source to the national grid, and solar systems of consumers connected but not supplying to the grid.¹⁸ The Solar Regulation provides clarity as to the regulatory framework for



large-scale investments, but only allows large-scale solar initiatives to supply power to the grid. Solar energy sources which are not connected to the grid are not regulated under the Solar Regulation. Individuals or companies, who are not connected to the grid are free to use solar energy but are not covered by the Solar Regulation.

In 2018 and 2019 alone, many new utility-scale solar farms have been approved, for a total of 415 MW that will power the national grid within the next few years. Compared to solar energies' 3% contribution to Cambodia's grid capacity in July 2019, this would amount to 14.3% of installed capacity, considering that in 2019 there were only three operational solar farms in the country producing 75 MW. Taking into account the fact that solar farms can be installed relatively quickly (within a year), the change will be spectacular.¹⁹

Solar equipment is widely accessible in Cambodia and has become an excellent solution for rural communities living too far from the grid. With the significant drop in prices, Solar Home System ("SHS") have gained popularity among households in remote villages (as well as in urban areas). Today, over half of Cambodia's off-grid consumers use SHS as one of their main sources of electricity. As the price of SHS continues to fall, solar energy will become a valuable component in bringing reliable electricity access to remote communities in Cambodia.²⁰ To support the installation of SHS in rural areas, the Cambodian government, through its Rural Electrification Fund ("REF") provides subsidies to households that wish to install SHS. In addition to the subsidy, the costs of the SHS is advanced by REF and can be repaid by the purchaser in four years. After full repayment, the purchaser becomes the owner of the SHS. REF has announced that this program, commenced in 2013, will continue to be implemented in 2020 as well.²¹

Biomass

Cambodia has vast biomass energy resources from various sources, such as rubber plantation forests, fast-growing tropical trees (e.g. Gliricidia and Acacia), and agricultural residues (e.g. rice husk, rice straw, corn cobs, wastes from palm oil extraction, cassava stalk, sugarcane bagasse, and cashew nut shells). These sources could be used by large processing mills for power generation. Cambodia already has several biomass generation power plants in operation.²²

In addition, biomass is commonly used in rural areas for cooking. Rural households still mostly use traditional biomass energy, mainly fuelwood, for cooking. However, it is mostly burned in traditional ways, by using traditional and inefficient stoves, which give off toxic smoke that pollutes the air both inside and outside homes. Toxic smoke is a major health issue in Cambodia, being a major contributor to illnesses such as asthma and acute respiratory infections, particularly amongst children. A close link between the use of solid fuels, especially amongst households in rural areas, and a high incidence of respiratory diseases has been shown by a number of studies. The promotion of more advanced stoves that burn biomass in cleaner and more efficient ways could help to reduce or mitigate such household pollution.²³

Furthermore, biomass is also used to produce biofuels for transport. These come from jatropha, palm oil, and sugarcane. In addition, roughly 36 million litres of bio ethanol are produced annually from cassava.²⁴

Wind

Cambodia's wind potential is located mostly in the southern part of the Tonle Sap lake, the mountainous districts in the southwest, and the coastal regions, such as Sihanoukville, Kampot, Kep, and Koh Kong.²⁵ ADB's localised wind assessments indicate that parts of the country have wind resources of medium intensity that are suitable for utility-scale turbines. ADB found that wind could potentially be economically feasible in areas with wind speeds greater than six meters per second per year that could be reached by the grid, or in small, off-grid applications.²⁶

After collecting data throughout the last four years, a Singapore based firm decided to set up Cambodia's first ever wind power plant in Kampot, in South Cambodia. In late 2019, the investor and the Cambodian government came to an agreement under which the government gave green light to the first testing phase of the wind energy production initiative, allowing the installation of four turbines which will be able to

produce 13 MW in total. Pursuant to the investor's estimation, Cambodia has a possibility of 500 MW plus of commercial wind power potential.²⁷

Investment in renewables including foreign investment

Even small nations like Cambodia can do a lot to join the fight against climate change by reducing carbon emission through a shift towards green power. More importantly, Cambodia can also seize this opportunity to become a leader in renewables within Southeast Asia by investing more in green technology, particularly wind, solar and biomass power sources. The Royal Government of Cambodia has recognised this opportunity and has set out amongst its priorities to promote clean energy production.²⁸

A vast majority of the power projects have already been set up by foreign investors, but the sector has further growing potential. Cambodia offers investor-friendly laws and regulations. For instance, there are no foreign exchange controls and profits can be freely repatriated. Foreign and local investors are treated equally. Though there is a restriction for foreigners to acquire land ownership, properties can be leased safely on a long-term basis. For qualified investment projects, special investment incentives are available, which can be obtained through a one-stop mechanism at the Council for the Development for Cambodia.²⁹

All in all Cambodia seems well positioned to follow a path of sustainable green energy to meet its ever increasing electricity needs - as its population grows and more and more rural households electrify and join the nation grid. Both its geography and government policy augur well for a greener future. Furthermore, Cambodia's liberal and open economy makes it an attractive market for foreign investment into the sector, which should further enhance its development of green renewable energy.



BATTERY-POWERED ELECTRIC VEHICLES TO PROMOTE GREEN ENERGY IN INDONESIA



Overview: The Enactment of Presidential Regulation on Battery-Powered Electric Vehicles

Indonesia's current status of being the largest energy-consuming country in the ASEAN region, although per capita energy and electricity demand are still below the world average, exposes Indonesia to the impacts of global climate change.¹ A number of factors contribute to the massive energy consumption in Indonesia, among others, the road transportation sector in Indonesia that mainly consumes fossil fuels. Further, such sector contributes to air-pollution which remains a severe problem in Indonesia particularly in large and densely populated cities.

For many years, the government has planned to push forward to formulate and implement various energy policies and strategies for the modern and green economy of Indonesia. One way forward is to create regulatory and financing frameworks that encourage green energy and economic transition. In order to bring it to fruition, President Joko Widodo (or popularly known as President Jokowi) issued Presidential Regulation No. 55 of 2019 on Acceleration of the Battery-Powered Electric Motor Vehicles for Road Transportation Program ("PR 55/2019") in August 2019. The regulation aims to increase energy production, energy security, and energy conservation in the transportation sector and at the same time to achieve clean energy, clean air quality, and environmentally friendly living. It is expected that Indonesia has the ability to foster the command of

industrial technology and vehicle design, and for Indonesia to be the manufacturing and export base for motor-vehicles, including battery-powered electric motor vehicles.

PR 55/2019 in essence regulates the manufacturing of Battery-Powered Electric Motor Vehicles ("BEV") and BEV components and the construction of electric vehicle charging infrastructures. It also sets out the government's incentives (fiscal and non-fiscal) to spur the new market.

PR 55/2019 sets out five critical ordinances for accelerating the implementation of BEV programme in Indonesia, as follows:

- i acceleration of the development of domestic BEV industry
- ii granting of incentives
- iii provision of electric charging infrastructures and regulation of electric power tariff for BEVs
- iv fulfillment of BEVs' technical provisions
- v protection of the environment

Further, we note that PR 55/2019 aims to foster a relationship between the government and private companies in the field of research, growth, and innovation in the BEV technology.

The Government's Objectives of Enacting PR 55/2019

By enacting PR 55/2019, the government intends to provide a much awaited legal framework and legal certainty to ensure the smooth growth and acceleration of BEV for the road transportation acceleration programme in Indonesia as a way to promote green energy and economy in Indonesia.

The main objectives of PR 55/2019 are to regulate the implementation of, among other things: (i) manufacturing of BEV and BEV components (including requirement of local components); (ii) development of electric charging infrastructures; and (iii) provisions of incentives.

Manufacturing of BEV and Components of BEV

PR 55/2019 sets out two categories of BEV: (i) two and/or three-wheeled BEV; and (ii) four-wheeled or more BEV. Similarly, the industries eligible to participate in the BEV for the road transportation acceleration programme are divided into two main industries, namely: (i) BEV industry, and (ii) BEV components industry. Both BEV and BEV components industry players are required to establish an Indonesian legal entity, operate in the Indonesian territory, and to hold an Industrial Business License (Izin Usaha Industri or "IUI") in order for them to assemble or produce BEV and BEV's components respectively. Both industry players are also obliged to establish BEV manufacturing facilities within the country by themselves or by way of 'production cooperation' with other industrial companies.

The government, through PR 55/2019, also requires fulfillment of the so-called 'Level of Domestic Components Requirement' (Tingkat Komponen Dalam Negeri or "TKDN") by mandating BEV industry and BEV components industry players to prioritise the use of domestic components based on the following TKDN criteria:

Two and/or three-wheeled BEV	A minimum of 40% TKDN from 2019 to 2023, raised to a minimum of 60% TKDN from 2024 to 2025, and further increased to 80% TKDN from 2026 onwards.
Four-wheeled or more BEV	A minimum of 35% TKDN from 2019 to 2021, increased to a minimum of 40% TKDN from 2022 to 2023, further increased to 60% TKDN from 2024 to 2029, and lastly increased to a minimum of 80% TKDN from 2030 onwards.

In the event that the BEV components industry players are not yet able to produce any main and/or supporting components of BEV, PR 55/2019 allows: (i) the BEV industry players to organise procurements of components by way importing in 'Incompletely Knock Down' and 'Completely Knock Down' state; and (ii) the BEV components industry players to organise procurements of components by way of importing in 'Incompletely Knock Down' state.

PR 55/2019 mandates the Ministry of Industry to stipulate detailed technical calculations and requirements for TKDN as well as rules for the 'Incompletely Knock Down' and 'Completely Knock Down' imports. We understand that the Ministry of Industry's implementing regulations on these matters and any other implementing regulations (including the Ministry of Energy and Mineral Resources on electricity tariff – see below) mandated under PR 55/2019 are yet to be issued. We note that PR 55/2019 provides a time frame of one year as of August 2019 for the Government through the relevant technical Ministries to issue such implementing regulations.

Electric Charging Infrastructures

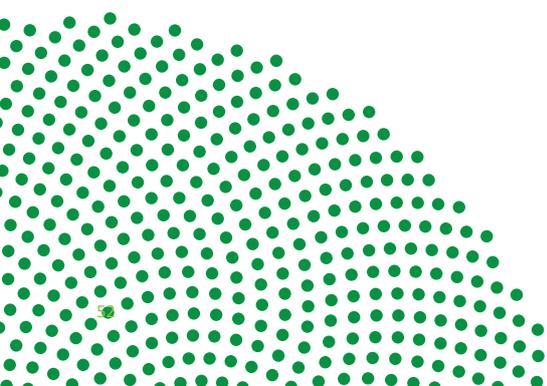
The concept of electric charging infrastructure for BEV is comparable to that of the conventional fuel infrastructure for conventional vehicles. Electric charging infrastructure for BEV is divided into two main categories: (i) electric charging facilities and (ii) battery exchange facilities. Generally, the provision of electric

charging infrastructure may be conducted by state-owned entities in the energy sector (such as PT PLN (Persero) ("PLN") and PT Pertamina (Persero)) and/or other business entities (such as private business entities – which possibly opens up opportunities for private ownership of electric charging facilities by private business entities). However, PR 55/2019 specifically provides an initial mandate to PLN to carry out the provision of electric charging infrastructures. In this case, PLN is also permitted to cooperate with other state-owned entities and/or business entities.

Electric charging activities may be conducted in: (i) private electricity installations (such as private residences, housing complex); and/or (ii) 'Public Electric Vehicle Charging Stations' (Stasiun Pengisian Kendaraan Listrik Umum or "SPKLU"). PR 55/2019 further regulates that, in order to accelerate the provision of electric charging infrastructure, electricity consumers who are the BEV users are allowed to make adjustments to the electrical installations in the consumers' own location, and constructions of SPKLU and/or battery exchange locations in public spaces (such as gas and fuel stations, government offices, shopping malls, and public parking spots) are also possible.

Selling of electricity at SPKLU may only be carried out by: (i) holders of an 'Electricity Supply Business License' (Izin Usaha Penyediaan Tenaga Listrik or "IUPTL") who have a designated working area; and/or (ii) the aforementioned IUPTL holders in cooperation with state-owned entities in the energy sector and/or business entities. In practice, this entails that effectively only PLN (and perhaps only IUPTL holders, including a handful of captive power operators) are eligible to sell the electricity at SPKLU. This also means that, only by way of cooperation with PLN, other entities (including state-owned entities in the energy sector and private business entities) are permitted to sell electricity at SPKLU. Further PR 55/2019 provides that the electricity tariff for sale at SPKLU is to be determined by the Ministry of Energy and Mineral Resources, which means that, similar to gas and fuel prices, the electricity tariff for charging at SPKLU will be regulated and controlled by the Government, and may not necessarily be based on an actual market price.

PR 55/2019 further stipulates the goals toward green energy practices by mandating that, as a means of environmental protection, the disposal



of waste batteries from BEVs must be carried out through waste recycling and/or waste management. Moreover, the usage of fossil-fuel fueled vehicles may be gradually controlled based upon policies created under a roadmap for the national motor vehicle industrial development.

Granting of Government Incentives and Investment Opportunities

The government, both central and regional, offers both fiscal and non-fiscal incentives with the aim to boost investments in the BEV for road transportation acceleration program through PR 55/2019. These incentives are to be granted to, among others, BEV industry players who build BEV and BEV components manufacturing facilities all over Indonesia.

The nature of the fiscal incentives will be in the form of, among others: (i) incentives for the production of SPKLU equipment; (ii) financial support for the construction of SPKLU infrastructure; and (iii) import duty incentives for machineries, goods, materials imports for investment, and several other attractive fiscal facilities listed in PR 55/2019. The non-fiscal incentives may be provided in the form of: (i) exemption from the restrictions on certain road use; (ii) transfer of production rights for technology related to BEV, which patent license is held by the Government; and (iii) development of security and/or safety of the industrial sector's operational activities.

As a concrete follow up to PR 55/2019, on 15 January 2020, the Regional Government of DKI Jakarta - Indonesia's capital - enacted the Governor of DKI Jakarta Regulation No. 3 of 2020 on Tax Incentive for the Motor Vehicle Transfer of Title of Battery Electric Vehicle for Road Transportation. This regulation stipulates that the 'Motor Vehicle Transfer Tax' (Pajak Bea Balik Nama) for the transfer of ownership/title of BEV is exempted automatically from 3 January 2020. The exemption is granted to the BEV users or owners which effectively will have an effect on the price of BEV. This regulation and, therefore the tax exemption granted under this regulation, is however only valid (and hence available) until 31 December 2024.

As discussed above, PR 55/2019 provides opportunities for investments in the manufacturing of two and/or three-wheeled and four-wheeled or more motor-vehicles and motor-vehicles

components provided that that the investors can obtain IUI license and establish manufacturing and assembly facilities in Indonesia. Whilst the investors are not yet able to produce any main and/or supporting components of BEV, they are permitted to import in 'Incompletely Knock Down' and 'Completely Knock Down' state (as applicable).

Further, the electricity sector players (and other investors who cooperate with the IUPTL holders having a designated working area) are also given an opportunity to invest in the BEV for road transportation sector. The holders of IUPTL having a working area and who are in cooperation with state-owned entities in the energy sector or other business entities are permitted to conduct the sale of electric power at SPKLU.

As of the enactment of PR 55/2019, foreign investments in the BEV industry have been rapidly increasing amounting to around USD4 billion (or equivalent to IDR57 trillion) as of August 2019.² Two of the largest automotive manufacturing industry players, Japan's Toyota and South Korea's Hyundai, are among the expanding list of industry players who are planning to invest in Indonesia's BEV industry and have declared their investment commitments.

Despite the fact that the Government has yet to issue further implementing regulations under PR 55/2019, we can look forward to the realisation of the BEV industry player goals as a number of BEV manufacturers have presented their plans to launch their BEVs in Indonesia this 2020. To name a few, China Sokonindo Automobile's DFSK plans to manufacture their SUV's E3 BEV model in their manufacturing facility in Banten, whilst Nissan with their plans to utilise their factory in Karawang (previously used to manufacture Nissan Datsun series) to produce BEVs, including the Nissan Leaf model.³

Presently there are several internationally known vehicle manufacturing companies that have been preparing to manufacture BEVs in Indonesia, and some of them have also installed electric charging facilities for BEVs. For example, Mitsubishi Motors have set up fast-charging facilities at Plaza Senayan, a shopping mall in Jakarta, for their own BEV models.⁴ Further, Mitsubishi Motors in cooperation with PLN plan to develop BEV charging

facilities at individual end-users' homes. Another example is the #LangkahHijau campaign by PT Grab Teknologi Indonesia in partnership with Hyundai Motor Indonesia that promotes the use of BEV in the Grab Car fleets to contribute to the reduction of air pollution by launching GrabCar Elektrik using Hyundai IONIQ Electric Vehicle.⁵ Further, Tesla (internationally known as a company specialising in the manufacture of BEV) has also contributed to the environmentally friendly movements by teaming up with the BlueBird group (the Indonesia's largest taxi operator) to provide BEV taxi fleets.⁶

Conclusion

The recent enactment of PR 55/2019 demonstrates the Indonesian government's determination to bring to fruition its goal to develop and promote green energy in Indonesia, by pushing forward with the BEV as road transportation programme. PR 55/2019 mainly showcases the government's intention to intensify manufacturing of BEV and BEV components as well as construction and operation of BEV electric charging infrastructures in Indonesia. In order to support the realisation of such goal, PR 55/2019 is also equipped with appealing incentives to attract investment opportunities for BEV and BEV component industry players.

The success of this programme, however, is contingent upon, among other things, the implementing regulations to be further enacted by the relevant technical ministries and/or authorities. Although such implementing regulations are yet to be seen to-date, it is promising to learn that numerous investors (including car manufactures) have expressed their interests and declared their investment commitments in this sector. Therefore, it can be noted that Indonesia has commenced its journey as a newcomer in joining a host of nations that are pushing ahead with this new technology.

TOWARDS THE GOAL OF BECOMING THE BATTERY OF SOUTHEAST ASIA



Introduction

Lao government has previously expressed its goal for Lao PDR to assume the position of the “battery” of the Southeast Asia region through the increase of its domestic electricity generation and power exportation activities.¹ Despite being a rather ambitious determination, many studies indicate, that such a goal is readily achievable, especially considering its extensive potential for renewable energy development.² Domestic consumption of electricity is currently low, but is predicted to increase in the future.³ Irrespective of this, should Lao PDR be successful in developing the renewable energy sector, power supply is forecast to be significantly and overwhelmingly abundant in Lao PDR for commercialisation in foreign markets.⁴

Lao PDR is thus a forerunner in the race for green energy development in both regional and international markets, resulting in a growing influx of foreign investment in the renewable energy sector. Despite this, the legal framework for renewable energy is still in its infancy, and has given rise to unmet regulatory needs for the development of the sector.

This article explores viabilities for exploitation of resources for a renewable energy market development in Lao PDR with a particular focus on electricity generation activities, before discussing the regulatory regime in the industry.

Lao PDR and Electricity Industry

Albeit not as fast as its neighbouring countries, Lao PDR has similarly experienced an increasing demand for electricity for domestic consumption, especially in the past decade.⁵ The internal demand for electricity rose from less than 1,000 GWh in early 1990s⁶ to over 4,660 GWh in 2016.⁷ It has also been recorded that, as of 2017, 93% of Lao households have access to electricity, representing a growth of over 18% from the figure in 2010.⁸

Nevertheless, the more interesting fact about the electricity sector in Lao PDR is, in fact, the increase of its generation capacity rate. Documented figures of total electricity generated, both by Électricité du Laos (“EDL”), the State Enterprise in the electricity sector, and independent power producers (“IPP”), between 2010 and 2017 in Lao PDR had skyrocketed by almost fourfold from approximately 8,500 GWh to over 31,500 GWh.⁹ The gap between the generation capacity and domestic electricity demand in Lao PDR is thus significantly wide. This renders Lao PDR one of the more active electricity exporters in the power market, especially to Thailand, which is documented to be the sole destination for IPP’s exportation activities.¹⁰

In contrast, the domestic demand of Lao PDR is met by a mixture of domestic and imported electricity as opposed to sole local supply, with the main importer being Thailand, the main destination of exporting activities. As it can be expected that

procurement of locally generated electricity power would lower the retail electricity cost in the internal market, the lack of interest of investors to engage in the domestic market proves to be a critical issue requiring further constructive and practical solutions for both sectoral and national development.

Lao PDR and Renewable Energy Market: Current State of Affairs

The utilisation of renewable energy is by no means new to Lao electricity market. Lao PDR in fact relies heavily on renewable energy for its electricity generation activities, particularly hydropower.¹¹ It is documented that over three-fifths of the electricity generation portfolio in Lao PDR is hydroelectric, accounting to 62.1% of the entire generation mix.¹² Coal-fire power predominantly dominates nearly over one-third of the sector, representing 37.5% of total Lao electricity production market share, while biomass power, another form of renewable energy, secures the remaining 0.4% of the industry.¹³

Prior to the collapse of the Xepian Xe Namnoy Dam on 23 July 2018, the hope and dream of renewable market expansion of Lao PDR were virtually placed on the development of the hydroelectric facilities. It is estimated that the developable hydropower potential in Lao PDR is at 23,000 MW¹⁴ while the total actual installed capacities had only just reached 6,373 MW in 2016.¹⁵ Given Lao authorities and electricity sector’s increased

familiarity and expertise with hydroelectricity, the attempt to disperse renewable energy profile to the field outside of hydropower had been relatively sparse.

Nevertheless, the collapse of the Xepian Xe Namnoy Dam changed the perception of hydroelectric as it was followed by the suspension of all consideration relating to the development of new hydropower project by the government on 7 August 2018.¹⁶ The excitement within the hydroelectric industry in Lao PDR has since calmed down, allowing more space for alternative renewable energy resources, such as solar, wind and biomass powers, to step into the discussion on Lao future renewable energy development. This however does not mean that hydropower has lost its foothold in Lao electricity generation market. In fact, it was reported in late 2019 that Lao government has recently given its green light to a Vietnamese venture for the development of a hydroelectric dam in Luang Prabang and there are currently nine potential hydropower projects under consideration.¹⁷

Lao PDR and Alternative Renewable Energy Potentials

Studies harmoniously recognise Lao PDR as a country with abundant renewable energy potentials outside of the realm of hydroelectric generation industry.¹⁸ A report by the National Renewable Energy Lab (“NREL”), after taking into account all technical restraints for alternative renewable energy development in Lao PDR such as geographical obstacles, land related restrictions and urbanisation, still purports that Lao PDR has technical potentials to develop electricity generation facilities with output capacity at the minimum of 731,000 GWh from solar power, 135,000 GWh from wind power and 720,000 GWh per annum from biomass.¹⁹ Provided that Lao PDR manages to fully embrace its development potentials for these alternative renewable energy resources, coupled with the constant expansion of hydroelectric sector discussed above, Lao electricity market will foreseeably flood with excess electricity supply, even with the highest expected growth in domestic demand from 4,660 GWh in 2016 to 33,024 GWh in 2030.²⁰ In support of unlocking its technical potentials in alternative renewable energy development, it is thus undeniable that Lao PDR needs to consider involving international power trading markets in its policy consideration.

The immediate starting point for cross-border electricity trading for Lao PDR is its neighbouring countries. The operation as electricity exporters is not new to Lao electricity generators. In 2015, EDL and IPP exports over 10,000 GWh to its two neighbouring countries, namely Thailand and Cambodia.²¹ However, the Intelligent Energy Systems Pty Ltd and the Mekong Economics found that demand for electricity in the Great Mekong Subregion, comprising Lao PDR, Cambodia, Vietnam, Thailand and Myanmar, will increase from 500,000 GWh in 2020 to over 900,000 GWh in 2030 before elevating to 1,685,000 GWh in 2050.²² China is also another attractive destination for Lao electricity exporters to explore. It is forecasted that by 2025, electricity consumption in China will be in the range of 6,409,000 GWh - 7,245,000 GWh whereas the calculation on estimated effective capacity in 2025 shows that Central and Eastern China may need to import electricity around 1-10% of electricity supply from outside of the region or country to satisfy the growing consumption level.²³ Taking advantage of the increasing regional demand by promoting investment from neighbours and power exportation is thus in fact a realistic solution in developing Lao renewable energy industry.²⁴

However, as evident in the recent policy development of the Lao Government, there is some reluctance in pursuing potential developments in the alternative renewable energy sector of Lao PDR. The immediate example of this is the issuance of the Notification on the Direction for the Consideration of Investment in Electricity Business Projects across the Country No. 467/PMO dated 18 March 2019 (“**Notification No. 467**”) which suspended all considerations for new investment projects in the entire electricity generation sector, including hydropower and other alternative renewable energy projects, until 31 December 2020. Nevertheless, the notification still allows the government to continue to consider and approve medium and major electricity projects that have specific private objective or have distribution market outside of Lao PDR. Expectedly, given the scope of its application, Notification No. 467 would limit investment option of small investors in the sector to the exploration of the possibility to invest in pre-existing projects until the suspension is lifted.

Legal Framework and Renewable Energy in Lao PDR

With the exception of biomass, one of the major difficulties in developing facilities for renewable energy power generation activities is due to the fact that they are highly site-specific. Thus, acquisition of land for project development stands at the forefront of any discussions regarding renewable energy development. In this context, Lao PDR clearly takes the position that land within its country is for general public use, and foreigners may utilise land for investment activities only by land lease or concession from State or Lao nationals.²⁵ The right of foreigners to lease or concede land is also subject to time limitations, ranging from 20 to 75 years, depending on its location and activities.²⁶ In addition to ensuring technical and economic viability of renewable projects, investors, particularly foreign investors, must therefore carefully factor land management into the feasibility assessment to ensure both compliance with law and possibility of project implementation.

Investment in a specialised electricity generation project, including renewable energy development, is also considered as a concession business under Lao law.²⁷ Investors in these sectors are required to secure an investment license from the relevant planning and investment authorities prior to commencement of their electricity generation projects.²⁸ Currently, projects with generation capacities over five MW will be under the supervision of the planning and investment sector at the central level, while the planning and investment department at the provincial level has the authority to consider projects with installed capacity not exceeding five MW.²⁹ It is important to note that, in order for an investment license to be issued, formalities and processes required by Lao law needs to be completed, such as the preparation of a feasibility study report, environmental assessment and the execution of a concession contract.³⁰

Electricity generation from renewable energy power is also considered as a form of electricity production operation which requires additional approval by the following authorities as required by the Law on Electricity No. 19/NA dated 9 May 2017:³¹

No.	Type of Project	Project Approving Authority	Project Supervising Authority	Technical Approval Authority
1.	Project with installed capacity at 100 KW and below or requires resettlement of less than 20 households	District Chief, Municipal Chief, or City Chief	Office of Energy and Mines	Provincial Department of Energy and Mines
2.	Project with installed capacity more than 100 KW but not exceeding 5,000 KW	Provincial Governor or Vientiane Capital Mayor	Department of Energy and Mines	Ministry of Energy and Mines
3.	Project with installed capacity not exceeding 5,000 KW and requires resettlement of more than 20 households	Lao People Assembly Standing Committee at the provincial level	Provincial Governor or Vientiane Capital Mayor	-
4.	Project with installed capacity more than 5,000 KW but not exceeding 100 MW	Lao Government	Ministry of Energy and Mines in coordination with relevant sectors	-
5.	Project with installed capacity more than 100 MW	National Assembly Standing Committee	Lao Government	-
6.	Project with water reservoir of size exceeding 10,000 hectares and/or requires resettlement of more than 500 households	National Assembly Standing Committee	Lao Government	-

A thorough understanding of investment procedures in concession businesses and electricity sectors in Lao PDR is thus crucial for the development of renewable energy projects in Lao PDR.

Another aspect of the legal framework relating to renewable energy in Lao PDR that raises concerns in many studies is the absence of a basis for tariff determination regarding electricity generated.³² Currently, the price of electricity is generally determined by EDL and generators subject to the approval of the Ministry of Energy and Mines and the government.³³ The feed-in-tariff regime which is a suitable pricing mechanism for electricity generated from renewable energy has also not been adopted. Coupled with the absence of an independent pricing regulator, this renders it difficult for investors to evaluate potential return on investment in renewable energy activities and may thus diminish the attractiveness of the sector.

Laws and regulations on investment and taxation incentives also play significant part in communicating the readiness and attractiveness of investment in renewable energy in Lao PDR. Lao PDR classes activities relating to efficient use of natural resources and energy as promoted activities.³⁴ This would incentivise investors in renewable energy, including profit tax exemptions and land-related incentives in the form of rent or land concession royalty exemptions for State land usages.³⁵ The recent adoption of a new income tax law contains a provision on the application of a reduced profit tax rate of 7% after the expiration of the profit tax exemption period under relevant investment promotion law for businesses relating to new innovative and eco-friendly technology application, efficient use of natural resources and clean energy in production activities.³⁶ This increase of incentives indicates the growing attention of Lao regulators and policy makers in supporting the growth of the renewable energy sector.

Reflection

In general, despite some reluctance of Lao policy makers in developing the renewable energy market, it is evident in laws and regulations that the renewable energy sector in Lao PDR is being increasingly promoted. However, the complexities and restraints of to the current regulatory regime proves cumbersome for investors to even enter and succeed in the Lao renewable energy market. The simplification of the investment procedure may prove to be a potentially effective option to facilitate investment in the renewable energy sector.

This may be done by introducing an integrated licensing model using the one-stop services unit at the central level for coordination between all relevant authorities for the development of renewable energy. The current system relies significantly on expertise of investors in regard to compliance with the regulatory requirements in Lao PDR in order to launch a renewable energy project, thereby exposing them to potential additional investment costs and risks of non-compliance.

Additionally, other than direct regulatory considerations, investment in renewable energy requires intensive technical, economic, and market potential assessments.³⁷ Equipping investors with information and a supportive regulatory environment may also facilitate market advancement for electricity generated by renewable energy resources. Examples of this includes the establishment of an independent electricity pricing regulator and the adoption of a uniform pricing system for renewable energy generated power. The introduction of sector-specific land regulations for the renewable energy sector would also likely have a positive effect in permitting investors to undertake the feasibility assessment process.

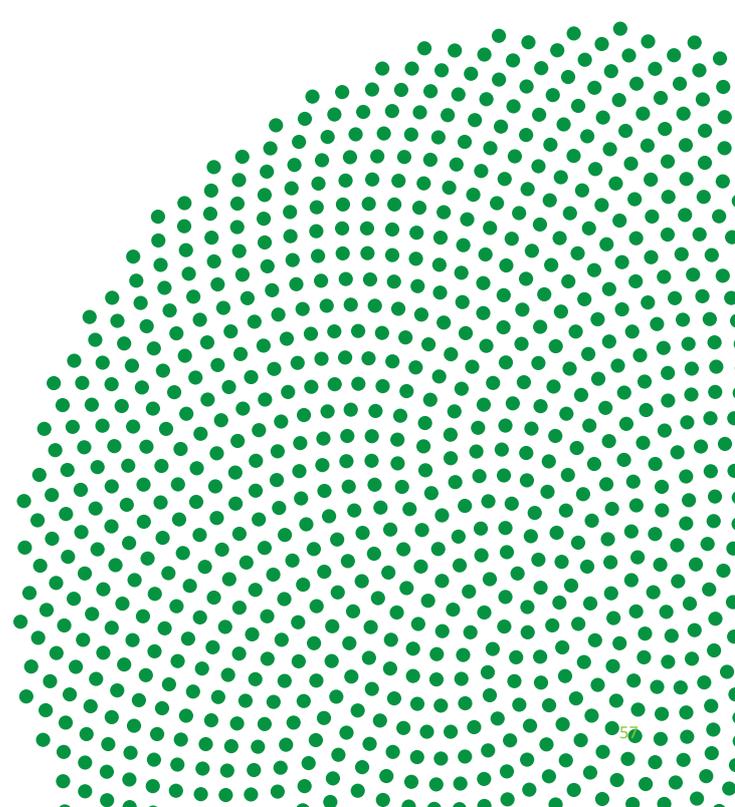


Conclusion

As discussed in this article, the potential of Lao PDR to take over the renewable energy market in Southeast Asia is limitless. The available unexploited renewable energy resources for electricity generation are abundant and internal demand is disproportionately low. This renders penetration into the regional market of paramount importance to the development of this sector for Lao PDR more than the establishment of a solid domestic market. However, given the technical complexities and capital requirements, the presence of foreign investment is unavoidable and, in fact, should be supported.

This article purports that regulatory development has an important role in fostering this sector. The current legal framework, despite creating an increasingly attractive investment environment for renewable energy activities, still has some room for further development. At present, the pressing regulatory need for the Lao electricity market may be the introduction of an investor-centric and simplistic investment procedure and the adoption of a regime capable of easing the complexities faced by investors to enable increased participation in renewable energy projects.

With thorough regulatory development coupled with the increasing investment incentives and market potentials, the goal for Lao PDR to become the “battery” of the Southeast Asia region can be expected to be readily achievable.



POWERING MYANMAR WITH RENEWABLE ENERGY: THE ROLE OF SOLAR IN MYANMAR'S ENERGY MIX AND OPPORTUNITIES FOR THE FUTURE

Introduction

Myanmar is commonly referred to as the last frontier market in Asia. Previously in isolation for 50 years under military rule, a series of reforms, which began in 2011 under former President Thein Sein, led to a gradual transition beginning in 2012 culminating in a democratic, civilian led government in 2016. Since the transition began in 2011, it has been largely heralded as the “opening up of Myanmar”, leading to an end of international sanctions and significant economic development. Particularly foreign direct investments (“FDI”) started pouring into Myanmar across all sub-sectors such as manufacturing, infrastructure, real estate and services. GDP growth since 2012 has been between 7-8% on average and is one of the highest in the region.

Energy Demand

Arising from this influx of FDI and economic development, energy consumption has been on the rise year on year measured by the Ministry of Electricity and Energy (“MOEE”) to have been increasing at a 10.2% average annual growth rate.¹ With the continued growth and development of Myanmar’s economy, the energy demand of Myanmar is expected to continue rising with current levels of both

energy and development being insufficient to keep up with the energy demand.

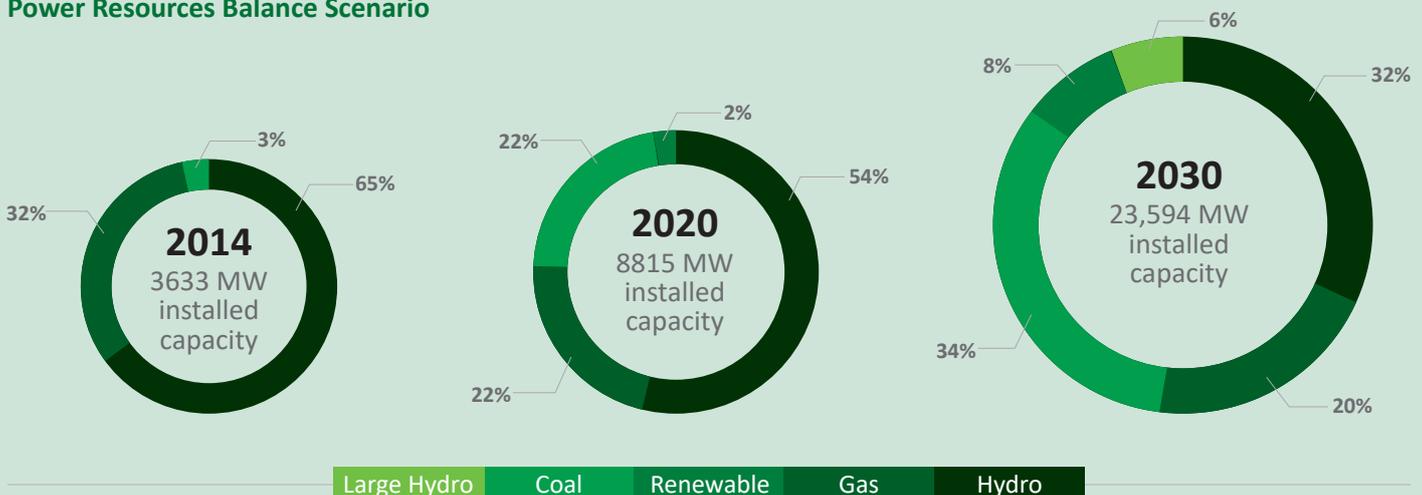
Current Status and Energy Mix

The current electrification rate of Myanmar stands at approximately 47%,² centered in the cities with the commercial capital of Yangon having the highest electrification rate of approximately 78% followed by Kayar (46%), Mandalay

(40%) and Nay Pyi Taw (39%) based on latest available data. The rural areas are poorly electrified averaging less than 20% electrification and in remote states it remains under 10%.³ At 47% electrification, this is a marked improvement from a previously measured rate of 33% in 2015-2016. The Myanmar Government had with the aim of universal access, launched the Myanmar National Energy Plan (“MNEP”) with a targeted goal of 100% electrification by 2030. Since the MNEP was launched, Myanmar’s energy mix (see below) had been anticipated to reflect an increase in coal and gas power. However, the current situation unfolding in Myanmar suggest a different picture being a clear focus for LNG (natural gas) and renewable energy such as hydropower and solar power. The MOEE approved three LNG and one combined-cycle gas turbine project with

a total capacity of 3,111 MW in 2018.⁴ As for hydropower, the MOEE similarly approved the 671 MW Shweli-3 dam project and 60Mw Deedoke project, which are largely seen as an important development for the hydropower sector given that there had been much uncertainty since the controversial Myitsone dam project had been suspended in 2011 amidst strong local opposition. Further, on 18 May 2020 the Electric Power Generation Enterprise (“EPGE”) being the single buyer in Myanmar announced an invitation to bid for solar power project sites at 30 designated connection points ranging between 30–50 MWac for a total installed capacity of 1060 MWac (“Solar ITB”). This signifies a marked shift to renewable energy as the current focus of the government in the energy mix.

Power Resources Balance Scenario



Source: Section 5.5, Final report for the Myanmar National Electricity Master Plan

Renewable Energy – Solar

Myanmar has high potential for renewable energy (“RE”) but *other* than hydropower, this RE potential particularly in solar has not been adopted in a significant way with only one previous project having achieved commercial operation, until the recent Solar ITB was announced. RE is certainly anticipated to be included in the energy mix with greater significance in the short to medium term as the ITB has a relative short completion period of 180 days. The Solar ITB has come under criticism on a number of fronts including a short bidding period of only one month and uncertainty as to the legal documentation, namely a requirement for construction to start upon a successful bidder’s receipt of a Letter of Award whilst the Power Purchase Agreement (“PPA”) is pending negotiations. It remains to be seen whether bidders are willing to do so, particularly as bankability of the PPA is also in question.

Notwithstanding, going back to the MNEP, where the Myanmar government has referred to a policy to support the utilisation of RE and encourage private investment in the sector.⁵ The development of a draft Renewable Energy Policy led by the National Energy Management Committee

(NEMC) with the assistance of the ADB had been undertaken in 2014,⁶ however, this draft has not been approved and adopted to date. At the time of writing, there is no separate or distinct regulatory framework for RE. It remains subject to the same electricity laws and procedures as other energy sources.

Based on World Bank studies, Myanmar has an annual global horizontal irradiation of between 100-1900 kilowatt-hours per square meter (kWh/m²) with central Myanmar having the strongest irradiation of more than 1,800 kWh/m² being amongst the highest in the world.⁷ Reports have indicated that 60% of land area in central Myanmar are suitable for photovoltaics.⁸

Currently in Myanmar, the status of solar power is that only recently in June 2019, Myanmar completed its first ever solar power plant in Minbu, Magway being the first 40 MWac phase of a four-phase 170 MW plant. The opening ceremony was officiated by State Counsellor Daw Aung San Su Kyi who stated that *“while hydropower stations with long construction periods were under construction, solar power stations which short construction periods, like this one, will be constructed after careful consideration to provide electricity”*.⁹ The results of the Solar ITB and successful

development of these projects in Myanmar we anticipate may play a pivotal role in shaping the renewable energy framework in Myanmar in the coming years.

Notably, off-grid solar has also emerged to play an important role in powering Myanmar by providing access to electricity to remote areas who were without prospects of being connected to the national grid in the next 10 years. These areas that were identified, were located at least 10 kilometers from the national grid. ADB recently funded 80% an Off-grid Renewable energy Demonstration Project of which under the project, solar mini-grid systems were installed in 12 villages located in Myanmar’s dry zones (Magway, Mandalay and Sagaing). On the commercial front, roof-top solar systems have become increasingly popular and is a financially viable alternative given the recent price hikes electricity tariffs.¹⁰

Legal & Regulatory Framework for Power Projects

Power projects in Myanmar falls under the general regulatory framework for the electricity sector, i.e. the Myanmar Electricity Law 2014 (“MEL 2014”) and Myanmar Electricity Rules 2015 (“ME 2015”). The MEL 2014 governs all electric power matters whereas the

ME 2015 are the clarifying rules. The rules among others, specifies MOEE’s powers and functions under MEL 2014, provides a list of the types of permits relevant to electricity matters in Myanmar and general principles governing the determination of tariff rates. Specific terms of a project are largely regulated under the contractual documents being the Power Purchase Agreement.

The journey for an independent power producer (“IPP”) starts with the submission of an expression of interest (“EOI”) to the MOEE, whether in response to MOEE’s publicly announced tenders or an unsolicited EOI. The process may then proceed with a Memorandum of Understanding entered into with MOEE to conduct a feasibility study for the implementation of the power project. Upon completion of the feasibility study, the IPP submits a proposal to MOEE based on a number of technical, commercial and financial perimeters. Thereafter, if the project is approved, MOEE issues a Notice to Proceed (“NTP”) exclusively to the IPP, setting out the scope, facilities and general principles on which the IPP shall implement the Project. Upon issuance of the NTP, the IPP commences negotiations of the project agreements (land, financing) with the relevant governmental authorities, including the Power Purchase Agreement



with the EPGE under the purview of MOEE. Myanmar has a single buyer system, being EPGE, who has the authority to purchase electricity from different public, and private producers through individual power purchase agreements. EPGE then on sells the electricity purchased to various local authorities, such as the Yangon Electricity Supply Corporation (YESC), Mandalay Electricity Supply Corporation (MESC) and the Electricity Supply Enterprise (ESE), which supplies electricity to consumers.

The IPP would also submit an application to the Myanmar Investment Commission (“MIC”) for an overriding investment license known as an “MIC Permit” governed under the Myanmar Investment Law 2016 (“MIL 2016”) and Myanmar Investment Rules 2017. Such an investment license when applied for, may grant the foreign investor tax incentives, custom duties exemptions, long-term land use rights and other non-fiscal benefits such as right to remit foreign currency and investment protection under MIL 2016. It should be noted that the MIC Permit approval process may take anywhere between three to six months from when a complete set of documents are presented as it includes various stakeholders who may comment on the project documents, therefore

investors would need to factor this into timelines for planning and project implementation. In respect of an MIC Permit, it is noted that there are specific incentives in place by way of MIC Notification 13/2017, which list several promoted sectors including “power generation, transmission and distribution”, and “production of renewable energy” whereby investors in these promoted sectors will be granted favorable tax and custom duties exemptions.

Opportunities in the Sector

As mentioned above, the current levels of both energy supply and development are insufficient to keep up with energy demand. The World Bank estimates that Myanmar’s electricity consumption will increase by 11% year on year until 2030, which based on current figures, the Myanmar government will need to triple its power generation.¹¹ To address rapidly growing electricity demand, Myanmar needs to invest USD2 billion per year, which is double the current level and implement projects three times faster, supported by higher electricity tariffs, as reported by the World Bank in a June 2019 report.¹²

Another important note on the overall development of the sector, relates to Myanmar’s electricity tariffs. Prior to July 2019, Myanmar has one of

the lowest electricity tariffs in the world. Residential prices in Myanmar are 35 Kyat/kWh¹³ for the first 100 units, 40 Kyat/kWh for the next 100 units, and 50 Kyat/kWh for all units after that. Commercial prices are 75 Kyat/kWh for the first 500 unites, 100 Kyats/kWh for the next 9,500 units, 125 Kyat/kWh for the next 10,000 to 50,000 units. The government had been heavily subsidising supplied electricity at a loss of MMK507 billion in the 2017-18 fiscal year and losses rose to MKK630 billion in 2018-19, according to data from the Ministry of Planning and Finance.¹⁴

Rate hikes were announced in July 2019 whereby under the new rates, residential households and religious buildings continue to pay at the previous rate of 35 Kyat/kWh, however, only up to the first 30 units. For the next units, the prices were tiered and adjusted to 50 Kyat/kWh for the next 31-50 units, 70 Kyat/kWh for the next 51-75 units, 90 Kyat/kWh for 76-100 units, 110 Kyats/kWh for 101-150 units, 120 Kyats/kWh for 151-200, and 125 Kyats/kWh for over 201 units, representing an overall average increase of approximately 70%. Commercial prices have increased an overall average of 50%.

The low rates had long been a major reason for under

investment by the private sector with little incentive in what is perceived to be risky, low yield projects in Myanmar.¹⁵ The increase in tariffs thereby reducing the MOEE subsidies is anticipated to free up funding for the MOEE and EPGE to invest in new power projects. It has been reported that power purchase agreements for a number of large power projects had previously been stalled due to the IPP and EPGE being unable to agree on tariff rates¹⁶ deemed to be too high by EPGE.

Overall, we have seen positive developments in the sector whereby recent investments in the sector have been made by foreign investors including major European players. Regulatory reforms (including the new NTP process stated above) streamlines the development of a power project lay the groundwork for continued development of the electricity sector on a whole with both the public sector and private sector working in tandem. The strong demand for electricity will represent significant opportunities in the near future and MOEE is expected to continue to release tender information for new projects as Myanmar strives to achieve the targeted electrification rates by 2030.



PHILIPPINE SEC ISSUES GUIDELINES ON THE ISSUANCE OF ASEAN GREEN BONDS

In 2018, the Philippine Securities and Exchange Commission (“SEC”) issued SEC Memorandum Circular No. 12 series of 2018, or the Guidelines on the Issuance of Green Bonds (“Guidelines”) under the ASEAN Green Bonds Standards (“ASEAN GBS”), which will mainly govern the issuance of ASEAN Green Bonds in the Philippines. Under the Guidelines, the requirements under the ASEAN GBS will be imposed in addition to the relevant requirements of the Securities Regulation Code (“SRC”) with respect to the issuance of securities.

ASEAN Green Bonds are bonds and sukuk (Islamic bonds) which comply with the ASEAN GBS, where the proceeds will be exclusively applied to finance or refinance, in part or in full,

new and/or existing eligible Green Projects. In the case of *sukuk*, it must also comply with the relevant laws and requirements applicable for the issuance of *sukuk*. In such instances, the *sukuk* may be labelled as ASEAN Green *Sukuk*.

The Guidelines aims to enhance transparency, consistency, and uniformity so that investors in green bonds labelled as ASEAN Green Bonds will have assurance that the ASEAN Green Bonds have met the uniform standards. Ultimately, the adoption of the ASEAN GBS seeks to contribute in the development of a new asset class, reduce due diligence costs, and help investors make informed business decisions.

Implications for business in the Philippines

Issuers of ASEAN Green Bonds must comply with the Guidelines. This in addition to the applicable requirements under Section 8 of the SRC on the registration of securities that will be sold or offered for sale in the Philippines and Section 12 of the SRC on the procedure for registration of securities. As the ASEAN GBS were aligned with the International Capital Market Association (“ICMA”) Green Bonds Principles, any relevant ICMA issuance on green bonds should also be considered.

Significant provisions of the Guidelines

To qualify as ASEAN Green Bonds, the following eligibility requirements must be met:

Eligibility of the Issuer¹	The Issuer must be: <ul style="list-style-type: none"> incorporated in any ASEAN country (“ASEAN Issuer”); or in case of a non-ASEAN Issuer, the eligible green project must be located in an ASEAN country.
Eligibility of the issuance	The ASEAN Green Bonds issuance must originate from any of the ASEAN member countries.
Eligible Green Projects	A designated green project, to be eligible, must provide clear environmental benefits. The following are examples of categories of green projects: <ul style="list-style-type: none"> renewable energy; energy efficiency; pollution prevention and control; environmentally sustainable management of living natural resources and land use; terrestrial and aquatic biodiversity conservation; clean transportation; sustainable water and waste water management; climate change adaptation; eco-efficient and/or circular economy adapted, production technologies and processes; and green buildings which meet regional, national, or internationally-recognised standards or certifications. <p>Other green projects which do not fall under the above-mentioned categories may be eligible <u>except fossil fuel power generation projects.</u></p>

In addition, in the issuance documentation, the Issuer is required to disclose to investors certain information on the utilisation of the proceeds and the project evaluation and selection process. These information should also be disclosed to the public through the Issuer’s designated website.

The following are the other salient provisions of the Guidelines:

Management of proceeds

the net proceeds from the ASEAN Green Bonds must be credited into a sub-account, moved to a sub-portfolio, or otherwise tracked by the Issuer in an appropriate manner and attested to by a formal internal process. Certain documentation on the management of proceeds should likewise be disclosed to investors.

Annual reporting requirement

the Issuers are required to report to investors at least on an annual basis and until full allocation, the list of projects, brief description of the projects, and the amounts allocated to each project and their expected impact. Any material development should also be disclosed.

Optional external review

Issuers are recommended to appoint an external reviewer with respect to the Issuer's process for project evaluation and selection, management and use of proceeds. External review can be in the form of a consultant review, verification, certification, or rating. In case the Issuer appoints an auditor or other third party to verify the management of proceeds, the auditor or other third party report must be made publicly available on a website designated by the Issuer at the time of the issuance of the ASEAN Green Bonds.



Conclusion

With the principles of transparency and integrity from which the ASEAN GBS are modeled, investors' confidence on ASEAN Green Bonds are expected to increase and thereby raising more capital to support green projects. In 2019, the Bank of the Philippine Islands, one of the largest universal banks in the Philippines, was reported to have pioneered the ASEAN Green Bonds issuance raising USD300 million capital.² The Philippine government is also looking at expanding the coverage of the ASEAN Framework for Green Bonds to cover other sectors such as transportation, infrastructure, and commercial banking.³ These developments, reinforced by the government's support on green financing, are foreseen to address the prevalent environmental concerns in the Philippines such as climate change, severe weather conditions, and threatened food and water security.

NEW GREEN DEALS: OMNIBUS GUIDELINES PASSED IN THE PHILIPPINES

In November 2019, the Department of Energy (“DOE”) of the Philippines published DOE Department Circular No. DC2019-10-0013, or the *Omnibus Guidelines Governing the Award and Administration of Renewable Energy Contracts and the Registration of Renewable Energy Developers* (“**Omnibus Guidelines**”), which provides new guidelines and procedures covering the awarding of renewable energy (“RE”) contracts, and the registration and management of RE projects.



Implications for business in the Philippines

The issuance of the Omnibus Guidelines is in line with the authority of the DOE to develop and update Philippine energy programs that favour and promote sustainable, environmentally friendly and affordable sources of energy. Previously, the DOE had already issued at least 10 rules and regulations with respect to the award and administration of RE contracts. With the implementation of the Omnibus Guidelines, the DOE seeks to harmonise and build on the existing rules, and to establish a more transparent and competitive application procedure. This will, in turn, ensure and enlarge the ownership base of the energy sector, encouraging more parties to invest in RE projects.

Significant provisions of the Guidelines

► QUALIFIED APPLICANTS FOR RE CONTRACTS

New applicants for RE contracts must comply with the Omnibus Guidelines. Existing awardees of RE contracts, however, need not go through the entire application procedure, but may apply for the conversion of their existing service contracts to RE contracts for the exploration, development or utilisation of RE resources with the DOE.

It is important to highlight that those who qualify to apply for RE contracts with the government remain the same

under the Omnibus Guidelines. Those who are qualified are Filipino individuals, or if a corporation, it must be a Filipino corporation duly registered with the Securities and Exchange Commission (“SEC”), with at least 60% of its capital duly owned and controlled by Filipinos. In case the RE applicant is a joint venture or consortium, the partners or members thereof must also organise themselves under the laws of the Philippines while still observing the nationality requirements.

Nevertheless, foreign investors may own up to 100% of an RE project under any of the following instances:

- for large-scale exploration, development and utilisation of geothermal resources, the Philippine government may enter into agreements with foreign-owned corporations involving technical or financial assistance;¹ and
- for RE application that involves biomass development and/or uses waste-to-energy technology (this is a new provision introduced by the Omnibus Guidelines and has a retroactive effect to all RE applications for biomass resource development and utilisation that are being evaluated prior to the effectivity of the Omnibus Guidelines).

► TYPES OF RE CONTRACTS

Under the Omnibus Guidelines, there are two types of RE contracts: RE Operating Contract and RE Service Contract. The former is a service agreement involving the development

and/or utilisation of RE resources that, due to their inherent technical characteristics need not go through the Pre-Development Stage,² such as biomass and solar RE sources. An RE Operating Contract covers only the Development/

Commercial Stage, which involves the development, construction and installation and commercial operation of the RE project. On the other hand, an RE Service Contract covers both Pre-Development and Development Stages of an RE project,

and grants the RE developer the exclusive right to explore, develop and utilise the RE resources within the covered area.

RE contracts are further classified per RE resource as illustrated in the table below:

RE resource	Type of contract ³	Period of pre-development stage	Total contract period ⁴
Biomass ⁵	Biomass Energy Operating Contract	Not applicable	25 (including 5 years to achieve commercial operations)
Geothermal	Geothermal Service Contract	7	25
Solar	Solar Energy Operating Contract	Not applicable	25 (including 5 years to achieve commercial operations)
Hydropower	Hydropower Service Contract	5	25
Ocean	Ocean Energy Service Contract	7	25
Ocean	Wind Energy Service Contract	3	25

► MODES OF AWARDING AN RE CONTRACT

The Omnibus Guidelines now provide for two modes of awarding an RE contract: Direct Application (“DA”) and Open and Competitive Selection Process (“OCSP”).

Through the OCSP, interested applicants may apply for RE contracts for pre-determined areas (“PDAs”) offered by the DOE during a prescribed period, or 60 calendar days from the date of the first publication of the PDAs. In order to ensure that stakeholders and prospective investors are made aware and thus encouraged to participate in the OCSP, the DOE, through the Renewable Energy Management Bureau (“REMB”), is tasked to conduct promotional activities, and it shall also arrange for the availability of data packages for the approved PDAs that can be purchased by interested parties should they want to use the same in their OCSP applications.

Stricter rules are imposed under the Omnibus Guidelines. In fact, under the OCSP, DOE will automatically disqualify applications with incomplete documents.⁷ Otherwise, or if an RE application passes the completeness test, the DOE will evaluate the same based on the legal qualification (with pass or fail grading), work program⁸ (40%), technical qualification (20%) and financial qualification (40%). The highest ranking RE application that meets all the legal, technical and financial requirements will be selected and endorsed by the REMB Director to the DOE Secretary who, based

on the written endorsement, may approve the application and issuance of the RE contract.

Where an OCSP (with respect to any or all PDAs offered during a specific period) is deemed a failure,⁹ the DOE shall open the PDA to applicants under the DA process,¹⁰ in which case, the interested participants should submit a letter of intent (“LOI”) to develop a certain area.¹¹ A party that files an LOI will be given an option to participate in an orientation the purpose of which is to inform the party about the RE application requirements, and to guide them through the process of evaluating and awarding of RE contracts, and the registration of an RE project.

For solar and biomass development, the applicant must submit an undertaking that it will submit a proof of ownership or possessory rights over the real property covered by the proposed project area/s located in private lands, or proof of application to acquire possessory rights over areas considered as public lands. Such proof shall likewise be submitted as part of the application requirements.

The DOE will then conduct a verification of the proposed area/s to determine if it is free and open for exploration or development. Following the area verification, the applicant may now proceed to submit its RE application. In case the RE application under the DA process does not pass any of the legal, technical or financial evaluations, the

REMB Director shall require the RE applicant to submit the documents in support of its application within a period of 10 working days from receipt of such notice. Failure to comply would be deemed an abandonment of the RE application. Nevertheless, if the applicant complies, but later on, still fails to meet any of the legal, financial or technical requirements, then the DOE will disqualify such applicant.

If the application process is successful, the DOE shall notify the selected (under the OCSP) or qualified (under the DA) RE applicant of the award and the schedule of the signing of the RE contract.

► RE PROJECTS WHERE RE CONTRACT IS NOT REQUIRED

The Omnibus Guidelines also provide for procedures involving RE projects where application for an RE contract is not required, i.e. when the RE project is for own use¹² or for non-commercial operations.¹³ The proponents intending to install, construct and operate an RE project for its own use or for non-commercial operations, however, will still need to apply for a Certificate of Registration (“COR”). The COR is initially valid for five years, renewable for the same period, but the total life of the project shall not be more than 25 years.

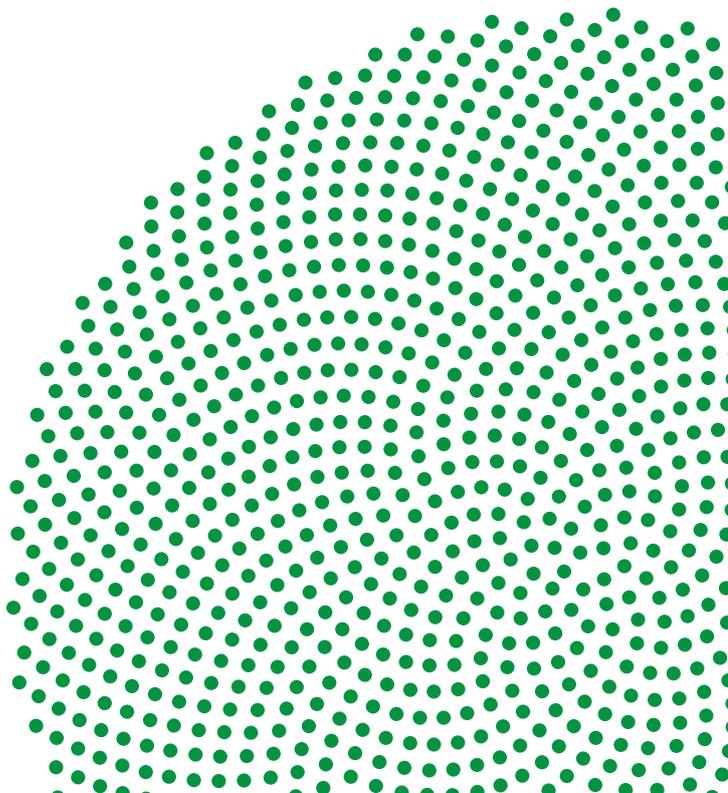
► EMERGING RE TECHNOLOGIES

Aware of the fact that RE resources may be developed through new and emerging technologies, and may not be explicitly included in the Omnibus Guidelines, the DOE tasks the REMB to develop a regulatory framework for the exploration, development, utilisation and commercialisation of such RE resources. In the meantime, and in the absence of such framework, procedures governing a particular RE resource that is most similar or analogous to the emerging technology shall be observed.



Conclusion

As the need for energy is increasing and the clamor for more sustainable, affordable and climate friendly solutions is becoming more mainstream, the Philippine government, through the DOE, is rightly relying on the “natural advantages”¹⁴ with which the country is blessed. With the implementation of the Omnibus Guidelines, stakeholders and prospective RE investors can expect transparency in the selection and awarding of RE contracts, which will eventually drive a level playing field in the energy sector.



THE POTENTIAL OF RENEWABLE ENERGY IN THAILAND

In 2017, Thailand's total power capacity was at 49,090 MW with fuel being the major source of power at more than 50% followed by renewable energy at around 20%. In this regard, the private sector contributed to more than 50% of the overall power capacity in Thailand.¹ The government forecasts that in 2037, the demand for power will rise to more than 53,000 MW with the private sector supplying the majority of power to the power system.²



Energy policies under the PDP

Energy policies, including alternative and renewable energy, are issued by the Ministry of Energy in its Power Development Plan ("PDP"), which is set out every five years. The current PDP is PDP 2018 (2017 - 2037) which focuses on the development of the Smart Grid system, power purchase from neighboring countries and renewable energy plant according to the Alternative Energy Development Plan ("AEDP"). It can be seen that the government is emphasizing on increasing the power system to encourage power stability and capacity. The Electricity Generating Authority of Thailand ("EGAT") is responsible for the planning of the regional grid connection and connection to the power distribution system to support the increase of renewable energy.³ Additionally, the PDP also shows promising plans in increasing the reliance on renewable energy by aiming to have renewable energy at 30% of the source of power supply in 2018 however in 2017 only 7% of renewable energy made up the total electricity generation.⁴

Part of the policies for the PDP 2018 is to allow the government to work closely with the community and private sector in order to develop the local community. One way this was done is by encouraging the production of power from biomass and biogas. Also the power plant for the public sector in next decade would not only generate power, but will also solve overall social issues, such as waste management. The PDP 2018 targets that by 2037, it is expected to see refuse-derived fuel power plant generates 400 MW and biomass power plants in the three Southern Border Provinces generate 120 MW.⁵

At present, the Ministry of Energy is in the process of drafting the AEDP 2018 to implement the renewable energy policies of PDP 2018. Under the draft AEDP 2018, beside biomass and refuse-derived fuel, the government plans to increase capacity of solar energy from 6,000 MW⁶ to nearly 16,000 MW. Thus, we can also speculate more solar power purchase from the private sectors.

Investment opportunities for renewable energy

According to the current AEDP (AEDP 2015) and draft AEDP 2018, the government support for renewable energy includes but not limited to investment promotion and investment grant.

The most significant investment promotion in Thailand is the investment promotion helmed by the Thailand Board of Investment (“BOI”). The BOI is commonly recognised as an investor-friendly authority that assists and facilitates both Thai and foreign investors. Investment promotion business under BOI include the business of production of electricity from fuse derived fuel and renewable energy (e.g. solar energy, wind energy, biomass or biogas).⁷ Incentives available under the BOI investment promotion are:

Tax Incentive

- corporate income tax exemption up to eight years;
- exemption on import duties on machinery; and
- exemption on import duties on raw materials used in production for export.

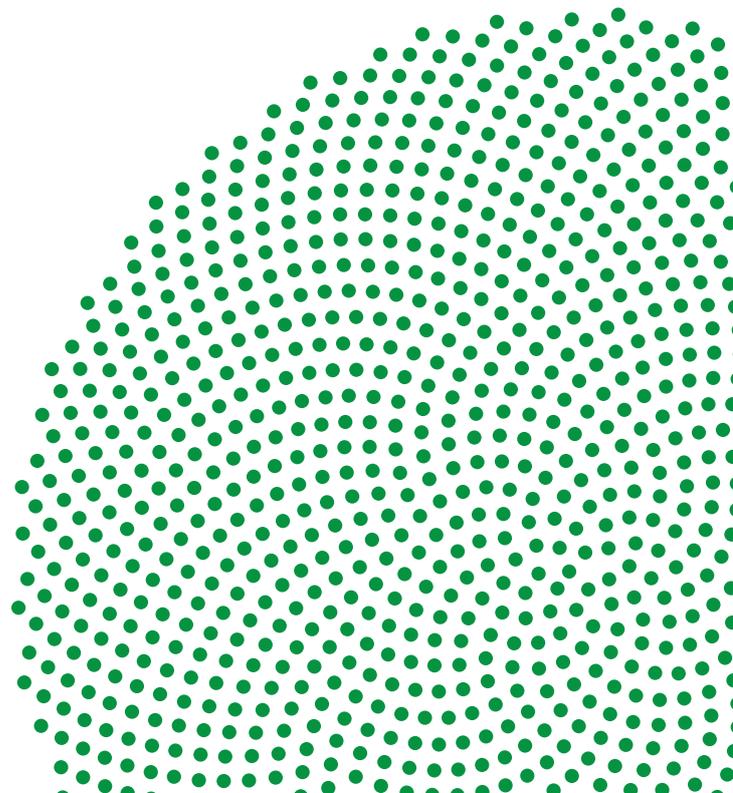
Non-Tax Incentive

- permission to own land;
- permission to bring skilled workers and experts to work in Thailand; and
- 100% foreign ownership in the business.

Moreover, a business operator could propose their business plan to the Department of Alternative Energy Development and Efficiency, and Energy Policy and Planning Office, Ministry of Energy for an investment grant. Such grant will be provided on a case by case basis.

Conclusion

Through the implementation of PDP 2018, plenty of job and investment opportunities for private sectors would be created. This would be a crucial progress proving that Thailand is heading in the right direction to transition the country to be well equipped with sustainable energy supply, create an eco-friendly society, and ultimately bring the well-being and prosperity to its population in the near future.



VIETNAM SAYS RIP TO FITS: THE BIRTH OF AUCTION PRICING FOR SOLAR POWER PURCHASING AGREEMENTS

2019 has witnessed a significant growth of foreign investment in green energy projects in Vietnam, especially in the solar power sector. Entering the first quarter of 2020, the Government is determined to accelerate investments in renewable energy to achieve or be on track with the following targets set out in the revised Power Development Plan VII:

- a target of 6.5% by 2020 and 10.7% by 2030 for electricity generated by renewable energy sources;
- a target of 10% by 2020 and 21% by 2030 installed capacity from renewable energy sources; and
- a target of 850MW of installed solar photovoltaic (“PV”) capacity by 2020, 4 GW by 2025, and 12 GW by 2030.¹

To ensure that the development of solar power is not hindered by any additional costs imposed in respect of electricity production, the Prime Minister has recently concluded the draft regime for encouraging the development of solar energy in Vietnam, which would officially replace the feed-in tariff (“FIT”) with new auction pricing for upcoming solar power purchase agreements (“PPA”).

Major Requirements and Investment Incentives for Solar Power Projects

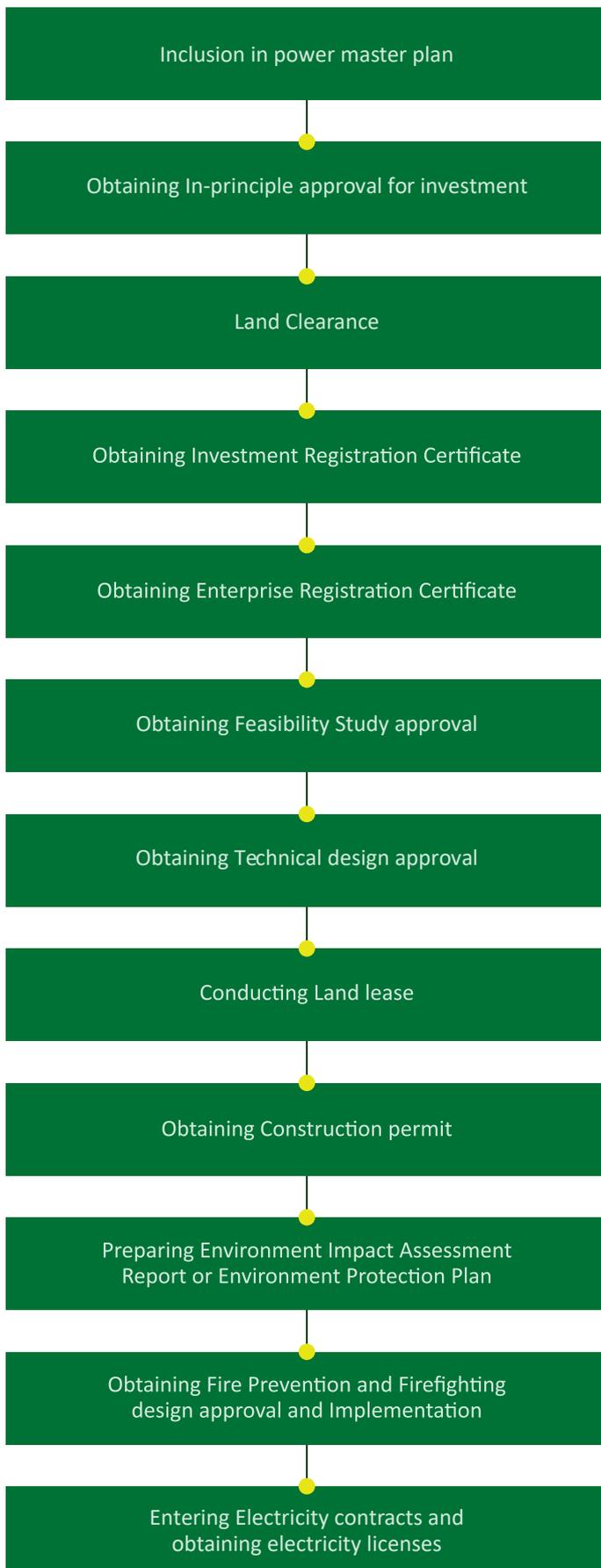
Before diving deeper into the new auction-pricing regime for solar energy, it is fundamental to understand the major requirements and investment incentives for solar power projects in Vietnam. Under Vietnamese law, the required minimum equity capital of a solar power project is 20% of the total investment capital of the project.

The available investment incentives for solar power projects include the following:

Tax incentives	<ul style="list-style-type: none"> • Import Duty – exemption from import duty for imports that form the fixed assets of the project (such as manufactured materials, raw materials and other parts); and • Corporate Income Tax (“CIT”) <ul style="list-style-type: none"> - eligible for CIT exemption for four years commencing from the first year in which taxable incomes arise and eligible for 50% CIT reduction for a maximum of nine following years; and - eligible for the preferential CIT rate of 10% for 15 years from the year of the project’s first revenue. In addition, subject to the Prime Minister’s approval, the preferential CIT may be extended for another 15 years in certain cases. 	
Land rental incentives	Years of exemption	Location eligibility
	Rental exemption for the entire investment duration	Projects located in an especially difficult socio-economic condition areas
	Rental exemption for 15 years	Projects located in a difficult socio-economic condition areas
	Rental exemption for 11 years	Projects located in any other area
	For example: Ninh Thuan province – all districts are eligible as especially difficult socio-economic condition areas, while Phan Rang City and Thap Cham are eligible as difficult socio-economic condition areas; Binh Thuan province – Bac Binh, Tuy Phong, Duc Linh, Tanh Linh, Ham Thuan Bac, Ham Thuan Nam, Ham Tan districts are eligible as a difficult socio-economic condition areas, and Phu Quy district is eligible as an especially difficult socio-economic condition area; and Khanh Hoa province – Truong Sa, Khanh Vinh and Khanh Son districts are eligible as an especially difficult socio-economic condition areas, while Van Ninh, Dien Khanh, Cam Lam, Ninh Hoa and Cam Ranh city are eligible as difficult socio-economic condition areas.	

Solar Power Project Development

Below is the outline of the general licensing procedures for a solar power project:



The investor of a renewable energy project will develop the project on an Independent Power Producer basis under a 20-year PPA with Vietnam Electricity (“EVN”) whereby EVN undertakes to off-take the entire solar power generated by the project.¹

► BANKABILITY OF VIETNAM’S CURRENT PPA

The law provides a template PPA for grid-connected solar projects (“**Model PPA**”). In practice, the Model PPA is usually not negotiable and the parties may only revise the Model PPA to the extent that the changes are for clarifying the parties’ rights and obligations under the Model PPA. The terms contained in the mandatory Model PPA (e.g. termination, grid curtailment risk, force majeure, change in law and currency convertibility and lender’s right to step in) do not comply with international market practice and thus, is not considered bankable by most international banks. As a result, it is difficult for solar power projects to secure international financing for solar power projects and instead the developers rely upon local banks, private equity funds and some regional banks for investment in renewable energy development in Vietnam.

► GRID CONSTRAINT CURTAILMENT

Throughout the years of using the FIT mechanism for the solar power purchase price, serious issues have arisen with respect to grid connection and power transmission due to the over-planning of solar capacity concentrated in only a few regional locations. For example, the transmission infrastructure in Ninh Thuan province is underdeveloped and not able of accommodating large-scale transmission (i.e. the maximum number of solar power projects currently in place), which results in the curtailment of power generation. Consequently, about ¼ of the current projects are forced to operate at only 30% -40% of their actual capacity.

Similar to Decision 11/2017/QĐ-TTg (“**Decision 11**”), Decision 13 (except for the expansion of the definition of electricity seller beyond only EVN and its authorised members (together referred to as “**EVN**”)) provides that the electricity purchaser (“**Purchaser**”) is obligated to pay for all the electricity which is delivered to and received by it but the Purchaser is still excused from the obligation to purchase electricity in any of the following scenarios (“**Curtailment Events**”):

- the Seller’s power plant does not operate and is not maintained in compliance with the provisions of operation of the national electricity system and standards, technical regulations of the power industry;
- during the time when the Purchaser installs equipment, or it repairs, replaces, inspects or examines the grid directly related to its connection to the Seller’s power plant;
- when the Purchaser’s grid system connected to the grid at the connection point malfunctions; and
- when the Purchaser’s grid needs support to recover after a malfunction incident in accordance with the provisions of operation of the national power system and the standards, technical regulations of the power industry.

The above provision affects the bankability of the PPA.

► FIT SYSTEM

Following the gap of one year after the expiry of Decision 11, the Prime Minister Office introduced Decision No.13/2020/QĐ-TTg (“**Decision 13**”) on 6 April 2020 which took effect on 22 May 2020 in respect of the encouragement of development of solar energy in Vietnam. The key points contained in Decision 13 and the key differences (and/or similarities) between Decision 13 and Decision 11 are summarised below:

General

- The classification of power schemes in Decision 13 is the same as Decision 11 (i.e. solar power is separated into rooftop solar power and grid-connected solar power).

However, Decision 13 provides further clarification on what constitutes grid-connected power projects – ground solar power and floating solar power projects. Under Decision 13, both types of grid connected power projects will enjoy different FiT rates.

- Under Decision 13, EVN is no longer the sole power purchaser as the definition of ‘electricity purchaser’ has been expanded to include any other organisations and individuals. Such expansion of power purchasers is in line with the upcoming pilot programme for direct power purchase agreement as seen under Proposal No.544/TTr-BCT dated 21 January 2020 (“**Proposal 544**”).

Note that the Model PPA issued by the Ministry of Industry and Trade (“**MOIT**”) will be mandatory for both rooftop solar and grid-connected power projects where the power purchaser is EVN. For power purchasers other than EVN in respect of rooftop solar power projects, the parties may agree on their own PPA with terms negotiated between the parties in conformity with current provisions of the law.

The term of the Model PPA is 20 years after the commercial operation day (“**COD**”) of the grid-connected solar power projects.

Whereas, where EVN is the power purchaser for rooftop solar power projects, the duration of the Model PPA will not be more than 20 years after the power generation date.

Grid-connected solar power projects

- Under Decision 13, the power purchasers (i.e. EVN or any other parties) are required to purchase all electricity generated by the power projects connected to the national grid system, whereas Decision 11 requires power purchasers to purchase “all electricity generated from solar power projects”.

Rooftop solar power projects

- Decision 13 defines rooftop solar power system as solar power systems with photovoltaic panels installed on the roof of a construction and having a capacity of not exceeding 1 MW, directly or indirectly connected to the grid with a voltage of 35 kV or less of the power purchaser. The threshold of 1 MW is non-existent in Decision 11 but is consistent with Circular 16/2017/TT-BCT dated 12 September 2017 in respect of project development and model PPA applicable to solar power projects. Note that any rooftop solar power system with capacity exceeding the 1 MW threshold will be subject to master planning related process.
- Similar to the grid-connected solar power projects, power produced by rooftop solar power system can be purchased by (i) EVN (parties are subject to the Model PPA); or (ii) any other organisations or individuals (parties are subjected to a direct PPA with terms negotiated between the parties).

New FiT rates

The new FiT rates set out in Decision 13 for respective types of solar power projects are as follows:

Types	FiT rate	Remark
(Special) Grid-connected solar power projects Ninh Thuan province		
Floating solar power projects; and Ground-mounted solar power projects	VND2,086 per kWh (equivalent to USD0.0935 per kWh)	The new FiT rates are only applicable to the solar power projects in Ninh Thuan province: <ul style="list-style-type: none"> • have been included in the regional power development master plan; • have the total accumulated capacity not exceeding 2,000 MW; and • have a solar cell capacity of more than 16% or a solar module of more than 15%; and • which will achieve their COD before 1 January 2021.
All other grid-connected solar power projects		
Floating solar power projects	VND1,783 per kWh (equivalent to USD 0.0769 per kWh)	The new FiT rates are only applicable to the solar power projects: <ul style="list-style-type: none"> • have obtained an in-principle investment approval from competent authorities before 23 November 2019; • have a solar cell capacity of more than 16% or a solar module of more than 15%; and • which will achieve their COD between 1 July 2019 until 31 December 2020.
Ground-mounted solar power projects	VND1,644 per kWh (equivalent to USD0.0709 per kWh)	
Rooftop solar power systems		
Rooftop solar power systems	VND1,943 per kWh (equivalent to USD0.0838 per kWh)	The new FiT rate is only applicable to rooftop solar systems: <ul style="list-style-type: none"> • are put into operation and have meter data confirmed between 1 July 2019 and 31 December 2020; • have a solar cell capacity of more than 16% or a solar module of more than 15%; and • that are directly (and indirectly) connected to EVN’s local grid with a voltage of 35 kV or less; and • the installed capacity is not more than 1 MW.

Any solar power projects (whether grid-connected or rooftop) that does not meet the above requirements to enjoy the new FiT rates under Decision 13 may alternatively consider joining the pilot programme on direct power purchase agreement (“DPPA”) or participate in the competitive auction mechanism. The current development in Vietnam of the pilot DPPA regime and auction mechanism are detailed in the later part of this article.

Shortly after the issuance of Decision 13, MOIT introduced the first draft of a new Circular on April 2020 regulating project development and standard form of PPA for solar power projects to replace the current Circular 16 (“the Draft New Circular”). In comparison to the current solar Model PPA, the Draft New Circular only made minor clarifications and updates but the major issues especially those causing bankability issues remain unresolved.

Vietnam’s Plans to Introduce an Auction Process for Solar Power Pricing Rates

► DIRECT POWER PURCHASE MECHANISM

The Prime Minister office has released a draft Decision on 21 January 2020 (“Draft DPPA Decision”) in respect of approving the pilot programme DPPA mechanism between renewable power producers and power end users (“DPPA Pilot Programme”). The DPPA Pilot Programme is a work in progress as it is still subject to further discussions and is anticipated to be launched by the end of 2020.

The key points proposed in the Draft DPPA Decision are as follows:

- (a) The DPPA Pilot Programme will be implemented on a nationwide basis;
- (b) The capacity scale will be approximately 400 MW to 1,000 MW;
- (c) The term of implementation of DPPA Pilot Programme is expected to be two years from 2020 to 2022;
- (d) In order for a power seller to be selected for participation in the DPPA Pilot Programme, such power seller must fulfill the following conditions:
 - registers for participation in the DPPA Pilot Programme;
 - has power plants with installed capacity of more than 30 MW;
 - has obtained approval for inclusion in the power development master plan, with priority being given to projects in areas with no or few risks of grid congestion;
 - has sufficient financial capacity, technical resources and experience in developing and operating renewable power projects.
- (e) In order for a power customer to be selected for participation in the DPPA Pilot Programme, such power customer must fulfill the following conditions:
 - be a power consumer for industrial manufacturing purposes;
 - registers for participation in the DPPA Pilot Programme;
 - purchases electricity at a voltage level of 2 kV or more;
 - has sufficient financial capacity and technical resources; and
 - priority given to power customer who has given international undertakings to implement targets on climate change mitigation, the environment and sustainable development.
- (f) The DPPA Pilot Programme mechanism:
 - a power customer purchases power directly from a power seller via a bilateral contract for differences (“CFD”) where the price and quantity of electricity are mutually agreed between the parties with a minimum term of at least 10 years;
 - trading between parties in the DPPA Pilot Programme will be carried out on the competitive power market (i.e. the Vietnam Wholesale Electricity Market (“VWEM”));
 - the power consumer will enter into a PPA with EVN’s Electricity Corporations (“EC”) in respect of the EC supplying 100% of the power consumption demand of the power customer at the selling price equal to the buying price of the ECs on VWEM during each trading cycle (taking into consideration losses on the distribution grid) plus the DPPA service charge calculated on each unit of electricity;



- in this regard, the power seller will enjoy (i) the payment at the spot power market price for all power it has produced and transmitted to the grid; (ii) the revenue being the difference between the spot power market price in the VWEM and the price under the CFD; and
- Power sellers participating in the DPPA Pilot Programme receive priority in mobilisation of the power they generated (except where the grid is congested/ overloaded or there is an adverse impact on the security of the power system).

► AUCTION PROCESS

In order to (a) reduce investment risk and prices of electricity; (b) have better grid management; (c) support the integration of solar energy to meet the rising power demand in Vietnam; and (d) increase competition and promote transparency, MOIT and Prime Minister have announced a transition plan from the fixed feed-in tariff scheme to an auction regime in respect of the grid-connected, large-scale solar projects.

The key components of an auction framework are:

- Bidding outline: Bidding process, qualification conditions (Financial and Technical), price determination regime);
- Procurement framework: type of agreement to be signed with EVN, ceiling tariff and limits of capacity for bidding;
- Contractual framework: Improve bankability of PPA by addressing issues on payment security, termination, change of law, force majeure, curtailment risk and tenure.

To-date, the following two auction models are proposed:

Type of auction model	Brief description	Remark
<p>Standard Substation-based Auction Model: Auction of transformer station capacity</p>	<ul style="list-style-type: none"> • The Government/ auctioneer identifies all eligible substations with available capacity and a certain capacity of each substation is listed for auction. • The solar energy developer (“Solar Developer”) is free to select any location that connects to the grid at designated substations. • The Solar Developer then identifies land near the selected substation(s) and obtains the licence/ permits required. • The Solar Developer submits bid in respect to the price per unit of electricity at which it is able to develop the project. • The Government/ auctioneer will then choose among the bidders and thereafter, the successful bidder will sign a power purchase agreement with EVN and supply power at the winning tariff. 	<p>(a) <u>Pro</u></p> <ul style="list-style-type: none"> - Helps to optimise the use of existing transmission capacity for solar power projects. <p>(b) <u>Con</u></p> <ul style="list-style-type: none"> - If the number of designated substations is too small, there may be greater competition for lands surrounding the substation. <p>(c) <u>Example jurisdiction</u></p> <ul style="list-style-type: none"> - Mexico; and - Germany.
<p>Solar Park Auction: Auction of land lots for development of solar farms</p>	<ul style="list-style-type: none"> • The Government/ auctioneer identifies as well as develops the solar park site and constructs its necessary infrastructure (i.e. securing land, obtaining required permits/ consents as well as preparing grid connectivity, land leveling, water and road access). • Once the project is ready for bidding, the Government/ auctioneer auctions the right to develop a solar power project in the solar park. • The Solar Developer submits bid in respect to the price per unit of the electricity sold. • The Government/ auctioneer will then choose among the bidders and thereafter, the successful bidder will sign a power purchase agreement with EVN and supply power at the winning tariff. 	<p>(a) <u>Pro</u></p> <ul style="list-style-type: none"> - Reduces the development risk (especially in respect to acquisition of land and obtaining consent(s)). <p>(b) <u>Con</u></p> <ul style="list-style-type: none"> - The auctioneer would need additional time and advance budget for the development of the solar park prior to the auction. As such, there is a risk that the infrastructure would not be ready within the agreed time which leads to extra cost being incurred. In this regard, it is vital to ascertain and divide the scope of development between the government/ auctioneer and the Solar Developer (e.g. transmission line) clearly in order to avoid any delays. <p>(c) <u>Example jurisdiction</u></p> <ul style="list-style-type: none"> - Morocco; - Zambia; - Senegal; and - India.

► **SUCCESSFUL AUCTION MECHANISM IN OTHER JURISDICTION**

The auction mechanism has been proven to be successful in the following neighboring countries:

(a) **Malaysia**

In 2016, the Energy Commission of Malaysia (“**ECM**”) introduced a large-scale solar programme (“**LSS Programme**”) to replace the FiTs. The LSS Programme is a competitive bidding process in order to reduce the levelised cost of energy for the development of solar PV plants. The auction framework comprises the following steps:

- ECM invites investors, by way of the ‘Request for Qualification’, to submit a technical qualification application which must contain description of (a) the investor’s financial and technical capabilities; (b) relevant industry

experience; and (c) resources to develop, operate and maintain a large-scale solar power plants in Malaysia; *Note: Foreign applicants are allowed but capped at 49% ownership interest in the bidding or consortium.*

- The participants would also need to prepare a Power System Study containing technical assessment in respect of the impact of the project on the electricity grid, grid connection point’s capacity and analysis on the voltage’s performance in different circumstances.
- The participants of the auction submit bids with a price per unit of electricity at which they are able to develop the project; and
- The bidder with the best combination of technical as well as financial capabilities and the costs of energy will sign a PPA with TNB.

The first two LSS bidding exercises carried out in 2016 and 2017 respectively have both received positive responses



with participation from foreign investors. The awarded capacity in the first auction rounds was 450 MW and 53 MW respectively.

The most recent third LSS bidding round was launched in February 2019 for solar power projects of 500 MW. The third LLS Bid has attracted 112 bids for more than 6.73 GW of generation capacity. The lowest price offered in the bid was RM0.177 per kWh (equivalent to USD0.042 per kWh). In early January 2020, the ECM has named five shortlisted bidders or the final phase. One of the bidders pitched a proposal for 90 MW project while the other four bidders put forward their tenders for 100 MW facilities, resulting in the total volume of awarded capacity being 490.88 MW (only slightly undersubscribed from projected 500 MW projects).

(b) Cambodia

With the support of the ADB, the Electricite du Cambodge (“EDC”) (the national electricity utility of Cambodia) has successfully carried out Cambodia’s first solar tender in respect of 60 MW of solar PV project. The 60 MW Project has attracted 26 bidders and has resulted in a record-lowest electricity price of USD0.039 per kWh for a solar project in Southeast Asia.

The 60MW Project is part of a 100 MW National Solar Park and is realised in a public-private partnership. EDC provides the land and transmission access in respect of the National Solar Park with ADB providing a loan together with climate finance to fund a new substation and transmission line for the 60MW Project located in Kampong Chhnang province.

Conclusion

The auction mechanism appears to be a feasible alternative to the FiT regime. However, such mechanism is not a “miracle pill” which cures all major issues as described under the Solar Power Project Development. In order to reap the benefits from auction mechanism, the Government of Vietnam should consider (a) making substantial changes to the model PPA’s terms to improve the PPA’s bankability (e.g. aligning the PPA with international market standards and requiring EVN to purchase all power produced regardless of whether the grid is able to accommodate; and (b) upgrading the grid, transmission lines and infrastructure.

GROWING CASE FOR GREEN FINANCE OPPORTUNITIES IN ASEAN



2019 witnessed a tremendous growth in the global green finance landscape. In June 2019, Government Pension Fund Global (which manages USD1 trillion of Norway's assets) announced its intention to divest more than USD13 billion of investments in coal and oil companies.¹ Though Norway has made clear that such a move was not motivated by climate concerns but rather to protect the Norwegian economy by reducing exposure to declining oil prices,² the fact that the world's largest sovereign wealth fund built on legacy oil earnings is moving away from fossil fuel and into renewables sends a clear signal to the rest of the world – that the future of investment lies in clean energy.

Such a shift towards a greener agenda in the investment world is similarly reflected across the global financial markets. In the banking sector, international banks are offering green loans and green revolving credit for large corporates and small companies alike.³ At the capital markets' end, there has been a steady growth in the issuance of green bonds reaching a 87% year-on-year growth and amounting to USD62.8 billion in issuance as at the third quarter of 2019.⁴ Across the global insurance sector, global insurers, recognising its role as risk manager, risk carrier and investor in managing climate related risks,⁵ are reallocating capital towards green assets and integrating environmental, social and governance ("ESG") criteria into asset allocation and stewardship activities.⁶

Driving forces behind growth of green finance

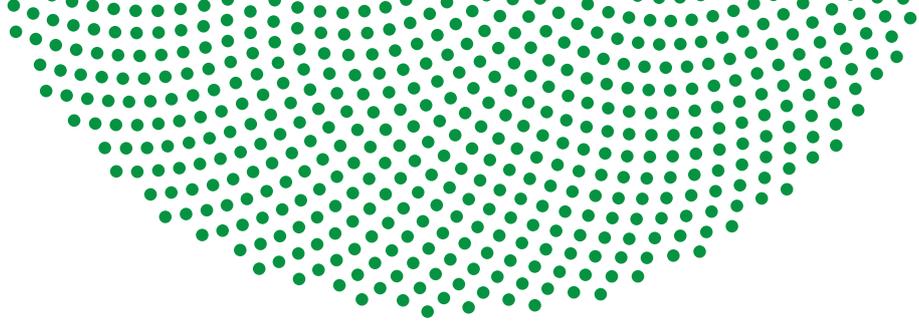
Such rapid growth in the green finance industry is largely galvanised by two broad global concerns – the need for sustainable growth and climate change.

Stemming from the recognition that economic growth has to go hand-in-hand with social and environmental growth, the 2030 Agenda for Sustainable Development was adopted in 2015, which sets out 17 Sustainable Development Goals ("SDGs"),⁷ including Affordable and Clean Energy (SDG7), Sustainable Cities and Communities (SDG11) and Climate Action (SDG13).⁸ Yet, with just 10 years to go before the SDGs' 2030 deadline, many countries have yet to fulfil their financing commitments and they lack the scale of financing resources necessary to achieve the SDGs.

The demand for green finance is further driven by the growing recognition that climate change currently presents the largest threat to us. The ongoing bushfires in Australia reinforces this, with reports that human caused climate change has resulted in more dangerous weather conditions for bushfires.⁹ It was further reported that global temperatures for the month of July 2019 reached 1.2°C above pre-industrial levels.¹⁰ This is particularly alarming as the Intergovernmental Panel on Climate Change (IPCC) has warned that global warming greater than 1.5°C may result in climatic destabilisation while a rise higher than 2°C would render such events inevitable. Though 185 parties to the 2015 Paris Agreement¹¹ have committed to "*holding the increase in the global average temperature to well below 2°C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5°C above pre-industrial levels*"¹² by NDCs, such commitments however, are hindered by a glaring challenge – a lack of funds.

Physical damages arising from climate change aside, the potential threats arising from climate change have also altered the conventional concepts of risks and returns for financiers. There is now an urgent need to manage the "time horizon risk" given that the timeline of when the impacts of climate change will take place remains uncertain.¹³ This risk becomes pertinent to long term investors such as pension funds, insurers, wealth managers, endowments and foundations as they typically adopt multi-decade time horizons (often 50 years or more), with portfolio exposure across the global economy.¹⁴ Therefore, it is essential to address the damages associated with climate change in both the short and long term to better prepare the portfolios for the future.¹⁵

In addition, investments are also subjected to a risk of "stranded assets" whereby assets are no longer able to deliver an economic return due to changes in the market and regulatory environment associated with the transition to a low-carbon economy.¹⁶ The energy and extraction industries face the highest risk for this.



As we transition to renewables and as governments tighten regulations on carbon emissions, fossil fuel reserves held by oil and coal companies may potentially become non-performing assets. In a 2015 study published by Ernst & Young, 62.4% of investors are concerned about the risk of stranded assets. Such concerns have caused more than one-third of the investors surveyed to reduce their holdings in a company's shares in fear of potential stranded assets while an additional quarter of investors surveyed reported their intention to closely monitor this risk in the future.¹⁷ As a result, there are ongoing discussions on the necessity to include ESG impacts in materiality disclosure across prospectuses.

It is against this backdrop that the green finance movement has gained tremendous momentum.

Green finance the answer to ASEAN's growth dilemma

A rapid growth in the green finance industry becomes even more pertinent across ASEAN. Forecasted to reach a GDP of USD4 trillion (making it the fifth-largest economy worldwide) by 2022,¹⁸ the biggest challenge ASEAN faces is to navigate between growing energy demands, environmental issues resulting from the rapid economic growth (e.g. transboundary haze), climate change threats (e.g. typhoons and rising sea levels) and the carbon emission reduction targets committed under the 2015 Paris Agreement.

The fast growing economy had led ASEAN's energy demand to grow by 60% over the past 15 years.¹⁹ The population of Southeast Asia is forecasted to expand by 20% with the urban population alone growing by over 150 million people,²⁰ therefore the energy demand is forecasted to grow by another two-thirds by 2040.²¹ To power the ever growing energy demands, the region relies heavily on coal and oil which results in heavy greenhouse gas emissions. Concurrently, the industry sector producing commodities such as rubber, timber and palm oil contributing to the growth of ASEAN's GDP growth has also resulted in heavy deforestation. The economic growth that ASEAN enjoys thus comes at the cost of environmental degradation.

Furthermore, every ASEAN member state is also vulnerable to the threats and damages arising from climate change, some even more so than others due to its geographical features. According to the Global Climate Risk Index, four of the world's 10 countries most affected by climate change are located in Southeast Asia, namely Myanmar, the Philippines, Thailand and Vietnam.²² Amongst other climate threats, sea level is expected to rise even more (and expected to be the most damaging in Indonesia) while extreme weather events are also expected to worsen (an example being the typhoons in the Philippines).²³ Annual transboundary haze originating from fires (mainly in Indonesia)

remains a diplomatically sensitive issue and at the same time, food security is threatened given that a large proportion of Southeast Asia's workforce is engaged in agriculture, forestry, and fisheries—sectors which are especially vulnerable to climate change.²⁴

The strong economic growth forecasted for ASEAN is thus at risk of being subverted by the effects of environmental degradation and the climate change threats. Due to these conditions, the GDP in ASEAN is projected to reduce by 6.7% by 2100.²⁵

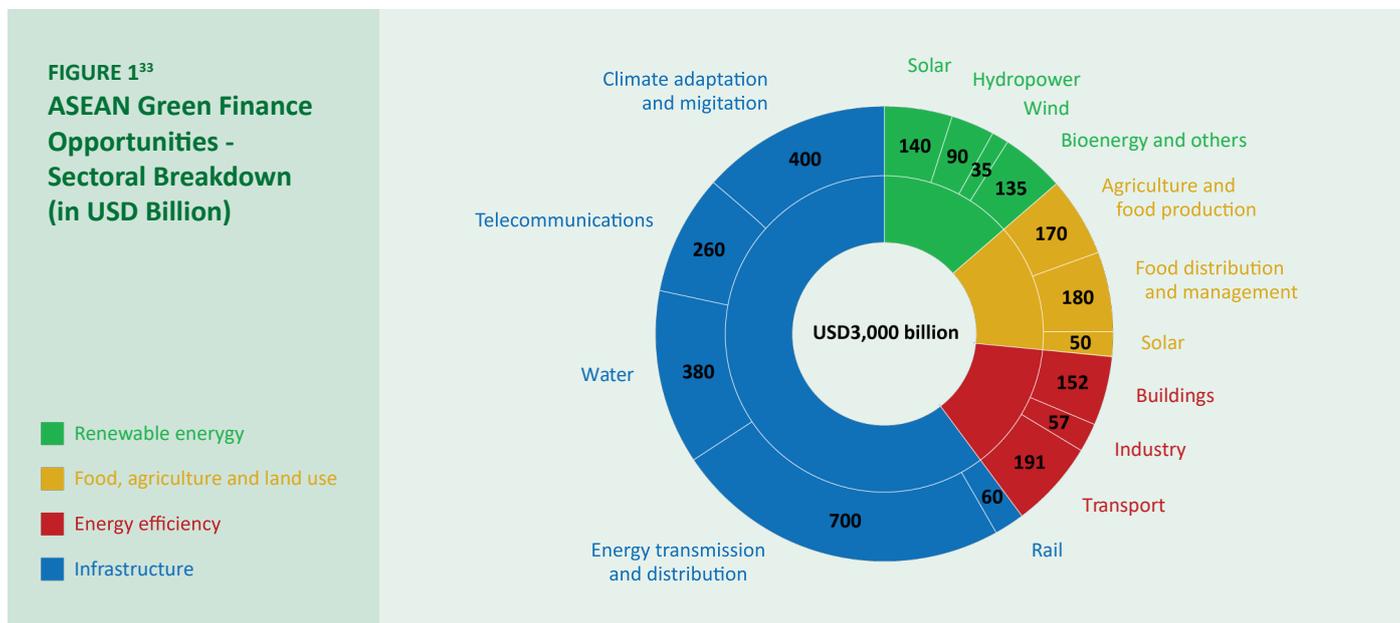
Recognising the urgent and real threats to the projected economic growth of the region and its vulnerabilities to climate change, many ASEAN member states have increased their commitments to reduce carbon emissions and mitigate climate change. Amongst other ASEAN member states, Indonesia, the world's fifth largest emitter of greenhouse gases, has pledged to reduce its greenhouse gas emissions by 29% by 2030 while Malaysia has pledged to reduce its carbon emissions by 45% by 2030.²⁶ Vietnam aims for a 8% reduction in emissions within the same time period and in particular, Hanoi has also pledged to increase forest cover to 45%.²⁷ The most ambitious of all member states may perhaps be Philippines as it aims to reduce its carbon emissions by approximately 70% by 2030.²⁸

These carbon emission reduction commitments however present ASEAN with a challenging dilemma – how best to preserve its strong economic growth rate while tackling environmental degradation and achieving its climate mitigation objectives at the same time? To meet its continuously growing energy demands while achieving its carbon emission reduction targets, ASEAN would need to shift from its heavy reliance on coal to renewables, amongst other initiatives. Given that “green finance” involves the financing of investments that provide environmental benefits in the broader context of environmentally sustainable development,²⁹ greening the financial system thus becomes a necessity to generate the required funds and implement sustainable financial practice to fund this transition.



In tandem with this, there is a ferocious demand for infrastructure from within the ASEAN member states. The ADB has forecasted that ASEAN member states will require approximately USD3 trillion in infrastructure investment between 2016 and 2030,³⁰ with infrastructure making up the

bulk of untapped investment potential.³¹ Such investment needs are spread across four sectors, namely infrastructure (USD1.8 trillion), renewable energy (USD400 billion), energy efficiency (USD400 billion) and food, agriculture and land use (USD400 billion)³² (see Figure 1 below).



Such funding needs however goes over and beyond government budgets and reserves. The global financial crisis has exacerbated the situation further and reduced the capacity within government budgets for public investment in infrastructure.³⁴ It has also weakened the capacity of traditional banks which provide long-term financing required for infrastructure investments.³⁵ It follows that larger and more innovative capital raising efforts are required in light of these financing needs and national fiscal constraints across ASEAN.³⁶

This is where green finance would shine best – it offers new sources to raise capital (with enlarged participation by private financiers), it shifts environmental priorities from the periphery to the centre of investment considerations, it internalizes environmental externalities and attempts to bridge the environmental information gap caused by information asymmetry in the current financial system. In other words, green finance offers considerable opportunities, not only for environmental sustainability and other impacts and benefits, but also for the region’s growth and development prospects. Projects that might otherwise be dismissed due to their high-risk nature may be revived through green financing as they become more financially feasible and viable for investment.³⁷ The green finance movement in the region is therefore a strategic shift which encourages new and innovative approaches to help boost and participate in ASEAN’s economic growth.

Scaling-up green finance across ASEAN

The current flow of green finance across ASEAN however, is grossly inadequate to capitalise on this opportunity. It has been estimated that the current annual ASEAN flow of green finance supply to be at USD40 billion, of which approximately 75% comes from public finance and 25% from private finance (largely in the form of commercial loans).³⁸ Compared against the average annual demand of roughly USD200 billion between

2016 and 2030, this highlights the urgent necessity for the total annual green finance to be increased by 400% to ensure that ASEAN green investment needs are met by 2030.³⁹ Green investment in the ASEAN region in the years to come clearly represents a huge opportunity for green finance.

Types of green finance instruments

What constitutes “green finance”? Green finance involves participation and contribution from a wide range of actors across the financial system and these include financial institutions, corporates, sovereign wealth funds, asset managers, pension funds and insurers amongst others. It thus offers instruments which provide opportunities to tap into both public and private finance.⁴⁰

Such instruments are typically categorised into four main groups, namely debt, equity, insurance and guarantees; and it covers a gamut of financial products including green loans, green bonds, green insurance (such as pollution liability insurance), green initial public offerings (IPOs), green stock indices, green credit, green asset securitisation and others.⁴¹ Though these instruments may have been labelled “green”, they are typically structured as their vanilla counterparts, with the difference being that the proceeds are earmarked to fund low-carbon assets and projects.⁴² Note that the list of green financing instruments is not exhaustive and would most certainly expand as green finance is scaled-up across the globe in the years to come.

The more commonly available green finance instruments that are globally recognised as effective instruments to direct investment capital towards projects with environmental benefits are as follows:

- **Green bonds:** Debt instruments whose proceeds are used to finance projects or assets which deliver environmental benefits, such as projects involving renewable energy,

sustainable land use, clean transport, sustainable water and waste management and green buildings. Apart from their proceeds being earmarked for environmentally beneficial investment, green bonds operate similar to its vanilla counterpart i.e. conventional bonds. Issuable by government-backed entities, banks, sovereign wealth funds, local governments and municipalities or financial or non-financial corporations, the green bond label can be applied to any debt format, including private placement, securitisation, covered bond, and sukuk.⁴³ Often, the green character of green bond is verified by external reviewers through second opinions.⁴⁴

- **Green loans:** Loan instruments that are made available to finance or refinance new or existing 'green projects' that fall within a non-exhaustive list of 10 categories of green projects under the Green Loan Principles.⁴⁵ Loan proceeds should be credited to a dedicated account or otherwise tracked, however external review is not required, though recommended.⁴⁶
- **Green equity investments:** "Green investments" typically refer to investment in "green" assets such as renewable energy companies, thematic green fund managing assets or carbon credit or in the form of an investment overlay, whereby ESG elements are integrated into general investment approach.⁴⁷ Where green equity investments are concerned, they are mostly made via index investing or equity funds.⁴⁸ In recent years, many indexes have been developed to identify and track the performance of specifically green industries, firms and investments.⁴⁹

Challenges to scaling up green finance across ASEAN

To capitalise on green finance opportunities and to scale up the green finance landscape across ASEAN to meet its required funding needs, there needs to be concerted efforts to both increase the supply of green finance instruments and investors demand for green finance across ASEAN.

There are however challenges to increasing the supply of green finance across ASEAN which may be addressed by relevant legal and regulatory reforms, as follows:

- **Lack of a harmonised definition of "green":** While the rapid growth of green finance can be credited to the differing definitions of "green" (which provided flexibilities for parties to adopt different shades of green according to their differing capacities), it is now necessary to achieve some level of harmonisation to avoid higher transaction cost and "greenwashing" risk. That said, regulators must be cognisant of the danger arising from a single definition in light of the regional variations in the economic standing of the ASEAN member states (which would result in adoption of different "green" priorities). It follows that a "band of green" definition may be best to accommodate the different market capabilities across the region. Additionally, governments may consider adopting a "labelling" system for consumer financial products;
- **Absence of linkage between national definition of "green" and NDCs:** Given that the overarching objective of green finance is to meet climate mitigation objectives, it becomes necessary to align the green finance movement with national priorities area to achieve the NDCs. Therefore, governments may consider curating a pipeline of climate resilient projects to qualify for green financing;

- **Higher transaction costs incurred for green bonds:** Additional cost is incurred to appoint third party assurance providers to evaluate green credentials and use of proceeds from green bonds. Therefore, regulators may consider levelling the playing field between green and conventional bonds by extending the same transparency, disclosure and reporting requirements on green credentials to all bond issuance; and
- **Information asymmetry in the green bonds market:** Due to a lack of awareness of green bonds amongst investors, regulators may consider a separate listing for green bonds on exchanges to promote transparency and easier visibility.

At the same time, the expansion of supply of green finance must also be accompanied by growth in investors demand for green finance to be scaled up successfully across the region. To increase investors demand for green finance across ASEAN, regulators may consider the following legal and regulatory reforms:

- **Mandatory ESG disclosure requirements:** Climate change threats have altered the conventional concepts of financial risks and returns of investments. Therefore, the imposition of mandatory ESG disclosure requirements on both listed and non-listed entities would ensure that investors are well-informed on material non-financial risks. This, in turn, would increase investors demand for green investments;
- **Climate-related financial disclosure recommendations:** Similar to ESG disclosure, climate-related financial disclosure may potentially increase investors demand for green investments. Therefore, regulators may consider implementing the Taskforce on Climate-related Financial Disclosures' recommendations to improve climate-related financial disclosure in the national legal framework; and
- **Sovereign wealth funds' role in scaling-up green finance:** Given sovereign wealth funds' sizeable and growing assets, an increase in sovereign wealth funds' demand for green investments could help achieve the required scalability of green finance across ASEAN. Therefore, the implementation of mandatory ESG and climate-related financial disclosure become ever more critical to drive this demand.

More importantly, such reforms must be accompanied by open-ended roadmaps (and not a one-size-fits-all blueprint) to encourage regional coherence on one hand while allowing for flexibility to accommodate the regional variations on the other.



BRUNEI

As an oil rich country, Brunei Darussalam utilises oil and gas as a primary source in its energy mix. However, with the global energy transition towards more sustainable energy production, has influenced Brunei to develop their own energy roadmap. Brunei plans to reduce its total energy consumption by 63% by 2035 and supply 10% of power generation from renewables. According to the Brunei Energy White Paper, three strategic goals have been set up to achieve this vision. The first is to improve its upstream/downstream of oil; second, ensure the development of sustainable energy; and third, maximise economic development through the energy industry. Brunei also plans to develop the Temburong Smart City which will be powered mainly from solar and is projected to become the 'Green Jewel of Brunei'.

CAMBODIA

The Government of Cambodia has issued the Strategy and Plan for Development of Rural Electrification in the Kingdom of Cambodia to set out essential targets in achieving rural electrification. According to the 2019 Cambodia Basic Energy Plan, the electrification rate of Cambodia is 81% in 2018. The rural electrification target is for all villages to have access to electricity by 2020 and quality grid electricity among at least 70% of households by 2030. There are many signs that Cambodia is heading towards a New Energy phenomenon. There has been increasing interest and investment in clean energy and renewable energy, especially solar power, in order to ensure long-term energy security. In 2019, the Cambodian government entered into a collaboration with a French private company to build the first wind farm in Cambodia with at least 10 wind turbines with an 80 MW capacity. By 2020, it is estimated that 260,000 remote households will be supplied through diesel-generated power and/or renewable energy, and solar home systems. In terms of hydropower, there are currently seven operating in Cambodia. However the government has decided to postpone the building of new hydropower dams on the Mekong river for the next decade.

INDONESIA

Indonesia has one of the largest fossil fuel reserves in ASEAN. Nonetheless, there has been a shift towards renewable energy solutions. Indonesia is one of the major markets where biofuels use has grown, mainly driven by blending mandates according to Ministerial Regulations. The country has set a target to increase renewable energy capacity by 9,051 Megawatts (MW) by 2024, and at the very least 23% and 31% of new and renewable energy in its primary energy supply mix in 2025 and in 2050, respectively. Indonesia is also focusing on renewable energy initiatives in other areas with its first pumped-hydro plant, the Upper Cisokan Pumped Storage Power Plant, under development and is expected to be commissioned in 2025 with a capacity of 1,040 MW. The total installed capacity of power plants based on new and renewable energy is estimated to reach 11,256MW in 2020. It will be further increased to 12,887MW in 2021, 14,064 MW in 2022, 15,184 MW and 17,421 MW in 2024. In terms of the solar industry, Indonesia has changed its FiT rates from a predetermined fixed tariff to one based on Basic Cost of Production (BPP) of the electricity project capped at 85% of the electricity supply costs depending on the region where the project is to be developed.

LAOS

Lao PDR has introduced several renewable energy and energy efficiency targets. Under the National Energy Efficiency Policy (2016), it intends to reduce Total Final Energy Consumption (TFEC) by 10% in 2030 and also to have 30% renewable share of total energy consumption by 2025. In Lao PDR, while there is almost 100% of electricity generation from hydropower, and the government plans to develop an additional 24 GW of capacity in the coming years, it is primarily intended for export. This is as Lao PDR is the only net exporter on an intraregional basis. Southeast Asia as a whole is a net electricity-importing region, with imports coming from China. Currently, there is a suspension of new investment projects in the entire electricity generation sector, including renewable energy projects, until 31 December 2020. Only medium and major electricity projects that have specific private objectives or have distribution markets outside of Lao PDR may be considered by the Government on case-by-case basis.

MALAYSIA

Various programmes have been implemented to help boost and increase RE generation such as implementation of LSS bidding and adoption of proactive initiatives to accelerate the increase in RE. A renewable energy transformation roadmap up to 2035 is also being developed to look at various types of renewable energy and their potential capacities. The government has continued to push ahead with the green energy agenda as evidenced by the Energy Commission's announcement on the 4th competitive bidding for the LSS Program, LSS@MEtARI or the Large Scale Solar program by Malaysian Electricity Industry to Attract RE Investment. The total capacity offered for bidding is 1000 MWac with the solar plants expected to commence operations by 31 December 2023. Given that currently RE constitutes only 1% of the total energy mix and with the aim to achieve 20% of the energy mix by 2025, there is an abundance of opportunities available for further development of RE generation in Malaysia.

MYANMAR

Myanmar has a current electrification rate of 52%, with a target of universal electrification by 2030. The government's involvement in RE is a big step forward in terms of RE development in Myanmar. By opening the country to foreign investment, Myanmar has become an attractive place to install RE projects. Currently only small power plants have been installed on a localised basis. Notwithstanding that, there are multiple large projects in the pipeline. Myanmar is one of the countries in the Mekong River Basin, including Cambodia, Lao PDR and Vietnam and there has been large growth in development of large hydro with an increase from 6 GW to 26 GW over the past decade.

PHILIPPINES

The government is committed to a 70% reduction in carbon emissions by 2030 and has set a renewable energy target of 15.3GW. It aims to decrease its dependence and use of coal by diversifying its energy sources. The Philippines has a current electrification rate of over 89% and according to its Development Plan of 2017-2022, is targeting a universal electrification plan by 2022. The Philippine Department of Energy launched its Energy Reform Agenda which is aimed at attaining energy self-sufficiency, energy security and environmental sustainability by promoting the development of the RE sector. This can be seen in the Philippine Energy Plan 2017-2040 which sets out the goals for the energy sector, including increasing the RE installed capacity to at least 20,000MW.

SINGAPORE

During Singapore International Energy Week (SIEW) 2019, the Minister for Trade & Industry announced that Singapore will harness "4 Switches" as part of its energy transformation plan. The "4 Switches" are natural gas, solar, regional power grids and emerging-low carbon alternatives. Currently, about 95% of Singapore's electricity is generated using natural gas, which is considered the cleanest fossil fuel. Whilst natural gas will continue to be a dominant fuel in the short term, Singapore will also scale up its three other "switches" to become less reliant on natural gas. Singapore is on track on reaching its solar target of 350 megawatt-peak (MWp) by 2020. However, to increase solar adoption from current capacity, Singapore will deploy and maximise solar panels over available spaces, including rooftops, reservoirs and offshore spaces. Singapore will explore ways to tap into regional power grids to access energy that is cost-competitive, via bilateral cooperation or regional initiatives. As part of the "4th Switch", Singapore will look at emerging low-carbon solutions that have the potential to reduce Singapore's carbon footprint.

THAILAND

In 2016, Thailand had the largest share of ASEAN's installed solar capacity at more than two GW with solar continuing to be a priority. The aim is to install six GW by 2037 as part of the overall target of 30% renewables in the energy mix. Thailand regularly increases its targeted volume of installed PV and revises tariffs in a way that reflects developments in the sector while attracting further investments. However, the rooftop market has yet to be fully developed largely due to technical and regulatory constraints. In accordance with the Power Development Plan 2018 and decrease in generation cost, Thailand plans to cancel the feed-in policy for solar, biomass and wind energy. However FIT for fuse derived fuel remains. Furthermore, the government is also considering the policy of encouraging "community power plant" which targets to have one community, one alternative energy. Thailand also adopted an Integrated Energy Blueprint which combines five key energy plans, covering power, oil, gas, energy efficiency, and alternative energy development, into one integrated energy document that takes a long-term, system approach to energy policy.

VIETNAM

Vietnam has one of the highest electrification rates in the ASEAN region at 99% and as part of its Power Development Plan VII, is targeting universal access by 2020. The Electricity Law of Vietnam established a special regime for encouraging the exploitation of RE for electricity generation. RE-based power plants will receive incentives relating to investments, electricity tariff and taxation. The government is prioritising developing RE for power generation and increasing the percentage of renewable power in total electricity generation to 4.5% in 2020 and 6.0% in 2030. The National Power Development Plan for 2011-2020 also suggests that the government develops policies on electricity prices, investments and tax incentives to promote the development of new and RE sources.

OPPORTUNITIES IN GREEN ENERGY SECTOR IN ASEAN

RENEWABLE ENERGY PROGRAMS

ASEAN is a growing population of over 630 million people with a combined GDP of USD2.4 trillion. It is one of the fastest-growing regions in the world with an average annual GDP growth rate of 5.3% over the last eight years. In line with the growth, the need for energy consumption has been steadily increasing, making it paramount for ASEAN to work towards a sustainable energy framework prioritising renewable and other forms of green energy. As noted by the IRENA Report on Renewable Energy Market Analysis, Southeast Asia countries stand at a crossroads in terms of the collective energy future. Through the ASEAN Plan of Action for Energy Cooperation 2016-2025, ASEAN has set an aspirational target to increase the component of renewable energy to 23% by 2025 in ASEAN's total primary energy mix.

GLOSSARY OF ABBREVIATIONS

ADB	Asian Development Bank
ASEAN	Association of Southeast Asian Nations
BESS	Battery Energy Storage System
COVID-19	Coronavirus Disease 2019
EC	Energy Commission of Malaysia
ESCO	Energy Service Company
ESG	Environmental, Social and Governance
FiAHs	Feed-in Approval Holders
FiT	Feed-in Tariffs Scheme
GDP	Gross Domestic Product
GITA	Green Investment Tax Allowance
GITE	Green Income Tax Exemption
GLC	Government-linked companies
GTFS	Green Technology Financing Scheme
IRENA	International Renewable Energy Agency
LSS	Large Scale Solar
LSS3	3rd Round of LSS programme
MENR	Ministry of Energy and Natural Resources
MESI 2.0	Malaysian Electricity Supply Industry 2.0
MESTECC	Ministry of Energy, Science, Technology, Environment and Climate Change
MIDA	Malaysian Investment Development Authority
NDC	Nationally Determined Contributions
NEM	Net Energy Metering
P2P	Peer-to-Peer
Petronas	Petroleum Nasional Berhad
PPA	Power Purchase Agreement
RE	Renewable Energy
RE Act	Renewable Energy Act 2011
RE Fund	Renewable Energy Fund
REPPA	Renewable Energy Power Purchase Agreements
RPVI	Registered PV Investor
RPVSP	Registered PV Service Provider
SARE	Supply Agreement of Renewable Energy
SC	Securities Commission
SEDA	Sustainable Energy Development Authority
SLA	Solar Leasing Agreement
Solar PV	Solar photovoltaic
SPPA	Solar Power Purchase Agreement
SREP	Small Renewable Energy Program 2001
SRI	Sustainable and Responsible Investment
Stimulus Package	Economic Stimulus Package 2020
TNB	Tenaga Nasional Berhad
TPA	Third-Party Access

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- (a) Living below the poverty line;
 - (b) Excluded and/or marginalised populations and/or communities;
 - (c) Vulnerable groups as a result of natural disasters;
 - (d) People with disabilities;
 - (e) Migrants and/or displaced persons;
 - (f) Undereducated;
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MYANMAR

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PHILIPPINES

PHILIPPINE SEC ISSUES GUIDELINES ON THE ISSUANCE OF ASEAN GREEN BONDS

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NEW GREEN DEALS: OMNIBUS GUIDELINES PASSED IN THE PHILIPPINES

¹ Section 2, Article XII of the Philippine Constitution. The contract is referred to as a "Financial and Technical Assistance Agreement" executed between the RE developer and the President of the Philippines, as opposed to an RE contract contemplated under the Omnibus Guidelines, which is executed between the RE developer and the DOE.

² Involves the conduct of preliminary assessment and feasibility study up to financial closing and Declaration of Commerciality ("DOC") of the RE project, including the identification of the proposed production area.

³ Templates for each type of RE contracts are annexed to the Omnibus Guidelines.

⁴ Includes the period dedicated to the pre-development stage and may be renewed for another 25 years.

⁵ The accreditation of biofuel producers is governed by Joint Administrative Order No. 2008-1 (series of 2008). At their option, nevertheless, accredited biofuel producers may register with the DOE as RE developers to avail of the incentives under the Renewable Energy Act.

⁶ PDAs are areas with RE resource potential determined through sufficient available technical data as approved by the Secretary of the DOE. An RE application shall cover only one PDA as published.

⁷ The checklist of required documents is annexed to the Omnibus Guidelines.

⁸ Refers to plans and programs and other related activities formulated for the performance of the work obligations under the RE contract by the RE developer, together with the corresponding budgetary estimate, submitted to the DOE for approval.

⁹ There is failed OCSP in any of the following cases:

- No RE application was received by the DOE;
- No RE application passed the legal requirements, e.g. nationality restrictions; or
- When one or more RE applications passed the legal requirements but after the evaluation of the technical and financial proposals, none of them were able to meet either the technical or financial requirements.

¹⁰ In addition to a declared OCSP, the following are instances where DA is available: RE Operating Contracts, and RE Service Contracts in areas identified by the RE applicant, and verified and confirmed by the DOE as available for exploration, development and/or utilisation of the proposed RE resource.

¹¹ The submission of the LOI, however, is not to be considered as the filing of an RE application and, in no means, will commence the application process.

¹² Refers to an RE project located within the premises of or in an area contiguous to an end-user's premises, and operated solely for the supply of a portion or all of the electricity requirements of such end-user.

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THE POTENTIAL OF RENEWABLE ENERGY IN THAILAND

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VIETNAM

VIETNAM SAYS RIP TO FITS: THE BIRTH OF AUCTION PRICING FOR SOLAR POWER PURCHASING AGREEMENTS

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