



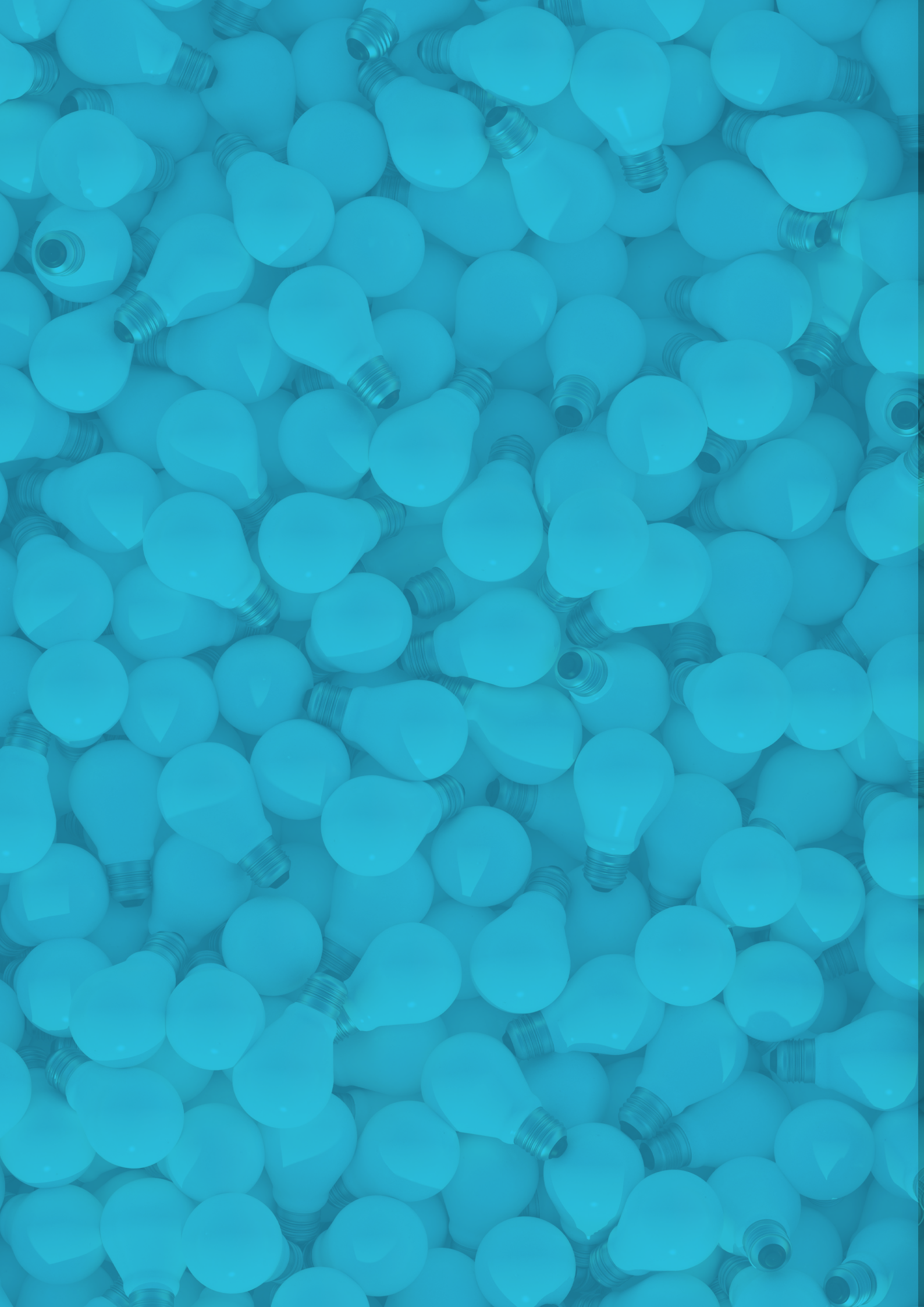
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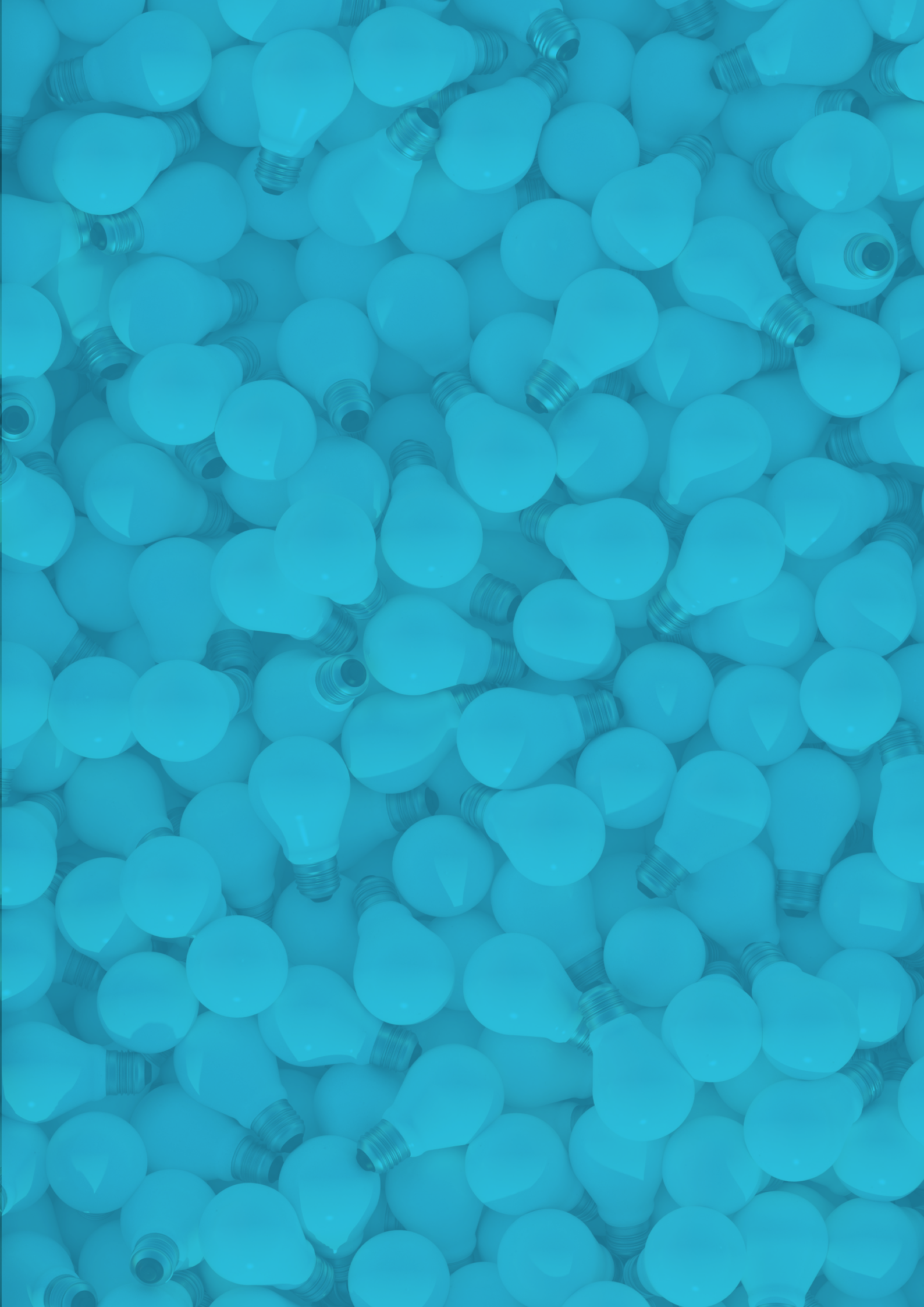


Kingdom of the Netherlands

RENEWABLE ENERGY IN ASEAN:

AN INVESTMENT GUIDEBOOK





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ABOUT THE HABIBIE CENTER

The Habibie Center was founded by Bacharuddin Jusuf Habibie and family as an independent, non-governmental and non-profit organization on November 10, 1999. Our vision is to promote the modernisation and democratisation of Indonesian society based on the morality and integrity of sound cultural and religious values. The missions are:

First, to establish a structurally and culturally democratic society that acknowledges, honors and promotes human rights.

Second, to promote and advance effective human resources management and the socialisation of technology.

The greatest asset and strength of The Habibie Center is in the people that are involved in the Center and their network. The prestigious names listed on our Board fully serve to assist in paving the way to ensure that the research and analyses conducted by the researchers are heard by the right individuals, institutions, and policy makers in Indonesia. The network that has existed since The Habibie Center was established has grown and broadened in the past years giving The Habibie Center an edge in disseminating the research. This has helped The Habibie Center carry out its mission and commit to work in concert with the relevant stakeholders.

The Habibie Center has also made its mark regionally as well as internationally, having several times been given the trust to manage grants and collaborations from and with national and international institutions, such as: the Hanns Seidel Foundation, International IDEA, National Democratic Institute (NDI), the Asia Europe Foundation, The World Bank, Center for Asian Strategic Studies-India, the National Bureau of Asian Research, Taipei Economic & Trade Office, European Union, Yayasan TIFA, USAID-SERASI, USAID-Chemonics, Sasakawa Peace Foundation (SPF), Coordinating Ministry for Human Development and Cultural Affairs of the Republic of Indonesia, Ministry of Law and Human Rights of the Republic of Indonesia, Tides Foundation, Mission of the Republic of Korea to ASEAN, and Harvard Kennedy School.

H.E. Amb. Rob Swartbol

*Ambassador of the Kingdom of the Netherlands
in Jakarta*

“Not only
governments
have to provide
sufficient (renewable)
energy, but equally
important, affordable
to all levels of society.

FOREWORD



Electricity is becoming an ever larger necessity for mankind, yet as of 2014 only 84 percent of the world population had access to electricity, which translates into 1.2 billion people worldwide living without it. The picture becomes even more worrisome when it comes to renewable energy, as sustainable energy only accounted for 22 percent of total world electricity output in 2014. The electrification ratio within the ASEAN region in 2016 is also around 84 percent with 102 million people having no access to power. Its target for renewable energy in its total energy mix by 2025 is 23 percent. While this sounds modest, reaching this target will require large investments, as the total energy demand is expected to increase by 50 percent by 2025 over the level of 2014.

Coupled with climate change issues, increasing demand of electricity for production purposes, have encouraged investments in renewable energy across the globe. Similarly in the region governments have set ambitious targets for use of renewable energy within their national energy mix and push for investments in the sector.

This is an exceptional challenge, as not only governments have to

provide sufficient (renewable) energy, but equally important, affordable to all levels of society. Government, academia, and the private sector, each have a role to play, but they also have to work hand-in-hand to provide incentives to create a positive enabling environment to conduct research and development, and finance renewable energy investments.

The apparent gap between renewable energy usage and its potential does create tremendous opportunities for ASEAN member states to push for renewable energy investments, and each member state has its preferred sources, depending on availability. Interestingly, the member states have initiated intra ASEAN cooperation to address the challenges of sustainable energy development by following specific policies of diversifying and using indigenous energy sources at the national level. These include several renewable energy initiatives, such as geo-thermal, bio-fuels, solar PV programs, as well as promoting open trade, facilitation and cooperation in the renewable energy sector.

European investors may be puzzled where and how to start, given the diversity in priorities of each member

state. Which member state has the comparative advantage for using their technologies? What is the regulatory framework in each of the ASEAN member states? What is the economic outlook? This Guidebook produced by The Habibie Center will serve as an excellent aid for companies to discover potential business opportunities.

The Embassy of the Kingdom of the Netherlands in Jakarta is proud to support this publication. The Netherlands has one of the most innovative renewable energy sector in the world, especially on Solar PV, small-scale wind energy and -increasingly- low-enthalpy direct use of geothermal. The latest example is a geo-thermal providing heat to the greenhouses in the horticultural hub called “Westland”. The Netherlands is keen to share its knowledge with others and to invest in promising areas. In Indonesia, we are supporting the government on a small scale in renewable energy programs, such as the Sumba Iconic Island, and Geothermal Capacity Building.

I hope this book will help companies from the region and beyond – especially the EU and The Netherlands – to create more business in ASEAN.

Rahimah Abdulrahim

Executive Director of The Habibie Center

“ASEAN still has a wide opportunity to develop its renewable energy sector.”

FOREWORD



Southeast Asia's demand for energy will rise by 80 percent between 2013 and 2040 due to the growing population and economy in the region. However, the region's dependency on fossil fuel energy has raised concerns as it creates environmental degradation. As such, renewable energy is seen as an alternative energy resource to reduce air pollution and CO₂ emissions.

Southeast Asian countries indeed have abundant renewable energy potential such as wind, hydro power, tidal, solar energy, and geothermal. Nevertheless, the renewable energy has been underutilized and underdeveloped when compared to its potential. Therefore, ASEAN still has a wide opportunity to develop its renewable energy sector.

Since developing renewable energy requires huge investment, it is important to advance private sector investment, both from ASEAN and non-ASEAN, in the renewable energy sector in the region. In this regards, it is essential to create

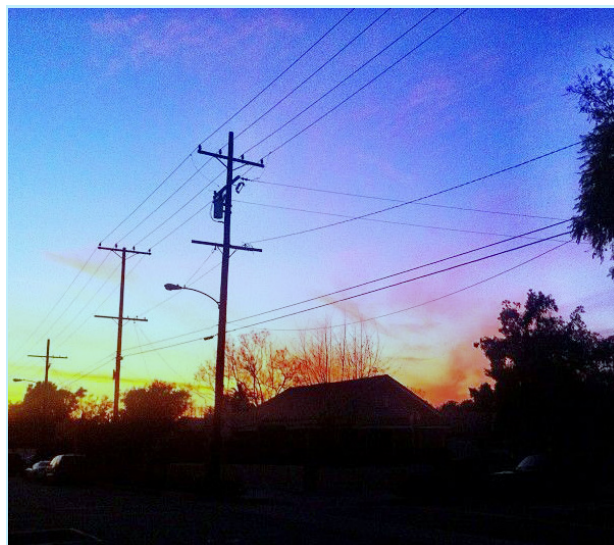
favorable conditions to attract more investment, commercialization, and trade potential of renewable energy technologies through better regulations and clear policies. While various initiatives have been taken and awareness amongst the private sector have been raised, more efforts need to be taken to improve private sector's engagement in developing renewable sector in ASEAN, given diverse regulatory and policy frameworks among ASEAN Member States. Hence, it is necessary to provide more accessible information on how to invest in renewable sector in ASEAN Member States to the private sector.

We are very proud that through the publication of this guidebook, The Habibie Center is able to provide comprehensive information on the rules and regulations, constraints, and market opportunities in an effort to pursue greater involvement from the private sector – both within and beyond the region. We believe the publication would also complement ASEAN's initiatives under the ASEAN Economic

Community to promote private sector investment in renewable energy sector.

Last but not least, we would like to extend our gratitude to the Embassy of the Kingdom of the Netherlands for the kind support for the project. We hope that the guidebook will contribute positively to the potential expansion of investment - especially in the renewable energy sector - between ASEAN and the Netherlands and the EU.

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LIST OF ABBREVIATIONS AND MEASUREMENTS

List of abbreviations

ACE	ASEAN Centre for Energy	MIDA	Malaysian Investment Development Authority
ACIA	ASEAN Comprehensive Investment Agreement	MPIC	Ministry of Plantation Industries and Commodities – of Malaysia
AEC	ASEAN Economic Community	MOIT	Ministry of Industry and Trade – of Vietnam
AEDP	Alternative Energy Development Plan – of Thailand	NEMC	National Energy Management Committee – of Myanmar
AEP	Alien Employment Permit – of the Philippines	NPWP	Taxpayer Identification Number (<i>Nomor Pokok Wajib Pajak</i>) – of Indonesia
AMS	ASEAN Member States	NREP	National Renewable Energy Program – of the Philippines
APAEC	ASEAN Plan of Action for Energy Cooperation	NRSE-SSN	New and Renewable Sources of Energy Sub-sector Network
ASEAN	Association of Southeast Asian Nations	NSEDP	National Socio-Economic Development Plan – of Vietnam
BPJS	<i>Badan Penyelenggara Jaminan Sosial</i> (Social Security Organising Agency) – of Indonesia	PDP	Power Development Plan – of Vietnam
E5	Ethanol 5	PERKESO	Malaysian Social Security (<i>Pertubuhan Keselamatan Sosial</i>)
EAC	Electricity Authority of Cambodia	PT	Limited Liability Company (<i>Perseeroan Terbatas</i>) – of Indonesia
EDC	<i>Electricité du Cambodge</i> (Electricity Authority of Cambodia)	PVC	Solar Photovoltaic
EGAT	Electricity Generating Authority of Thailand	QIPs	Qualified Investment Projects – of Cambodia
EIDPMO	Ministry of Energy and Industry at the Prime Minister's Office – of Brunei Darussalam	RE-SSN	ASEAN Renewable Energy Sub-sector Network
EGA	Environmental Goods Agreement	SEZs	Special Economic Zones
IEA	International Energy Agency	TIEB	Thailand Integrated Energy Blueprint
LPG	Liquefied Petroleum Gas	SPPG	Singapore Power Grid
MIC	Myanmar Investment Commission	SPS	Singapore Power Services

List of measurements

BOE	Barrel of oil equivalent
FiT	Feed-in-tariff
GJ	Gigajoule
GW	Gigawatt
GWh	Gigawatt hours
KL/year	Kiloliter per year
Ktoe	Kilotonne of oil equivalent
KWh	Kilowatt-hour
KWp	Kilowatts peak
KW/m ² /day	KiloWatts per meter squared per hour
m/s	Meter per second
ML/day	Mega liters per day
Mtoe	Million Tonnes of Oil Equivalent
MW	Megawatt
MWac	Megawatt alternating current
MWe	Megawatts electric
MWh	Megawatt hours
MWp	Megawatt peak
Rai	Equivalent to 0.16 hectares
T/Day	Tonnes per day
TWh	Terawatt-hours

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All human activity depends on energy. Unfortunately, the energy sources that almost all ASEAN economies depend on - such as oil, gas, and coal - are: (1) non-renewable, thus quickly depleting due to increase demand of these energy sources, and (2) demonstrably ruinous to the environment, as seen by our increasingly polluted surroundings. At the same time, ASEAN's high-achieving economies are consuming more and more energy as their populations grow in size and in prosperity. Accordingly, matching this high and growing demand with adequate level of supply requires us to search for alternative energy sources that are sustainable both in terms of its provision and its effect on the environment.

To attain this goal, all ASEAN countries have each set their own targets on reaching electricity generating capacities powered by renewable energy sources, and have also cooperated amongst each other in pushing for the

broader use of renewable energy sources. Yet, achieving these relatively modest targets, let alone eliminating their dependence on fossil fuels, requires commitments and actions not only from the national governments, but also a concerted investment effort from the private sector, both domestic and foreign. As technologies for harnessing renewable energy become increasingly cost-efficient, renewable energy sector is no longer a lacklustre investment prospect, particularly in Asia, where the growth of energy demand is projected to outstrip the world average two-fold in the coming decades.

The publication of this Guidebook is part of the larger project that aims to familiarise business actors from within and beyond ASEAN about business opportunities and challenges deriving from the full implementation of the ASEAN Economic Community (AEC).

Specific to this Guidebook, this publication is specifically intended to encourage greater investment to be made into the region's renewable energy sector by businesses from both within and beyond ASEAN. Aside from the official websites of ASEAN Member States' relevant agencies, information presented in this Guidebook is also based on available information from credible sources from regional and international organisations (e.g. ASEAN Centre for Energy, the International Energy Agency, the World Bank, and so on), and private sector bodies or organisations. Whilst it is the intention of the authors to present the information in the Guidebook as uniformed as possible, available information from some countries may differ from those available in others. Notwithstanding such challenges, the authors acknowledge the increasing transparency across ASEAN that made the completion of this project possible.



About This Guidebook

Renewable Energy in ASEAN



A photograph of three white wind turbines on a grassy hill. The turbines are positioned in a row, with the one on the right being the most prominent. The background shows rolling hills and a clear blue sky with some light clouds. The text "1. INTRODUCTION AND OVERVIEW" is overlaid in white, bold, sans-serif font at the bottom center of the image.

1. INTRODUCTION AND OVERVIEW

INTRODUCTION AND OVERVIEW

1.1. Overview of renewable energy sector in ASEAN

The deepening of integration amongst the Member States of the Association of Southeast Asian Nations (ASEAN) set a new landscape and architecture of the region's energy market.¹ Envisaged to be a single market and production base, a highly competitive economic region, a region of equitable development, and one that is fully integrated with the global economy, speculations abound over the ability of the ASEAN Economic Community (AEC) to transform the region to become one of the global economic powerhouses in the foreseeable future.² This, along with the increasing number in the region's population, requires ASEAN Member States (AMS) to identify and develop environmentally-friendly and, efficient energy solution in order to be sustainable.³ Indeed, with an estimated annual economic growth of 6.1 percent between 2013 and 2035 and population growth of 0.96 percent per annum, the energy demand of ASEAN can be expected to grow by up to 4.7 percent, from 619 Mtoe in 2013 to an estimated 1,685 Mtoe in 2035.⁴ Despite diverse energy needs across the region, ASEAN is set to become a more energy-intensive economy.

Table 1.1. Renewable energy target and progress for each ASEAN Member States

Country	Target Year	Renewable Energy Target	Most Renewable Technology Preference	Renewable Energy Installed in 2014 (MW)	Progress to target (in percent)
Brunei Darussalam	2025	954 GWh*	Solar Energy (954 GWh)	1.67 **	0.2
Cambodia	2020	2,241 MW*	Hydropower (2,241 MW)	952	42
Indonesia	2025	46,307 MW	Hydropower (21,300 MW)	6,680*	16
Lao PDR	2025	951 MW*	Small hydro (543 MW)	3,348	5
Malaysia	2050	21,370 MW	Solar Energy (18,700 MW)	6,286	29
Myanmar	2016	472 MW*	Small hydro (472 MW)	3,204	n.a.
The Philippines	2030	15,304 MW	Hydropower (8,937 MW)	5,898	38
Singapore	2020	350 MWp*	Solar Energy (350 MWp)	33.1*	9*
Thailand	2036	19,684 MW	Solar Energy (6,000 MW), Biomass (5,570 MW)	7,901	40
Vietnam	2030	45,800 MW	Hydropower (27,800 MW)	17,140	37

Notes: *Special renewable energy targets – hydropower only for Cambodia, excluding biomass for Indonesia, excluding large hydropower for Lao PDR, and only solar photovoltaic (PV) for Brunei Darussalam and Singapore. As for Myanmar, renewable target is not calculated since, as of 2016, it only targets the development of small hydro, whilst data for small hydro was absent; ** in GWh. Source: Pranadi (2016).

Given the diverse political, regulatory and policy frameworks, and natural resources (e.g. solar, wind, water, biomass and geothermal resources) found across ASEAN, the energy policy and renewable energy strategy of each AMS consequently varies from one member to another. To date, each AMS has been developing its own renewable energy targets, and has been making considerable progress to achieve these targets (refer to Table 1.1.). As of 2014, renewable energy made around 9.4 of ASEAN's total primary energy supply.⁵

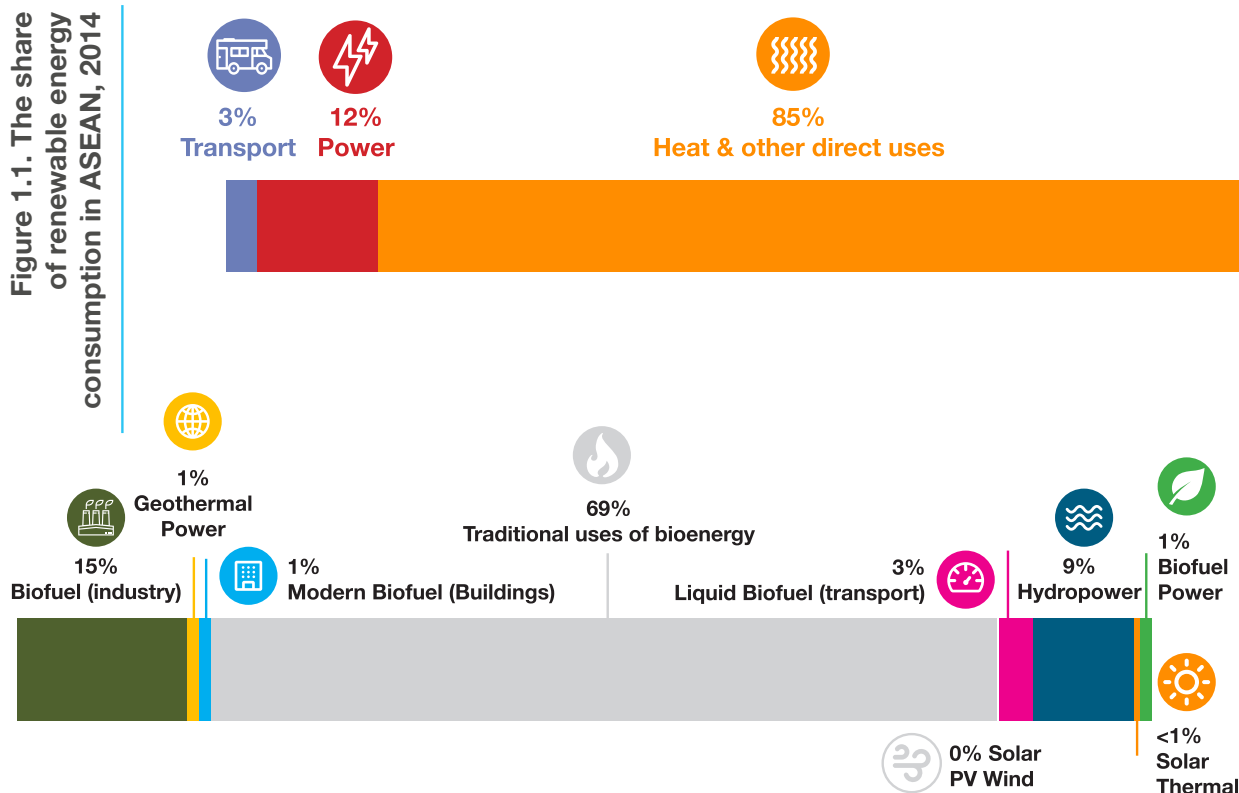
As it stands, renewable energy sources in the region derive from hydropower, geothermal, wind, solar photovoltaic (PV), solar thermal, and bio-energy. Amongst these, biofuel is the most consumed form of renewable fuel, especially

for industrial activities. Most of the renewable energy sources in ASEAN are used for heating and other direct uses, and only 15 percent are used for transportation and power generation. Hydropower was one of the most consumed renewable energy sources in 2014, whilst other sources were still under-consumed (refer to Figure 1.1.).

As far as its potentials, Southeast Asia is blessed with abundant sources for renewable energy. Whilst tremendous geothermal potential can be found in Indonesia and the Philippines and biomass in Thailand, hydropower, one of the most affordable resources, is vastly used in the newer member countries, such as Cambodia, Myanmar, Lao PDR, and Vietnam.⁶ More importantly, the region is blessed with sun shines throughout the year. It has been estimated that the solar energy potential in ASEAN

is in the range of 3.6 to 5.3 kWh/m²/day, whereas its annual growth of 62.3 percent per annum is far higher than the 31.2 percent per annum average for other renewable energy resources.⁷ Moreover, with the range of wind speed ranging from 1.2 m/s to 6.5 m/s, the development of wind power has been showing a promising progress, with the cumulative wind power capacity in the region tripling from 145 MW in 2012 to 750 MW in 2015.⁸ As far as investors are concerned, the development of solar and wind energies are potential areas in which investment could be made, particularly as both sources of renewable energy are not only capital-intensive, but are also relatively expensive to be developed by AMS themselves.

Figure 1.1. The share of renewable energy consumption in ASEAN, 2014



2014 - 110 Mtoe

Source: IRENA and ACE (2016).

1.2. Overview of ASEAN cooperation in the renewable energy sector

Although ASEAN's endeavours on energy cooperation date back to the 1970s, the first notable commitment of the Association on renewable energy began with the signing of the Agreement on ASEAN Energy Cooperation in 1986. The Agreement that was signed in Manila, the Philippines, stipulates AMS's collective intention 'to cooperate in the efficient development and use of all forms of energy, whether commercial, non-commercial, renewable or non-renewable, ... [to strengthen] the economic resilience and solidarity of ASEAN'.⁹ Subsequently, the New and Renewable Sources of Energy Sub-sector Network (NRSE-SSN) was founded in 1995 with a mandate of promoting and maintaining sustainable development in ASEAN through the use of renewable energy.¹⁰

It was only through the adoption of the *ASEAN Vision 2020* in 1997 that strengthened recognition was given to renewable energy. Indeed, the Vision outlines the intention of ASEAN to, amongst other things: (1) establish interconnecting arrangements for electricity, natural gas, and water within the region through the ASEAN Power Grid, the Trans-ASEAN Gas Pipeline, and Water Pipeline; and (2) promote cooperation in energy efficiency and conservation, as well as the development of new and renewable energy resources.¹¹

To realise the above-mentioned Vision, ASEAN adopted the Hanoi Plan of Action in 1998, which became the basis for the subsequent *ASEAN Plan of Action for Energy Cooperation (APAEC) 1999-2004*, which served as a guide for the implementation of various ASEAN energy cooperation programme within the said timeframe.

Table 1.2. Milestones of ASEAN's renewable energy cooperation

1967	● ASEAN establishment through the signing of the Bangkok Declaration
1975	● Establishment of ASEAN Council on Petroleum
1980	● First meeting of the ASEAN Economic Ministers for Energy Cooperation, which, after 1995, known as the ASEAN Ministers on Energy Meeting (AMEM)
1986	● ASEAN Energy Cooperation Agreement was signed
1988	● Establishment of the ASEAN-European Community Energy Management Training and Research Center
1995	● Establishment of the New and Renewable Sources of Energy Sub-sector Network
1995	● Establishment of the Energy Efficiency and Conservation Sub-sector Network
1997	● ASEAN Vision 2020 was adopted
1998	● Hanoi Plan of Action was adopted
1999	● The launching of the First APAEC (1999-2004)
1999	● The establishment of the ASEAN Center for Energy
2000	● ASEAN Forum on Coal was established to cooperate and promote sustainable development and utilisation of coal whilst addressing environmental issues and facilitating intra-ASEAN coal-related issues
2002	● The EC-ASEAN Energy Facility was launched to facilitate energy partnership between ASEAN and the European Union
2004	● The adoption of the APAEC 2004-2009
2009	● The adoption of the APAEC 2010-2015
2014	● The 32nd ASEAN Ministers on Energy Meeting (AMEM), which resulted in the APAEC 2016-2025
2014	● Joint statement of the Lao PDR, Thailand, Malaysia and Singapore Power Integration Project in Vientiane, Lao PDR
2015	● The ASEAN Business Forum 2015 was held, which promoted cooperation and investment in renewable energy sector
2016	● Launching of the ASEAN Community

Source: Various.

Amongst some of ASEAN's initial commitment to implement the said Plan of Action was the establishment of the ASEAN Center for Energy in 1999, which has been mandated not only to serve as the energy sector think-tank for ASEAN and its AMS, but also to ensure energy policies and programmes that are in harmony with economic growth and environmental sustainability of the region.¹²

Table 1.3. Renewable energy outcome-based strategies and action plans under the 2017-2025 APAEC

Outcome-based Strategy 1: Aspirational target to increase the component of renewable energy to 23 percent by 2025 in the ASEAN Energy Mix	
Action Plans	- AMS to enhance and implement renewable energy policy and targets; - Develop and adopt ASEAN renewable energy Roadmap by 2020; and - Monitor renewable capacity additions/deployment of the AMS on an annual basis.
Outcome-based Strategy 2: Enhance awareness on the role of renewable energy amongst policy makers, private sectors and public	
Action Plans	- Develop a nodal network with at least minimum two regional or international institutions on renewable energy by 2020; - Develop a renewable energy-hub information sharing mechanism amongst AMS on renewable energy data, policy instruments, policy update, and best practices for promoting renewable energy; - Conduct at least two high level policy dialogues; and - Conduct annual technical training on renewable energy.
Outcome-based strategy 3: Enhance research and development network on renewable energy technology development and utilisation within the region	
Action Plans	Establish a nodal network with at least minimum two research institutions or universities to promote cooperation, technology development, sharing of research facilities and exchange and mobility of researchers on renewable by 2020.
Outcome-based Strategy 4: Increase the promotion of renewable energy financing schemes	
Action Plans	- Establish a nodal network with at least two national/regional/ international financial institutions for renewable energy financing; - Develop a guideline of Renewable Energy Support Mechanism for Bankable Projects; and - Conduct regular training on renewable energy financing.
Outcome-based Strategy 5: Increase the commercial development and utilisation of biofuels with a reference standard to facilitate deployment	
Action Plans	- Develop a nodal network with automotive and related industries on technological know-how and research and development activities for biofuel; and - Conduct market studies to fully determine the commercial potential of bioenergy.

Source: ACE (2015b: 37-38).

To date, up to four APAEC documents have been issued by ASEAN over the years.¹³ The present 2016-2025, or Fourth, APAEC identifies seven programme areas, covering issues such as: 1) ASEAN Power Grid; 2) Trans-ASEAN Gas Pipeline; 3) Coal and Clean Coal Technology; 4) Energy Efficiency and Conservation; 5) Renewable Energy; 6) Regional Energy Policy and Planning; and 7) Civilian Nuclear Energy. The implementation of the Fourth APAEC will be carried out in two phases: 2016-2020 (Phase I) and 2021-2025 (Phase II). In the implementation of the first phase of the said Plan of Action, ASEAN has identified a collective target for AMS to increase the component of renewable energy in the region's energy mix to 23 percent by 2025, or an eight percent increase from the 2015 share of renewable energy in the region's total energy mix. The present, 2017-2025, APAEC's renewable energy outcome-based strategies and action plan are presented in Table 1.3.

Thus far, the achievements and progress of various APAECs launched over the years vary across AMS, particularly since the document has been designed to meet each country's specific capacity and needs. Based on the current targets and policies being implemented, renewable energy production in ASEAN is projected to reach only around 17 percent by 2025, which means that there remains a six percent gap for the region to meet its 23 percent target by 2025.¹⁴

1.3. Renewable energy trade and investment in ASEAN

1.3.1. Renewable energy trade

As far as trade in the energy sector is concerned, ASEAN's primary focus is on the trade in electricity. In line with its plan to develop the ASEAN Power Grid as espoused in the grouping's 2016-2025 APAEC, the Association has targeted to initiate multilateral electricity trade in at least one sub-region by 2018. The Lao PDR, Thailand, Malaysia, and Singapore, also short for LTMS, Power Integration Project will be used as a pathfinder to complement

existing mechanism in achieving an ASEAN Power Grid to enable a power trading system in the region and beyond.¹⁵ Although the ASEAN Power Grid programme under the 2016-2025 APAEC does not make specific mention of renewable energy, ASEAN and its AMS consider this as one of potential sources for electricity generation in the region.

Specific reference to renewable energy trade is made in the 2016-2025 APAEC programme area number five. As part of the strategies and action plans under the first phase of the implementation of this programme area, ASEAN envisages that a roadmap with clear policies, response plans, and programmes for research and development in renewable energy will enable the commercialisation, investment, market and trade potential of renewable energy technologies. A market study is currently being conducted to identify and address the constraints in developing and deploying renewable energy, especially in terms of technology and financing, which would enable the renewable industry and its players to be self-sustaining.¹⁶

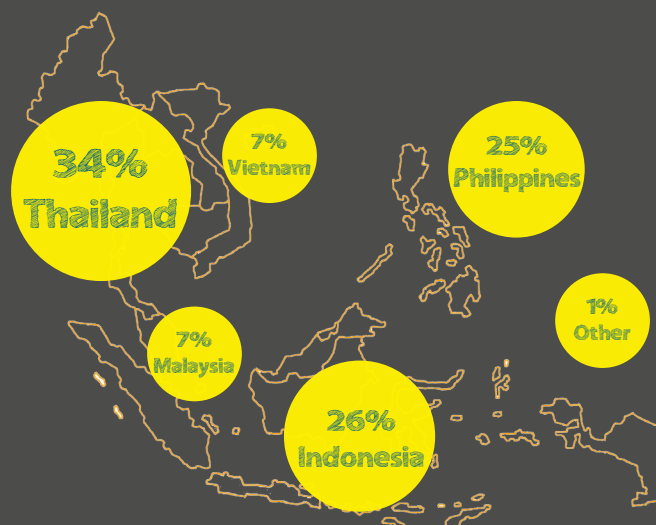
Moreover, ASEAN's economic liberalisation currently does not cover efforts to eliminate tariffs on environment-related products, which would include renewable energy technologies, such as wind turbine and solar panel. As of now, Singapore is the only AMS that is part of the negotiations

establishing the Environmental Goods Agreement (EGA) under the World Trade Organisation.¹⁷ Whilst there is ample space for other AMS to follow the footstep of Singapore in joining the EGA negotiations, the highly sensitive nature of energy sector in each AMS also means that it might take sometimes before environmental goods can be freely traded across ASEAN.

1.3.2. Renewable energy investment

In 2015, total investment for wind, solar, biomass and geothermal energy projects in Southeast Asia amounted to USD 2.7 billion, or a decrease of 16 percent from the USD 3.2 billion in 2014.¹⁸ At the time, investment in wind and solar projects accounted for nearly two-thirds of the total renewable energy investments in the region. With a total of USD 1.7 billion in 2015, investment in solar projects made a significant increase of 600 percent from USD 323 million worth of investment made in 2014.¹⁹ Up until 2015, investments in renewable energy projects in ASEAN were largely concentrated in Thailand, Indonesia, and the Philippines, all of which took up more than 80 percent of renewable energy project financing between 2010 and 2015. Vietnam and Malaysia are currently considered as emerging renewable energy markets, whilst the remaining AMS are still lagging behind (refer to Figure 1.2.).

Figure 1.2. The proportion of renewable energy projects investment in Southeast Asia, 2010-2015*



Note: * Only include investment for wind, solar, biomass and geothermal energy projects. Source: Bird & Bird and Clean Energy Pipeline (2015: 3).

Not only unevenly distributed, the aggregate investment for clean energy and energy efficiency in Southeast Asia is still comparatively lower than other Asian countries, including India and China.²⁰ Indeed, according to an estimation made by the International Energy Agency (IEA), total investment in renewable energy sector in Southeast Asia has been generally lower than total investment in other energy sectors, such as oil, gas, and fossil fuels.²¹ For ASEAN to be able to meet its 23 percent renewable energy target by 2025, the Association will need an investment of USD 27 billion annually, or a total of USD 290 billion by 2025.²²

Each AMS has put in place different policies to attract investment in renewable energy. At the regional level, ASEAN has an investment facility, or the ASEAN Comprehensive Investment Agreement, which was set up in 2009 and took effect in 2012 to create a liberal, facilitative, transparent, and competitive investment environment in ASEAN. Replacing and building up upon two other previously launched investment-related agreements, including the 1987 ASEAN Investment Guarantee Agreement and the 1998 ASEAN Investment Area, the ACIA offers wide range of benefits to potential investors, including the promotion of investment liberalisation, non-discrimination principle, transparency, investor protection, and Investor-State Dispute Settlement mechanism. The ACIA applies to investment in renewable energy sector.²³

1.4. Key renewable energy-related institutions and information

1.4.1. ASEAN Center for Energy (ACE)

Established on 1st January 1999, the ACE is the main intergovernmental organisation within the official structure of ASEAN that represents the interest of AMS in the energy

sector. Aside from serving as an energy think-tank, as well as data centre and knowledge hub, for ASEAN and its AMS, the Center also works as a catalyst to unify and strengthen ASEAN energy cooperation and integration. It does so by implementing relevant capacity building programmes and projects to assist AMS develop their energy sector. Furthermore, the Centre also ensures that energy policies and programmes of ASEAN are in harmony with the region's economic growth and environmental sustainability needs. With its office located in Jakarta, ACE's plans and priorities are guided by a Governing Council composed of Senior Officials on Energy from each AMS, as well as a representative from the ASEAN Secretariat as an *ex-officio* member. The Centre plays central role in facilitating the networking and interactions amongst energy-related entities of ASEAN, such as Heads of ASEAN Power Utilities/Authorities, ASEAN Council on Petroleum, Renewable Energy Sub Sectoral Network, and the ASEAN Forum on Coal. Together with the Sub-sector Networks, the Specialised Energy Bodies, and the ASEAN Secretariat, ACE composes periodical ASEAN energy action plan, or APAEC.

Further information about ACE

For further information about ACE, visit: <http://www.aseanenergy.org>

1.4.2. ASEAN Renewable Energy Sub-sector Network (RE-SSN)

RE-SSN is a working-group under the ASEAN Senior Officials Meeting on Energy that specifically deals with issues concerning renewable energy. This body works in coordination with the ASEAN Center for Energy (ACE). It holds a meeting once a year to discuss the development of renewable energy sector in ASEAN. In 2016, the RE-SSN held its 23rd annual meeting in Iloilo, the Philippines, which facilitated the sharing of experience and knowledge concerning policies to support renewable energy development. On that occasion,

representatives of international organisations and dialogue partners were invited to share their knowledge and experience in the renewable energy sector.

Further information about RE-SSN

As a working group under the Senior Officials Meeting on Energy (SOME), RE-SSN does not have a special, dedicated, online portal. Information concerning the Network can be obtained from the official website of the ASEAN Center for Energy.

1.4.3. ASEAN Renewable Energy Guidelines

The ASEAN Renewable Energy Guidelines is an online portal to assist potential investors and project developers in accessing renewable energy market in ASEAN. Developed jointly by the ASEAN-German Energy Programme, the ASEAN Center for Energy, and the German Development Agency, or the GIZ (*Deutsche Gesellschaft für Internationale Zusammenarbeit*), this online portal highlights administrative procedures (e.g. project requirements for potential investors or developers), lists legal and regulatory provisions, identifies country-specific challenges, and provides financial closure information.

Further information about the ASEAN Renewable Energy Guidelines

For further information about the ASEAN Renewable Energy Guidelines visit: <http://www.re-guidelines.info/>.

1.4.4. ASEAN Renewable Energy Information Portal

Jointly implemented by the ASEAN Center for Energy, the German Development Agency, or the GIZ, and the German Federal Ministry for Economic Cooperation and Development, the ASEAN Renewable Energy Information Portal was launched in 2016 to enhance the effectiveness of the information dissemination about renewable

energy development in ASEAN, and to improve the knowledge sharing within the ASEAN region and beyond. The online platform provides AMS' renewable energy profiles, a directory of renewable energy business in the region, as well as a database of relevant reports and studies.

1.5. Overall overview of renewable energy policy in ASEAN Member States

ASEAN has a varying degree of economic development, as well as different geographical conditions and political systems that influenced their renewable energy policy frameworks. AMS that possess large area and population, as well as relatively large total GDP (i.e. Indonesia, Malaysia, the Philippines, Thailand, and Vietnam), have realised the importance of renewable energy, and thus have incorporated their renewable energy target into their national energy mix. These countries have also been able to provide incentives in various forms, including Feed-in Tariff (FIT) and price incentives for renewable energy, due to their relative advantage in having more natural renewable energy resources such as ample sun insolation, favourable wind speed, and considerable geothermal resources. On the other hand, for countries that have just started to open their economy, such as Cambodia, Lao PDR, and Myanmar, the energy sector is expected to be a driving force in facilitating social and economic growth. Renewable energy policies in these countries are aimed at ensuring energy security for sustainable development and providing affordable and reliable energy supply to all population.

Table 1.4. ASEAN in various global governance ranking

Ease of Doing Business Index 2016		Global Competitiveness Index 2016		Corruption Perception Index 2016	
Country (by ASEAN Rank)	World Ranking	Country (by ASEAN Rank)	World Ranking	Country (by ASEAN Rank)	World Ranking
Singapore	2	Singapore	2	Singapore	7
Malaysia	23	Malaysia	25	Brunei	41
Thailand	46	Thailand	34	Malaysia	55
Brunei	72	Indonesia	41	Indonesia	90
Vietnam	82	Philippines	57	Philippines and Thailand (Tie)	101
Indonesia	91	Brunei	58	Vietnam	113
Philippines	99	Vietnam	60	Lao PDR	123
Cambodia	131	Cambodia	89	Myanmar	146
Lao PDR	139	Lao PDR	93	Cambodia	156
Myanmar	N.A.	Myanmar	N.A.		

Source: World Bank (2016), World Economic Forum (2016), and Transparency International (2017).

Other countries, such as Brunei Darussalam and Singapore, have different conditions. They have relatively small geographical size and low amount of renewable energy resources, coupled with high-energy consumption and high GDP per capita. The policies in these countries centered around the objective to ensure energy security by relying on stable supply of fossil fuel. The main focuses of their renewable energy policy are energy efficiency and the strategy to use renewable energy as a way to reduce pollution and greenhouse gas emissions. The summary of renewable energy policy in ASEAN countries is available in the following table.

Further information about the ASEAN Renewable Energy Information Portal

For further information about the ASEAN Renewable Energy Information Portal, visit: <http://aseanrenewables.info/>.

Table 1.5. Summary of renewable energy policy in ASEAN Member States

Country	Reference Institution to start business	Summary of the Policy	Target Year	RE Target	Technology Preference
Brunei Darussalam	Department of Electrical Services of the Prime Minister's Office	The Sultanate's Energy White Paper in 2013 sets the strategic goals of Brunei to generate at least 10 percent of its total power generation mix from renewable energy sources by 2035	2035	954 GWh	Solar Energy (954 GWh)
Cambodia	The Ministry of Mines and Energy (MME)-Directorate General for Energy, the Electricity Authority of Cambodia (EAC), and the Electricity Authority of Cambodia (EDC – <i>Electricité du Cambodge</i>)	Mandatory biofuel of 5 percent for the period of 2011-2015 and 10 percent until 2020 has been set. National Policy on Rural Electrification by Renewable Energy in 2007 encourages the use of local RE for electricity.	2020	2,241 MW	Hydropower (2,241 MW)
Indonesia	Directorate General of New, Renewable Energy and Energy Conservation Ministry of Energy and Mineral Resources (MEMR) for government permit and to PLN electricity IPP permit, while PT Pertamina and Ministry of Industry for biofuel	Guided by the Government Regulation No. 79/2014 to optimize fossil fuel consumption while sets out energy mix objective with 23 percent renewable resources by 2025. The MEMR Regulation No. 12/2015 mandate the use of biofuel in the transportation sector, industry, commercial, and power generation. MEMR Regulation No. 12/2017 and MEMR decision No.1404 K/20/MEM/2017 regulates the utilisation of Renewable Energy Resources for Electricity Supply as well determining the Cost of Electricity Supply	2025	46,307 MW	Hydropower and biofuel but solar and wind are becoming more attractive
Lao PDR	Ministry of Planning and Investment. The Institute of Renewable Energy Promotion The Ministry of Energy and Mines (MEM), <i>Electricité du Laos</i> (EdL),	Renewable Energy Development Strategy in 2011 has Renewable energy target of 30 percent by 2025. Policy on Sustainable Hydropower Development in 2015 is intended to boost the renewable energy share from hydro.	2025	951 MW*	Small hydro (543 MW)

Country	Reference Institution to start business	Summary of the Policy	Target Year	RE Target	Technology Preference
Malaysia	Malaysian Investment Development Authority (MIDA) , Sustainable Energy Development Authority Malaysia	The Biofuel Industry Act in 2007 regulates biofuel industry and it's blending with petroleum diesel and targeted at 10 percent and 7 percent mid-2016. For power generation, the 2009 National Renewable Energy Policy and Action Plan increases the share of renewable energy in total electricity generation to 10 percent by 2030 and 15 percent by 2050 as well as implement a Feed-in-Tariff (FIT) and Renewable Energy Fund mechanisms.	2050	21,370 MW	Solar Energy (18,700 MW)
Myanmar	The Ministry of Electricity and Energy (MOE), National Energy Management Committee (NEMC), Ministry of Mineral resources and Environment Conservation	Though specific renewable energy policy is absent, the government specifies 15-20 percent of the total installed energy capacity should be from renewable energy share by 2020. For biofuel, a substitute for 10 percent of imported oil and gasoline by 2020. Those RE are solar, wind, biomass, biofuel, and geothermal.	2020	472 MW*	Small hydro (472 MW)
Singapore	Economic Development Board Energy Market Authority Ministry of Trade and Industry, Ministry of the Environment and Water Resources Agency for Science, Technology and Research	Though specific policy or mandate for biofuel or electricity from renewable energy is absent, the country envisioned to be the leading clean energy hub in Asia. This is achieved through the 2007 National Energy Policy Report on efficiency in the power and transport sectors, the 2008 National Climate Change Strategy on GHG emissions reduction and climate change and the 2009 Sustainable Development Blueprint for sustainable economic growth and social development strategies. The country hence aims to raise solar penetration rates and targets to increase solar power contribution to 350 MWp by 2020.	2020	350 MWp	Solar Energy (350 MWp)

Country	Reference Institution to start business	Summary of the Policy	Target Year	RE Target	Technology Preference
The Philippines	Department of Energy (Renewable Energy Management /Oil Industry management / Electric Power Industry Management) Department of Trade and Industry - Board of Investments National Biofuels Board Department of Environmental and Natural Resources (Management Bureau)	National Biofuels Programme mandates biofuel blending of 10 percent and two percent for ethanol and biodiesel respectively by 2030. For electricity from RE, the National Renewable Energy Programme (NREP) of 2011-2030 seeks to increase the renewable energy-based power capacity in the country to an estimated 15,304 MW by 2030.	2030	15,304 MW	Hydropower (8,937 MW) with geothermal as well as biofuel from coconut biodiesel
Thailand	Ministry of Energy, Department of Alternative Energy Development and Efficiency, Energy Policy and Planning Office, Energy Regulation Commission, Electricity Generating Authority of Thailand (EGAT)	Alternative Energy Development Plan of 2015-2036 by the National Energy Policy Council in 2015 sets the objectives of developing renewable energy, creating an integrated green community, supporting renewable energy technology industry and making it competitive in international markets. The Energy Efficiency Development Plan of 2011-2030 aimed at reducing energy intensity by 25 percent in 2030, or equal to reduction of final energy consumption by 20 percent in 2030. Specifically for biofuel, the Ministry of Energy targets ethanol consumption to 11.3 million litres per day by 2036 and biodiesel to 14 million litres per day by 2036. As a result, by 2013, the country had ten biodiesel.	2036	19,684	Solar Energy (6,000 MW), Biomass (5,570 MW) and biofuel particularly ethanol
Vietnam	Ministry of Industry and Trade (MOIT), Ministry of Planning & Investment (MPI), General Directorate of Energy (GDE), Electricity Regulatory Authority of Vietnam (ERAV), Vietnam Electricity (EVN), National Power Transmission Corporation (NPT)	National Energy Development Strategy (NEDS) mandate the use of biofuels to 8.3 billion by 2020. The revised 7 th Power Development Planning 2016 emphasis on renewable energy development and power market liberalization. The RE targets are set above 10 percent in 2030.	2030	45,800 MW	Hydropower (27,800 MW) with solar and wind gain stronger.

Tips for doing renewable energy business in the AEC

According to the 2016-2025 APAEC, one of key energy policies of ASEAN, energy is a key to the realisation of the ASEAN Economic Community (AEC) which calls for a well-connected ASEAN to drive an integrated, competitive and resilient region. It is also important to note that in the current institutional setting of ASEAN, energy cooperation is highly linked with one of the vision of the AEC to incorporate a sustainable growth agenda that promotes a science-based use of green technology and energy.²⁴ AEC is, therefore, important for the development of renewable energy in the region as it opens up investment opportunities to be made in the sector. It supports the realisation of a free and open trade and investment for renewable energy by facilitating free flows of energy-related goods, technologies, labour, and capital. Essentially, it gives ASEAN an impetus to promote its vision to create an open and competitive region based on sustainable and renewable energy. As to which AMS is better to do business with or invest in, this depends entirely on the business or sector, regulatory environment (e.g. rules, regulations, bureaucracy, etc.), infrastructures, and other factors in which such a potential investment is to be made. Where each AMS stands in the different global governance ranking is indicative of the right place in which renewable energy investment is to be made (refer to Table 1.4)

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1. Silitonga (2016).
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3. ACE (2016: 14).
4. ACE (2015a: 17).
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6. See country chapter for more details.
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A photograph of two large white offshore wind turbines standing in a calm blue sea under a clear sky. The turbines are reflected in the water. The image is framed by a white border.

2. BRUNEI DARUSSALAM

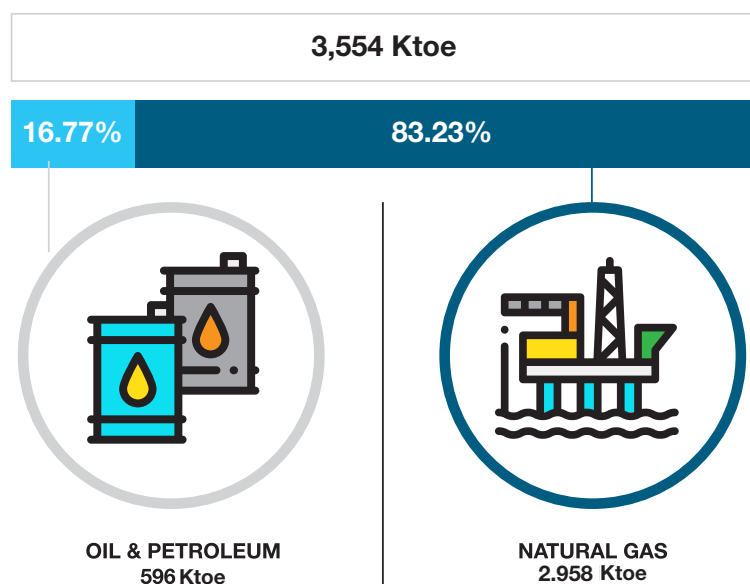
BRUNEI DARUSSALAM

2.1. Brief Country Profile

Although geographically small, the Sultanate of Brunei Darussalam is one of the wealthiest countries in Southeast Asia. With per capita GDP of USD 30,554.7 in 2015,¹ the Sultanate's average GDP growth is projected to reach 2.3 percent per year from now until 2018.² A major producer of oil and gas, both of which account for 60 percent of its GDP and 90 percent of its exports, the main export commodities of the Sultanate include crude oil, liquefied natural gas (LNG), and methanol. Brunei exports these commodities mainly to India (crude oil), Japan (LNG), and China (methanol).³ The Tenth National Development Plan 2012-2017, known as the *Wawasan Brunei 2035* or Brunei Vision 2035, emphasises the sultanate's plan to accelerate economic growth, which is to be reached by attaining a target of 6 percent of average annual economic growth. In order to realise this target, Brunei needs to decrease its dependency on the oil and gas sectors, as well as to diversify its economy.⁴ Renewable energy is expected to serve as an alternative energy source to support Brunei's growth strategy.

2.2. Renewable energy sector in Brunei Darussalam

Figure 2.1. Brunei's primary energy supply, 2014



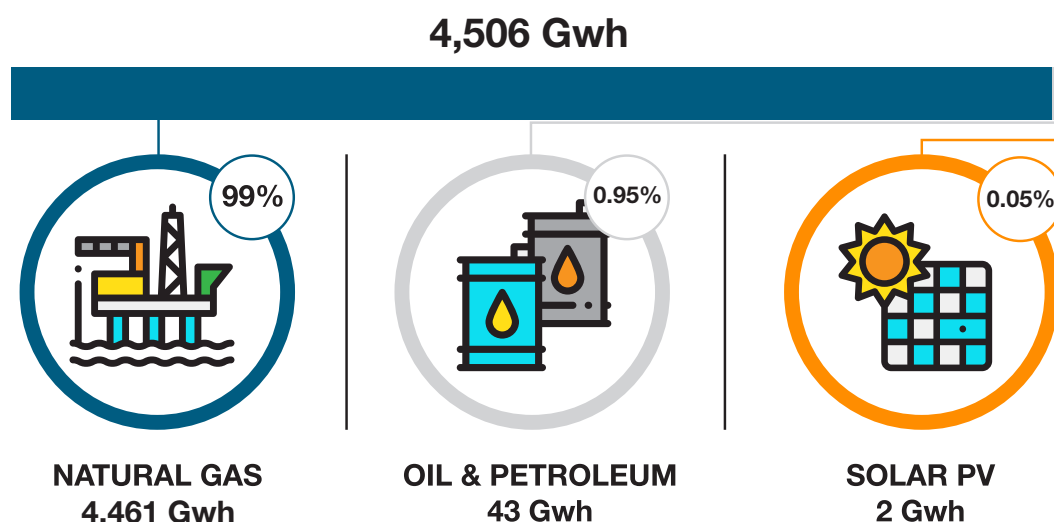
Source: ARES and ACE (2016: 2).

Overall, energy consumption in Brunei is projected to increase over the next few years along with the increase of its GDP growth, which is estimated to be around 2.7 percent annually between 2010 and 2035.⁵ The major demand for energy is expected to come from the residential, commercial and transportation sectors, which is in line with the increase in the number of population and economic activities in the commercial sector. The country's goal to develop renewable energy is linked with its own sustainable development objective. Brunei currently employs an energy strategy that ensures energy security, diversification

of energy supply, as well as energy efficiency and conservation. The Sultanate's primary energy supply comes mainly from fossil fuels, in which 83.2 percent comes from natural gas and 16.7 percent comes from oil and petroleum.⁶ In the power sector, about 99 percent of electricity generation comes from natural gas, whilst the rest comes from oil and petroleum (0.95 percent) and solar photovoltaic (PVC) (0.5 percent).⁷

To date, the total installed capacity of renewable energy sources in Brunei comes almost exclusively

Figure 2.2. Brunei's energy mix for electricity generation, 2014



Source: ACE and ARES (2016: 3).

from the Tenaga Suria Brunei (Solar Power of Brunei) PVC Power Generation Demonstration Project, which is a joint project between the Bruneian government and the Japanese company, the Mitsubishi Corporation.⁸ It is estimated that this project generates around 2 GWh of electricity per year. Moreover, the government also plans to develop a utility-scale solar project and waste-to-energy project using municipal solid waste. These projects are expected to generate power of around 10-20 MW.⁹

2.2.1. Biofuel

Unlike most ASEAN countries, Brunei does not have a specific target to develop biofuels for its transportation sector.¹⁰ The country virtually has no biofuel production capacity and very little feedstocks potential, which mostly comprises of cassava and rice paddy.¹¹ A report from the Economic Research Institute for ASEAN and East Asia even projected that the Sultanate is not expected to develop biofuel even up to 2035.¹²

2.2.2. Other renewable energy sources for electricity generation

Solar

Brunei has set a target of reaching 10 percent of electricity generation from renewable energy sources by 2035, with solar power as the most potential source for electricity generation in the country.¹³ The main

solar PVC project in the Sultanate is the Tenaga Suria Brunei Photovoltaic Power Generation Demonstration Project, which, as discussed earlier, is capable of generating 2 GWh of electricity annually.

Hydropower

In 2015, the government announced its intention to develop a joint hydroelectric dams with Malaysia in northern Sarawak with an estimated 20,000 MW hydropower capacity.¹⁴ Brunei Darussalam's Prime Minister's Office, the Sarawak Energy Bhd., and the Department of Electrical Services conducted a study in 2010 to develop the hydroelectric dam project.¹⁵ The study came up with some proposals whereby the first phase of the project would entail power exports to be moved from Tudan to the Sultanate via a border point at Sungai Tujuh, whilst the second phase will focus on a 200 MW hydroelectric dam project in Limbang.¹⁶ The proposal also highlights the urgency to increase renewable energy in Brunei's energy mix.

Waste-to-energy

Another main renewable energy source in Brunei is waste-to-energy, which mainly comes from municipal solid waste. The government has developed a plan to build a waste-to-energy facility, which is expected to have an installed capacity of up to 10 MW. It is projected that the combination of primary energy supply from solar and waste-to-

energy plants will reach around 0.02 Mtoe, or 0.03 percent of the total primary energy supply in 2040.¹⁷

Another renewable energy sources potential for electricity generation in Brunei include wind and tidal, all of which are currently being studied to be further developed in the future.

2.3. Policy context

2.3.1. Renewable energy policy

Brunei's energy policy is mainly focused on the oil and gas sector. Currently, there are two main regulatory frameworks for this sector, and these include the Oil Conservation Policy and the Brunei Natural Gas Policy. In conserving energy and promoting environment sustainability, the Sultanate focuses on energy efficiency, rather than coming up with specific renewable energy-related development programme. The government, for example, actively promotes energy efficiency through, amongst others, the implementation of the National Appliance Standards and Labelling Regulation. It also implements the Energy Efficiency and Conservation Program, which aims to reduce the general energy use by 30 percent by 2025. The policy to promote energy efficiency, however, is mainly aimed at increasing the volume of gas exports, rather than in promoting the development and use of renewable energy.

Figure 2.3. Brunei's strategic goals for renewable energy development

Introduction of a renewable energy policy

- Establishment of renewable energy policies and regulatory framework
- Introduction of support mechanisms to stimulate private sector investments
- Establishment of clear market, grid access rules and procedures

Scaling-up of market deployment for Solar Photovoltaic (PV) and promote waste-to-energy technologies

- Establishment of grid-connected solar development targets
- Adaptation of the most efficient and state-of-the-art waste-to-energy technologies
- Creation of policy framework for public-private partnership to accelerate the implementation of solar and waste-to-energy projects

Raising awareness and human capacity development

- Carrying out public awareness programmes, such as roadshows, forums, and exhibitions, to increase the awareness of renewable energy
- Utilising Tenaga Suria Brunei as a training facility for best practice project development to stimulate replication and the scaling-up of investments
- Strengthening higher learning institutions and industry stakeholders to promote renewable energy education, capacity building, and entrepreneurship

Supporting research, development, and demonstration and technology transfer

- Promotion of support research, development, and demonstration of renewable energy technologies that have potential for commercialisation in the country and for exports
- Promotion of transfer of technologies and the facilitation of linkage between international research institutions and private companies and local entities.

Source: Energy and Industry Department of the Prime Minister's Office of Negara Brunei Darussalam (2013).

Policy for biofuel

Brunei currently does not have a specific policy for biofuel development or biofuel blending. There is also no known incentive or instruments to stimulate the development of biofuel production in the country.

Policy for electricity generation from renewable energy

The Long-Term Development Plan, also known as the Brunei Vision 2035, specifies the country's goal to diversify its own economy, whilst, at the same time, reinforces its oil and gas sector. In addition to this long-term plan, the Sultanate also has an Energy White Paper. The document, which was published in 2013, sets the strategic goals of Brunei to generate at least 10 percent of its total power generation mix from renewable energy sources by 2035.¹⁸ The country is expected to achieve these goals by carrying out several key measures, which are highlighted in Figure 2.3.

2.3.2. Investment policy, incentives, and procedure for renewable energy sector

Investment policy

The energy sector in Brunei is almost exclusively dominated by the public sector. Up until 2014, the private sector outside of the oil and gas sector contributed only about 20 percent of the Sultanate's GDP.¹⁹ Although promoting fair competition between foreign and local companies, the National Vision 2035 encourages high participation of local workforce and the boosting of local content to create economic spin-offs in the Sultanate's energy industry. Specific to local content requirements, potential investors in the sector are required to observe the so-called *Local Business Development* framework, which aims at increasing the country's economy through the use of local goods and services, employment creation for the locals, and to develop truly Bruneian businesses that are able to compete regionally.²⁰

Aside from this, the government of Brunei also encourages public-private investment partnerships to develop the renewable energy sector. A number of mechanisms have been launched to support such an initiative, including:

- Investment in key strategic infrastructure and incentives provision, such as strategic income tax reliefs and agreements; and
- The creation of a business-friendly environment and a cosmopolitan society to attract foreign talent to live and work in Brunei by:
 - Improving the ease of doing business; and
 - Developing a social ecosystem that embraces the diverse needs of foreign investors personnel.²¹

Investment incentives

Since many renewable energy-related policies and instruments (e.g. incentives, permits, licenses, and so on) are currently being studied,

there is little information available on the subject. There are, however, a number key policy initiatives related to electricity selling tariffs. Back in 2015, for instance, the Energy Department at the Prime Minister's Office planned to introduce a feed-in-tariff system to encourage investment in renewable energy development. More specifically, the introduction of this system is expected to boost the development of distributed solar generation and enable homeowners with installed solar panels to sell their excess electricity back to the government.²²

2.4. Barriers for renewable energy development

There are at least four observable main barriers for renewable energy development in Brunei, and these include:

- **The absence of a clear policy framework**

Brunei currently does not have a clear specific policy framework

that regulates renewable energy development. Various policies concerning the subject are currently being studied.

- **Fuel subsidy**

Fuel subsidy artificially lowers the price of conventional fuel and discourages the development of renewable energy sources. Subsidies in Brunei specifically target diesel, gasoline, and the liquefied petroleum gas. Efforts to reform the fuel subsidies have been implemented mainly by increasing diesel and gasoline prices for foreign-registered vehicles. The government of Brunei also subsidises the price of electricity, which mainly comes from the country's large LNG reserves. According to a 2013 report of the International Energy Agency, subsidies in Brunei were the highest in Southeast Asia on a per capita basis. On average, residents in Brunei only pay around USD 0.03 per KWh, whilst industrial consumers pay USD 0.09 per KWh on average.²³

To reduce the electricity subsidy, the government has introduced a progressive electricity tariff structure in 2012.²⁴

- **Lack of infrastructure**

Other factors that hinder renewable energy development in Brunei include the lack of available utilities infrastructure for industrial activities and access to credit for renewable energy investors.²⁵

2.5. Institutional framework

The Ministry of Energy and Industry at the Prime Minister's Office (EIDPMO) is the primary government institution that deals with the energy sector development in Brunei. Other important government agencies include the Department of Electrical Services of the Prime Minister's Office and the Ministry of Development. Table 2.1. highlights renewable energy-related government agencies, their missions, and responsibilities.

Table 2.1. Main renewable energy-related institutions in Brunei Darussalam

Institution	Mission	Responsibility
Ministry of Energy at the Prime Minister's Office (EIDPMO)	To accelerate and enhance economic growth, underpinned by conducive environment, and industry-ready workforce.	• Implement and supervise Brunei's energy policy and agenda; • Promote energy efficiency and conservation; and • Support the development of renewable energy in the country.
Department of Electrical Services of the Prime Minister's Office	Improving electricity supply, operation, services, and infrastructure.	• Looking after and being responsible for the operation and development of the electricity sector; • Responsible for the generation, transmission, and distribution of electricity to the end-users; and • Setting the standard for the implementation of electricity usage in public buildings, as well as overseeing their overall Electro-Mechanical maintenance.
Brunei National Energy Institute	To support and promote national goals under the Energy White Paper through policy research and capacity building.	• Create and develop a world class energy research and development capability in Brunei; • Conduct research and development in all fields of energy; and • Promote, commercialise, and enable the deployment of research products in the field of energy.
Ministry of Development	Ensure the provision of infrastructure and the achievement of sustainable development in the country.	Providing services for construction permit and land management for development purposes.

Source: Various.

2.6. Setting up a business in Brunei Darussalam

Table 2.2. below summarises the process of setting up a business, including the length of time and cost required, in Brunei. The procedure will be slightly different between men and women.

Table 2.2. The process of setting up a business in Brunei Darussalam

No.	Procedure	Time to complete (day)	Cost to complete (in BND)
1.	Obtain permission from husband to leave home in order to start a business (For women)	1 day	No charge
2.	Check uniqueness of company name and reserve the name	1 day on average	5 (for name application) and 15 (for name reservation)
3.	Submit incorporation documents and pay registration fees	7 days	300 (for an industrial company) and 30 (for Sole Proprietorship)
4.	Certify the Memorandum of Articles of Association and the Articles of Association	1 day	4 per page of Memorandum of Articles and Articles of Association
5.	File the Return of Allotment Shares	1 day, simultaneous with previous procedure	10
6.	Stamp share certificates at the Ministry of Finance	1 day, simultaneous with previous procedure	no charge
7.	Make a company seal or stamp	3 days	185
8.	Register for Employees Provident Fund	1 day, simultaneous with previous procedure	no charge

Source: World Bank (n.d.a).

2.7. Other relevant information

2.7.1. Taxes

Table 2.3. summarises the current tax rates in the Sultanate.

Table 2.3. Tax rates in Brunei Darussalam

Individual income tax	
There is no personal income tax on individuals, resident or non-resident, in Brunei (note: remunerations paid to non-residents company director are subject to a 20 percent withholding tax)	
Corporate income tax	18.5 percent
Withholding tax	- Dividends are not subject to withholding tax in Brunei; - Royalties paid to a non-resident are subject to 10 percent withholding tax (though this may be reduced under a tax treaty); - Interests payments made to a non-resident are subject to 15 percent withholding tax; - Other withholding taxes on payments to non-residents include technical assistance, management fees, and director's remuneration (20 percent), rent of movable property (10 percent).
Withholding tax for foreign payment	10-15 percent
Value added tax	n.a.
Other taxes	Customs duty, excise duty, stamp duty, property taxes (the rate decided by local municipal board), vehicle tax (BND 4.50 per 100 c.c.), building tax (up to 12 percent).

Source: KPMG (2015) and World Bank (n.d.b.).

2.7.2. Labour condition landscape and employment system

Due to its small population, Brunei faces a serious shortage of skilled and unskilled workers, and is forced to recruit a large number from overseas. More than half of the country's total workforce consists of lower-skill workers, most of whom work in construction, wholesale, retail trade, and other professional and support services. Meanwhile, consisting mainly of Bruneian citizens and permanent residents, as well as foreign workers (usually on short-term visas), the country's skilled labour pool usually prefer public sector work as they offer generous benefits, such as bonuses, housing allowances, etc.²⁶

As far as the employment system is concerned, there are at least five key regulations worth noting, and these include the Workmen's Compensation Act of 1957, the Employment Information Act of 1974, the Employment Agencies Order of 2004, the Employment Order of 2009, and the Workplace Safety and Health Order of 2009.²⁷

The employment of foreign nationals is controlled by a Labour Quota System of the Labour Department, as well as the issuance of employment passes by the Immigration Department. The country also allows for new companies to apply for 'special approval' to expedite the requirement of foreign nationals in select positions for essential jobs (up to seven days may be required to obtain such an approval). This special approval is applicable to new companies operating in urban and suburban areas for six months, and covers businesses such as restaurants and shops.²⁸

According to the 2009 Employment Order, an employee in Brunei shall work not more than 44 hours a week, and is not allowed to work more than 12 hours each day (inclusive of overtime work). Employees are entitled to have paid annual leave depending on their years of services. As for maternity leave, local and foreign female employees are entitled to have 15 weeks of maternity leave.

2.7.3. Social security system

The social security system in Brunei Darussalam is administered by the *Tabungan Amanah Pekerja* (TAP – Employees Savings Trust), which covers benefits such as old age, disability, and survivors, sickness and maternity, and work injury. Unfortunately, the social security system in Brunei only covers those who are citizens of the country and permanent residents.²⁹

2.7.4. Land policy

Land and property in Brunei is regulated under the Land Code (Strata) Cap 189, which came into effect in 2009. According to the law, residents of Brunei (including citizens, permanent residents, or foreigners with work permits) are able to purchase buildings with 'strata' title and they can lease for up to 99 years.³⁰ Foreigners and permanent residents are not allowed to own land property in Brunei.³¹

2.7.5. Commercial dispute settlement

In the case of dispute settlement related to contracts, export and import of goods, purchase and sale of commodities, and other business cases, the Supreme Court in Brunei Darussalam just recently established the Commercial Court in 2016 to resolve the aforementioned issues. The use of alternative dispute mechanisms is common and rooted in Brunei's local tradition.³²

2.8. Electronic links to relevant government agencies related to renewable energy

- Energy and Industry Department – Prime Minister Office of Brunei Darussalam: <<http://www.ei.gov.bn/SitePages/Home.aspx>>
- Brunei Economic Development Board: <<http://www.bedb.com.bn/>>
- Business Brunei: <<http://www.business.gov.bn/>>
- Brunei National Energy Research Institute: <<http://www.bneri.org.bn/site/Home.aspx>>

AEC business tip for Brunei Darussalam

Brunei Darussalam is generally an open economy, with a relatively stable political environment. The government encourages public-private investment partnerships to develop the Sultanate's renewable energy sector. Despite its focus on the oil and gas industry, the country's participation in the AEC allows Bruneian businesses better access to larger ASEAN markets and renewable energy potentials. Taking advantage of Brunei's relatively relaxed regulatory environment, ASEAN and non-ASEAN companies could consider establishing a base in Brunei not only to exploit market opportunities and renewable energy potentials in the country, but also the wider ASEAN region.

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3. CAMBODIA

CAMBODIA

3.1. Brief country profile

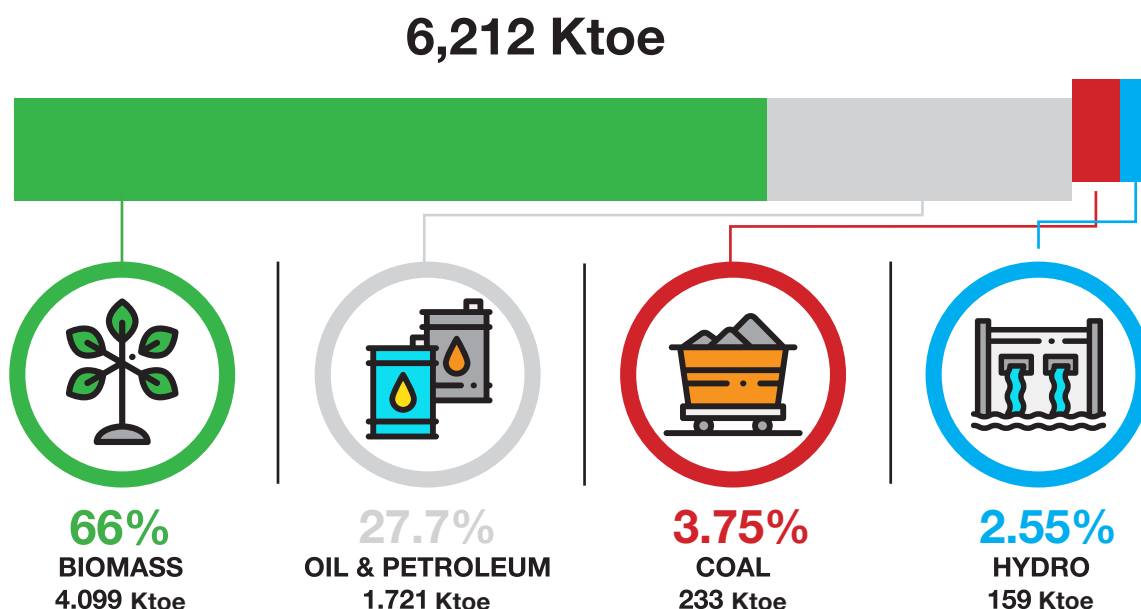
The continuous changes in the political, economic, and social landscapes of Cambodia since it gained its independence from France in 1953 has influenced the way the economy works in the country. It was in 1989 that the Kingdom of Cambodia, then known as the People's Republic of Kampuchea, decided to open up its economy, with major reforms taking place since then. With a population of around 15 million, Cambodia attained a lower-middle income country status in 2015. Despite the decline of its economic growth from 7.1 percent in 2014 to 7 percent in 2015, Cambodia experienced a robust growth of

6.9 percent in 2016, which was relatively higher compared to other ASEAN Member States (AMS). The Kingdom's average GDP growth is forecasted to remain around 7 percent up until 2019.¹ Despite the discovery of vast oil and natural gas reserves in 2005, Cambodia still lacks the infrastructure required for the energy sector to match the pace of its development. To date, most of electricity generated in the Kingdom comes largely from fuel oil and diesel generators. Given its heavy reliance on imported fuel and a fragmented power supply system, electricity prices in Cambodia is known to be one of the highest in the ASEAN region, and even the world.²

3.2. Renewable energy sector in Cambodia

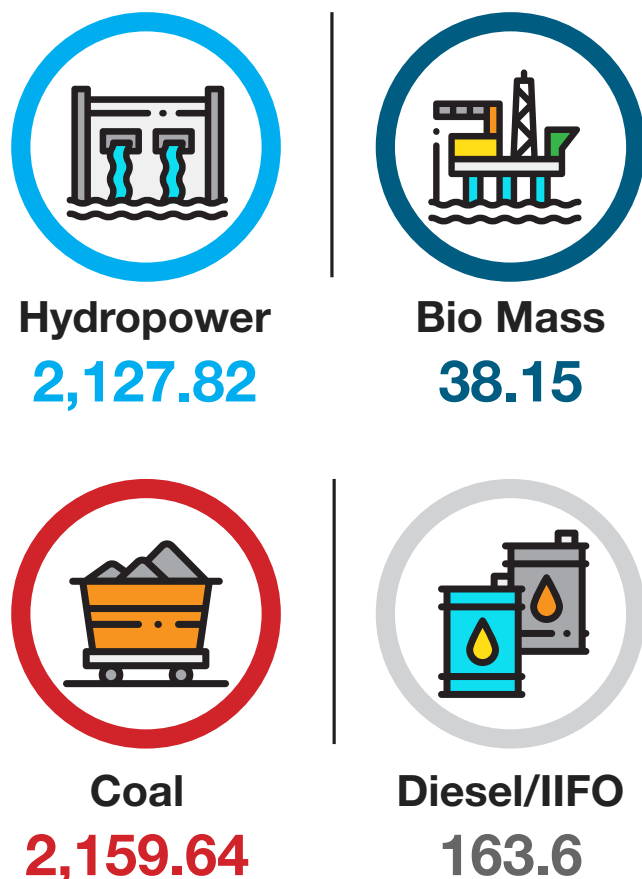
As the population increases and industries expand, Cambodia's energy demand is forecasted to grow. Between 2009 and 2015, energy demand in the country grew at an average of 15 percent annually,³ whilst electricity consumption is expected to grow at an average of 9.9 percent per year from 2005 to 2030.⁴ At 66 percent, biomass was the dominant source of energy in Cambodia's energy mix in 2014, and this was followed by oil and petroleum (27.7 percent) and coal (3.7 percent). Despite being the dominant component of the

Figure 3.1. Share of Cambodia's primary energy supply, 2014



Source: ARES and ACE (2016: 2).

Figure 3.2. Energy production in Cambodia by type of generation, 2015 (in million kWh)



Source: Electricity Authority of Cambodia (2016: 25).

country's energy mix, the application of biomass was limited to thermal energy generation in the residential sector, rather than for electricity generation purposes.⁵ Given its inability to generate sufficient electricity to cover its demand, a moderate amount of electricity (16.4 percent) is usually imported from neighbouring countries. During the first quarter of 2016 alone, Cambodia imported 302,776 tonnes of petroleum from Vietnam, Singapore, and Thailand.⁶ The share of energy sources in Cambodia's primary energy supply is illustrated in Figure 3.1.

Hydropower also makes a significant contribution to total renewable energy produced in Cambodia (refer to Figure 3.2.). In 2015 alone, the Electricity Authority of Cambodia reported that hydropower generated around 2,127.82 million kWh of electricity. Despite this, it has not

contributed significantly to the general energy consumption in Cambodia, which, with around 2,159.64 million kWh contribution in 2015, is still dominated by coal.⁷

3.2.1. Biofuel and biomass

Biomass is the most commonly used alternative energy source in Cambodia. Large use of biomass in the Kingdom is closely linked to the country's big agriculture production that produces around 5 billion metric tonnes of agricultural biomass waste annually.⁸ Reportedly, biomass production in Cambodia could potentially reach around 18,852 GWh per year,⁹ but only around 50 MW was operational as of 2015.¹⁰ It is projected that the use of biomass and waste could supply around 73 percent of Cambodia's total energy demand.¹¹ Cambodia's biomass potential is illustrated in Figure 3.3.

Cambodia also has the potential for producing biofuel from cassava and sugar cane. A 2012 report produced by the government of Cambodia, for example, suggested that a Korean company managed to produce 36,000 litres of ethanol a year from 100,000 tonnes of cassava. The same report also mentioned about biofuel production from 20,000 ha of sugarcane and 4,000 ha of palm oil, which, at the time, was intended to be expanded to up to 10,000 ha.¹²

3.2.2. Other renewable energy sources for electricity generation

Electricity consumption in Cambodia has been growing an average 20 percent annually since 2010.¹³ Up until now, most of the renewable energy projects in Cambodia are still in the pilot or demonstration stage. As it stands, the installed capacity of renewable energy in the country is only able to produce around 980 MW.

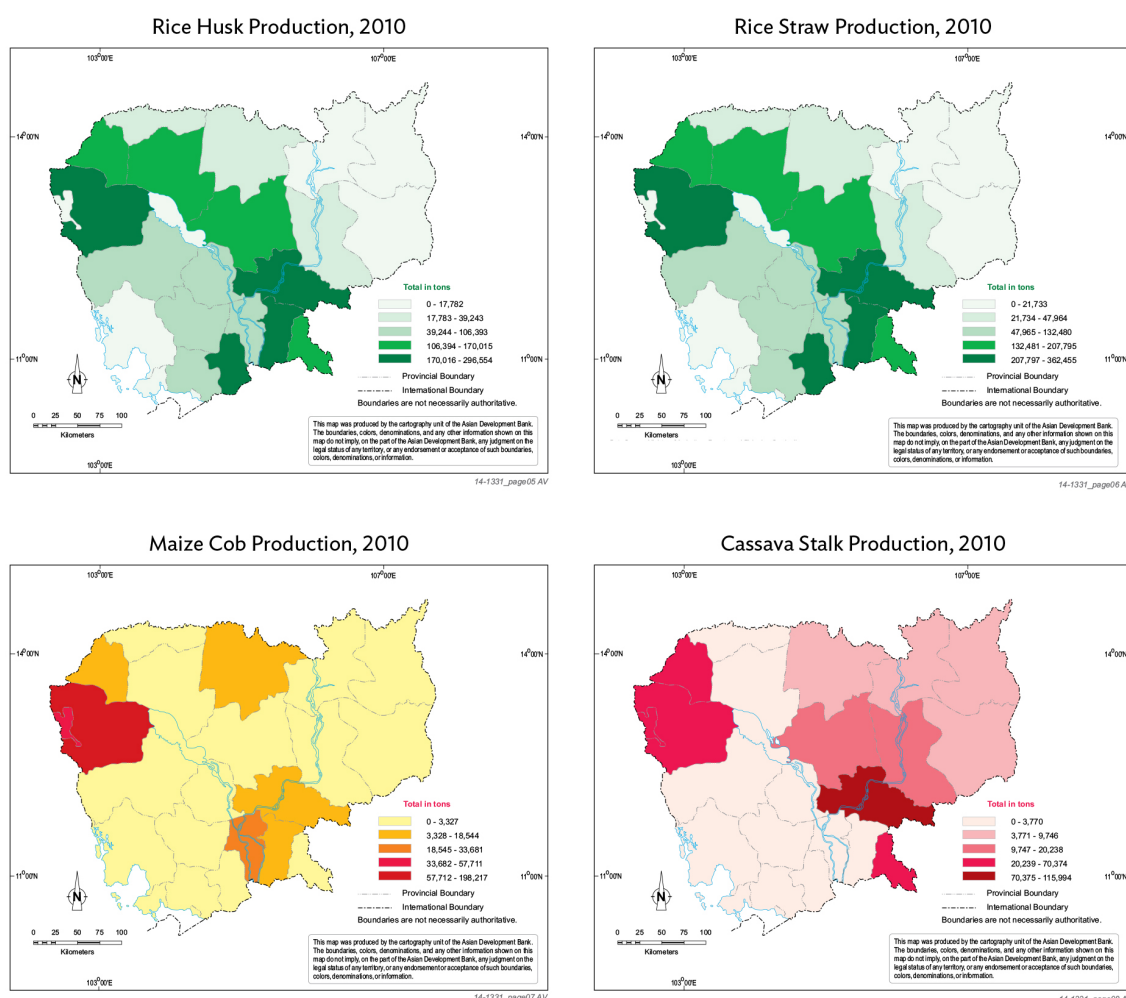
Hydropower

Hydropower is one renewable energy source in Cambodia that has major potential for electricity generation. It is estimated that the country's total electricity generation potential from hydropower stands at 10,000 MW.¹⁴ By the end of 2015, however, the installed capacity of hydropower in Cambodia was only able to generate around 929.47 MW,¹⁵ mainly because many hydropower projects in the country are either still being developed or currently under review.

Solar

Solar energy also serves as another potential renewable energy source in Cambodia. On average, the Kingdom has the potential to generate around 5 kWh of solar energy per day,¹⁶ though so far, only about 2 MW of solar power has been installed.¹⁷ Currently, most of the solar energy projects in the country are supported by development agencies and private sectors, such as the Climate Investments Funds, Energy and Environment Partnership (EEP) Mekong, Khmer Solar, Kamworks, and Pico Sol. The country's solar energy potentials are presented in Figure 3.4.

Figure 3.3. Cambodia's biomass potential according to main crop residues, 2010

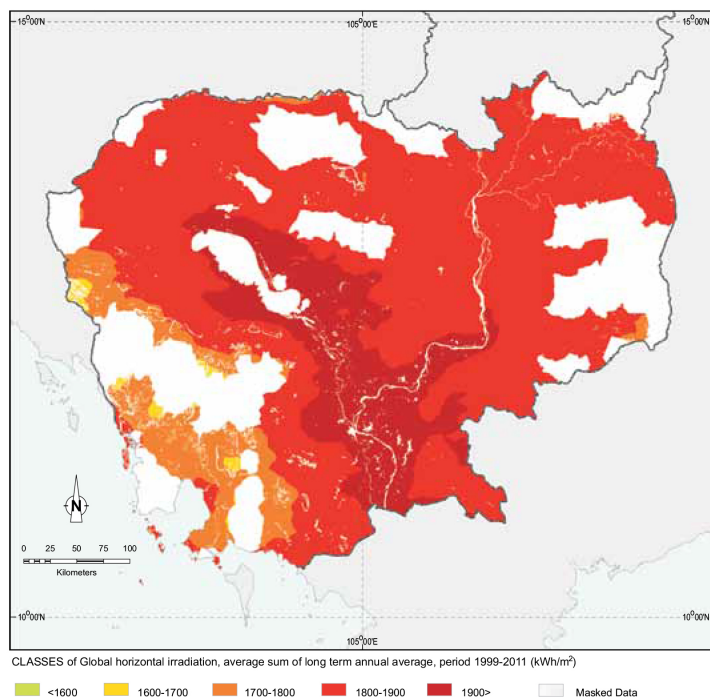


Source: Ministry of Agriculture, Forestry and Fisheries, Cambodia in ADB (2015: 21).

Wind

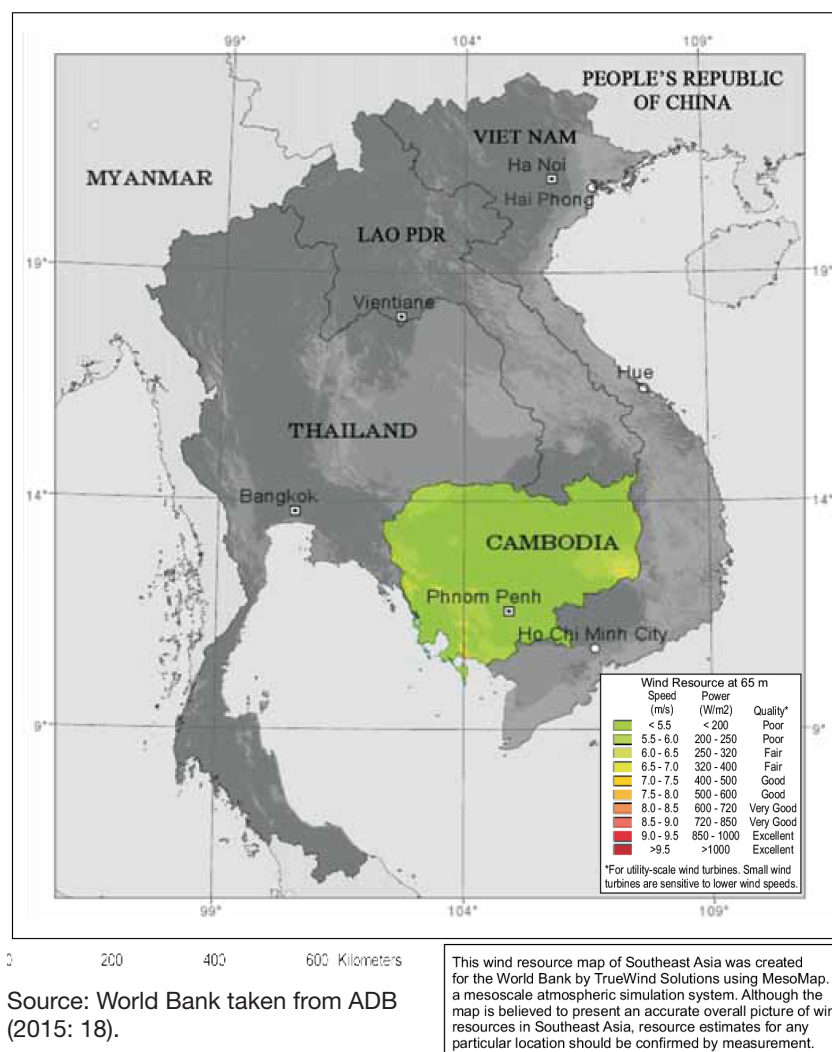
As shown in Figure 3.5., wind energy also provides an excellent potential for electricity generation in Cambodia. According to a 2015 Report of the Asian Development Bank, the Kingdom has a theoretical potential wind capacity of 65 GW and a potential generation capacity of 154 TWh annually.¹⁸ At the moment, however, only a small percentage of wind energy is being developed. A single wind turbine installed in Sihanoukville in 2010 was a project that received support from the Sihanoukville's Port Authority, the government of Belgium, and the European Union, and served as a pilot project to pave the way for the development of wind energy in Cambodia.¹⁹

Figure 3.4. Map of solar potential in Cambodia



Sources: GeoModel Solar; Lahmeyer International in ADB (2015: 16).

Figure 3.5. Map of wind resources potential in Cambodia



Source: World Bank taken from ADB (2015: 18).

3.3. Policy context

3.3.1. Renewable energy policy

Aside from ensuring the country's energy security, the energy policy of Cambodia is primarily aimed at encouraging the development of energy resources, promoting efficient use of energy, minimising environmental effects of energy production and consumption, and facilitating investments as well as economic development in the sector. Whilst the specific target and timeline to develop renewable energy are absent in Cambodia, the country's Ministry of Mines and Energy has developed a plan to foster the development of all types of renewable energy, which include biomass, biogas, and biofuel. The current policy instrument to promote renewable energy in Cambodia is very much linked to the government's plan for electrification. The government of Cambodia has two general policy targets, which include full electrification rate for all villages in the country by 2020, and to provide at least 70 percent of total households with access to quality grid-supplied electricity by 2030.²⁰ Renewable energy is considered as one of the alternative energy sources to meet the said targets.

In 2013, the government also launched the *National Policy on Green Growth* and the *National Strategy Plan*, both of which were aimed at promoting and ensuring an effective implementation of green growth strategy through the mainstreaming of the so-called *green processes*. There is also the National Climate Change Strategic Plan 2014-2023 that covers policies to promote the use of renewable energy technology as a way to mitigate the impact of climate change.²¹

Policy for biofuel

In order to save the amount of fuel imported each year and, at the same time, create jobs, the Cambodian government introduced a mandatory biofuel blending policy. Between 2011 and 2015, such a mandatory blending was set at 5 percent. The current mandatory blending, which is applicable until 2020, is set at 10 percent.²²

Policy for electricity generation from renewable energy

The main policy that regulates electricity in Cambodia is the Electricity Law that has been enforced since 2001. The law serves as the main policy framework for electric power supply and services in the Kingdom, with some of its key components including the regulation of electricity operation and the objective to establish favourable conditions for competition, private investment, and commercial operation of the electric power industry.²³

As far as renewable energy use for electricity generation is concerned, the Rural Electrification Master Plan was adopted in 2006 with the aim of developing renewable energy sources to achieve the country's rural electrification rate target.²⁴

The document, however, does not specify the target for renewable energy share nor does it set a particular deadline for the target to be achieved. Subsequently, in 2007, the government launched the National Policy on Rural Electrification by Renewable Energy to further promote the development of renewable energy for rural electrification programme. The policy encourages the participation of private sector in developing renewable energy sources to supply electricity in the rural areas. It is also stated in the said policy that the government will support renewable energy development by providing various incentives and involve members of the society in rural areas.²⁵ Existing renewable energy-related policies in Cambodia is summarised in Table 3.1.

Table 3.1. Renewable energy-related policies in Cambodia

Title	Agency	Key Points
Cambodia Climate Change Strategic Plan 2014-2023	National Climate Change Committee	The plan aims to develop Cambodia towards a green society and support sustainable development.
		The document encourages the integration of renewable energy sources in the future energy production and promote technology transfers for renewable energy development.
National Strategic Plan on Green Growth 2013-2030	National Council on Green Growth	The plan is envisaged to develop sustainable economy and environment. One of the key strategies is to support green investment in all economic activities. Renewable energy use is encouraged in the green industry and green energy activities.
National Policy on Rural Electrification by Renewable Energy	Ministry of Industry, Mines and Energy	The objective of renewable energy development is to provide reliable and safe electricity access in rural areas that will not damage the environment.
		The policy promotes the use of renewable energy technologies and encourages private sector involvement.
Rural Electrification Master Plan	Ministry of Industry, Mines and Energy	Covers the study and objective to develop renewable energy sources to achieve the rural electrification rate target.
Electricity Law	Electricity Authority of Cambodia (EAC)	The law sets out the regulation for the operation of electric power industry and to create a favourable investment and commercial operation in electricity generation.

Source: Various.

3.3.2. Investment policy, incentives, and procedure for renewable energy sector

General investment policy for renewable energy projects

Policy instrument to support investment in renewable energy is linked with the government's rural electrification programme. In view of the absence of renewable energy-specific investment rules and regulations, investment in the sector adheres to Cambodia's 1994 Law on Investment, which was later amended in 2003. With the exception on matters related to land ownership, laws and regulations governing foreign investment in Cambodia are generally very investor-friendly. There are virtually no restrictions on investment sectors, and companies can be wholly foreign owned, though participation arrangements may exist on occasion.²⁶

It is also important to note that Cambodia's 1996 Law on Environment Protection and Natural Resource Management also requires every investment project proposal to include a (preliminary) Environmental Impact Assessment, which is to be submitted to and reviewed by the Ministry of Environment.

General investment procedures for renewable energy projects

The following are investment procedures in Cambodia:

- The 2003 Investment Law of Cambodia requires potential investors to submit an investment application to the Council for the Development of Cambodia, which will then make a decision within three days whether the status of Qualified Investment Project (QIP) may be accorded to the said investment (an investment proposal is automatically approved if a decision is not made by the Council within three days);
- Upon meeting all the requirements set under the sub-decree of the said Investment Law, the Council shall issue a Conditional Registration Certificate to the applicant;
- On behalf of the applicant, the Council will obtain all of the necessary licenses from relevant ministries and institutions listed

in the Conditional Registration Certificate. The existing Investment Law guarantees that the process to obtain all the necessary documents for authorisation, clearance, license, permit and registration will be done no later than 28 working days from the date of the Conditional Registration Certificate;

- It is also important to note that all individuals wishing to pursue business activities in Cambodia are required to obtain Tax Identification Number within 15 days, starting from the commencement of economic activities, or after receiving registration approval certificate or approval letter from relevant authorities;
- Every electricity provider is also required to obtain a license from the Electricity Authority of Cambodia (EDC), which regulates the electricity tariff by implementing the Cost Adjustment Mechanism. There is no unified electricity tariff in Cambodia and the license from the EDC will define the applicable tariff. The license is also important to access various investment incentives and clean development mechanism approval.

Investment incentives

• The 2003 Investment Law

The 2003 Investment Law provides the Kingdom of Cambodia a legal basis to offer incentives for investments in renewable energy projects. Aside from offering a reduction of custom duties on various renewable energy-related equipments (e.g. seven percent, from originally 30 percent, tariff for solar photovoltaic components, and zero percent tariff, from originally 15, for biomass and solar water heating), the Cambodian government also offers a subsidy of USD 100 per renewable energy system installed to reduce the purchasing and instalment cost.

• Rural Electrification Fund

Incentives are also available in the form of Rural Electrification Fund (REF), which was established in 2004 and is part of the Electricity Authority of Cambodia (EDC –

Electricité du Cambodge).

Aside from providing electricity access for poor households in the rural areas, the Fund also gives private electricity suppliers in the rural areas the opportunities to expand their investment.²⁷ The REF provides grants to support rural electrification from conventional energy sources, as well as renewable energy technologies. Through the support provided by the Fund, private electricity providers are able to access the funds needed to develop or improve existing electricity infrastructure. In 2015 alone, REF executed 106 contracts to improve infrastructure with 84 licensees.²⁸

• Qualified Investment Projects (QIP)

Incentives are also available for investors with the so-called Qualified Investment Projects (QIP) status. Potential investors can be granted with such a status if their investments meet the requirements set by the Cambodian government. Incentives offered to investors with QIP status include: (1) tax exemption of up to nine years; (2) accelerated depreciation on manufacturing assets;²⁹ (3) exemption from import duty on production equipment, raw materials, and inputs manufacture; and (4) the right to employ foreign labour. Given the strategic nature of the energy sector, investments made in the sector are usually eligible to obtain QIP status. Those with such a status are also required to obtain the **Certificate of Compliance** if it wishes to continuously enjoy receiving such incentives in the future.

• Special Economic Zones

Introduced in 2005, Cambodia's Special Economic Zones (SEZ) were set up to provide a 'One-Stop Service' and various fiscal and tax incentives for investors within the zones. Through this facility, investors are offered with a number of incentives, such as nine years tax holidays, zero percent rate of value-added tax, full import duty

exemption, permanent visa for investors and their families, long-term lease of up to 99 years, and free repatriation of profit. The SEZ also has a Special Economic Zone Administration (SEZA), which provides services such as company registration and investment licensing, export/import permit, work permit and labour books (both workers and expatriate), and on-site immediate legal and administrative assistance.³⁰ There are currently two types of SEZs across Cambodia, including: (1) SEZs that are located near the official checkpoint, or between 20 km from inland or coastal border of Custom Zone; and (2) SEZs that are not located near the official checkpoints or between 20 km from inland or coastal border of Custom Zone. Table 3.2. summarises the existing SEZs in Cambodia.

3.4. Barriers for renewable energy development

The following are barriers for the development of renewable energy sector in Cambodia:

- **Lack of clarity and information on renewable energy market characteristics and regulatory framework**

Information concerning the market characteristics and potentials of

Cambodia's renewable energy is in need of studies and further updating. In addition, the lack of clear regulatory framework and dedicated institutions on renewable energy also means that the country has no specific target and timeline to harness and further develop its renewable energy potentials. Lack of clarity is also evident in commercial distribution of electricity generated from renewable energy, as well as in regulations pertaining to the feed-in tariff or net metering system.³¹

- **Import tariff rate for renewable energy technology**

Cambodia imposes relatively high import tariff rate for renewable energy technology or components, the average of which stands at 12.5 percent. This rate is the highest amongst the AMS.³² Import tariff duty for solar energy equipment, however, is set at a lower rate of 7 percent. Solar panels and equipments are also still subject to value added tax.³³

- **Lack of financial support**

Banking and financial institutions and initiatives to support renewable energy-related projects remain underdeveloped. The lack of regulatory clarity in the renewable energy sector has probably generated a lack of confidence between borrowers and lenders, and this leads to a cautious attitude

amongst Cambodian banks to provide loans for renewable energy-related projects.³⁴

3.5. Institutional framework

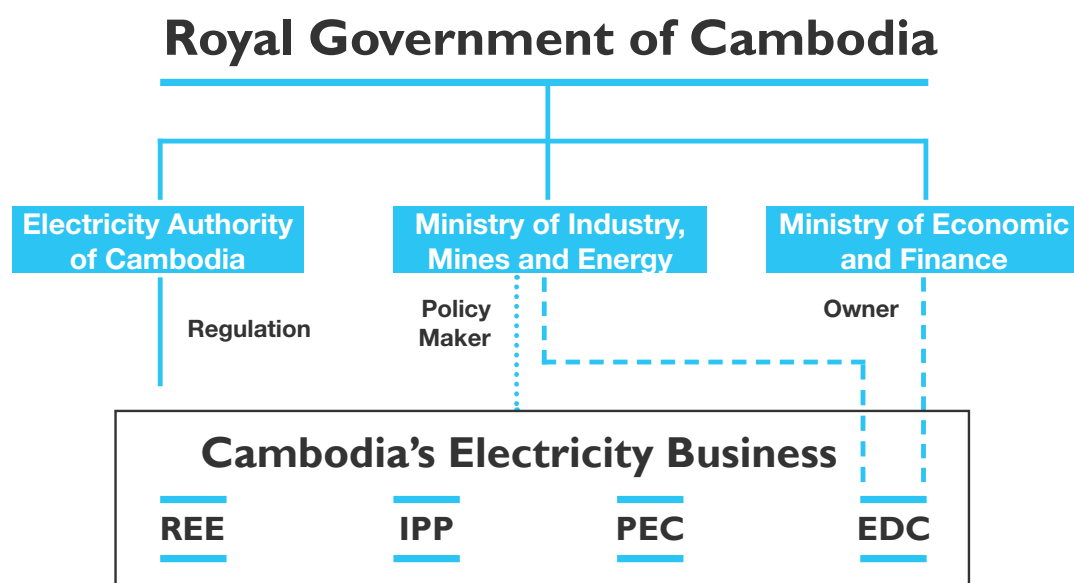
The Ministry of Mines and Energy (MME), particularly its Directorate General for Energy, the Electricity Authority of Cambodia (EAC), and the Electricity Authority of Cambodia (EDC – *Electricité du Cambodge*) are some of the most important government-related actors that deal with energy and electricity sectors. Whilst the Directorate General for Energy of MME works on the energy sector planning and consumption, as well as data collection,³⁵ the EAC, as mandated by the 2001 Electricity Law, is an autonomous body set up to regulate and monitor the electric power sector throughout the country. It has the duties of issuing licenses, approving and enforcing performance standards for licensees, and the setting up of rates and charges for electric power services.³⁶ Meanwhile, the EDC is a state-run utility company that has the responsibility to generate, transmit, and distribute electric power throughout Cambodia.³⁷ The Company also serves as the main institution responsible in encouraging private sector's participation in sustainable rural power supply services, particularly in developing new technologies and renewable energy.³⁸ There are also other institutions that provide electricity generation services, and these include the Provincial

Table 3.2. Special economic zones in Cambodia

Location	SEZs	Year established	No. of firms operating	Total employment	Employees per firm (avg)
Phnom Penh	Phnom Penh	2008	50	17,000	340
	Manhattan	2006	26	28,051	1,079
Bavet	Tai Seng Bavet	2007	17	7,968	469
	Dragon King	2013	2	280	140
Sihanoukville	Sihanoukville SEZ 1	2009	2	424	212
	Sihanoukville SEZ 2	2008	40	8,967	224
	Sihanoukville Port SEZ	2012	2	416	208
PoiPet	Poi Pet O'Neang	2011	2	830	415
Koh Kong	NeangKokKoh Kong	2005	4	3,953	988
Total	9		145	67,889	468

Source: Warr and Menon (2015: 6).

Figure 3.6. The policy-making structure of Cambodia's energy and electricity sector



Source: WWF, *et al.* (2016: 11).

Electricity Companies in small towns, private entities, and the Rural Electricity Enterprises (REEs). The policy-making structure of Cambodia's energy and electricity is illustrated in Figure 3.6.

3.6. Setting up a business in Cambodia

Table 3.3. summarises the process (including estimated time and cost required) of setting up a business in Cambodia.

Table 3.3. The process of setting up a business in Cambodia

No.	Procedure	Time to complete (day)	Cost to complete
1.	Conduct an initial check for uniqueness of the company name and obtain company name approval at the Business Registration Department	7	USD 10
2.	Incorporate the company with the Business Registration Department in the Ministry of Commerce	30	USD 420
3.	Make a company seal	1	USD 15
4.	Open a bank account, deposit the legally required initial capital or KHR 4,000,000 and obtain deposit evidence	1	No charge
5.	Have registration documents stamped, approved, registered for Tax Identification Number, Patent Tax, and VAT Tax	30	USD 100
6.	Notify the Ministry of Labour of the start of the operations and hiring of employees	30	KHR 280,000 (8-100 employees)
7.*	Submit company original statutes and capital deposit evidence at the Business Registry	1	No charge
8.*	Receive inspection from Labour Inspector	1 day	Included in procedure 6
9.*	Register at the National Social Security Fund	14 days	No charge

Note: *Take place simultaneously with another procedure.
Source: The World Bank (n.d.).

3.7. Other relevant Information

3.7.1. Taxes

Various tax rates in Cambodia are highlighted in Table 3.4.

Table 3.4. Tax rates in Cambodia

Individual income tax	
Income (in KHR)	Progressive rates (in percent)
Up to 800,000	0
800,001-1,250,000	5
1,250,001-8,500,000	10
8,500,001-12,500,000	15
12,500,001-upwards	20
Corporate taxes	
Type of taxes	Tax rates (in percent)
Corporate tax standard rate or tax on profit	20 for large taxpayers or 0-20 for small tax payers
Industry-specific tax rates	
Oil, gas, and mineral exploitation	30
Insurance	5 on gross premium income and 20 on other income derived from non-insurance activities.
Value added tax	0-10
Withholding taxes	14 for dividends, 14 and 15 for non-resident and resident interests respectively, 14 and 15 for non-resident and resident royalties respectively, and 14 for technical service fees.
Other taxes	Real property tax (0.1 percent per year on immovable property with value not exceeding KHR 100 million, 10 percent on land and house rentals, and 2 percent of market value of land per metre square of unused land), social security, stamp duty, as well as various taxes on vehicles.

Source: General Department of Taxation of Ministry of Economy and Finance of the Kingdom of Cambodia (n.d.), Deloitte (2016), and PwC (2016).

3.7.2. Labour condition landscape and employment system

As a lower middle income country, Cambodia suffers from a lack of depth in skilled worker pool. It has been noted, for instance, that four out of every ten Cambodian youth lack sufficient education to adequately perform their jobs.³⁹ With around 90 percent of workers

operating in the informal economy, as well as a growing emigrating outflow to find jobs with higher wages, Cambodia is in dire need to make adequate investment to improve its workforce, especially as it seeks to move its economy beyond basic manufacturing jobs.⁴⁰

As far as the employment system is concerned, labour relations and employment are regulated by the

Constitution and the 1997 Labour Law. Locally hired employees are entitled to a minimum wage of USD 80 per month, 18 days annual leaves, and 25 days public holidays. In the case where required skills are not available in Cambodia, companies may hire foreign workers. No foreign nationals, however, can work in the Kingdom unless s/he possesses a valid work permit and employment card issued by the Ministry of Labour and Vocational Training. The work permit is usually valid for a period of one year, and may be extended as long as the validity of extension does not exceed the stay period in Cambodia.⁴¹

3.7.3. Social security system

Social security system in Cambodia is administered by the National Social Security Fund and regulated under the Law on Social Security (Royal Kram NS/RKM/0902/018). The National Social Security Fund consists of three main schemes, including: (1) employment injury scheme; (2) health insurance scheme; and (3) pension scheme. The social security system covers all persons in Cambodia, regardless of their nationality, race, religion, social origin, and membership of trade union.⁴²

3.7.4. Land policy

Since the pursuance of a free market system in the early 1990s, Cambodia has been implementing a series of unprecedented land reforms. Although the April 1989 land policy confirmed the state as the default owner of the country's land, the law also acknowledged citizens' rights to acquire private ownership of residential land and private possession of agricultural land. The government also issued a White Paper on Land Policy in 2012, which was aimed at promoting land use, land management, and natural resource management for sustainable and equitable socio-economic development.⁴³

As far as foreign investment is concerned, the Law on Investment, which has been implemented since 2011, allows foreigners to lease for

up to 50 years, and this can be renewed either for short- or long-term period.⁴⁴ The government also adopted a Sub-Decree on Economic Land Concessions in 2005, which facilitated the granting of land concessions to foreign and local investors.⁴⁵ The same [Sub-Decree] also stipulates that land can be used for the cultivation of food or industrial crops, including tree planting, the raising of animals and aquaculture, construction, such as plant or factory and facilities for the processing of domestic agricultural raw materials, or a combination of some or all of these activities.⁴⁶

3.7.5. Commercial dispute settlement

Cambodia adopted a Commercial Arbitration Law in 2006, whilst the National Commercial Arbitration Centre was established four years later to serve as the country's alternative dispute resolution mechanism to facilitate companies in resolving commercial disputes more quickly and cheaper than through the conventional court system. International arbitration is also available for commercial disputes involving parties in Cambodia. The Kingdom is a member of the World Bank's International Centre for Settlement of Investment Disputes since 2005.⁴⁷

3.8. Electronic links to relevant government agencies related to renewable energy

- Cambodian Ministry of Mines and Energy (MIME): <http://www.mme.gov.kh/>
- Electricity Authority of Cambodia (EAC): <http://eac.gov.kh/>
- Rural Electrification Fund of Cambodia (REF): <http://ref.gov.kh/>
- Council for the Development of Cambodia (CDC): <http://www.cambodiainvestment.gov.kh/>

AEC business tip for Cambodia

Fuelled by domestic consumption and foreign investment, the Cambodian economy has been seeing a relatively robust economic growth in the past few years. The government is also making serious efforts to create a favourable business and investment climate in the country. Along with traditional sectors, such as manufacturing, garment and agriculture, the government has been promoting private investment to support the development of renewable energy in the country, especially to improve the Kingdom's electrification rate. Although continuously liberalising its economy, Cambodia's participation in the AEC provides an additional boost to reduce investment impediments in the country. The AEC's investment facilitation initiatives, such as the ASEAN Comprehensive Investment Agreement (ACIA), for instance, help expedite the investment procedure in Cambodia.

- Cambodian Investment Board (CIB): <http://www.cambodiainvestment.gov.kh/>
- Cambodian Special Economic Zones Board (CSEZB): <http://www.cambodiainvestment.gov.kh/>

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4. INDONESIA

INDONESIA

4.1. Brief country profile

The world's fourth most populous nation (258 million as of 2015), tenth largest economy in the world in terms of purchasing power parity, an emerging middle-income economy, one of the most vibrant democracies in the world, and a member of the Group of 20 (G20) nations,¹ Indonesia is currently transitioning itself from being a commodities export economy, which is dominated by oil and gas, into an economy that is fuelled by manufacturing and investment, particularly after becoming a net oil importer in 2004. Located between the Indian and the Pacific Oceans, the country is the largest archipelago in the world, though only 6,000 out of its 17,508

islands are inhabited. With an average GDP growth of between five to six percent over the past decade, the country's GDP per capita stood at USD 3,357 in 2015.² To sustain steady growth in the economy, as well as to meet the increasing demand in energy, Indonesia is striving to harness and manage sustainable sources of energy. The Indonesian government has recently projected that the country's energy demand is likely to grow by around 7 percent per year, with electricity demand alone projected to triple between 2010 and 2030.³ Fortunately, Indonesia is blessed with immense amount of renewable energy resources. It

has been estimated, for example, that the country has 75 GW of hydropower potential, 1,200 GW potential for solar energy, as well as 28 GW, or 40 percent, of global geothermal reserves.⁴ Despite these potentials, Indonesia's renewable energy sources remain under-developed, and this provides vast possibilities for foreign investment to tap into opportunities in this emerging sector.

4.2. Renewable energy sector in Indonesia

With a total value of around 1.4 million BOE in 2015, the primary energy supply for Indonesia is still dominated by oil, coal and natural gas (refer to Figure 4.1).⁵ The use of traditional biomass,

Figure 4.1 Share of primary energy supply in Indonesia 2015⁵

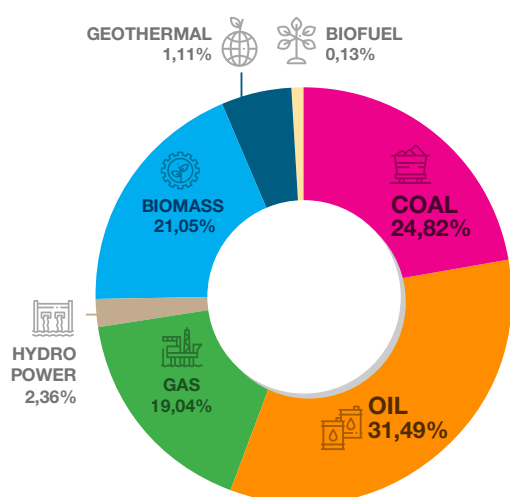
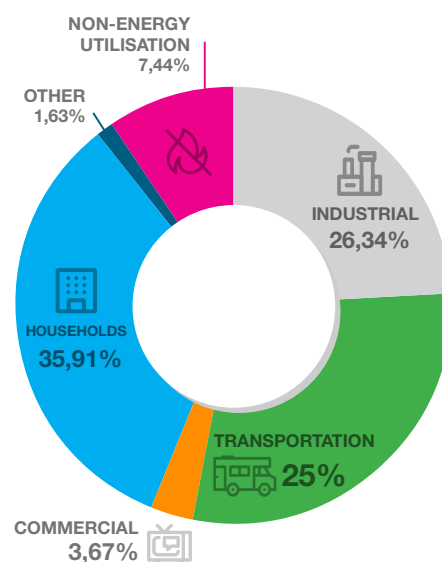


Figure 4.2 Share of final energy consumption in 2015⁶



Source: Ministry of Energy and Mineral Resources of the Republic of Indonesia (2016: 10-11).

which accounts for about 21 percent of the country's primary energy supply in 2015, has been common amongst millions rural households for basic cooking and thermal purposes. The reduction of fossil fuel and the use of traditional biomass are also feasible given the potential wealth of Indonesia's renewable energy sources. As discussed earlier, aside from holding 40 percent of the world's geothermal reserves (28,910 MW), the country also has significant potential for, amongst others, hydropower, solar, biomass, and wind energy potentials (refer to Table 4.1.). Although relatively small in amount, uranium deposits can also be found in Kalan region of the western part of Central Kalimantan.⁶

Table 4.1. Renewable energy resources in Indonesia

No.	Energy type	Resources	Reserves	Potential	Installed capacity
1	Geothermal	12,386 (MWe)	16,524 MWe	28,910 MW	1,403.5 MW
2.	Hydro	75,000 MW		45,379 MW*	8,671 MW
3.	Mini-micro hydro				2,600.76 KW
4.	Biomass	32,654 MWe			1,626 MW (off-grid) and 91.1 MW (on-grid)
5.	Solar energy	4.80 kWh m ² /day			14,006.5 KW
6.	Wind energy	970 MW			1.96 MW
7.	Uranium	3,000 MW			30 MW
8.	Shale gas	574 TSCF			
9.	Coal bed methane	456.7 TSCF			
10.	Wave energy	1,995.2 MW **			
11.	Ocean thermal energy conversion	41,012 MW**			
12.	Tide and tidal wave	4,800 MW**			

Note: * Identified resources; ** Practical potential.

Source: Agency for the Assessment and Application of Technology of Republic of Indonesia (2016: 18).

Indonesia's final energy consumption in 2015 stood at 1,040,677,025 BOE.⁷ At 34 percent, the residential sector dominated the country's energy consumption at the time, and this was followed by the industrial sector (26.34 percent) and transportation (25 percent).⁸ Figure 4.2. illustrates the sectoral share of final energy consumption in 2015.

4.2.1. Biofuel

Biofuel, including biogas and liquid biofuels (e.g. biodiesel and pure plant oil from crude palm oil, and bioethanol derived from cassava and sugar cane), is a logical option for Indonesia when it seeks alternative energy sources. Biofuel productions in the country, which is currently focused on first-generation biofuels (e.g. starch, sugar, animal fats, or crude oil palm), has been viewed as a viable way for the country to reduce oil imports, maintain crops commodity prices at acceptable levels, and reduce carbon emissions.

The combination of an adequate supply of raw material, especially palm oil, and a regulation that requires a mandatory blending scheme have made the use of biodiesel particularly successful in the Indonesian fuel market. So far, up to 7.6 million KL/year has been supplied by 29 biodiesel producers in the country.⁹ Despite the mandatory blending on biodiesel 15, or B-15, for transportation and industry sectors, and biodiesel 30 and 60, also known as B-30 and B-60 respectively,¹⁰ for electricity generation, the government has been having a difficult time to achieving its 3.2 million kl biodiesel production target.¹¹ Aside from inadequate transportation and the lack of blending and storage facilities, low harvest, and the relatively higher price of biodiesel compared to diesel were key reasons for the government not being able to meet the above-mentioned target.

As far as bioethanol is concerned, high production costs still create a major stumbling block in making this renewable energy more commonly used in the market. As a market leader in the liquid retail business, the country's state-owned oil company, or *Pertamina*, is still reluctant to market ethanol-5 (E5)¹² more widely to the public, mostly because the government's unwillingness to subsidise the price difference between bioethanol and gasoline. The situation in 2017 is expected to improve, particularly as subsidies will no longer be applied to the liquid fuel in the market. Accordingly, any additional cost of

blending bioethanol and gasoline will be borne by the consumers. It is also expected that the E5 will be launched in limited geographical locations, including East Java, Bandung, and Jakarta.

4.2.2. Other renewable energy sources for electricity generation

Indonesia still faces massive challenges in ensuring a consistent supply of electricity throughout the country, particularly as the major electricity grid system covers only Java, Madura and Bali. Although 88 percent of Indonesia's population has access to electricity compared to less than 68 percent in 2010, the country still has a low electrification rate compared to countries with similar income levels.¹³ With about 40 million of its population without electricity today, the government is aiming to attain 99 percent electrification rate by 2019.¹⁴

As far as energy mix is concerned, about 88 percent of total electricity generated in the country still came from fossil fuels (e.g. coal, oil, and natural gas) in 2015.¹⁵ To cope with persistent electricity shortages and in anticipation of electricity demand growth of 8.7 percent per year between 2015 and

2019, the Indonesian government launched a programme in 2015 designed to provide an additional 35 GW capacity by 2019. The programme is supported by tailor-made regulations, which includes the development of 210 power plant projects across the country. Unfortunately, it is very likely that fossil fuels continue to be the dominant component of this power capacity enhancement programme. Out of 35 GW capacity mentioned earlier, coal-fired power plants will represent 20 GW, 13 GW for gas-fired project, and the remaining 3.7 GW will be sourced from renewable energy (including 2.4 GW of hydropower, 1.2 GW geothermal, and 120 MW wind energy).¹⁶

Biomass

Another potential use of biomass is for the electricity generation.¹⁷ It has been estimated that Indonesia produces about 146.7 million tonnes of biomass per year, or equal to about 470 GJ per year. Apart from rice, which provides the largest technical energy potential of 150 GJ per year, residues from rubber wood, sugar, and palm oil, each with technical energy potential of 120

GJ per year, 78 GJ per year, and 67 GJ per year respectively, are also main sources of biomass energy in the country.¹⁸ Sources of biomass energy can be found all over the country, though the biggest potential in concentrated scale can be found in Kalimantan, Sumatera, Papua, and Sulawesi.¹⁹

Geothermal

At around 29,000 MW, or 40 percent of the world's potential, Indonesia's geothermal potential is vast, and this can help the country meet the rising electricity demand and electrification rate. Geothermal resources of the country are usually associated with volcanoes found along the islands of Sumatera, Java, Bali, and the eastern part of the country. To date, the country has about ten geothermal fields, with the installed electrical capacities consisting of 1,438 MW, and short-medium term development for 2025 of about 6,000 MWe, or roughly five percent of the total energy needs of the country.²⁰ By 2020, the Indonesian government intends to achieve around 6,000 MW of installed geothermal capacity, or a more than fourfold increase on the end of 2012 capacity of 1,335 MW, which would require strong government support to materialise.²¹

Table 4.2. Geothermal resources and reserves in Indonesia, 2015 (in MW)

No	Location	Number of locations	Resources		Reserves			Total resources and reserves	Total installed capacity
			Speculative	Hypothetic	Probable	Possible	Proven		
1.	Sumatera	97	3,191	2,334	6,992	15	380	12,912	122
2.	Java	73	2,560	1,739	4,023	658	1,815	9,795	1,274
3.	Bali and Nusa Tenggara	33	295	431	1,179	0	15	1,920	125
4.	Sulawesi	14	1,221	318	1,441	150	78	3,208	80
5.	Maluku	33	560	91	800	0	0	1,451	0
6.		27	153	30	0	0	0	183	0
7.	Papua	33	75	0	0	0	0	75	0
Total		330	7,055	4,943	14,435	823	2,288	29,544	1,438

Source: Ministry of Energy and Mineral Resources of the Republic of Indonesia (2016: 99; n.d.).

Hydropower

Table 4.3. Installed capacity of hydropower station in Indonesia

No.	Provinces	Number of power station with hydropower project	Total power generated (MW)
1.	Aceh	1	86.6
2.	North Sumatera	5	915
3.	West Sumatera	3	353.5
4.	Bengkulu	2	226
5.	Riau	1	114
6.	Lampung	2	118
7.	West Java	8	1,952.27
8.	Central Java	10	317.28
9.	East Java	10	293.78
10.	South	1	30
11.	North Sulawesi	5	50.58
12.	South Sulawesi	4	561
13.	Central Sulawesi	3	740

Source: Aiman and Prawara (2014: 17-19).

Indonesia's hydro potential is estimated to be 75,624 MW, but its installed capacity only stands at 3,649 MW, or less than five percent of its potential.²² This energy source can be found in regions that have relatively low power demand and electrification rates, including Sumatera, Sulawesi, Papua, and East Kalimantan (refer to table 4.3.). Whilst larger reservoir-based hydropower projects, including pumped storage hydropower plants, are well suited to supply high power demand regions, such as Java, smaller run-of-the-river hydropower projects are usually suited for rural areas and the eastern provinces of the country.²³ The largest hydropower project currently under construction is the 1,040 MW Upper Cisokan plant, which is a pumped storage project located in western Java.

The project, which is estimated to cost around USD 800 million, with an additional USD 640 million specific investment loan from the World Bank, is aimed to increase the peaking capacity of the Java-Bali grid in an environmentally and socially sustainable way.²⁴

Solar

Located on the equator, most geographical areas of Indonesia are exposed to maximum sun intensity year-round. It has been estimated that the country has an average daily insolation in the range of 4.5 kWh/m² and 5.1 kWh/m², which indicates good solar potential. Solar power is particularly useful for remote areas, as well as communities with limited or no grid connections. Solar energy development in the country is usually appropriate for mini grids

for lighting and thermal purposes, in isolated grids, for solar home systems in very remote, off-grid rural areas, or for solar rooftops in urban areas.²⁵

Relative to its potential, however, the country's present installed capacity is low, reaching only 27.2 MW, but PLN, or the state-owned electricity company, plans to scale up Indonesia's solar capacity, including the development of 620 MW solar plants by 2020.²⁶ In 2016, the Indonesian Ministry of Energy and Mineral Resources also announced its intention to increase the budget for renewable energy by fivefold, from USD 182 million in 2015 to USD 909 million in 2016, with solar projects being set as a top priority component of the new renewable energy budget. Aside from major government buildings in the capital, East Java, Bali, and Aceh, the government is also looking into installing PV systems at airports in East Nusa Tenggara province.²⁷

Wind

Although it was long thought that Indonesia had limited wind power generation potential, recent experience suggests that wind potential of the country may be as high as 9 GW.²⁸ On average, the wind speeds in the country are around three to seven m/s, with an estimated installed capacity potential of around 9.29 GW.²⁹ The areas with the largest wind potential tend to be those that are least populated (e.g. eastern islands that are often lacking adequate transmission infrastructure),³⁰ and, so, wind resources in the country generally fit the design of low speed wind turbines.

The government has, so far, pursued projects to improve the country's wind power capacity. In 2015, for instance, the government launched the first on-shore wind turbine farm in Indonesia. Located in Bantul, in the Special Autonomous Region of Yogyakarta, this was the first large-scale wind energy implementation in the

country that was built under a joint venture between PT Binatek Energi Terbarukan and the UPC Renewables Indonesia Ltd. of the United States.³¹ Subsequently, under a partnership between Indonesia and Denmark, a power purchasing agreement was signed between the two parties to commence another large-scale wind farm project in South Sulawesi. Known as the Tolo Wind Farm Project, this project has been touted by the two countries as an icebreaker project as it demonstrates to domestic and international investors that wind

energy holds a profitable and viable future in Indonesia.³²

4.3. Policy context

4.3.1. Energy policy overview

The present Indonesian energy policy is guided by Government Regulation No. 79/2014 on National Energy Policy.³³ This policy, which replaces the previous 2006 National Energy Policy, emphasises Indonesia's effort to attain energy independence by redirecting its energy resources from being export focused to the domestic market-oriented. The new

energy policy also aims to rebalance the country's energy mix towards indigenous energy supplies, which can also be translated into the minimisation of oil consumption, increase the exploitation and consumption of renewable and coal, optimising gas production and consumption, and consideration of nuclear energy as the option of last resort. This policy also sets out an ambitious energy mix objective by 2025, including 30 percent coal, 22 percent oil, 23 percent renewable resources, and 25 percent natural gas.³⁴ Table 4.5. summarises the main energy policies of Indonesia.

Table 4.4. Wind power potential in Indonesia by provinces (MW)

Province	Potential	Province	Potential	Province	Potential
NTT	10,188	Sulawesi Utara	1,214	Papua Barat	437
JawaTimur	7,907	Lampung	1,137	Sumatera Barat	428
JawaBarat	7,036	DI. Yogyakarta	1,079	Sumatera Utara	356
JawaTengah	5,213	Bali	1,019	Sumatera Selatan	301
Sulawesi Selatan	4,193	Kalimantan Selatan	1,006	Kalimantan Timur	212
Maluku	3,188	Kep. Riau	922	Gorontalo	137
NTB	2,605	Sulawesi Tengah	908	Kalimantan Utara	73
Bangka Belitung	1,787	Aceh	894	Jambi	37
Banten	1,753	Kalimantan Tengah	681	Riau	22
Bengkulu	1,513	Kalimantan Barat	554	DKI Jakarta	4
Sulawesi Tenggara	1,414	Sulawesi Barat	514		
Papua	1,411	Maluku Utara	504		

Source: Directorate General of New, Renewable Energy and Energy Conservation, (2017: 17).

Table 4.5. Energy policies of Indonesia

No.	Official titles of rules or regulations	Official number of rules or regulations	Status and key points
1.	Geothermal Law	Law No. 27/2003	- This Law is superseded by the new Geothermal Law No. 21/2014 (refer to point 10 below). - The law gives powers to regional governments to develop geothermal energy, including the issuing of relevant licenses; - It also allows investors to deal directly with regional governments; and - It provides incentives for investment by establishing long-term licenses for land use (of more than 30 years) and a regulated price for geothermal energy.
2.	Green Energy Policy	Ministerial Decree No. 2/2004	The Policy provides guidelines for the development of renewable energy, including regulatory instruments.

Table 4.5. Energy policies of Indonesia

3.	Blueprint of National Energy Management, 2005-2025	n.a.	Instructs the development of the National Energy Policy, including energy specific programmes and targets.
4.	National Energy Conservation Master Plan	n.a.	Sets the goal of decreasing the country's energy intensity by one percent annually until 2025, which will be done through energy savings of 15-30 percent for industrial sector, 25 percent for commercial buildings, 10-30 percent for households.
5.	National Energy Policy	Presidential Regulation No. 5/2006	- This regulation is superseded by the 2014 National Energy Policy (refer to point number 10 below); and - It sets the 2025 objectives of the country's energy policy, which includes significant reduction of oil use, the increase use of coal, liquefied coal, natural gas, geothermal, biofuel and other forms of renewable energy, reduces energy elasticity to below one, and improves the country's energy infrastructure.
6.	National Biofuel Roadmap, 2006-2025	Presidential Decree No. 10/2006	- Accelerates the use of biofuel as a replacement for fossil-based fuel; and - Sets specific targets for the production and gradual increase utilisation of biofuel from two percent to five percent of energy mix.
7.	Energy Law	Law No. 30/2007	- General principles for the management of the energy resources and government's basic targets for future development of the energy mix; - Sets the foundation for the establishment of the National Energy Council, the main government institution that plans and formulates the National Energy Policy, and specifies the distribution of prerogatives of different branches of the government; and - Gives more power to regional and local governments to develop regional master plans and regulations on energy.
8.	Electricity Law	Law No. 30/2009	- Secures sustainable energy supplies, promotes conservation, and use of renewable energy resources; - Enhance electricity generated by small- and medium-scale of renewable energy power plant (or excess power to be purchased by state- or regional-owned company, or cooperatives; and - Whilst it does not provide a feed-in-tariff, it does provide for different tariffs in different regions, which more accurately reflect the cost of supply.
9.	National Energy Policy	Government Regulation No. 79/2014	- Redirects the focus of Indonesia's energy focus from export to domestic market orientation; - Sets out an ambitious 2025 energy mix target that includes 30 percent coal, 22 percent oil, 23 percent renewable energy, and 25 percent natural gas; - Gradual reduction of natural gas and coal exports; and - Introduces energy emergency policy frameworks and actions.
10.	Geothermal Law	Law No. 21/2014	- It replaces the old 2003 Geothermal Law; and - It relaxes the old legal and regulatory framework, including the removal of geothermal activities under the consideration of mining activities, distinction between direct and indirect utilisation, new restriction on the transfer of licenses and shares in entities holding them, mandatory production bonus payable to the local government in which the geothermal field is located, and the centralisation of the tender process for indirect utilisation projects.

Source: IEA (2008: 30-31); Reegle (2012); IEA and IRENA (n.d.).

4.3.2. Renewable energy policy

Generally speaking, the overall direction of Indonesia's renewable energy is defined by two major policies. The first is the future energy mix that seeks to reduce the country's dependence on oil, and ensures that renewable energy contributes around 23 percent, or 92 MTOE, of total energy use by 2025 (refer to Government Regulation No. 70/2014 on National Energy Policy presented in Table 4.5.). It has been estimated that, to achieve this target, Indonesia would need to secure a total investment of IDR 1,600 trillion (including IDR 475 trillion for geothermal, IDR 645 trillion for bioenergy, IDR 320 trillion for hydro, and IDR 160 trillion for new

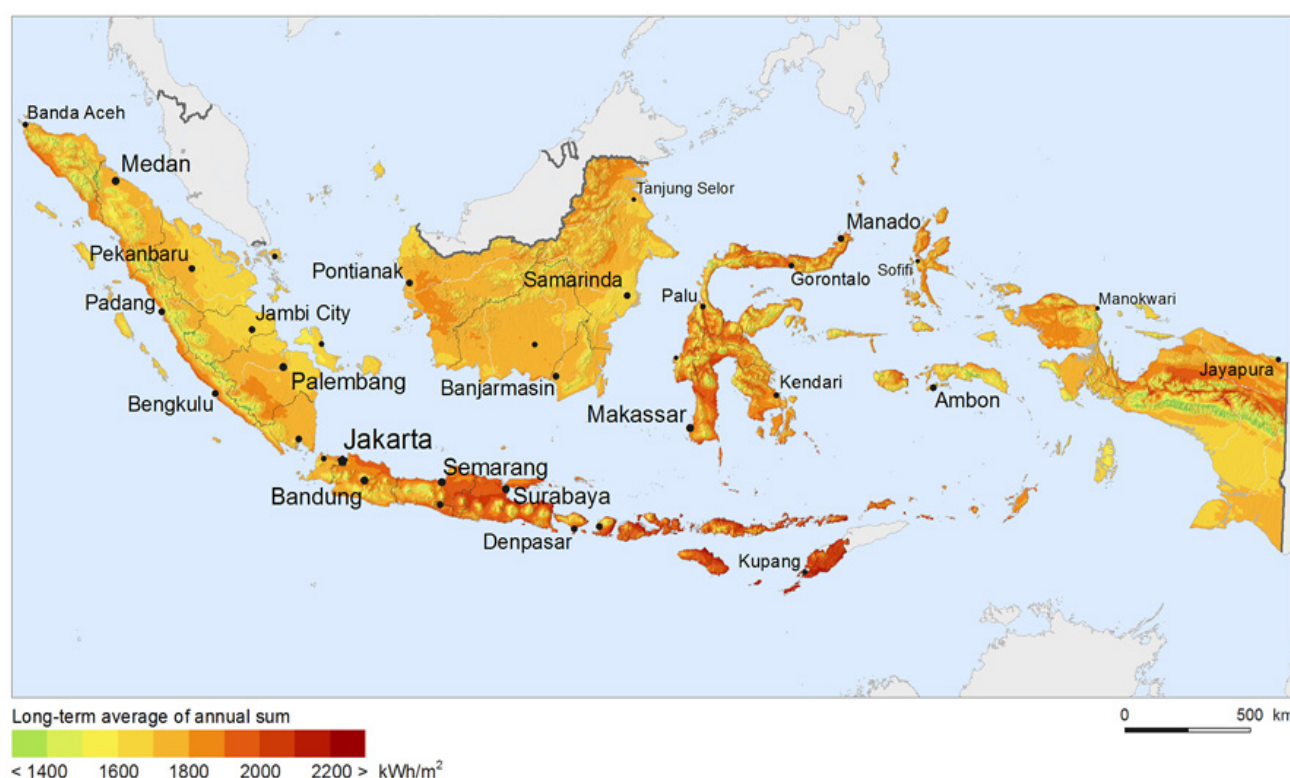
energy).³⁵ The second has to do with Indonesia's international commitment at the 2009 Group of 20 meeting in Pittsburgh, the United States, and, subsequently, at the Conference of Parties 15 in Copenhagen, Denmark, in the same year, to reduce greenhouse gas emission by up to 26 percent if Indonesia were to do it unilaterally, or an additional 15 percent (which would total to 41 percent) if the country manages to secure international support.³⁶ Figure 4.6. illustrates the targeted shift of Indonesia's energy sector proposed by the 2014 National Energy Policy.

Policy for biofuel

The development of biofuel in Indonesia has been governed

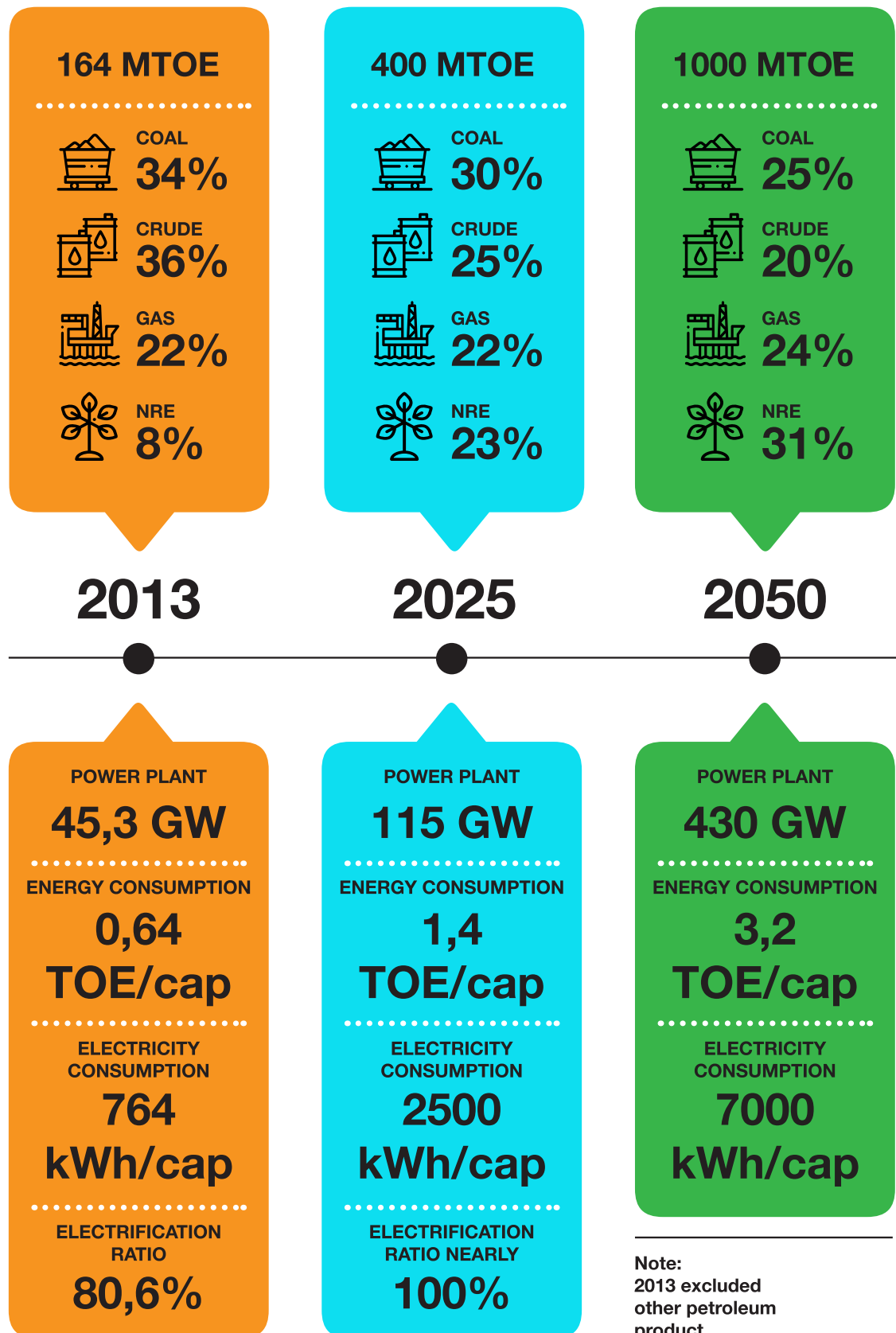
by a number of rules and regulations. Presidential Instruction No. 1/2006 on the Provision and Utilisation of Biofuel was an important step for the development of this form of energy as it governs the procurement and usage of biofuels. Subsequently, Decree No. 10/2006 rules the establishment of a National Biofuels Development Team, which supervises the implementation of the government's various biofuel programmes. The Decree, furthermore, also tasks the National Team with creating a blueprint for biofuels development.

Figure 4.3. National energy target set by the 2014 National Energy Policy



Source: CEST of BPPT (2015: 21).

Figure 4.4. Energy Projection up to 2025 and 2025 according to BPPT Energy Outlook



Source: CEST of BPPT (2015: 21).

Table 4.6. The evolution of biofuel-specific policies in Indonesia

No.	Official titles of rules or regulations	Official number of rules or regulations	Status and key points
1.	National Team for Biofuel Development and Biofuel Roadmap	Decree No. 10/2006	- Accelerates the use of biofuel as a replacement of fossil-based fuel; and - Establishment of the National Team for Biofuel Development to support and coordinate communication between government offices, public, and private stakeholders, as well as creating the Biofuel Road Map establishing a specific agenda for biofuel production targets.
2.	Provision and Utilisation of Biofuel	Presidential Instruction No. 1/2006	The Presidential Instruction establishes the framework for coordination amongst ministries to promote the supply and use of biofuel.
3.	Development Credit for Biofuels and Plantation Revitalisation	Ministry of Finance Regulation No. 117/2006 and No. 79/2007	The Regulation facilitates the provisioning of loans at rate lower than that provided by national banks for farmers, especially those planting palm oil for biofuel.
4.	Biofuel Supply, Utilisation, and Trading	Ministry of Energy and Mineral Resources Regulation No. 32/2008	Sets the mandatory utilisation of biodiesel, bioethanol, and bio-oil in the transportation, industrial, commercial, and power generation sectors from 2009 until 2025.
5.	Biofuel Blending	Ministry of Energy and Mineral Resources Regulation No. 25/2013	An ambitious biofuel programme that aims to diversify domestic biodiesel consumption beyond the transportation sector, or the country's main biodiesel consumer.
6.	Biofuel Blending	Ministry of Energy and Mineral Resources Regulation No. 12/2015	The Regulation revises the previous 2013 Biofuel Blending Regulation.

Source: IEA and IRENA (n.d.).

Following the enactment of Law No. 30/2007 on Energy, which strengthens the use of renewable energy and biofuels, the government also created a biofuel blending mandate in 2008 through the Ministry of Energy and Mineral Resources Regulation No. 32/2008. The mandate has been revised on

several occasions. The recent one was through the Ministry of Energy and Mineral Resources Regulation No. 12/2015, which increases the mandatory biodiesel blending from 10 percent to 15 for transportation and industrial uses, and 25 percent for electricity generation. Given the lack of ethanol infrastructure,

feedstock, supply gaps, and the general focus on diesel, the same Regulation reduces mandatory bioethanol blending from 10 percent to one percent for transportation used by small-scale industry, fishing, and agriculture, and two percent for other types of transportation and industry.³⁷

Table 4.7. Indonesia biodiesel and bioethanol mandatory targets (in percentage)

Biodiesel (minimum)				
Sectors	April 2015	2016	2020	2025
Transportation, public service obligation (PSO)	15	20	30	30
Transportation, non-PSO	15	20	30	30
Industry	15	20	30	30
Electricity	25	30	30	30
Bioethanol (minimum)				
Transportation, PSO	1	2	5	20
Transportation, non-PSO	2	5	10	20
Industry	2	5	10	20

Source: Ministry of Energy and Mineral Resources of Republic of Indonesia (2015).

Policy for electricity generation from renewable energy

At the moment, the majority, or 85 percent of installed power capacity in Indonesia is dominated by the state-owned electricity company, PLN, which is also the sole operator of transmission and distribution services.³⁸ Efforts to encourage private sector's participation in electricity generation, however, are not new. The Ministry of Energy and Mineral Resources Regulation No. 1122 K/30/MEM/2002 on Small Distributed Power Generation Using Renewable Energy, for example, obliges PLN to purchase electricity generated from renewable energy sources by independent power producers. Although the original ruling limits the installation capacity of up to one MW, additional regulation in 2006 adjusted this to 10 MW.³⁹ Furthermore, Ministry

of Energy and Mineral Resources Regulation No. 31/2009 on Small and Medium Scale Power Generation using Renewable Energy extends the obligation of PLN to purchase electricity not only from small-scale renewable energy power plants, but also those of medium-scale ones.⁴⁰

In order to stimulate investment in renewable energy, for the past five years the Indonesian government also employs a feed-in-tariff (FiT), which is a premium price paid to renewable energy generators for a guaranteed period (usually between ten to 20 years) that helps offset the higher capital costs associated with renewable energy projects.⁴¹ The Ministry of Energy and Mineral Resources Decree No. 12/2017 on the Utilisation of Renewable Energy Resources for Electricity Supply prescribes power purchase prices from all existing renewable

energy types such as solar PV, wind, hydropower, biomass, biogas, municipal waste, and geothermal (refer to table 4.8.). It uses the regional PLN's main cost electricity supply as its new reference price and requires PLN to purchase power from renewable energy plants. This regulation is expected to provide the most affordable electricity and to lower the existing cost electricity supply at the associated local grids.

The Ministry of Energy and Mineral Resources Decision No. 1404K/20/MEM/2017 regulates the reference cost of electricity supply. The regulation sets the cost of electricity supply at IDR 983 (approx. USD 7.39 cents) per kWh for 2016, which serves as the power purchasing reference for PLN for the period of April 2017 to March 2018.⁴²

Table 4.8. Electricity purchase tariff from renewable energy plants

Renewable Energy Type	Purchasing Method	Tariff	
		Regional CES > National CES	Regional CES ≤ National CES
Biogas	Reference Price (for ≤ 10MW)	Maximum 85 percent x regional CES	100 percent x regional CES
	Direct Selection (for > 10MW)	Price determined by direct selection process	
MSW	Reference price	Maximum 100 percent x regional CES	Mutual agreement
Geothermal	Reference price	Maximum 100 percent x regional CES	Mutual agreement
Solar PV	Auction based on award capacity	Maximum 85 percent x regional CES	100 percent x regional CES
Wind	Auction based on award capacity	Maximum 85 percent x regional CES	100 percent x regional CES
Hydro	Reference price	Maximum 85 percent x regional CES	100 percent x regional CES
	Direct selection	Price determined by direct selection process	
	Reference price (for ≤ 10MW)	Maximum 85 percent x regional CES	100 percent x regional CES
	Direct selection (for > 10MW)	Price determined by direct selection process	

Source: Ministry of Energy and Mineral Resources of the Republic of Indonesia (2017a).

4.3.3. Investment policy, incentives, and procedure for renewable energy sector

Investment policy

Indonesia recognises two types of investments, including direct, where investors make direct investment in a company, both to establish a presence and participate in management, and indirect, or portfolio, investments. Direct foreign investment is regulated under Law No. 25/2007 concerning Capital Investment (or 'Investment Law'), and must be carried out in the form of a limited liability company where a foreign investor holds shares in a so-called 'PMA Company or PT. PMA (*Perseroan Terbatas Penanaman Modal Asing*)' incorporated in Indonesia. In other words, an investor is required to go in partnership with an Indonesian person or entity as shareholders, with the former able to have between 30-95 percent ownership in various

sectors, or even up to 100 percent, though this varies within sectors and business fields.⁴³ Incorporated companies are subject to Law No. 40/2007 concerning Limited Liability Companies.

Approval for all forms of foreign investment is carried out by the Investment Coordinating Board (BKPM – *Badan Koordinasi Penanaman Modal*), except in banking and other financial services, oil, gas, and portfolio investments. Foreign investors are also required to submit periodic investor activity reports to the BKPM, summarising their investment progress or obstacles in pursuing their activities.

Prior to the enactment of Ministerial Decree of the Minister of Energy and Mineral Resources No. 12/2017 on the Utilisation of Renewable Energy Sources for the Supply of Electricity, investments in the power sector that used renewable energy resources were governed by a series of ministerial regulations that covered

specific renewable energy resources concerned. The new Ministerial Decree above provides clearer mechanisms for PLN to purchase electricity from renewable energy resources. Some key points of this new regulation include the following:

- The capping of electricity tariff at 85 percent of the electricity supply costs of any regions whose electricity supply costs are higher than the national average (this, however, does not apply to geothermal and waste-to-energy plants); and
- It gives PLN the annual responsibility to propose the domestic electricity supply costs to the Ministry of Energy and Mineral Resources for the basis of national electricity rates.⁴⁴

Investment incentives

Incentives available for renewable energy investment in Indonesia are summarised in Table 4.9.

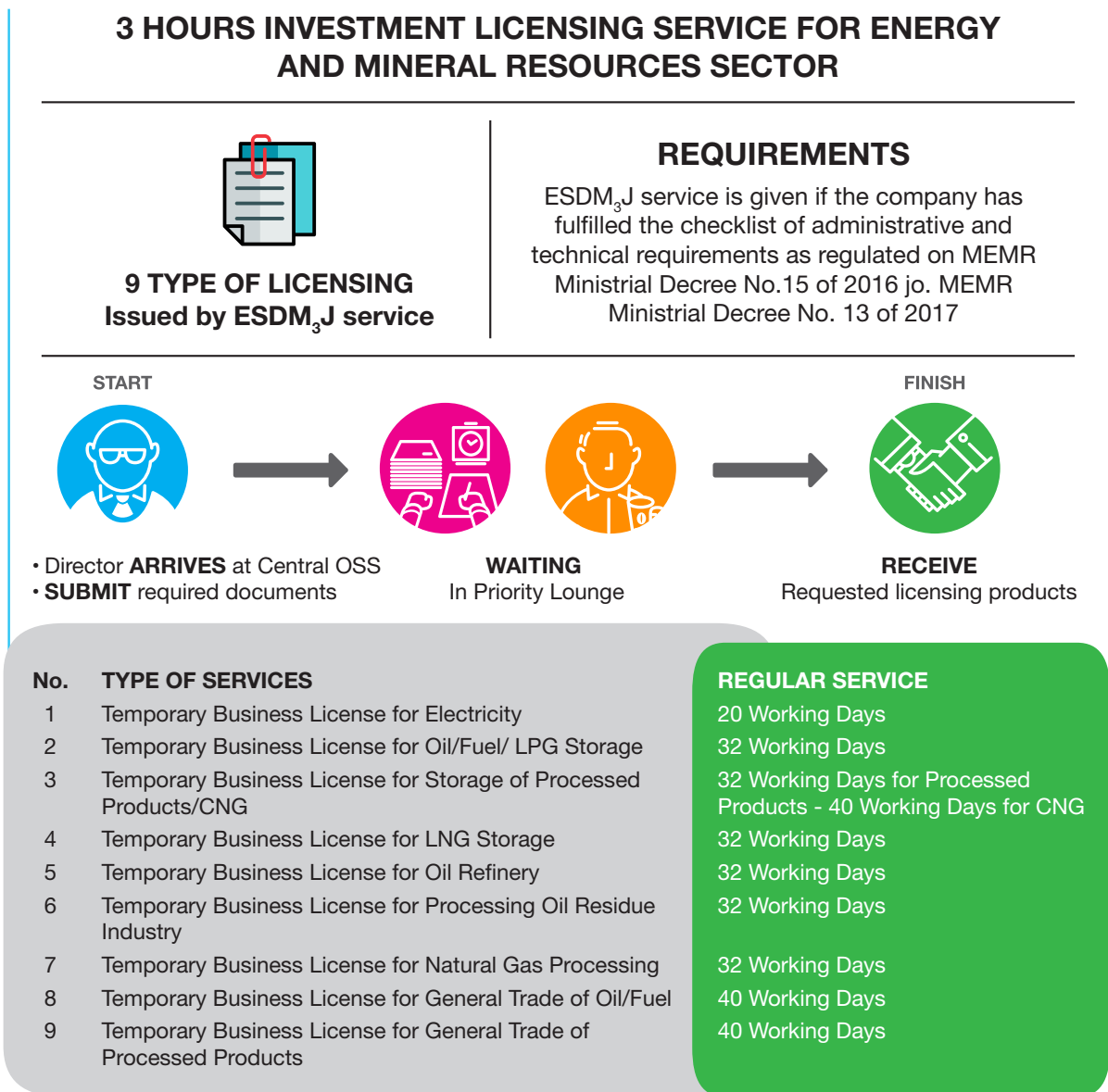
Table 4.9. Investment incentives for renewable energy in Indonesia

Type of incentive	Laws/regulations	Description of incentives
Import duty exemption	Minister of Finance Regulation No. 76/PMK.011/2012	All green-field or expansion investment projects are granted import duty exemption on imported machineries, equipment and raw materials (for two years) for the company usage during initial production period, provided that they are not or inadequately produced in Indonesia.
Tax allowance	Government Regulation No. 18 of 2015	• A reduction in net income of up to 30 percent of the amount invested, pro-rated at five percent for six years of the commercial production, provided that the assets invested are not transferred out within six years; • Acceleration of depreciation & amortization for building and non-building; • A reduction of income tax on dividends paid to non-residents to ten percent or lower rate according to double taxation avoidance agreement; and • Extension of tax losses carry forwards for five years and up to ten years (according to certain criteria).
Tax holiday	Ministry of Finance Regulation No. 159/PMK.011/2015	Corporate income tax exemption between five to 15 years from the start of commercial production is granted for companies with minimum investment project value of IDR 1 Trillion (approx. USD 69 million).

Feed-in Tariff	Ministry of Energy and Mineral Resources Decree No. 12/2017	- Under the Power Purchase Agreement, the state-owned electricity company, or PLN, is obliged to purchase electricity generated from renewable energy sources from up to 10 MW power plants owned by independent power producers; <i>Ceiling Price</i> mechanism regulates maximum offering price submitted by bidding participants (e.g. independent power producers) during the procurement of hydropower and geothermal power plants; and - Feed-in-Tariff and Ceiling Price under the Power Purchase Agreement can also be negotiated with PLN, though this may subject of approval from Minister of Energy and Mineral Resources.
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Source: Directorate for Infrastructure Planning of the Indonesian Investment Coordinating Board (2015: 1-2).

Figure 4.5. Three hours investment licensing procedure for energy and mineral resources sector



OSS : One Stop Service (PTSP), MEMR : Minister of Energy and Mineral Resources

Source: Indonesia Investment Coordinating Board (2015).

General investment procedure for renewable energy projects

The Indonesian government has recently launched a specific, simplified, investment procedure for investment to be made in energy and mineral resources sector. Known as the *ESDM3J* (which basically translates to three hours service for investment in energy and mineral resources), this procedure, which is regulated under the Decree of the Minister of Energy and Mineral Resources No. 15/2016, is applicable for investors or developers wishing to pursue general electricity generation business in the country.⁴⁵ Under this initiative, all licensing requirements can be issued within three hours by the Investment Coordinating Board if the following requirements are satisfied by potential investors or developers:

The submission of the completed registration form;

- Administrative requirements, which may include profile and identity and tax registry number of potential investors or

- developers; and
- Technical requirements, such as pre-feasibility study and license for electricity generating services that can be obtained from the Directorate General of Electricity of the Ministry of Energy and Mineral Resources.

As for other requirements for renewable energy investment in Indonesia, these are summarised in Table 4.10.

4.4 Barriers for renewable energy development⁴⁶

• Infrastructure barriers

Limited infrastructure capacity hinders effective renewable energy deployment in Indonesia, and this is particularly so with regard to electricity transmission. As a result of the country's archipelagic nature, the electrical grid system in Indonesia remains fragmented, with the existing system mostly concentrated on the islands of Java and Bali. This barrier has made it difficult

for Indonesia's major power grid to be connected to various renewable energy potential that exists throughout the country.

• Limited funding support

Despite numerous incentives to support the development of renewable energy, the cost to use electricity from this type of energy remains high. At the same time, however, the government also lacks adequate capacity to fund the development of high-cost renewable energy projects.

• Technical barriers

Aside from the difficulty of and high cost associated with the process of obtaining relevant permits and licenses, the lack of information and data makes the exploration of renewable energy sources in Indonesia to be high. Other technical barriers associated with the exploration of renewable energy projects normally include environmental impact assessment, land acquisition, as well as other social issues.

Table 4.10. Requirements for renewable energy investment in Indonesia

Type	Law/regulation	Requirements & key points
Minimum capital	Investment Coordinating Board Regulation No. 12/2013	Minimum investment value for foreign direct investment is IDR 10 Billion (approx. USD 690,000), with minimum paid-up capital of IDR 2.5 billion (approx. USD 175,000).
Business model	Law No. 30/2009 on Electricity	• Public or private sector are allowed to participate on power generation, transmission, distribution, sales of electricity as Independent Power Producer or Private Power Utility; • Private Power Utility must hold an Operating License (<i>Izin Operasi</i>) from the Directorate General of Electricity of Ministry of Energy and Mineral Resources; • Private Power Utility is allowed to sell excess capacity to the state-owned electricity company, or PLN, or directly to end-customer, subject to approval of relevant minister, governor, or mayor/regent; and • Private power utility may rent PLN's grid under Power Wheeling mechanism.
Share ownership	President Regulation No. 39/2014	• Foreign investors are allowed to invest in small scale power generator (1-10 MW) projects with maximum share ownership of 49 percent; • Greater scale (> 10 MW) of power generator is allowed with maximum 95 percent foreign share ownership; and • 100 percent ownership under Public Private Partnership scheme during concession period is allowed.

Source: Directorate for Infrastructure Planning of the Investment Coordinating Board (2015: 1).

• **Lack of awareness and public support**

Despite increased publication and information dissemination concerning sustainable development-related issues, a large portion of the Indonesian public remains unaware about renewable energy and its potential. The lack of use of renewable energy-related technologies is particularly apparent amongst, for example, land and building owners, industrial players, private car owners, and so on. All these hinder support for the deployment of renewable energy in the country.

4.5. Institutional framework

Generally, renewable energy deployment and development is the core responsibility of the Ministry of Energy and Mineral Resources. The Ministry has a specific and dedicated Directorate General of New Renewable Energy and Energy Conservation, whose main tasks include the design and implementation of renewable energy policies.⁴⁷ Other key renewable energy-related government institutions are presented in Table 4.11.

4.6 Setting up a business in Indonesia

Table 4.12. summarises the process of setting up a business, including the length of time and cost required, in Indonesia.

4.7 Other relevant information

4.7.1 Taxes

Table 4.13. summarises various tax rates and facilities in Indonesia.

Table 4.11. Main renewable energy-related institutions in Indonesia

Institutions	Key roles and responsibilities
Ministry of Energy and Mineral Resources	- Responsible for the development and implementation of energy policy; - Issues business license for energy-related businesses or projects; and - Supervises and manages all activities and policies related to energy.
Directorate General of New Renewable Energy and Energy Conservation of the Ministry of Energy and Mineral Resources	- Designs and implements policies related to renewable energy and energy conservation; - Builds infrastructure to support renewable energy deployment; - Provides consultation and supervision for renewable energy development; and - Evaluates and reports activities on renewable energy development.
Directorate General of Electricity of the Ministry of Energy and Mineral Resources	- Issues electricity generation-related licenses; and - Responsible for the design and implementation of policies related to electricity.
Pertamina (state-owned oil enterprise)	Key institution responsible for the distribution and commercialisation of liquid fossil fuel and renewable energy fuel, such as biodiesel.
PLN (state-owned electricity company)	- Monopoly of transmission, distribution, and supply of electricity to the public; - Purchases and sells electricity from independent power producer or private power utility.
Investment Coordinating Board	- Regulates and promotes domestic and foreign investment in Indonesia; - Issues investment licenses for investment in energy and mineral sector; and - Implements various policies and regulations related to investment in renewable energy.
Ministry of Environment and Forestry	- Promotes and supports the use of renewable energy as a means to achieve sustainable development; and - Implements programmes and projects related to environmental protection and energy conservation to mitigate climate change impacts.
Ministry of Finance	Regulates and implements various tax and financial incentives for renewable energy investment and development.

Source: Various.

Table 4.12. The process of setting up a business in Indonesia

No.	Procedure	Time to complete (day)	Cost to complete (in IDR)
1.	Obtaining standard form of the company deed and clearance for company's name at the Ministry of Law and Human Rights	4	200,000 (name reservation and clearance)
2.	Notarise company's documents before a public notary	4	2,526,816 (notary fee)
3.	Pay the State Treasury for the non-tax state revenue fees for legal services at a bank	1	200,000
4.	Apply to the Ministry of Law and Human Rights for approval of the deed of establishment	7	1,580,000 (1 million for validation of company as a legal entity, 30,000 for publication in the State Gazette, and 550,000 for publication in the Supplement to the State Gazette)
5.	Apply at the One Stop Service for the Business Trading Licence (SIUP) and the Company Registration Certificate	15	500,000
6.	Registration with the Ministry of Manpower (this procedure can be completed concurrently with other post-registration procedures by filing the manpower compulsory report and company regulations with the Ministry of Manpower)	14	No charge
7.	Apply for the Workers Social Security Programme, also known as the <i>Program Jamsostek</i>	7	No charge
8.	Obtain a taxpayer identification number (NPWP) and a value-added tax collector number	1	No charge

Source: World Bank (n.d.).

Table 4.13. Tax rates in Indonesia

Personal income tax		
Taxable income (in IDR)	Rate (in percent)	Taxed amount (in IDR)
First 50 million	5	2.5 million
Next 200 million	15	30 million
Next 250 million	25	62.5 million
Next over 500 million	30	30 percent of the relevant amount
Corporate income tax	25 percent (flat rate)	
Value added tax	Generally 10 percent, but 0 percent VAT may be applicable to: (1) export of taxable goods; (2) export of intangible taxable goods; (3) export of certain taxable services (e.g. toll manufacturing, repair and maintenance services related to movable goods utilised outside the customs zone, or construction service related to immovable goods that are located outside the customs zone.	
Withholding tax	Between 0.3 to 7.5 percent of import values or selling prices.	
Luxury goods sales tax	Between 10 to 125 percent for motor vehicles, and between 10 to 75 percent for taxable goods other than motor vehicles.	
Tax holidays	To be eligible for this facility, a company must be incorporated in Indonesia no earlier than 14 th August 2010, and should have legalised new capital investment plan of minimum IDR 1 trillion, 10 percent of which should be deposited in local banks.	

Source: PwC (2015); Deloitte (2015).

4.7.2 Labour condition landscape and employment system⁴⁸

Despite its improved standing in global economic community, Indonesia is finding it more difficult to respond to the skills needs of its workforce at a time of increasing globalisation, new technology, and changing patterns of work. Aside from out-migration, the shortages of skilled labour in the country are also due to an ageing workforce and the lack of capacity to provide

adequate training to the country's 120.1 million workforce.⁴⁹ To date, the country's workforce consists largely of people with lower than an upper-secondary education (around 45 percent), though the proportion of people with high-school diploma and university degree has steadily risen over the years (to around 22 and 8 percent of people aged over 25 in 2015 respectively).

In terms of the employment system, foreign nationals are allowed to work in Indonesia providing that the

work to be performed cannot be performed by Indonesian nationals, and is not prohibited by prevailing laws and regulations of the country. This requirement, however, may be subject to additional regulations in a number of sectors. Indonesian labour laws and regulations apply to both Indonesian and foreign workers. Law No. 13/2003 on Manpower provides guidelines on employment relationship, employment terms and conditions, and employment termination.

Regions	Minimum wages (in IDR)
Special autonomous region of Aceh	2,118,500
Northern Sumatra	1,811,875
Western Sumatra	1,800,725
Southern Sumatra	2,206,000
Riau	2,095,000
Riau Islands	2,178,710
Jambi	1,906,650
Bangka-Belitung Islands	2,341,500
Bengkulu	1,605,000
Special Capital Region of Jakarta	3,100,000
Banten	1,784,000
Western Lesser Sunda Islands	1,482,950
Eastern Lesser Sunda Islands	1,425,000
Western Borneo	1,739,400
Southern Borneo	2,085,050

Table 4.14. Minimum wages in Indonesia, 2016

Regions	Minimum wages (in IDR)
Central Borneo	2,057,550
Eastern Borneo	2,161,253
Moluccas	1,775,000
Northern Moluccas	1,681,266
Gorontalo	1,875,000
Southeastern Sulawesi	1,850,000
Central Sulawesi	1,670,000
Western Sulawesi	1,864,000
Southern Sulawesi	2,250,000
Northern Sulawesi	2,400,000
Papua	2,435,000
Western Papua	2,237,000
Lampung	1,763,000
Western Java	2,250,000
Central Java	1,100,000
Eastern Java	1,283,000
Special Region Yogyakarta	1,108,249
Bali	1,807,600

Source: Wage Indicator (n.d.).

4.7.3 Social security system⁵⁰

As part of the broader changes in the Indonesian social security system, the Indonesian social security agency, also known as the *Jamsostek*, is now known as the Social Security Organising Agency (BPJS – *Badan Penyelenggara Jaminan Sosial*), with separate administration for health and social security programmes. Under the new

BPJS social security programme, any foreign nationals working in Indonesia for more than six months would be required to participate, regardless of any home country coverage. Under the BPJS scheme, social security contributions of employee are calculated as follows:

- Work accident insurance – contribution between 0.24 percent to 1.74 percent to be

paid by employer;

- Life insurance benefit – contribution of 0.3 percent to be paid by employer; and
- Pension – employer contribution of 3.7 percent and employee contribution of 2 percent.

When leaving Indonesia at the end of their assignment, foreign

nationals are permitted to withdraw the pension component of this social security scheme.

4.7.4 Land policy

The Indonesian constitution rules that all land, water, air space, and natural resources are controlled by the state, and must be used for the welfare of the general population. The Basic Agrarian Law, or Law No. 5/1960, further reiterates that land is controlled by the state on behalf of the people, and should be made available for distribution to citizens under various forms of land tenure. The National Land Agency, or the *Badan Pertanahan Nasional*, is the main agency responsible for the formulation and implementation of land-related policies, including, but not limited to, land surveys and mapping, land registration and ownership, and so on.

Foreigners, in principle, are not eligible to own land in Indonesia, but they can be granted some other types of land use rights. The above-mentioned Basic Agrarian Law sets six forms of land rights, including:

- Right of ownership (*hak milik*), which is the most solid land rights of all. It is a freehold title that can be bought, sold, mortgaged, and inherited. Unfortunately, this form of land rights is only applicable for Indonesian individuals and corporations;
- Right to cultivate or exploit (*hak guna usaha*), which is the right to use state-owned land for agricultural and aquaculture purposes for a period of up to 35 years with 25 years extension. This type of land rights is also only applicable to Indonesian citizens or corporate bodies incorporated under Indonesian law and domiciled in Indonesia;
- Right to build (*hak guna bangunan*), which is the right accorded to both domestic and foreign companies and individuals to construct a

building on a plot of land for a period of up to 20-30 years, which is extendable through the approval of the National Land Agency;

- Right to use (*hak pakai*), which is the right for land use for a specific and agreed purpose for a defined amount of time. This type of right is applicable for Indonesian nationals, foreigners domiciled in Indonesia, foreign investment companies and their representative offices;
- Right to lease (*hak sewa bangunan*), which is the right to rent land for building purposes within an agreed time period by the parties involved. The user of this right is obliged to make rental payments to the land owner. This type of right can be held by a foreigner residing in Indonesia, or an Indonesian branch of a foreign company. However, the right to lease is basically an informal agreement that is neither certified nor registered with the land authorities. Accordingly, legal protection of those engaged in this is relatively unclear; and
- Right to clear the land and to collect forest products (*hak untuk membuka tanah dan memungut hasil hutan*), which is only applicable for Indonesian citizens.

Along with the increasing number of high rise apartment buildings in Indonesia, the concept of *strata title* is becoming quite popular in the country. It is basically the right of use of an apartment (vertical space as opposed to land), which can be purchased by a foreigners who resides in or has a regular presence in Indonesia.

4.7.5 Commercial dispute settlement

Arbitration in Indonesia is governed under Law No. 30/1999, dated 12th August 1999, on Arbitration and

Alternative Dispute Resolutions. This arbitration law recognises and regulates domestic and foreign arbitration.⁵¹ Unlike in many jurisdictions, however, the arbitration law in Indonesia is not based on the United Nations Commission on International Trade Law Model Law on International Commercial Arbitration.⁵² The Indonesian Chamber of Commerce and Industry promoted the establishment of the Indonesian National Board of Arbitration, or *Badan Arbitrase Nasional*, in 1977, which has its own rules and procedures. The existing arbitration law stipulates that only disputes in the commercial sector (e.g. commerce, banking, finance, capital investment, industry, and intellectual property rights), which concerns rights fully controlled by the parties in dispute, can be settled by arbitration.

4.8. Electronic links to relevant government agencies related to renewable energy

- Ministry of Energy and Mineral Resources (MEMR): <<https://www.esdm.go.id/>>.
- Directorate General of New Renewable Energy and Energy Conservation of the Ministry of Energy and Mineral Resources: <<http://ebtke.esdm.go.id/>>.
- Ministry of Environment and Forestry: <<http://www.menlhk.go.id/>>.
- Investment Coordinating Board of the Republic of Indonesia (BKPM): <<http://www.bkpm.go.id/>>
- Pertamina (state-owned oil and mining enterprise): <<http://www.pertamina.com/en/>>.
- PLN (state-owned electricity enterprise): <<http://www.pln.co.id/>>.

AEC business tip for Indonesia

Not only the largest country in terms of economic potentials in Southeast Asia, Indonesia's renewable energy potentials are also huge. Supported by a relatively solid domestic economy and a government that embraces market-oriented reforms, Indonesia has been one of the strongest performing emerging market economies in recent years. Despite these potentials and ongoing reforms, Indonesia has been considered one of the most difficult markets to penetrate in ASEAN. Apart from rampant use of non-tariff measures or non-tariff barriers, complex bureaucracy, lack of transparency, high logistics costs, and poor infrastructures are often cited as major stumbling blocks that prevent ASEAN and non-ASEAN businesses to invest in the country. In addition to the present government's initiatives to continuously pursue economic reforms, Indonesia's participation in the AEC can be expected to help in reducing investment barriers in the country. ACIA, for example, encourages non-discrimination and transparency of complex rules, regulations, and standards commonly found in various sectors in the country. ASEAN's connectivity plan also facilitates infrastructure developments that are badly needed to reduce the cost of doing business and support the high-cost renewable energy development in Indonesia.

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5. LAO PEOPLE'S DEMOCRATIC REPUBLIC (LAO PDR)

LAO PEOPLE'S DEMOCRATIC REPUBLIC

5.1. Brief country profile

Although considered one of Asia's smallest economies, the Lao People's Democratic Republic (Lao PDR), also popularly known as *Laos*, along with Cambodia and Myanmar, is also amongst one of the region's fastest growing economies.¹ A lower-middle-income economy, the only landlocked country in ASEAN has been experiencing an average of eight percent GDP growth over the past decade.² Since pursuing major economic reforms in mid-1980s, Lao PDR has witnessed remarkable economic growth, macroeconomic stability, significant rise in public and private investment, as well as improvement of economic activities at both regional and global levels.³ Despite having a relatively small GDP per capita compared to its immediate ASEAN neighbours (USD 1,818 in 2015, or third lowest in ASEAN after Cambodia and Myanmar),⁴ the country has vast growth potential. Supported by a healthy pipeline of power projects and growing opportunities in the non-resource sectors resulting from closer ASEAN integration, the economy of Lao PDR is projected to expand around 7 percent between 2017 and 2019.⁵ Moreover, despite lacking conventional energy sources, such as oil and natural gas, Lao PDR is reportedly blessed with abundant renewable

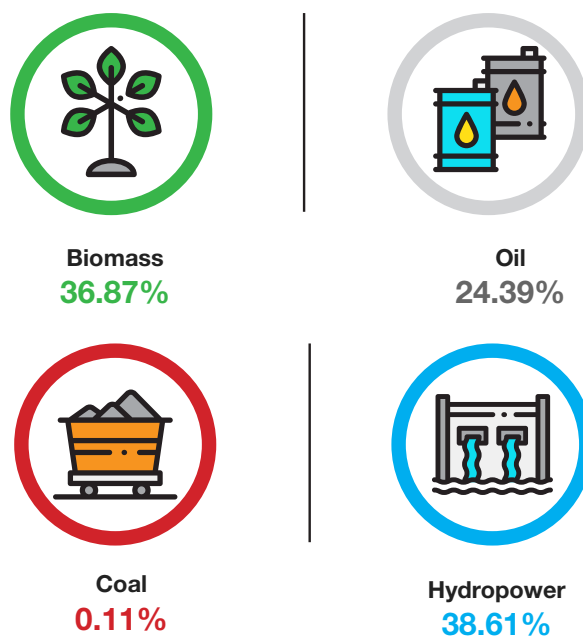
energy resources, such as biomass, hydropower, and solar energy.⁶ Notwithstanding these potentials, vast amount of investments is needed for the country to be able to tap into its renewable energy potentials.

5.2. Renewable energy sector in Lao PDR

To date, hydro and traditional biomass dominates energy supplies in Lao PDR. Back in 2013, the country's total primary energy supply

was 2.47 Mtoe, which consisted mainly of hydro (1.33 Mtoe), biomass (1.27 Mtoe), oil (0.84 Mtoe), and coal (0.004 Mtoe) (refer to Figure 5.1).⁷ With regard to energy consumption, the transportation sector experienced the highest growth rate during the period from 1990 until 2013, with an annual average of 7.3 percent.⁸ The second fastest growing sector was the industrial sector with a growth rate of 6.4 percent per year, and this was followed by other sectors (residential, agriculture, services, and commerce) with an average growth of 2.1 percent annually.⁹

Figure 5.1. Share of primary energy supply in Lao PDR, 2013



Source: Kouphokham (2016: 194 & 201).

To ensure energy security, sustain socio-economic development, and enhance environmental and social sustainability in the country, the government of Lao PDR actively promotes the development of renewable energy. The government also pursues such a strategy to reduce the country's reliance on imports of petroleum products. To date, policies to promote and develop renewable energy in the country has been materialised in small power development and the improvement of grid connection.¹⁰

5.2.1. Biofuel

With transportation fuel demand projected to increase by 5 percent annually, from 607 million litres in 2010 to more than 1,300 million litres in 2025, the government of Lao PDR expects to meet at least 10 percent of the sector's needs with domestically produced biodiesel and bioethanol.¹¹ Given this target, Lao PDR will be required to produce about 70 million litres of biodiesel and 70 million litres of

bioethanol by 2025.¹² Whilst several public and private organisations have been involved in biofuel promotion and production, most companies have initially targeted the export market. For example, KOLAO Farm and Bio-energy Co. Ltd., Lao PDR's biggest biodiesel producer, reportedly produced 100,000 litres of oil from 400 tons of *Jatropha* seeds in 2009.¹³

5.2.2. Other renewable energy sources for electricity generation

With a total of 5,813 MW of electricity generated in 2015, all of Lao PDR's electricity came from renewable energy sources. At the time, with a total 3,849 MW, hydropower made the largest contribution to electricity generation in the country, and this was followed by thermal power (1,878 MW), biomass (39.7 MW), and solar (0.8 MW) (refer to Figure 5.2.). From the total installed electricity capacity, *Electricité du Laos*, a state-owned enterprise that owns and operates electricity generation, transmission, and distribution, only accounted for around 10 percent of electricity

production, whilst independent power producer companies and private companies accounted for around 90 percent of electricity production.¹⁴ Amongst renewable energy sources, hydropower currently receives the biggest attention from the Laotian government.¹⁵

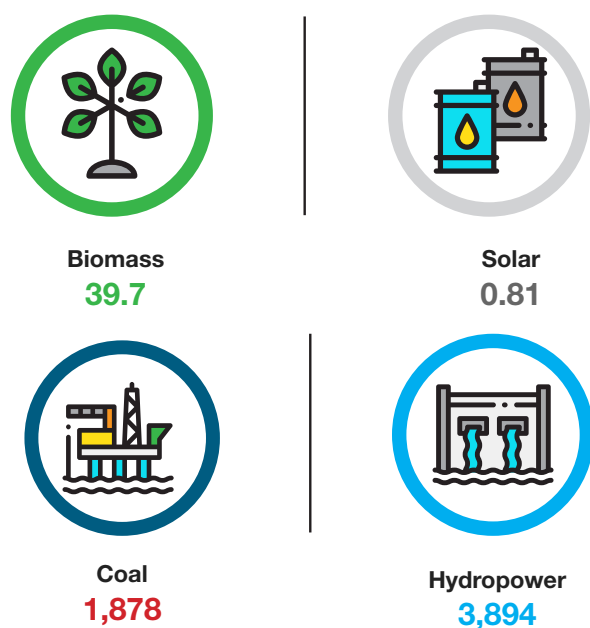
Hydropower

With a total theoretical potential of 26.5 GW, Lao PDR is one of the richest ASEAN countries in terms of hydropower resources.¹⁶ In 2015 alone, total installed hydropower capacity in the country reached 4,168 MW. As part of its *intended nationally determined contribution* within the context of the United Nations Framework Convention on Climate Change, the government had indicated its intention to reach the target of 5,500 MW installed capacity by 2020, and a further 20,000 MW after 2020.¹⁷ At around the same time, it was also reported that there were 15 on-going hydropower plant projects in the country, most of which are expected to be completed between 2016 and 2020.¹⁸

Solar

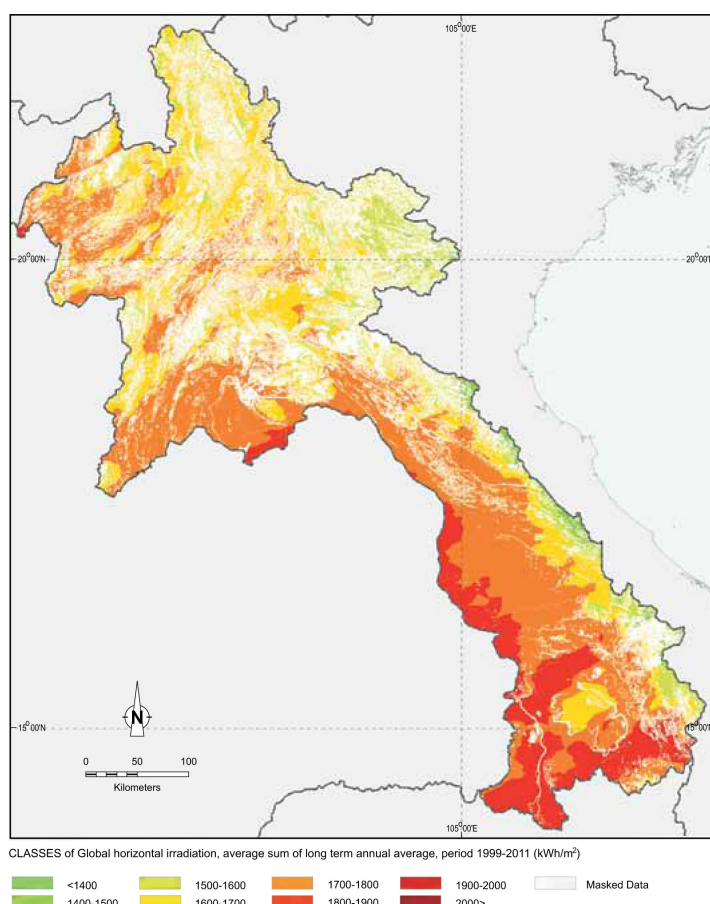
Due to the country's mountainous topography, especially that in the northern region, only 60 percent of land area in Lao PDR is suitable for large-scale solar Photovoltaic (PV) installations (refer to Figure 5.4.). Despite this, estimated to be around 11.7 TWh per year, the country's solar energy potential is quite vast.¹⁹ Lao's initial solar power project, which has recently been set up in Vientiane, is expected to generate around 32-50 MW between 2017 and 2018, and up to 100 MW by 2020.²⁰ Solar energy is a viable alternative for the rural population that are not connected with the country's electricity grid.

Figure 5.2. Share of electricity generation in Lao PDR, 2015 (in MW)



Source: Department of Energy Policy and Planning, Ministry of Energy and Mines (2017: 4).

Figure 5.3. Areas potentially suitable for Solar PVC development in Lao PDR



Data sources:
 Solar radiation (Same as in example)
 Elevation and Slope dataset : SRTM3
 Water bodies: data processed from SWBD - SRTM3
 Urban areas GeoModel Solar
 Protected areas: WDPA 2010

Source: GeoModel Solar; Lahmeyer International in ADB (2015: 34).

Table 5.1. Solar energy potentials in Lao PDR

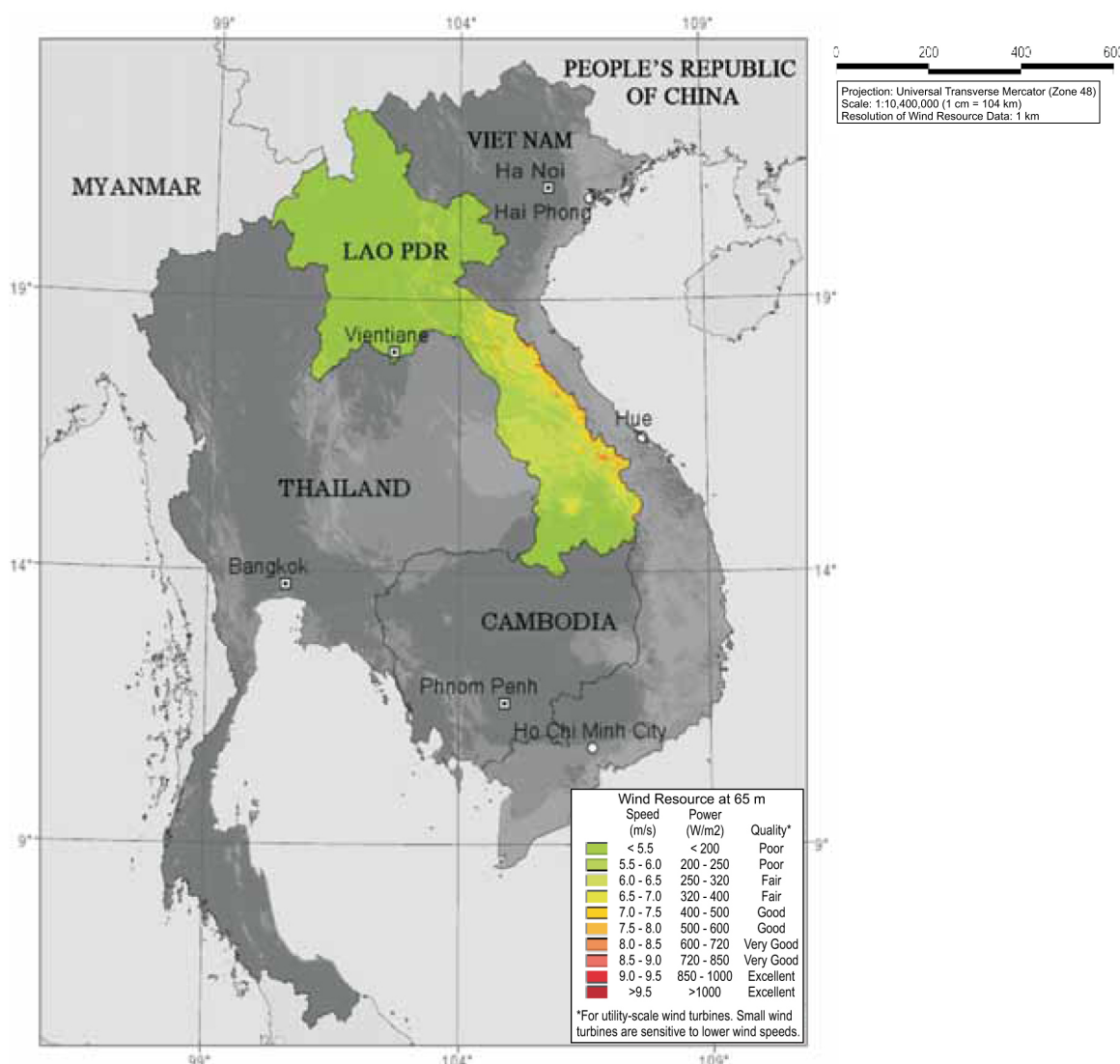
	Potential suitable area	Percentage of total	Technical potential		Levelised cost of electricity
Area (km ²)	('000 km ²)	Area	MWp	MWh/yr	(\$/kWh)
Unsuitable area	89.24	37.80	...	...	...
1,200–1,300	0.09	0.04	5.5	5,613	0.251
1,300–1,400	1.88	0.80	112.7	125,148	0.233
1,400–1,500	12.84	5.44	770.1	918,500	0.217
1,500–1,600	41.02	17.38	2,461.4	3,137,931	0.203
1,600–1,700	69.14	29.29	4,148.7	5,630,307	0.190
1,700–1,800	21.89	9.27	1,313.2	1,890,265	0.180
1,800–1,900	n.a.	n.a.	n.a.	n.a.	0.170
1,900–2,000	n.a.	n.a.	n.a.	n.a.	0.161
Over 2,000	n.a.	n.a.	n.a.	n.a.	0.157
Total			8,812	11,707,764	

Note: km²: square kilometer; MWh: megawatt hour; Wp: megawatt peak
 Source: ADB (2015: 35).

Wind

Lao PDR has a considerable wind resource potential. Around 20 percent of the country's total land area has an average wind speed greater than 6 m/s, which is the minimum speed needed for modern wind turbines.²¹ The theoretical wind energy potential in the country is estimated to be more than 182,000 MW.²² The Laotian government is reportedly to have approved the development of the country's first wind energy project in 2015. The project aims to develop 600 MW wind energy project in some part of the country's provinces.²³

Figure 5.4. Areas with good wind energy resources in Lao PDR



Source: World Bank (2001).

Biomass

As the main resources for biomass, wood and charcoal make up almost 70 percent of Lao PDR's energy mix today, and this give rise to concerns over extensive deforestation in the country. Biomass in the country is usually coming from agricultural residues from household cooking, heating, as well as electricity generation-related commercial activities. As 80 percent of Lao PDR's population depends on farming and natural resources for their livelihood, the country has a large potential of agricultural waste. Some potential sources for biomass from agricultural production in the country include residues from rice, maize, and sugarcane.²⁴

Biogas

As part of its strategy to improve rural livelihoods, the government of Lao PDR promotes the use of biogas generated from animal (e.g. cow, buffalo, and pig) manure as household energy fuel. The country has considerable potential for biogas production as around half of household farms in Lao PDR raise buffalo, whilst another one-third of these farms raise cattle and other animals, such as pigs and small ruminants (e.g. goats).²⁵ Despite being carefully planned, a project launched in 2006 to install 6,000 biodigesters in rural household systems was only partly successful. Unfortunately, cultural, financial, and other factors impeded

the adoption of the technology in these households. Despite this, the government continued its plan to expand the use of biogas amongst 10,000 households in five provinces.²⁶

5.3. Policy context

5.3.1. Energy policy overview

As Lao PDR strives to graduate from Least Developed Country status by 2020,²⁷ the energy sector is expected to play an important driving force in facilitating social and economic growth in the country.²⁸ With the establishment of the Ministry of Energy and Mines in 2006, energy

policy has not only been gaining a lot of public attention, but has also been developing in more complexity. Whereas past energy policies of the country were primarily focused on the power sector, the current policy also covers most other energy types and energy-related activities.²⁹

As it stands, rapid expansion of rural electrification is one of the major policy priorities for the government, which has a goal of attaining an electrification ratio of 90 percent by 2020. Moreover, given that the electrification priority is now moving to off-grid areas, which effectively would make on-grid electrification becoming more expensive, the government also promotes off-grid options, with an emphasis on renewable technologies.³⁰ Other priorities of the government include:

- The expansion of the transmission networks to support the industrialisation and modernisation of the country;
- The integration of the country's power sector in the ASEAN Community through the

Association's power exchange programmes; and

- Tapping into the country's hydropower potential by encouraging participation from the private sector.³¹

To meet these policy targets, the government has approved the construction of five hydropower projects with a total capacity of 2,121 MW, whilst memorandums of understanding and power development agreements have each been signed for 47 and 18 projects respectively, including an agreement with the governments of Thailand and Vietnam, each with the provision of 7,000 MW and 5,000 MW power supply by 2020 respectively.³²

5.3.2. Renewable energy policy

As a key component of the country's socio-economic development plan, the government of Lao PDR issued the *Renewable Energy Development Strategy* in 2011. The Strategy, which is aimed at developing new

renewable energy resources to replace resources that are expected to be exhausted in the future, has three main objectives, including: (1) ensuring adequate supply of energy, energy efficiency, and energy conservation throughout the country, and to promote the cultivation of fuel crops for the production of biofuels to replace imported fossil fuels; (2) bringing socio-economic benefits, including the development of renewable energy industry, and to contribute to national economic growth, and (3) ensuring environmentally and socially sustainable development through enforcement of adequate safeguards.³³

Through the enforcement of this Strategy, the government intends to increase the share of renewable energy to 30 percent of the country's total energy consumption by 2025. Aside from promoting investments in energy production from public and private sectors, as well as those from local and foreign investors, the Strategy also outlines the focus of renewable energy development of

Table 5.2. Renewable energy targets in Lao PDR

Types	Potential	Existing	2015		2020		2025	
	MW	MW	MW	Ktoe	MW	Ktoe	MW	Ktoe
Electricity			140		243		728	416
Small hydropower	2,000	12	80	51	134	85	400	256
Solar	511	1	22	14	36		33	21
Wind	>40		6	4	12	23	73	47
Biomass	938		13	8	24	8	58	37
Biogas	313		10	6	19	16	51	33
Solid waste	216		9	6	17	12	36	23
Geothermal	59					11		
Biofuel	ML	ML	ML		ML		ML	
Ethanol	600		10	7	106	178	150	279
Biodiesel	1,200	0.01	15	13	205	239	300	383
Thermal Energy	Ktoe		Ktoe		Ktoe		Ktoe	
Biomass	227		23		29		113	
Biogas	444		22		44		178	
Solar	218		17		22		109	
Total								
Energy demand (Ktoe)			2,504		4,064		4,930	
Renewable energy contribution			172		668		1,479	
Proportion			7%		20%		30%	

Source: ADB (2015: 32).

the country to focus on biofuels, small power, as well as other forms of renewable energy, such as solar, biomass, biogas, and wind.

In order to attain the above-mentioned objectives, the government has outlined the following short, medium-, and long-terms plans:³⁴

- Short term (2010–2015): (1) develop framework laws, regulations, and guidelines for renewable energy projects; (2) study development models; (3) conduct market assessments and energy resource studies; (4) advance rural energy planning; (5) develop model projects; (6) facilitate capacity building and raise awareness of renewable energy technology; and (7) support financing and marketing at both the national and local levels;
- Medium term (2016–2020): (1) promote the renewable energy technology industry; (2) formulate a clear midterm development plan; (3) support the full development of biodiesel and bio-ethanol production from crops and the production of biogas from livestock manure; and (4) increase competition and reduce dependence; and
- Long term (2021–2025): (1) promote economically viable, renewable energy technologies; (2) facilitate full competition; and (3) promote Lao PDR as a biofuel exporter.

Policy for biofuel

The development of biofuel in Lao PDR has been mainly the endeavour of the private sector, which has gained support from the government.³⁵ The target to develop domestic biofuel production, which is envisioned to reach 10 percent of total energy consumption in the transportation sector, is mainly aimed to reduce Lao's reliance towards fossil fuels import.³⁶ In 2016, the government of Lao PDR

passed the Decree No. 410/GO on Biofuels (dated 10 November 2016), which sets out the procedures for biofuel production, storage, and distribution.³⁷

Policy for electricity generation from renewable energy

The 1997 Law on Electricity, which was later amended in 2011, serves as the main policy for electricity activities, including business operations related to electricity generation in Lao PDR.³⁸ Article 43 of the said Law highlights the use of renewable energy to promote rural electrification, which is supported by investment incentives according to the investment law. Aside from this, the Law also provides the legal framework for private sector's participation in electricity generation through various modes of public-private partnership. According to the Law, electricity generation and transmission conducted by public and private sectors is defined as an electricity business in the form of concession. To operate as an electricity business concession, investors are required to obtain approval from the Ministry of Energy and Mines.

Lao also has a specific policy for hydropower development for electricity generation, which is called *the Policy on Sustainable Hydropower Development*.³⁹ This policy, which was approved through the issuance of Decree No. 02/GoL on 12th January 2015, and supersedes the previous 2006 National Policy on Environment and Social Stability of the Hydropower Sector (No. 561/CPI), serves as a policy guideline for the development of hydropower projects in the country.⁴⁰ With an inter-ministerial committee under the Ministry of Energy that supervises the implementation of this Policy, the document also stipulates the requirement for hydropower project development to follow the build-operate-transfer (BOT),⁴¹ build and transfer (BT),⁴² or build-own-operate (BOO)⁴³ scheme, which will be explained in the next section.

5.3.3. Investment policy, incentives, and procedure in renewable energy sector

Investment policy

The (Amended) Law on Investment Promotion of 2009 (Law No. 02/NA) is the main investment policy of Lao PDR. The Law, which is in the process of being amended again, only mentions energy sector in relation to the decentralisation of authority for investment management between central and provincial authorities (refer to Article 84 of the Law).⁴⁴ The draft of the new, amended, Investment Promotion Law, however, has 106 articles, as opposed to the previous existing version of 99 articles, and covers issues such as the protection of the environment and biodiversity amongst other priority investment areas. Generally speaking, however, foreign investment in Lao PDR can be pursued either in the form of full, 100 percent ownership, joint ventures, or business by contract (a foreign company pursues an agreement with a local partner).⁴⁵ Foreign investment is generally open to all sectors, except in areas and business operations that are detrimental to national security, environment, public health, and culture.⁴⁶

In order to promote and develop renewable energies, the government, through its 2011 Renewable Energy Development Strategy, also encourages domestic and foreign entrepreneurs and investors to invest in renewable energy projects, especially in rural areas. As discussed earlier, policies on the promotion and development of renewable energies in Lao PDR focus on small power development to improve energy self-sufficiency, grid connection, biofuel production and marketing, and the development of other forms of clean energy. To this end, the government provides, amongst others, financial incentives to investors aiming to produce clean energies to meet domestic demand.⁴⁷

The amended Law on Electricity in 2011 also promote rural electrification through various forms of renewable energy. In order to address the country's difficulty in developing large-scale solar and wind systems, the Law permits electricity projects to be undertaken in various forms, including the Build-Operate-Transfer, Build and Transfer, Build-Own-Operate, or state-operated.⁴⁸ Depending on the size of the project, the implementation of electricity investment projects will require approvals from relevant government institutions.

Investment incentives

Consistent with the country's 2009 Investment Promotion Law, and further emphasised in the 2011 Renewable Energy Development

Strategy, investment in renewable energy projects in Lao PDR, whether on biofuels production, grid-connected, or isolated systems, off-grid projects, and individual systems, are entitled to financial and non-financial incentives as presented in Table 5.3. It is also important to note that certain tax incentives are also provided for promoted sectors depending on where the investment is located. Article 49 of the 2009 Investment Promotion Law designates agriculture, industry, handicrafts, and services as strategic sectors that the government intends to promote. The most lucrative tax incentives are offered for promoted sector investments in remote areas with no economic infrastructure, or also known as *Zone 1*, whereas zones with moderate and good levels of economic infrastructures

are classified as *Zone 2* and *Zone 3* respectively (refer to Table 5.4).⁴⁹

General investment procedure

The 2009 Investment Promotion Law recognises three types of investments, including *general business*, *concession business*, or *activities related to the development of special economic zones*.⁵⁰ The following is the general procedure to start investing in Lao PDR:

General business:

- Investor intending to engage in *general business* will be required to apply for the establishment of a corporate entity, known as the Enterprise Registration Certificate (ERC), with the Enterprise Registry Office of the Ministry of Industry and Commerce;

Table 5.3. Financial and non-financial investment incentives in Lao PDR

Financial incentives	Non-financial incentives
- Import duty free on production machinery, equipment, and raw materials; - Import duty free on chemical materials necessary for biofuels production within seven years; and - Profit tax exemption, which can be made applicable for a certain period of time depending on activities, as well as the areas and size of the investment.	- Up to 75 years leasing term (for enterprise construction land); - Permission to expatriate earnings to home or third countries; and - The rights to employ foreign workforce (not more than 10 percent of the enterprise's total labours); - Permission to bring in foreign nationals to conduct investment feasibility studies; - Permission to own, sell, or remove all improvements and structures on the leased land and to transfer leases to other entities; - Facilitation of entry and exit visa facilities and work permits for expatriates; and - Guarantees against nationalisation, expropriation, and requisition without compensation

Source: Investment Promotion Department of the Ministry of Planning and Investment (n.d.b.).

Table 5.4. Investment promotion incentives for sectors that are promoted by the Lao PDR government

Promoted sectors	Zone	Level	Period of exemption (in years)
Agriculture Industry Handicraft Service	1 (mountainous, plateau zones with no economic infrastructure to facilitate investments)	1	10
		2	6
		3	4
	2 (mountainous, plateau zones with a moderate level of economic infrastructure to accommodate investments)	1	8
		2	4
		3	2
	3 (plateau zones with good economic infrastructure available for investments)	1	4
		2	2
		3	1

Source: Investment Promotion Department of the Ministry of Planning and Investment of Lao PDR (n.d.c.).

- A company that has one or more foreign investors is required to have a minimum registered capital of LAK 1 billion;
- Following the submission of a complete application, the ERC will be issued within ten working days, or 13 days for investments to be made in government-controlled businesses (e.g. logging, plantation, agriculture, transportation, etc.). For the latter, an additional approvals from other relevant ministries or agencies may be required before the Ministry of Industry and Commerce could issue the ERC;
- Along with the application of the ERC, the potential investor is also required to submit the proposed articles of association of the investment in question to the Ministry of Industry and Commerce. Once approved by the said Ministry, the document must be registered with the State Assets Management Department of the Ministry of Finance;
- The potential investor will, subsequently, need to reserve the name of the enterprise, which can be lodged with the Enterprise Registry Office; and
- Following the completion of the registration of the name of the business, the potential investor is required to apply for the tax identification number with the Tax Department of the Ministry of Finance.

Concession business:

- Specific investment approval is required for investment to be made in concession-related activities, or investment that requires special authorisation for the use of the government's properties. In such circumstances, the potential investor is required to submit an application to obtain the Concession Registration Certificate to the Investment Promotion Department of the Ministry of Planning and Investment. A special investment approval from the provincial Division of Planning and

Investment may also be required before the enterprise can be registered with the Ministry of Industry and Commerce;

- The articles of association of the proposed investment vehicles, along with other documents, are also required to be submitted by the potential investor to the Investment Promotion Department or the provincial Division of Planning and Investment.

Other operating licenses:

In addition to the above-mentioned investment requirements, the potential investor may be required to obtain other operating licenses, such as capital importation certificate from the Bank of Lao PDR, company seal from the Ministry of Public Security, company sign installation approval from the Ministry of

Table 5.5. Investment procedures based on project type

Type of projects	Related procedures and institutions
Law on Investment Promotion of 2009 (Law No. 02/NA)	
General business.	Obtain business license from the Ministry of Industry and Commerce.
Concession business.	Obtain license from the Ministry of Planning and Investment.
Activities for development of special economic zones and specific economic zones.	License from the Secretariat to National Committee for Special Economic Zones at Government Office.
Decree on Biofuels (No. 410/GO, 10 November 2016)	
Investors in biofuel must prepare a detailed Biofuel Development Plan, which proves the project to be 'environmentally sustainable' and 'economically viable.'	
The project company must obtain an operation license issued by the Ministry of Energy and Mines.	
Large-scale investment with production capacity more than 10,000 liters per day.	Approval from the Office of the Prime Minister.
Medium-sized investments with production capacity between 100 and 10,000 liters per day.	Approval from the Provincial Governor where the facility is located.
Small-scale investments with production capacity less than 100 liters per day.	Approval from the District Governor or the Head of Municipality where the production facility is located.
The 1997 Law on Electricity	
100 MW, or a reservoir which has an area of more than 10,000 hectares, or having considerable impact on the environment, society, or nature.	The proposal must be submitted through the Government Office, with the approval to be carried out by the National Assembly Standing Committee.

Table 5.5. Investment procedures based on project type

15 MW - 100MW.	The proposal must be submitted through the Ministry of Planning and Investment, with the approval needs to be obtained from the Ministry of Energy and Mines and the Government Office.
100kW - 15 MW or a reservoir area of less than 1,500 hectare.	Provincial Governor where the facility is located.
Less than 100 kilowatts.	Head of the municipality where the facility is located.

Source: Various.

Public Works and Transport. As for investment in energy sector, the potential investor may also be required to obtain exploration, survey, mining, or mineral processing licenses issued by the Ministry of Energy and Mines.

5.4. Barriers for renewable energy development

The following are potential barriers for renewable energy development in Lao PDR:⁵¹

- **Administrative or regulatory challenges**

Notwithstanding renewable energy-specific policies and regulations, such as the 2011 Renewable Energy Development Strategy and other supporting rules and regulations, the lack of coordination amongst government agencies, as well as those between the government and private sector, hinders effective implementation of the country's renewable energy priorities and policies. Complex bureaucracy, furthermore, also discourages potential investors to consider investing in the country's renewable energy sector.

Lack of financial support

As is the case with most ASEAN countries, the development of renewable energy projects can be

expensive to pursue. This situation, unfortunately, is not complemented by the existence of support for resources. To a large extent, lack of financial institutional support and the absence of appropriate financing avenues, including the availability of public funding support, make renewable energy sector a relatively unattractive sector to invest in.⁵²

- **Lack of skills and awareness**

Lack of awareness about Lao's renewable energy potential remains rampant amongst policy-makers and the public. Unfortunately, public knowledge about biomass, one of major renewable energy potentials in the country, is extremely lacking. The same also applies with regard public's awareness about the potential benefit that renewable energy production may bring about to the environment of the country. Another area of concern is the lack of renewable energy specialists that are capable of promoting reforms in the country's energy sector.

- **Technical challenges**

Land issue and the lack of grid electricity access, especially in rural areas, has increased the transaction costs for developing renewable energy projects in the country.⁵³ Another related concern is the lack of standards for renewable energy equipments and technologies that can be deployed in the country.

5.5. Institutional framework

The Ministry of Energy and Mines is the main agency responsible for energy sector in Lao PDR. Two departments within the Ministry are particularly relevant to renewable energy-related policies, and these include the Department of Energy Policy and Planning and the Department of Energy Promotion and Development. Whereas the former sets national energy policies and regulations (including those of tariffs), monitors compliance by the public and private energy suppliers, and develops strategic plans for electricity generation, transmission, distribution, renewable energy development, and energy export, the latter negotiates agreements and other legal documents with hydropower investors and contractors.⁵⁴

As far as renewable energy is concerned, this is handled by the Institute of Renewable Energy Promotion of the Ministry of Energy and Mines. The Institute is tasked to implement the government's 2011 Renewable Energy Development Strategy, especially in developing small-scale hydro, biodiesel, and biogas projects, along with a range of guidelines on renewable energy production and use.⁵⁵

5.6. Setting up a business in Lao PDR

Table 5.7. summarises the process of setting up a business, including the length of time and cost required, in Lao PDR.

5.7. Other relevant information

5.7.1. Taxes

Tax rates in Lao PDR are summarised in Table 5.8.

Table 5.6. Main renewable-energy related institutions in Lao PDR

Institutions	Main roles and responsibilities
Ministry of Energy and Mines	- Under the purview of the Prime Minister's Office, the Ministry is the central agency in charge of the country's energy sector, including renewable energy; - The Ministry has two renewable energy-related agencies, including the <i>Department of Energy Policy and Planning</i> and the <i>Institute of Renewable Energy Promotion</i>. Whereas the former develops national energy policies, regulations, and strategic plans, as well as monitors compliance by public and private energy suppliers, the latter is more focused on the promotion of renewable energy. Aside from this, the Institute also facilitates access to the revolving fund for renewable energy programme, and conduct feasibility studies and monitor research on the issue; and - Responsible for three state-owned enterprises, including the <i>Electricité du Laos</i>, Lao Holding State Enterprise, and Electrical Construction and Installation company.
Ministry of Agriculture and Forestry	Collaborates with the Ministry of Natural Resources and Environment and provincial governments to support land use for biomass crop production.
Ministry of Natural Resources and Environment	Conducts research into the use of water resources and collaborated with the Ministry of Energy and Mines to address environmental and social impact of renewable energy development.
Ministry of Planning and Investment	Formulates investment policies and incentives to support domestic and foreign investment in renewable energy projects.
Ministry of Industry and Commerce	- Facilitates the import of equipment and technologies related to renewable energy development; and - Supports the construction of gas stations to distribute biofuels.

Source: Various.

Table 5.7. The process of setting up a business in Lao PDR

Step	Procedure	Agency	Time	Cost (LAK)
1	Apply for Name Reservation Certificate and Enterprise Registration Certificate	Enterprise Registry Office, Ministry of Industry and Commerce	2 weeks	390,000
2	Register the Articles of Association	State Asset Management Office, Ministry of Finance	5-10 days	No charge
3	Apply for Tax Registration Certificate	Tax Department	2 weeks	125,000
4	Obtain approval of Content of Company Signage and Signage Building Permit	Ministry of Information Culture and Tourism	2 weeks	10,000
5	Carve a company seal	Ministry of Industry and Commerce and Ministry of Public Security	2 weeks	Not available
6	Register company seal	Provincial Department of Public Security	1-2 weeks	Included in procedure 6
7	Register workers for social security	Social Security Office	1 week	No charge
8	Register for VAT	Tax Authority	3 weeks	No charge

Source: World Bank (n.d.).

5.7.2. Labour condition landscape and employment system

Despite consistent economic growth in the past few years, limited human resources, weak capacity, and skill shortages represent critical constraints for Laos. To keep up with the pace of future economic growth, the country is said to need around 70,000 skilled foreign workers.⁵⁶ Skill shortages are particularly evident in sectors such as construction, furniture-making, and automobile and machinery repair.⁵⁷ In order to tackle such human resource challenges, the government committed a great deal of investment into the country's education sector, with around 3.3 percent of Laos's GDP is devoted to it.

As far as the country's employment system is concerned, foreign nationals, in general, are allowed to work in Lao PDR provided that the work cannot be performed by Lao nationals, and as long as it is not prohibited by prevailing laws and regulations. Laotian labour laws and regulations apply to both Laotian

and foreign workers. The labour laws of 2013 provide the framework on employment relationships.⁵⁸

5.7.3. Social security system

The Laotian social security system covers pensions and health insurance. Social security contributions are deductions from an employee's gross salary, where 6 percent is paid by the employer, and another 5.5 percent by the employee. There is a salary cap of LAK 2,000,000, so there is no contribution exceeding LAK 230,000 per employee.

5.7.4. Land policy

Generally speaking, land in Lao PDR belongs to the population as whole, though citizens and legal entities have the right to receive permanent land use rights. Land use rights are usually certified in the form of land titles, which can be issued to individuals, collectives, and state land. The Department of Land Administration of the Ministry of Natural Resources

and Environment is the primary government institution that has the mandate to survey and adjudicate land parcels and issue land titles. Land issue in the country is currently undergoing a reform process, with a draft of the National Land Policy currently being prepared by a drafting committee under the Ministry of Natural Resources and Environment.⁵⁹

5.7.5. Commercial dispute settlement

Mediation and arbitration proceedings in Lao PDR are governed by the Law on Resolution of Economic Disputes No. 06/NA, dated 17th December 2010. Unfortunately, the judicial system in Lao PDR is still a work in progress, and still faces challenges in meeting the needs of a modern market economy. Given the country's relatively weak legal sector, foreign arbitration is currently the most commonly chosen dispute resolution mechanism in commercial agreements with foreign parties.⁶⁰

Table 5.8. Tax rates in Lao PDR

Personal income tax

Taxable income	Rate (in percent)	Taxed amount (in LAK)
First LAK 1 Million	0	0
Next LAK 2 Million	5	100.000
Next LAK 3 Million	10	300.000
Next LAK 6 Million	12	720.000
Next LAK 12 Million	15	1.800.000
Next LAK 16 Million	20	3.200.000
Next LAK over 40 Million	24	24 percent of related amount
		24 flat rate, 26 for businesses in the tobacco industry
Corporate Income Tax		Publicly listed companies get 5 percent reduction for the first four years since registration at the stock exchange
		Companies with revenues less than LAK 12 million do not pay VAT or corporate income tax but only a 3-7 percent lump-sum tax, depending on industry and revenue
Value Added Tax		Standard 10 percent with some special exemptions

Sources: PwC (n.d.a. and n.d.b.).

5.8. Electronic links to relevant government agencies related to renewable energy

- Ministry of Energy and Mines: <<http://laoenergy.la/>>;
- Ministry of Natural Resources and Environment: <<http://www.monre.gov.la/home/en.html>>.
- Ministry of Agriculture and Forestry: <<http://www.maf.gov.la/>>.
- Ministry of Planning and Development: <<http://www.investlaos.gov.la/>>.
- Ministry of Industry and Commerce: <<http://www.moic.gov.la/>>.

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34. ADB (2015: 29-30).
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36. *Ibid.*, pp. 16.
37. Details of these procedures will be further discussed under section 5.3.3. of this Chapter.
38. For further details concerning

AEC business tip for Lao PDR

Blessed with abundant renewable energy resources, robust commodity exports and huge infrastructure investment, Lao PDR is one of the fastest growing economies in ASEAN and the wider Asia-Pacific region. Although considered as one of the most difficult countries in the world to set up and do business in, companies do get set up, and the government has supported investment to develop renewable energy, especially hydropower. The process of economic reforms in Lao PDR received a significant boost from its participation in the AEC, which gradually reduces investment barriers.

the (2011 amended) Law on Electricity of Lao PDR, visit, amongst others, the official website of the Investment Promotion Department of the Ministry of Planning and Investment of Lao PDR at: <https://www.investlaos.gov.la/images/sampleddata/pdf_sample/Electricity_Law_2012_Eng.pdf>.

39. Government of Lao PDR (2015).
40. IEA (n.d.).
41. A type of arrangement whereby private sector builds an infrastructure project, operates it, and eventually transfer ownership of the project to the government.
42. A type of arrangement whereby private sector builds an infrastructure projects, and have the ownership and operation of the projects transferred to the government upon completion.
43. A form of public-private partnership model in which a private organisation builds, own, and operates some infrastructure facilities with some degree of government support (e.g. tax-exempt status, etc.).
44. For further details concerning the (2016 amended) Law on Investment of Lao PDR, visit, amongst others, the official

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6. MALAYSIA

MALAYSIA

6.1. Brief country profile

A highly open, upper-middle income economy, Malaysia is the third largest economy in ASEAN, and one of 13 countries identified by the Commission on Growth and Development to have recorded average growth of more than 7 percent for 25 years or more.¹ Registering a GDP per capita of USD 9,657 in 2015, the country with a population of slightly over 30 million experienced an average annual growth of 5.3 percent per annum between 2010 and 2015.² Malaysia has undergone a major economic transformation over the last four

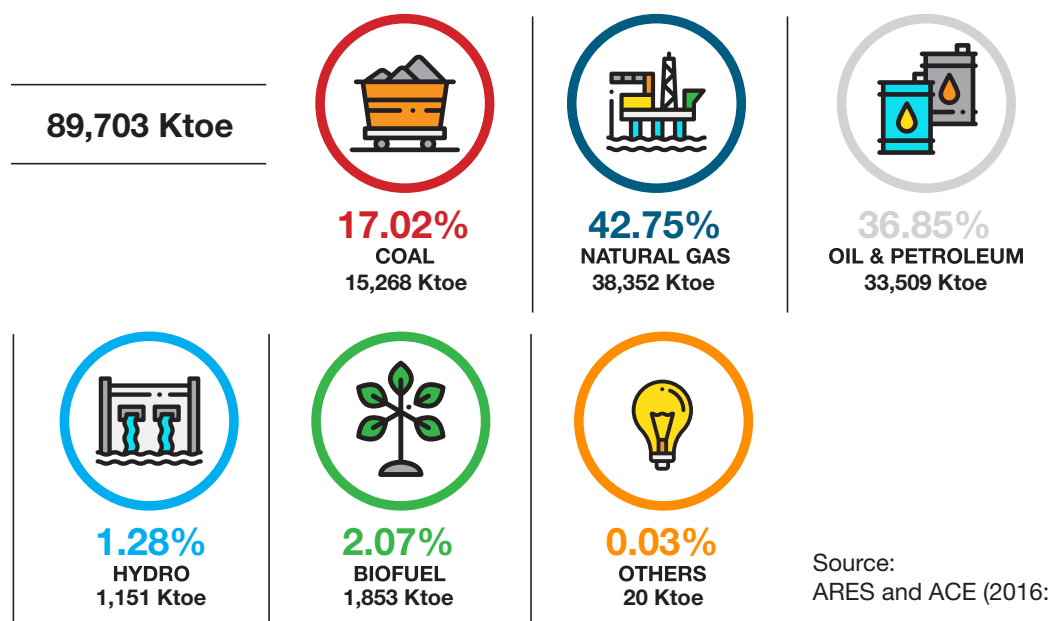
decades, transitioning from being a heavy reliant on raw materials exports to a more advanced, multi-sector economy. At 54.6 percent, the services sector is a major contributor to the country's GDP, and this is followed by manufacturing and mining and quarrying, each at 23 percent and 8.8 percent respectively.³ As reflected in its Eleventh Malaysian Plan of 2016-2020, the Malaysian government remains committed to anchor the country's economic growth in its people. This major policy document also envisions the Malaysian government's plan to pursue green growth for sustainability and

resilience, as well as to reduce the country's dependence on oil-related revenue by 2020.⁴

6.2. Renewable energy sector in Malaysia

Although energy security and renewable energy development make up one of the core objectives of the Eleventh Malaysia Plan 2016-2020, a medium-term national development plan of Malaysia, oil and gas still serve not only as the main energy source of the country, but also one of the biggest contributors to the government's revenue. Oil

Figure 6.1. Total energy mix of Malaysia, 2014



Source:
ARES and ACE (2016: 2).

and gas export alone, for example, contributes to around 40 percent of the Malaysian government's revenue.⁵ The country's main energy supply also comes primarily from oil and gas, both of which accounted for about 80 percent of Malaysia's energy mix in 2014 (consisting of 36.9 percent of oil and petroleum, and 42.8 percent for natural gas). Meanwhile, the contribution of renewable energy to the country's total energy mix in the same year only stood at around 3.38 percent. The overall energy mix in Malaysia in 2014 is illustrated in Figure 6.1.

Conventional energy sources still dominate electricity generation in Malaysia. In 2014, natural gas contributed to more than 50 percent of electricity generation, and this was followed by coal with a total 38 percent contribution to the electricity generation in the country.⁶ As illustrated in Figure 6.2., renewable energy remains underdeveloped in Malaysia as it only contributed to around 10 percent of the total electricity generation.

6.2.1. Biofuel

With around 2 percent contribution to the country's overall energy mix,

biofuel is the largest renewable energy source in Malaysia (refer to Figure 6.1.). Biodiesel and ethanol are widely used by the country's transportation sector. Whilst crude palm oil remains the main feedstock for biodiesel, jathropa is currently being explored to become another potential source for biodiesel production.⁷

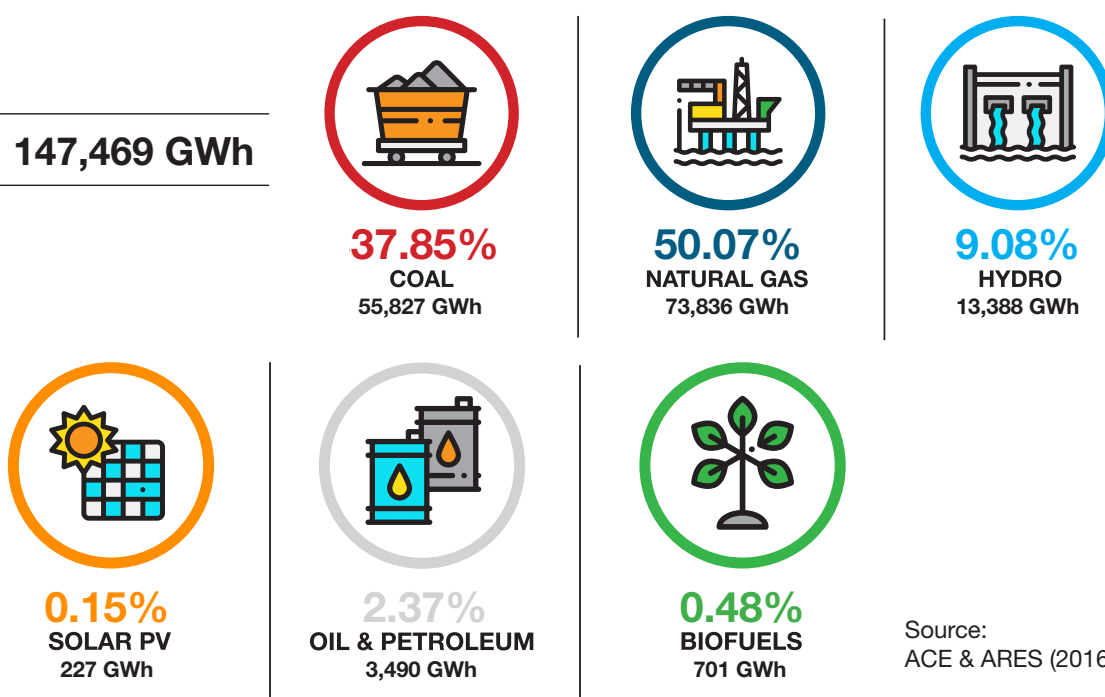
Following the requirement for biodiesel blending that has been in place since 2009, biodiesel production has been on the rise in Malaysia. As of 2015, the production of biodiesel increased by 99 million litres, from 451 million litres in 2014 to 550 million litres in 2015. Constituting nearly 80 percent of total usage, land transportation is the largest user of biodiesel, whilst the remaining 20 percent is taken up by sea transportation.⁸ The production of biodiesel in Malaysia, however, is still far below its potential. The utilisation rate for the B10 mandate, for instance, only stands at 33 percent, which is way below industry full capacity.⁹ Aside to neighbouring countries in ASEAN, Malaysia also exports its biodiesel to many European countries, such as Spain, the Netherlands, and Switzerland.

In contrast to biodiesel, there is no major ethanol production in Malaysia, especially one that uses biomass as its source. Aside from the difficulty in finding a consistent supply of feedstock, the country also lacks adequate technology and investment to further advance its ethanol production.¹⁰

6.2.2. Other renewable energy sources for electricity generation

Malaysia has developed several renewable energy sources for electricity generation, including biogas, biomass, hydro, and solar. As illustrated in Table 6.1., solar photovoltaic (PVC) is the most developed renewable energy technology, and contributed 45 percent of total electricity generation by renewable energy in 2016. The second major renewable energy contributor was biomass with a 36 percent share of the total electricity generation by renewable energy. Both small hydro and biogas contributed no more than 10 percent to the total electricity generation from renewable energy. Meanwhile Malaysia currently has no geothermal capacity.

Figure 6.2. Generation of electricity by source, 2014



Source:
ACE & ARES (2016: 3).

Table 6.1. Annual power generation of commissioned renewable energy installations (in MWh)

Year	Biogas	Biogas (landfill/agri waste)	Biomass	Biomass (solid waste)	Small hydro	PVC	Geothermal
2017	0	3513.56	47566.37	0	2371.79	15969.57	0
2016	8039.99	37703.47		22404.26	31450.36		0
2015		41122.39		18090.07	55406.38		0
2014		31844.44		4347.83	64549.65		0
2013		9477.59		11144.25	73032.12	47365.15	0
2012	0	0	0	0	0	0	0

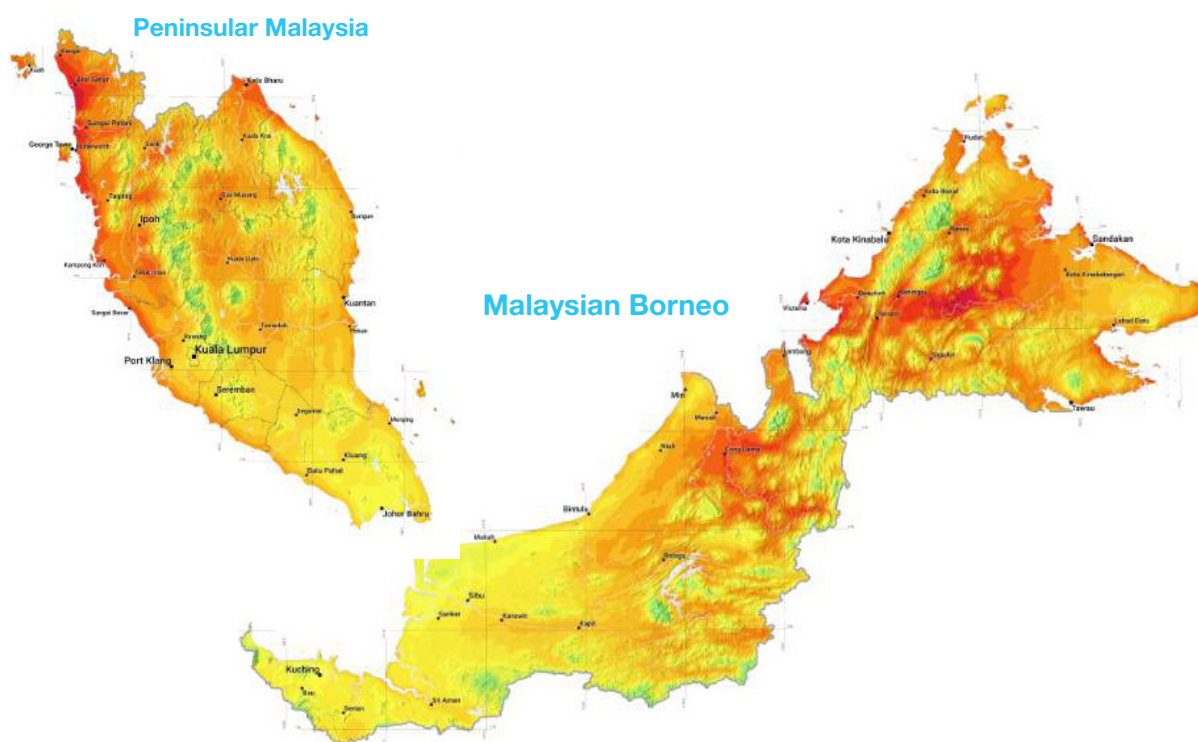
Source: SEDA (2017).

As far as the country's solar potential is concerned, Malaysia has the potential to harness up to 4.5 kWh/m²/day solar radiation.¹¹ The current installed capacity of solar PV in Malaysia is 299.37 MW.¹² As Malaysia wishes to become a

major hub for solar manufacturing by 2030, the Malaysian Industry-Government Group for High Technology, an independent not-for-profit technology think-tank under the purview of the Prime Minister's Department, has been tasked to

improve supply chains and the integration of local PVC systems, whilst, at the same time, lend its support to local manufacturers of PV technologies to foster production and innovation.¹³

Figure 6.3. Solar radiation potential of Malaysia



Source: World Bank (n.d.a.).

6.3. Policy context

6.3.1. Energy policy overview

Malaysia's national energy policies are generally focused on oil and gas. Launched in 1975, the National Petroleum Policy was the first energy policy in Malaysia that provided the country with broad guidelines on long-term objectives and strategies to ensure efficient, secure, and environmentally sustainable supplies of energy. This policy was subsequently improved with the launching of the National Energy Policy in 1979. Aside from developing non-renewable and renewable energy resources to ensure adequate, secure, and cost-effective energy supply, this policy was also aimed at promoting efficient utilisation of energy, as well as to ensure that environmental protection is not neglected in the pursuit of the supply and utilisation objectives mentioned earlier.¹⁴ Over the years, numerous other policies

and regulations were formulated to address various emerging issues in the energy sector. Table 6.2. presents the main energy policies of Malaysia.

6.3.2. Renewable energy policy

The diversification of energy sources was first explicitly considered under the 1981 Four-Fuel/Diversification Policy. As indicated in Table 6.2., the issuance of this policy was intended to ensure a consistent energy supply in Malaysia, which was to be done through the diversification of fuel. In 2001, the Malaysian government passed the Five-Fuel Policy to encourage the use of various kinds of renewable energy such as biomass, solar, and mini hydro. The utilisation of renewable energy, especially those of indigenous origins, was further strengthened by the National Renewable Energy Policy and Action of 2009. This particular policy outlines the government's main strategies

to promote renewable energy in Malaysia.

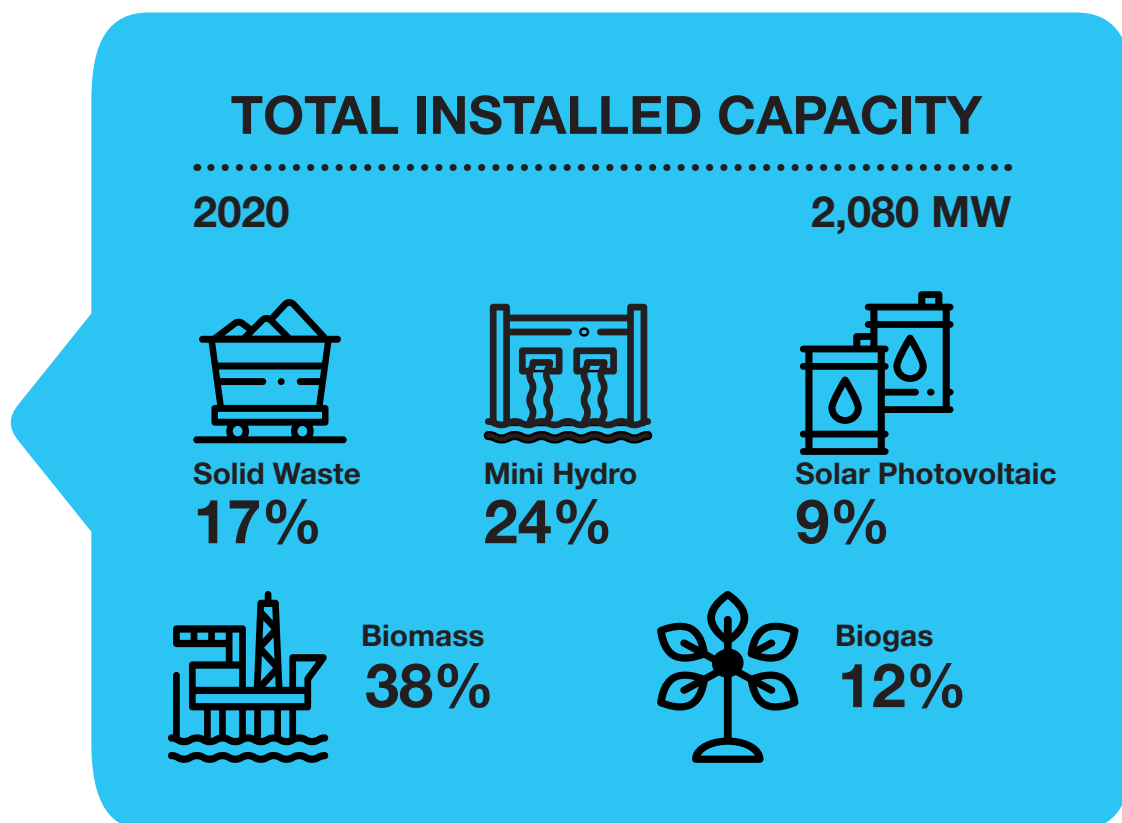
More recently, the vision to incorporate renewable energy in the country's overall economic development plan was also strengthened in the so-called Eleventh Malaysia Plan 2016-2020.¹⁵ By pursuing a green growth strategy, Malaysia intends to shift its development trajectory from conventional and costly 'grow first, clean-up later' to a greener path that will ensure that socio-economic development is pursued more sustainably.¹⁶ The Plan also gives support to the so-called Sarawak Corridor of Renewable Energy (SCORE), which is one of Malaysia's main economic corridors to facilitate green economic growth in the country.¹⁷ The Plan targets to increase the renewable energy installed capacity to 2,080 MW by 2020.¹⁸ Specific renewable energy targets of Malaysia are shown in Figure 6.4.

Table 6.2. The evolution of energy policies of Malaysia

No.	Energy policies	Year issued	Key features or objectives
1.	National Petroleum Policy	1975	- Efficient utilisation of petroleum resources; and - Ensuring the state exercise majority control in the management and operation of the industry.
2.	National Energy Policy	1979	- Ensure adequate, secure, and cost-effective energy supply (supply objective); - Promote efficient utilisation of energy and eliminate wasteful and non-productive usage (utilisation objective); and - Minimise negative impacts to the environment.
3.	National Depletion Policy	1980	Prolong the life span of the nation's oil and gas reserves; and
4.	The Four Fuel/Diversification Policy	1981	Ensuring reliability and security of supply through diversification of fuel (oil, gas, hydro, coal, and so on).
5.	The Five-Fuel Policy	2001	- Encourage the utilisation of renewable energy resources, such as biomass, solar, mini hydro, etc.; and - Efficient utilisation of energy.
6.	National Renewable Energy Policy and Action Plan	2009	- Increase renewable energy contribution in the national power generation mix; - Facilitate the growth of renewable energy industry; - Ensure reasonable renewable energy generation costs; - Conserve the environment for future generations; and - Enhance awareness on the role and importance of renewable energy.

Source: Ministry of Energy, Green Technology, and Water of Malaysia (2008: iii; 2011: 6-8).

Figure 6.4. Target for renewable energy share in total installed capacity by 2020



Source: Director General of Economic Planning Unit, Malaysia's PM Department (2015: 6-17).

Policy for biofuel

Published in March 2006, the National Biofuel Policy serves as the main regulatory framework for the development of biofuel in Malaysia. Aside from reducing the country's dependency on fossil fuels, this policy is also aimed at stabilising and boosting palm oil prices, promoting the production of biodiesel derived from palm oil, as well as boosting its utilisation, export, and research. In order to attain these objectives, the policy focuses on the conversion of palm oil into biodiesel for export and the blending of processed palm oil with petroleum diesel.¹⁹

The Biofuel Industry Act was subsequently launched in 2007 to further regulate and facilitate biofuel sector development in the country. The Act requires manufacturing companies to apply for only one license, and this reduces administrative barriers by streamlining the licensing process for biofuel industry. The Act also

regulates the blending of biofuel with petroleum diesel. As of mid-2016, the blending requirement for biodiesel was 10 percent and 7 percent for the industrial sector.²⁰

Policy for electricity generation from renewable energy

The 2009 National Renewable Energy Policy and Action Plan is the main policy instrument that sets Malaysia's target and strategy for electricity generation from renewable energy sources. This policy document emphasises the country's objective to increase the share of renewable energy in total electricity generation to 10 percent by 2030 and 15 percent by 2050.²¹ To achieve the said targets, the policy identifies five strategic thrusts, including: (1) the introduction of appropriate regulatory framework; (2) the creation of favourable environments for renewable energy businesses; (3) the intensification of human capital development; (4) the enhancement

of renewable energy research and development; and (5) the designing and implementation of renewable energy advocacy programme.²² The policy also details the government's plan to implement a feed-in-tariff (FiT) and Renewable Energy Fund mechanisms.²³

Subsequently, the Renewable Energy Act (Act 725) of 2011 was enacted to regulate the FiT system and renewable energy fund. According to the Act, the Sustainable Energy Development Authority Malaysia is the main body responsible for receiving application and granting FiT, as well as in managing the Renewable Energy Fund,²⁴ which is administered for the purpose of facilitating the implementation of the FiT scheme. With the implementation of this Act, Malaysia managed to increase the installed capacity of renewable energy from 53 MW in 2009 to 243 MW in 2014.²⁵ Table 6.3 illustrates some major renewable-energy related policies in Malaysia.

Table 6.3. Key points of the main renewable energy policies in Malaysia

Title	Entry into force	Target	Agency	Key points
National Biofuel Policy	2006	Bioenergy, biofuels for transport	The Ministry of Plantation Industries and Commodities	The main policy for biodiesel industry that focuses on the commercialisation, usage, research, technology and export of biodiesel.
Biofuel Industry Act	2007	Biofuel for industry	The Ministry of Plantation Industries and Commodities	The Act regulates the mandatory use of biofuel and licensing of activities relating to biofuel.
National Renewable Energy Policy and Action Plan	2009	All renewable energy sources	The Ministry of Energy, Green Technology and Water	This policy document seeks to increase the share of renewable energy in the national electricity mix, support the expansion of a local renewable energy manufacturing sector, ensure reasonable renewable energy generation costs, and protect the environment.
Renewable Energy Act (Act 725)	2011	Renewable energy for electricity generation	The Sustainable Energy Development Authority Malaysia (SEDA)	The Act regulates the FiT system and Renewable Energy Fund for electricity generation from renewable energy.
Eleventh Malaysia Plan 2016-2020	2015	All renewable energy sources	Director General of Economic Planning Unit, Malaysia's Prime Minister Department	The Plan supports green growth by promoting energy efficiency and developing renewable energy technology.

Source: Various.

6.3.3. Investment policy, incentives, and procedure for renewable energy sector

Investment policy

The Malaysian government recognises the importance of foreign investment as a tool to assist the country's development. The present

investment policy of Malaysia is mainly geared towards moving the economy further up the value chain to high income status. The government intends to do so by promoting investment in higher value-added manufacturing and services sectors. The country's investment regime undertook major reforms in 2009 when the government initiated a gradual liberalisation of foreign participation in the sector. The removal of the country's so-called Foreign Investment Committee

investment guideline in the same year also meant that transactions involving the acquisition of interests, mergers, and takeovers of local companies by domestic or foreign parties could be pursued without the approval of the Committee. Since 2011, 100 percent foreign ownership is allowed in various sectors, such as healthcare, retail, education, professional, environmental, and courier services, though some limits on foreign equity are imposed in transportation, financial services, and telecommunications.²⁶ The Malaysian Investment Development Authority (MIDA) is the Malaysian government's principal agency dealing with the promotion of manufacturing and services sectors in the country. It assists companies that intend to invest in both sectors, as well as facilitating the implementation of their projects.²⁷

Investment policy for biofuel

In order to produce biofuel in Malaysia, potential investors must first gain a license for biofuel manufacturing. The Biofuel Licensing Task Force under the Ministry of Plantation Industries and Commodities (MPIC) is the main body responsible for issuing biofuel manufacturing licenses. The Biofuel Working Committee evaluates and makes recommendations on the applications, which are then submitted to the Biofuel Licensing Committee for consideration and approval.²⁸

The requirements to obtain a biofuel manufacturing license are as follows:

- Applicants must show proof that they have secured the finances and stable feedstock supply to start the operation; and
- Applicants must undertake capacity enhancement and have been in operation since 31st December 2007 or produce phytonutrients from oil palm products.

The biofuel licensing authority has the right to suspend or revoke a license if the licensee stops the production or operation of any activity for which the license was issued.²⁹

Investment policy for electricity generation from renewable energy

Requirements associated with the development of renewable energy projects for electricity generation can be referred to the Electricity Supply Act 1990 (Act 447), which regulates licensing, control of

electrical installations, and efficient use of electricity.³⁰ According to this Act, contractors are required to obtain a license from the Malaysian Energy Commission to conduct activities related to electricity generation. The license can be obtained by submitting an online application. It is important to note, however, that different types or capacity of electricity generation follows different application systems. Table 6.4 summarises license types and the corresponding online application systems for the application of electricity generation projects in Malaysia.

Table 6.4. Application system based on license application type

Type of License Application	Online Application System
Private installation with capacity of less than 5 MW	Energy Commission Online System (ECOS) ecos.st.gov.my
Private installation with capacity of 5 MW and above	Online Application System (OAS) oas.st.gov.my
Public installation	
Provisional license	

Source: Energy Commission of Malaysia (2016).

Investment incentives

Table 6.5. highlights of various investment incentives provided by the Malaysian government.

Table 6.5. Investment incentives in Malaysia

Type of incentives	Incentive components
Pioneer status	• Tax exemption of at least 70 percent of the company's statutory income for five years (though the degree of exemptions may vary depending on the type of product or activity of investment); and • Accumulated losses and unabsorbed capital allowances incurred during the pioneer period can be carried forward and deducted against post-pioneer income of a business relating to the same promoted activity or product.
Investment Tax Allowance (ITA)	• At least 60 percent allowance on its qualifying capital expenditure (e.g. factory, plant, machinery, or other equipments required for the approved investment project) incurred within five years from the date on which the first qualifying capital expenditure is incurred; • Once operational, the investing company is allowed to offset the above-mentioned allowance against 70-100 percent of its statutory income for each assessment year; and • Any unused allowance can be carried forward to subsequent years until fully utilised.
Reinvestment allowance	• Applies to manufacturing company that has been in operation for the duration of at least 12 months, and incurring qualifying capital expenditure to expand, modernise, or automate or diversify its existing business into any related products within the same industry; • The allowance is set at the rate of 60 percent on the qualifying capital expenditure incurred by the company, and can be offset against 70-100 percent of its statutory income for the assessment year; and • Any unutilised allowance can be carried forward to subsequent years until fully utilised.
Second round incentives	• Applicable for companies in resource-based industry, such as rubber, palm oil, wood-based, and oleochemical industry, that have export potential, and are at least 51 percent owned by Malaysian nationals; and • Companies in the above-mentioned industries are eligible for another round of either Pioneer Status or Investment Tax Allowance incentive.

Source: Asia Biomass Office (n.d.: chapter 2).

General investment procedure for renewable energy projects³¹

Generally speaking, the development of renewable energy projects in Malaysia can be implemented by pursuing the following procedures:

- Project developers must first identify and select a suitable site for the building of a renewable energy plant;
- Concurrently, permission for grid connection must be obtained;
- Typically, project developers must establish a *Special Purpose Company* to develop, construct and operate a small hydropower plant. The establishment of such a company must be done from the outset of the project;
- Several permits must be obtained from the government and relevant authorities;
- A provisional license must be obtained from the Energy Commission of Malaysia, allowing a project developer to generate electricity in Malaysia;
- Financing must be secured from

- banks or financial institutions;
- After the final closure, procurement and construction may then proceed;
- After completing the construction of small hydropower plant, inspection and testing must then be conducted;
- Subsequently, operations of the renewable energy plant may commence.

Investors should also note that different renewable energy source may follow different project development procedures. The step-by-step project development procedure is illustrated in Figure 6.5.

6.4. Barriers for renewable energy development

The following are potential barriers for renewable energy development in Malaysia:

- **Conventional energy subsidy**
The Malaysian government currently implements subsidies for 95-octane gasoline, diesel,

liquefied petroleum gas (LPG), and electricity.³² Despite various strategies to remove energy subsidies, the existing government plans are still focused on reducing the state's budget deficit, rather than on the promotion of renewable energy development.³³

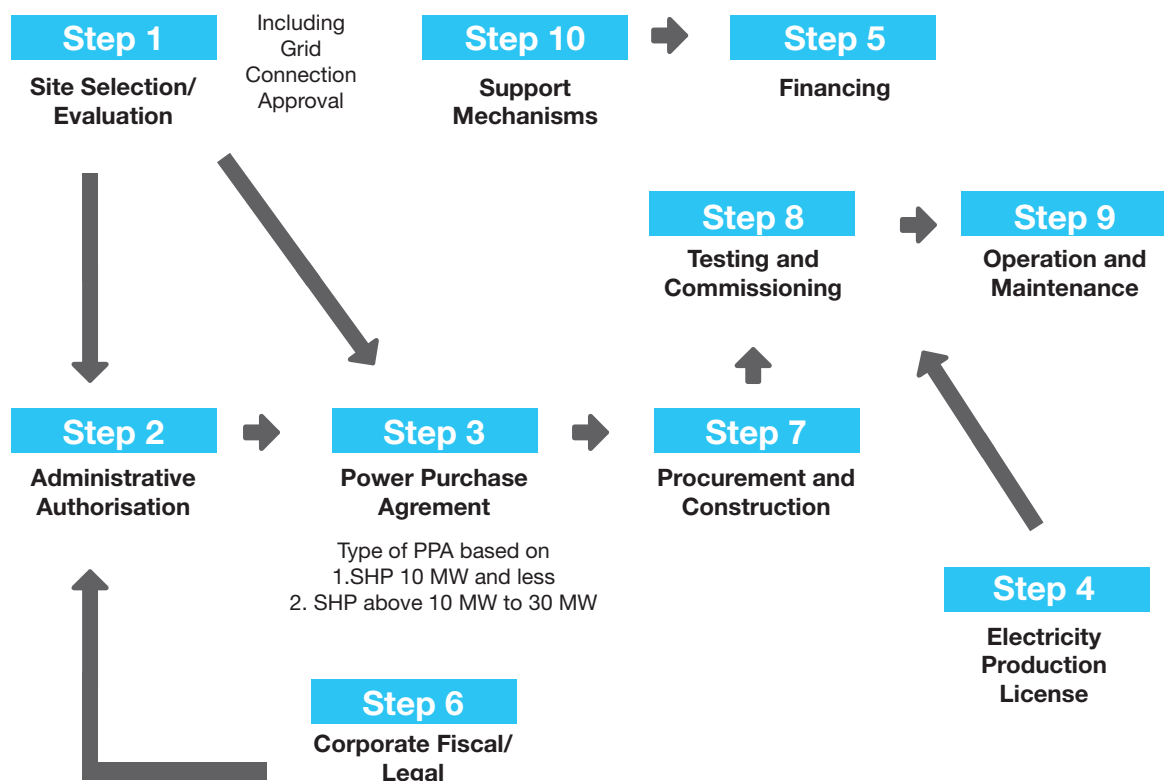
- **Import tariff for renewable energy technology**

Although relatively low, Malaysia still imposes import tariff for renewable energy technologies, which stands at 4.8 percent.³⁴

- **High cost of capital and lack of financial access for developers**

High cost of capital and lack of access to capital and consumer credit negatively affect the development of renewable energy in Malaysia. Financial access is especially important since renewable energy projects are usually capital-intensive. Currently, there is also a lack of experience and expertise in Malaysian financial institutions in evaluating the risk of renewable energy investment.³⁵

Figure 6.5. Renewable energy project development procedure in Malaysia



Source: ASEAN-German Energy Programme (2017).

6.5. Institutional framework

Table 6.6. presents main governmental institutions dealing with renewable energy in Malaysia.

Table 6.6. Main renewable energy-related institutions in Malaysia

Institutions	Responsibility
Economic Planning Unit	Petroleum and privatisation of electricity supply.
Ministry of Energy, Green Technology, and Water	Ensuring the implementation of development policies in the power industry, water and green technology to support energy efficiency and renewable energy technology development.
Ministry of Natural Resources and Environment	General management of environment and land use.
National Green Technology Centre	The main focal point for stakeholders interested in renewable energy and energy efficiency research.
Sustainable Energy Development Authority	Responsible for the implementation of the Renewable Energy Act, FiT licensing and tariffs management, the conditioning for renewable energy power purchase agreements, and the promotion of investment from private sector in developing sustainable energy.
Ministry of Plantation Industries and Commodities	Responsible for the enforcement of national biofuel policy and the Biofuel Industry Act, as well as the management of palm oil plantations, mills, and refineries.
Biofuel Licensing Task Force	Responsible to issue biofuel manufacturing licenses.

Source: Various.

6.6. Setting up a business in Malaysia

Table 6.7. summarises the general process of setting up a business in Malaysia.

Table 6.7. The process of setting up a business in Malaysia

No.	Procedure	Time to complete (day)	Cost to complete (in MYR)
1.	Search and reserve company name at the Companies Commission of Malaysia's one-stop-shop (this can be done electronically at: http://www1.ssm-mycoid.com.my/omni/omni/portal/mycoid)	Less than 1	30 per name search application
2.	Preparation of documents for the incorporation of the company	1-3, and can be simultaneously done with previous procedure	1,000
3.	File all the relevant documents with the Companies Commission of Malaysia's one-stop-shop, and obtain company incorporation, as well as the post-incorporation package (including company seal, share certificates, and statutory books)	2	1,000 (registration fee) + 200 (stamp) + 75 (post-incorporation package) + 10 (online processing fee)
4.	Open a bank account	1 day, and can be done simultaneously with previous procedure	No charge

5.	Register for Goods and Services Tax	14	No charge
6.	Register for income tax and Pay-As-You-Earn scheme	1, and can be done simultaneously with previous procedure	No charge
7.	Register for Employees Provident Fund	1, and can be done simultaneously with previous procedure	No charge
8.	Register for social security	1, and can be done simultaneously with previous procedure	No charge

Source: World Bank (n.d.b.).

6.7. Other relevant information

6.7.1. Taxes

Table 6.8. below summarises the various tax rates in Malaysia.

Table 6.8. Tax rates in Malaysia

Individual income tax	
Income (in MYR)	Progressive rates (in percent)
Up to 2,500	0
2,501-5,000	1
5,001-20,000	3
20,001-35,000	7
35,000-50,000	12
50,000-70,000	19
70,000-100,000	24
100,000 and over	26
Corporate taxes	
Type of taxes*	Tax rates (in percent)
Corporate tax standard rate	24
Corporate tax rate for resident SMEs with total capitalisation of MYR 2.5 million	19 on the first MYR 500,000, and, subsequently, 24
Capital gain taxation	25
SMEs	20 on the first MYR 500,000, and 25 on the remaining
GST	6
Other taxes	Petroleum income tax, stamp duty, and real property tax

Note: *There is no distinction between resident and non-resident companies or the subsidiaries of foreign companies.

Source: Santander Trade Portal (n.d.) and PwC (2016a).

Despite its status as a middle-income country, Malaysia is facing a major shortage of skilled workers. A survey carried out in early 2016, for instance, shows that more than 30 percent of employers stated that talent deficiency in the country not only hampers their operations, but also caused them to miss business targets.³⁷ Although labour productivity grew 3.3 percent in 2016, it will be challenging for labour productivity to grow in the years to come as a result of the lack of skilled workers. Malaysia, however, has put in place a target for skilled workers, including those with diplomas and higher qualifications, to reach 35 percent or 5.35 million of the country's total workforce by 2020.³⁸

In terms of the employment system, meanwhile, the entry of foreign nationals in Malaysia is governed by the Immigration Act of 1963, which also determines the types of employment passes that can be applied by foreign nationals wishing to work in the country. The applications of foreign nationals to work in Malaysia will need to be reviewed by relevant government agencies, particularly the Ministry of Manpower. There are three different work permits issued by the government, and these include:

- Employment Pass, which is a work permit that enables a foreign knowledge worker to take up employment under a contract service with an organisation in Malaysia. This pass is normally issued to employees with specific skills (e.g. technical or managerial-related employment), and consists of three categories, including

6.7.2. Labour condition landscape and employment system³⁶

category 1 (those with monthly base salary of MYR 5,000 and a minimum employment contract of 24 months), category 2 (those with monthly base salary of MYR 5,000 and have a minimum employment contract of 23 months), and category 3 (those earning monthly base salary less than MYR 5,000, but at least MYR 2,500);

- Temporary Employment Pass, which can be granted to a foreign national whose application for an expatriate post has been made by a Malaysian company that requires immediate service from the said foreign national (this pass is valid for up to three months); and
- Professional Visit Pass, which is issued to a skilled foreign national that provides services to a Malaysian company on behalf of an overseas company on a temporary basis (this pass is valid for up to twelve months).

As of August 2016, foreign nationals applying for an Employment Pass or a Professional Visit Pass will only be granted work permits if they enter Malaysia with the work permit approvals. In addition, those

Table 6.9. Minimum wages in Malaysia, as of July 2016

Regions	Minimum wage (in MYR)
Federal Territory of Kuala Lumpur, Federal Territory of Putrajaya, Johor, Kedah, Kelantan, Malacca, Terengganu, Selangor, Perlis, Perak, Penang, Pahang, Negeri Sembilan	1,000
Sabah, Sarawak, Federal Territory of Labuan	920

Source: Wage Indicator (n.d.).

applying for an Employment Pass Category 3 will be required to undergo medical examinations.

Hoping to reduce the country's dependence on foreign workers, the Malaysian government recently increased the level of minimum wages across the country. The country's 2016 budget included a raise in minimum wage for private sector workers from MYR 900 to MYR 1,000 in the peninsula region, whilst those in Sabah, Sarawak, and Labuan saw an increase from MYR 800 to MYR 920 (refer to Table 6.9).³⁹

6.7.3. Social security system⁴⁰

The Malaysian Social Security system (PERKESO – *Pertubuhan Keselamatan Sosial*) provides financial

assistance to employees and their families in the event of accidents that result in death, illness, or disability. The system offers two types of insurance, including the employment injury assurance, and the invalidity pension scheme. Unfortunately, only Malaysian citizens and permanent residents are eligible to contribute to this social security system. Those exempt from contributing to the system include business owners and their spouses, domestic servants, foreign workers, government employees, and self-employed people. The amount paid into the scheme depends on an employee's earnings. An employer has the responsibility to register its employees with the PERKESO. Although foreign nationals who work in Malaysia are not covered by PERKESO, the 1952 Workers' Compensation Act allows them to be eligible for employment injury compensation.

6.7.4. Land policy

The Malaysian constitution provides the foundation for private land ownership in the country. The country's National Land Code of 1965, which has the vision of bringing Malaysia towards sustainable development through excellent resource management, supports this through the creation of a comprehensive and organised system of land ownership, registration, and dealing, which ensures the indefeasibility of title to land.⁴¹

There are at least seven types of land titles in Malaysia, including:

- Town lease, or lands classified within the town area, which can be leased either for 30, 60, or 99 years;
- Country lease, or mixed zone, which covers any land located outside town area, and can be leased for either 60, 99, or 999 years;
- Native title, or land that is classified for native own, and is perpetual in basis;
- Malay reserve, or land classified for native Malay own and is perpetual in basis;
- Field register, or land that is classified under the native title, but has not been issued the final title by the land agency;
- Provisional lease, or provisional title issued during the lifetime of the monarch in each state; and
- Temporary occupation lease, which is a lease granted by the state government to an individual or a company for a certain period of time and certain amount of annual rent.

Generally speaking, agricultural-related activities fall into the title of native title, Malay reserve, country lease, and provisional lease, whilst those in the commercial and industrial activities fall into

the country lease and town lease categories. Other economic activities, such as the extraction of timbers, sand, rock, etc., fall into the category of temporary occupation lease.⁴²

6.7.5. Commercial dispute settlement

The 2005 Arbitration Act, which was later revised in 2011, governs arbitration in Malaysia. It is based on the United Nations Commission on International Trade Law's Model Law on International Commercial Arbitration. The Kuala Lumpur Regional Centre for Arbitration, which was established in 1978, has developed new rules to cater to the growing needs of the global business community, including the i-Arbitration Rules, the Fast Track Rules of the Kuala Lumpur Regional Centre for Arbitration, and the Mediation and Conciliation Rules. Some commercial cases may be settled in less than six months under the Fast Track Rules.⁴³

6.8. Electronic links to relevant government agencies related to renewable energy

- Ministry of Energy, Green Technology, and Water: <<http://www.kettha.gov.my/portal/index.php>>.
- Sustainable Energy Development Authority of Malaysia: <<http://seda.gov.my/>>.
- Energy Commission of Malaysia: <<http://www.st.gov.my/index.php/en/>>.
- Ministry of Plantation Industries and Commodities: <<http://www.mpic.gov.my/mpic/index.php/en/>>.
- Malaysian Investment Development Authority: <<http://www.mida.gov.my/home/>>.
- Ministry of International Trade and Industry: <<http://www.miti.gov.my/>>.

As a middle-income country, Malaysia's economy is highly open and trade-dependent. At the same time, the government also considers foreign investment as an instrumental force for the sustainability of the country's economic development. Although the country's ease of trading and investment is highly ranked internationally, its economic openness has its own limits, especially in regards to renewable energy development. Technical barriers, for example, are common in its highly regulated energy sector. Despite this, Malaysia is a very good place to do business in. Taking advantage of its strategic location in the heart of Southeast Asia, Malaysia offers highly competitive facilities for investors intending to serve the wider ASEAN market.

- Malaysia Energy Information Hub (MEIH) <<http://meih.st.gov.my/statistics>>.
 - GreenTech Malaysia: <<http://www.greentechmalaysia.my/about-us/corporate>>
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 16. Economic Planning Unit of the Prime Ministers' Department (2016: 6-1).
 17. To facilitate green economic growth, SCORE mainly supports the provision of infrastructure and access to economic opportunities, especially for entrepreneurs and rural areas dwellers. For further information

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 39. ASEAN Briefing (2016).
 40. Adapted from the official website of the PERKESO at:

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7 MYANMAR

MYANMAR

7.1. Brief country profile

A lower-middle income country, Myanmar's GDP growth is expected to reach 8.3 percent in 2017, the highest in Southeast Asia.¹ The westernmost country in Southeast Asia, with a total population of 53.9 million, registered a GDP per capita of USD 1,246 in 2015.² After decades of military rule, Myanmar, also known as the *Golden Land*, is finally run by a civilian-led government following free elections that took place in 2015. This turn of event has attracted much enthusiasm towards one of the most promising economies in ASEAN. Despite a favourable economic outlook, Myanmar faces several macroeconomic risks to stable growth, such as a narrow production base, a more competitive global market, a lack of diversification in commodities, vulnerability to natural disasters, and higher prices for international commodities.³ Notwithstanding these challenges, Myanmar's economic prospects remain bright. Whilst global prospectors continue to be enticed by the potential wealth that lies beneath Myanmar's soil, structural reforms that the present government promises are expected to attract much needed capital to support the economic growth potential of the country. Policy reforms

and initiatives in the country's energy sector (e.g. electricity subsidies, tax on liquefied natural gas imports, offtake commitments, and provision of government guarantees in the sector) will be of particular interest to potential investors. Given the expected increase of Myanmar's

energy needs in the future, the country requires between USD 30 billion and USD 40 billion investment in the sector over the next 15 to 20 years.⁴ All these translate into opportunities waiting to be tapped.

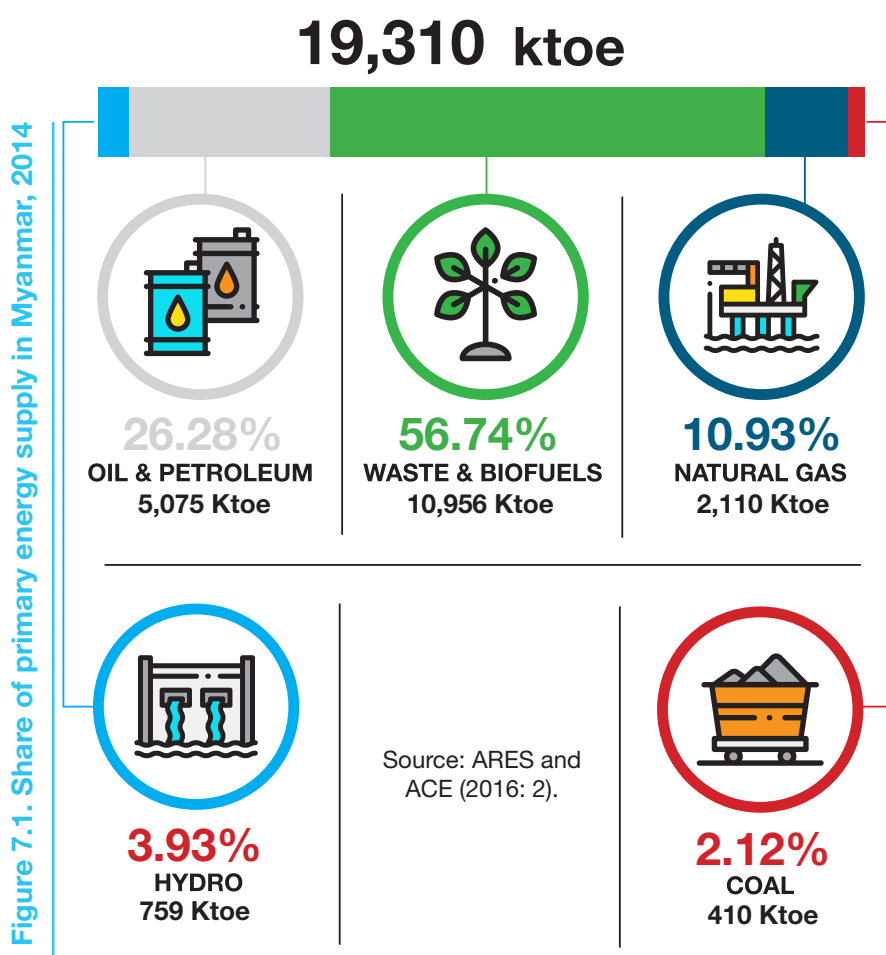


Figure 7.1. Share of primary energy supply in Myanmar, 2014

7.2. Renewable energy sector in Myanmar

The power industry and oil and gas sectors are amongst the most productive economic sectors in Myanmar. Natural gas is one of the major export resources of the country, and, generally, along with oil, they account for around 55 percent of Myanmar's total exports, and 86 percent of foreign direct investments in the country.⁵ Despite this, Myanmar's domestic energy consumption is one of the lowest in the world, mostly because the country exports most, or 80 percent, of its natural gas resources, whilst keeping the rest for domestic utilisation.⁶ As of 2014, for example, only 33 percent of Myanmar's population had access to electricity.⁷ Given the extremely low electrification rate in the country, the present government has made it a priority to strengthen the domestic supply of energy.

Interestingly, standing at around 60 percent, the share of renewable energy in Myanmar's total energy mix is relatively high. Given that the majority of the population uses traditional biomass for household activities, such as cooking and lighting,⁸ most of the country's renewable energy comes from waste and biofuels (56.74 percent).⁹ Currently, however, hydropower, which contributes to around 3.93 percent to the country's total energy mix, is the only renewable energy that has been exploited commercially in the country.¹⁰ As for other renewable energy sources, their commercialisation potential are currently either being studied or are still being developed at a very early stage. The overall energy mix in Myanmar is presented in Figure 7.1.

7.2.1. Biofuel and biomass

Traditional biomass is usually used for thermal energy application, such as cooking, with the majority of consumption is made in rural areas. Around 75 percent of biomass in Myanmar comes mainly

Table 7.1. Theoretical biomass energy potential of agricultural residues in Myanmar, 2009

Biomass residue*	Total yearly biomass production (10 ³ tonnes)	Total theoretical energy potential (10 ⁶ GJ)	Total theoretical energy potential (GWh)
Rice			
Rice husk	8,170	104.9	29,163
Rice straw	10,784	65.1	18,094
Sugarcane			
Sugarcane tops and trash	2,754	18.5	5,145
Sugarcane bagasse	2,280	14.6	4,073
Maize or corn cobs	311	4.4	1,241
Cassava stalks	31	0.2	60
Oil palm			
Oil palm frond	179	1.4	398
Oil palm fibre	10	0.16	45
Oil palm shell	3	0.04	10
Oil palm empty fruit bunches	29	0.3	83

Note: *Residues that are theoretically available for energy production.
Source: ADB (2015b: 65).

from firewood and charcoal, both of which contribute significantly to deforestation and health problems in the country. Precisely because of this, the present government is pursuing an energy policy that supports the wider use of renewable energy sources, whilst, at the same time, addressing various environmental, health, and social issues associated with excessive household use of firewood and charcoal.¹¹ Given Myanmar's reliance on its agricultural sector, it has a considerable potential for the cultivation of crops suitable for the production of biodiesel and bio-ethanol feedstock. To date, rice husks, rice straw, corn cob, cassava

stalk, bagasse, sugarcane, oil palm, and coconut residues are some agricultural wastes potential that can be converted into biomass.¹²

Myanmar's biofuel sector, on the other hand, has been relatively underdeveloped. It is reported that the government of Myanmar has planned to substitute 10 percent of imported oil and gasoline with domestically produced biodiesel and bio-ethanol by 2020.¹³ Some of the potential sources for biofuel production in the country include sugar, starch-based crops, unused biomass from rice husk, straw, corn, palm oil fibre, and waste biomass.

7.2.2. Other renewable energy sources for electricity generation

Renewable energy also serves as one of the main sources for electricity generation in Myanmar. In 2014 alone, hydropower generated 62.4 percent, or 14,157 GWh, of total electricity generation in the country, and this was followed by natural gas, with a total of 4,977 GWh, or around 35.16 percent. On the other hand, fossil fuels in the form of oil, petroleum, and coal contributed to a mere 2.5 percent of total electricity generation.¹⁴ The share of energy sources in Myanmar's electricity generation is presented in Figure 7.2.

Hydropower

Hydropower is currently the most developed renewable energy source for electricity generation in Myanmar. The utilisation of hydropower, however, is not stable as its intensity depends on the season. The share of hydropower in the overall energy mix of the

country usually decreases in the dry season.¹⁵

Solar

Although still at a very early stage of development, solar energy has promising potentials, particularly since 60 percent of Myanmar's land areas are suitable for solar photovoltaic (PVC) development.¹⁶ Areas in red in Figure 7.3. indicate where the global horizontal insolation levels are the highest, and where solar PVC development is most suitable in Myanmar. On this basis, Myanmar has installable capacity per unit of land area of 0.06 kWp/m, and the maximum technical solar power potential of 40 TWh/yr.

Wind

Myanmar also has some wind energy potentials. Although most of Myanmar has a low average of wind speeds (below 4 m/s), there are some areas in the country that have higher wind speeds. Theoretically, the country's wind

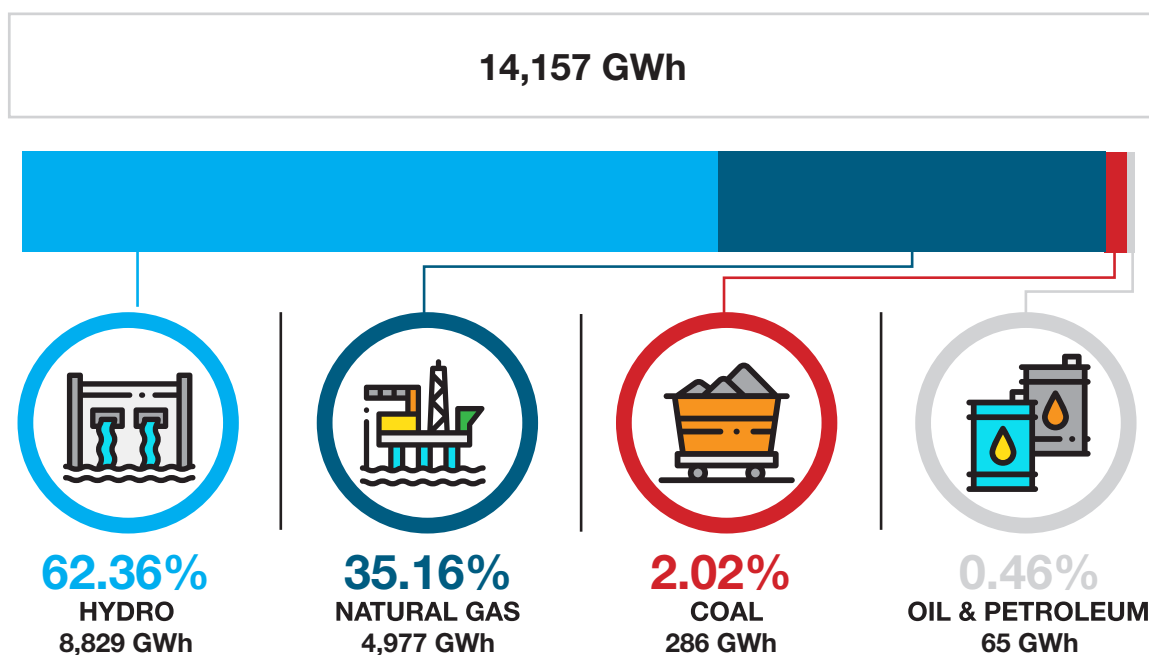
energy generation has the potential of reaching around 80 TWh/year.¹⁷ Despite this, most of the wind energy projects in Myanmar are still in the early developmental stage.

7.3. Policy context

7.3.1. Energy policy overview

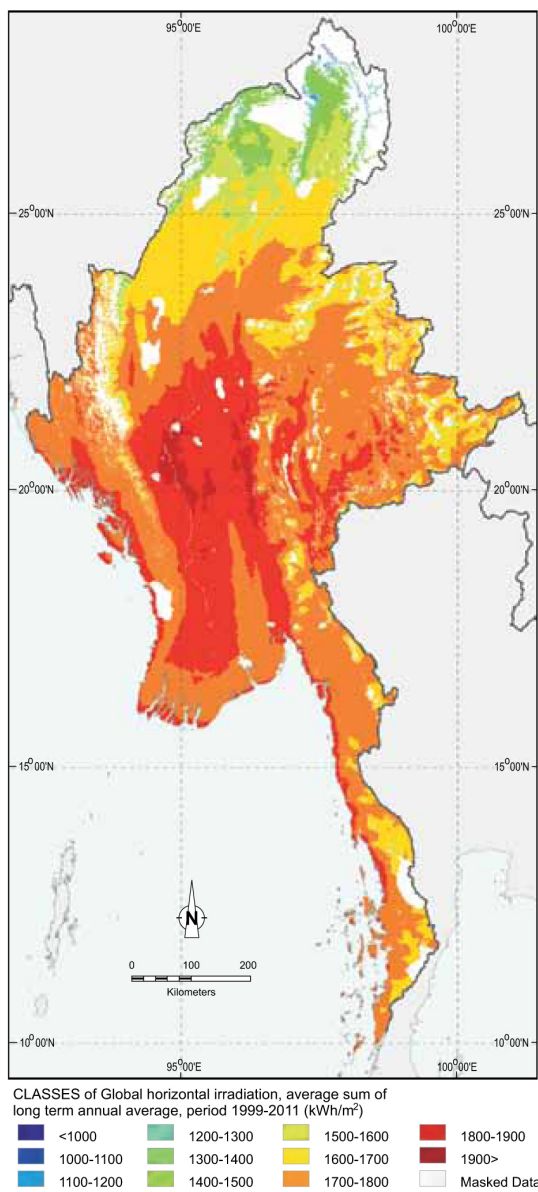
The National Energy Management Committee (NEMC), which is a ministerial level energy policy coordination body in Myanmar, launched a National Energy Policy in 2014 that currently serves as the main energy policy framework for the country. The policy, which has the objectives of ensuring energy security for sustainable economic development of the country, as well as to provide affordable and reliable energy supply to consumers, especially those without electricity,¹⁸ is closely linked with the government's broader reform agenda, including the short-term Framework for Economic and Social Reforms of 2012-2015¹⁹

Figure 7.2. Share of energy sources in Myanmar's electricity supply, 2014



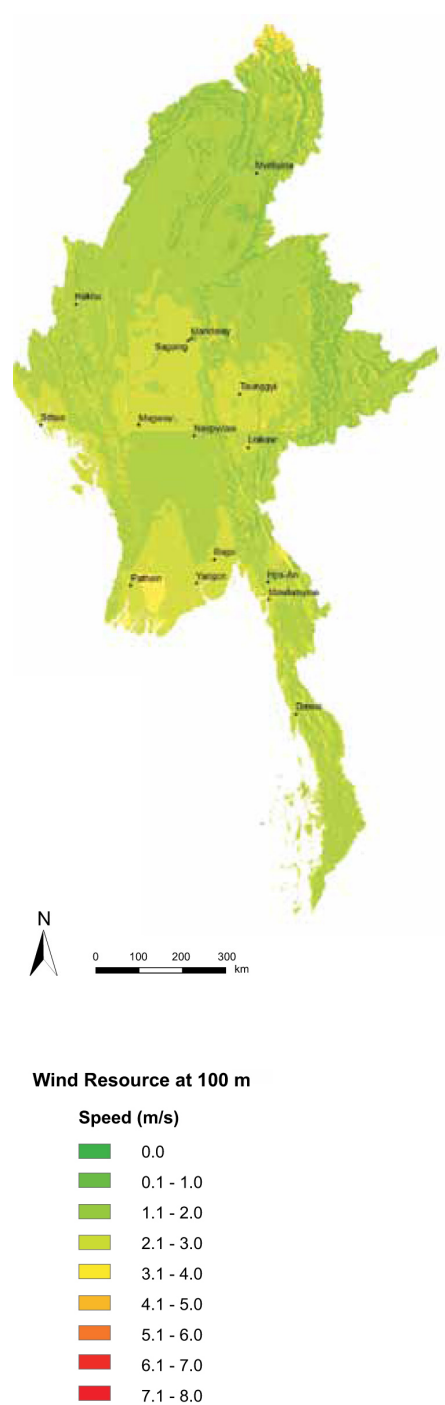
Source: ARES and ACE (2016: 3).

Figure 7.3. Map of suitable areas for photovoltaic development in Myanmar



Source: Lahmeyer International in ADB (2015).

Figure 7.4. Map of wind resource potential in Myanmar



Source: Lahmeyer International in ADB (2015).



that served as a bridge for the longer-term 2011-2031 National Comprehensive Development Plan. Subsequently, with technical assistance provided by the Japan Fund for Poverty Reduction, the NEMC launched an Energy Master Plan in 2015 to provide energy supply strategies through viable energy mix scenarios to secure long-term stable and reliable energy supply for the country.²⁰ The Master Plan includes a projection for 2030 electricity mix, which includes 57 percent for hydropower, 8 percent for natural gas, 5 percent for photovoltaic, and a significant increase in coal from 2 percent to 30 percent.²¹

7.3.2. Renewable energy policy

Led by the National Energy Management Committee (NEMC), and with the support from the Asian Development Bank (ADB), the government of Myanmar is currently in the process of developing a national renewable energy policy. Based on its 2014 draft, the policy can be summarised in the following five points: (1) the provision of adequate energy at sustainable cost; (2) encourage citizens to contribute to electricity service to help the weak; (3) give priority to viable distributed generation from renewable energy sources; (4) encourage private development of renewable energy generation; and (5) ensure proper standards, attractive financing, and continuous capacity development. Moreover, the policy draft also sets the potential contribution of renewable energy to the total energy mix (without large hydro) of the country to reach 26.8 percent, or equal to 3,995 MW, by 2030 (refer to Table 7.2.).

In the absence of a national renewable energy policy, existing Myanmar government's plans and initiatives related to the issue are reflected in the above-mentioned Myanmar Energy Master Plan. According to this policy document, Myanmar plans to

Table 7.2. Anticipated components of share and volume of renewable energy by 2030

Types		Share of total renewable energy (in percentage)	Volume equivalent (in MW)
Hydro power	Off-grid	1.3	198
Wind power	Grid-connected	3	446
Solar power	Grid-connected	17.8	2,658
	Off-grid	3.7	544
Biomass (biogas, gasification)	Grid-connected	1	147
	Off-grid	0.02	3
Total		26.8	3,995

Source: NEMC and ADB (2014: 8).

have between 15 percent and 20 percent of renewable energy share in its total installed capacity by 2020, most of which will be used for rural electrification purposes.²²

Policy for biofuel and biomass

The government of Myanmar has been promoting the production and use of biofuels, which include biodiesel and bio-ethanol, as alternatives fuels. It has a plan to use domestically produced biodiesel and bio-ethanol as substitutes for 10 percent of imported oil and gasoline by 2020.²³ Although the country does not have specific rules and regulations in support of biofuels and biomass development, existing laws and policies, such as the Forestry Law (1992), National Environmental Policy (1994), and National Sustainable Development Strategies (2009), make references to this form of renewable energy.

Policy for electricity generation from renewable energy

As it stands, Myanmar has yet to develop a specific policy

for electricity generation from renewable energy. Existing renewable energy development efforts are currently aimed at supporting electrification in rural areas. Hydropower currently serves as the main source of electricity generation, with the Ministry of Electricity and Energy understood to be planning the construction of more hydropower plants in the foreseeable future.²⁴ The government also encourages the participation of private sector in the development of hydropower, either as an independent power producer or through a joint venture initiative with local developers.²⁵ Main policies related to the electrification from renewable energy in Myanmar are highlighted in Table 7.3.

7.3.3. Investment policy, incentives, and procedure for renewable energy sector

Investment policy

Myanmar does not have a specific renewable energy investment policy and procedure. Currently, any investment projects made in the renewable energy sector must be

Table 7.3. Myanmar's major policies related to the electrification from renewable energy

Policies	Entry into force	Sector	Implementing agency	Key points
National Energy Policy	2014	Energy in general	National Energy Management Committee	• Energy sector reform as part of broader national economic reforms that are aimed at liberalisation and modernisation of the economy; • Ensuring energy security, as well as providing affordable and reliable energy supply to all population; and • 100 percent electrification rate in Myanmar.
Myanmar Electricity Law	2014	Electricity	Ministry of Electricity and Energy	• Repeals Myanmar Electricity Law of 1984, which lacked the legal framework to allow the participation of private sector in power projects and independent power producers; • Establishes the Electricity Regulatory Commission to supervise the monopolistic power entities; • The Law provides limited regulatory authority to the Electricity Regulatory Commission • The Law also authorises the Ministry of Electricity and Energy, region and state governments, as well as leading bodies of self-administered zones and divisions the power to grant permits to entities engage in electricity-related works; and • Foreign and domestic investments are encouraged to take part in power projects.
Myanmar Energy Master Plan	2015	Energy in general	National Energy Management Committee	• Between 15 percent and 20 percent share of renewable energy contribution in the total installed capacity by 2020; and • Renewable energy sources, including solar, wind, biomass, biofuel, and geothermal, to be used as an alternative to attain rural electrification target.

Source: Various.

referred to the new 2012 Foreign Investment Law that regulates investment in Myanmar. The said Law underlines the importance for the country to expand its energy sector resources, and promotes foreign investment in the development of renewable energy resources. To encourage foreign investment in the country, the Law allows foreign investors to own up to 100 percent of local enterprises. Moreover, investors with a permit from the Myanmar Investment Commission (MIC), which is responsible in reviewing and approving all investment applications in the country, will also be protected from potential nationalisation.²⁶

Investment incentives

As discussed earlier, any renewable energy-related investment issues, including investment incentives, must be referred to Myanmar's 2012 Foreign Investment Law. The Law lists the following incentives for any foreign investment projects made into the country:

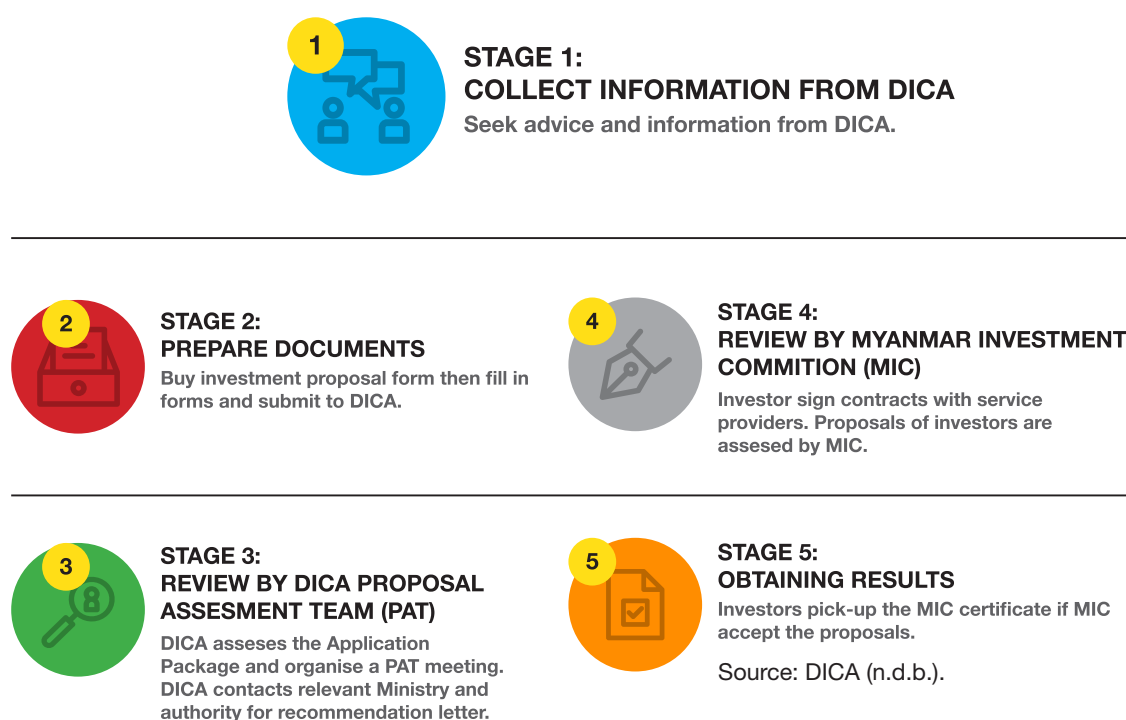
- A five-year income tax holiday for foreign investors;
- Exemption from a tax on profits if the profits are maintained in a reserve fund and reinvested in Myanmar within one year;
- For exported goods, income tax reliefs of up to 50 percent of the profits;

- Deductions for research and development expenses;
- Right to carry forward a loss and offset it against profits for up to three consecutive years from the year the loss is sustained; and
- Exemptions of reliefs from customs duties for the importation of machinery, equipment, instruments, machinery components, spare parts, and materials required for the enterprise.²⁷

General investment procedure

Whilst the Myanmar Investment Commission (MIC) is an agency that is responsible in issuing all investment-related permits, the

Figure 7.5. Application process to obtain MIC permit in Myanmar



Directorate of Investment and Company Administration (DICA) is the authority responsible for overseeing all investment activities in Myanmar. Details concerning general investment procedures in Myanmar are provided in Figure 7.5.

7.4. Barriers for renewable energy development

The following are potential barriers for renewable energy development in Myanmar:

- **Lack of specific renewable energy regulations**

The main barrier for renewable energy development and investment in Myanmar is the lack of a specific and clear policy framework for renewable energy. Aside from being focused on fossil-fuel energy sources, existing energy policy in Myanmar, though underscoring the importance of efficient energy use, does not provide specific roadmap

in which renewable energy is to be harnessed and further developed. Other supporting policies, however, are relatively accommodative towards renewable energy development. The country's trade policy, for instance, imposes import tariff on renewable energy technology or components at a relatively low rate of 1.8 percent.²⁸

- **Conventional fuel subsidy**

Similar to most other Southeast Asian countries, Myanmar also subsidises its fossil fuels. More specifically, the government provides subsidies on kerosene, natural gas, and electricity. To reform its energy subsidies, the government has gradually increased electricity prices and indexed the prices of diesel and gasoline to Singapore's spot market prices.²⁹

- **Lack of financial support**

Financially, there is also a lack of capital subsidies for processing

industries, interest rates subsidies to set up renewable energy plant, and tax concession for renewable energy producers. In biofuel development, there is also an absence of buy-back arrangements from any company to procure biodiesel crops that can guarantee its market value.³⁰

- **Fragmented institutional framework**

The complex structure of responsibilities amongst different government agencies is the main ingredients for ineffective decision-making and approval processes in Myanmar's energy sector.³¹ This institutional problem also creates coordination hurdles to advance the development of renewable energy sector in the country.

7.5. Institutional framework

Table 7.4. highlights specific tasks and responsibilities of different energy-related government agencies in Myanmar.

Table 7.4. Main renewable - energy related institutions in Myanmar

Institutions	Main roles and responsibilities
Ministry of Electricity and Energy	- Focal point for Myanmar's energy sector cooperation with international and regional organisations; - Management of generation, transmission, and maintenance of electricity power supply at the national level; - Increasing electrification rate, especially in rural areas, and generate more energy from renewable energy sources; - Encouraging public-private participation in each sector of electricity; and - Supervising and managing the Department of Hydropower Implementation and Electric Power Generation Enterprise.
Ministry of Natural Resources and Environmental Conservation	- Combination of the previous Ministry of Mines and Ministry of Environmental Conservation and Forestry; - Ensuring sustainable use of forestry sector and preservation of natural environment for national socio-economic development; and - Managing and supervising forest conservation and natural resources utilisation for business purposes.
Ministry of Industry	- Planning, installing and operating several off-grid PV projects nationally; and - Promoting domestic production of renewable energy technology.
Ministry of Education (Science and Technology)	- Leading institution for energy research, which include exploration, research and development for renewable energy technology; and - Promoting education for energy sector development in design, operation and distribution.
Ministry of Agriculture and Irrigation	- Involved in the operation of hydro power systems, which are used for electrification of rural areas and farms; and - Management of agricultural product and waste, which potentially could support the development of bioenergy projects (biofuel and biogas).
Energy and Renewable Energy Committee	- A committee under the Myanmar Engineering Societies; - Provides consultation and advice in energy efficiency and conservation, as well as energy management and renewable energy development; and - Focal point for cooperation and coordination with various government agencies, NGOs, and other international organisations.

Source: Various.

7.6. Setting up a business in Myanmar

The process of setting up a business in Myanmar, including the length of time and cost required, is highlighted in Table 7.5.

Table 7.5. The process of setting up a business in Myanmar

No.	Procedure	Time to complete (in day)	Cost to complete (in MMK)
1.	Name check at the Company Registration Office at the Directorate of Investment and Company Administration	1	1,000 (for form fee)
2.	Request business incorporation certificate	1	5,100 (application fee)
3.	Obtain signature of the directors before a lawyer or certified public accountant	1	40,000 for witnessing the signature of the memorandum and articles of association
4.	Payment of stamp duty and registration fee	1	500 for registration fees and 60,000 for stamp duty

Table 7.5. The process of setting up a business in Myanmar

5.	Open bank account	1	No charge
6.	Obtain certificate of incorporation	3	Paid as part of company incorporation fees
7.	Submit certification of registration document	1	No charge
8.	Obtain a seal or rubber-stamp	1	2,000
9.	Register for commercial tax	1	No charge
10.	Registration of employees at the Labour office in township	1	No charge
11.	Registration with the Social Security Board for social security benefits	1	No charge.

Source: World Bank (n.d.).

7.7. Other relevant information

7.7.1. Taxes

Various taxes in Myanmar are summarised in Table 7.6.

7.7.2. Landscape of labour condition and employment system

Around 54.2 percent of Myanmar's total workforce work in the

agricultural sector, and this is followed by the wholesale and retail trade sector (13.9 percent), the manufacturing sector (10.6 percent), and the transportation sector (4.2 percent). At the same time, about 56 percent of the employed population in the country are equipped with either primary or pre-primary levels of education.³² The country is, therefore, experiencing major shortages of skilled workers.³³ To address this issue, the government decided to set up the National Skill Standard Authority in 2007 to prepare the country's labour market ahead of the launching of the AEC in 2015. Subsequently, the government also launched the Employment and Skill Development Law in 2013 to facilitate job creation, unemployment rate reduction, and employees' capacity enhancement.

Meanwhile, employment practices in Myanmar are governed by both old and new laws and regulations, as well as internal policies and practices of the Ministry of Labour, Employment, and Social Security (refer to Table 7.7.). With regard to the employment of foreign nationals, however, there are no specific provisions covering this issue with the existing labour laws supposedly applying to all persons working the country. At the time of the writing, it is understood that the Ministry of

Table 7.6. Tax rates in Myanmar

Personal income tax	
Taxable income	Tax rates
Salaries	Progressive rates between 1 to 25 percent for resident and non-resident foreigners
Other incomes	Progressive rates between 1 to 25 percent for resident and non-resident foreigners
Corporate income tax	25 percent (flat rate), with a branch of foreign firms present in Myanmar also subject to 25 percent tax on Myanmar-source income.
Value added tax	None, although commercial tax is levied as a turnover tax on goods and services, which may range between 5 and 120 percent depending on the type of products and services.
Withholding tax	None for dividends (applied to both resident and non-resident foreigners), between none for interests paid to resident foreigners and 15 percent for interests paid to non-resident foreigners, and 15 percent for royalties of resident foreigners and 20 percent for non-resident foreigners.
Other taxes	Capital duty (none, though registration fees of up to MMK 1 million or more are applied for both the incorporation of a company and the registration of a branch) and payroll tax (tax on employment income is withheld by the employer).

Source: Deloitte (2017).

Labour, Immigration, and Population is currently drafting a law concerning the employment of foreign nationals. If enacted, this law may require foreign nationals working in Myanmar to obtain work permits and adhere to various new regulations.³⁴

Table 7.7. Relevant employment-related laws, rules, and regulations in Myanmar

Relevant employment-related laws	Relevant employment-related regulations, rules, and policies
• Workman's Compensation Act (1923) as amended in 2005; • Leave and Holidays Act (1951) as amended in 2014; • Factories Act (1951) as amended in 2016; • Oilfields (Labour and Welfare) Act (1951); • Employment Restriction Act (1959); • Income Tax Law (1974) as amended by Union Tax Law (2012); • Law Relating to Overseas Employment (1999); • Labour Organisation Law (2011); • Social Security Law (2012); • Settlement of Labour Dispute Law (2012) as amended in 2014; • Employment and Skill Development Law (2013); • Minimum Wage Law (2013); • Payment of Wages Law (2016); • Shop and Establishment Law (2016); and • Various sector-specific laws which contains labour regulations.	• Settlement of Labour Dispute Rules; • Minimum Wage Rules as amended in 2016; • Labour Organisation Rules; • Instruction of the Factories and General Labour Law Inspection Department; • Ministry of Labour Notification No. 84/2015 on Severance Payments; • National Minimum Wage Committee Notification No. 2/2015; • Ministry of Labour Notification No. 1/2015 on Labour Contracts; • Etc.

Source: Luther (2016: 3).

7.7.3. Social security system

Myanmar enacted the Social Security Law in 2012, which facilitated the subsequent launching of the country's Social Security Fund that took effect in April 2014. Under this social security law, employees are eligible for various benefits, such as sickness, maternity, death, employment injury, invalidity, and superannuation. With the exception of international organisations, employers of more than four employees are required to register and contribute to the Social Security Fund. Contributions are calculated at 5 percent of an employee's monthly salary up to a prescribed ceiling, which is set at MMK 300,000 per month, with the employer contributing up to 5 percent, and 2 percent from the employee.³⁵

7.7.4. Commercial dispute settlement

Reform of the arbitration regime and legislation is currently underway in Myanmar to accommodate the growing foreign investment into the country. Myanmar acceded to the New York Convention on the Recognition and

Enforcement of Arbitral Awards in 2013, and issued a draft Arbitration Bill modelled after the United Nations Commission on International Trade Law. Issued in early 2016, the new Arbitration Law does not specify the kinds of disputes that may be arbitrated, though, in general, any civil disputes may be referred to arbitration.³⁶

7.7.5. Land policy

Generally speaking, the lack of firm property rights remains an issue in Myanmar. Aside from the lack of protection of private property, the pervasiveness of corruption also hinders adequate property rights in the country. In order to address this, parliament enacted the Farmland Law and the Vacant, Fallow, and Virgin Management Law in 2012, both of which allow long-term use of large tracts of lands by private investors in various sectors, including agriculture. In January 2016, the government of Myanmar issued a new National Land Use Policy, which is regarded as an important step towards improving the governance of land tenure in the country. Despite several shortcomings, this new policy is expected to become the fundamental basis of land-related policies in the future.

7.8. Electronic links to relevant renewable energy information and government agencies

- Ministry of Energy: <<http://www.energy.gov.mm/>>.
- Ministry of Electricity and Energy: <<http://www.moep.gov.mm/>>.
- Directorate of Investment and Company Administration (DICA): <<http://www.dica.gov.mm/en>>.
- Ministry of Environmental Conservation and Forestry: <<http://www.moecaf.gov.mm/>>.
- Ministry of Industry: <<http://www.industry.gov.mm/en>>.
- Ministry of Science and

AEC business tip for Myanmar

After decades of isolation, Myanmar has transformed itself into an open, reform-driven, economy. Its projected economic growth and renewable energy potentials offer huge potentials for ASEAN and non-ASEAN companies to assist Myanmar meets the expected increase of energy demand in the country. Unfortunately, Myanmar still lacks regulatory transparency, whilst complex bureaucracy and corruptions continue to hamper the ease of doing business in Myanmar. The country's involvement in the AEC, however, allows further regulatory reforms and improves transparency, and, hence, creates a better and promising business environment for companies to do business in the country. Aside from being part of the regional production network, the AEC also provides a platform for companies in Myanmar to have a greater access to other markets in the region.

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11. ADB (2015b: 62).
12. *Ibid.*, p. 64.
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19. Further details concerning this policy, see, amongst others, the official website of the Centre for Economic and Social Development at: <https://myanmarcesd.org/2013/01/30/publication-fesr/>.
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32. Ministry of Labour, Employment, and Social Security and Central Statistical Organisation (2015: 13).
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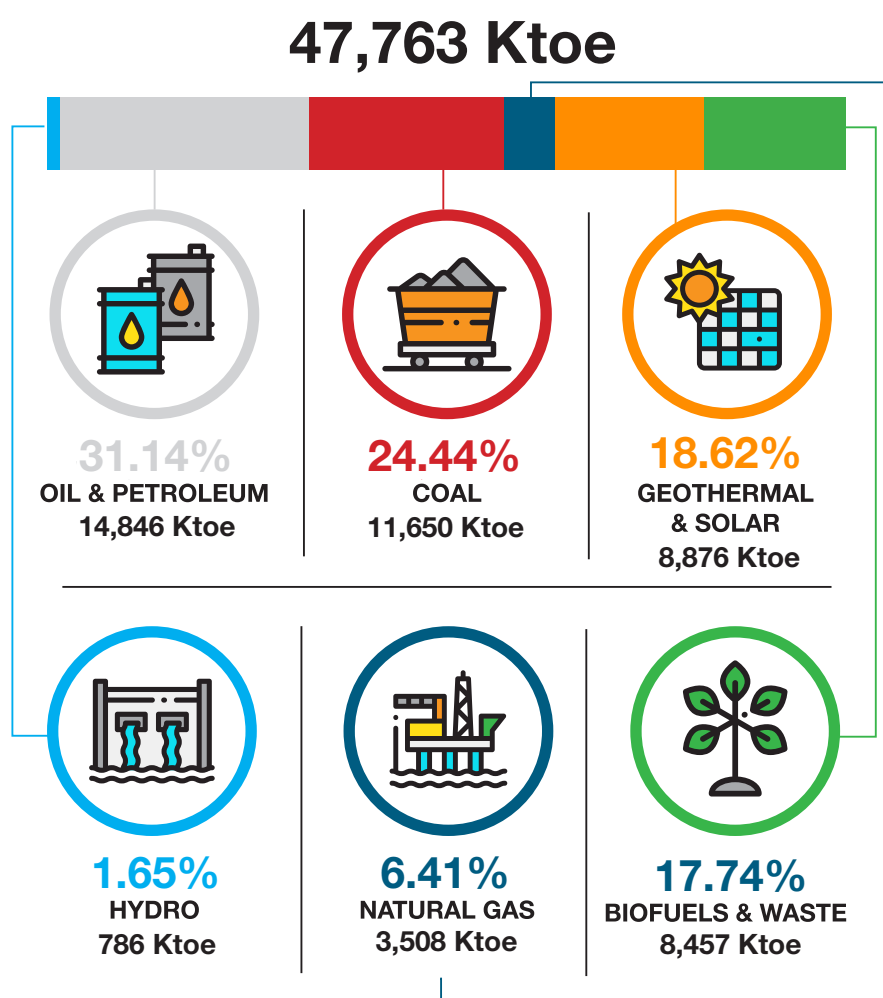
8. THE PHILIPPINES

THE PHILIPPINES

8.1. Brief country profile

The Republic of the Philippines continues to be one of the strongest economic performers in Asia. Registering a GDP per capita of USD 2,850 in 2015,¹ the Republic's GDP growth rate rose from 5.5 percent in the first half of 2015 to 6.9 percent in the first half of 2016, which allowed the country to outperform many of its regional peers, such as Malaysia, Thailand, Indonesia, and Vietnam.² One of the top emerging markets in the world, the economy of the Philippines has been transitioning from an agriculture-based to one that is more focused on services and manufacturing. At 58.8 percent, services made the highest contribution to the country's GDP in 2015.³ Geographically located on the Pacific Ring of Fire, the country is reported to have a high potential for geothermal energy. Currently, the Philippines is the only ASEAN country with a plan to utilise the ocean as an alternative renewable energy source. Launched in 2015, and expected to be completed in 2020, the first ocean energy project in the country would include the so-called *Ocean Thermal Energy Conversion*, a project that attempts to convert wave and tidal into energy.

Figure 8.1. The Philippines' primary energy mix, 2014



Source: ARES and ACE (2016:2).

8.2. Renewable energy sector in the Philippines

The Philippines' main goal for the energy sector is to enhance its energy security so as to allow the country to become energy self-sufficient. In 2014, the Philippines imported

around 55 percent of its energy supply, and these included 79 percent of oil, 20 percent of coal, and one percent of biofuels.⁴ To address the energy security issue in the country, the government intends to harness indigenous energy sources by bringing in more investment to exploit domestic fossil fuel and renewable energy resources.⁵ At 38 percent in 2014, renewable energy made a considerable contribution to the energy mix of the Philippines. Unfortunately, the contribution of conventional energies to the country's energy mix were even larger, with oil and petroleum contributing 31.1 percent, and this was followed by coal with 24.4 percent (refer to Figure 8.1).⁶

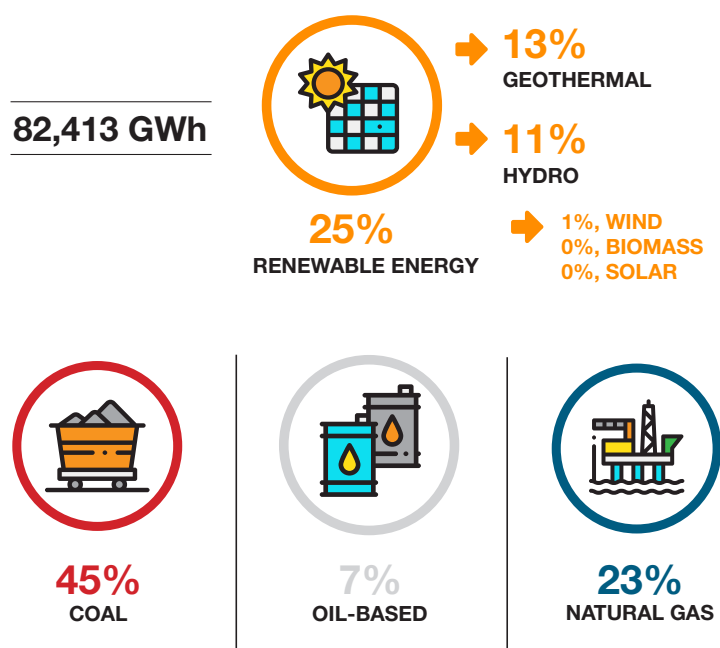
8.2.1. Biofuel

At 17.7 percent in 2014, the share of biofuels and waste is relatively high in the energy mix of the Philippines. The present blending mandates of the government are 10 percent and two percent for ethanol and biodiesel respectively.⁷ As of 2016, the Philippines had a total of 11 biodiesel and 10 bio-ethanol production facilities.⁸ To attain energy self-sufficiency and sustainable environment, the Philippines hopes to see more indigenous biofuel sources to be found in the country's 2030 energy mix.

8.2.2. Other renewable energy sources for electricity generation

Electricity generation in the Philippines is still dominated by conventional energy sources. In 2015, coal (45 percent) was the main source for electrification in the country, and this was followed by renewable energy (25 percent) and natural gas (23 percent). The highest renewable energy contributor was geothermal (13 percent), and was followed by hydro (11 percent).⁹ Figure 8.2. presents the overall capacity and share of energy sources for electricity generation of the Philippines in 2015.

Figure 8.2. Share of energy source in the Philippines's electricity power generation, 2015



Source: Department of Energy of the Republic of the Philippines (2015).

Geothermal

The Philippines is the world's second largest producer of geothermal energy after the United States of America. The country's geothermal potential is reported to reach around 4,407 MW, which is around two-fold its current geothermal capacity.¹⁰ As of 2015, there were 43 geothermal service contracts, seven of which produced around 1,868 MW of electricity, whilst the remaining 36 were in the process of development.¹¹ The government of the Philippines is currently expanding opportunities for geothermal project in the country. Figure 8.3. presents geographical areas in which geothermal fields are in their pre-development stage.

Solar

Solar is also another major potential of renewable energy source for the Philippines. According to the National Renewable Energy Program (NREP) of the Philippines, the country's renewable energy base should reach 15,304 MW by 2030, or almost triple the current installed

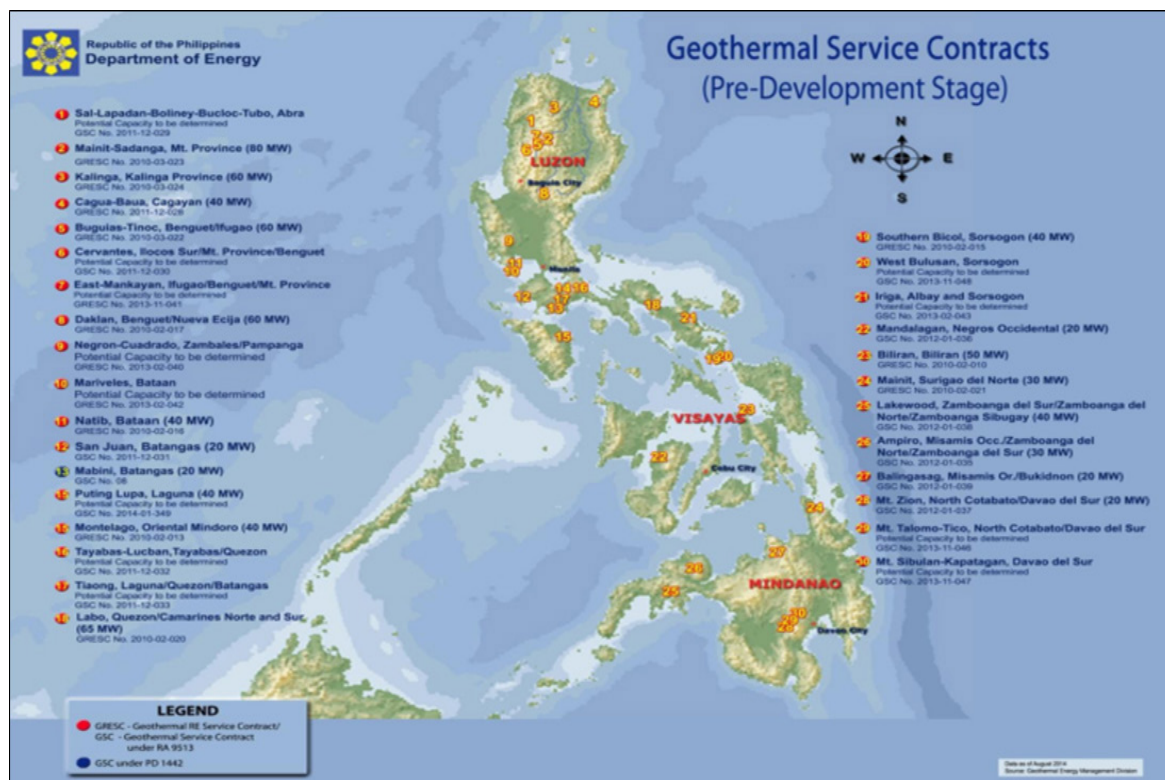
base. Of this total, ten percent, or 1,500 MW, will be attributed to solar.¹² Moreover, with an average solar radiation range from 128-203 watts per square meter, or an average of 161.7 watts per square meter, the Philippines has the potential to generate solar power with a capacity between 4.5 kWh and 5.5 kWh per square meter per day.¹³

8.3. Policy context

8.3.1. Energy policy overview

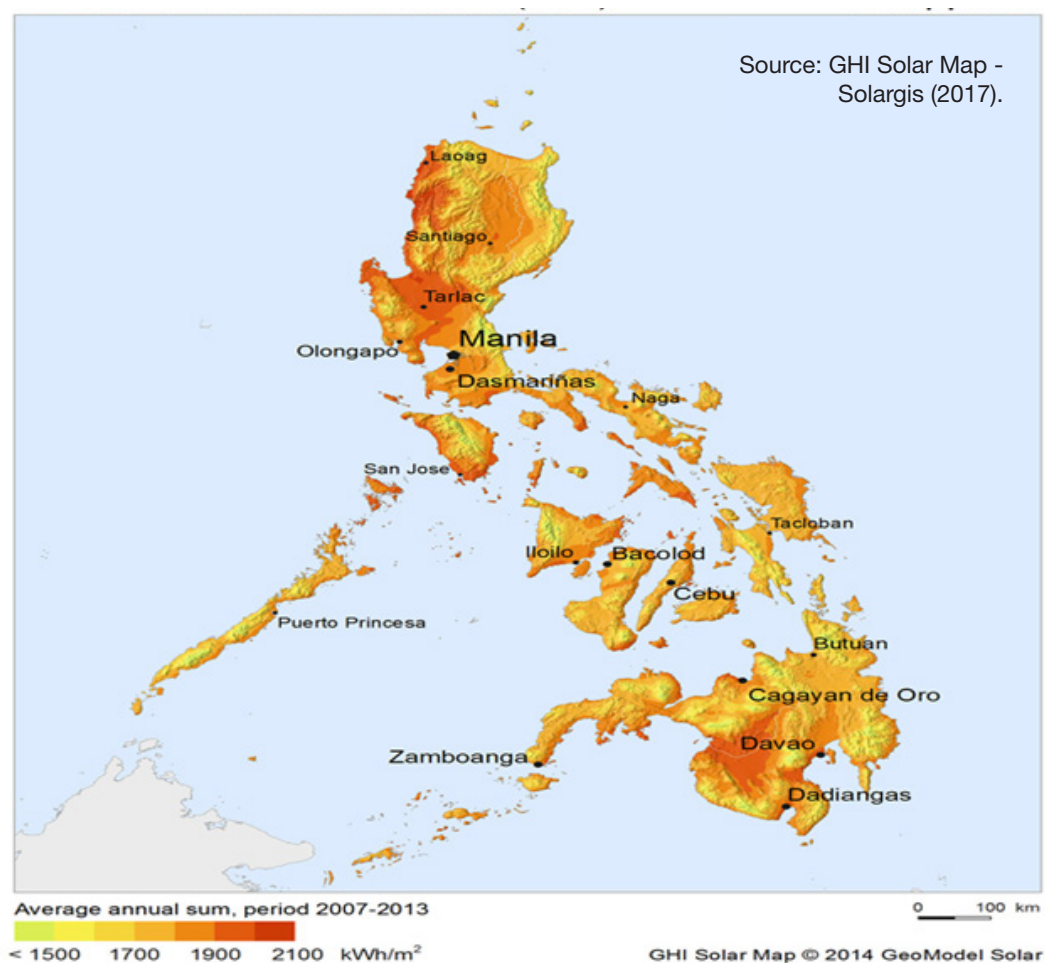
With a vision of 'energy access for more', the Philippine Energy Plan of 2012-2030 is the main energy policy guideline of the Philippines. The policy, which seeks to mainstream access of the larger populace to reliable and affordable energy services to fuel local productivity and countryside development, contains an energy reform agenda that provides the following policy directions: (1) the attainment of energy security through the development of indigenous energy, such as renewable energy and hydrocarbon fuels (oil, gas, and coal); (2) the achievement of optimal energy pricing in electricity and

Figure 8.3. Map of areas in which geothermal projects are in their pre-development stage



Source: Fronda *et al.* (2015: 15).

Figure 8.4. Global horizontal irradiation of Philippines



Source: GHI Solar Map - Solargis (2017).

oil; and (3) the development of a sustainable energy system through the formulation and the updating of national plans and programmes on energy development, which should be consistent with the country's overall economic development plan.¹⁴ Despite this, conventional energy sources in the form of fossil fuels continue to be the main focus of the government's effort to ensure energy sufficiency, whilst renewable energy remains an alternative energy source to promote clean energy.¹⁵

8.3.2. Renewable energy policy

To tap in and accelerate the utilisation of renewable energy potential in the country, the Philippine Congress passed the Republic Act No. 9513, also known as the Renewable Energy Act, in 2008. Whilst effectively reducing harmful emissions and achieving economic development, the launch of the Act was also expected to protect the health of the population and the environment in the country.¹⁶ Considered one of the most comprehensive and forward-looking renewable energy laws in the world, the Act provides generous fiscal and non-fiscal incentives to private sector investors and renewable energy equipment manufacturers or suppliers.¹⁷

Furthermore, launched in 2011, the Renewable Energy Programme (NREP) of 2011-2030 sets the

strategic building blocks that are expected to assist the country in achieving the goals set in the aforementioned 2008 Renewable Energy Act. More specifically, the NREP seeks to increase the renewable energy-based power capacity in the country to an estimated 15,304 MW by 2030, almost triple the 2010 figure of 5,369 MW.¹⁸ As far as renewable energy technology is concerned, the government also plans to, amongst others, increase the country's geothermal capacity by 75 percent, hydro capacity by 160 percent, as well as developing the country's first ocean energy facility.¹⁹

The enforcement of the NREP has facilitated the implementation of numerous renewable energy projects in the country. Throughout the first half of 2016, for instance, a total of 724 renewable energy service contracts, with an aggregate potential capacity of 14,498 MW and total installed capacity of 4,132.5 MW, were awarded by the Department of Energy.²⁰ Amongst renewable energy resources, meanwhile, the government approved 398 hydropower projects with a potential capacity of 8,037 MW and 160 solar projects.²¹ Table 8.1 summarises the Philippines' renewable energy installation targets, which illustrates the government's priority for hydropower and geothermal development.

Policy for Biofuel

The Philippine Congress passed the Republic Act No. 9367, or the

Biofuels Act, on January 2007, which made the country the first ASEAN Member State to have biofuels-blending legislation.²² The Act mandates the blending of biofuels in fuels, which, at present, stands at five percent for biodiesel, and ten percent for gasoline.²³ The government is also committed to continuously increase the mandated blending, whilst, at the same, improve research and development support and build more infrastructures for biofuels.²⁴ Aside from blending requirement, the Act also provides incentives in the production, distribution, and the use of locally-produced biofuels,²⁵ as well as creating the National Biofuels Board that monitors and evaluates the implementation of the country's National Biofuels Programme.²⁶

Policy for electricity generation from renewable energy

Regulation for electricity generation from renewable energy is provided by the 2008 Renewable Energy Act. Aside from laying out the policy framework for renewable energy development, the Act also regulates the Renewable Portfolio Standards, the feed-in-tariff (FIT) system, as well as various incentives for renewable energy projects.

As far as Renewable Portfolio Standards is concerned, the Act obliges electric power industry participants, such as generators, distribution utilities, or suppliers to produce a fraction of their electricity from eligible renewable energy resources, the amount of which will be determined by the National Renewable Energy Management Bureau of the Department of Energy.²⁷ Meanwhile, the FIT is the obligation on the part of electric power industry participants to source electricity from renewable energy generation at a guaranteed fixed price for a given period of time.²⁸ Depending on the renewable energy sources used, different FIT rates will be applied to different renewable energy technologies.

In order to accelerate renewable energy development, the government plans to finalise the guidelines for Renewable Portfolio Standards,

Table 8.1. Renewable energy-based capacity installation targets in the Philippines (in MW)

Sector	Target Capacity Addition by			Total Installed Capacity by 2030
	2020	2025	2030	
Geothermal	1,100.0	95.0	80.0	3,461.0
Hydro	3,161.0	1,891.8	0.0	8,724.1
Biomass	0.0	0.0	0.0	315.7
Wind	855.0	442.0	0.0	2,378.0
Solar	5.0	5.0	5.0	285.0
Ocean	35.5	35.0	0.0	0.5
Total	5,156.5	2,468.8	85.0	15,304.3

Source: Department of Energy of the Republic of the Philippines (2010: 23).

as well as policy instruments for other forms of renewable energy. In addition, it also seeks to establish an Energy Investment Coordinating Center to strengthen coordination and linkages amongst energy-related regulatory agencies, as well as developing a renewable energy database, support capacity building and education programme for renewable energy.²⁹

8.3.3. Investment policy, incentives, and procedure for renewable energy sector

Investment policy

The 2008 Renewable Energy Act declares the renewable energy sector a priority investment sector that will regularly form part of the country's investment Priority Plan, which is an annual list of promoted areas of investments eligible for government incentives. Accordingly, the Act highlights general incentives for investments made in renewable energy projects.³⁰ Additional reference to renewable energy investment regulation is provided by

the Department of Energy Circular No. DC 2009-05-0008 concerning Rules and Regulations Implementing the aforementioned Republic Act No. 9513 (on Renewable Energy). Part IV of the Circular states that 'the exploration, development, production, and [utilization] of natural resources shall be under the full control and supervision of the state'. The policy document further states that the state may enter into co-production, joint venture, or co-production sharing agreements with Filipino citizens or corporations in which Filipino(s) own at least 60 percent of the capital.³¹ Foreign investors or developers are also allowed to develop renewable energy through a Renewable Energy Service or an Operating Contract with the government.³²

Investment Incentives

The 2008 Renewable Energy Act lists a number of fiscal and non-fiscal incentives attached to renewable energy-related projects in the Philippines, and these include, but are not limited to:

- Income tax holiday for up to seven years with specific

requirements;

- Exemption from duties on renewable energy machinery, equipment, and materials within the first ten years from the issuance of a Certificate of Registration to a Renewable Energy Developer;
- Special realty tax rates on equipment and machinery, which will not exceed 1.5 percent;
- Net operating loss carry-over eligible during the first three years from the start of commercial operation;
- Corporate tax rate of ten percent of their net taxable income for developers that were or have been in commercial operation for more than seven years;
- Zero percent value-added tax rate for the sale of fuel from renewable energy sources, purchase of local goods or services, and the process of exploration; and
- Tax exemption³³ of carbon credits.

Energy, along with environment and climate change, are also sectors that are covered under the present 2017-2019 Investment Priorities Plan. Sectors listed in the so-called

Table 8.2. Key points of main renewable energy policies in the Philippines

Titles	Year	Targets	Implementing agencies	Key points
Biofuels Law	2006	Biofuels utilisation	Department of Energy	• Biofuel blending requirements for biodiesel and bio-ethanol; • Incentives for the production, distribution, and use of locally-produced biofuels; and • The establishment of National Biofuels Board to monitor and evaluate National Biofuels Programme.
Republic Act No. 9513 on Renewable Energy	2008	Renewable energy in general	National Renewable Energy Management Bureau	The Act regulates the exploration development, utilisation, and commercialisation of renewable energy resources for the generation, transmission, distribution, sale and use of electricity and fuel.
National Renewable Energy Programme	2011	Renewable energy in general	Department of Energy	The Programme sets the goals, objectives, and targets for renewable energy development in the country, which would cover all forms of renewable energy sources, such as geothermal, hydro, wind, solar, biomass and ocean.
2012-2030 Philippine Energy Plan	2012	Renewable energy in general	Department of Energy	The Plan sets the general direction for the energy reform agenda in the Philippines so as to allow the country to attain energy security, optimal energy pricing, and the ability to develop a sustainable energy system.

Source: Various.

‘preferred’ investment areas are eligible for fiscal incentives, and this applies to activities such as exploration, and development of energy sources, as well as the development of power generation plants. A potential investor, however, must be given a ‘pioneer industry’ status by the Board of Investments of the Philippines before it can secure access to land and offshore areas to harness energy sources. Potential developers or investors must also secure Certificate of

Registration from the Renewable Energy Management Bureau of the Department of Energy.

Additional financial assistance programmes are also available from various financial institutions in the country, including the Development Bank of the Philippines, Land Bank of the Philippines, Philippine Exim Bank, and so on. The government has also established the Renewable Energy Trust Fund to enhance the development and greater utilisation

of renewable energy, especially for activities related to research and development, operation, market assessment, and training.³⁴

General investment procedure

As discussed earlier, foreign investors or developers are allowed to develop renewable energy through a Renewable Energy Service or an Operating Contract with the government. There are two stages involved in obtaining the said contract, including the

Table 8.3. Various incentives for renewable energy-related projects in the Philippines

Incentives	Renewable energy developers	Renewable energy commercialisation	Electricity suppliers	End-users
Seven years income tax holidays	Yes	Yes		
Duty-free importation	Yes	Yes		
Value added tax free importation	No tax credit	Yes		
Special realty tax rate of less than 1.5 percent	Yes			
Net operating loss carryover	Yes	Yes		
10 percent corporate tax rate after income tax holiday	Yes			
Accelerated depreciation	Yes	Yes		
Zero percent value added tax on renewable energy sales and purchases	Yes	Yes		
Cash incentive equivalent to 50 percent of universal charge for missionary electrification	Yes			
Tax exemption on carbon credits	Yes			
Tax credit on domestic capital equipment and services	Yes	Yes		
Renewable Portfolio Standards	Yes			
Feed-in-Tariff on emerging technologies	Yes		Yes	
Renewable energy market and certificates			Yes	
Green energy options				Yes
Net metering				Yes
Government waives share of proceeds on renewable energy micro-scale project of less than 100 kW	Yes			
Exemption from universal charge	Yes			
Payment of transmission and wheeling charge equivalent to the average kWh rate	Yes			
Tax rebate for renewable energy components	Yes			
Financial assistance programme	Yes			
Incentives for host communities				Yes

Source: Maniego, Jr. (2012: 6-7).

Pre-Development Stage and Development/Commercial Stage. The *Pre-Development Stage* involves the preliminary assessment, feasibility study, and financial closure of the renewable energy project. The *Development/Commercial Stage* involves the development, production and/or utilisation of renewable energy resources. Application for a Renewable Energy Service Contract must be submitted to the Renewable Energy Management Bureau of the Department of Energy.³⁵

Different investment procedures, however, may apply to different renewable energy projects. In general, potential investors are advised to observe the Department of Energy Circular No. 2009-07-0011 concerning *Guidelines Governing a Transparent and Competitive System of Awarding Renewable Energy Service/Operating Contracts and Providing for the Registration Process of Renewable Energy Developers*, which provides details on various requirements on different renewable energy projects.

The general procedure to invest

and develop renewable energy in the Philippines usually involves the following steps:

- **Project preparation**

Potential project developer or investor must determine the location (site selection) and prepare the necessary data for a feasibility study. At this stage, the said developer or investor is also required to apply for the Renewable Energy Service Contract at the Department of Energy so as to allow it access to available support for the proposed project from the government;

- **Pre-development**

At this stage, potential developer or investor may form a company (Corporate Fiscal/Legal) and obtain the necessary permits or licences (administrative authorisation) from the Department of Environment and Natural Resources, the Department of Agrarian Reform, the National Commission on Indigenous People, the Department of Energy, and local government units. The

said developer or investor must also approach power utilities to obtain the grid connection permit. Financial support can be obtained from local banks;

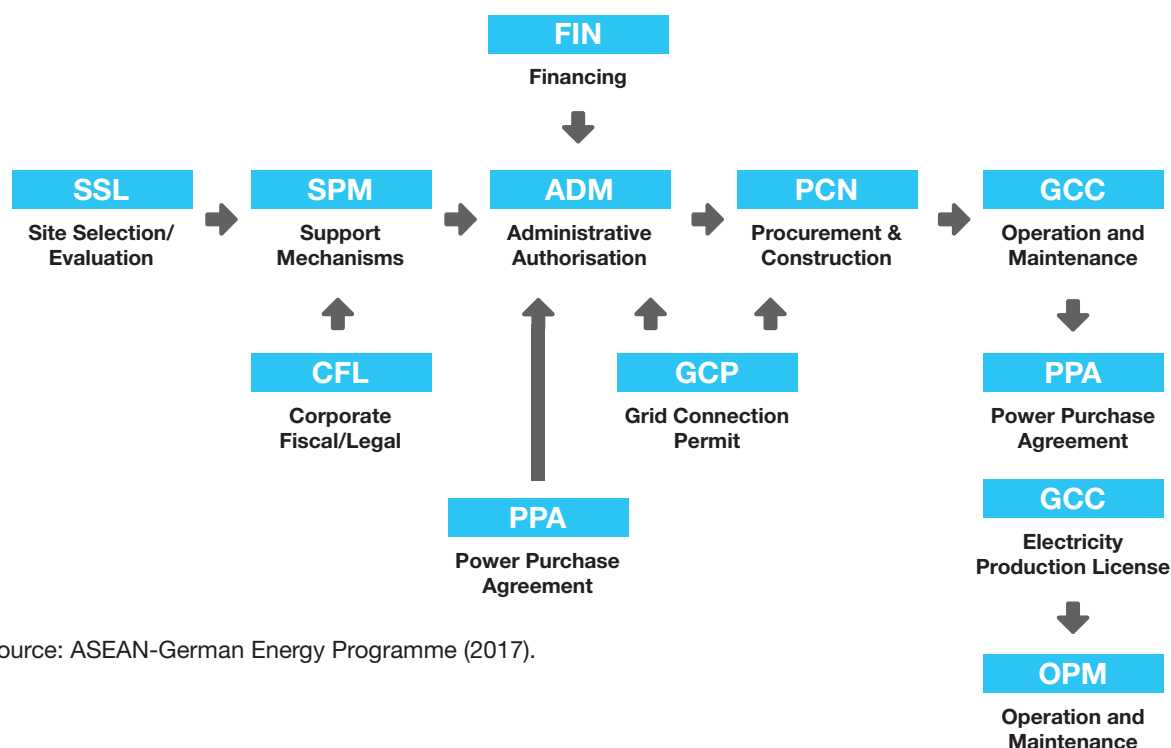
- **Development**

After the financial closure, equipment procurement and physical construction, development of the project may begin. A final inspection will take place when the progress of the project reaches 80 percent;

- **Registration and Connection**

Before its commercial operation, the developer or investor must obtain several permits/certifications. In the case of a renewable energy project under the FIT scheme, a certificate of FIT from Department of Energy must be obtained. For a renewable energy project under a power supply agreement, an approval from the Energy Regulatory Commission is required. Renewable energy developer is also required to obtain a certificate of compliance (COC) from the

Figure 8.5. The development process of renewable energy projects in the Philippines



Source: ASEAN-German Energy Programme (2017).

Energy Regulatory Commission to gain the Electricity Production License from the same government institution;

- **Operation**

Developer must ensure appropriate operation and preventive maintenance measures are in place.

8.4. Barriers for renewable energy development

The following are potential barriers for renewable energy development in the Philippines:

- **Lack of financial support and competency**

Although all consumer energy subsidies were eliminated during the 1996-2001 period, there are still a number of market barriers for renewable energy development in the Philippines. Aside from the lack of subsidies and grants for renewable energy installation,³⁶ financial institutions also lack the competency to evaluate renewable energy projects. The issue is highly problematic since capital costs

and perceived risks associated with the development of renewable energy products and technologies in the country are considerably high.³⁷

- **Lack of coordination and knowledge sharing**

Insufficient coordination and knowledge sharing mechanisms amongst renewable energy-related institutions are some of key problems preventing the development of renewable energy in the Philippines. The country requires a more effective streamlining of administrative processes to ease renewable energy project development.³⁸

- **Lack of social awareness and acceptance**

There is also little awareness and social acceptance for renewable energy utilisation in the society.

8.5. Institutional framework

The Department of Energy is the main governmental body that is responsible for the overall energy-related policy-making in the Philippines. In implementing various

renewable energy policies, the Department of Energy is supported by its own National Renewable Energy Management Bureau. The Bureau, which was established to support the implementation of the Renewable Energy Act of 2008, formulates and implements policies, plans, and programmes related to the accelerated development, transformation, utilisation, and commercialisation of renewable energy resources, including emerging energy technologies. The Bureau has several divisions that are responsible for specific renewable energy sources, and these include: (1) Biomass Energy Management Division; (2) Hydropower and Ocean Management Division; (3) Geothermal Energy Management Division; and (4) Solar and Wind Energy Management Division.³⁹

8.6. Setting up a business in the Philippines

Table 8.4. summarises the process of setting up a business, including the length of time and cost required, in the Philippines.

Table 8.4. The process of setting up a business in the Philippines

No.	Procedure	Time to complete (day)	Cost to complete (in PHP)
1.	Verify and reserve the company name with the Securities and Exchange Commission	1 day	PHP 40
2.	Deposit the paid-in minimum capital at the bank	1 day	No charge
3.	Notarize articles of incorporation and treasurer's affidavit at the notary	1 day	PHP 500
4.	Register the company with the Securities and Exchange Commission and pre-registration for Taxpayer Identification Number, Security System, Philippine Health Insurance Company (PhilHealth), and Home Development Mutual Fund (Pagibig Fund).	2 days on average	(Visit the World Bank's website for further detail)
5.	Obtain barangay clearance	1 day	PHP 500
6.	Pay the annual community tax and obtain the Community Tax Certificate from the City Treasurer's Office	1 day	PHP 500

Table 8.4. The process of setting up a business in the Philippines

No.	Procedure	Time to complete (day)	Cost to complete (in PHP)
7.	Obtain the business permit to operate from the Business Permit and Licensing Office	6 days	(Visit the World Bank's website for further detail)
8.	Buy special books of account at bookstore	1 days	PHP 400
9.	Apply for Certificate of Registration and Taxpayer Identification Number at the Bureau of Internal Revenue	1 day	PHP 100 (certification fee) and PHP 15 (documentary stamp tax, in loose form to be attached to Form 2303)
10.	Pay the registration fee and documentary stamp taxes at the Authorized Agent Bank	1 day	(Visit the website for further detail)
11.	Obtain the authority to print receipts and invoices from the Bureau of Internal Revenue	1 day	No charge
12.	Print receipts and invoices at the print shop	7 days	PHP 3,500
13.	Have books of accounts and Printer's Certificate of Delivery stamped by the Bureau of Internal Revenue	1 day	No charge
14.	Final Registration with the Social Security System	1 day	No charge
15.	Final registration with the Philippine Health Insurance Company (PhilHealth)	1 day	No charge
16.	Final registration with Home Development Mutual Fund (Pag-ibig)	1 day (simultaneous with previous procedure)	No charge

Note: * For detail of the charges, see the official website of the World Bank at: <<http://www.oiingbusiness.org/data/exploreeconomies/philippines>>. Source: World Bank (n.d.)

8.7. Other relevant information

8.7.1. Taxes

Table 8.5. below summarises various taxes imposed in the Philippines.

Individual income tax	
Income (in PHP)	Progressive rates (in percent)
Up to 10,000	5
10,000-30,000	10
30,000-70,000	15
70,000-140,000	20
140,000-250,000	25
250,000-500,000	30
500,000 and over	32

8.7.2. Labour condition landscape and employment system

The relatively high economic growth experienced by the Philippines in recent years has been able to absorb the available labour force in the country. To date, about half of total employment in the Philippines are employed in the services sector, whilst agriculture absorbs only one-third of total employment. Although relatively successful in producing well-educated and skilled workers, the country faces a shortage in employment that can absorb these more educated and skilled workers. Aside from ending up in low-paid jobs, many of these workers opt to leave the country to seek

Table 8.5. Tax rates in the Philippines

Corporate taxes	
Type of taxes	Tax rates (in percent)
Corporate tax standard rate	30 (foreign corporations, whether residents or non-residents, are taxable only on income derived from sources within the Philippines)
Sales Tax/VAT rate	12 (but none (or zero) for export)
Withholding taxes	15 for dividend, 20 for interest, 30 for royalty and technical fee
Other taxes	• Percentage taxes (imposed on domestic or international carriers, franchises, banks, financial intermediaries, finance companies, life insurance companies, agents of foreign insurance companies, overseas communications, amusement, winnings, and stock transactions; • Initial Public Offering tax (based on the gross selling price or gross value in money of the shares of stock sold): 4 percent for up to 25 percent; 2 percent for over 25 percent but not over 33 1/3 percent, and 1 percent for over 33 1/3 percent; • Excise taxes (imposed on alcohol and tobacco products, petroleum, etc.); • Stamp duty; and • Real property tax (imposed on owners of real property and is calculated on the assessed value of the property).

Source: PKF (2016).

better opportunities abroad. Despite this, workers' competitiveness in the Philippines continues to improve, and has become one of the country's biggest assets.⁴⁰

In terms of the employment system, the Labour Codes of the Philippines, issued by the country's Department of Labour and Employment, regulates labour protection, employers and workers relations, medical services, and other issues related to labour. Based on existing regulation, workers in the Philippines are entitled to work no more than eight hours a day and five days a week. Workers who work overtime

are eligible for compensation. Table 8.6. summarises minimum wages across the Philippines.⁴¹

Foreign nationals wishing to seek employment in the Philippines will need to obtain an Alien Employment Permit (AEP) issued by the Department of Labour and Employment. The application for the AEP can be made personally by the individual foreign national, or through his or her respective employer, with the Regional or Field Office of the Department of Labour and Employment that has jurisdiction over the place in which the said foreign national intends

to work. The application process of the AEP usually takes about 24 hours if the application is made with the Regional Office, or five working days if application is filed at the Field Office. The Permit is valid for a one year period, or co-terminus with the duration of employment, consultancy services, or other modes of employment.⁴²

8.7.3. Social security system

By virtue of the Republic Act No. 1161, the Social Security System of the Philippines is a state-run social insurance programme for workers in the private, professional, and informal sectors. Aside from the Social Security Programme, the System also provides Medicare Programme and the Employees' Compensation Programme. Benefits of this social security programme include coverage for sickness, maternity, disability, retirement, death, and funeral.⁴³

8.7.4. Land policy

Land ownership in the Philippines is highly regulated. In general, only Filipino citizens and corporations or partnerships with at least 60 percent of the shares owned by Filipinos are able to own or acquire land in the Philippines. Foreign corporations, however, are allowed to own land providing that the land to be acquired is private, and the foreign equity in the corporation does not exceed 40 percent. In the case that foreign equity in the corporation exceeds 40 percent, they may be granted temporary rights, such as a lease contract. Foreign corporations are also allowed to acquire other immovable or real properties, such as buildings and other improvements on the land, including condominium units. Based on the Republic Act No. 7652, entitled 'Investor's Lease Act', foreign nationals may enter into lease agreements with Filipino landowners, with a lease period of 50 years, which is extendable for another 25 years. Specific to the tourism sector, the lease is limited to projects with an investment of no less than USD 5 million, of which 70 percent shall

Table 8.6. Minimum wages in the Philippines

Region	Non-agriculture (PHP)
National Capital Region (NCR)	454.00 – 491.00
Cordillera Administration Region (CAR)	265.00 – 285.00
Ilocos Region (Region I)	243.00 – 280.00
Cagayan Valley (Region II)	300.00
Central Luzon (Region III)	313.00 – 364.00
Calabarzon (Region IV-A)	285.00 – 378.50
Mimaropa (Region IV-B)	225.00 – 285.00
Bicol Region (Region V)	248.00 – 265.00
Western Visayas (Region VI)	256.50 – 298.50
Central Visayas (Region VII)	295.00 – 353.00
Eastern Visayas (Region VIII)	260.00
Zamboanga Peninsula (Region IX)	296.00
Northern Mindanao (Region X)	303.00 – 318.00
Davao Region (Region XI)	317.00
Soccsksargen (Region XII)	295.00
Caraga (Region XIII)	280.00
Autonomous Region in Muslim Mindanao (ARMM)	265.00

Source: Department of Labor and Employment (2016).

be infused in the said project within three years from the signing of the lease contract.⁴⁴

8.7.5. Commercial dispute settlement⁴⁵

The arbitration system in the country is regulated by the Civil Code of the Philippines, the Republic Act No. 9876 (otherwise known as the Arbitration Law), the Republic Act No. 9285 (otherwise known as the Alternative Dispute Resolution Act of 2004, or the Alternative Dispute Resolution Act of 2004), and the Supreme Court's A.M. No. 07-11-08-SC 01 September 2009, or the Special Rules of Court on Alternative Dispute Resolution. Generally speaking, the Philippine government is active in promoting alternative modes of dispute resolutions, such as mediation and arbitration, as well as a government-initiated mandate to include arbitration clauses in government-related contracts. A large number of international commercial disputes are currently

being resolved through the country's commercial arbitration. Between 2013 and 2014, for instance, the Philippine Dispute Resolution Centre Inc. handled 17 cases involving PHP 16.2 billion. As a result of the establishment of the Philippine Construction Industry Arbitration Commission in 1985, arbitration has been very common in this particular sector.

8.8. Electronic links to relevant government agencies related to renewable energy

- Department of Energy: <<https://www.doe.gov.ph/>>
- Energy Regulatory Commission: <<http://www.erc.gov.ph/>>
- Department of Environment and Natural Resources: <<http://www.denr.gov.ph/>>
- The Philippine Board of Investment: <<http://www.boi.gov.ph/>>
- National Economic and Development Authority: <<http://www.neda.gov.ph/>>

AEC business tip for the Philippines

The Philippines is a growing economy with strong macroeconomic fundamentals. It has abundant renewable energy potentials, especially geothermal, and its strategic location between two trade routes, the Pacific Ocean and the South China Sea, can serve as an ideal base for companies wishing to establish a presence in ASEAN. Although corruption and bureaucracy can make the setting up of a business a tedious affair in the Philippines, the overall investment climate in the country remains attractive, particularly as the present government continues its efforts to deregulate and further open up the country's economy, particularly in the renewable energy sector. Such reform efforts are deepened as the country continues to participate in the deepening of ASEAN's economic integration, particularly through the AEC.

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32. This, however, is subject to basic principles of the country's economy as laid down Article

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41. For further details concerning the Labour Codes of the Philippines, see the official website of the Department of Labour and Employment at: <http://www.dole.gov.ph/labor_codes>.
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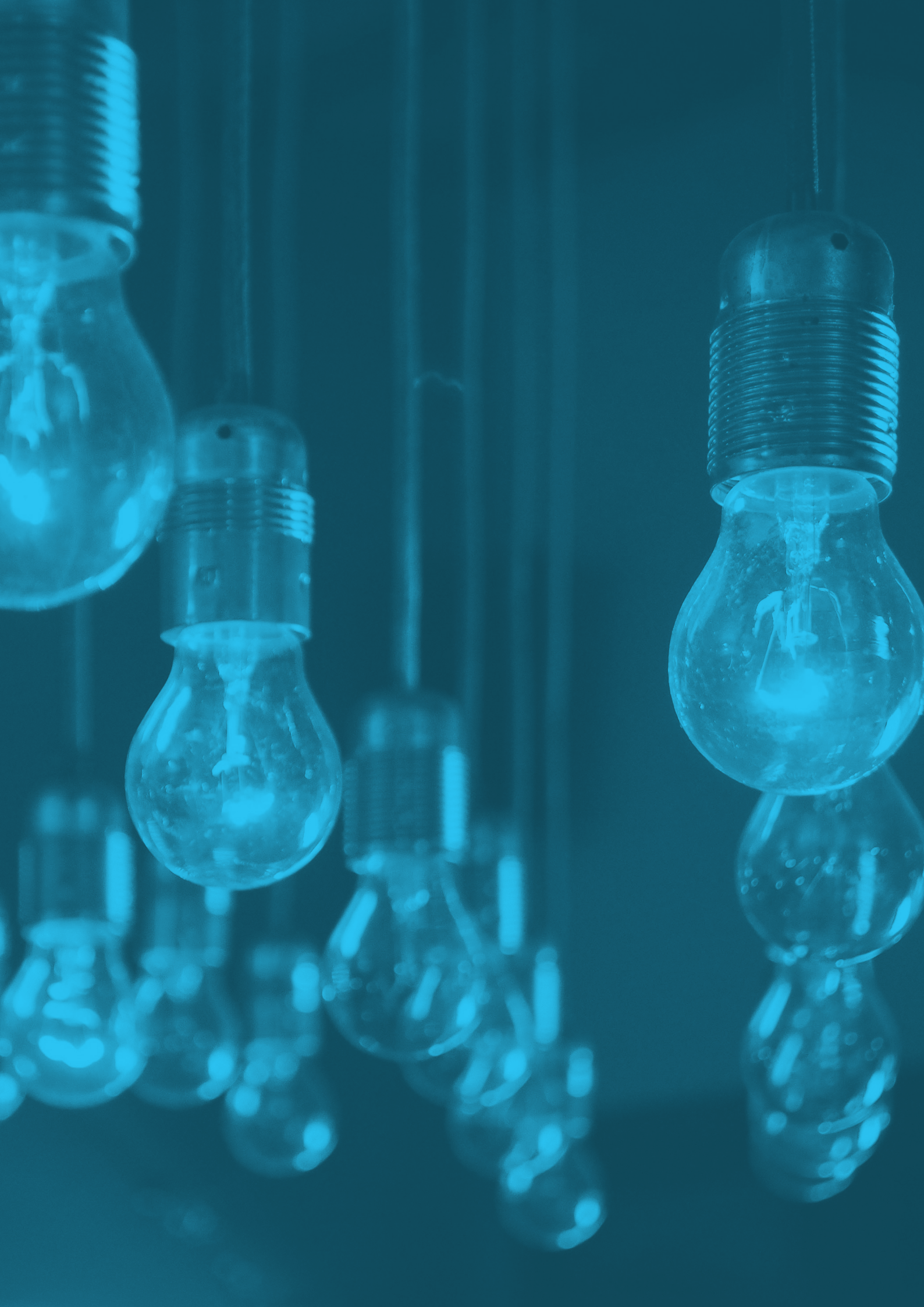
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9. SINGAPORE

SINGAPORE

9.1. Brief country profile

Though a small and densely populated country (5.7 million as of 2016), Singapore is a high income country and the wealthiest in Southeast Asia. A major commercial hub in the world, the city-state has been regarded as the most open economy, second most competitive¹ and pro-business,² and eighth least corrupt in the world.³ A highly open economy, Singapore also has the largest financial centres and busiest ports in the world. Despite its heavy reliance on global trade, which has been showing a downward trend amidst the weak global demand over the past few years, the city-state's GDP growth is expected to grow between two and four percent per year from now until 2020.⁴ A

highly urbanised city-state with very limited natural resources, Singapore invests heavily on the development of sustainable energy solutions to address pressing energy constraints of the country. Currently, Singapore is the only ASEAN member country that joined the negotiations for the establishment of the Environmental Goods Agreement under the auspices of the World Trade Organisation to eliminate tariffs on environment goods, including renewable energy-related products.⁵

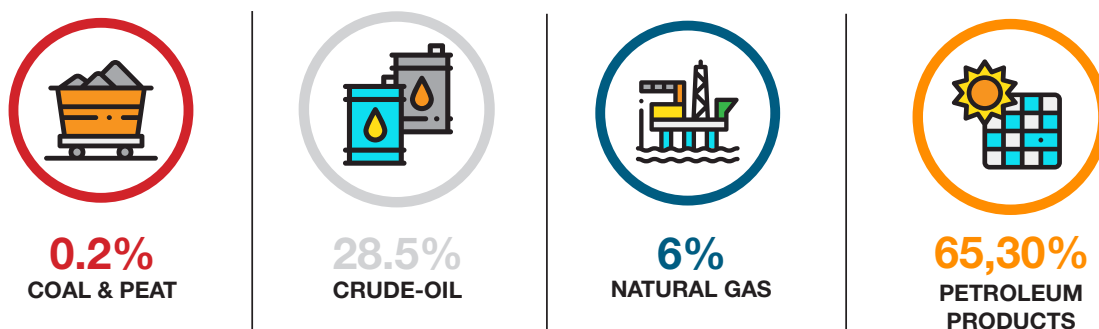
of which were used in industrial-related, as well as commercial and services-related activities.⁶ The city-state almost entirely relies on energy imports to meet its domestic energy needs. In 2015, the country imported 174 Mtoe of energy, mostly in the form of petroleum products (113.4 Mtoe), and this was followed by crude oil (49.4 Mtoe), natural gas (10.4 Mtoe), and coal and peat (0.4 Mtoe).⁷ Figure 9.1. illustrates the share of primary energy supply imported into Singapore in 2015.

9.2. Renewable energy sector in Singapore

In 2015, Singapore consumed around 47,513 GWh of electricity and 57,748 TJ of natural gas, most

Contributing around 2.5 percent of the country's total energy mix in 2014, renewable energy is one of main energy sources in Singapore.⁸ Due to its geographical conditions, only solar photovoltaic (PV), solid biomass, and biofuels can be

Figure 9.1. Primary energy supply imported into Singapore, 2015



Source: Energy Market Authority (2016a: 6).

developed in the city-state. Despite this, the Singaporean government aims to become a regional leader in renewable energy research and development. With its extensive experience in the semiconductor industry, solar PV is reportedly to be the focus of Singapore's renewable energy market.⁹

9.2.1. Biofuel

Despite having limited space to develop feedstock for biofuel, Singapore is the proud owner of the largest biodiesel plant in the world, which can produce up to 800,000 MT of fuel per year. The plant, which is located in Tuas and is operated by a Finnish multinational firm, Nestle Oil, produces renewable paraffinic diesel using palm oil, palm waste, and waste animal fat. Aside from this, the city-state also pursues research and projects that could leverage bio-renewable raw materials for the production of fuels and chemical products, whilst some of the country's private firms, such as Alpha Biodiesel, are reportedly to have had some success in refining waste oil.¹⁰ In addition to its close proximity to jatropha-producing countries in ASEAN, especially Indonesia, as

well as customers in Japan, China, India, and Australia, Singapore, which already serves as the headquarter of Wilmar International Ltd., the largest agribusiness group in the world,¹¹ has a unique opportunity to become a major export hub for jatropha oil and biodiesel.¹²

9.2.2. Other renewable energy sources for electricity generation

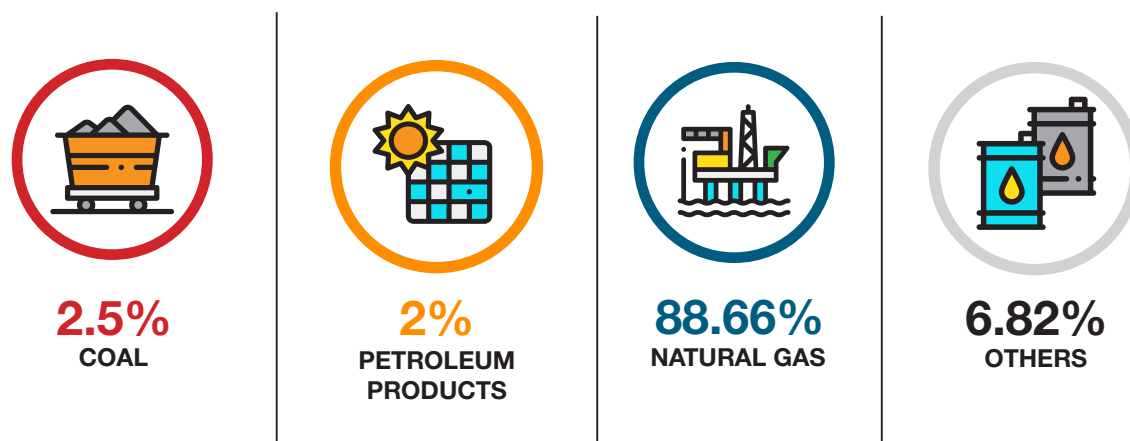
Singapore generated around 4,323 Ktoe, or 50 TWh, of electricity in 2015, most of which came from natural gas (9,064.8 Ktoe) and was followed by petroleum products (204.8 Ktoe) and coal (255.9 Ktoe) (refer to Figure 9.2.). Most, or around 95 percent, of electricity supply in Singapore, however, came from imported natural gas, which has raised concerns over energy supply security and energy prices stability amongst the city-state policy-makers.¹³ Since 2001, the Energy Market Authority of Singapore has opened the retail electricity market to competition. Instead of buying electricity at a regulated tariff from Singapore Power Services (SPS), consumers can, since then, choose to buy electricity from electricity retailers under customised price plans.¹⁴

Although lacking renewable energy potentials, the Singaporean government, as mentioned earlier, provides extensive support for research and development in this sector, particularly to expand the country's industrial capacity to develop potential renewable energy technologies.¹⁵ Currently, solar energy is the most potential renewable energy source in Singapore.

Solar

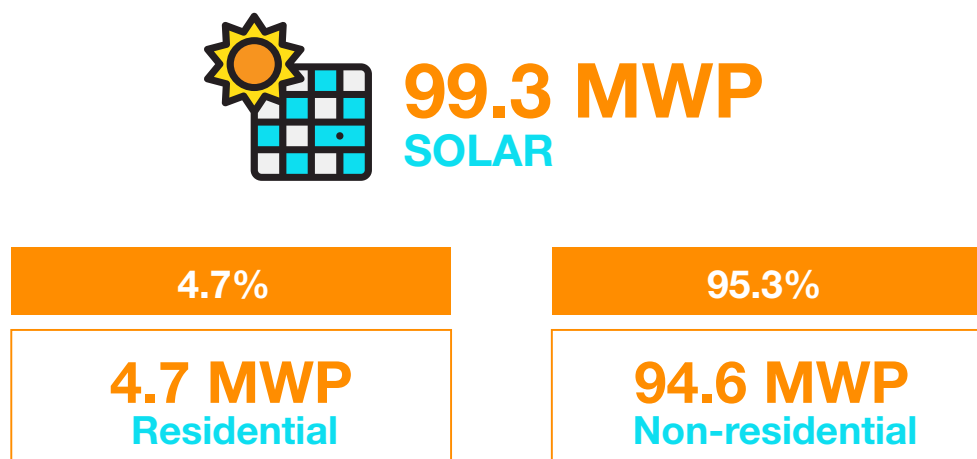
Singapore has an average annual solar irradiance of 1,580 kWh/m²,¹⁶ and installed capacity of solar PV system of around 99.3 MWp in 2015.¹⁷ Most solar energy in country is consumed by non-residential users, such as government institutions (e.g. town councils and the Housing Development Board), whilst the remaining are used by residential users.¹⁸ In 2014, the Singaporean government also announced its commitment to have 350 MWp of solar energy by 2020, which would make up about five percent of the country's projected 2020 peak electricity demand.¹⁹ Figure 9.3. illustrates the share of solar energy use in Singapore in 2015.

Figure 9.2. Share of primary electricity supply in Singapore, 2015



Source: Energy Market Authority (2016a: 22).

Figure 9.3. Share of solar energy use in Singapore, 2015



Source: ARES and ACE (2016: 5).

Biomass

The use of municipal solid wastes, wood and horticultural wastes have the potential for large-scale power generation in Singapore.²⁰ The city-state's first waste-to-energy facility was launched in 2012, a woody biomass steam production plant in Jurong Island.²¹ There are also some other biomass production plants, including a plant developed by the China Guangdong Nuclear Power Holding Corporation, a project operationalised by ecoWise,²² a Singapore-based company that focuses on renewable energy-related businesses, and a plant constructed by Tuas Power Plant in Tembusu Multi-Utilities Complex.²³ However, due to limited sources of feedstock, Singapore mostly imports its biomass from neighbouring countries, such as Indonesia and Malaysia.²⁴

Wind

Singapore does not have a good potential for wind power. The average wind speed in the city-state only stands at about 2 m/s, whilst commercial wind turbines operate at an average wind speed of around 4.5 m/s.²⁵ Despite this, the Singaporean government has envisioned the country to be the leading clean energy hub in

Asia and, in relation to this, for the country to host the Asia Wind Energy Association, the main trade association for the wind energy sector in the Asia-Pacific region.²⁶

Hydro

Despite the lack of natural hydropower potential, the national water agency of Singapore, or the Public Utilities Board, is looking at the feasibility to develop underground reservoirs, which would include tunnels to channel storm water, as well as a pumped storage hydropower system to harness the power of flowing water to generate electricity.²⁷ Once completed, the project would add a long list of subterranean projects in Singapore.

Geothermal

Although considered economically unviable by the government, Singapore, technically, has three suitable hot springs, including those in Sembawang, Jurong, and Pulau Tekong, capable of generating electricity.²⁸ A study estimates that the three hot springs are capable of producing up to 50 MW of electricity to the city-state. If a project to develop these geothermal potentials is to be carried out, it is expected that the proof of concept would cost

USD 19 million, and an additional USD 200 million for the actual development of the project. The scientist behind the proposal believes, however, that these costs could be written-off in 6.4 years after production has started.

9.3. Policy context

9.3.1. Energy policy overview

Energy-related policies and strategies of Singapore are reflected in three major policy documents of the government, and these include the 2007 National Energy Policy Report, the 2012 National Climate Change Strategy, and the 2015 Sustainable Singapore Blueprint. The 2007 National Energy Policy Report gave emphasis on energy markets, energy diversification, energy efficiency improvement, and the building of energy industry and research,²⁹ whereas the 2012 National Climate Change Strategy deals primarily with green growth agenda, greenhouse gas emission reduction, climate change mitigation efforts, and environmental cooperation partnership building of Singapore.³⁰ The 2015 Sustainable Singapore Blueprint, meanwhile, focuses the government's efforts to balance the promotion of social and economic well-being, whilst, at the same time, protecting the environment of the nation.³¹

9.3.2. Renewable energy policy

The drive and impetus for the uptake of renewable energy in Singapore is present and growing. Although the country does not possess much renewable energy potentials, it has envisioned itself to be the leading clean energy hub in Asia, which is supported by a strong foundation for research and development competencies, favourable intellectual property protection, as well as the ability to attract international talents.³² The city-state is, furthermore, positioned as a *Living Lab*, a microcosm of Asia, where companies can develop, test and commercialise to develop urban technologies for clean energy.³³

Table 9.1. References to renewable energy in main energy-related policies of Singapore

No.	Official titles of policy documents	Year issued	Key points
1.	National Energy Policy	2007	• The pursuit of growth opportunities in clean and renewable energy including solar energy, biofuels and fuel cells; • The promotion of energy market integration, energy efficiency and renewable energy in regional and international cooperation and forum; • The development of renewable energy as a part of key measures to mitigate green-house gas emissions and to improve energy efficiency; and • The setting-up of a Renewable Energy Exchange that aims to bring together investors looking for bankable renewable energy for Clean Development Mechanism projects and developers looking for financing.
2.	National Climate Change Strategy	2012	• Energy efficiency as the core strategy to reduce emissions; • 35 percent reduction in economy-wide energy intensity by 2030; • Increasing the use of solar energy as the main alternative for power generation; • Fostering research and development to develop technologies for climate change mitigation and adaptation, including renewable energy technologies; and • The development of eco-city (with China in Tianjin) with a target to reach 20 percent of renewable energy share in the city's energy use.
3.	Sustainable Singapore Blueprint	2015	• To be a leading green economy, Singapore aims to raise solar penetration rates and targets to increase solar power contribution to 350 MWp by 2020; • Creating lead demand for solar deployment through the SolarNova programme; and • Develop and test more green innovations, including a Renewable Energy Integration Demonstrator on Semakau Landfill.

Source: Various.

Despite extensive renewable energy-related policies since the late 1970s,³⁴ the present renewable energy priorities and strategies of Singapore are well reflected in three of its overarching energy policies as mentioned earlier. Given the country's limited renewable energy potential, Singapore's primary focus is on energy efficiency as its core strategy to reduce emissions.³⁵ Its main target is to achieve a 35 percent reduction in economy-wide energy intensity, or the amount of energy required to produce each SGD, by 2030.³⁶ Singapore gives particular emphasis on the development of solar energy for power generation as a cost-competitive alternative to fossil fuels.³⁷ Other references to renewable energy in the country's main energy policy and report are summarised in Table 9.1.

9.3.3. Investment policy, incentives, and procedure for renewable energy sector

Investment policy

The Singapore Economic Development Board, which is the lead government agency for planning and executing strategies to enhance the city-state's position as a global business centre, puts its core vision as making Singapore a 'home for business, innovation, and talent'. The agency intends to leverage Singapore's position in Asia and globally through business-friendly policies, innovation, and as a source of skilled talent.³⁸ As it stands, the city-state only limits foreign investment in several sectors, including telecommunication,

the financial sector, domestic news media, and broadcasting.

In the country's liberalised market environment, investments in power generation are very commercially driven.³⁹ Being the most promising renewable energy source for the country, the deployment of solar energy has become one of the government's renewable energy foci. To enhance the deployment of solar energy, the country's Energy Market Authority, the main government agency responsible for the operation, regulation, and development of energy industry in the country, issued

the so-called Final Determination Paper, entitled: *Enhancements to the Regulatory Framework for Intermittent Generation Sources in the National Electricity Market of Singapore* in 2014, which includes several enhancements to the market and regulatory framework of solar energy.⁴⁰ Aside from raising the existing threshold for solar energy energy from 350 MWac to 600 MWac, the enhancements in the said Policy Paper also includes greater clarity on the licensing framework and the improved streamlining of market registration and settlement procedures.⁴¹

Investment incentives

Various energy efficiency- and environment-related investment incentives in Singapore are presented in Table 9.2.

Table 9.2. Energy efficiency- and environment-related investment incentives in Singapore

Incentive schemes	Responsible institutions	Incentives and/or conditions
Grant for Energy Efficient Technologies	National Environment Agency and Singapore Economic Development Board	• Funding for registered owner or operator of industrial facilities to invest in energy efficient equipment or technologies; and • Funding is provided up to 20 percent of the qualifying costs and capped at USD 4 million per project.
Energy Innovation Research Programme	Energy Innovation Programme Office	• Research grants to develop clean energy sector; and • Available for research institutes, Higher Learning, public sector agencies, NGOs, and private companies.
Fast-Track Environmental and Water Technologies Incubator Scheme	Environmental and Water Industry Development Council	• Supports environmental and water start-ups by providing financial incentives; and • Up to USD 500,000 per project or up to 85 percent of qualifying costs is provided.
TechPioneer Scheme	Environmental and Water Industry Development Council	• Accelerates the commercialisation of new environment and water technologies; and • Funding up to 70 percent of total qualifying costs for a technology user is provided for Singapore government adoption projects, and up to 30 percent for others.
Environment Technology Research Programme	National Environment Agency	• Grants given to research and development projects on waste management, such as energy recovery, materials recovery and special waste treatment; and • Available for research institutes, Higher Learning, public sector agencies, Singapore-registered companies as well as for-profit and non-profit organisations.

Source: Tay (2015).

Specific to the development of solar energy, Singapore also provides the following support programmes:

- Funding of more than SGD 900 million for the next five years since 2016 for Urban Solutions and Sustainability to strengthen innovation in clean energy, smart grids and energy storage;⁴²
- NTU EcoCampus and the Centre of Excellence for Energy Development and Piloting, which, developed by the Singapore Power and the Economic Development Board, facilitates companies to develop, test, and commercialise cutting-edge urban technologies;⁴³ and

- Renewable Energy Integration Demonstrator – Singapore, which is a platform that was set up in 2014 to facilitate researchers and industry to develop, test, and demonstrate the integration of solar, wind, tidal-current, diesel, storage and power-to-gas technologies on Semakau Landfill.⁴⁴

General investment procedure for renewable energy projects

Generally speaking, the establishment of a business (either as a company, foreign company, sole proprietorship, partnership, limited liability partnership,

or limited partnership) is governed by the Business Names Registration Act of 2014, the Companies Act (Cap 50, 2006 Rev Ed), the Limited Liability Partnership Act (Cap 163A, 2006 Rev Ed), and the Limited Partnership Act (Cap 163B, 2010 Rev Ed). The registration of a business entity also requires an authorised representative (e.g. Singaporean citizens, permanent resident, or Employment Pass holder) in cases where the individual proprietor, all partners, or all officers of a foreign company do not reside in Singapore. In addition to the Singapore Economic Development Board, other relevant investment authorities include the Accounting and Corporate Regulatory Authority, which is responsible for regulating business entities and public accountants, and the mission of Contact Singapore that devises strategies to attract overseas Singaporeans and foreigners to invest and work in Singapore.⁴⁵

As for intermittent generation sources, or sources of energy or electrical power that is not consistently available due to some factor outside direct control, developers are required to obtain specific license to operate their intermittent generators. As indicated in the 2014 Final Enhancement Paper on *Enhancements to the Regulatory Framework for Intermittent Generation Sources in the National Electricity Market of Singapore*, the type of license needed for an intermittent generator is determined according to the capacity of the generators (refer to Table 9.3.). However, it is important to note that an Electrical Installation License is still required for the connection of all types of intermittent generation sources.⁴⁶

Prior to connecting and operating any intermittent generation sources parallel to the grid, the Licensed Electrical Worker appointed by the owner is also required to have a consultation with Singapore Power Grid (SPPG) on the appropriate connection scheme and the relevant technical requirements. The Licensed Electrical Worker is also required to submit installation details (name-plate capacity, location, etc.) to the SPPG to be recorded in a Solar PV Registry.⁴⁷ After meeting all requirements set by the SPPG, it will then proceed to activate the solar PV

Table 9.3. Summary of licensing requirements for intermittent generators

IGS (installed capacity)	Connected to the Power Grid?	Type of License	Issuing institutions
Below 1 MWac	Yes	Exempted	-
	No		
1 MWac or more but less than 10 MWac	Yes	Wholesaler (generation) license	Energy Market Authority
	No	Exempted	-
10 MWac or more	Yes	Generation license	Energy Market Authority
	No		

Source: Energy Market Authority (2014: 9).

system and connect it to the grid.⁴⁸

9.4. Barriers for renewable energy development

The following are potential barriers for renewable energy development in Singapore:

- **Limited renewable energy sources**

Singapore is a small, resource-constrained country that has limited renewable energy options.⁴⁹ To date, as discussed earlier, the government's primary focus on renewable energy is on the development of solar energy, as well as research and development of renewable energy technologies.

- **Regulatory barriers**

Singapore does not have a specific policy designed to support renewable energy development. The lack of financing mechanisms to promote private and public sector involvement also hampers the exploration and development of renewable energy in Singapore.⁵⁰

- **The need for local capability building**

Singapore still needs to further develop its human resources, as well as data collection and analysis on energy, to develop the capacity to build alternative energy.⁵¹

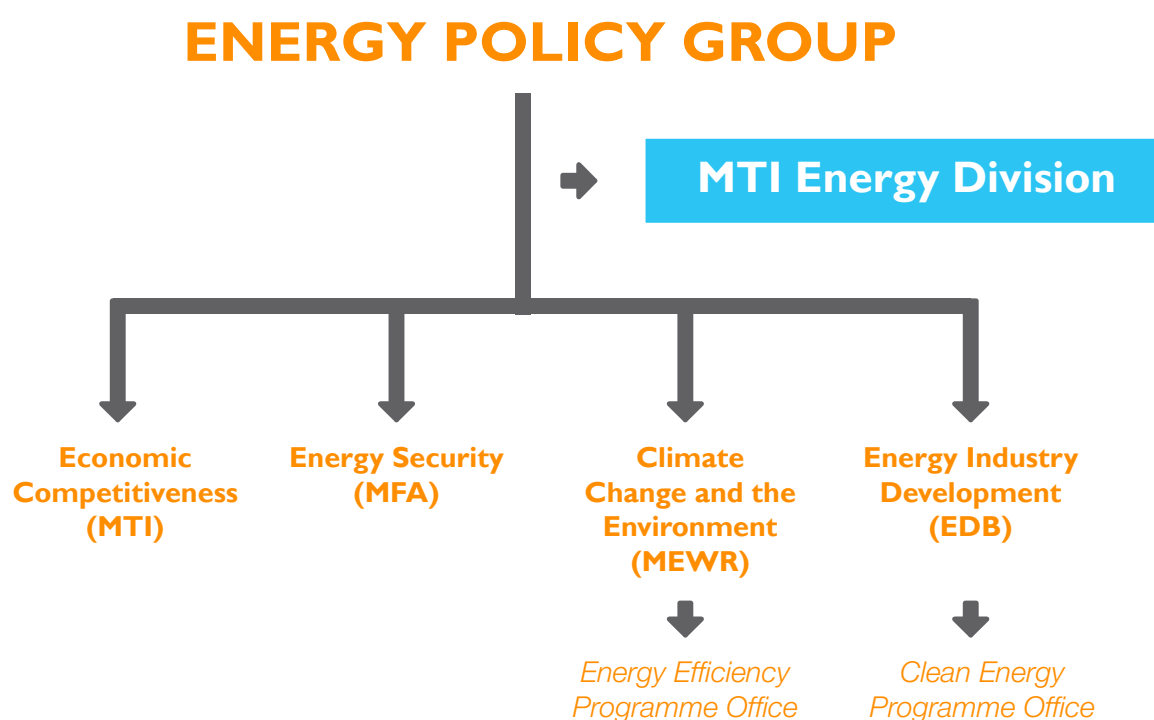
- **Lack of public understanding and acceptance**

The government needs to promote public understanding and acceptance to ease the implementation of sustainable development policies in the country.⁵²

9.5. Institutional framework

The energy sector in Singapore is governed by an inter-agency Energy Policy Group (EPG) (refer to Figure 9.4), which is chaired by the Permanent Secretary of the Ministry of Trade and Industry.⁵³ The Group has developed a national energy policy framework to maintain the balance between economic competitiveness, energy security, and environmental sustainability as laid out in the 2007 *Energy for Growth – National Energy Policy Report*. The EPG consists of senior representative from key energy-related ministries and agencies, whose roles and responsibilities are summarised in Table 9.4.

Figure 9.4. Singapore's Energy Policy Group



Source: Low Carbon Singapore (2009)

Table 9.4. Main renewable energy-related institutions in Singapore

Institutions	Key roles and responsibilities
Ministry of Finance	Management of public finances and funding for energy technology development
Ministry of Foreign Affairs	Energy security and the development of energy cooperation
Ministry of the Environment and Water Resources	- Climate change and environmental policies design and implementation; and - Energy efficiency policies design and implementation.
Ministry of Trade and Industry	- The drafting and implementation of energy market policy, including pricing mechanisms; - Fostering the development of competitive energy markets; and - The promoting regional energy cooperation.
Ministry of Transport	Supports energy efficiency and sustainable development programme by enhancing public transportation
Agency for Science, Technology and Research	- Advancement of science to develop innovative technology to further economic growth and improve lives; and - The bridging of the gap between academia and industry in research and development.
Building and Construction Authority	Promotes energy efficiency in buildings as a social responsibility to mitigate climate change.

Table 9.4. Main renewable energy-related institutions in Singapore

Institutions	Key roles and responsibilities
Economic Development Board	- Promotion of sustainable energy agenda and endorsement of clean energy sector; - Supporting clean energy project development and financing capabilities; and - Endorsement of the development of solar energy.
Energy Market Authority	- Power systems operator, industry developer, and industry regulator under the Ministry of Trade and Industry; - Supports the development of smart energy and sustainable development; - Conduct consultation for better policy design and implementation with relevant industry and stakeholders; and - Facilitates the deployment of renewable energy in Singapore by enhancing market and regulatory framework.
Land Transport Authority	Supports sustainable land transport and energy efficiency in land transport.
National Environment Agency	Improves and sustains a clean and green environment

Source: Various.

9.6. Setting up a business in Singapore

Table 9.5. summarises the process of setting up a business, including the length of time and cost required, in Singapore.

Table 9.5. The process of setting up a business in Singapore

No.	Procedure	Time to complete (day)	Cost to complete (in SGD)
1.	Online registration via BizFile* for company name, tax number (GST), and filling the company incorporation	Less than one day (on-line procedure)	315
2.	Make a company seal	1	70
3.	Sign up for Employee Compensation Insurance at an insurance agency	1	No charge

Note: *Electronic filing and information retrieval system of the Accounting and Corporate Regulatory Authority.

Source: World Bank (n.d.).



9.7. Other relevant information

9.7.1. Taxes

Table 9.6.below summarises various taxes imposed in Singapore.

Table 9.6. Tax residency status, its implications, and tax rates in Singapore

Tax residency status and its implications		
Period of stay	Tax residency status	Tax implications
A minimum of 183 days within a year	Tax resident (in that year)	Progressive resident rate
A minimum of 183 days within a year for two years in a row	Tax resident for those two years	
Three years in a row	Tax resident for those three years	
Non-resident tax status		
Duration of stay	Tax residency status	Tax implications
61 – 182 days	Non-resident	• Personal income tax is charged 15 percent or progressive resident rates; • Director's remuneration and other income are charged 20 percent of prevailing rate.
Less than 60 days		Income for this category get tax exemption, except under following conditions: • Company's director, public entertainer, or professional; • If one is leaving Singapore incidentally or temporary.
Individual income tax		
Income (in SGD)	Progressive rates (in percent)	Gross tax payable (in SGD)
On the first 20,000	0	0
On the next 10,000	2	200
On the first 30,000	-	200
On the next 10,000	3.50	350
On the first 40,000	-	550
On the next 40,000	7	2,800
On the first 80,000	-	3,350
On the next 40,000	11.5	4,600
On the first 120,000	-	7,950
On the next 40,000	15	6,000
On the first 160,000	-	13,950
On the next 40,000	18	7,200
On the first 200,000	-	21,150
On the next 40,000	19	7,600
On the first 240,000	-	28,750
On the next 40,000	19.5	7,800
On the first 280,000	-	36,550
On the next 40,000	20	8,000
On the first 320,000	-	44,550
On the next 320,000	22	

Table 9.6. Tax residency status, its implications, and tax rates in Singapore

Corporate taxes	
Type of taxes	Tax rates (in percent)
Corporate tax standard rate	17
Corporate income tax rebate	50 (and is capped at USD 20,000)
Withholding taxes	• Interest, commission, and/or fee in connection with any loan or indebtedness (15); • Royalty or other payments for the use or the right to use moveable property (10); • Management fees and service rendered (depending on the prevailing corporate tax rate); • Rent (15).
GST	7

Source: Various.

9.7.2. Labour condition landscape and employment system

Home to five internationally renowned public universities and many more international campus branches, Singapore is one of the world's leaders in education, especially higher education. At above 80 percent, the country's gross enrolment rate in tertiary education ranks highest amongst ASEAN countries.⁵⁴ This translates into a very high-skilled labour force, where 40 percent of the country's labour force has at least enrolled in post-secondary institutions.

With a total of 1.4 million foreign workers, Singapore's employment system is very open to foreign nationals. The Employment of Foreign Manpower Act⁵⁵ regulates the employment of foreign employees and protects their well-being. It also specifies different valid passes issued by the country's Ministry of Manpower that all foreign workers must acquire to be able to work in Singapore. There are three types of professional employment passes, and five types for those of skilled and semi-skilled foreign workers (refer to Table 9.7.).

Table 9.7. Type of employment passes for foreign nationals in Singapore

Pass type	Who is it for?
Professional	
Employment pass	For foreign professionals, managers, and executives earning at least SGD 3,300 per month, and have acceptable qualifications.
Entre-Pass	For eligible foreign entrepreneurs wishing to start and operate a new business in Singapore.
Personalised Employment Pass	For high-earning existing employment Pass holders or overseas foreign professionals. This Pass offers greater flexibility than an Employment Pass.
Skilled and Semi-Skilled	
S-Pass	For mid-level skilled staff who is earning at least SGD 2,200 per month and meets the assessment criteria.
Work Permit for Foreign Worker	For semi-skilled foreign workers in the construction, manufacturing, marine, process, or services sector.
Work Permit for Foreign Domestic Worker	For foreign domestic workers to work in Singapore.
Work Permit for Confinement Nanny	For Malaysian confinement nannies to work in Singapore for up to 16 weeks starting from the birth of the employer's child.
Work Permit for Performing Artist	For foreign performers working in public entertainment outlets, such as bars, hotels, and nightclubs.
Trainees and students	
Training Employment Pass	For foreign professionals undergoing practical training and is earning at least SGD 3,000 per month.
Work Holiday Programme	For students and graduates aged 18 to 25 who wish to work and holiday in Singapore for up to six months.
Training Work Permit	For semi-skilled foreign trainees or students undergoing practical training in Singapore for up to six months.

Source: Ministry of Manpower of Singapore (n.d.a.).

With regard to general employment, the Employment Act is Singapore's main labour law. It provides basic terms and conditions for all types of employment. The official website of the Ministry of Manpower of Singapore (at: <http://www.mom.gov.sg/employment-practices>) provides easy-to-digest information on details concerning employment practices in Singapore. In terms of minimum wage, the Singaporean government does not prescribe minimum wages for all workers in the country, and this applies to both local and foreign workers. The increase and decrease of wages in the city-state are determined by the market demand and the supply for labour, skills, capabilities, and competency to perform the task.⁵⁶

9.7.3. Social security system

The Central Provident Fund (CPF) is the main national social security system in Singapore. The Fund consists of: (1) the Medisave Account, which covers healthcare, sickness and maternity; (2) the Ordinary Account, which allows the beneficiary to withdraw some amount of money under specific conditions; (3) the Special Account, which allows those in possession of more than SGD 40,000 to invest their surpluses into ventures approved by the government; and (4) the Retirement Account. The contribution of employees to this social security scheme varies. Those earning less than SGD 500 per month are not obliged to make any contributions, but those earning between SGD 500 and SGD 1,500 per month are required to pay a flat amount, whilst those with income above the aforementioned classifications are required to pay different percentage of income. Unfortunately, foreign workers are not eligible to be enrolled under the CPF scheme, and are advised to prepare individual insurance

schemes before commencing their employment in Singapore.⁵⁷

9.7.4. Land policy

With a total of 719.1 km², land is extremely scarce in Singapore. Accordingly, optimising the use of land resources is critical to sustaining the country's economic and social growth. Land-related issues are regulated under three key regulations, including the Residential Property Act (Cap 274, 2009 Rev Ed), Land Acquisition Act (Cap 152, 1985 Rev Ed), and Land Titles (Strata) Act (Cap 158, S. 130, 2010 Rev Ed).⁵⁸ A foreign national, according to the Residential Property Act (Cap 274, 1985 Rev Ed), is allowed to purchase landed residential property, though in order to do so requires the government's approval. The application to purchase landed residential property for a foreign national can be done electronically through the Singapore Land Authority (at: <https://www.sla.gov.sg/ldau/MainPage.aspx>).

9.7.5. Commercial dispute settlement

Following the examples of the United Kingdom and Hong Kong, SAR, Singapore has in recent years established itself as an internationally recognised alternative dispute resolution centre. Mediation is currently the employed method of resolving commercial disputes in the city-state, particularly since the Singaporean government is actively promoting its development. Foreign companies wishing to seek commercial litigation may also appeal to the Singapore International Commercial Court, which is considered as one of the most prestigious courts in the world when it comes to the resolution of business-related issues.⁵⁹

9.8. Electronic links to relevant government agencies related to renewable energy

- Energy Market Authority: <https://www.ema.gov.sg/index.aspx>.

AEC business tip for Singapore

As one of the major commercial hubs in the world, Singapore is undoubtedly a business-friendly country. It offers numerous convenient facilities for ASEAN and non-ASEAN companies, such as well-developed infrastructure, supportive business environment, and skilled and educated labour forces. Many multinational companies also decide to establish their bases in Singapore as a way to access the wider ASEAN markets. Unfortunately, Singapore has limited renewable energy potentials. Despite this, Singapore has committed to be the leading clean energy hub in Asia. The arrival of the AEC makes it even easier for Singaporean-based businesses to tap the economic and renewable energy potential in the entire region.

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- Accounting and Corporate Regulatory Authority: <https://www.acra.gov.sg/home/>.
- The Ministry of the Environment and Water Resources: <http://www.mewr.gov.sg/>.
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10. THAILAND

THAILAND

10.1. Brief country profile

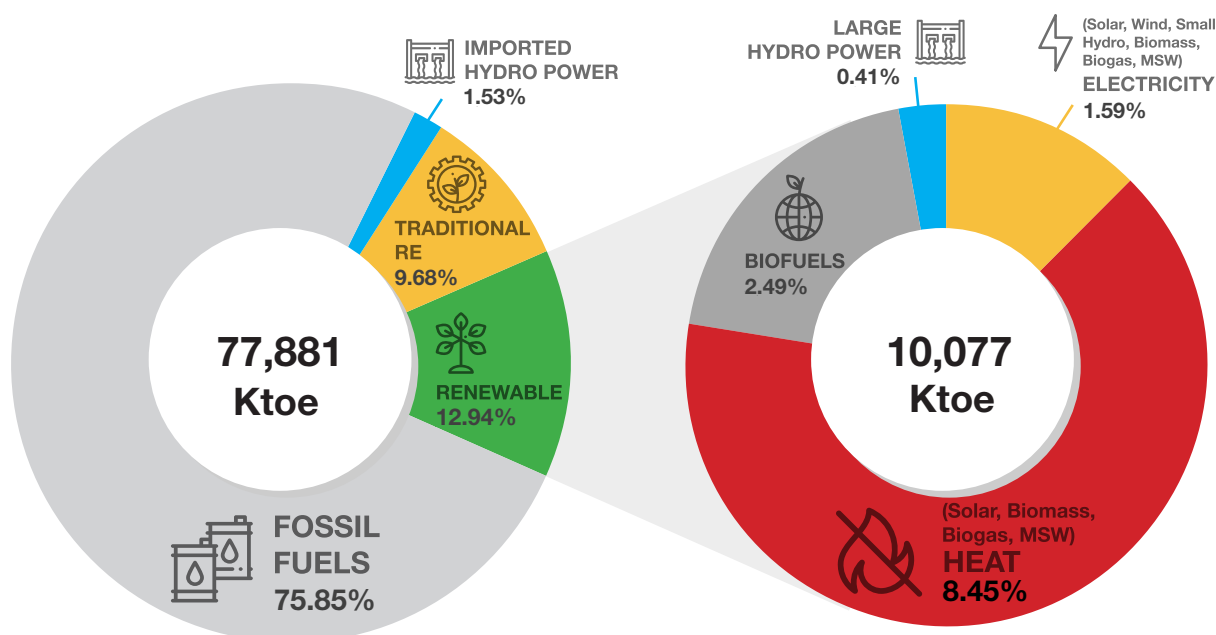
The second largest economy in ASEAN with a GDP per capita of USD 5,737 in 2015,¹ the Kingdom of Thailand has made remarkable progress in social and economic development over the course of its modern history. Despite having had 19 military coups since it became a constitutional monarchy in 1932, the Kingdom has been heralded for its impressive achievements in multiple dimensions of welfare.² Poverty, for instance, fell substantially from 67 percent in the mid-1980s to 10.5 percent in 2014. More children are reportedly obtaining more years of education, whilst nearly everyone in the Kingdom is covered by health insurance

and other forms of social security. Fuelled mainly by the agriculture and tourism sectors, the country's GDP growth is expected to be around 3 percent per year up until 2019.³ The government of Thailand is also currently pursuing an ambitious reform programme to increase the country's long-term growth path and achieve high-income status.⁴ It increasingly pays attention to productivity improvements not only in the manufacturing sector, but also those in agriculture and services. Thailand's vibrant economy requires the country to consistently secure energy supplies. Although relying heavily on imported energy sources, renewable energy sources are in high demand as alternative source of energy.

10.2. Renewable energy sector in Thailand

Energy demand in Thailand is expected to be on the rise over the coming decades. Even if calculated under conservative assumptions, such as stable growth of population, GDP growth of 3.4 percent per year until 2030, the successful implementation of the Kingdom's long-term *Energy Efficiency Programme*, which aims to reduce energy use by 30 percent by 2036, and the development of smart-grid development, the country's energy consumption is set to jump around 75 percent over the next two decades. Given such circumstances, energy import can be expected to increase from 42 percent in 2013 to a staggering 78 percent in 2040.⁵

Figure 10.1. Thailand's Primary Energy Mix (2015)



Source: Prakobboon (2016).

As of 2015, Thailand's total renewable energy consumption reached 10,077 Ktoe, or roughly about 12.9 percent of total energy consumption in the Kingdom. Despite this, fossil fuels still take up the largest share of total energy mix in Thailand (75.8 percent).⁶ At present, the majority of renewable consumption is in the form of heat, though power and biofuels are also contributing a growing share of renewable energy in Thailand.⁷ Solar, bioenergy, and hydropower are amongst the most potential renewable energy in Thailand (refer to Figure 10.1.).

10.2.1. Biofuel

The Thai government fully supports the consumption and production of biofuel in the Kingdom. In 2011, for instance, the Ministry of Energy made the blending between three to five percent biodiesel mandatory. By 2013, the country had ten biodiesel factories with a total capacity of 4.96 million gallons per day. Ethanol

production in Thailand was also increased over time. By 2014, for instance, the Kingdom had 22 ethanol production facilities with a total capacity of 4.31 million litres per day. However, Thailand's capacity to produce and consume biofuel often fluctuates, primarily as a result of limited capacity for Thailand to produce crude palm oil, a main ingredient for biodiesel production.⁸

Efforts to increase the production and use of biofuel in Thailand are facilitated by the government's Alternative Energy Development Plan 2015 (AEDP 2015). According to this Plan, domestic biodiesel and ethanol productions in the Kingdom is expected to reach 14 million litres per day and 7.38 million litres per day respectively by 2036. As the share of biofuel in Thailand's alternative energy mix is expected to increase considerably, the land needed to

meet these targets will be extensive. It is estimated that up to 10.2 million ha will be planted with palm oil as feedstock for biodiesel by 2036, whilst another 24.5 million ha will be planted with sugarcane and cassava as feedstocks for bio-ethanol.⁹

10.2.2. Other renewable energy sources for electricity generation

Electricity in Thailand is mainly generated from natural gas and coal. As shown in Figure 10.2., 64 percent of electricity in 2015 was generated from natural gas, whilst 20 percent came from coal and lignite. Other renewable energy sources, such as geothermal, wind, solar photovoltaic (PV), bio, and waste only contributed around eight percent of electricity generation in 2015. As for imported electricity in the Kingdom, they are mostly generated from hydropower in Lao PDR.¹⁰

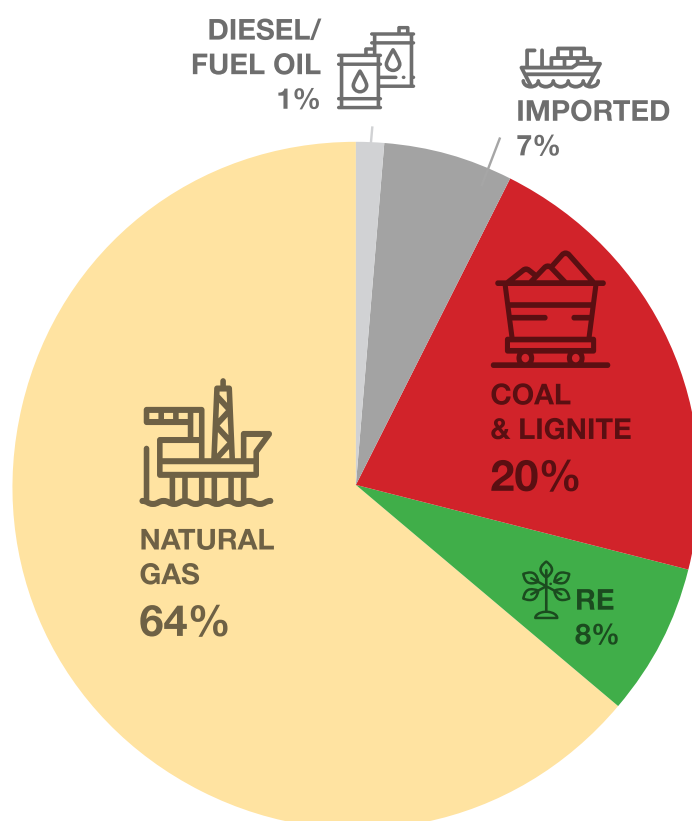
Solar

Thailand has strong irradiation levels, and, hence, excellent solar power potential. The Kingdom has around 380,00 km² of area suitable for solar PV systems, which potentially can have an installable capacity of 0.06 kWp/m².¹¹ With a target of nearly 2,000 MW, solar PV installation is expected to make up about 20 percent of the Kingdom's installed renewable energy capacity by 2021.¹² As illustrated in Figure 10.3., areas in dark red are areas with the highest irradiation levels.

Wind

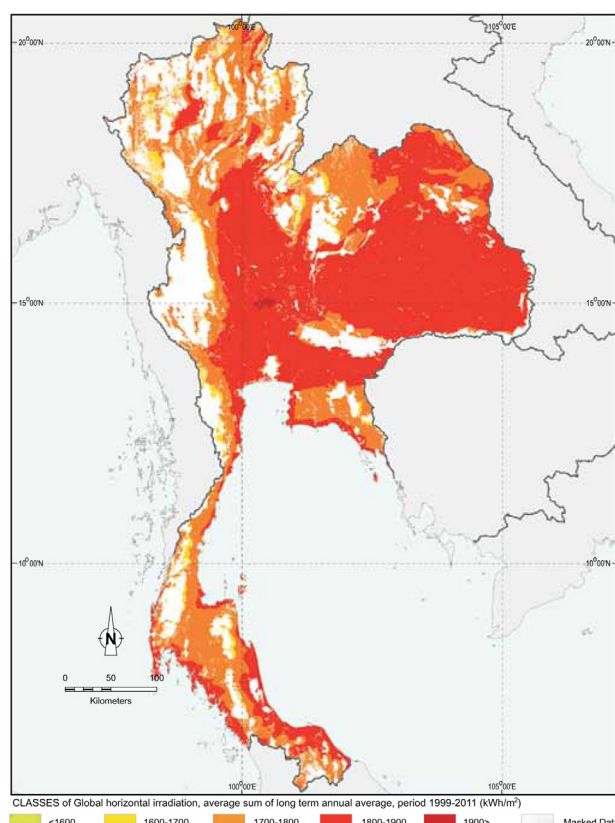
With average wind speed of less than 6 m/s in most of the country, Thailand's wind resource potential is relatively modest.¹³ As of 2013, Thailand's capacity to generate wind power stood at 222.7 MWh. By 2021, however, this figure is expected to increase to 1,800 MWh.¹⁴ Apparently, aside from favourable a tariff system and various incentives, well-established grid and robust load systems have been critical factors in making

Figure 10.2. Share of power generation in Thailand (2015)



Source: Prakobboon (2016: 5).

Figure 10.3. Potential area for solar PV development in Thailand



Data sources:
Solar radiation (Same as in example)
Elevation and Slope dataset : SRTM3
Water bodies: data processed from SWBD - SRTM3
Urban areas GeoModel Solar
Protected areas: WDPA 2010

Source: GeoModel Solar; Lahmeyer International in ADB (2015: 79).

efforts to promote wind energy relatively effective in Thailand.

Biomass

One of the key renewable energy alternatives for electricity generation, biomass consumption reached 2,452 MW in 2014. Being an agricultural-based economy, Thailand has the advantage of being able to produce substantial amount of agricultural waste per year, which, on average, stands at 80 million tonnes per year. The production of biomass utilises the combustion or partial combustion of organic materials from agricultural waste from rice, sugarcane, cassava, corn, rubber, and palm production that can be converted to electricity or fuel.¹⁵

Municipal solid waste

Thailand is estimated to have around 26,774 million ton of municipal solid waste per year, which has the potential to generate around 631 MW of energy.¹⁶ In 2014, Thailand

consumed around 66 MW of power generated from this form of energy. Municipal solid waste can also be converted into biogas, which is another renewable energy source that can also be generated from farm animal manure.¹⁷

10.3. Policy context

10.3.1. Energy policy overview

The main policy framework for Thailand's energy sector is known as the *Thailand Integrated Energy Blueprint* (TIEB). The Blueprint is an overarching energy sector policy that has three main objectives, including: (1) ensuring the stability of national energy demand; (2) reasonable energy cost for the people and business sector; and (3) the reduction of negative impact on environment and the community.¹⁸ The Blueprint serves as the foundation for five other long term energy development plans, which include the Energy Efficiency Development Plan, Power Development Plan,

Alternative Energy Development Plan, Gas Roadmap, and Oil Roadmap.¹⁹ Key points concerning each of these long-term energy development plans are summarised in Table 10.1.

10.3.2. Renewable energy policy

Driven by the need to secure consistent energy supply in the future, as well as to increase its economic competitiveness regionally and globally, Thailand has become one of the first countries in Asia to encourage investment in alternative energy. The Kingdom's Ministry of Energy, for instance, has been promoting electricity generation from renewable energy since 1989.²³ As discussed in the earlier subsection, the Thai government has three main policy frameworks that support the development of renewable energy, and these include the Power Development Plan (2015-2036), the Alternative

Table 10.1. Key points from Thailand's main energy master plan documents

2015-2036 energy development plans	Key Points
Energy Efficiency Development Plan, 2011-2030	• 30 percent energy intensity reduction by 2036; • Introduction of additional fees for excessive electrical use in buildings and factories to promote energy conservation; • Seven percent reduction of green-house gas emission by 2020, following the target of the United Nations Framework Convention on Climate Change in the Conference of the Parties 20; and • Government supports for energy efficiency technology research and development.
Power Development Plan, 2015-2036 ²⁰	• Ensuring the security of all power system components and supporting fuel diversification to reduce fuel dependency; • Improving the percentage of renewable energy sources in fuel mix; and • Decreasing the environmental impacts, especially the impacts of climate change and global warming.
Alternative Energy Development Plan 2015-2036 ²¹	• Promotion of power generation from municipal solid waste, biomass, and biogas to benefit farmer and the community; • Setting up the target for the provincial renewable energy development by zoning electricity demand and renewable energy potential; • Promoting power generation from solar and wind; and • Promoting incentives through competitive bidding and the promotion of utilisation by energy consumption reduction (Net Metering Self-Consumption).
Gas Roadmap (Gas Plan 2015)	• Reducing gas demand; • Reducing LNG dependency; and • Extending the capacity of domestic production.
Oil Roadmap (Oil Plan 2015) ²²	• Promotion of biofuel production and consumption; • Fossil fuel subsidy removal; • Energy saving in transport; and • Infrastructure investment support.

Source: Various.

Energy Development Plan (2015-2036), and the Energy Efficiency Development Plan (2011-2030). Whilst the first deals specifically with electricity generation in the country, the other two serve as general policy frameworks for renewable energy development.

The Alternative Energy Development Plan of 2015-2036 was approved by the National Energy Policy Council in 2015 to replace the previous version of the Plan that lasted from 2012 until 2021. The new Development Plan has the following objectives: (1) developing renewable

energy to replace imported fossil fuels and strengthen Thailand's energy security; (2) creating an integrated green community based on renewable energy; and (3) supporting the country's renewable energy technology industry and making it competitive in international markets. The Thai government also supports investment led by private entities to support the achievement of the Kingdom's overall renewable energy target. Important elements of the Development Plan are summarised in Figure 10.4.

The Energy Efficiency Development Plan of 2011-2030, meanwhile, is aimed at reducing energy intensity by 25 percent in 2030, or equal to reduction of final energy consumption by 20 percent in 2030.²⁴ To reach the said target and reduce carbon emission, the document includes the promotion of renewable energy utilisation as an alternative energy source.

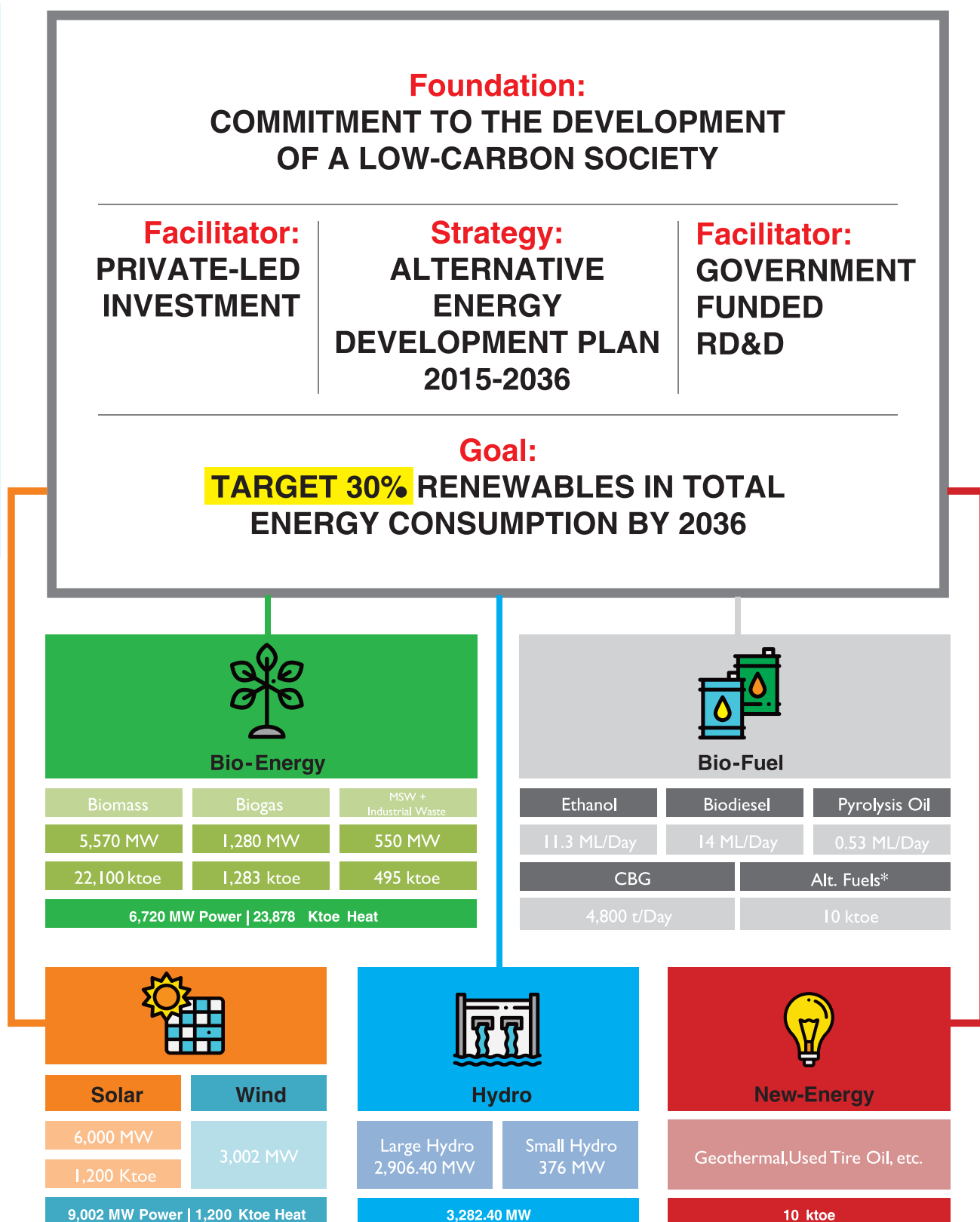
Policy for biofuel

In order to accomplish the renewable energy target set in the Alternative Energy Development Plan of 2015-2036, the Thai government has targeted the increase of bio-ethanol consumption from 3.51 million litres per day in 2015 to 11.3 million litres per day by 2036, as well as the increase of biodiesel consumption from 3.37 million litres per day in 2015 to 14 million litres per day by 2036.²⁵ Various strategies pursued by the Thai government to attain the said targets are summarised in Table 10.2.

Policy for electricity generation from renewable energy

As discussed earlier, effort to use renewable energy for electricity generation in Thailand has been in place since 1989. At the time, the Ministry of Energy encouraged the Electricity Generating Authority of Thailand (EGAT) to buy electricity from Small Power Producers that used waste or residues from

Figure 10.4. Summary of Thailand's AEDP 2015-2036



Source: Prakobboon (2016).

Table 10.2. Summary of biofuel development strategy in Thailand

Strategies for biodiesel development	Strategies for bio-ethanol development
Biodiesel Development and Promotion Strategy (2005): Endorses palm oil as the main feedstock for biodiesel production.	Alternative Energy Development Plan(2015-2036): - Improving yields of existing feedstock to around 8.5 million rai* for cassava and 16 million rai for sugarcane by 2036; - Promoting ethanol use through price incentives paid by the State Oil Fund to make the price 20 to 40 percent cheaper; and - Excise tax reduction for cars compatible with E20 and E85 gasohol (ethanol-blended gasoline at 20 and 85 percent).

Alternative Energy Development Plan (2015-2036):

- Target of palm planting area of 10.20 million rai*;
- The increase of biodiesel blend ratio to 10 percent by 2021; and
- Requirement of B10 and B20 (10 to 20 percent biodiesel) blending, which is to be pilot-tested in fleet trucks and fishing boats.

Note: * 1 ha = 6.25 rai.

Source: Preechajarn & Prasertsri (2016); ADB (2015); and Department of Renewable Energy Development and Energy Efficiency (2015).

Table 10.3. Renewable energy feed-in-tariff in Thailand

Renewable Energy Technology	Adder Rate (THB/kWh)		Special Adder Rate for Diesel Replacement (THB/kWh)	Special Adder Rate for Three Provinces in the South (THB/kWh)	Duration (Years)
	2007	2010			
Biomass					
Installed capacity ≤1 MW	0.30	0.50	1.00	1.00	7
Installed capacity >1 MW	0.30	0.30	1.00	1.00	7
Biogas					
Installed capacity ≤1 MW	0.30	0.50	1.00	1.00	7
Installed capacity >1 MW	0.30	0.30	1.00	1.00	7
Municipal Solid Waste (MSW)					
Digester landfill	2.50	2.50	1.00	1.00	7
Thermal process	2.50	3.50	1.00	1.00	7
Wind					
Installed capacity ≤50 kW	3.50	4.50	1.50	1.50	10
Installed capacity >50 kW	3.50	3.50	1.50	1.50	10
Mini- and micro-hydropower					
kW> Installed capacity <200 kW	0.40	0.80	1.00	1.00	7
Installed capacity ≤50 kW	0.80	1.50	1.00	1.00	7
Solar					
All capacity sizes	8.00	6.50	1.50	1.50	10

Source: ADB (2015: 77).

agricultural production.²⁶ The policy was later expanded to include the purchasing of electricity from other renewable energy sources, such as hydropower, solar, biogas, and wind from Very Small Power Producers²⁷ in order to support more Small Power Producers in remote areas.²⁸

As it stands, the Power Development Plan of 2015-2036 is the main policy document that focuses on the development of electricity power generation in Thailand. The document was developed by the Sub-committee on Load Forecast and Power Development Plan Formulation, which was tasked to revise the previous power sector development plan that covered the 2012-2030 timeframe as a response to changes in ASEAN's effort to turn itself into an economic community by the end of 2015.²⁹ In order to ensure energy security and decrease carbon emission, the Power Development Plan of 2015-2036 encourages the development of renewable energy that is in line with the Alternative Energy Development Plan of 2015-2036.³⁰ It is expected that by 2036, Thailand would have a total of 21,648 MW electricity generating capacity from renewable energy sources.³¹

10.3.3. Investment policy, incentives, and procedure for renewable energy sector

Investment policy

Thailand does not have a specific investment policy for renewable energy projects. Foreign investors seeking to do business in the renewable energy sector are subject to Foreign Business Act B.E. (Buddhist Era) 2542 (1999), which is the main law for foreign investment in the country. Foreign investors may also enter a joint venture with a Thai partner who holds the majority of the company's shares, in which case the company will not be regarded as *foreigner* and the restrictions in the above-mentioned investment law does not apply.³²

Investment incentives

Thailand has three main incentives for renewable energy development, and these include the feed-in-tariff (FiT), tax exemption, as well as a range of financial incentives. The FiT scheme, which also refers to as feed-in premium, provides energy producers with a fixed price for energy that they sell to the Ministry of Energy or Provincial Energy Authorities for a fixed period of time.³³ Currently, the FiT scheme is only available for biomass, wind, municipal solid waste, solar, as well as mini- and micro-hydropower (refer to Table 10.3.).

Another type of incentive available for renewable energy projects in Thailand is in the form of tax exemption, including:

- Exemption of corporate income tax for up to eight years for earnings from solar cells manufacturing, generation of renewable energy, energy-saving and renewable energy equipment and machinery manufacturing, and consulting services to enable energy savings;
- Exemption from import duties on machines and raw materials;
- Exemption from restrictions on foreign equity in manufacturing or services;
- Exemption from land ownership restrictions; and
- Facilitation for the employment of foreign experts and information awareness services.³⁴

In addition, the Thai government also offers financial incentives in the form of low-interest loans and grants for renewable energy-related projects, such as:

- Grants, ranging from 20 to 100 percent of the capital investment for up to THB 50 million per project, are available from the Ministry of Energy to support solar thermal, biogas, and municipal solid waste

projects;

- Grants from the Energy Conservation Fund that can be made available to provide low-interest loans of up to THB 50 million to support small and medium-sized projects for a maximum of seven years; and
- Equity Fund, which enables renewable energy developers to opt for credit guarantees or government shareholder participation of up to THB 50 million in either case.³⁵

General investment procedure for renewable energy projects

The following are investment procedures in Thailand:

- In line with the 1999 Foreign Business Act, foreigners may operate businesses upon obtaining a license from the Director-General of the Department of Business Development. According to Section 17 of the said investment law, to obtain the permit, foreign investors must submit an application to the Director-General of the Department of Business Development or the Ministry of Commerce;
- Applications for the said permit also requires the applicants to submit several supporting documents, such as official identification, certificate of business, financial statement, map of indicated location, etc.³⁶
- The Thai government also requires a minimum capital of THB 3 million for foreign investors to start a business, but this can be reduced if the industry in question is promoted by the Thai Board of Investment at the time of entry;³⁷
- After granted with the necessary business license, the Thai government requires the business to conduct technology transfer. An annual report of technology transfer activities must be carried out by completing the so-called technology transfer plan form at the Department of Business Development.³⁸

10.4. Barriers for renewable energy development

The following are barriers for the development of renewable energy sector in Thailand:

- **Lack of data and assessment on renewable energy potentials**

Some renewable energy potentials in Thailand, such as wave and tidal current, remain under-studied. More investment is needed to study the overall renewable energy potentials of the Kingdom.³⁹

- **Weak governance**

Generally speaking, weak governance plagues effective implementation of renewable energy policy in Thailand. Despite the existence of various renewable energy-related development plans, there is no clear

Table 10.4. Main renewable energy-related institutions in Thailand

Institutions	Main roles and responsibilities	Links to official website
Ministry of Energy	Overall management and development of energy policies and regulations.	http://energy.go.th/2015/en/
Department of Alternative Energy Development and Efficiency	Developing policies to and promoting of the use of renewable energies in Thailand.	http://weben.dede.go.th/webmax/
Energy Policy and Planning Office	Planning and implementing the Kingdom's overall energy policies, including those pertaining to renewable energy.	http://www.eppo.go.th/index.php/en/
Electricity Generating Authority of Thailand	State-run enterprise that is supervised by the Ministry of Energy to regulate and manage electricity generation and transmission.	https://www.egat.co.th/en/index.php
Energy Regulation Commission	Regulating and supervising energy market in Thailand.	http://www.erc.or.th/ERCWeb2/EN/
Metropolitan Energy Authority and Provincial Energy Authorities	The Metropolitan Energy Authority is responsible for the provisions of energy in Bangkok Metropolitan Area, as well as the provinces of Nonthaburi and Samutprakarn. The Provincial Energy Authorities, meanwhile, is responsible for the provision of energy in other provinces. Both Authorities purchase energy from the Electricity Generating Authority of Thailand.	http://www.mea.or.th/en and https://www.pea.co.th/EN/

Source: Various.

Table 10.5. The process of setting up a business in Thailand

No.	Procedure	Time to complete (day)	Cost to complete (in THB)
1.	Search and reserve a company name online	Less than one day (online procedure)	No charge
2.	Deposit paid-in capital in a bank	1 day	No charge
3.	Obtain a corporate seal	2 days	between 400-800
4.	Get approval for memorandum of association, apply and pay to register the company as a legal entity (final registration) and obtain TIN	22 days	**
5.	Register for Value Added Tax*	1 day, simultaneous	no charge

Notes: * Takes place simultaneously with previous procedure; ** Refer to the original source of the Table. Source: World Bank (n.d.).

mechanism to ensure that the targets set in these plans are met. Moreover, political interference and the emphasis on top-down policy planning also prevent inputs from relevant stakeholders to be incorporated effectively in the country's renewable energy policy.⁴⁰

- **High cost to develop renewable energy projects**

The development of renewable energy in Thailand is not only highly dependent on foreign-owned capital and technology, but can also be quite expensive to do. This is particularly so for the development of solar power. Although the International Energy Agency had forecasted a declining trend of PV module cost through towards 2035, the reduction of soft costs of solar PV may play a critical role in making solar PV more financially viable in the Kingdom. Whilst alternative financing arrangements, such as crowdsourcing options,⁴¹ to support solar PV projects exist globally, the crowdsourcing investment market is not yet well developed, preventing potential investors access to much needed capital to engage effectively in solar development.⁴²

- **Technical and geographical conditions**

Renewable energy project developers must consider the challenges of geographic and spatial diversity of Thailand in building renewable energy plants, which can add to the cost of generation and transmission investment. The lack of proper policy to regulate land use and environmental impact of renewable energy technology production is also considered as one of the challenges in developing renewable energy projects in Thailand.⁴³

10.5. Institutional framework

The Ministry of Energy is the main institution responsible in developing, organising, and managing energy resources and policy in Thailand.⁴⁴ Other energy-related institutions in the Kingdom work under the supervision of the Ministry of Energy. Table 10.4. summarises the main roles of various renewable energy-related institutions in Thailand.

10.6. Setting up a business in Thailand

Table 10.5. summarises the process (including estimated time and cost required) of setting up a business in Thailand.

10.7. Other relevant information

10.7.1. Taxes

Various taxes in Thailand are summarised in Table 10.6.

10.7.2. Labour condition landscape and employment system

Thailand's national education policy guarantees twelve years of public schooling for all Thai children. In recent years, there has been a significant growth of tertiary education institutions in both private and public sectors. With around four percent of the country's GDP dedicated to education, more than 30 percent of adult population are reported to have attained an upper-secondary degree. That being said, a good deal of these high-skilled graduates tend to enter either the industrial or services sector.⁴⁵ In recent years, Thailand has also shown a strong aspiration to become ASEAN's education hub. The country is now the administrative centre for both the ASEAN University Network and the Regional Centre for Higher Education and Development.

As far as employment is concerned, foreign nationals wishing to work in Thailand are subject to the Foreign Employment Law. Under this law, a foreign national may only be permitted to carry out his or her work once a work permit has been issued by the

Foreign Employment Division of the Labour Department and Social Welfare Ministry.⁴⁶

With regard to employment in general, several regulations have been enacted to protect workers, and these include the Labour Protection Act B.E. 2541 (1998), the Labour Protection Act B.E. 2551 (2008), the Labour Relations Act (No. 2) B.E. 2518 (1975), and others. For non-hazardous work, employees are entitled to work eight hours a day, but must not exceed 48 hours a week. For hazardous work, employees shall not work more than seven hours a day, or 42 hours a week. The minimum age for a worker is 15 years for non-hazardous work and not less than 18 years for hazardous work.⁴⁷

10.7.3. Social security system

The social security system in Thailand is administered by the Office of Social Security, an institution under the Ministry of Interior. According to the Social Security Act B.E. 2533 (1990), an insured person is entitled to receive several benefits, such as injury or sickness benefits, maternity benefits, invalidity benefits, death benefits, child benefits, old-age benefits, and unemployment benefits (except for an insured person under section 39 of the Social Security Act).⁴⁸

10.7.4. Land Policy

In accordance with the Land Code Act B.E. 2497 (1954), land ownership by foreign nationals or foreign companies are prohibited. According to the Section 97, foreign companies that are not able to own land are defined as follows:

- a limited (or public limited) company which has more than 49 percent of its registered capital held by non-Thai nationals and/or a Private Limited Company which has more than 50 percent non-Thai shareholders (bearer shares in limited companies being deemed to be held by non-Thai

Table 10.6. Tax rates in Thailand

Individual income tax	
Income (in THB)	Progressive rates (in percent)
Up to 150,000	0
150,001-300,000	5
300,001-500,000	10
500,001-750,000	15
750,001-1,000,000	20
1,000,001-2,000,000	25
2,000,001-4,000,000	30
Over 4,000,000	35
Corporate taxes	
Type of taxes	Tax rates (in percent)
Small companies	15 (for companies with net profit of minimum THB 300,000, but not exceeding THB 3 million) and 20 (for companies with net profit of more than THB 3 million)
Companies listed on the Stock Exchange of Thailand	20
Companies <i>newly</i> listed on the Stock Exchange of Thailand	20
Companies newly listed in Market for Alternative Investment	20
Withholding tax for domestic payment	1-10
Withholding tax for foreign payment	10-15
Value added tax	10, although the current reduced rate is 7
Other taxes	Specific business taxes (e.g. commercial banking, life insurance, etc.), stamp duty (depending on the document, it can be between THB 1 to THB 1,000), petroleum income tax, etc.

Source: The Revenue Department (n.d.) and PwC (2015).

shareholders for the purpose of evaluating ownership under the Land Code);

- a limited partnership or registered ordinary partnership where more than 49 percent of the total capital was contributed by non-Thai shareholders, or where more than half of the partners are non-Thai nationals;
- associations (including cooperatives) in which more than half the members are non-Thai nationals or where the association operates

primarily in the interests of non-Thai nationals; and

- foundations whose objectives are substantially in the interest of non-Thai nationals.

However, foreign companies are able to lease land, and construct and own buildings.⁴⁹ Foreigners can lease land for up to 30 years with an option to extend the lease for another 30 years.

10.7.5. Commercial dispute settlement

Thailand's jurisdiction is based on civil law with a modern set of legal codes, though litigation practice and laws have been influenced by common law traditions. The country was one of the first contracting Asian states to the New York Convention in 1959, and its predecessors, including the Geneva Protocol 1923 and the Geneva Convention 1927. Thailand enacted its first comprehensive law on commercial arbitration in 1987, which was later updated by the Arbitration Act B.E. 2545 (2002). Some commercial arbitration in Thailand is conducted under the supervision of the International Chamber of Commerce. The country, however, has two main domestic arbitration institutes, including the Thai Arbitration Institute of the Alternative Dispute Resolution Office, Office of the Judiciary, and the Thai Commercial Arbitration Institute of the Board of Trade. Administrative and arbitrator fees under these two domestic arbitration institutions are considerably more reasonable than those charged by many international institutes.⁵⁰

10.8. Electronic links to relevant government agencies related to renewable energy

- Ministry of Energy: <<http://www.energy.go.th>>
- Department of Alternative Energy Development and Efficiency:<<http://weben.dede.go.th>>

AEC business tip for Thailand

Thailand has an open and export-dependent economy that has seen robust growth since the economic crisis in the late 1990s. The government has long supported renewable energy use and investment for electricity. The country's participation in the AEC provides ASEAN and non-ASEAN companies more opened access to the Kingdom's renewable energy potentials, whilst, at the same time, it also provides Thai companies less fettered access to the rest of the ASEAN economy. Although the Kingdom still faces some governance and technological issues, the AEC's push for regulatory reform can be expected to make Thailand's renewable energy sector more competitive.

Office of the Ministry of Energy of the Kingdom of Thailand at the following website: <<http://www.eppo.go.th/images/POLICY/ENG/AEDP2015ENG.pdf>>.

- Energy Policy and Planning Office: <<http://www.eppo.go.th/index.php/en>>
- Electricity Generating Authority: <<http://www.egat.co.th/en/index.php#>>
- Energy Regulatory Commission: <<http://www.erc.or.th/ERCWeb2/EN/Default.aspx>>
- Thailand Board of Investment: <<http://www.boi.go.th/>>
- Department of Business Development, Ministry of Commerce: <http://www.dbd.go.th/dbdweb_en/more_news.php?cid=329&filename=index>.
- Energy Fund Administration Institute: <<http://www.efai.or.th>>

- 8. Department of Renewable Energy Development and Energy Efficiency (2015: 6).
- 9. *Ibid.*, pp. 12-13.
- 10. ARES and ACE (2016: 3).
- 11. ADB (2015: 78).
- 12. UBM Asia (2014).
- 13. ADB (2015: 81).
- 14. Department of Renewable Energy Development and Energy Efficiency (2014: 3).
- 15. Thailand Board of Investment (n.d.: 3).
- 16. Achawangkul (2015: 9).
- 17. Thailand Board of Investment (n.d.: 5).
- 18. Wiwattanadate (n.d.: 5).
- 19. *Ibid.*, p. 4.

- 20. For further details of the Plan, visit the official website of the Energy Policy and Planning Office of the Ministry of Energy of the Kingdom of Thailand at the following website: <http://www.eppo.go.th/images/POLICY/ENG/PDP2015_Eng.pdf>.
- 21. For further details of the Plan, visit the official website of the Energy Policy and Planning

- 22. For further details of the Plan, visit the official website of the Energy Policy and Planning Office of the Ministry of Energy of the Kingdom of Thailand at the following website: <http://www.eppo.go.th/images/POLICY/ENG/oil_plan2558.pdf>.

- 23. Department of Renewable Energy Development and Energy Efficiency (2015: 3).

- 24. Ministry of Energy (2011: 1)

- 25. Prakobboon (2016: 17).

- 26. Department of Renewable Energy Development and Energy Efficiency (2015: 3).

- 27. Small Power Producers usually have generating capacity no larger than 10 MW.

- 28. Department of Renewable Energy Development and Energy Efficiency (2015: 3).

- 29. Energy Policy and Planning Office of the Ministry of Energy of the Kingdom of Thailand (2015: 1-1).

- 30. *Ibid.*, pp. 2-1.

- 31. *Ibid.*, pp. 2-4.

- 32. *Ibid.*, pp. 9.

- 33. Lorenz & Partners (2016: 3).

- 34. ADB (2015: 77) and Lorenz & Partners (2016: 4).

- 35. ADB (2015: 75).

- 36. For further details concerning documents required for the application of foreign investment permit, see the Application Preparation Handbook, which is available in the official website of the Ministry of Commerce of the Kingdom of Thailand at: <http://www.dbd.go.th/dbdweb_en/more_news>.

ENDNOTES

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- 2. World Bank (2016a).
- 3. *Ibid.*
- 4. World Bank (2016b).
- 5. Tarragó (2016).
- 6. Prakobboon (2016: 3).
- 7. Theerarattananoon (2015: 11).

[php?cid=329&filename=index>](#).
The said Handbook can be accessed by clicking the following sub-section: 'Application Preparation Guidebook'.

37. Dezan Shira & Associates (2017).
38. Bureau of Foreign Business Administration, Department of Business Development (n.d.: 18).
39. Mekong River Commission (n.d.).
40. Tongsopit, *et al.* (2015: 13-14).
41. Crowdsourcing is the practice of engaging a *crowd* or group for a common goal, such as innovation, problem-solving, or efficiency. Powered by new technologies and social media, it has become an innovative resource mobilization method to support the implementation of projects.
42. Tongsopit, *et al.*, p. 14.
43. *Ibid.*, p. 16.
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46. For further details concerning the employment of foreign nationals in Thailand, see Thailand Law Online at: <http://www.thailandlawonline.com/thai-company-and-foreign-business-law/work-permit-for-foreigners-in-thailand>.
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ASEAN Secretariat (2015), *ASEAN Statistical Yearbook 2015*, Jakarta: ASEAN Secretariat.

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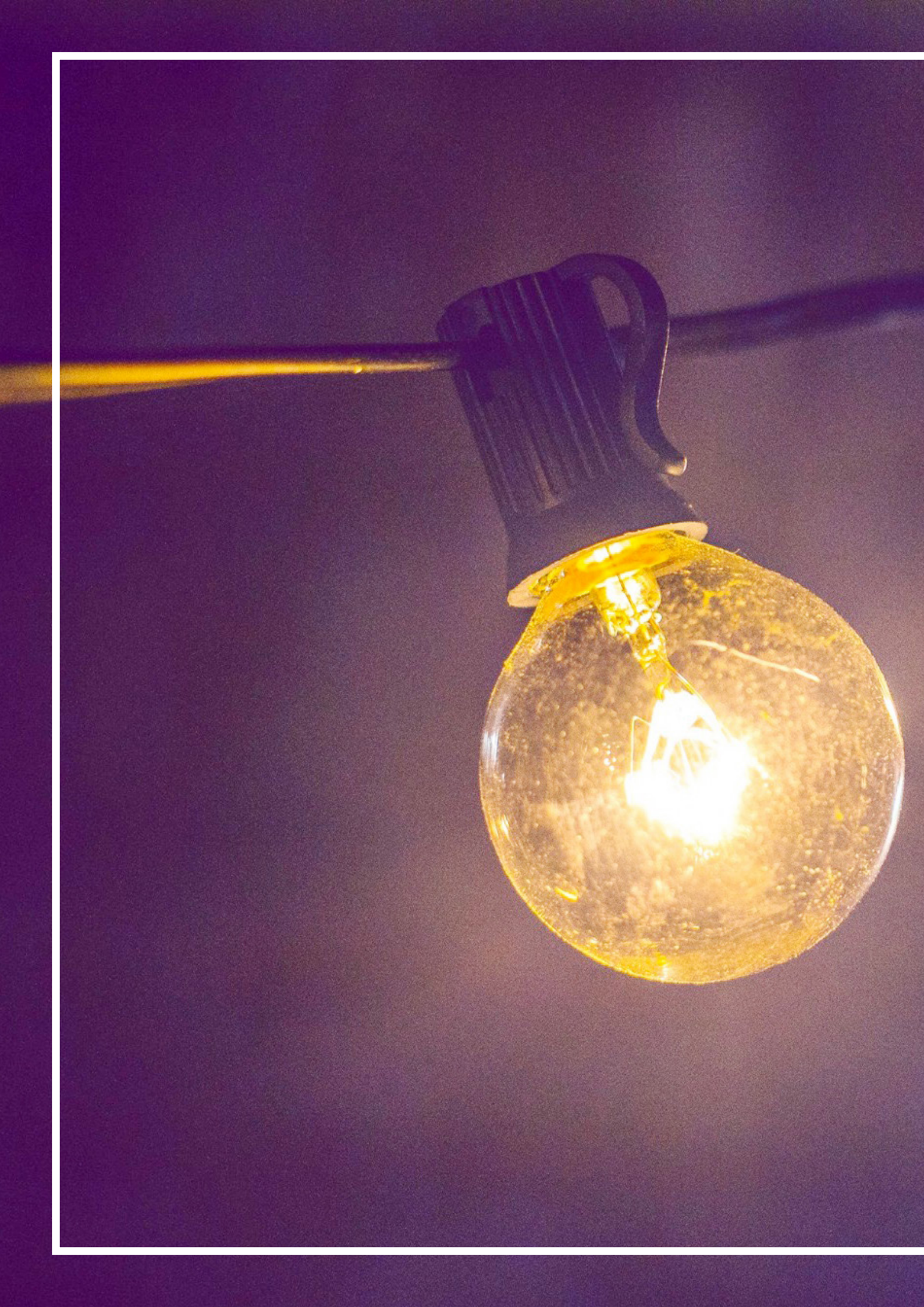
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11. VIETNAM

VIETNAM

11. 1. Brief country profile

One of ASEAN's successful economic development stories, Vietnam's development record over the past 30 years has been extraordinary. Under the so-called *Đổi Mới* initiative that was launched in 1986, the country carried out major political and economic reforms that helped Vietnam transition from a centrally-planned economy to a more market driven one. Since then, the country's social indicators have improved significantly, with several elements of the Millennium Development Goals achieved ahead of time. The number of people living in extreme poverty,

for instance, dropped from about 50 percent in the early 1990s to a mere three percent in 2012. Attaining a lower-middle-income economy status in 2010, Vietnam registered a GDP per capita of USD 2,109 in 2015.¹ Whilst better educated, the population in the country, which numbers around 94.9 million today, also has higher life expectancy than most other countries with a similar per capita income (USD 2,109 in 2015).² Along with rapid economic development, energy demand in Vietnam has been on the rise in recent decades, and this could provide impetus for the country to develop its emerging renewable energy industry.³

11.2. Renewable energy sector in Vietnam

Vietnam's economic growth has fuelled a rapid rise in the country's energy consumption, which grows at an average of 13 percent annually over the past decade, and resulted in a 50 percent increase in the country's energy intensity.⁴ In 2014, the industrial sector took up the largest share, or about 29 percent, of final energy consumption in Vietnam, and this was followed by residential sector (24 percent), transportation sector (15), and other commercial and service sectors (3 percent).⁵ At the time, Vietnam's main energy sources included coal

Figure 11.1. Share of primary energy supply in Vietnam, 2014

66,280 Ktoe

Source: ARES and ACE (2016: 2).



28.92%
COAL
19,171 Ktoe



13.46%
NATURAL GAS
8,921 Ktoe



7.60%
HYDRO
5,035 Ktoe



27.04%
OIL & PETROLEUM
17,924 Ktoe



22.98%
RENEWABLES
15,222 Ktoe



22.98%
BIOFUELS & WASTE
OTHERS
7 Ktoe

(28.9 percent), petroleum (27.04 percent), biofuel and waste (22.9 percent), natural gas (13.4 percent), and hydropower (7.6 percent) (refer to Figure 11.1.). Renewable energy sources in the form of biomass in Vietnam are mainly used in rural households to generate thermal energy (e.g. heating, cooking, etc.).⁶ Most of the renewable energy sources in Vietnam, however, are still at their infancy. Nonetheless, the government has targeted the increase of the share of renewable energy in power generation from 3.5 percent in 2010 to 4.5 percent by 2020, and possibly to six percent by 2030.⁷

11.2.1. Biofuel

Vietnam has considerable potential for domestically-produced biofuel in the form of biodiesel and bioethanol. Potential feedstocks for bioethanol are sugarcane, cassava and corn, whilst biodiesel can be produced from waste of catfish and coconut.⁸ In general, the country's national strategy to develop biofuel domestically, which will be discussed more thoroughly in the next section, is closely linked

with the country's overall energy security and environment protection concerns.⁹ As it stands, the present annual ethanol production capacity in Vietnam is about 150,000 tonnes, which is only enough to produce around 3 million tonnes of Ethanol 5 (E5). It is projected that the demand for E5 will reach around 7.5 million tonnes per year, especially after the phasing out of the 92-octane gasoline, currently the most popular grade in Vietnam, in 2018.¹⁰

11.2.2. Other renewable energy sources for electricity generation

Vietnam also has vast amount of potential for other types of renewable energy, such as solar photovoltaic (PVC), wind, biomass, and small hydropower. In 2014, total electricity generated from renewable energy sources amounted to 60,455 GWh, which came mostly from hydropower (98.7 percent) (refer to Figure 11.2.).

Solar

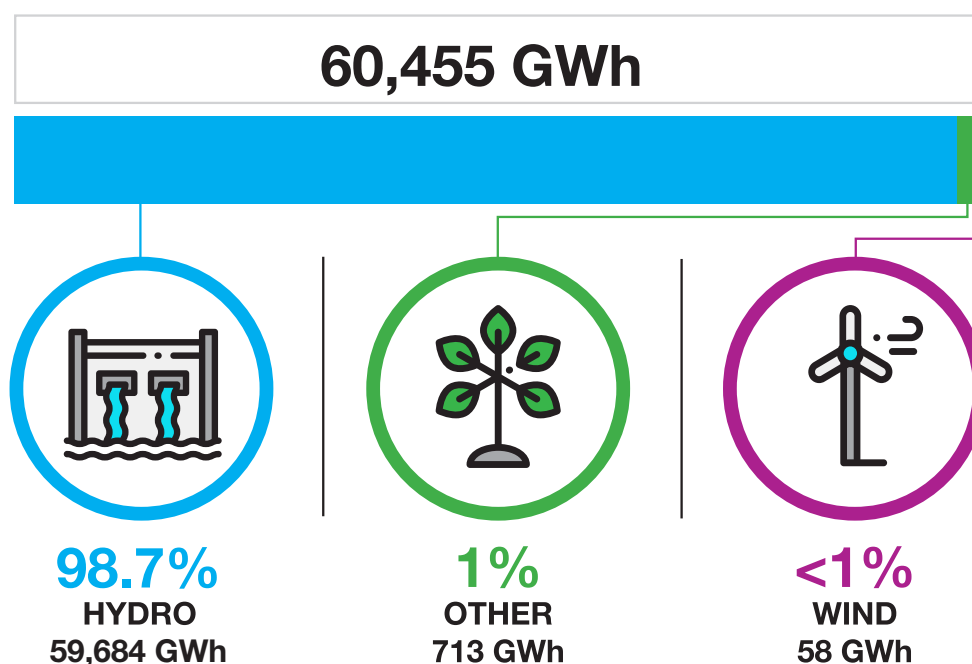
Vietnam has significant potential to develop solar energy. The country

has solar irradiation level that is considered either *good* or *very good*.¹¹ It is estimated that about 220,000 km² in Vietnam could be suitable for solar PV systems (refer to Figure 11.3). By the end of 2014, Vietnam had around 4.5 MWp of solar PV installed capacity, 60-70 percent of which were of small applications (either Solar Home Systems SHS or solar public lighting systems), whilst the remaining 30-40 percent were bigger systems (local solar network stations and off-grid hybrid systems in remote areas).¹² Currently, a number of small-scale grid-connected PV plants have been developed with capacity ranging from 100-200 kW.¹³

Wind

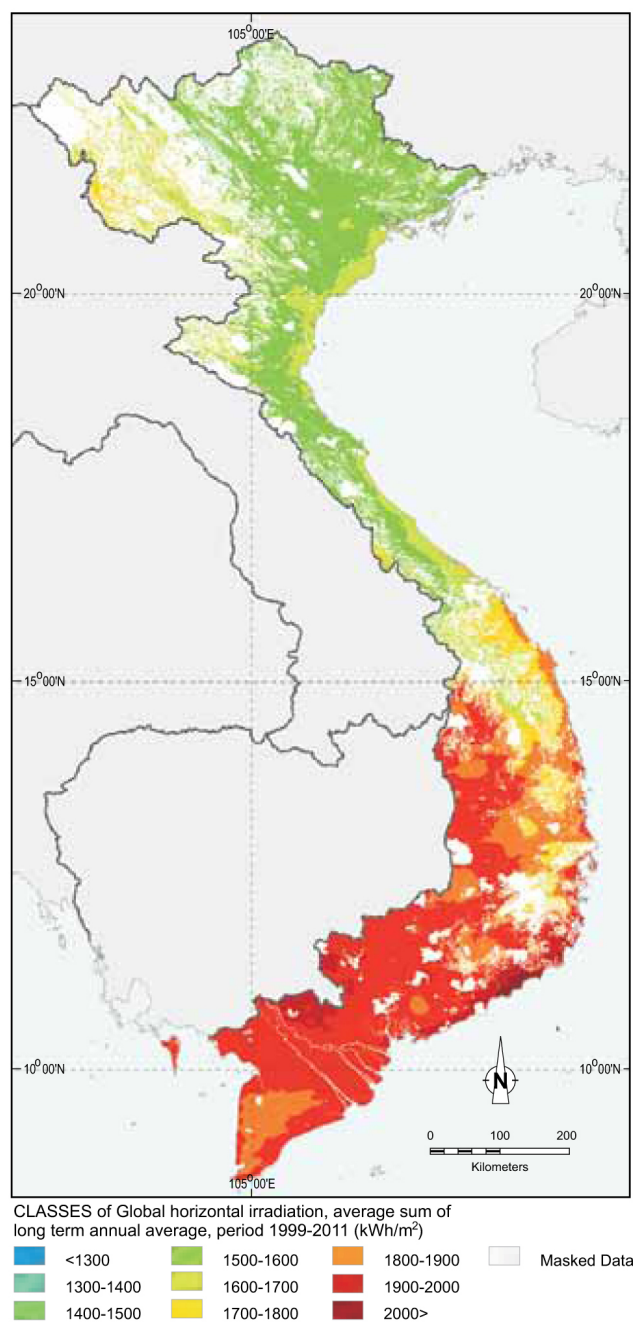
Wind energy is another renewable energy potential in Vietnam. Wind potential at the height of 65 meters in the country is considered the highest in Southeast Asia, which is estimated to be able to generate up to 513,360 MW.¹⁴ Up until 2016, there were 48 wind power projects with a total capacity of 4,876 MW being implemented in Vietnam at various levels of development. About one-

Figure 11.2. Share of electricity generation from renewable energy sources in Vietnam, 2014



Source: ARES and ACE (2016: 6).

Figure 11.3. Map of potential area for solar PV development in Vietnam



Source: ADB (2015: 104).

third of the projects were executed in partnership with foreign investors, the total of which represented an installed capacity of 1,366 MW.¹⁵

Biomass

Agricultural residues continue to be an important source of energy in rural areas of Vietnam. Despite the declining contribution of the

sector towards the country's GDP, around 60 percent of Vietnam's total workforce remains engaged in agriculture. With around 11 million ha currently under cultivation, rice production occupies three-quarters of the country's total cultivated area.¹⁶ Although crop yields in 2010 indicate that the annual theoretical potential of biomass energy from the combustion of rice husks, rice straws,

corn cobs, cassava stalk, bagasse, and sugarcane trash can reach up to 84,875 GWh, the technical implementation is far less than this given the difficulty in the collection process of the residues, as well as their inclusion in the grid network. Nonetheless, biomass continues to be one of the primary energy sources for Vietnam.¹⁷

11.3. Policy context

11.3.1. Energy policy overview

The present energy policy of Vietnam is guided by the *National Energy Development Strategy 2020 (with an outlook to 2050)*. The policy document that was launched in 2007 has the objectives to: (1) ensure the national energy security; (2) supply the country with high quality energy to support its own socio-economic development; (3) reasonably use domestic resources; (4) diversify energy investments and business models; (5) develop a competitive energy market; (6) promote new and renewable energy sources (including nuclear power); and (7) effectively and sustainably pursue development in association with environmental protection.¹⁸

Aside from securing primary energy supply between 100 to 110 million TOE by 2020, 110 to 120 million TOE by 2025, and 310 to 320 million TOE by 2050, the specific goals included in the above-mentioned Strategy include: (1) the capacity expansion of the country's oil refinery plants to reach between 25 to 30 million tonnes of crude oil by 2020; (2) increase the national strategic oil stockpiling from 45 consumption days by 2010 to 60 days by 2020, 90 days by 2025; and (3) the increase of share of new and renewable energy from 3 percent in 2010 to 5 percent in 2020, and further 11 percent by 2050.¹⁹

Although serving as the umbrella policy to guide the socio-economic development of the country, the National Socio-Economic Development Plan (NSEDP) also gives clues as to how Vietnam intends to bring forth its energy

sector. The current Development Plan, which runs from 2011-2020, continues to give emphasis on large infrastructure investment projects to overcome existing constraints in the country's power sector.²⁰ Despite this, the government continues to aim higher in sustainably developing and modernising the country's energy sector by enhancing human resource capacity, technological advancement, modernisation of power infrastructure, increasing renewable energy generation, and

enhancing efficiency in generation and consumption.²¹

11.3.2. Renewable energy policy

Renewable energy is relatively new in Vietnam where its presence has been mainly driven by government policies, which are usually positioned within the context of sustainable development and greenhouse gas reduction frameworks.²² To date, in addition to the *Sustainable Development Strategy of 2011-*

2020, Vietnam also implements its *National Strategy on Climate Change and the National Action Plan on Green Growth 2014-2020*.²³ Other energy-related policies, such as the revised Seventh Power Development Planning Decision No 428/QD-TTg in 2016 provided a new vision 2030 that places stronger emphasis on renewable energy development, as well as the government's efforts to liberalise the country's power market.²⁴ Various renewable energy-related policies of the government of Vietnam are highlighted in Table 11.1.

Table 11.1. Renewable energy-related policies of Vietnam

Law/ regulation numbers	Official titles of laws/ regulations	Year issued	Key points	Electronic links
Decision 1855/QD- TTg	Approving Vietnam's National Energy Development Strategy Up To 2020, with 2050 Vision	2007	• Mandates further research to explore renewable energy potential; • Through rural electrification programme, promotes the use of renewable energy sources in remote areas; and • Prioritises the development of renewable energy, bio-energy, and nuclear power.	http://extwprlegs1.fao.org/docs/pdf/vie78162.pdf
Decision 117/2007/ QD-TTg	Approving the Scheme on Development of Biofuels	2007	Aside from creating legal setting for the development of biofuel, the regulation also sets specific targets for biofuel productions in the country from 2007 until 2025.	http://extwprlegs1.fao.org/docs/pdf/vie79326.pdf
Decision 2139/QD- TTg	Approval of the National Climate Change Strategy	2011	• Broad multi-sectoral objectives, which includes food security, energy security, social security, conservation of natural resources, etc.; • Target for the capacity of hydropower plants to reach 20,000-22,000 MW by 2020; • Target to increase the share of new and renewable energies to 5 percent of the total commercial primary energies by 2020 (11 percent by 2050); and • Target to use 85 percent of collected urban household solid waste for energy generation.	http://vietnamlawmagazine.vn/decision-no-2139-qd-ttg-of-december-5-2011-approving-the-national-strategy-for-climate-change-4728.html
Decision 37/2011/ QD-TTg	Mechanism to Support the Development of Wind Power Projects in Vietnam	2011	• Provides the mechanism to support the development of wind power projects, including the procedures for the elaboration, approval and public notification for wind power development plans; and • Provides mechanisms to support wind power projects developments, including incentives related to investment capital, taxes, charges, etc.	http://extwprlegs1.fao.org/docs/pdf/vie105088.pdf

Table 11.1. Renewable energy-related policies of Vietnam

Law/ regulation numbers	Official titles of laws/ regulations	Year issued	Key points	Electronic links
Decision 1393/QĐ- TTg	Vietnam Green Growth Strategy	2012	- Target to reduce of greenhouse gases emissions per unit of GDP by eight to ten percent; - Strategy to develop tax incentives for high-technology, scientific research, and technology development in environmental sector; and - Strategy to develop import tax exemptions to encourage the import and use of clean energy-related technologies.	https://www.giz.de/de/downloads/VietNam-GreenGrowth-Strategy.pdf
Decision 55/2014/ QH13	Law on Environmental Protection	2014	- Environmental protection should be in harmony with economic development; and - Recommendation on the development and use of clean and renewable energy to reduce greenhouse gases emissions.	http://extwprlegs1.fao.org/docs/pdf/vie64190.pdf
Decision 24/2014/ QĐ-TTg	FIT for Biomass energy: Support Mechanism for development of power plant project	2014	- Investment capital and tax incentives (Tax exemption on import, reduction of corporate tax, land incentives) - Power sale price of grid-connected biomass power projects (VND 1,220 / kWh or USD 5.8 cents/kWh) excluding value-added tax for co-generation and a list of avoidable expenses electricity production for non co-generation power project using biomass - Incentives and support for non-grid connected biomass power projects	http://gizenergy.org.vn/media/app/media/PDF-Docs/Legal-Documents/Blomass/Decision%2024-2014-QĐ-TTg%20on%20support%20mechanism%20for%20Biomass_EN.pdf
Decision 2068/QĐ- TTg	Renewable Energy Development Strategy to 2030 and vision to 2050	2015	- To combine the development of renewable energy with the implementation of environmental, social and economic objectives - To develop and use the renewable energy in combination with development of renewable energy industry - To combine the application of short-term technology (Hydro, Wind) with long-term technological development (advanced second and third generation biofuel)	https://luatminhkhue.vn/en/decision/decision-no-2068-qd-ttg-dated-november-25-2015-of-the-prime-minister-approving-the-development-strategy-of-renewable-energy-of-vietnam-by-2030-with-a-vision-to-2050.aspx
Decision 428/QĐ- TTg	Approval of revised National Power Development Master Plan for the 2011-2020 period with the vision extended to 2030	2016	- Provide adequate electricity for the domestic demand, satisfy socio-economic development objectives with average GDP growth rates of 7 percent during 2016-2030: - Commercial electricity projection: 235 – 245 billion kWh in 2020; 352 – 379 billion kWh in 2025; 506 – 559 billion kWh in 2030 - Electricity production and import: 265 – 278 billion kWh in 2020; 400 – 431 billion kWh in 2025; 572 – 632 billion kWh in 2030.	

Law/ regulation numbers	Official titles of laws/ regulations	Year issued	Key points	Electronic links
Decision 428/QD- TTg	Approval of revised National Power Development Master Plan for the 2011-2020 period with the vision extended to 2030	2016	• Prioritize the development of renewable energy sources for electricity production; increase the proportion of electricity generated from renewable energy sources (excluding large-scale, medium-scale and pumped storage hydro power) up to around 7 percent in 2020 and above 10 percent in 2030. • Construct the power transmission grid with flexible operation and high automation capabilities from electricity transmission to distribution; develop unmanned substations and substations with 50 percent of human participation to increase the capacity of the electricity industry. • Accelerate the program of electrification in rural and mountainous areas to ensure that in 2020 most of the rural households have access to electricity.	http://gizenergy.org.vn/media/app/media/PDF-Docs/Legal-Documents/PDP%207%20revised%20Decision%20428-QD-TTg%20dated%2018%20March%202016-ENG.pdf
Decision 11/2017/ QD-TTg	Support mechanisms for the Development of Solar Power Projects in Vietnam (FIT for Solar Energy)	2017	• All output produced by solar power projects will be purchased for VND 2,086 (USD 9.3 cent)/kWh (excluding VAT) • Applied to power grid-connected projects with the cell efficiency above 16 percent or productivity module over 15 percent. • Investment incentives of exemption from land rental fees	http://gizenergy.org.vn/media/app/media/Legal%20documents%20VI/Decision%2011_2017%20of%20PM%20on%20solar%20PV%20FIT_Eng.pdf

Source: Various.

Table 11.2. Biofuel development scheme of Vietnam, 2007-2015, with a vision to 2025

Item	Up to 2010	2010–2015	Vision up to 2025
Legal framework	• Formulation of legal systems to promote industrial-scale production and use of biofuels; • Campaign to raise public awareness of biofuels; and • Development of road map for use of biofuels to partially replace fossil fuels.		
Technology	Research and development towards mastery of technologies for biofuel production, from biomass generation and blending, to increasing conversion efficiency.	Mastery of the production of materials and additives for biofuel production.	

Policy for biofuel

The development of biofuel in Vietnam is regulated under Decision No. 117/2007/QD-TTg Approving the Scheme on Development of Biofuels Up to 2015 with a Vision to 2025.²⁵ After pursuing planning, research, capacity building, and development of biofuels between 2007 and 2015, the present implementation phase of the policy is focused on the advancement of the biofuel production technology applied in Vietnam to match global advanced levels. It is also expected that, by the end of 2020, ethanol and vegetable oil output will reach 1.8 million tonnes, which would satisfy 5 percent of the country's gasoline and oil demand (refer to Table 11.2.).²⁶ As discussed earlier, the government is currently also pursuing a plan to phase-out Octane-92 gasoline, and to replace it with a more environmentally-friendly E5 fuel.²⁷

Table 11.2. Biofuel development scheme of Vietnam, 2007-2015, with a vision to 2025

Item	Up to 2010	2010–2015	Vision up to 2025
Human resources	Initial implementation	• Technical staff with in-depth knowledge and skills in major areas related to biofuel production; and • Technicians with general skills, ready for biofuel production.	
Feedstock preparation	• Planning and development of raw material areas; and • Mastery of production of high-yield plant seeding.	• Development of raw material areas now being planned; and • Large-scale production of high-yield plants.	
Expected output	• Pilot models for biofuel production and use; and • Annual capacity: 100,000 tons E5 and 50,000 tons B5 (equivalent to 0.4 percent of the country's projected oil and gasoline demand).	• Wide use of biofuels to replace fossil fuels; • Scaling up of production and distribution network; and • By 2015: 250,000 tons of ethanol and vegetable oil output (blendable to 5 million tons of E5 and B5).	• Biofuel technology at world state-of-the-art level; and • Up to 1.8 million tons of ethanol and vegetable oil output.

Source: MOIT and AFD in ADB (2015: 114).

Policy for electricity generation from renewable energy

In 2015, the annual electricity production was 164.31 TWh. Coal accounted for the largest share, followed by hydropower and gas. Apart from large-scale hydropower, renewable energy - including small-scale hydropower - represented only a minor part of the electricity production (refer to Figure 11.4).

In order to diversify the country's energy mix to reduce Vietnam's dependence on oil, Order No. 24/2004/LCTN on the Electricity Law emphasises the

government's intention to step up the exploitation and use of sources of new and renewable energy for electricity generation.²⁸ The same Law also stipulates the need for renewable energy-related incentives on investment, electricity prices, and taxes. To that end, the government issued the Decree No. 04/2009/ND-CP on Incentives and Supports for Environmental Protection Activities, including renewable energy.²⁹ Further planning of the electricity sector is also regulated under the country's Power Development Plan (PDP), or known as the PDP VII. The Plan that underwent major changes in 2016, prioritises the development of renewable energy

sources for electricity production, and, more specifically, increases the percentage of electricity from these energy sources from 6.5 percent of total electricity production in 2020, and further 6 percent in 2030.³⁰ Figure 11.5 illustrates specific renewable energy targets of Vietnam by 2020, 2025 and 2030 respectively.

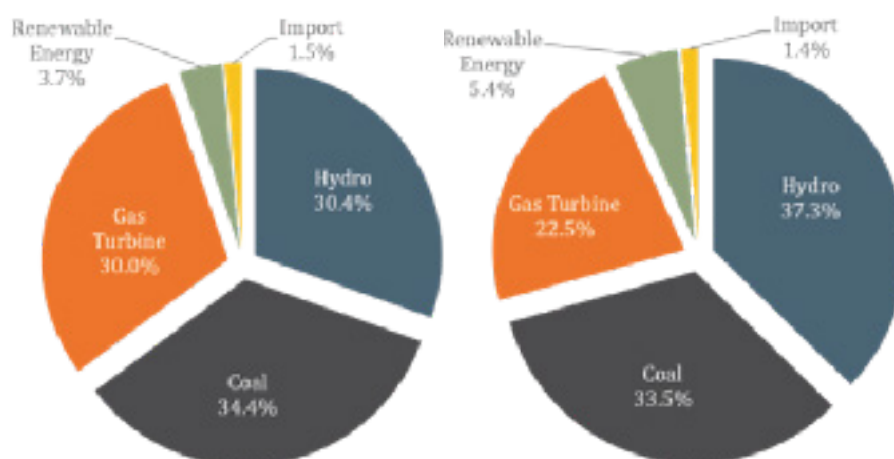
11.3.3. Investment policy, incentives, and procedure in renewable energy sector

Investment policy

Foreign investment in Vietnam is governed under the 2005 Law on Investment, which underwent several amendments over the past few years, the most recent of which was at the end of 2014, and took effect in early 2015. The new version of the Investment Law resolved the confusion found in the earlier version of the law that related to the level of foreign ownership that will result in a company incorporated in Vietnam being deemed a foreign invested enterprise, and which is subject to a more stringent requirements and restrictions than other type of companies in the country. The 2015 amendments removed the concept of foreign invested enterprise, and introduced instead the concept of a foreign invested economic organisation, which is now subject to more stringent requirements than other types of investment in the country.³¹ Whilst initially foreign ownership was limited to 49 percent, the adoption of Decree 60/2015 permits foreign investors to own up to 100 percent of the equity in most public Vietnamese companies.³²

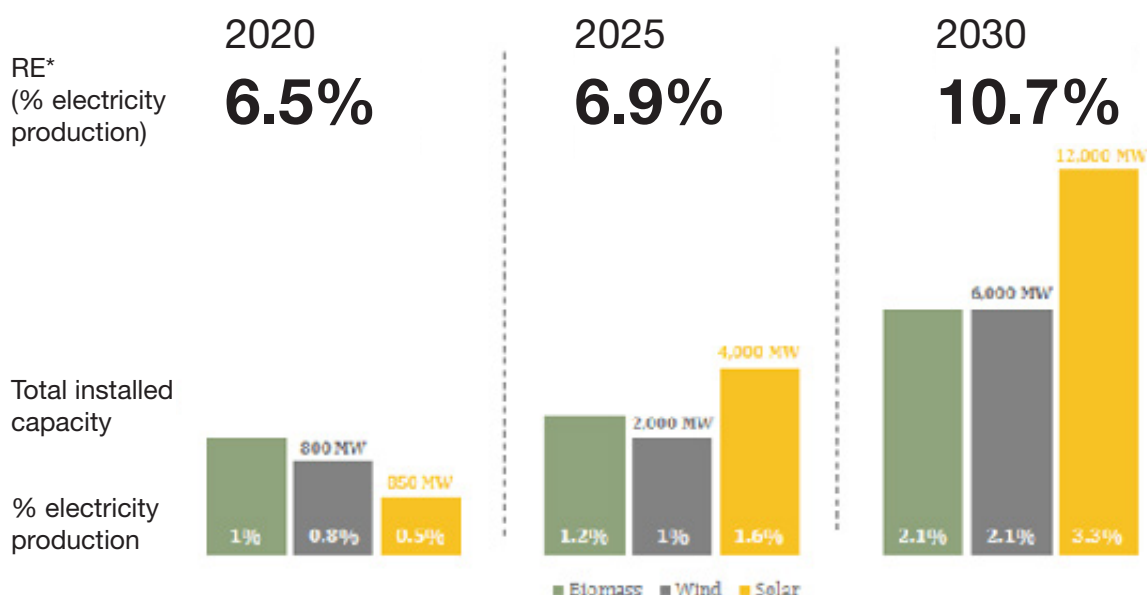
Although the aforementioned Law on Investment does not make specific reference to the renewable energy sector, existing laws and regulations in the country are generally supportive towards investment in the sector.³³ To further boost the competitiveness of the power sector, for example, the government is currently pursuing a plan, which is to be completed by 2018, to privatise three of its main electricity generating companies, including the Electricity of Vietnam, PetroVietnam, and the Vinacomin. At the same time, a policy to ensure

Figure 11.4. Vietnam overall consumption (164.31 TWh) and installed electricity generation capacity (39 GW) in 2015



Source: GIZ (2017)

Figure 11.5. Target for the share of renewable energy in total electricity by 2020 and 2030 according to the revised PDP VII



Source: GIZ (2017)

the competitiveness of the wholesale electricity market in the country is scheduled for completion in 2017, after which Electricity of Vietnam is expected to stop functioning as the single buyer in the electricity generation market.³⁴ As it stands, Electricity of Vietnam does not only have full control of power transmission and distribution, but also the authority to purchase power from all renewable energy projects.³⁵

As far as electricity generation is concerned, however, investment in renewable can be referred to the 2004 Electricity Law (enacted through Order No. 24/2004/L-CTN) mentioned earlier. This particular Law

does not only allow the exploitation and use of alternative sources of electricity generation, but also encourages domestic and international organisations and individuals to participate in the process.³⁶ Article 8 of the said Law, in particular, stipulates that for investment in electricity development, it must be carried out in line with local or national electricity development planning, each of which is to be developed by either the provincial or national government respectively.³⁷

Investment incentives

Decree No. 04/2009/ND-CP provides

the legal framework for incentives and support in environmental protection activities, including that in the renewable energy sector. All activities related to renewable energy development, such as the import of renewable energy-related machinery, equipment, and materials, as well as power generation from renewable energy sources, are included in the list of environmental protection activities eligible for incentives and supports provided by the Decree.³⁸ Table 11.3 summarises the key incentives and supports for renewable energy project development in Vietnam as stipulated by the aforementioned Decree.

Table 11.3. Key incentives and supports for renewable energy projects in Vietnam

Type	Incentive and support
Infrastructure and land	• Supports for investment in building technical infrastructure works (roads, electricity transmission lines, water supply and drainage works) outside project areas and connected with common regional technical infrastructure system; and • 50 percent reduction of land use levy and land rent.
Capital, tax and charge	• State supports of up to 50 percent of construction investment capital (40 percent from central budget and 10 percent from local budgets; • Another 50 percent of capital might be taken from the preferential loans of the Development Bank of Vietnam or the Environmental Protection Fund of Vietnam; • Income tax incentives under the law on enterprise income tax; and • Imported machines, equipment, means, tools and materials related to the development of renewable energy are exempt from import duty.
Price subsidies and supports for product sales	• Feed-in tariff (FiT) for wind power of USD 0.078/kWh (a combination of a fixed purchase price of USD 0.068/kWh and a USD 0.01/kWh subsidy financed from the state budget through the Environment Protection Fund; and • FiT for solar power has been set in 2017 at VNĐ 2,086 (USD 9.3 cent)/kWh (excluding VAT) and exempted from land rental fees • FiT for biomass power projects (Decision 24/2014/QĐ-TTg). The FiT for grid-connected co-generation is VNĐ 1,220 / kWh or USD 5.8 cents/kWh excluding value-added tax. For non co-generation power project, the FiT is set by avoidable expenses electricity production.
Other	• Environmental protection awards; and • Supports for product advertisement and sorting of garbage at source.

Source: Government of the Socialist Republic of Vietnam (2009), ADB (2015a: 101), and Vinkenberg (2016).

General investment procedure

Table 11.4. Permits or licences needed to develop renewable energy projects in Vietnam

Permit/certificate/license	Issuing institution
Electricity activity licenses	Ministry of Industry and Trade
• Power Purpose Agreement (PPA); and • Agreement about the connection point and metering design.	Electricity of Vietnam (EVN)
Investment registration certificate	Ministry of Industry and Trade
Approval of Environment Impact Assessment Report	Department of Environment Impact Assessment (EIA), VEA (Vietnam Environmental Administration) under the Ministry of Natural Resources and Environment
Land lease permit	People's Committee
Construction permit	Ministry of Construction

Source: Various.

The 2004 Electricity Law requires an organisation or individual to obtain a license before being able to be involved in generating, transmitting, or distributing electricity in Vietnam. In order to obtain such a license, the said individual or organisation is required to submit a feasibility project or scheme proposal for the intended electricity activities to be carried out in the country. In addition, the applicant is also required to submit other documents, such as valid application form, environmental assessment impact report, and a proof of professional qualification of staff, managers, or administrators.³⁹

If approved, the Ministry of Industry and Trade will grant electricity activity licenses for electricity activities with connection to the national electricity system. If the approved proposal only involves small-scale electricity activities within their respective localities, the license will be granted by the provincial-level People's Committees, under the guidance of the Ministry of Industry and Trade.⁴⁰ Other specific permits required for renewable energy projects in Vietnam are summarised in Table 11.4.

11.4. Barriers for renewable energy development

The following are potential barriers for renewable energy development in Vietnam:

- **Gap between policy and implementation due to low FiTs**

Vietnam has several renewable energy-related policies that have yielded little results in the development of this energy source to date. It has been reported that existing incentive mechanisms (low FiT among others) have failed

to promote the development of other renewable energy sources, such as wind and biogas.⁴¹ The investors think such a low FiT could not guarantee sufficient return. Another example is the promotion of biofuel, which is mandated by the 2007 regulation Approving the Scheme on Development of Biofuels. It faces roadblock as demand for E5 has not been as high as expected. Given the low demand for E5, two ethanol-making facilities had to be shutdown in 2016, whilst the remaining one is struggling to maintain production.⁴²

- **High transaction costs**

Lengthy procedures to establish a renewable energy project as well as a lack of coordination between related institutions hinder the development of renewable energy projects in Vietnam.⁴³ Aside from this, the lack of consolidated renewable energy rules and regulations creates further uncertainties for foreign businesses to invest in the sector.⁴⁴

- **Lack of technological infrastructures**

Vietnam currently does not possess any technological infrastructure for the development of renewable energy. The country needs to develop institutional system and, subsequently, technical infrastructure, such as centres for technical inspection, equipment installation and maintenance, and financial system, to facilitate the development of this energy source.⁴⁵

- **Lack of information and awareness**

Despite vast amount of information about renewable energy today, the majority of the population in Vietnam remains unaware about the benefits of renewable energy. Most technical information concerning this source of energy is usually confined within technical conferences, workshop, or exhibitions, most of which happening in major cities in the

country. This circumstance, unfortunately, creates very low demand for renewable energy in the country.⁴⁶

11.5. Institutional framework

The Office of the Prime Minister has the overall authority over policies, regulations, strategies, as well as plan related to renewable energy. All decisions pursued by implementing agencies must receive approval from the Prime Minister's Office.⁴⁷ Table 11.5. summarises the main roles and responsibilities of the key institutions under the Prime Minister's Office related to renewable energy development in Vietnam.

Table 11.5. Main renewable energy-related institutions in Vietnam

Institutions	Main roles and responsibilities
Ministry of Industry and Trade (MOIT)	Planning energy policies, managing energy sources such as coal, gas, oil, and renewable energy sources, as well as granting investment application and electricity activities license.
Ministry of Planning and Investment	Coordinating and managing funds for energy projects submitted by related ministries and agencies.
Ministry of Finance	Formulating and implementing regulations related to taxation and tariff.
Ministry of Science and Technology	Designing and implementing technical regulations for biofuel.
General Department of Energy	Formulating overall energy policy, as well as managing electricity development plans. It has a New and Renewable Energy Department that focuses on renewable energy sector development.
Electricity Regulatory Authority of Vietnam of the Ministry of Industry and Trade	Formulating regulations to implement competitive electricity markets, developing standards and code for electricity activities, and supervising all activities related to electricity (transmission, distribution, tariff, etc.)
Electricity of Vietnam	The main state enterprise that implements the general electricity activities, including power generation, transmission, distribution and trading.
Institute of Energy	Conducting research and planning on national energy strategies, and generally act as research organization and think tank for government.

Source: Various.

11.6. Setting up a business in Vietnam

Table 11.6. summarises the process of setting up a business, including the length of time and cost required, in Vietnam.

Table 11.6. The process of setting up a business in Vietnam

Step	Procedure	Agency	Time (days)	Cost (in VND)
1	Obtain Business Registration Certificate and Tax Registration Certificate from the Department of Planning and Investment	Business Registration Office, Department of Planning & Investment	5	200,000
2	Make company seal		2-4	165,000-370,000
3	Registration of the seal-sample with the Business Registration Office	Business Registration Office, Department of Planning & Investment	5	No charge
4	Open a bank account		1	No charge
5	Buy pre-printed VAT invoices from the Municipal Taxation Department or obtain and print self-printed VAT invoices	Municipal Taxation Department	10	200,000/book
6	Publish registration contents on National Business Registration Portal	National Business Registration Portal	5	300,000
7	Pay business license tax	Tax office or commercial bank	1	1,000,000
8	Register use of labour at Municipal Department of Labor	Municipal Department of Labor	1	No charge
9	Register employees in Social Insurance Fund for social and health insurance	Social Insurance Fund	1	No charge

Source: World Bank (n.d.b.).

11.7. Other relevant information

11.7.1. Taxes

Various tax rates in Vietnam are highlighted in Table 11.7.

Table 11.7. Tax rates in Vietnam

Personal income tax (per annum, for employment income of residents)		
Taxable income	Rate (in percent)	Taxed amount (in VND)
First VND 108 million	0	0
Next VND 60 million	5	3 Million
Next VND 60 Million	10	6 Million
Next VND 104 Million	15	15.6 Million
Next VND 168 Million	20	33.6 Million
Next VND 240 Million	25	60 Million
Next VND 336 Million	30	100.8 Million
Next VND over 960 Million	35	35 percent of related amount
Corporate Income Tax	20 percent flat rate	
	0 percent for exported goods/services	
Value Added Tax	5 percent for essential goods (including various agricultural products)	
	10 percent for other goods/services not exempted for lower rates	

Table 11.7. Tax rates in Vietnam

Withholding tax	0 percent for dividends
Personal income tax (per annum, for employment income of residents)	
Withholding tax	5 percent for interests
	10 percent for royalties
Other taxes	Numerous other fees and taxes may apply, including a business licence tax and registration fees on the transfer of certain registered assets.

Source: PwC (2016a).

11.7.2. Labour condition landscape and employment system

The 1992 Constitution and 2005 Civil Code serve as the main guidelines for the employment of Vietnamese nationals in foreign invested enterprises. More recently, the 2012 Labour Code regulates employment relationship in the country. This, along with Decree 11/2016 ND-CP, provides guidance on matters pertaining to work permits and other related issues for foreign nationals wishing to work in Vietnam. The country's labour legislations, however, does not apply to foreign nationals who are assigned by its parent company to work in its Vietnam-based subsidiary on a temporary basis. The processing time of a work permit normally takes about seven days, and costs about VND 400,000.⁴⁸

by Resolution No. 71/2006/QH11, dated 29th June 2006, and is administered by the Social Security Administration.⁴⁹ The country currently has three social security schemes, including social insurance, unemployment insurance, and health insurance. A social insurance contribution is mandatory for all registered companies, the contribution of which is deducted as a percentage of the employee's gross salary. Social pension and unemployment insurance is applicable only to Vietnamese nationals where 9 percent of the insurance is paid by the employee and 19 percent by the employer. Health insurance, on the other hand, is applicable to all residents regardless of nationality (1.5 percent is paid by the employee⁵⁰ and 3 percent by the employer).

provisions and implementation guidance for the above-mentioned Resolution 55. More recently, the National Assembly approved the Revised Land Law in 2013, which extends agricultural land tenure for household to 50⁵² years, from previously 20 years.

Notwithstanding these improvements, there remains certain restriction to land usage in Vietnam, particularly with regard to agricultural land. The 2003 and 2013 Land Laws allow the government to dictate usage allocation for each parcel of land. Although this land-use designation is theoretically changeable, it is generally difficult to do. The existing land laws also stipulate that the government may appropriate the land for any development purposes it sees fit, with land-right owners to be compensated at prices of current use (e.g. crop farming, etc.), rather than prices for future usage purposes (e.g. urban settlements or industry).

Table 11.8. Minimum wages in Vietnam, 2017

Regions	Minimum wage per month (in VND)
Region I*	3,750,000
Region II*	3,320,000
Region III*	2,900,000
Region IV*	2,580,000

Note: *For the detailed list of districts and provinces covered by each region, see the website of the Wage

Indicator (at: <http://www.wageindicator.org/main/salary/minimum-wage/vietnam>).

Source: Wage Indicator (n.d.).

11.7.3. Social security system

The implementation of the social security system in Vietnam is guided

11.7.4. Land policy

The Vietnamese Constitution provides that land is owned by the entire people of Vietnam, with the state playing a role in administering the land to the people. In practice, however, the state allocates or leases a piece of land to individuals, households, or entities to be used in accordance with the Land Law and its implementing regulations.⁵¹ Given the importance of agriculture for Vietnam, land policies hold a very special interest amongst the population of the country. In order to facilitate greater agricultural production, the National Assembly approved Resolution No. 55/2010/QH12 on agricultural land-use tax exemption and reduction in 2010, and, subsequently, issued Decree No. 20/2011/ND-CP in 2011 on the detailed

11.7.5. Commercial dispute settlement

The arbitration of commercial disputes in Vietnam is guided by the Ordinance on Commercial Arbitration of 2003, as well as Resolution No. 54/2010/QH12, dated 17th June 2010, on the Law on Commercial Arbitration. The government's Decree No. 63/2011/ND-CP, dated 28th July 2011, provides additional implementing guidelines on the 2010 Arbitration Law. The arbitration law in the country is generally aimed at encouraging resolution of disputes through arbitration, as well as facilitating the development of commercial arbitration in Vietnam

Table 11.9. Legal documents related to land policies in Vietnam, 2007-2013

No.	Legal code	Issuing date	Issuing entity	Policy name / issue
1.	84/2007/ND-CP	May 2007	Government	Additional provisions on issuance of land use right certificates; on land recovery; on exercise of land use rights; on order and procedures for compensation, assistance, and resettlement when the state seizes land; and on resolution of complaints about land.
2.	391/2008/QĐ-TTg	April 2008	Government	Review and supervision of the situation of land planning, management, and usage from 2006-2010 at the national level, particularly for agricultural land and paddy land.
3.	88/2009/ND-CP	October 2009	Government	On provision of certificates of land-use rights and house and land-attached assets ownership.
4.	63/2009/NQ-CP	December 2009	Government	On national food security.
5.	55/2010/QH12	November 2010	National Assembly	On agricultural land use tax exemption and reduction.
6.	20/2011/ND-CP	March 2011	Government	On detailing and guiding the implementation of the Resolution No. 55/2010/QH12 of the exemption from, reduction of tax of agricultural land use.
7.	42/2012/ND-CP	November 2012	Government	On management and use of paddy-farming land.
8.	The Revised Land Law	November 2013	National Assembly	Extending agricultural land tenure for household to 50 years from the previous 20 years.

Source: Thang and Linh (2014).

in line with the country's on-going socio-economic development. Furthermore, the 2005 Law on Investment also stipulates that disputes between a foreign investor and a Vietnamese state-related agency concerning investment activities in the country may be settled by a Vietnamese arbitration body or by a Vietnamese court. There are about eight arbitration centres in Vietnam, with the most well known one being the Vietnam International Arbitration Centre.⁵³

11.8. Electronic links to relevant government agencies related to renewable energy

- Office of the Prime Minister:

<http://primeminister.chinhphu.vn/>.

- Ministry of Industry and Trade: <http://www.moit.gov.vn>.
- Ministry of Planning and Investment (MPI): <http://www.mpi.gov.vn>.
- Ministry of Natural Resources and Environment (MONRE): <http://www.monre.gov.vn>.
- General Department of Energy: <http://www.tcn.gov.vn>.
- Electricity Regulatory Authority of Vietnam: <http://www.erav.vn>.
- Vietnam Electricity (EVN): <http://www.evn.com.vn>.
- National Power Transmission Corporation (NPT): <http://www.npt.evn.vn>.

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3. Sembiring (2016).
4. Climate Investment Fund (n.d.).
5. IEA (n.d.).
6. ARES and ACE (2016: 2).
7. ADB (2015a: 99).
8. Hieu (n.d.: 3-7).
9. Petrovietnam Oil Corporation (n.d.).
10. VnExpress (2017).
11. European Chamber of Commerce in Vietnam (2016:

AEC business tip for Vietnam

Vietnam's economy has seen rapid transformation from a closed and traditional economy to an open and high-productivity economy since the Đổi Mới reforms in the late 1980s. Although the country's renewable energy potentials has been exploited considerably for electricity, there remains investment impediments as Vietnam is lacking in technological infrastructures and market capacity to absorb renewable energy potentials. Vietnam's consistent engagements in the AEC, and other bilateral and multilateral trade and investment fora, is expected to encourage the country to pursue wider economic reforms, including, hopefully, in the country's renewable energy sector.

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13. ADB (2015a: 105).
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17. Ibid., p. 111.
18. Government of the Socialist Republic of Vietnam (2007a).
19. Ibid., pp. 45-46.
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21. ADB (2015b: 20)
22. Sembiring, Op. Cit.
23. Government of the Socialist Republic of Vietnam (2011b)
24. Vietnam Office of the Prime Minister (2016)
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27. VnExpress, Op. Cit.
28. Government of the Socialist Republic of Vietnam (2004).
29. Government of the Socialist Republic of Vietnam (2009).
30. GIZ (2017)
31. Allen and Overy (2014).
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33. Eversheds Sutherland (International) LLP (2016).
34. Vinkenborg (2016).
35. Eversheds Sutherland (International) LLP, Op. Cit.
36. Electricity Law No. 28/2004/QH11, Article 4 point 4 and Article 5.
37. Government of the Socialist Republic of Vietnam (2004).
38. See, in particular, the 'List of Environmental Protection Activities and Products Turned Out from these Activities Eligible for Incentives and Supports' attached to the Decree No. 04/2009/ND-CP.
39. Refer to Article 33 of the Electricity Law of 2004.
40. Refer to Article 39 of the Electricity Law of 2004.
41. Sembiring (2016).
42. TuoiTre News (2016).
43. Ibid.
44. Andreatta (2016: 5).
45. Hai and Hoang Lien (n.d.).
46. Ibid.
47. ADB (2015a: 99).
48. Practical Law (2016).
49. For further details concerning Vietnam's Social Security system, see the official website of the Office of Retirement and Disability Policy at: <<https://www.ssa.gov/policy/docs/progdesc/ssptw/2008-2009/asia/vietnam.html>>.
50. PWC (2016b).
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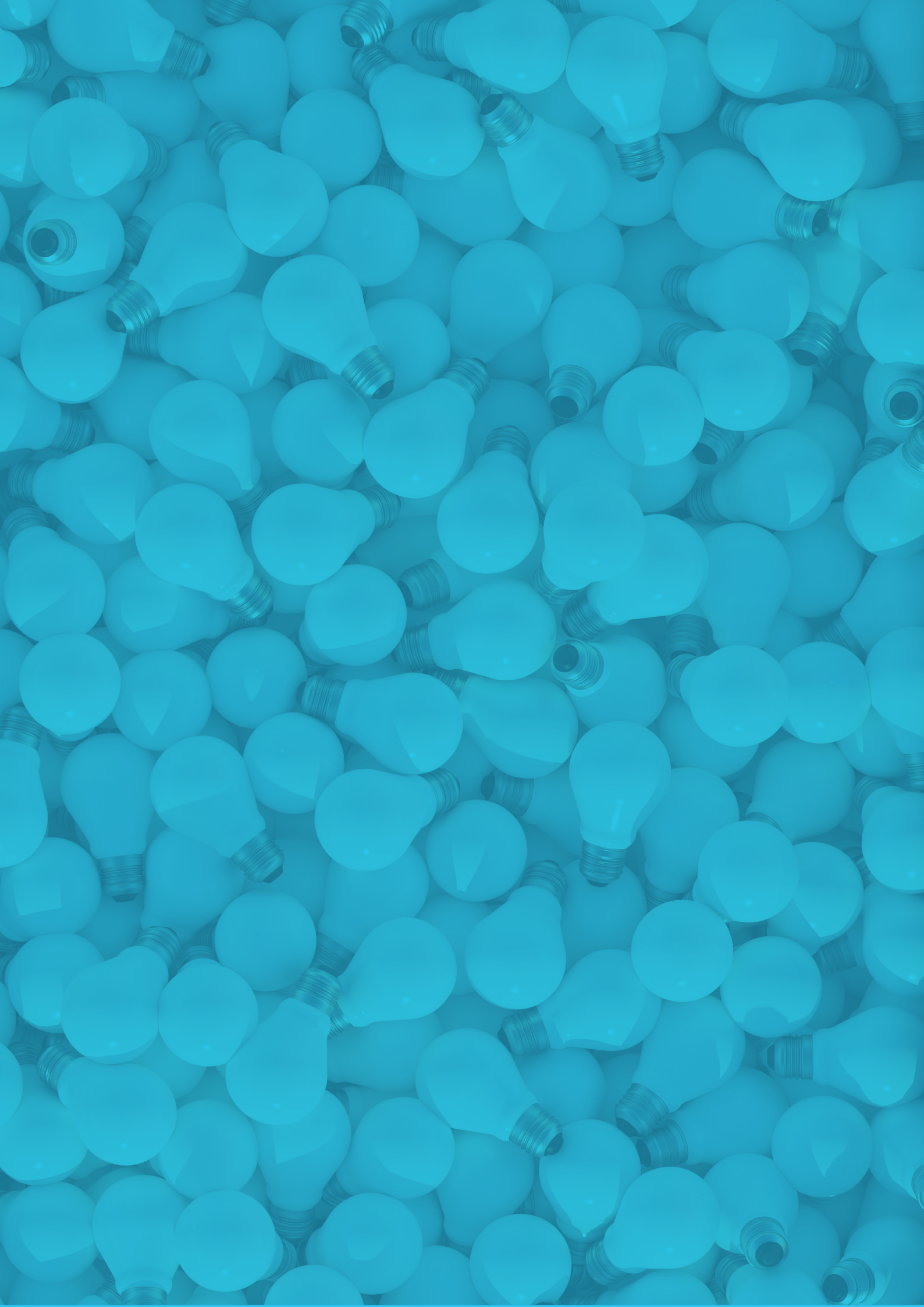
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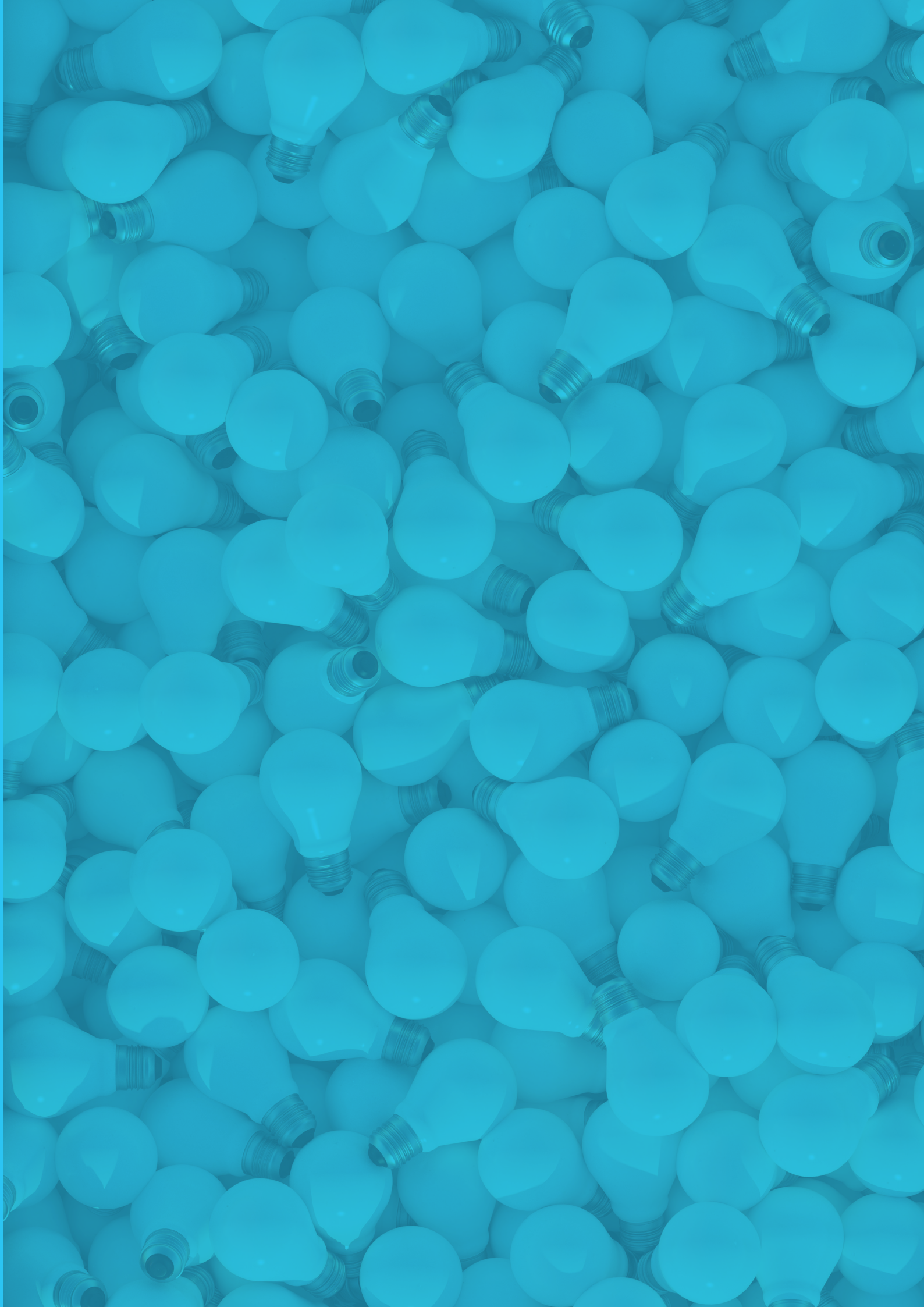
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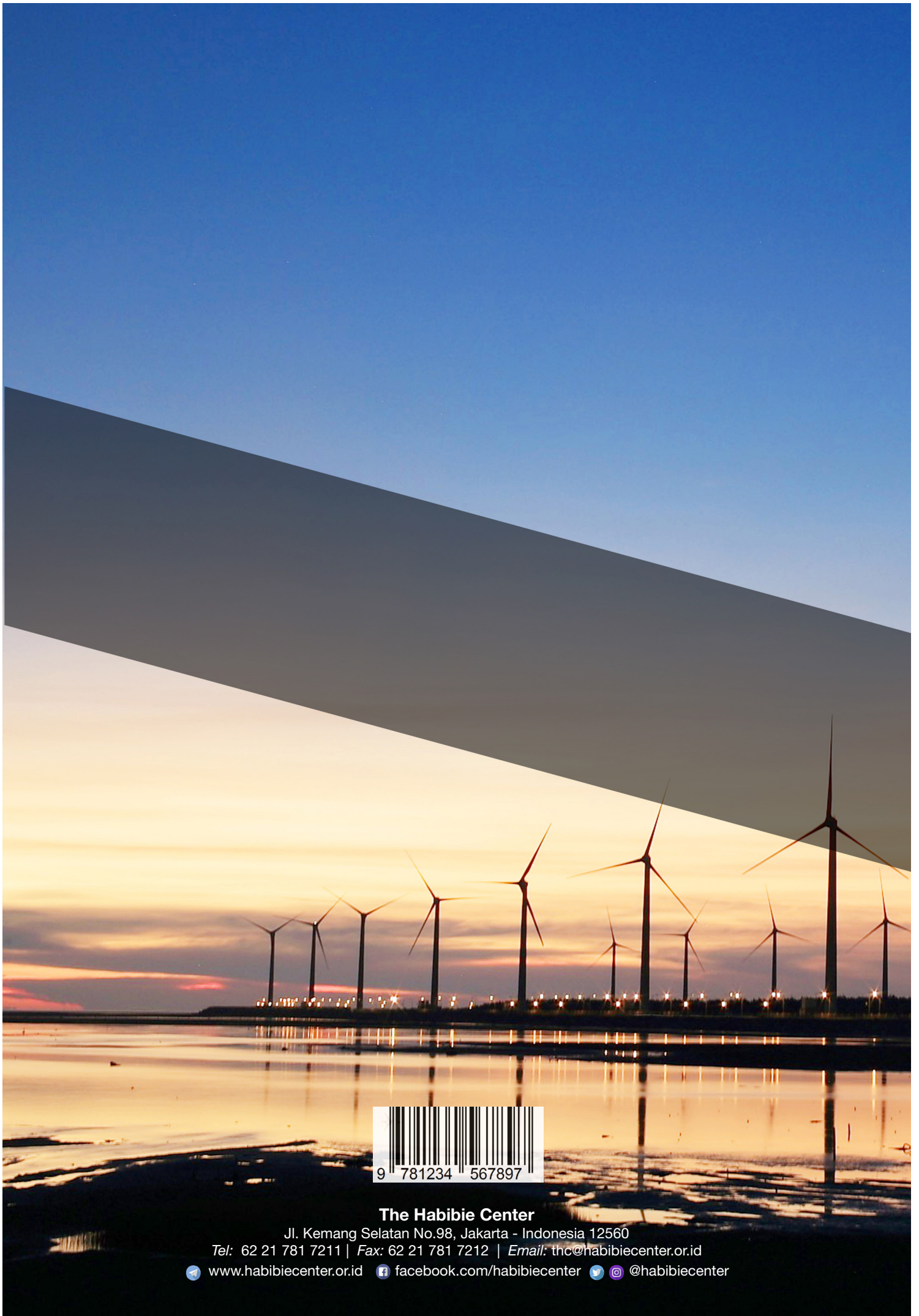
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