KPOWER BERHAD

(FORMERLY KNOWN AS KUMPULAN POWERNET BERHAD)

AMINVESTMENT BANK POWER TALK SERIES

Renewable Energy Power Talk – The Future of Hydro and Solar Power

20 January 2021

INTRODUCTION

ENERGY

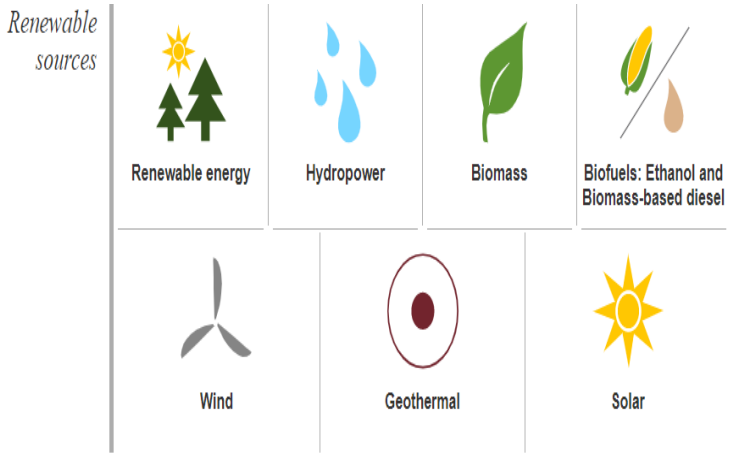
- Energy is the capability to produce motion, force, works, change in shape, change in forms and etc.
- Energy exists in several forms. Energy transformations are responsible for various activities.

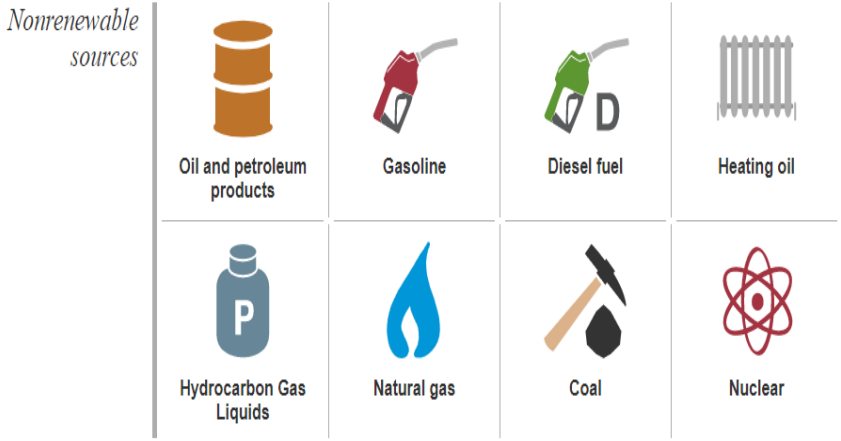
RENEWABLE ENERGY

A renewable resource is a resource that can be replenished as quickly as they are used.

NON RENEWABLE ENERGY

A non-renewable resource is a resource that cannot be replenished as quickly as they are used

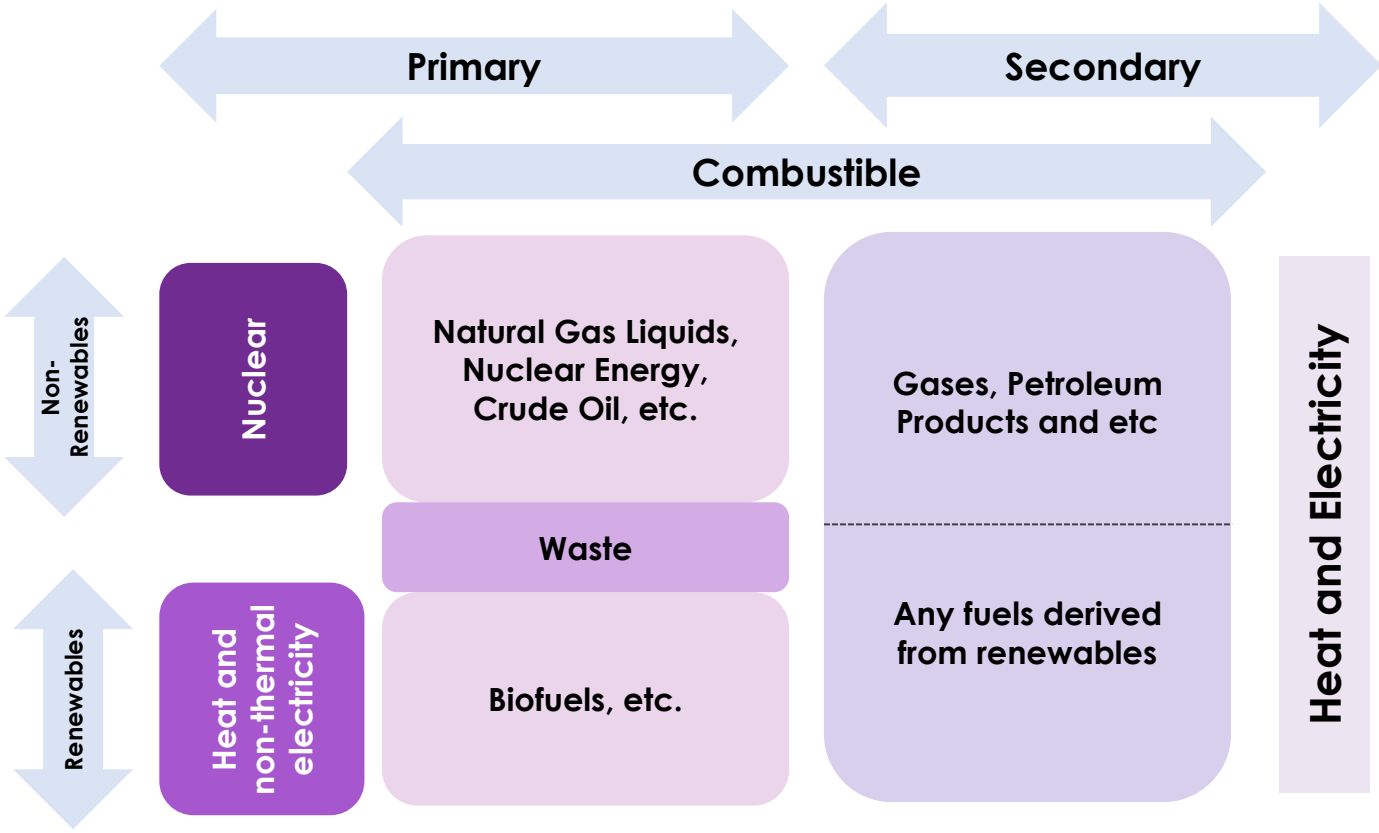




Sources:
U.S. Energy Information Administration

SOURCE OF ENERGY

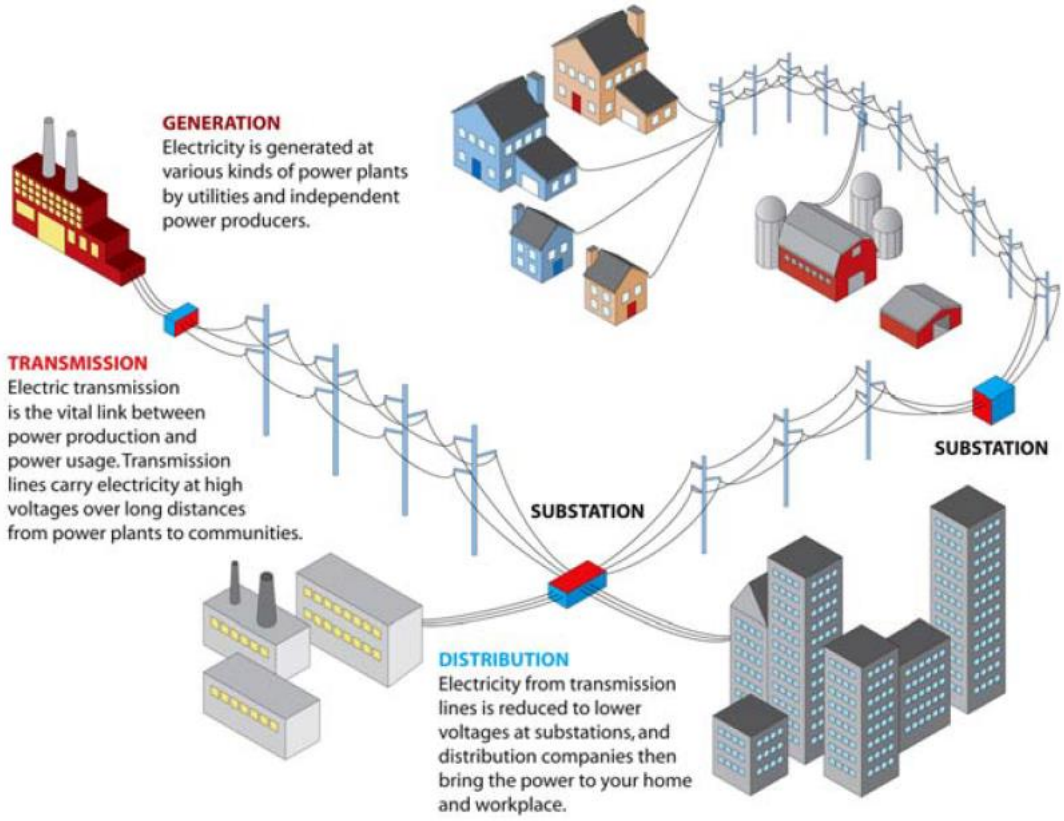
Primary energy consists of unconverted or original fuels.
Secondary energy includes resources that have been converted or stored.



RENEWABLE VS NON-RENEWABLE

	Renewable	Non- Renewable Energy
Nature	Sustainable	Exhaustible
Presence	Unlimited quantity	Limited quantity
Pollution problems	Less	More
Cost	Low	Comparative high
Rate of renewal	Rate of renewal is greater than the rate of consumption.	Rate of renewal is lower than the rate of consumption.

HOW ENERGY WORKS



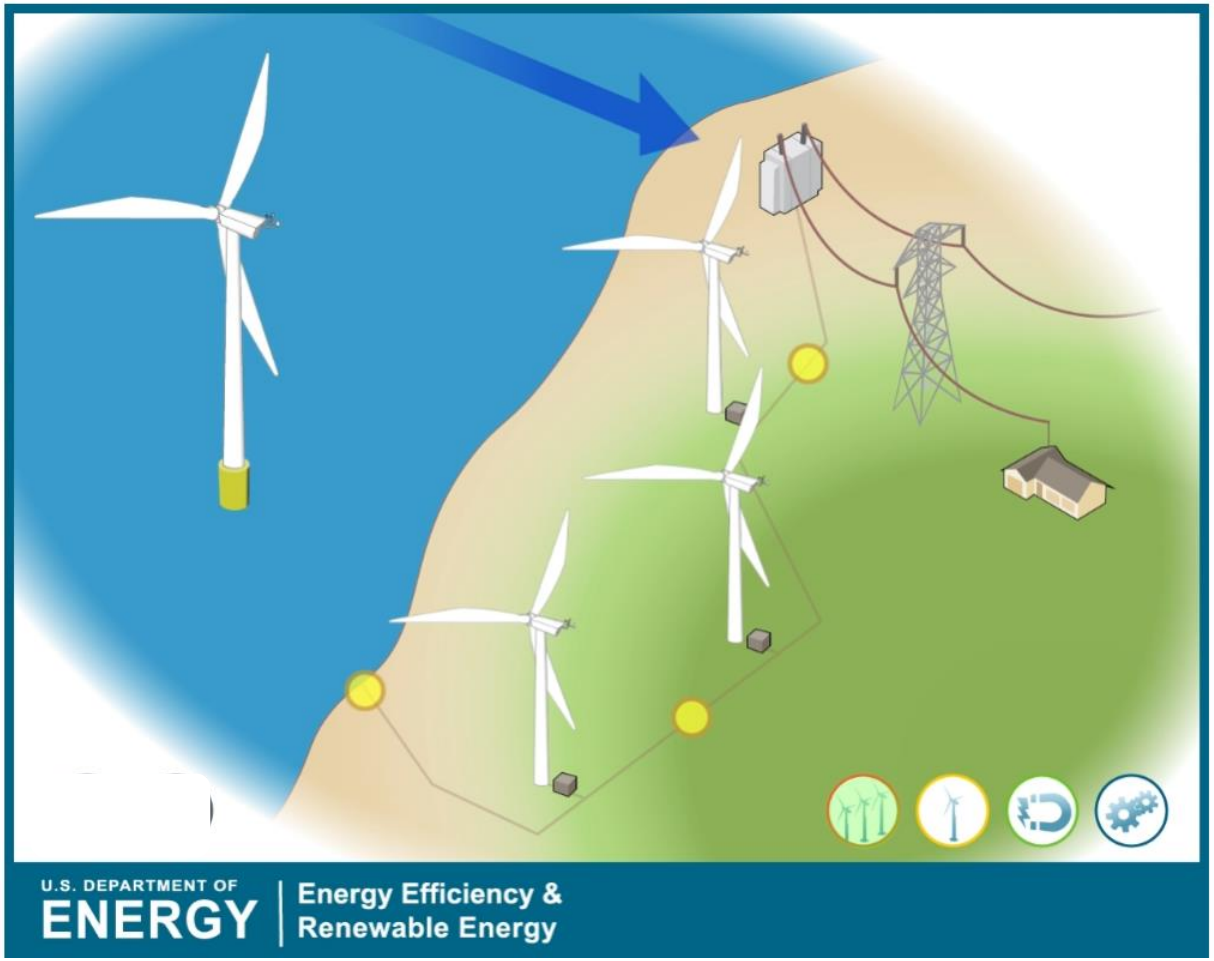
Renewables are often associated with distributed **generation** (also called dispersed generation or decentralized energy).

Source: U.S. Department of Energy. "Benefits of Using Mobile Transformers and Mobile Substations for Rapidly Restoring Electric Service: A Report to the United States Congress Pursuant to Section 1816 of the Energy Policy Act of 2005." 2006.

MODE OF RENEWABLE ENERGY

Wind

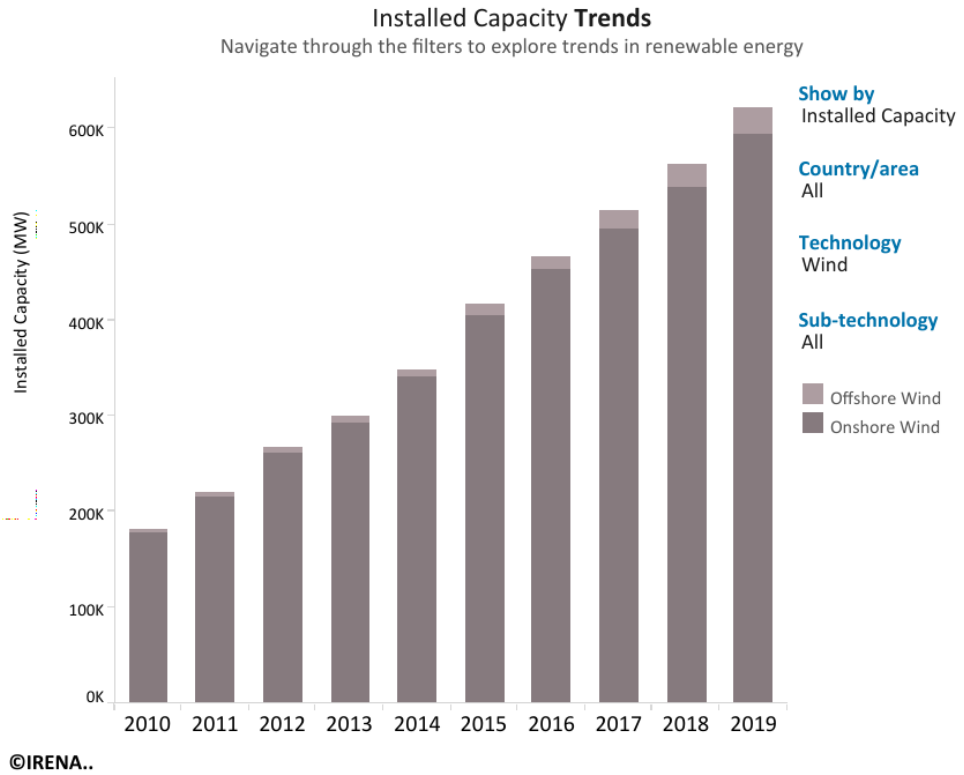
- Wind is used to produce electricity **using the kinetic energy** created by air in motion.
- This is transformed into **electrical energy using wind turbines** or wind energy conversion systems.
- Wind first hits a turbine's blades, causing them to rotate and turn the turbine connected to them.
- That changes the kinetic energy to rotational energy, by moving a shaft which is connected to a generator, and thereby producing electrical energy through electromagnetism.
- The amount of power that can be harvested from wind depends on the size of the turbine and the length of its blades.
- The output is proportional to the dimensions of the rotor and to the cube of the wind speed.
- Theoretically, when wind speed doubles, wind power potential increases by a factor of eight.



Source: International Renewable Energy Agency
U.S. Department of Energy, Office of Energy Efficiency & Renewable Energy

Wind (continued)

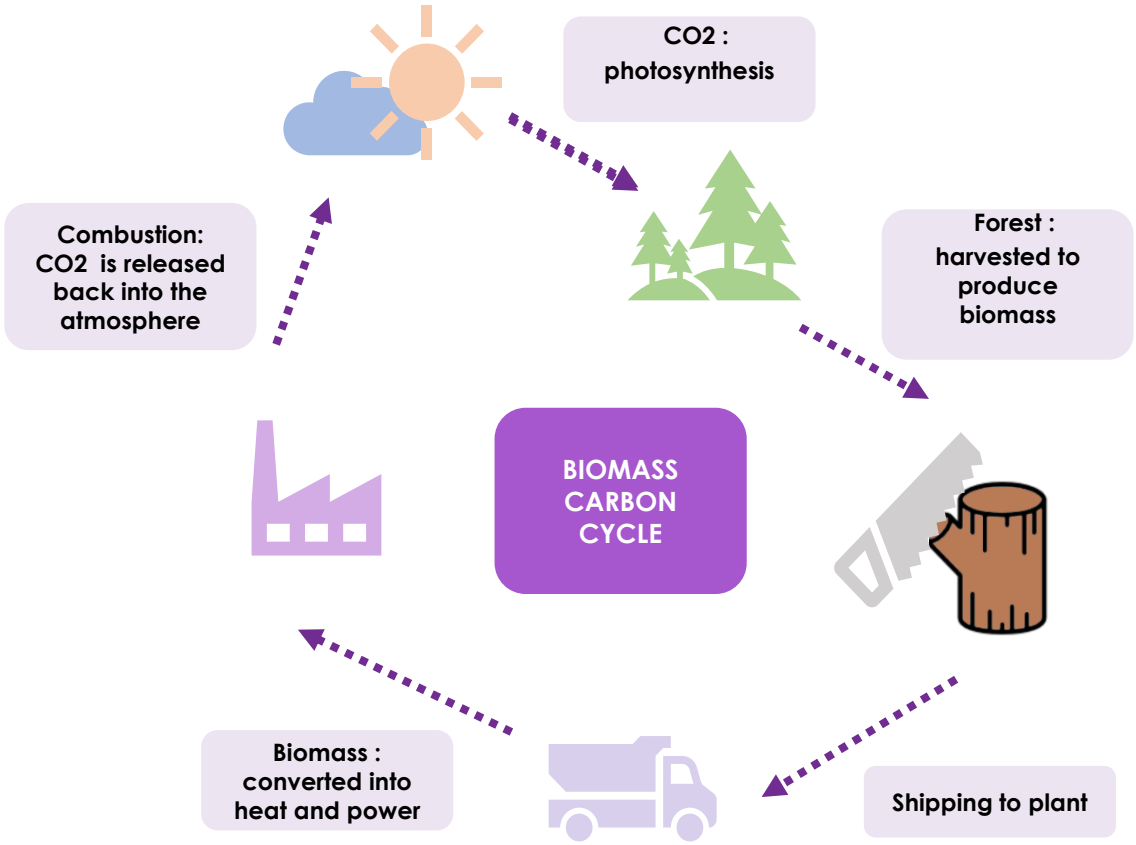
- Wind power is one of the **fastest-growing renewable energy technologies.**
- Usage is on the rise worldwide, in part because costs are falling.
- Global installed wind-generation capacity onshore and offshore has increased by a factor of almost 75 in the past two decades, jumping **from 7.5 gigawatts (GW) in 1997 to some 564 GW by 2018.**
- Production of wind electricity doubled between 2009 and 2013, and in 2016 wind energy accounted for 16% of the electricity generated by renewables.
- Many parts of the world have strong wind speeds, but the best locations for generating wind power are sometimes remote ones. Offshore wind power offers tremendous potential.
- World leaders in wind energy use: **Germany, USA, Spain, India**



Source: International Energy Agency

Biomass

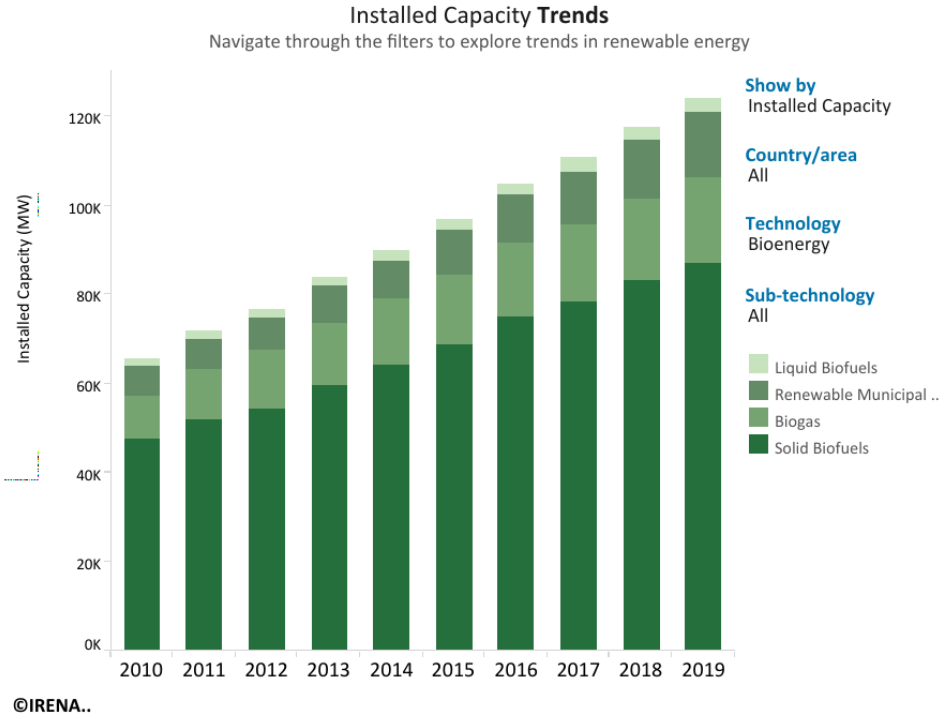
- Bioenergy use falls into two main categories:
  - **Traditional use** refers to the combustion of biomass in such forms as wood, animal waste and traditional charcoal.
  - **Modern bioenergy technologies** include liquid biofuels produced from bagasse and other plants; bio-refineries; biogas produced through anaerobic digestion of residues; wood pellet heating systems; and other technologies.
- About **three-quarters of the world's renewable energy use involves bioenergy**, with more than half of that consisting of traditional biomass use.
- Bioenergy accounted for about **10% of total final energy consumption and 1.4% of global power generation in 2015.**



Source:
International Renewable Energy Agency

Biomass (continued)

- Biomass has **significant potential to boost energy supplies in populous nations** with rising demand, such as Brazil, India and China.
- It can be **directly burned for heating or power generation**, or it can be converted into oil or gas substitutes.
- Liquid biofuels, a convenient renewable substitute for gasoline, are mostly used in the transport sector.
- **Brazil is the leader in liquid biofuels** and has the largest fleet of flexible-fuel vehicles, which can run on bioethanol – an alcohol mostly made by the fermentation of carbohydrates in sugar or starch crops, such as corn, sugarcane or sweet sorghum.

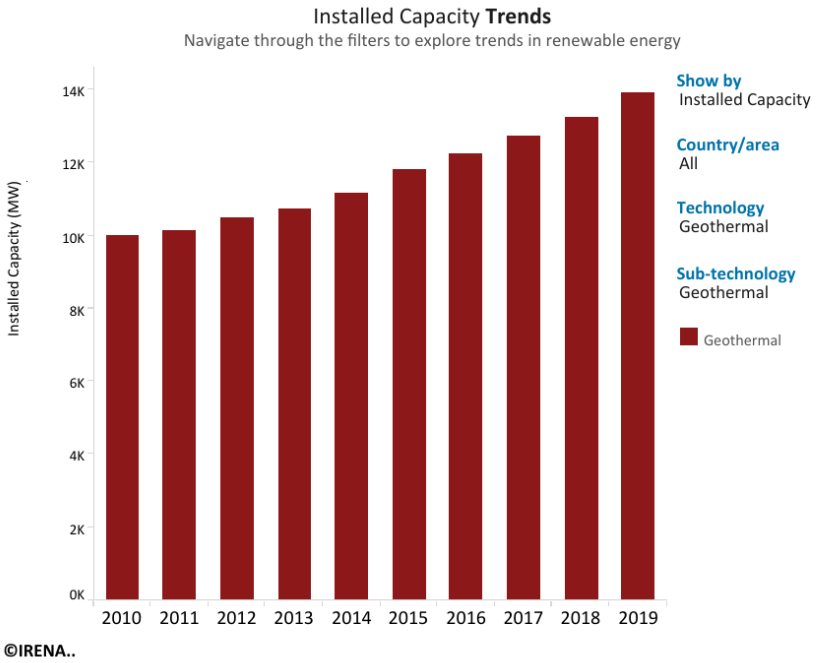


Source:
International Energy Agency

Thermal

- Geothermal energy is heat derived within the sub-surface of the earth.
- Water and/or steam carry the geothermal energy to the Earth's surface.
- Depending on its characteristics, geothermal energy can be used for heating and cooling purposes or be harnessed to generate clean electricity.
- For electricity, generation high or medium temperature resources are needed, which are usually located close to tectonically active regions.

- Covers a significant share of electricity demand in countries like **Iceland, El Salvador, New Zealand, Kenya, and Philippines** and more than 90% of heating demand in Iceland.
- Main advantages :
  - It **is not depending on weather conditions** and has very high capacity factors;
  - geothermal power plants are **capable of supplying baseload electricity**, as well as providing ancillary services for short and long-term flexibility in some cases.



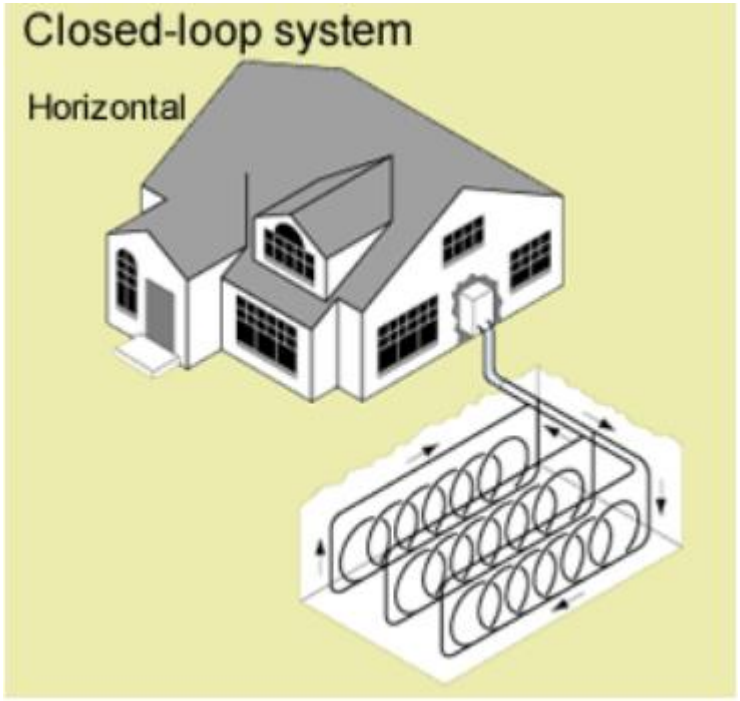
Source:
International Renewable Energy Agency

Thermal

Geothermal technologies

Geothermal heat pumps

- use the earth's constant temperatures for heating and cooling buildings.
- Geothermal heat pumps transfer heat from the ground (or water) into buildings during the winter and reverse the process in the summer.



Sources:
U.S. Energy Information Administration
U.S. Department of Energy, Office of Energy Efficiency & Renewable Energy

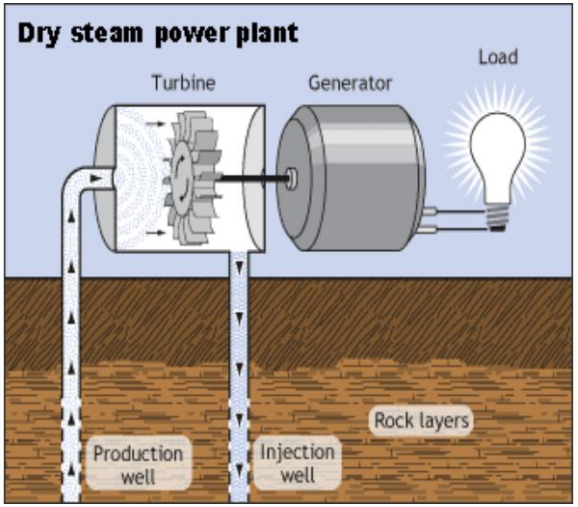
Thermal

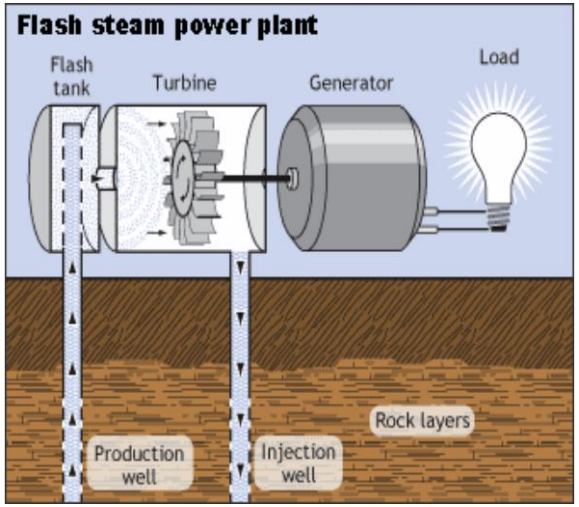
Geothermal technologies (continued)

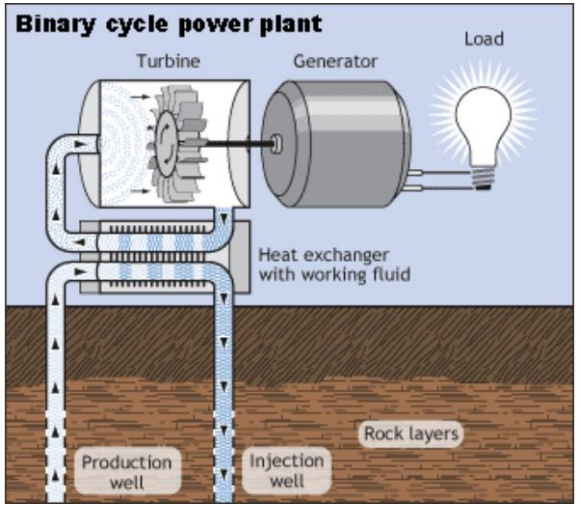
Geothermal power plants

- use hydrothermal resources that have both water (hydro) and heat (thermal)

- 3 types of plants :
  I. **Dry steam plants** use steam directly from a geothermal reservoir to turn generator turbines.
  II. **Flash steam plants** take high-pressure hot water from deep inside the earth and convert it to steam to drive generator turbines. When the steam cools, it condenses to water and is injected back into the ground to be used again. Most geothermal power plants are flash steam plants.
  III. **Binary cycle power plants** transfer the heat from geothermal hot water to another liquid. The heat causes the second liquid to turn to steam, which is used to drive a generator turbine







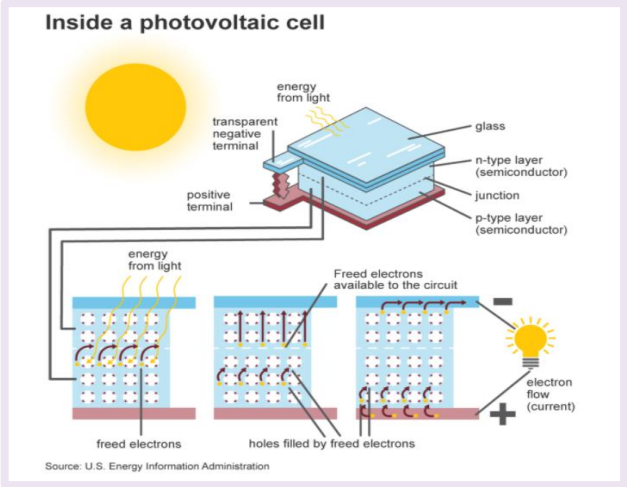
Sources:
U.S. Energy Information Administration
U.S. Department of Energy, Office of Energy Efficiency & Renewable Energy

Solar

- Energy can be harnessed directly from the sun, even in cloudy weather.
- Solar energy is used worldwide and is increasingly popular for generating electricity or heating and desalinating water.
- Solar power is generated in two main ways:

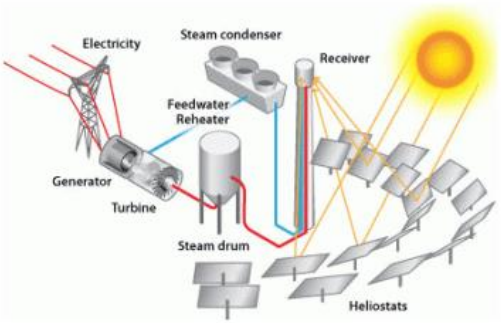
Photovoltaic solar technology

- which directly converts sunlight into electricity using panels made of semiconductor cells.



Solar thermal technology

- uses mirrors to concentrate solar rays.
- These rays heat fluid, which creates steam to drive a turbine and generate electricity.
- Used to generate electricity in large-scale power plants.

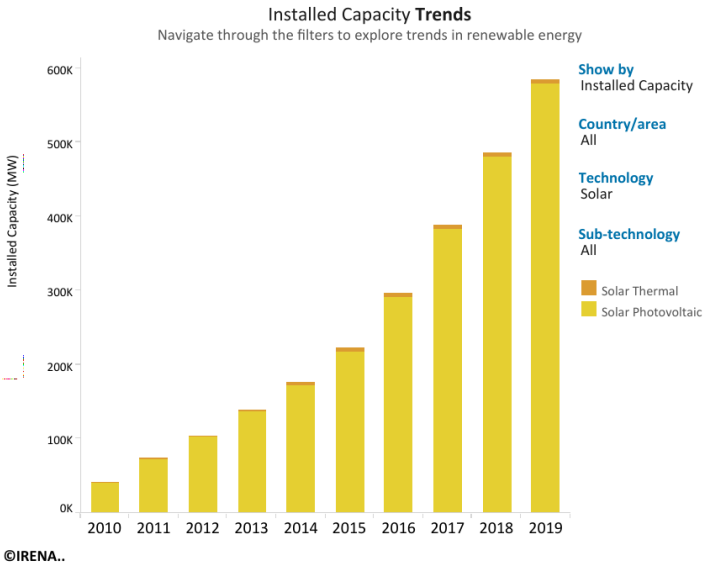


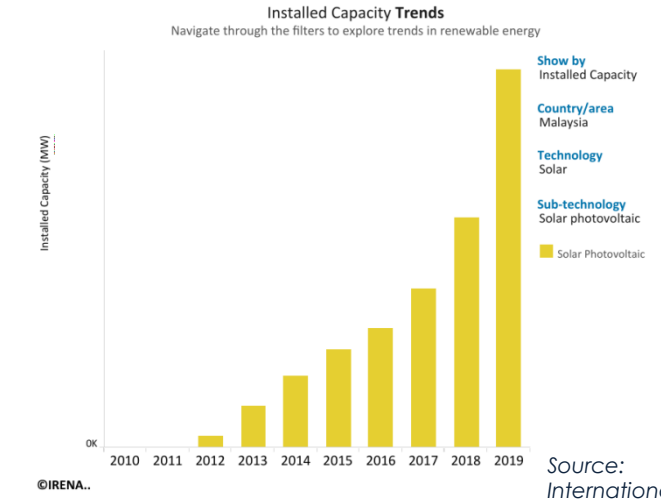
Sources:
U.S. Energy Information Administration
International Renewable Energy Agency
U.S. Department of Energy, Office of Energy Efficiency & Renewable Energy

Solar (continued)

Two different types of installations are used:

- **Individual systems for homes or small communities**. Photovoltaic panels can power electrical devices, while solar thermal collectors can heat homes or hot water.
- **Photovoltaic or concentrated** solar power plants that cover hundreds of acres produce electricity on a large scale, which can be fed into power grids.





Source:
International Renewable Energy Agency

HYDRO

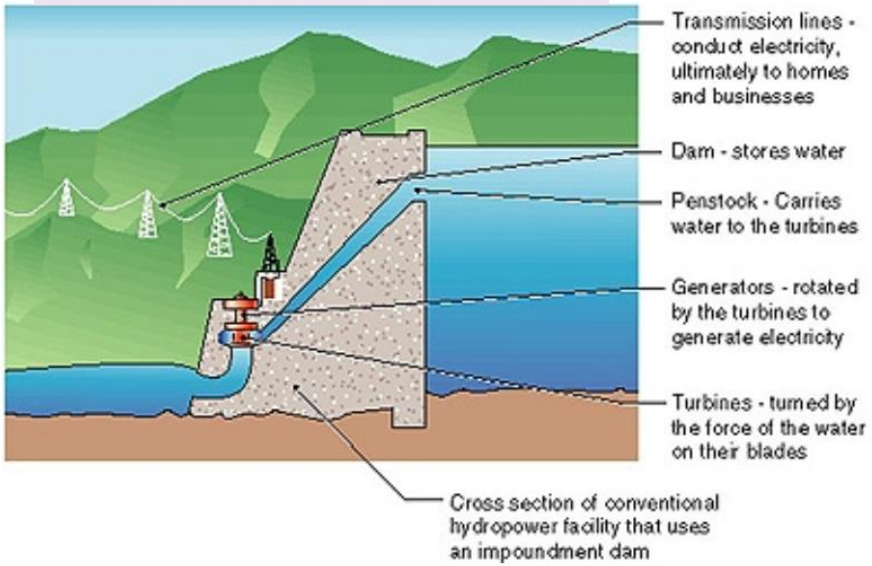
Hydroelectric energy is generated by converting kinetic energy from water into electrical energy. To harness this power, enormous hydroelectric infrastructures are built to extract maximum power from this renewable emission-free, local resource. Since water is much denser than air, its movement generates more energy.

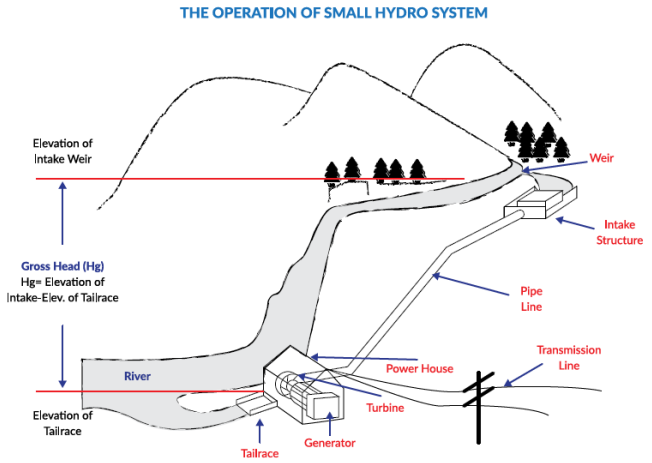
The basic principle of hydropower is using water to drive turbines.

Hydropower relies on the water cycle :

- Solar energy heats water on the surface of rivers, lakes, and oceans, which causes the water to evaporate.
- Water vapor condenses into clouds and falls as precipitation—rain and snow.
- Precipitation collects in streams and rivers, which empty into oceans and lakes, where it evaporates and begins the cycle again.

The most common type of hydroelectric power plant





Source:
U.S. Department of Energy, Office of Energy Efficiency & Renewable Energy
U.S. Energy Information Administration
SEDA : Sustainable Energy Malaysia | Volume 4 Issue 10

HYDRO (continued)

- Hydropower dams with a large reservoir can store water over short or long periods to meet peak demand.
- The facilities can also be divided into smaller dams for different purposes, such as night or day use, seasonal storage, or pumped-storage reversible plants, for both pumping and electricity generation.
- Hydropower without dams and reservoirs means producing at a smaller scale, typically from a facility designed to operate in a river without interfering in its flow. For this reason, many consider small-scale hydro a more environmentally-friendly option.

Hydropower is all about HEAD & FLOW

- **Head** is the change in water levels between the hydro intake and the hydro discharge point. It is a vertical height measured in meters.
- **Flow** refers to the flow of water over the course of the year to ensure the plant is producing energy year round .

HYDRO (continued)

Sizes of Hydroelectric Power Plants

Large Hydropower	Small Hydropower	Micro Hydropower
Hydro power plant with capacity more than 30 MW.	Hydro power plant with capacity between 30 MW to 100 KW.	Hydro power plant with capacity less than 100 KW.

HYDRO (continued)

Types of Hydroelectric Power Plants

Impoundment

- The most common type of hydroelectric power plant
- Typically a large hydropower system, uses a dam to store river water in a reservoir.
- Water released from the reservoir flows through a turbine, spinning it, which in turn activates a generator to produce electricity.
- The water may be released either to meet changing electricity needs or to maintain a constant reservoir level.

Diversion/ run-of-river :

- Facility that channels a portion of a river through a canal or penstock.
- The energy they produce cannot be ramped to cover demand for electricity.
- It may not require the use of a dam.

Pumped Storage :

- Works like a battery, storing the electricity generated by other power sources like solar, wind, and nuclear for later use.
- It stores energy by pumping water uphill to a reservoir at higher elevation from a second reservoir at a lower elevation.
- When the demand for electricity is low, a pumped storage facility stores energy by pumping water from a lower reservoir to an upper reservoir.
- During periods of high electrical demand, the water is released back to the lower reservoir and turns a turbine, generating electricity.

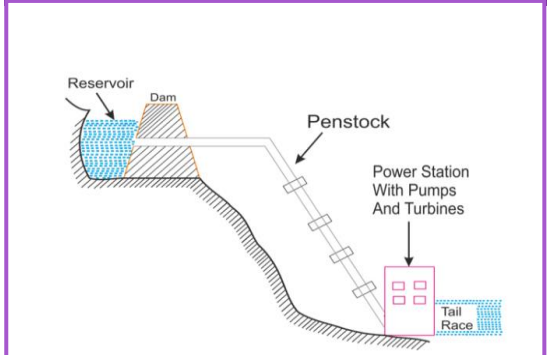
Source:
U.S. Department of Energy, Office of Energy Efficiency & Renewable Energy

HYDRO (continued)

KPOWER
Sustainability Through Diversity

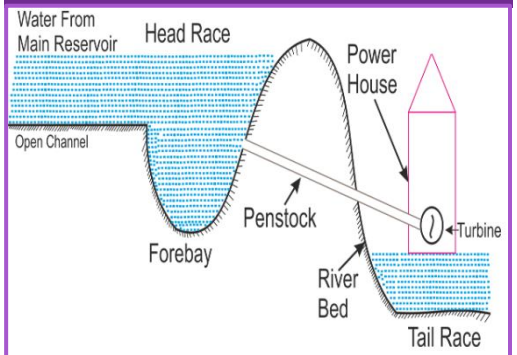
Categories of Hydroelectric Power Plants

Low Head



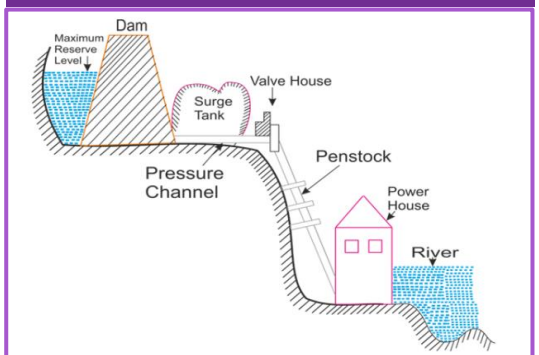
- Uses Francis, Kaplan or propellor turbines
- Consist of a dam across the river
- A sideway stream diverges from the river at the dam, powerhouse is constructed over the stream, which further joins the river.
- No surge tank is required for this plant.

Medium Head



- Head : 30m to 100m
- Uses Francis Turbine
- Forebay provided at the beginning of penstock at as reservoir.
- Water is carried in open canals from main reservoir to forebay then to powerhouse through penstock.

High Head

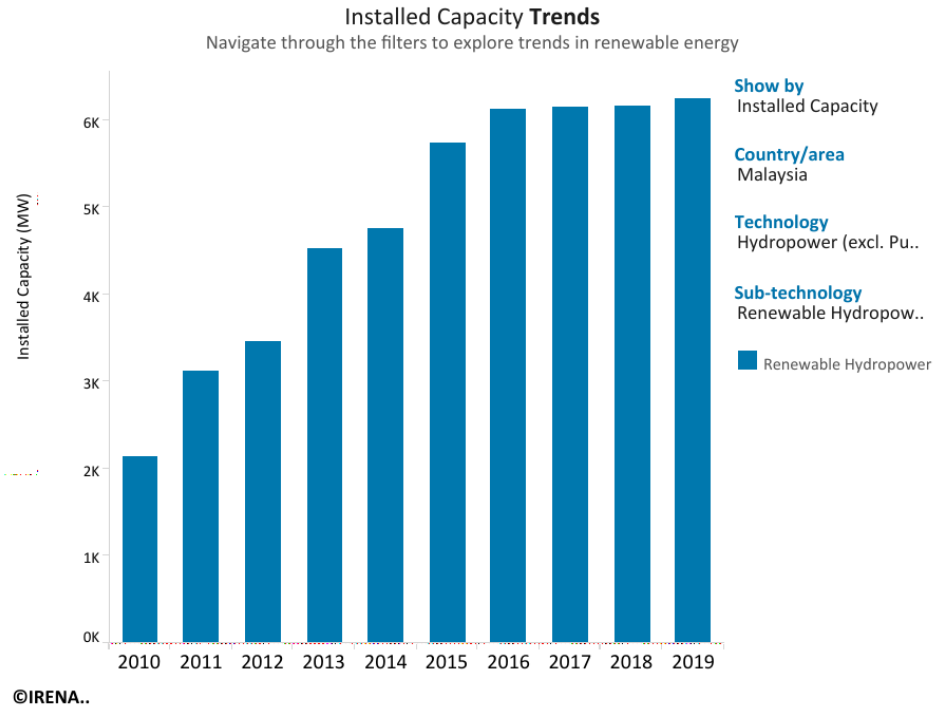


- Head: 100m to 2000m
- Uses Pelton Wheel turbine
- Water is stored in the lake over the mountain during high rainy season or when snow
- Water should be available throughout the year.

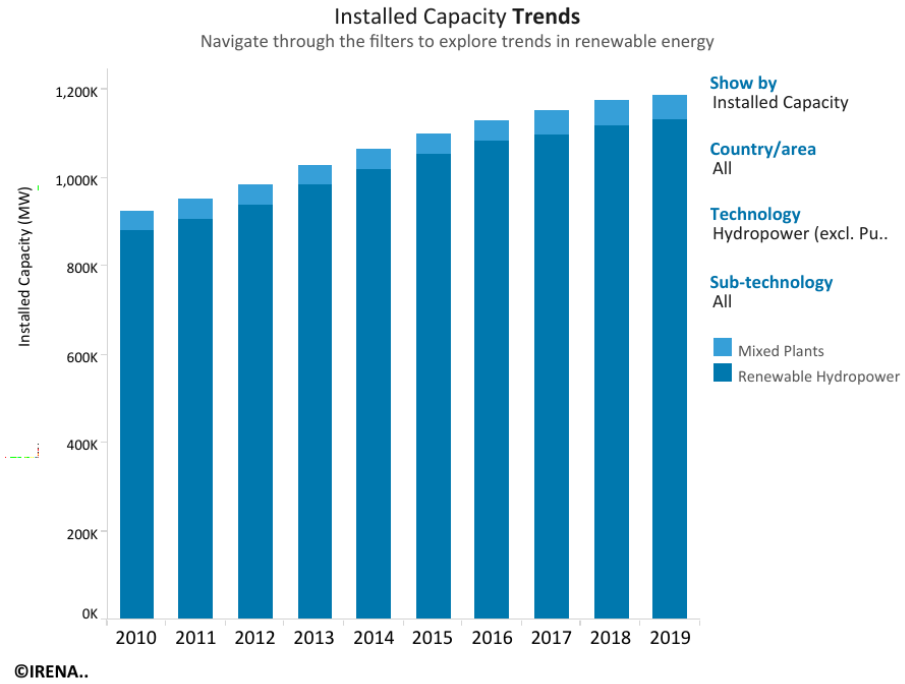
HYDRO (continued)

Installed Capacity

Malaysia



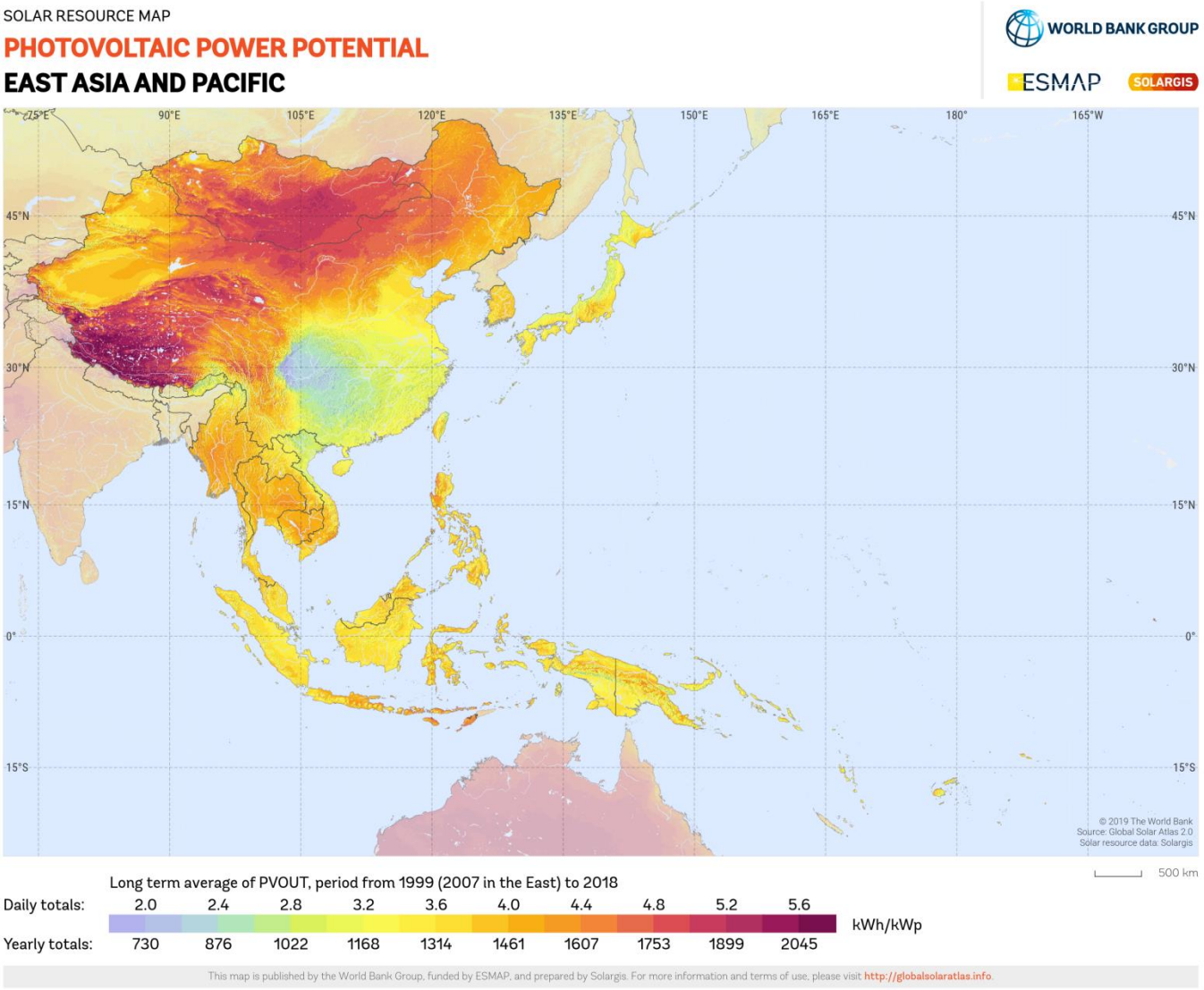
WORLDWIDE



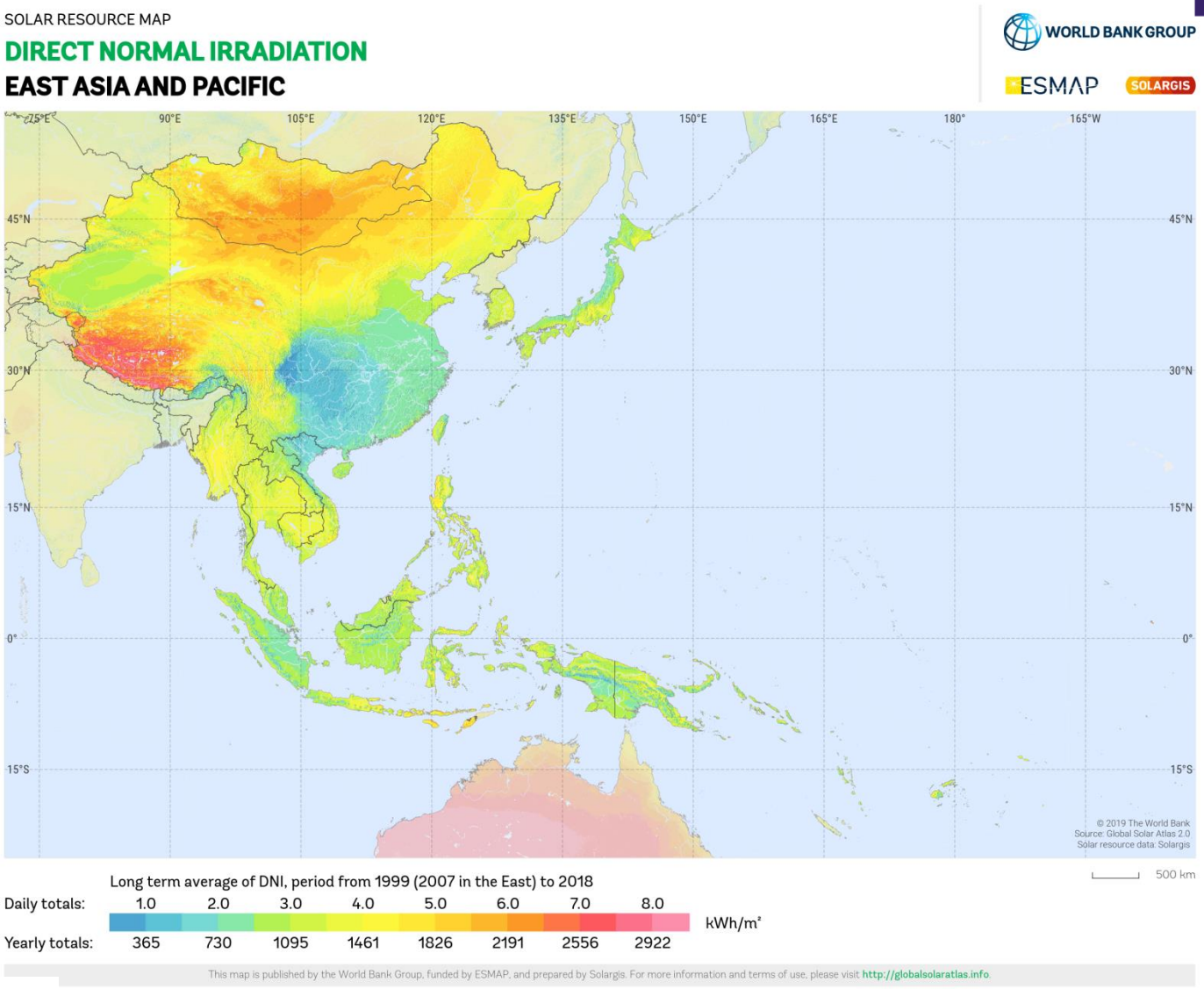
Source: International Energy Agency

ASEAN :
HYDRO & SOLAR POTENTIAL

SOLAR POTENTIAL



SOLAR POTENTIAL



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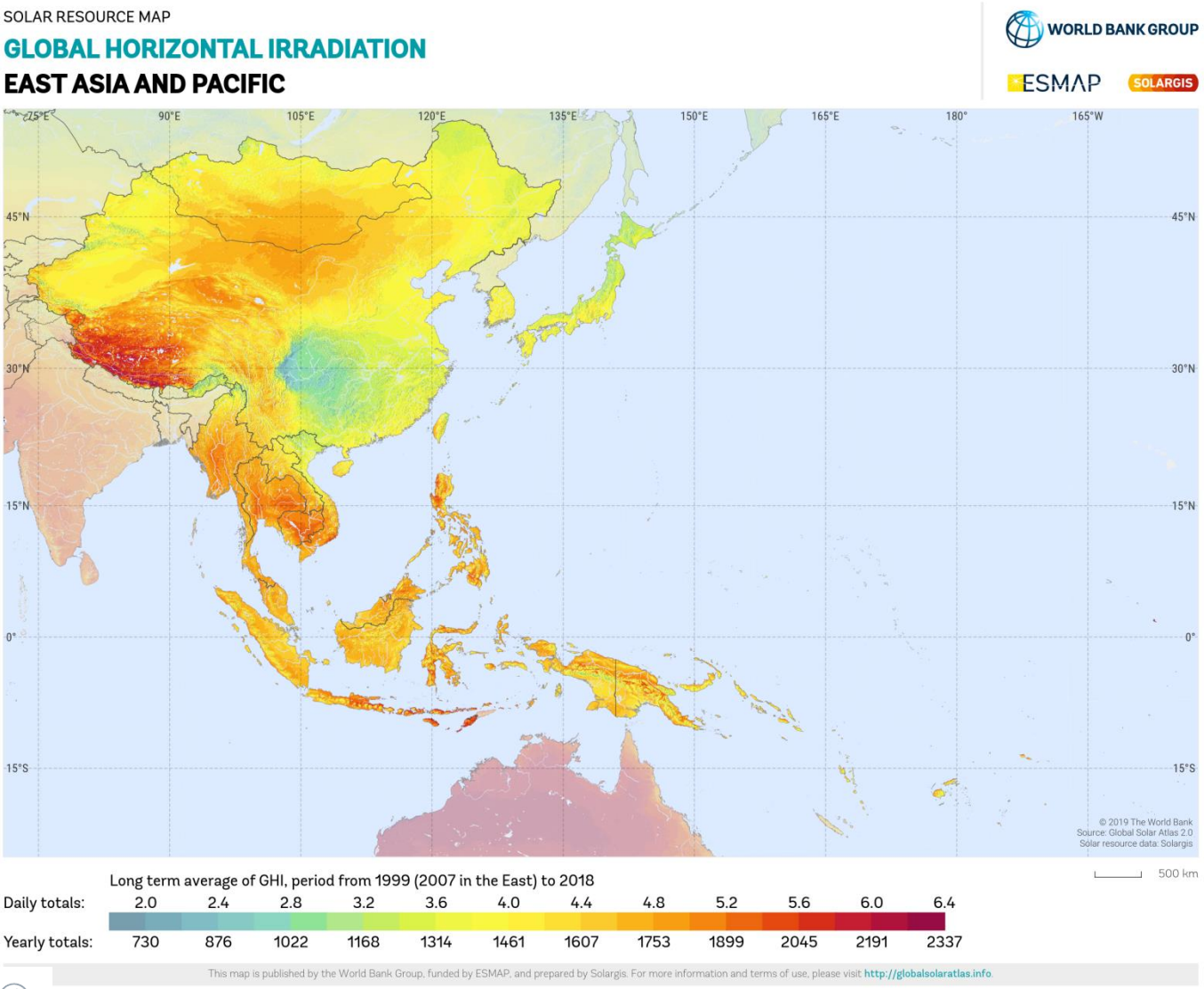
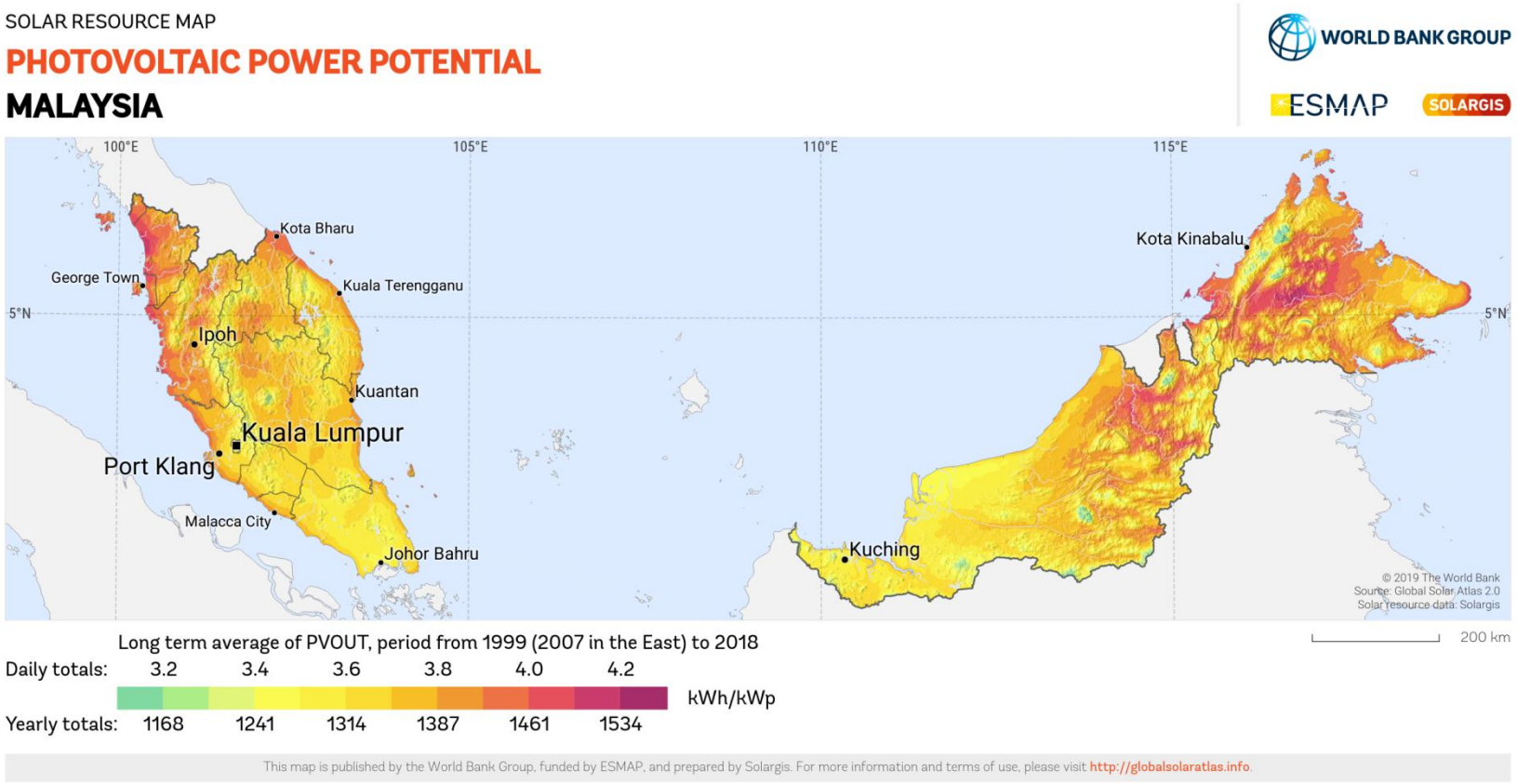
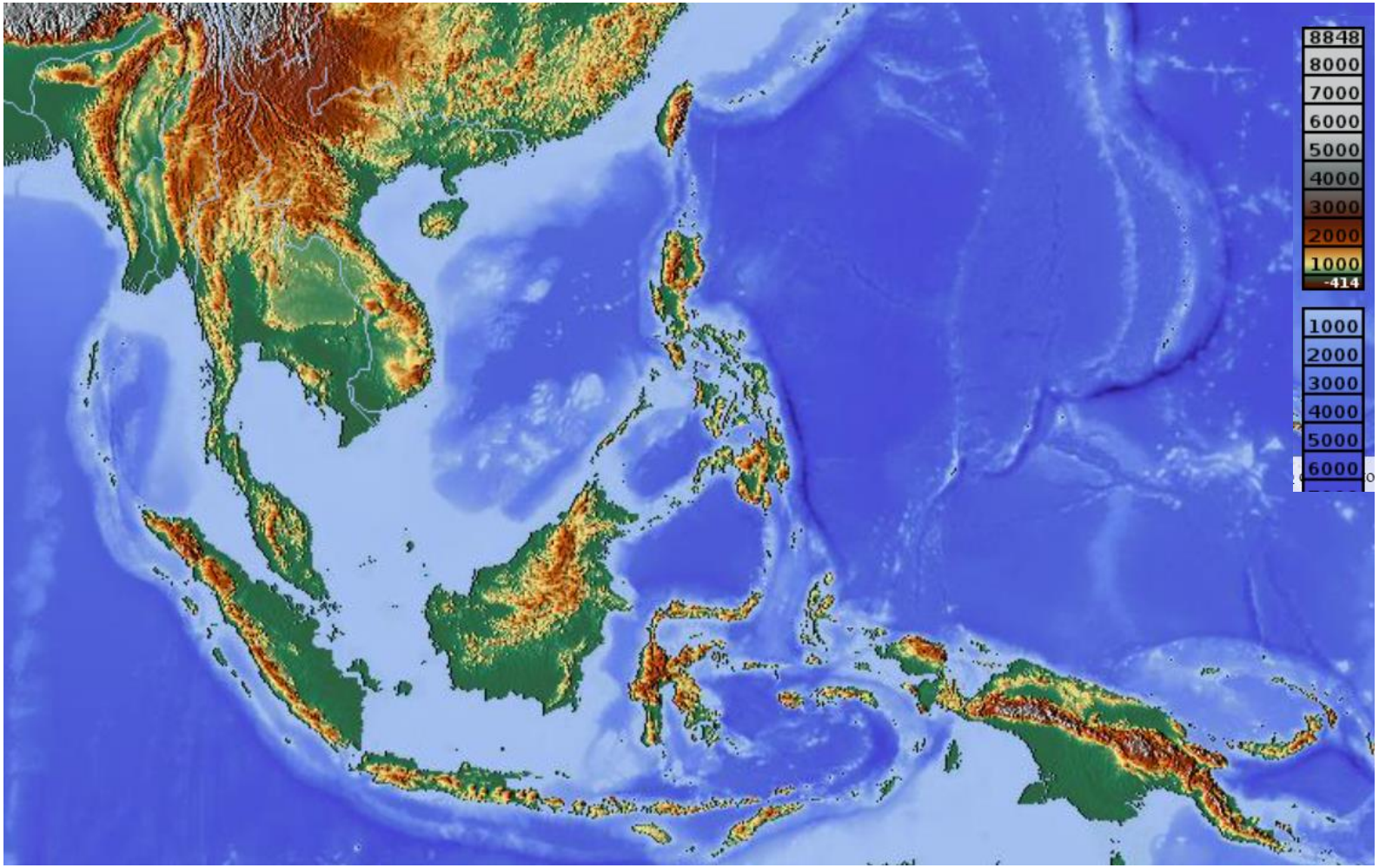


SOLAR POTENTIAL



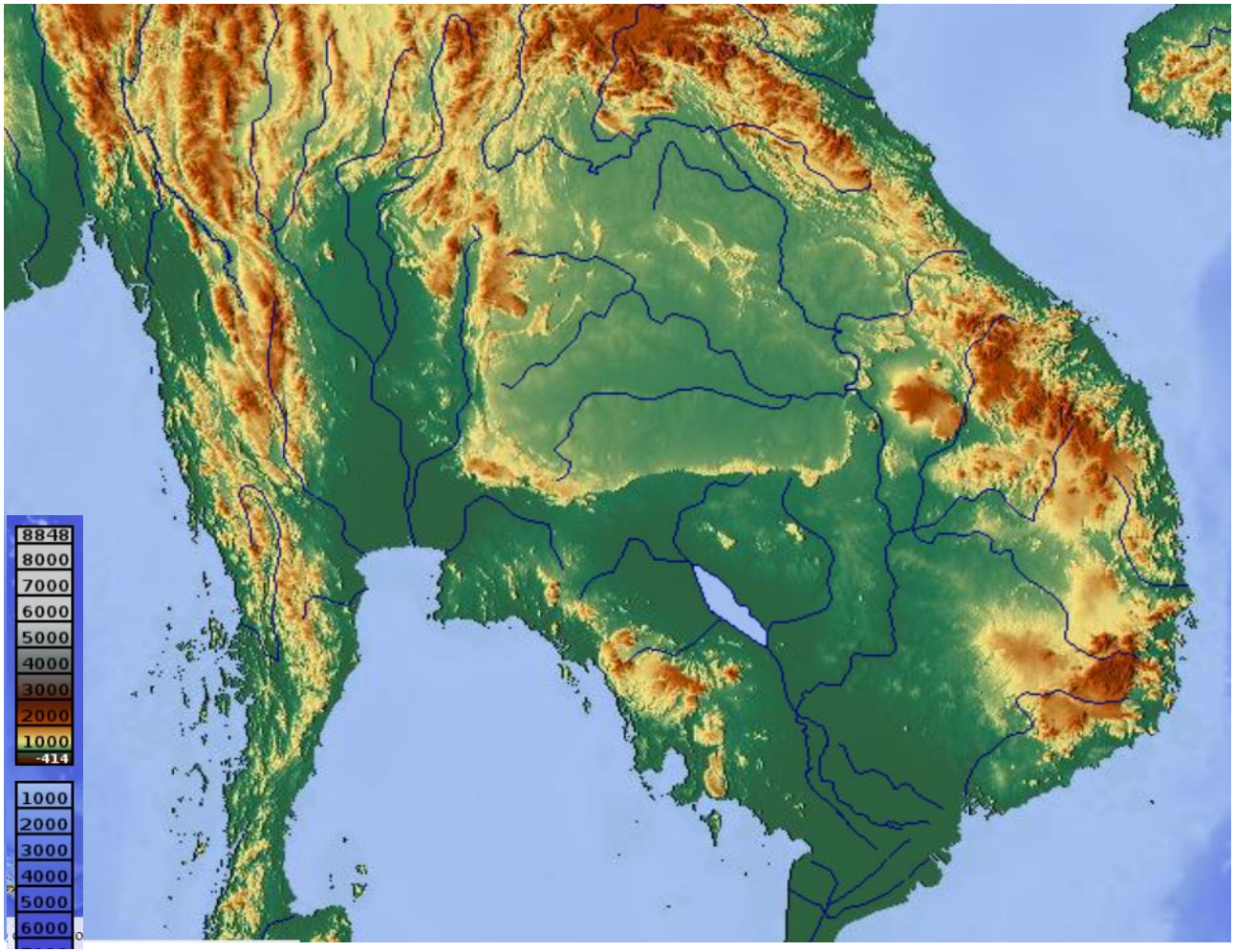
HYDRO (continued)

South East Asia's terrain : mountainous + river + heavy rainfall



HYDRO (continued)

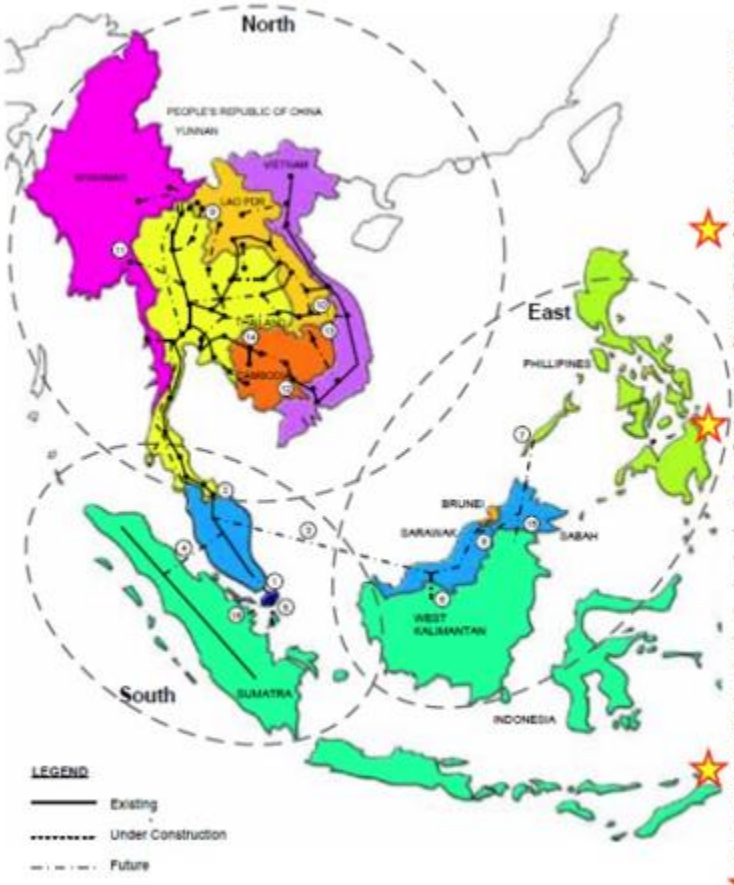
Topo vs main river line in South Asia continent



ENERGY INDUSTRY

ASEAN POWER GRID (2016)

As at : March 2016



		Earliest COD
1)	P.Malaysia - Singapore (New)	post 2020
2)	Thailand - P.Malaysia	
•	Sadao - Bukit Keteri	Existing
•	Khlong Ngae - Gurun	Existing
•	Su Ngai Kolok - Rantau Panjang	TBC
•	Khlong Ngae – Gurun (2nd Phase, 300MW)	TBC
3)	Sarawak - P. Malaysia	2025
4)	P.Malaysia - Sumatra	2020
5)	Batam - Singapore	2020
6)	Sarawak - West Kalimantan	2015
7)	Philippines - Sabah	2020
8)	Sarawak - Sabah – Brunei	
•	Sarawak –Sabah	2020
•	Sabah – Brunei	Not Selected
•	Sarawak – Brunei	2018
9)	Thailand - Lao PDR	
•	Roi Et 2 - Nam Theun 2	Existing
•	Sakon Nakhon 2 – Thakhek – Then Hinboun (Exp.)	Existing
•	Mae Moh 3 - Nan - Hong Sa	2015
•	Udon Thani 3- Nabong (converted to 500KV)	2019
•	Ubon Ratchathani 3 – Pakse – Xe Pian Xe Namnoy	2019
•	Khon Kaen 4 – Loei 2 – Xayaburi	2019
•	Nakhon Phanom – Thakhek	2015
•	Thailand – Lao PDR (New)	2019-2023
10)	Lao PDR - Vietnam	2016-TBC
11)	Thailand - Myanmar	2018-2026
12)	Vietnam - Cambodia (New)	TBC
13)	Lao PDR - Cambodia	2017
14)	Thailand - Cambodia (New)	post 2020
15)	East Sabah - East Kalimantan	post 2020
16)	Singapore – Sumatra	post 2020

Priority Projects

Source : HAPUA, APAEC 2016-2025

ASEAN POWER GRID (2020)

ASEAN Power Grid (APG) Subregions : CAPACITY 2,275 MW

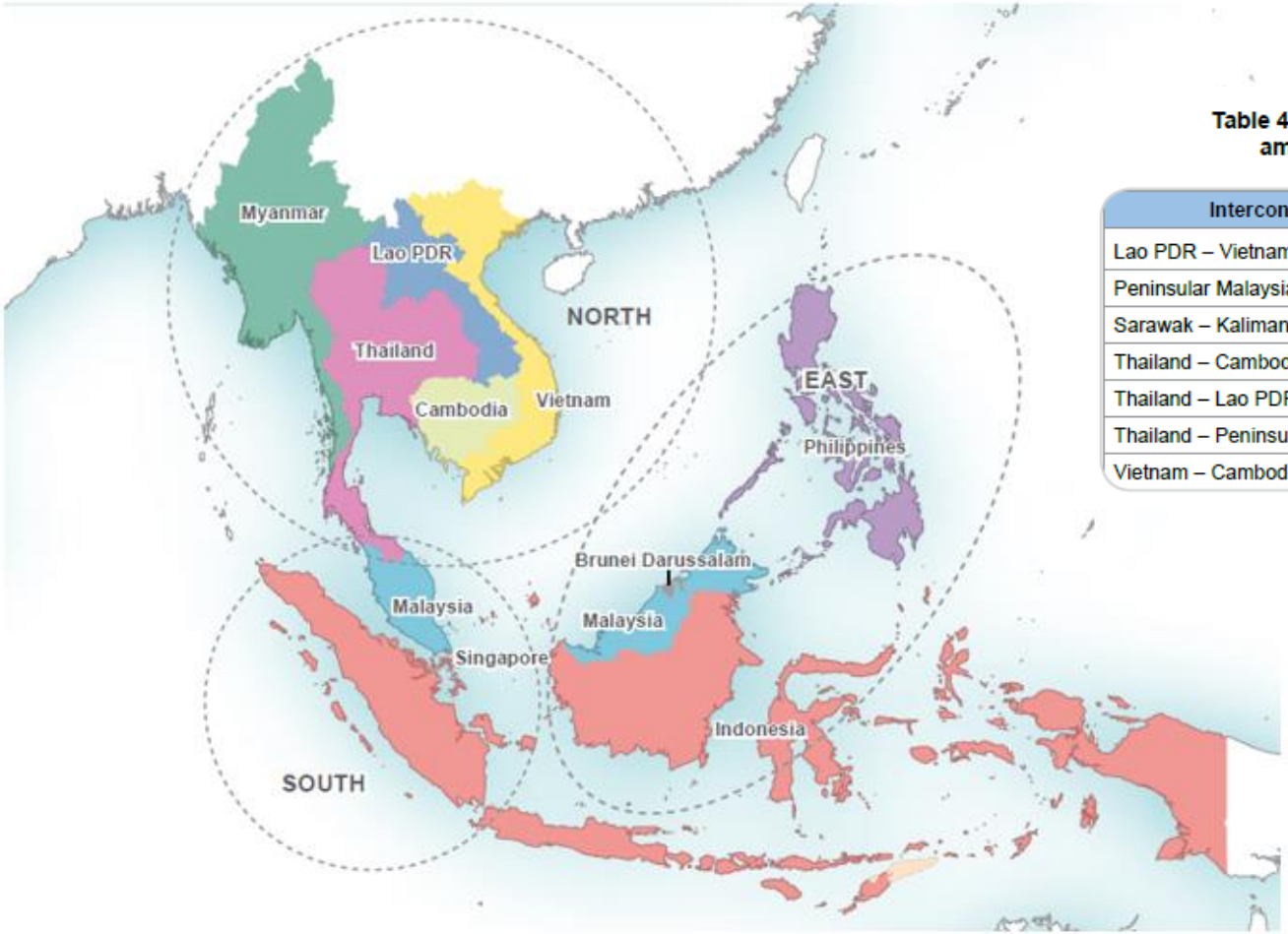
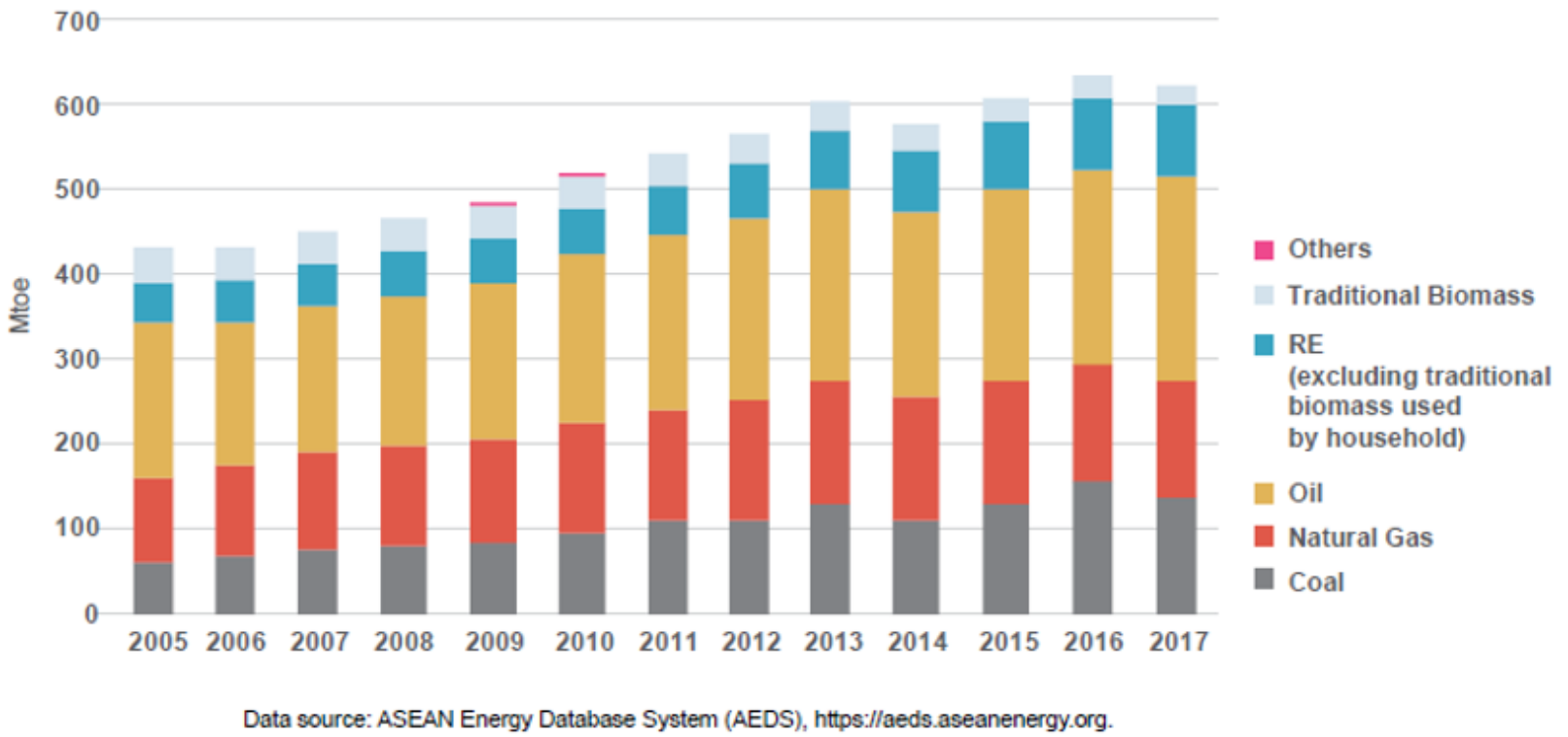


Table 4. Cross-border Interconnections among ASEAN Member States

Interconnection	Max Capacity (MW)
Lao PDR – Vietnam	200
Peninsular Malaysia – Singapore	525
Sarawak – Kalimantan	230
Thailand – Cambodia	120
Thailand – Lao PDR	700
Thailand – Peninsular Malaysia	300
Vietnam – Cambodia	200

Source : HAPUA, APAEC 2016-2025

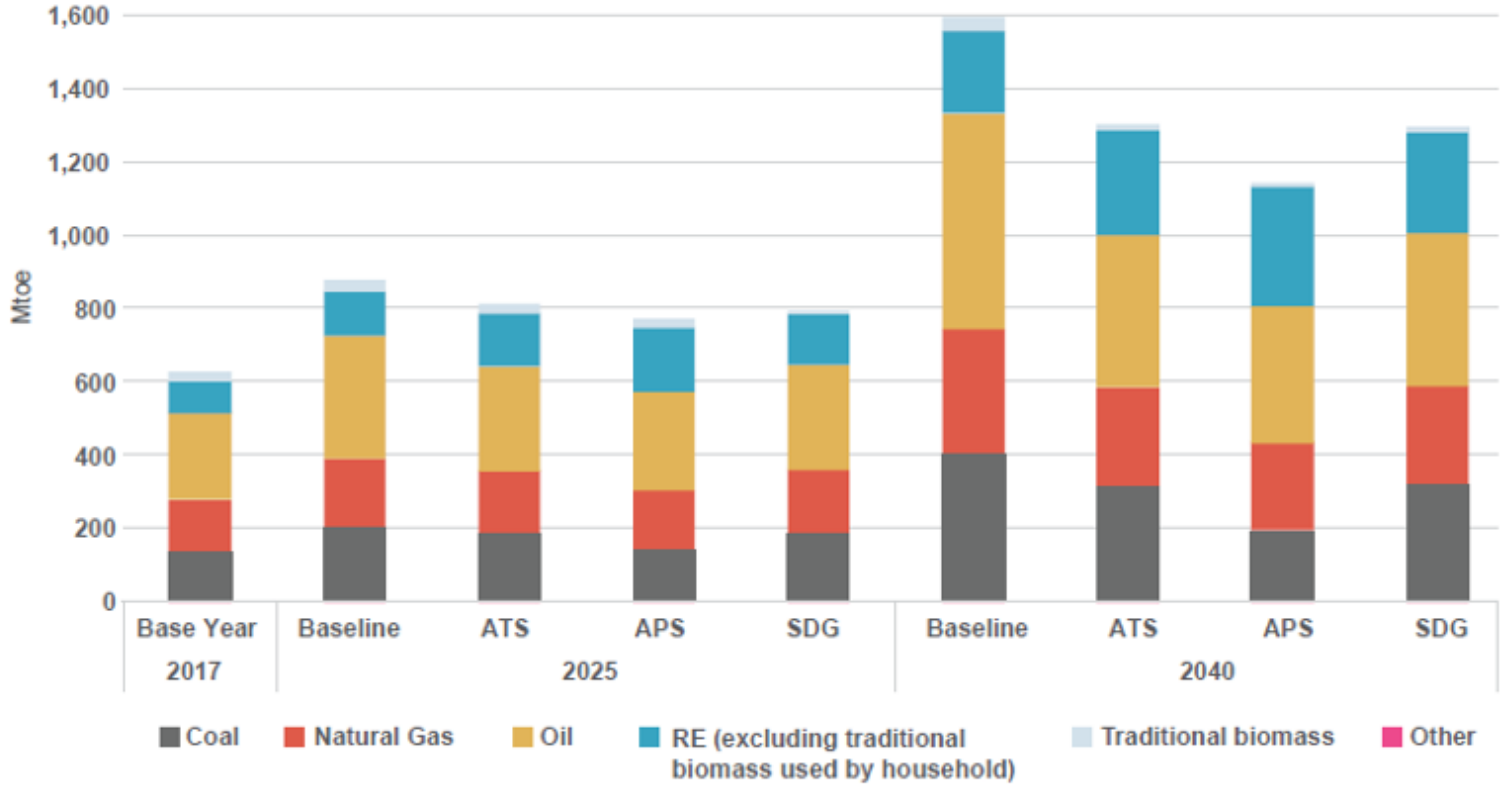
ASEAN HISTORICAL ENERGY SUPPLY BY FUEL



Data source: ASEAN Energy Database System (AEDS), https://aeds.aseanenergy.org.

Source : The 6th ASEAN Energy Outlook

ASEAN TOTAL PRIMARY ENERGY



Source : The 6th ASEAN Energy Outlook

MODE OF FINANCING

CORPORATE FINANCING AND PROJECT FINANCING

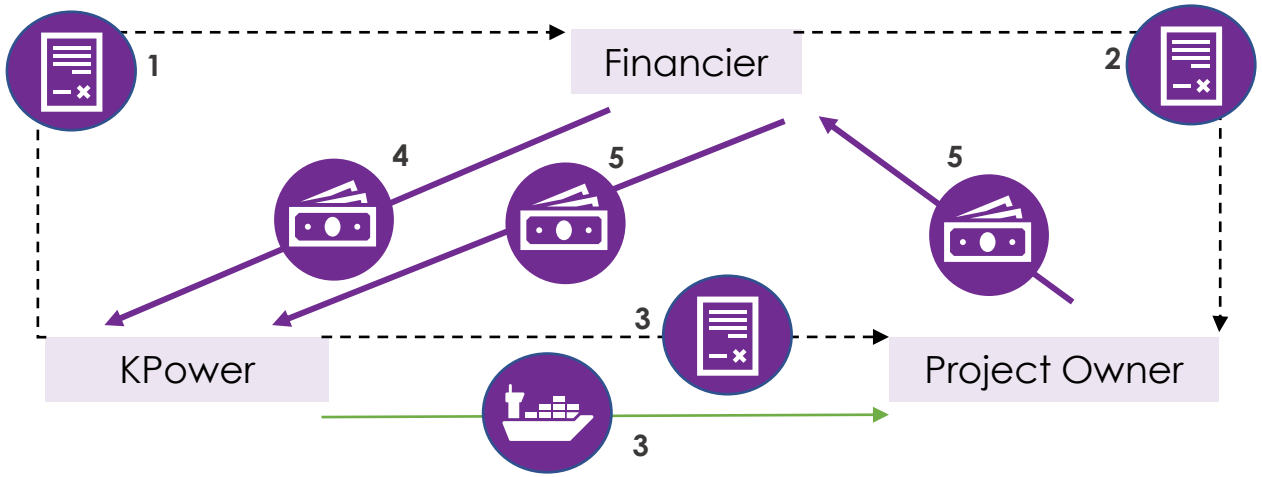
	Corporate Financing (Contractor)	Project Financing (Project Owner)
Financing Vehicle	Corporate itself with more than single revenue source	Special Purpose Vehicle with single revenue source
Dividend Payout	Flexible. Lenders are typically less restrictive	Lenders are more restrictive to ensure enough cash flow to service the debt
Capital Investment Decision	No clarity to creditors	Transparent to creditors; may be pre-determined
Financial Structure	Typically very straight forward (plain vanilla)	Specific structure to suit project's specific needs
Transaction cost	Low costs due to competition from other funding providers, routine process and usually short turnaround time	Relatively higher costs to account for SPV costs and pre-financing project costs e.g. due diligence, technical feasibility, advisors fees; etc
Size of financings	Flexible	Typically requires critical mass to cover high transaction costs
Basis for credit evaluation	▪ Rates the financial health of corporate entity ▪ Focus on balance sheet and cash flow of the borrower, its operating subsidiaries, other assets or credit support	▪ Technical, economic and environmental feasibility ▪ Extensive due diligence process ▪ Focus on project's assets, cash flow and contractual arrangements of the project only

Source : Maybank Investment, Training Module: Introduction to Investment Banking
Ministry of Finance

CONTRACT/CORPORATE FINANCING

Contract Financing (KPower as EPC Contractor)

- Contract financing is a very common method used by companies to help accelerate cash flow and alleviate working capital requirements. This process allows financiers to advance proceeds to companies while backed by contracts awarded to KPower. Funding required typically is **30% of awarded contract value**.
- Backed by company assets ie. Cash collateral, property, inventory etc.



1. Financing facility entered into between KPower and financier.
2. Notice of assignment of contract to financier provided to Project Owner.
3. Works fulfilled and Project Owner invoiced by KPower.
4. Financier disburses 80-100% of proceeds to KPower.
5. Buyer pays the invoice/contract to financier and seller receives the balance 20%.

PROJECT FINANCE

Project Finance is a technique for the financing of capital intensive projects (eg. power plants, toll-roads, ports & airports; etc), typically on a long-term basis, whose repayment and servicing is based on the projected cash flows of the project itself, rather than from external sources.

Financing parties comprise equity investors ("Sponsors") and banks or lending institutions, or the debt capital markets (ref. Malaysia).

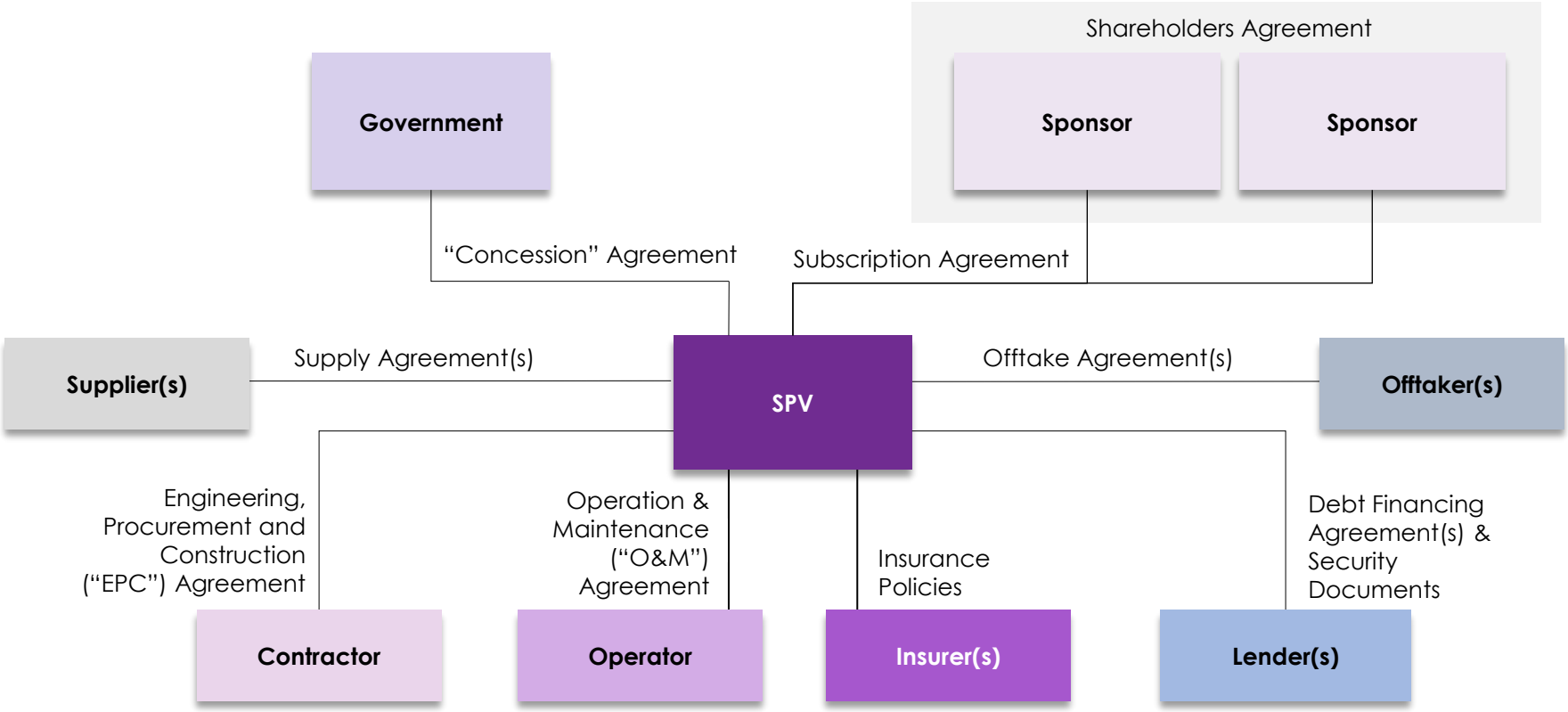
A Special Purpose Vehicle ("SPV"), which has no other assets apart from the project, is incorporated to shield the Sponsor(s) from the effects

Debt is raised by the SPV from the syndicate of banks/lenders. This debt is usually "limited-" or "non-recourse" to the Sponsors.

Source : Maybank Investment, Training Module: Introduction to Investment Banking
Ministry of Finance

GENERIC PROJECT FINANCE CONTRACTUAL STRUCTURE

"Risks are allocated to parties best suited to bear them".

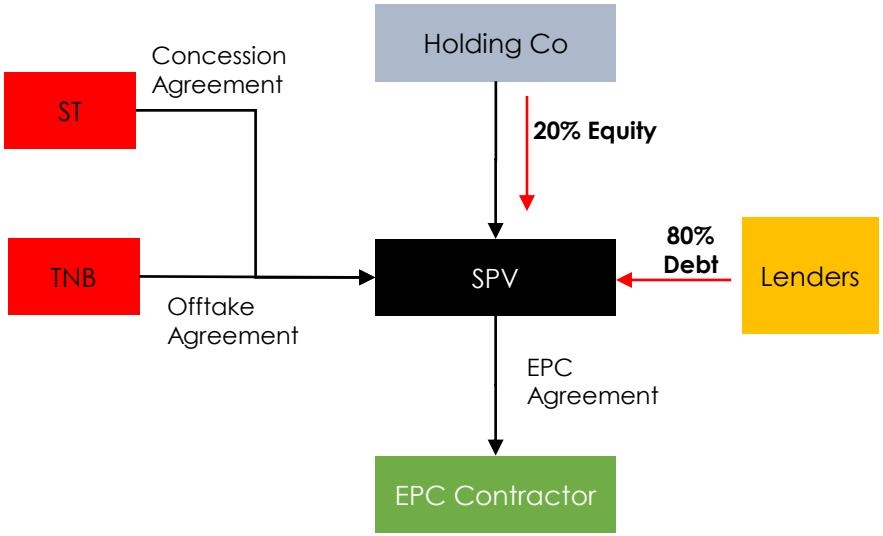


Source : Maybank Investment, Training Module: Introduction to Investment Banking
Ministry of Finance

PROJECT FINANCING CASE STUDY

Project Financing of a Large Scale Solar Farm under the LSS2 Bid (2018)

Overview of the Transaction Structure



Salient Financing Terms	
Debt to equity ratio	• 80:20
Tenure	• Up to 18 years
Minimum FSCR	• 1.25 times with cash balances
Security Package	• Security deed which creates first ranking debenture incorporating fixed and floating charges over all assets of Customer • Legal assignment over customer's rights, titles, interest and benefits under relevant project agreements (e.g. Concession Agreement, etc) • 2nd legal charge over shares of the customer • Deed of subordination

Source : Maybank Investment, Training Module: Introduction to Investment Banking
Ministry of Finance

ASEAN : Incentives for RE

Incentives

Incentives for Grid connected RE Power typically is a combination of the 3 :

Feed-in Tariff :

- Key Incentive where household and business receives payment for electricity generated
- Democratisation of power generating
- Promotes renewable energy development and grid readiness for RE

Soft Loans :

- Subsidised rate for renewable energy power
- Via Commercial banks or Development Financial Institutions

Tax Incentives :

- Special tax break in form of tax holiday for assets owner, zero rate on equipment and machineries and others
- Capital Allowances and special relief

The above is on top of commercially driven incentives for example Green Bonds and ESG driven instruments

Incentives for Grid connected RE Power :

- Countries with the all 3 incentives
  - Indonesia, Malaysia and Thailand
- FiT and tax incentives but no lower-interest-rate loans
  - The Philippines and Vietnam
- Tax incentives only
  - Myanmar, Singapore, Cambodia and Lao PDR

RE installed Capacity Ranking

- Thailand leads in RE installed capacity in the region, with 6.2GW
- Philippines at 3.6GW, Indonesia at 3.6GW, Malaysia at 1.5GW and Vietnam at 0.7GW

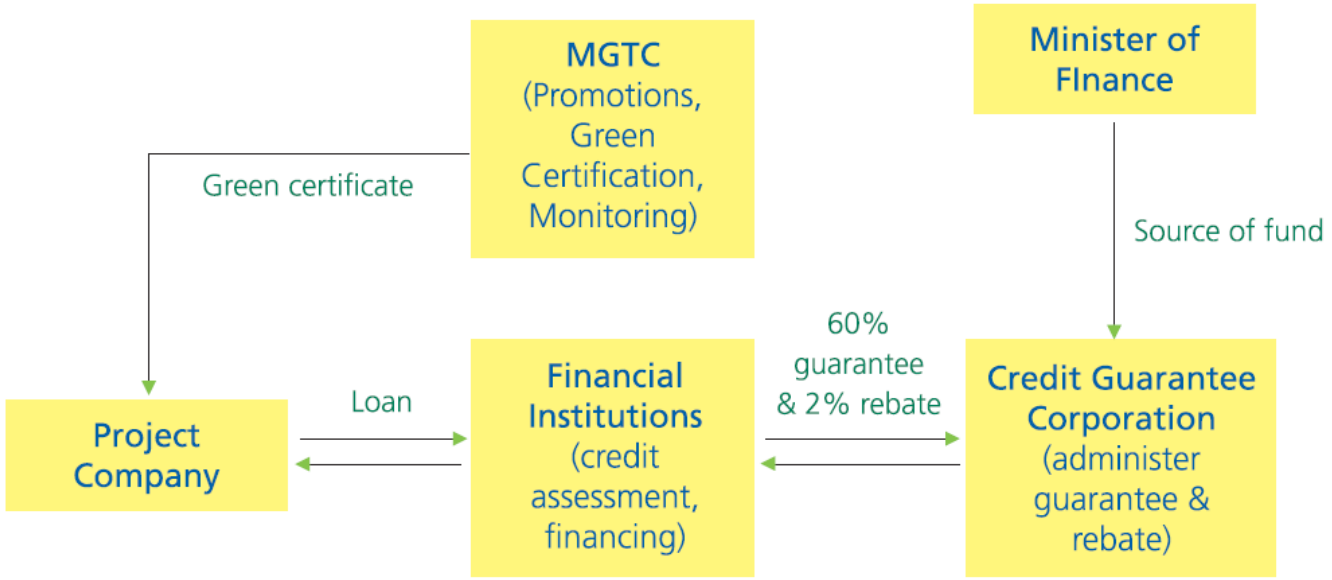
Source: https://www.energy.gov

Financing for RE - Malaysia

Various incentives but the following is the most well known :

Green Technology Financing Scheme ("GTFS")

- A loan guarantee scheme with 2% interest rebate and 60% loan guarantee
- GTFS 1.0 allocated and spent RM3.5 billion until 2017
- GTFS 2.0 was allocated RM2 billion from January 2019 till end of 2020



Source: https://www.energy.gov

Financing for RE - Malaysia

Sustainable and Responsible Investment ("SRI") framework

- Introduced by SC in 2014
- For Sukuk and Bond issuance
- Several incentives
  - Tax deduction on issuance cost of SRI Sukuk from 2016 to 2020
  - Green SRI Sukuk Grant scheme, grant covers external review cost like the independent expert reviews

ASEAN Green Bond Standard ("GBS")

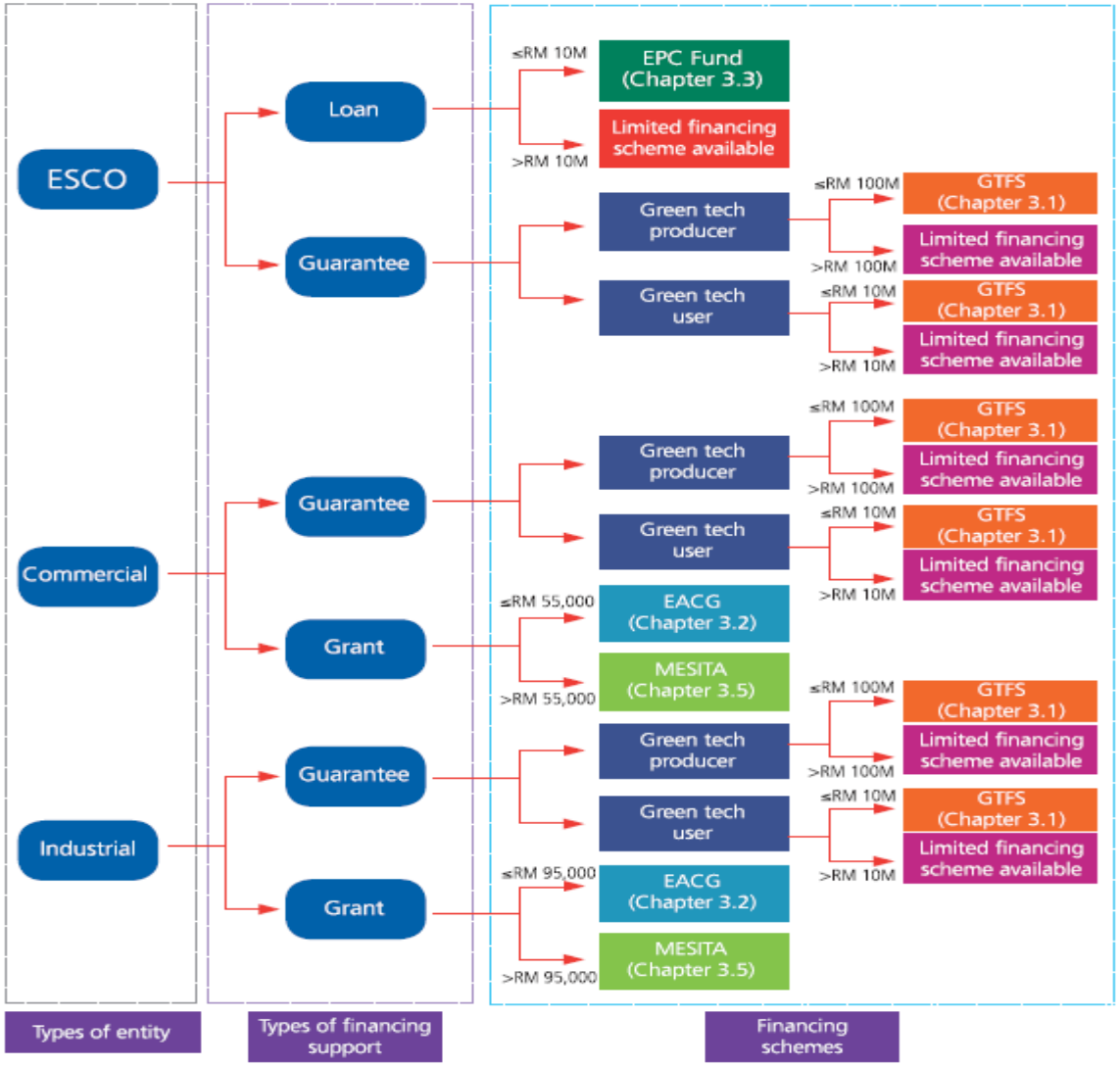
- ASEAN Capital Market Forum ("ACMF") introduced GBS in 2017
- Initiatives lead by Malaysia SC and Philippines Securities and Exchange Commission
- ASEAN GBS are aligned with International Capital Market Association ("ICMA") 's Green Bond Principles
- Subsequently ACMF introduced another 2 standards ASEAN Social Bonds Standard and ASEAN Sustainability Bond Standards
- The standards provide broad principles but implementations of the standards is subject to each individual ACMF member countries' regulations

SRI and GBS impact

- **Various issuance of green and sustainable theme sukuk and bonds**
- **World's first green sukuk**
- **First Sovereign green sukuk issues by Indonesia in 2018; US1.25 billion**

Source: U.S. Department of Energy, Office of Energy Efficiency & Renewable Energy

Financing for RE - Malaysia



>> Figure 7: Decision Tree for EE Financing Support in Malaysia

Available Scheme:

GTFS
– Green Technology Financing Scheme

EPC
– Energy Performance Contracting

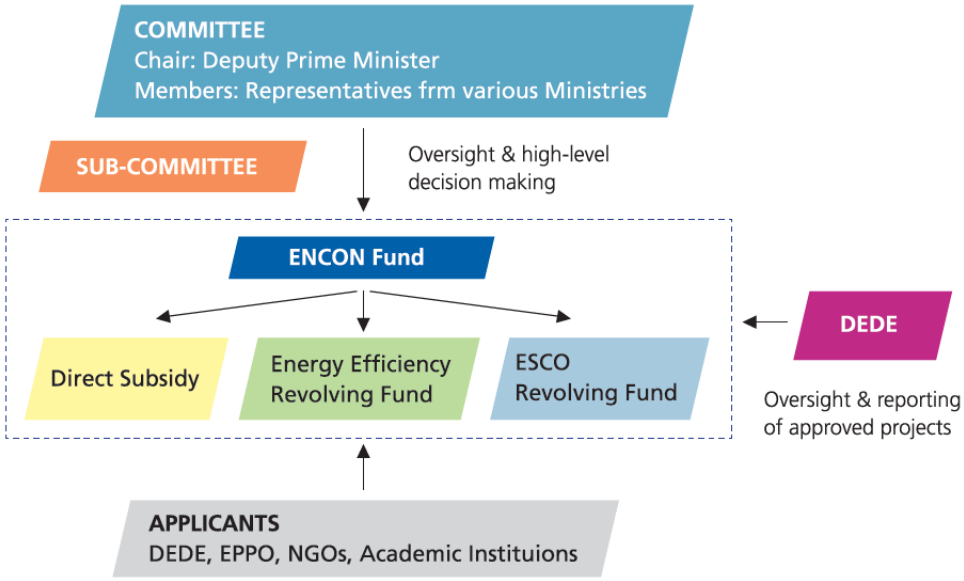
EACG
– Energy Audit Conditional Grant
RM55,000 / RM 95,000 grant

MESITA
– Malaysia Electricity Supply Industry Trust Account
- 1% of revenue contribution from power producer

*ESCO
– Energy Service Company

Source: U.S. Department of Energy, Office of Energy Efficiency & Renewable Energy

Financing for RE - Thailand



Energy Conservation Promotion ("ENCON") FUND

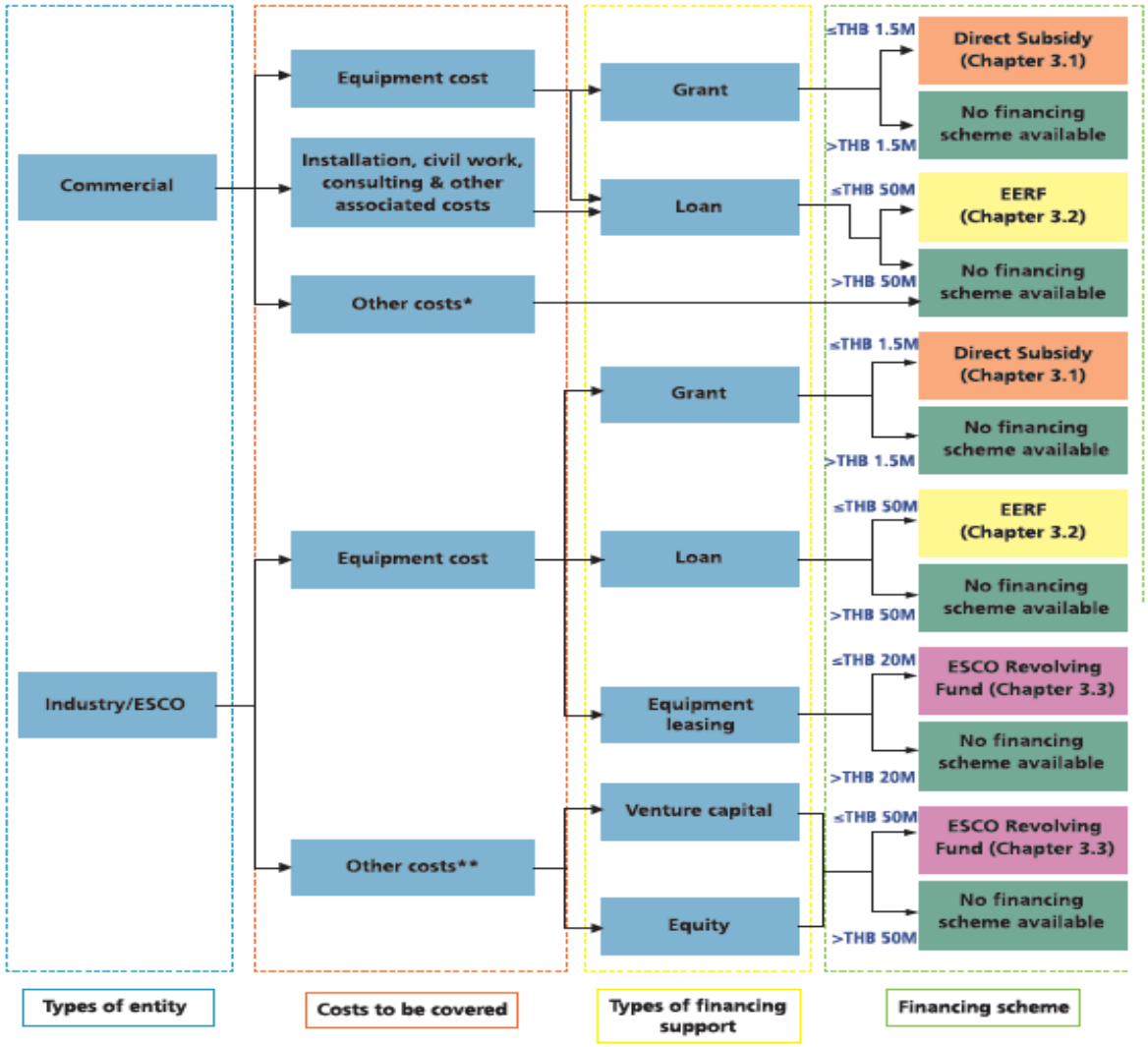
- ENCON Fund derives its money via levy of THB0.1 per litre of petroleum product
- Roughly USD200 million annually and had USD 1.1 billion in 2017

Energy Efficiency Revolving Fund ("EERF")

- Subsidised rate loan via Banks utilising ENCON FUND
- 3.5% vs normal rate of 6-7%
- 2003 – 2014 – USD 216 m
- 2015 – now – more than USD 125 m

Source: U.S. Department of Energy, Office of Energy Efficiency & Renewable Energy

Financing for RE - Thailand



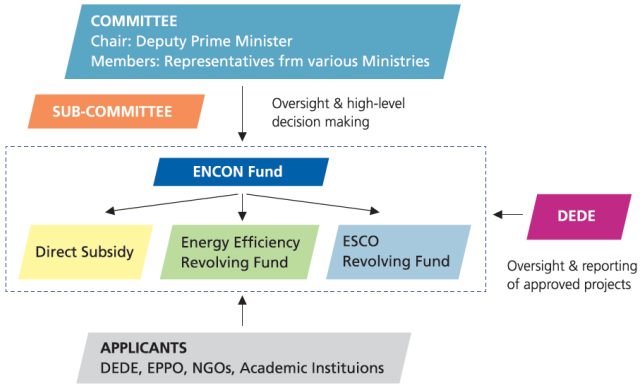
Reference :

EERF

– Energy Efficiency Revolving Fund
- Subsidised rate loan via Banks
- 3.5% vs normal rate of 6-7%
- utilising ENCON FUND
- 2003 – 2014 – USD 216 m
- 2015 – now – more than USD 125 m

ESCO

– Energy Service Company



Source:
https://www.energy.gov

ASEAN :
DEMAND FOR RENEWABLES

ENERGY OUTLOOK

World Energy Consumption by 2050	**+50%** Most of this growth comes from regions where strong economic growth is driving demand, particularly in Asia	**Renewables** – accounting for almost ¼ of global demand growth **+4.0%**
Global Renewable Energy Investment Trends, 2010-2019	**USD 2.8 trillion** total renewable energy investment	**USD 301.7B** total investment in 2019
Malaysia and ASEAN's Energy Mix Target by 2025	**35%** from renewable energy in installed power capacity (20% in 2019)	**RM 33B** investments to be supported by government, public-private partnerships & private financing. Latest government stimulus via 1000 MW LSS4.
Asia Estimated Infrastructure Investment Needs, 2016-2030	**USD 22,551B** including maintenance & rehabilitation costs (without climate change mitigation & adaptation costs)	Power: USD 11,689B Transport: USD 7,796B Telecommunications: USD 2,279B Water & sanitation: USD 787B
Small Hydropower Plants Growth in Malaysia by 2024	**225MW** (from 59.3MW in 2018)	Representing CAGR of **24%**

Sources:
U.S. Energy Information Administration; Frankfurt School-UNEP Centre; International Energy Agency; Joint Ministerial Statement of the 38th ASEAN Ministers on Energy Meeting, 19 November 2020 ; Asian Development Bank; Protégé Associates Sdn Bhd

OPPORTUNITIES IN THE ENERGY SECTOR

Main concerns of ASEAN countries

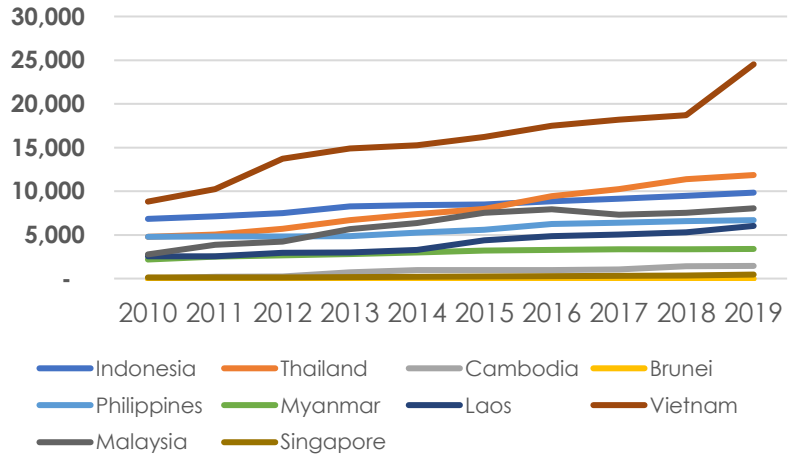
Energy security

Struggling to meet the escalating energy demand of the growing populations and economies

The need to develop energy infrastructure

Low electrification rate among the countries especially the rural areas

RE Installed Capacity (MW) in Southeast Asia



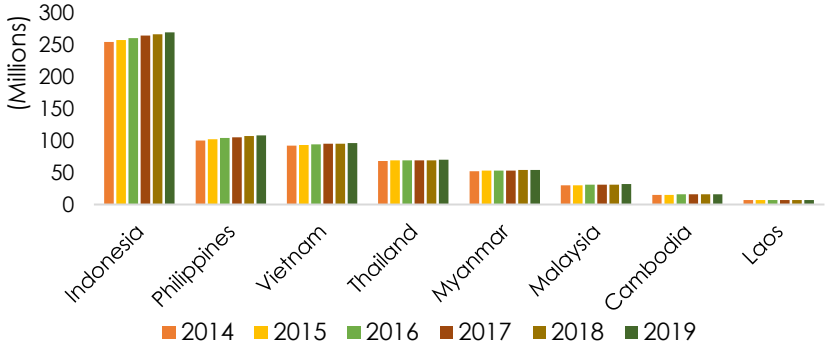
Source: Renewable Energy Statistics 2020, International Renewable Energy Agency (IRENA)

A new target of **35% renewable energy** in installed power capacity in the ASEAN region **by 2025**

Source: Joint Ministerial Statement of the 38th ASEAN Ministers on Energy Meeting, 19 November 2020

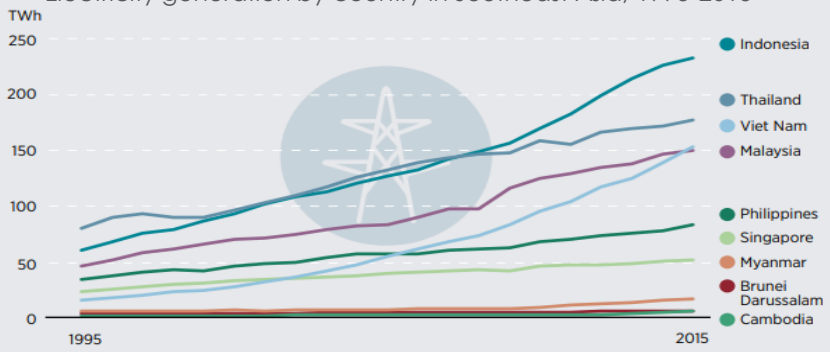
Rapid Economic & Demographic Growth

Total Population (2014-2019)



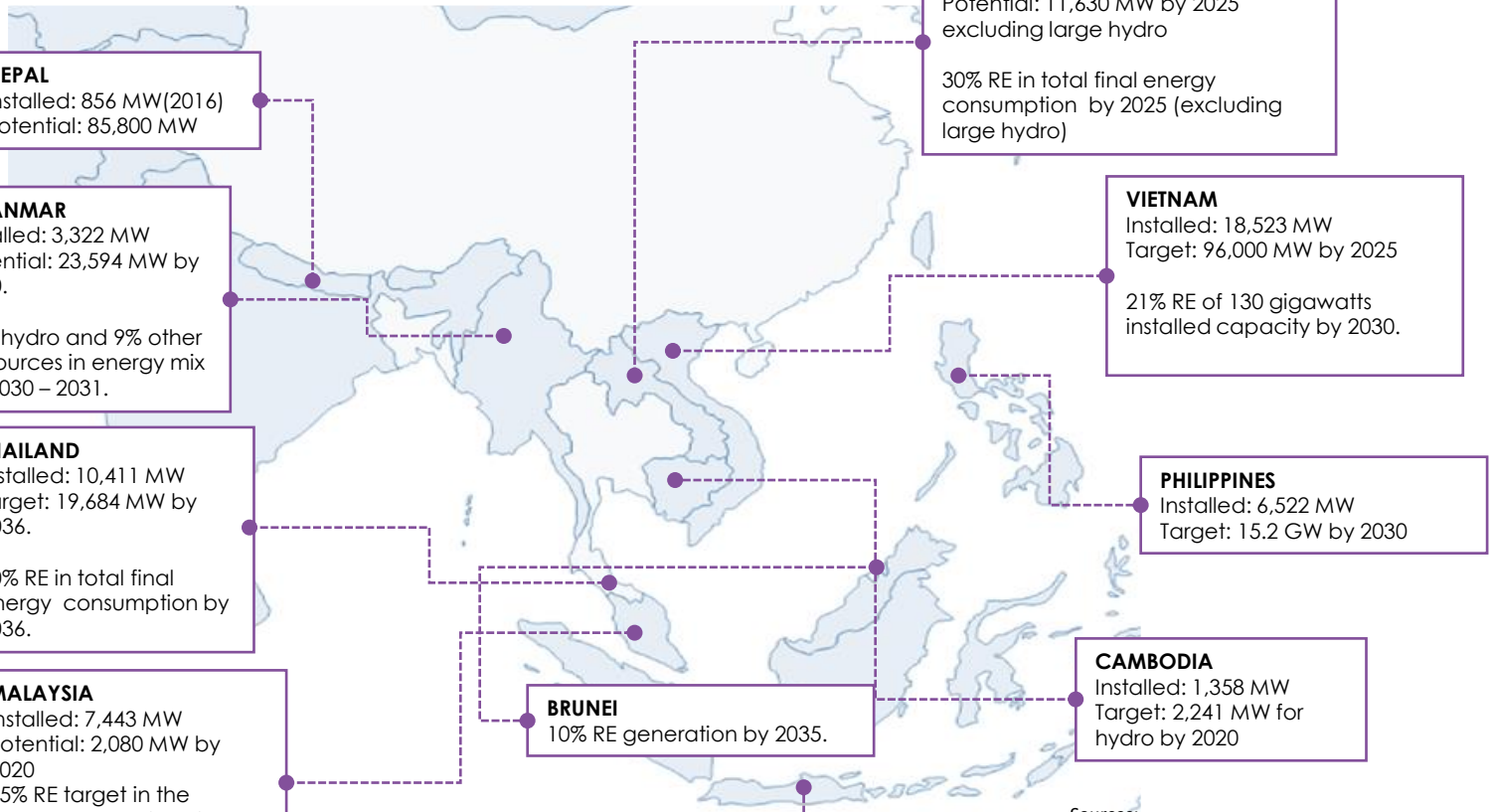
Electricity generation in the region has tripled between 1995 and 2015, reaching over 872 terawatt hours (TWh). During this period, electricity generation grew at an average rate of 7% per year, led by increases in Indonesia, Malaysia, the Philippines, Singapore, Thailand and Vietnam

Electricity generation by country in Southeast Asia, 1995-2015



Source: International Energy Agency, 2017

RENEWABLE ENERGY TARGETS



NEPAL
Installed: 856 MW(2016)
Potential: 85,800 MW

MYANMAR
Installed: 3,322 MW
Potential: 23,594 MW by 2030.

38% hydro and 9% other RE sources in energy mix by 2030 – 2031.

THAILAND
Installed: 10,411 MW
Target: 19,684 MW by 2036.

30% RE in total final energy consumption by 2036.

MALAYSIA
Installed: 7,443 MW
Potential: 2,080 MW by 2020
35% RE target in the installed capacity mix by 2025 (excl. large hydro of more than 100MW)

LAOS
Installed: 5,118 MW
Potential: 11,630 MW by 2025 excluding large hydro

30% RE in total final energy consumption by 2025 (excluding large hydro)

VIETNAM
Installed: 18,523 MW
Target: 96,000 MW by 2025

21% RE of 130 gigawatts installed capacity by 2030.

PHILIPPINES
Installed: 6,522 MW
Target: 15.2 GW by 2030

CAMBODIA
Installed: 1,358 MW
Target: 2,241 MW for hydro by 2020

BRUNEI
10% RE generation by 2035.

INDONESIA
Installed: 9,484 MW
Potential: 45,200 MW by 2030.

23% renewable energy in total primary energy supply by 2025.

Sources:

1) *Renewable Energy to Replace Coal Power in Southeast Asia, – Renewable Energy Institute, October 2019*
2) *Renewable Energy Market Analysis, Southeast Asia, International Renewable Energy Agency*
3) *The 5th ASEAN Energy Outlook 2015-2040, ASEAN Centre for Energy*
4) *Nepal Energy Sector Assessment, Strategy, and Road Map, Asian Development Bank, March 2017*
5) *Joint Ministerial Statement of the 38th ASEAN Ministers on Energy Meeting, 19 November 2020*

Policy & Target Summary - ASEAN

KPOWER
Sustainability Through Diversity

Table 3. Official Renewable Energy Targets and NDCs of the 10 ASEAN Member States

AMS	Reference	Official Targets
Brunei Darussalam	Discussion with MEMI16 (AEO6 Country Visit, 30 October 2019)*	10% renewable energy share in installed power generation capacity by 2035
Cambodia	AEO6 2nd working meeting16 (26-28 March 2019). Last confirmed with MME Cambodia in AEO6 Country Visit, 14 November 2019.*	3% of residential electricity demand met by rooftop solar PV by 2035
Indonesia	Government Regulation No. 79/2014: National Energy Policy	23% RE in primary energy supply by 2025
	Ministry of Energy Regulation 12 /2015 –Mandatory Biofuel; Indonesia Energy Outlook (National Energy Council, 2019)	Biodiesel blending ratio target 30% by 2020, and maintain that level through 2025 and to 2050
	Ministry of Energy Regulation 26 /2016 –Mandatory Biofuel	20% bioethanol blending ratio target by 2025; 50% by 2050
Lao PDR	Vision 2030, Strategic Plan 2025, and 5-year power development plan (2016-2020), MEM. Last confirmed with Lao PDR in AEO6 Country Visit, 12 November 2019*	30% RE share of total energy consumption by 2025, including 20% of electricity from RE that is not large-scale hydro, and 10% biofuel share (blending ratio 5–10%)
Malaysia	National Renewable Energy Policy and Action Plan (NREPAP) 2011	20% RE in the power capacity mix by 2025 (excluding large-scale hydro)
Myanmar	National Energy Master Plan (2015)	12% share of RE in national power generation mix by 2030 (excluding large-scale hydro)
Philippines	National Renewable Energy Program (NREP) 2011 – Sectoral Plans and Roadmap	Triple RE installed capacity by 2030 from 2010 level, to 15.3 GW from 5.4 GW
	Biofuels Roadmap Short Term: 2017 - 2018 - Sectoral Plans and Roadmap	Biofuel blending ratio around 2% for biodiesel and 10% of bioethanol
Singapore	Sustainable Singapore Blueprint 2015 Singapore's Energy Story	350 MWp** of solar capacity by 2020 and at least 2 GWp by 2030
Thailand	Alternative Energy Development Plan (AEDP) 2015	30% RE share in total final energy consumption (TFEC) by 2036, including15–20% renewable electricity in total generation; 30–35% of consumed heat from renewables; and a 20–25% biofuel share in TFEC
Vietnam	Vietnam's Renewable Energy Development Strategy up to 2030 with an outlook to 2050 (Decision2068/QD)	32.3% RE share in TPES by 2030 and 44% by 2050; 32% RE share in power generation by 2030 and 43% by 2050

Policy Driven

MALAYSIA'S ENERGY ACTS

Petroleum Development Act, 1974

- PETRONAS was established and vested with the entire ownership, exploration and production of petroleum resources and control of the petroleum resources in Malaysia
- PETRONAS comes under the direct purview of the Prime Minister
- Upstream activities:
  - PETRONAS: Responsible for planning, investment and regulation
- Downstream activities:
  - Ministry of International Trade and Industry (MITI): responsible for the issuance of licenses for the processing and refining of petroleum and the manufacture of petrochemical products.
  - Ministry of Domestic Trade, Cooperative and Consumerism (MDTCC): issue licenses for the marketing and distribution of petroleum products

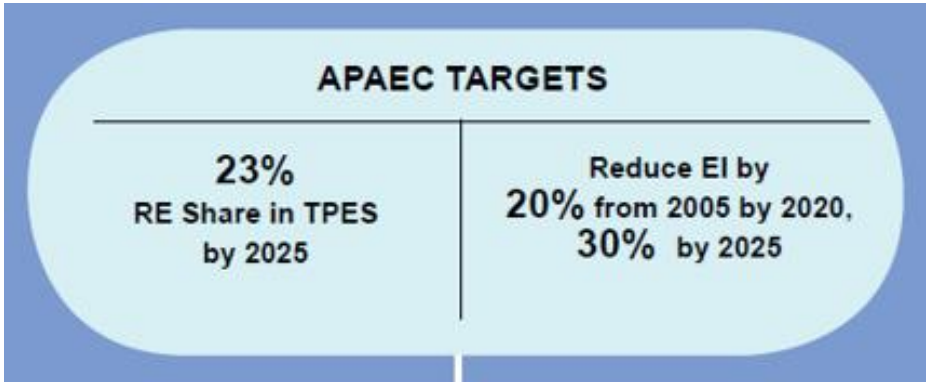
Renewable Energy Act, 2011

- Provide for the establishment and implementation of a special tariff system to catalyse the generation of renewable energy and to provide for related matters such as:
  - Feed-in Tariff (FiT) System
  - Connection, Purchase and Distribution of RE
  - Feed-in Tariff
  - Renewable Energy Fund

Sustainable Energy Development Authority (SEDA) Act, 2011

- Provide for the establishment of the Sustainable Energy Development Authority of Malaysia (SEDA).
- Provide for its functions and powers, to promote, stimulate, facilitate, develop and implement the national policy objectives for renewable energy and related matters

ASEAN ENERGY TARGET - OVERALL



ASEAN Plan of Action for Energy Cooperation ("APAEC")
Phase I : 2016–2025
Phase II: 2021–2025

Energy Intensity ("EI") vs Energy Efficiency ("EE")

- EI = quantity of energy required per unit output or activity/GDP
- Less energy used lower intensity = higher efficiency
- Lower energy intensity is good for the economy as it is cost effective and energy security
  - it reduce the cost per unit, competitive energy cost, reduces CO2, emissions and other negative environmental impact
- ASEAN has target of reducing EI by 20% in 2020 from 2005 level and by 30% in 2025
- This has been achieved by 21.6% reduction in 2020

RE target in 2025 = 23% of Total Primary Energy Supply ("TPES") & 35% of installed capacity

- Currently around 13% of TPES
- To reach target more must be done in terms of RE installed capacity

Source : The 6th ASEAN Energy Outlook

ASEAN ENERGY OUTLOOK

Baseline Scenario: This scenario assumes ASEAN Member States' energy systems continue to develop along historical trends, with little effort to meet their national or regional targets. Labelled as "Business as Usual" in AEO5, it has been renamed to emphasise that it does not reflect the expected future, but rather historical patterns, as a point of reference for the other scenarios.

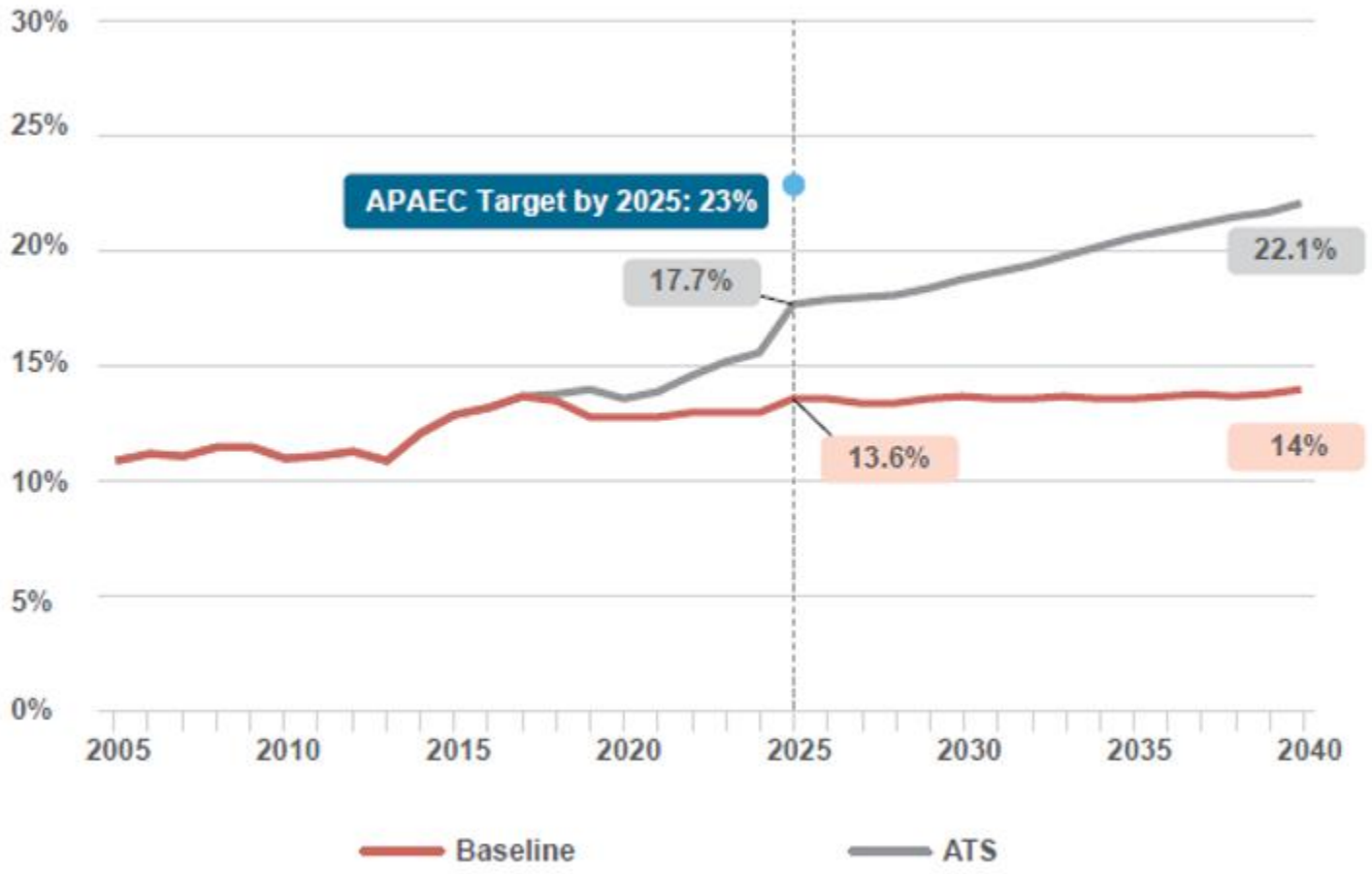
AMS Targets Scenario (ATS): This scenario projects the future development of ASEAN energy systems if Member States do what is needed to fully achieve their own national energy efficiency and renewable energy targets, as well as their climate commitments – but do not make adjustments to reflect ASEAN regional targets.

APAEC Targets Scenario (APS): This scenario explores what it would take to achieve the regional targets for energy intensity and renewable energy outlined in APAEC 2016–2025, and how this might transform ASEAN's energy systems even beyond 2025; achieve 23% of total primary energy supply (TPES) from renewable energy and reduce the energy intensity by 30% from 2005 levels, both in 2025.

Sustainable Development Goals (SDG) Scenario: This scenario builds on the **ATS** to explore what ASEAN Member States would have to do to achieve the three targets of SDG 7 by 2030: to ensure universal access to affordable, reliable and modern energy services; increase substantially the share of renewable energy in the global energy mix; and double the global rate of improvement in energy efficiency (from 2015 levels).

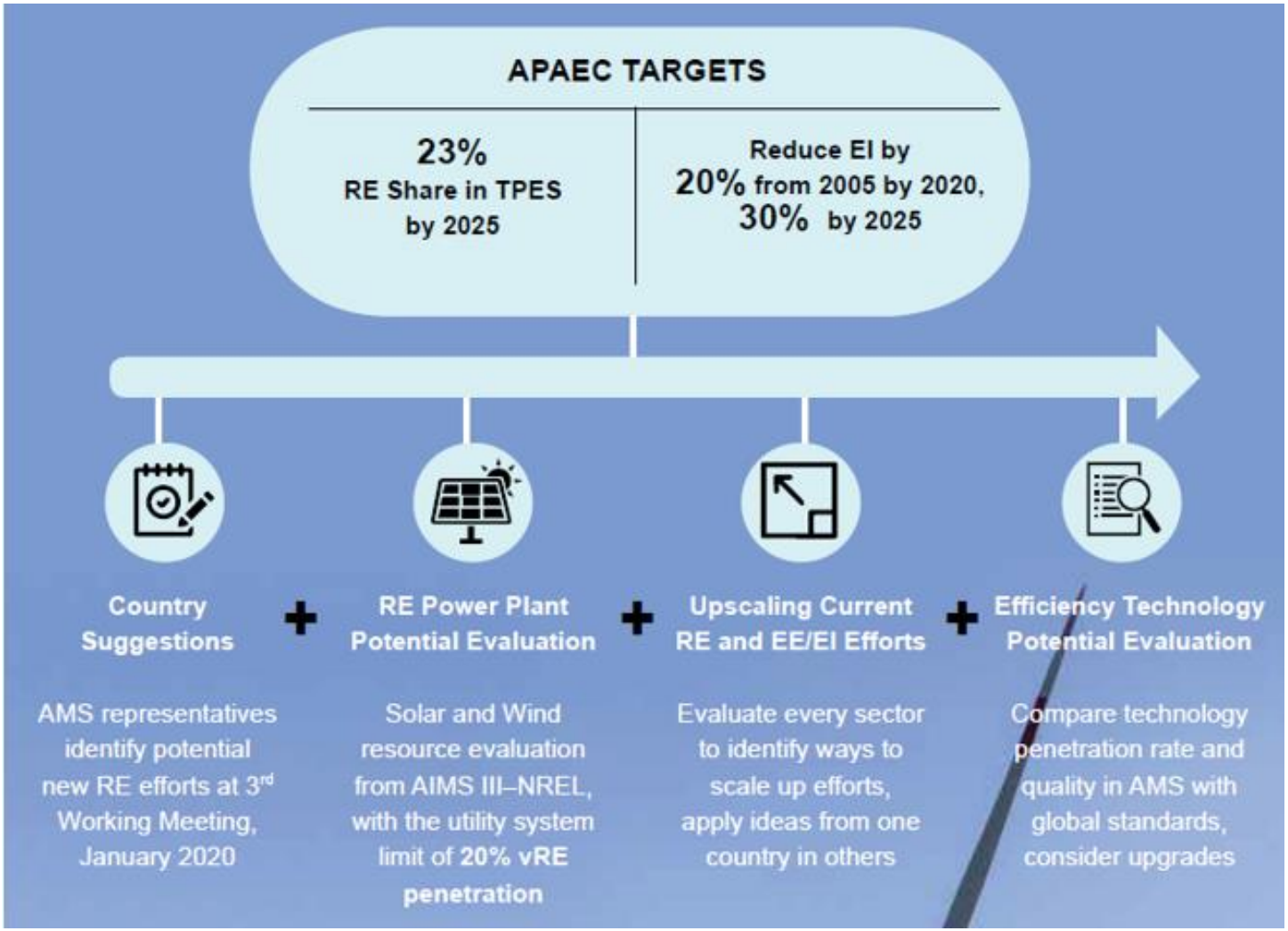
Source : The 6th ASEAN Energy Outlook

RENEWABLE ENERGY SHARE IN TPES, COMPARED WITH BASELINE



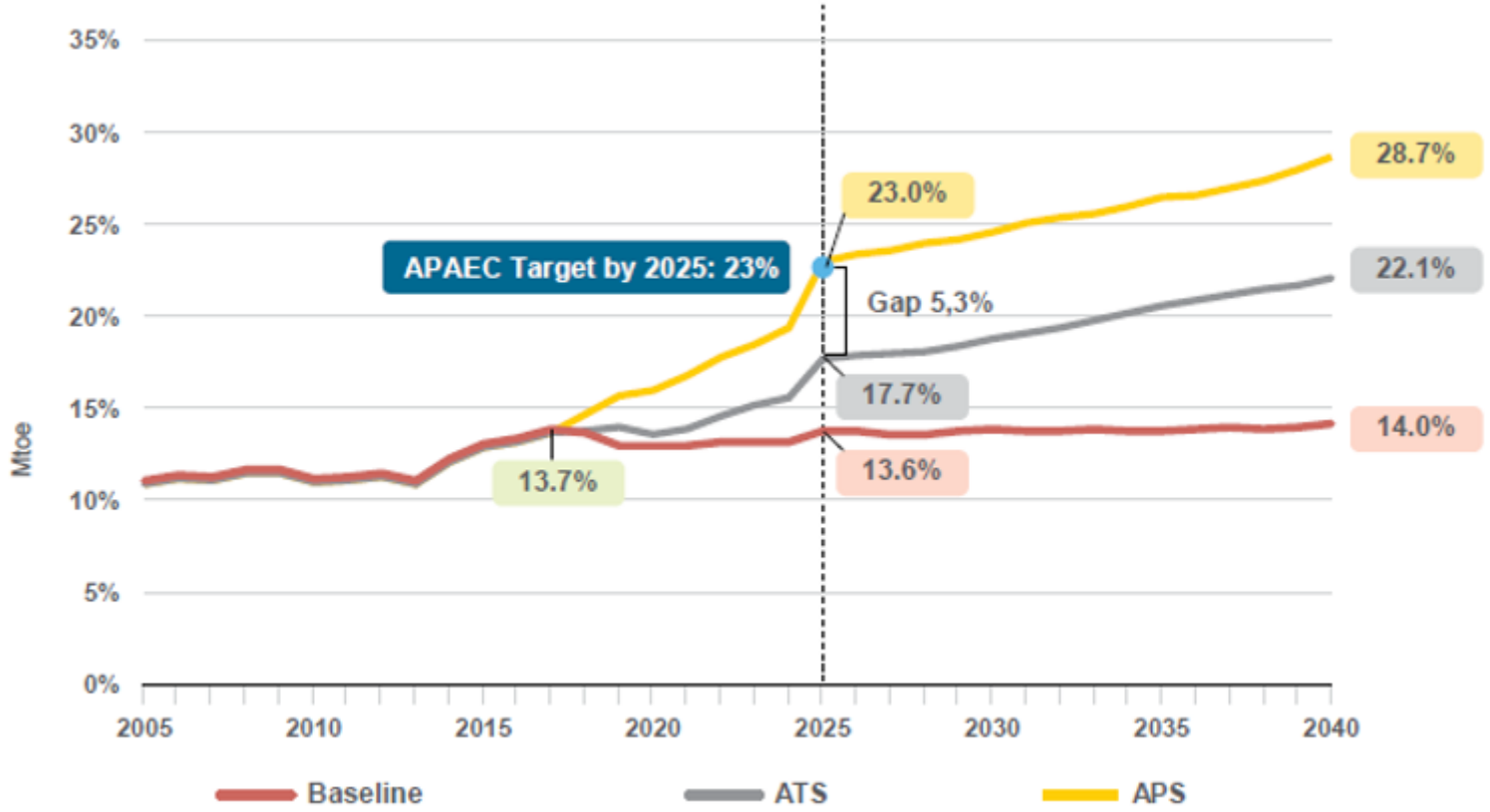
Source : The 6th ASEAN Energy Outlook

SEQUENTIAL APPROACH IN FILLING THE GAPS BETWEEN NATIONAL AND APAEC TARGETS



Source : The 6th ASEAN Energy Outlook

MEETING THE APAEC RENEWABLE ENERGY TARGET



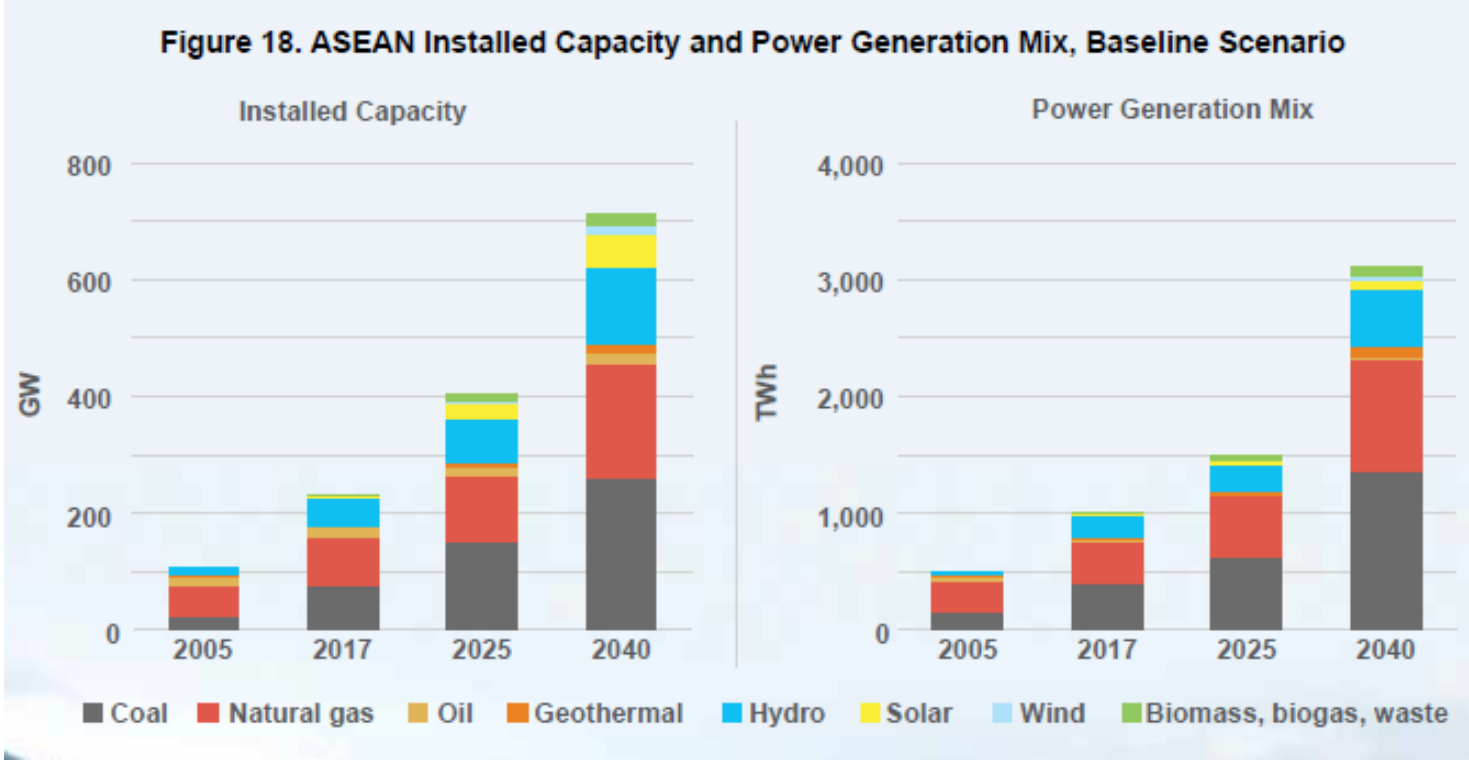
Source : The 6th ASEAN Energy Outlook

ASEAN Energy Stats : Now & Future

	Baseline		AMS Targets Scenario (ATS)		APAEC Target Scenario (APS)		SDG Scenario	
	2025	2040	2025	2040	2025	2040	2025	2040
Population (million persons) – constant across scenarios	698.5	768.2	698.5	768.2	698.5	768.2	698.5	768.2
GDP (billion 2011 USD PPP) – constant across scenarios	10,177	20,252	10,177	20,252	10,177	20,252	10,177	20,252
Total final energy consumption (TFEC, in Mtoe)	518	922	474	714	451	624	459	702
% electricity in TFEC	21.7%	25.7%	22.0%	27.1%	21.8%	25.8%	22.8%	27.7%
Total primary energy supply (TPES, in Mtoe)	874	1589	810	1298	769	1139	790	1281
% coal in TPES	22.8%	25.3%	22.8%	24.3%	18.4%	16.8%	23.4%	25.0%
% oil in TPES	38.2%	36.9%	35.1%	32.0%	35.0%	32.8%	36.1%	32.5%
% gas in TPES	21.8%	21.6%	21.4%	20.7%	21.0%	21.1%	22.5%	21.0%
% RE in TPES	13.6%	14.0%	17.7%	22.1%	23.0%	28.7%	17.2%	21.7%
Electricity generation capacity (GW)	404	713	401	600	412	544	401	600
Electricity generation (TWh)	1,489	3,123	1,379	2,550	1,305	2,118	1,379	2,550
Energy-related GHG emissions (Mt CO_2-eq)	2,228	4,171	1,962	3,002	1,701	2,264	1,965	3,014

Source: https://www.energy.gov

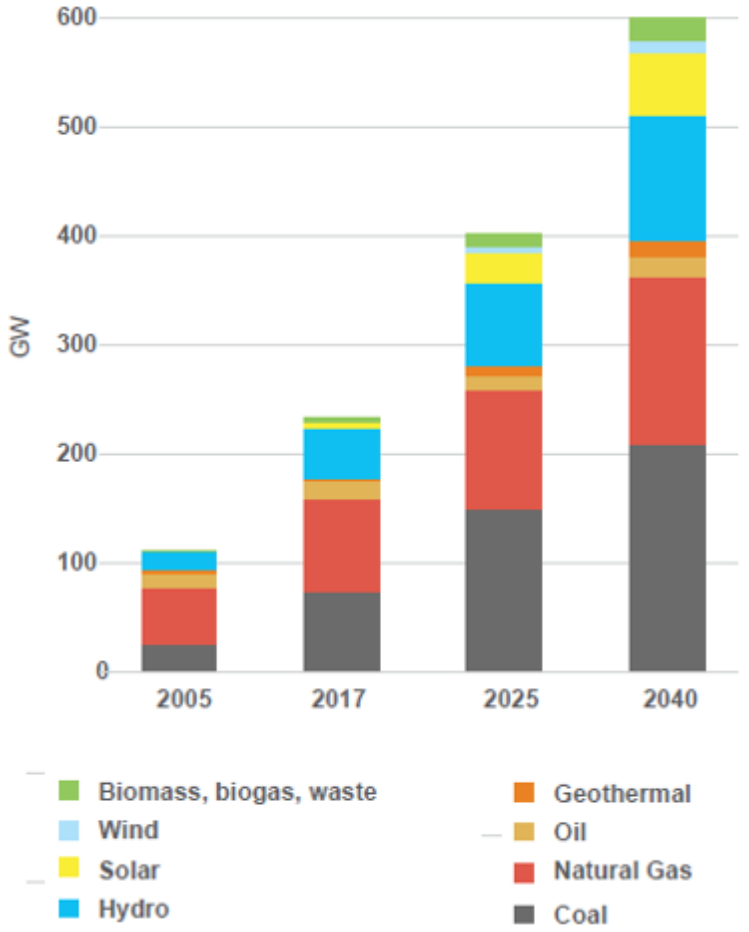
ASEAN INSTALLED POWER GENERATION CAPACITY GROWTH, Baseline Scenario



- Stay at current trajectory Energy intensity reduction is low and efficiency low
- Resulting in higher cost of energy and more installed capacity of 713 GW
- To satisfy this demand more fossil fuel based power plant is needed
- Composition of coal remain high, CO2 and Green house gas emission is low
- RE capacity remain significant however unlikely to meet the 23% contribution to TPES
- Challenges in Coal financing and insuring from worldwide pact will be an issue

Source : The 6th ASEAN Energy Outlook

ASEAN INSTALLED POWER GENERATION CAPACITY GROWTH, ATS



APS Renewable energy growth forecast :

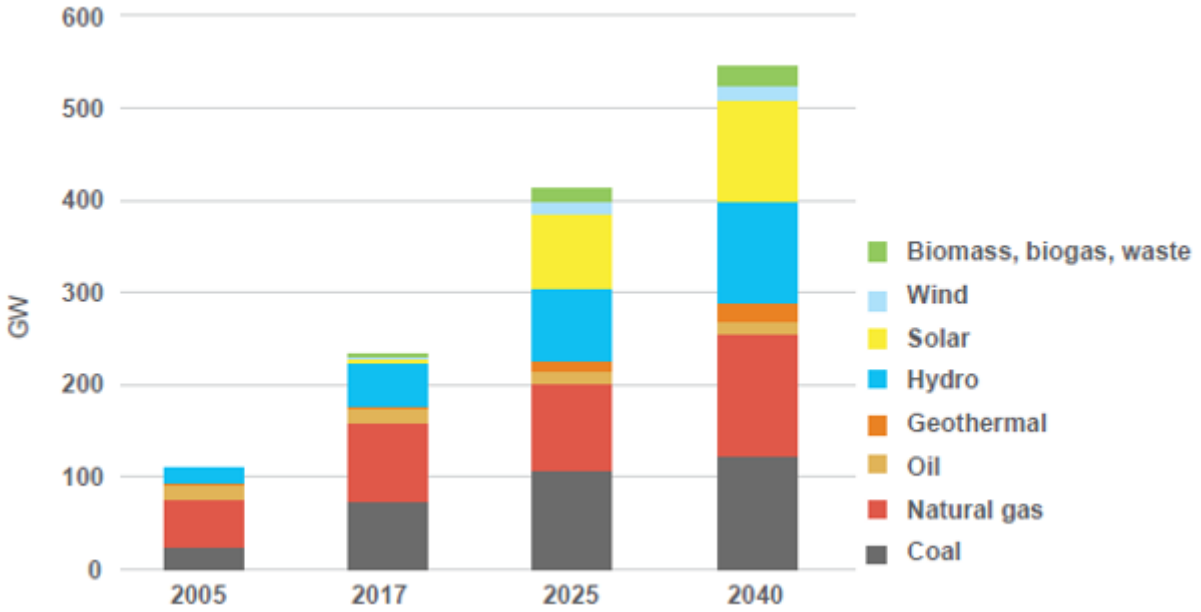
- Solar capacity is projected to grow by 15% per year from 2017 levels by 2040,
- Wind capacity, by 12% per year.
- Geothermal and biomass generation capacity would be 25% and 10% higher than in the ATS, respectively,
- Biogas and waste-to-energy technology would be 20% higher.

APS Fossil fuel forecast :

- The introduction of more biomass/coal co-firing plants, using 5% biomass feedstock,
- Coal power capacity of the four major coal-consuming countries would be reduced by 15% by 2025

Source : The 6th ASEAN Energy Outlook

ASEAN INSTALLED POWER GENERATION CAPACITY GROWTH, APS



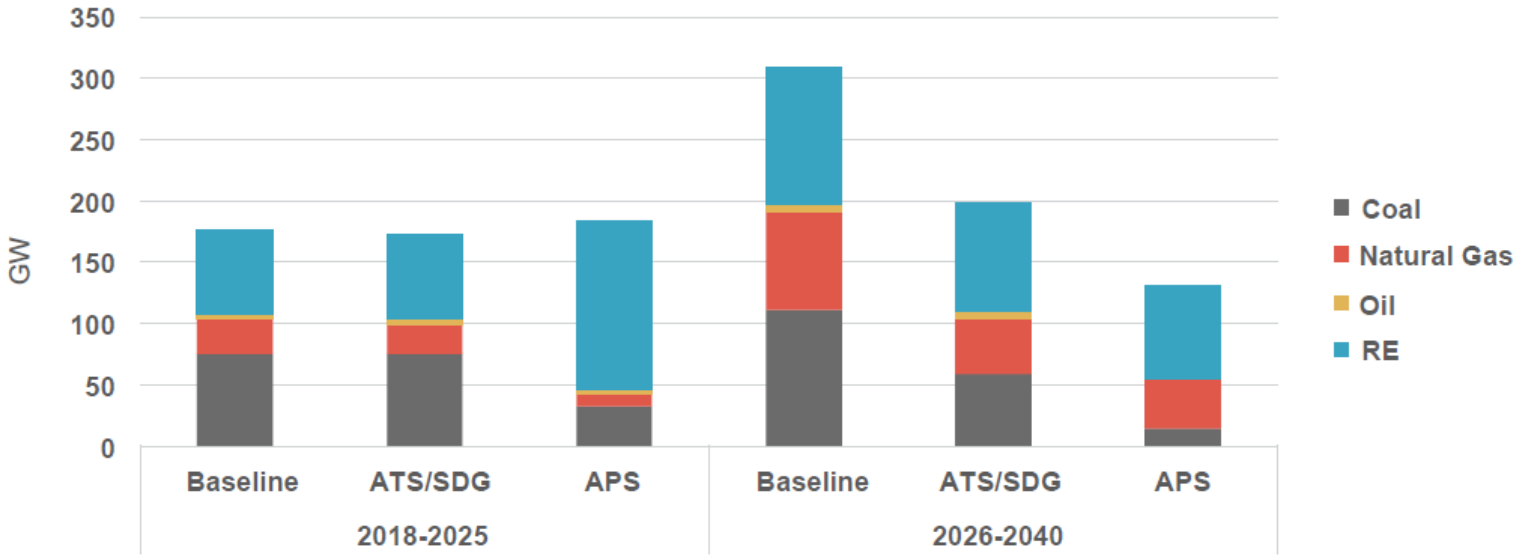
As the APAEC regional target is for 2025 From 2020 to 2025 alone, the scenario envisions

- **Solar PV** capacity across ASEAN increasing from 32 GW to 83 GW, a **159%** increase.
- The next-largest jump projected in the model is for **Hydropower** capacity, which would increase by from 59 GW in 2020 to 77 GW in 2025, or **31% increase**.

Source : The 6th ASEAN Energy Outlook

ASEAN INVESTMENT IN POWER SECTOR
- Capacity in GW

Figure 61. ASEAN Historical and Projected Power Capacity Expansion by Scenario

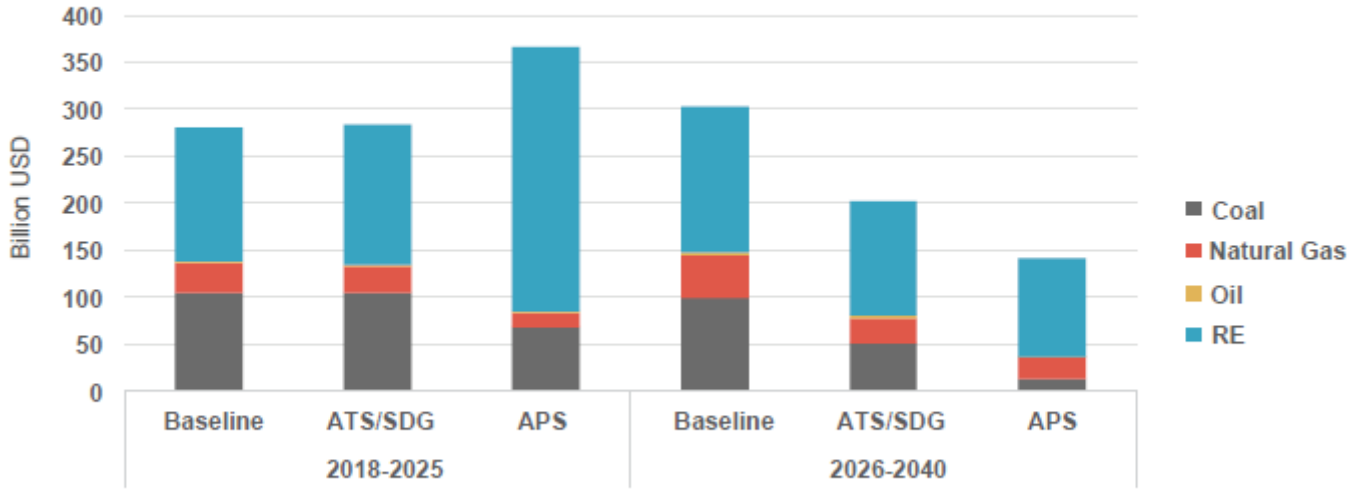


- Continuous expansion until 2040 with 2025 sees huge growth
- 138 GW of new installed capacity until 2025 is RE
- Variable RE power generation especially solar and wind has lower capacity factor compared to fossil fuel plant, thus higher capacity is needed for similar capacity output

Source : The 6th ASEAN Energy Outlook

ASEAN INVESTMENT IN POWER SECTOR
- Capacity in USD

Figure 62. ASEAN Cumulative Power Sector Investment, Historical and by Scenario



Note: Cumulative investment is discounted at 3% to present value (year 2020).

- In Short base case alone will see huge investment
- Baseline : USD 281b; RE >USD 100 b or RM405 billion
- ATS : USD 283b; RE >USD 100 b or RM405 billion
- APS with 35% share of RE in installed capacity by 2025 : USD367m
  - RE investment by 2025 will be a minimum of USD281b or RM1.1 trillion

Source : The 6th ASEAN Energy Outlook

RENEWABLE ENERGY CONTINOUS GROWTH?

- Renewable energy is becoming cheaper than fossil fuel
- Always on ability
- Carbon negative
- Abundant and renewable supply of "fuel"
- Fixed cost of fuel
- No pass-through of fuel cost to utilities companies

- Worldwide, demand for truly green mobility doesn't stop with electric vehicles but also the method the energy used to charged them
- Hydrogen fuel cell demand will also be positive for RE
  - excess renewable energy output can be utilised in electrolysis to separate hydrogen for storage in stationary fuel cells

- Most important factor : **Cost effective** & **Consumer Demand**
  Renewable energy is not a policy driven demand anymore as it is becoming increasingly more competitive vs fossil fuel and driven by consumer demand due to environmental concern

ABOUT KPOWER

KPOWER
Sustainability Through Diversity

BOARD OF DIRECTORS

Dato' Dr. Ir. Ts. Mohd Abdul Karim Abdullah
Non-Independent Non-Executive Chairman
Founder of oil-and-gas engineering company Serba Dinamik Holdings Berhad since 1993. Presence in Southeast Asia, Central and South Asia, the Middle East, United States of America, Europe and most recently Africa.

Dato' Arivalagan A/L Arujunan
Non-Independent Non-Executive Director
Currently Director of Aspire Homes Sdn Bhd, a property developer.

Mustakim Mat Nun
Deputy Chairman and Group Managing Director
Over 23 years experience in Power, Water, Finance and Private Equity. Served in various locations in the middle east, ASEAN and domestic market.

Kok Pauline
Independent Non-Executive Director
Over 13 years of experience in auditing and accounting in various industries, including government linked companies (GLCs).

Sarah Azreen Abdul Samat
Non-Independent Non-Executive Director
Over 19 years of experience in corporate finance transactions involving equity issuance, mergers and acquisitions, corporate restructuring and corporate valuation.

Tan Yee Hou
Independent Non-Executive Director
Deputy Managing Director of LTKM's wholly-owned subsidiary LTK Development Sdn Bhd, which he led diversification into property sector.

KEY MANAGEMENT TEAM

KPower is led by a team of dynamic professionals with a wealth of experience in **project management and implementation, construction and investment activities especially in utility and renewable energy sectors.**

Mustakim Mat Nun
Group Managing Director
Over 23 years' experience in finance, power & water industries

Amirul Afif Abd Aziz
Group Chief Financial Officer
Over 20 years' experience in finance, power & water industries in Malaysia and Middle East

Muhammad Syukri Sulaiman
SVP, Head of Corporate Finance and Investor Relations
Over 15 years' experience in finance, power & infrastructure industries

Zainal Azwadi Zainal Abidin
SVP, Supply Chain Management and Acting Head of Risk & Compliance
Over 20 years' experience in oil & gas, finance & power industries

Khairulaklam Omar
SVP, Head of Project Development
20 years' engineering experience in power & water covering Southeast Asia with multinational companies

Kamalulariffin Ahmad
VP, Head of Project Implementation
20 years' experience in construction, water & energy project management

Puteri Nur Qistina Abd. Rahman
Acting Head of Finance
10 years of experience in audit with several Big Four accounting firms

Lilik Harianti Saijan
VP, Head of Corporate Resources & Administration
20 years' experience in multinational & government-linked companies across various sectors

LEVERAGING ON HUMAN CAPITAL

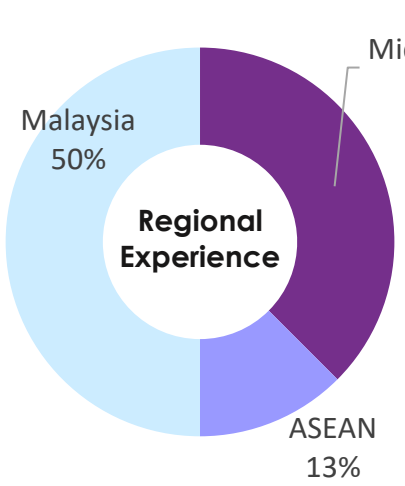
The Board of Directors of KPower and key management team with **combined experience of over 200 years** will further enhance KPower's **strength to evolve for future growth.**

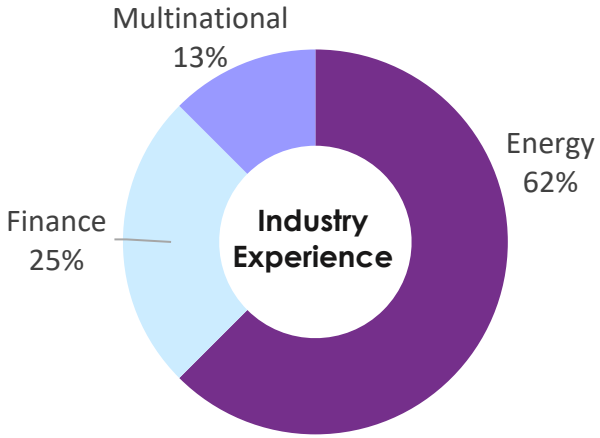
BOARD OF DIRECTORS

- **Diverse background**
- **Extensive experience**
- **Dynamic**
- **Vast industry network**

KEY MANAGEMENT

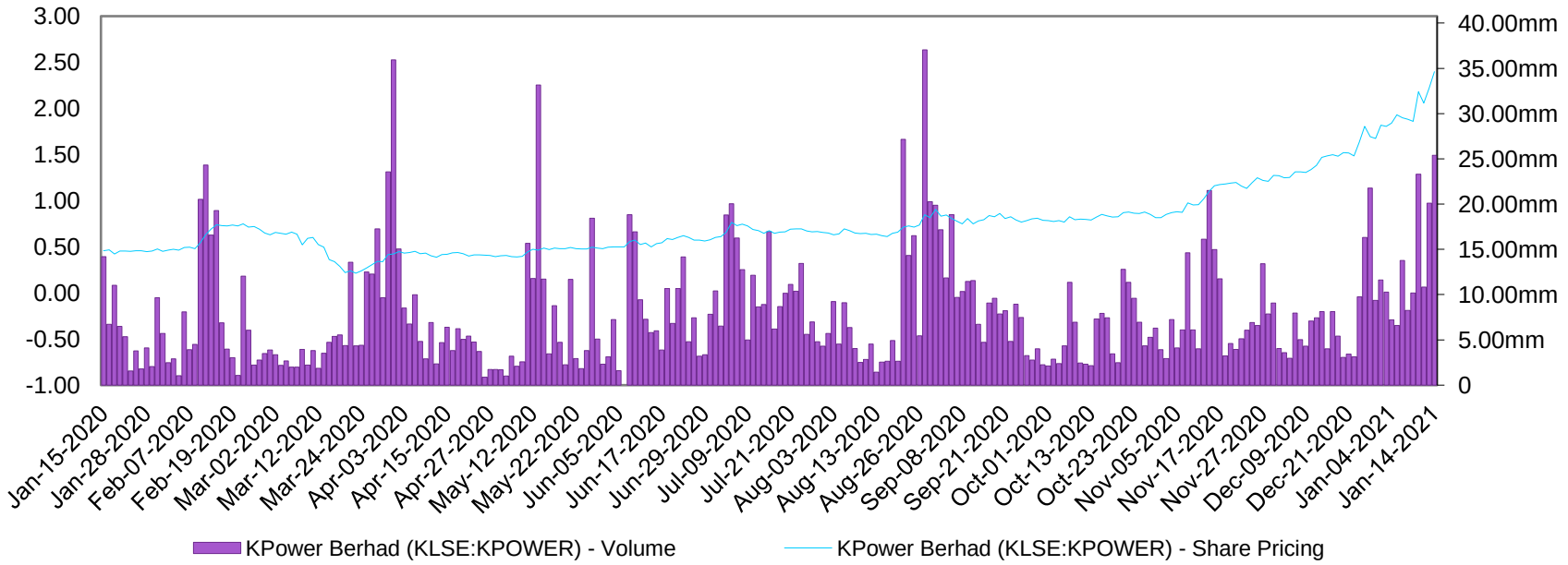
By leveraging on the management's vast experience and industry network, KPower is well positioned to land more major projects in the future.





STOCK INFORMATION

1-YEAR SHARE PRICE AND VOLUME MOVEMENT



Stock Name / Code	:	KPOWER / Code: 7130
Market	:	Main Market
Sector	:	Consumer Products & Services
Shares Outstanding	:	452.3 million
Market Capital	:	RM1.1 billion
52-week high/low	:	RM2.47/ RM0.21
Share Price	:	RM 2.42 (14 January 2021)
Dividend Policy	:	20% of PAT

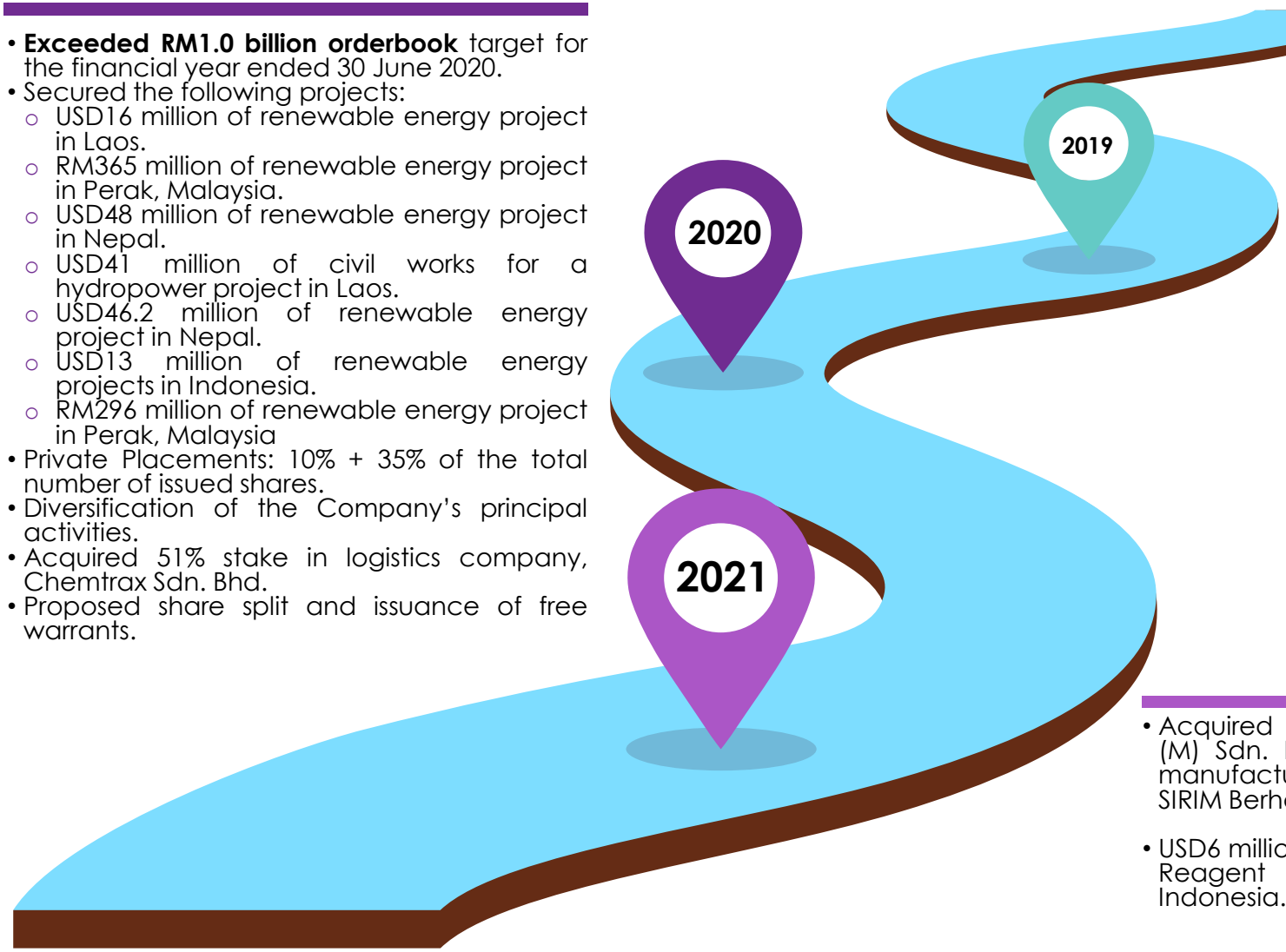
SUBSTANTIAL SHAREHOLDERS

Holder	% of Total Shares Outstanding
Mohd Abdul Karim bin Abdullah	32.14
Grand Deal Vision Sdn Bhd	14.94

Source: S&P Capital IQ, as at 14 January 2021

HISTORY & KEY MILESTONES

- **Exceeded RM1.0 billion orderbook** target for the financial year ended 30 June 2020.
- Secured the following projects:
  - USD16 million of renewable energy project in Laos.
  - RM365 million of renewable energy project in Perak, Malaysia.
  - USD48 million of renewable energy project in Nepal.
  - USD41 million of civil works for a hydropower project in Laos.
  - USD46.2 million of renewable energy project in Nepal.
  - USD13 million of renewable energy projects in Indonesia.
  - RM296 million of renewable energy project in Perak, Malaysia
- Private Placements: 10% + 35% of the total number of issued shares.
- Diversification of the Company's principal activities.
- Acquired 51% stake in logistics company, Chemtrax Sdn. Bhd.
- Proposed share split and issuance of free warrants.



- Dato' Dr. Ir. Ts. Mohd Abdul Karim Abdullah, founder of Serba Dinamik Holdings Berhad, and Grand Deal Vision Sdn. Bhd. acquired majority stake in KPower.
- The Group diversified into energy & utilities and infrastructure & logistics.
- Secured RM270 million of utilities project in Kuala Lumpur, Malaysia.

- Acquired 70% stake in Granulab (M) Sdn. Bhd., a medical device manufacturing company, from SIRIM Berhad.
- USD6 million contract to supply PCR Reagent Kit for COVID-19 in Indonesia.

THE NEW KPOWER - BUSINESS SEGMENT

The Company successfully repositioned itself by expanding into new sectors to generate sustainable revenue streams, in addition to its existing businesses.

ENERGY & UTILITIES

Green and renewable energy related to hydropower, solar, waste to energy and biomass

PROPERTY

Sustainable property development

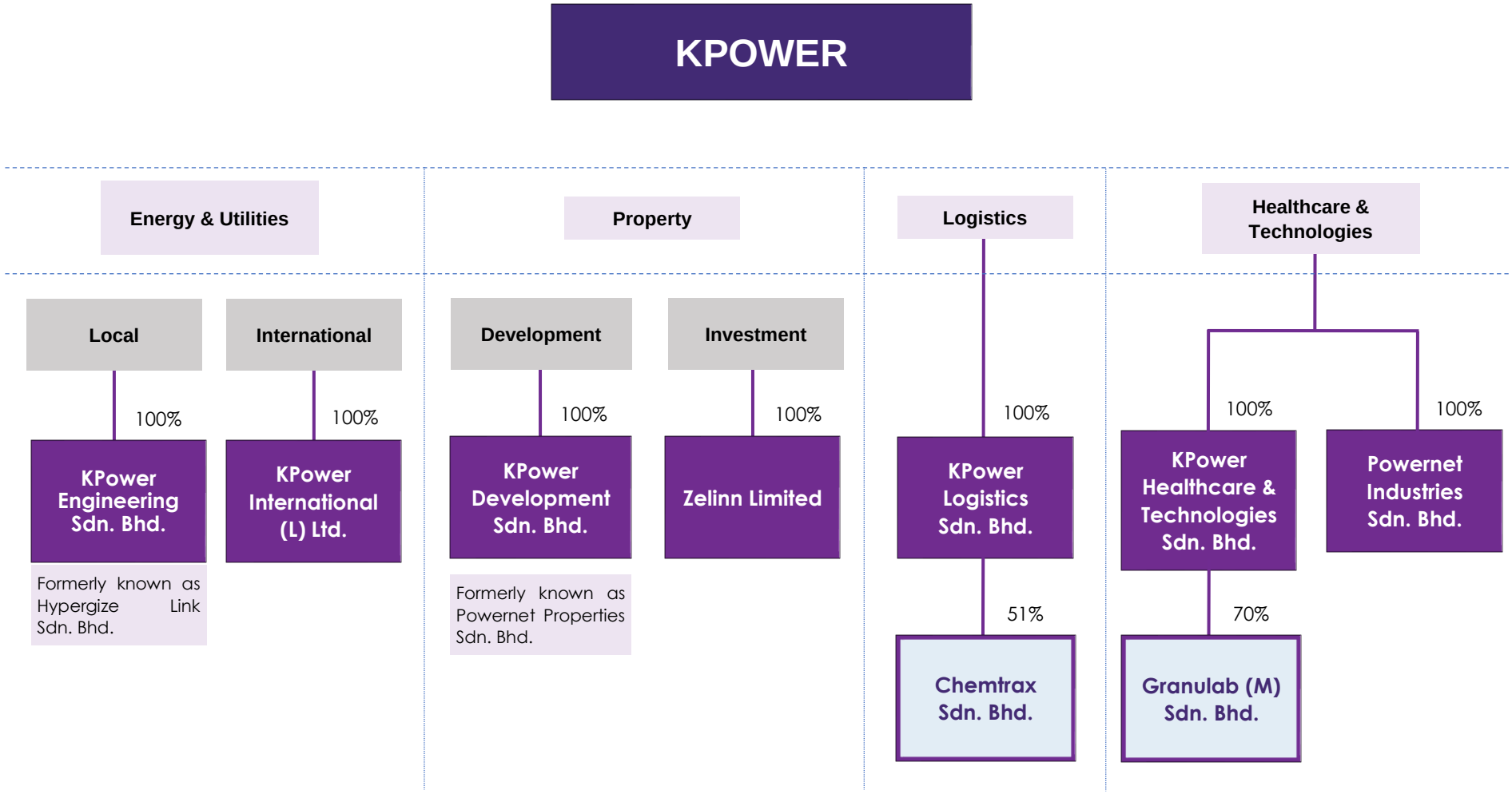
LOGISTICS

To provide logistic solutions to complement various activities within the network of shareholders

HEALTHCARE & TECHNOLOGIES

To venture into healthcare and medical products focusing on technology applications and solutions

CORPORATE STRUCTURE



CURRENT ORDER BOOK

8 MW NAM SAMOY HYDROPOWER PLANT

Contract Value : USD16 million (equivalent to approximately RM66 million)

3X5 MW NAM TAEP 1 AND 3X5 MW NAM TAEP 2 HYDROPOWER PLANTS

Contract Value : USD41 million (equivalent to approximately RM175 million)

KUALA LUMPUR SEWERAGE TREATMENT PLANT

Contract Value : RM270 million

32.47 MW PERAK MINI HYDROPOWER PLANTS

Contract Value : RM365 million

PROPERTY DEVELOPMENT & OTHER JOBS

Contract Value : RM53 million

27.3 MW PERAK MINI HYDROPOWER PLANT

Contract Value : RM296 million

22.9 MW NEPAL MINI HYDROPOWER PLANT

Contract Value : USD48 million (equivalent to approximately RM208 million)

22 MW NEPAL MINI HYDROPOWER PLANT

Contract Value : USD46.2 million (equivalent to approximately RM193 million)

3.1 MW SG. SIMPANG, SUMATERA MINI HYDROPOWER PLANT

Contract Value : USD7 million (equivalent to approximately RM30 million)

2.6 MW SG. KLAAI, SUMATERA MINI HYDROPOWER PLANT

Contract Value : USD6 million (equivalent to approximately RM25 million)

SUPPLY OF PCR REAGENT KIT FOR COVID-19

Contract Value : USD6 million (equivalent to approximately RM24 million)

MISCELLANEOUS

Contract Value : Approximately RM40 million

CURRENT TENDER ACTIVITIES

TOTAL BID WON
(since KPower's acquisition)
RM1.745 Billion

- Malaysia RM984 Mil
- Nepal RM401 Mil
- Laos RM241 Mil
- Indonesia RM119 Mil

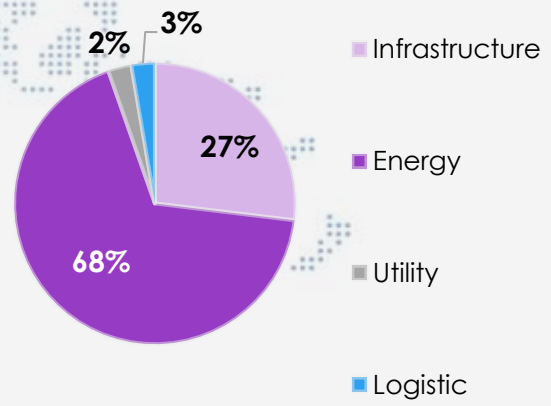
- Utilities : RM270 Mil
- Energy : RM1.361 Bil
- Infrastructure : RM52 Mil
- Property Development : RM42 Mil
- Healthcare : RM24 Mil

TOTAL ORDER BOOK OUTSTANDING
(as at to date)
RM1.583 Billion

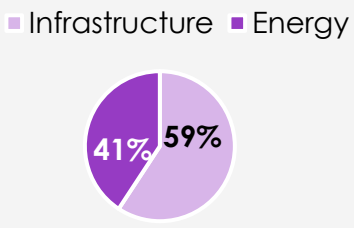
TOTAL BID = RM3.91 Billion

Laos
RM44 Million

Malaysia
RM743 Million



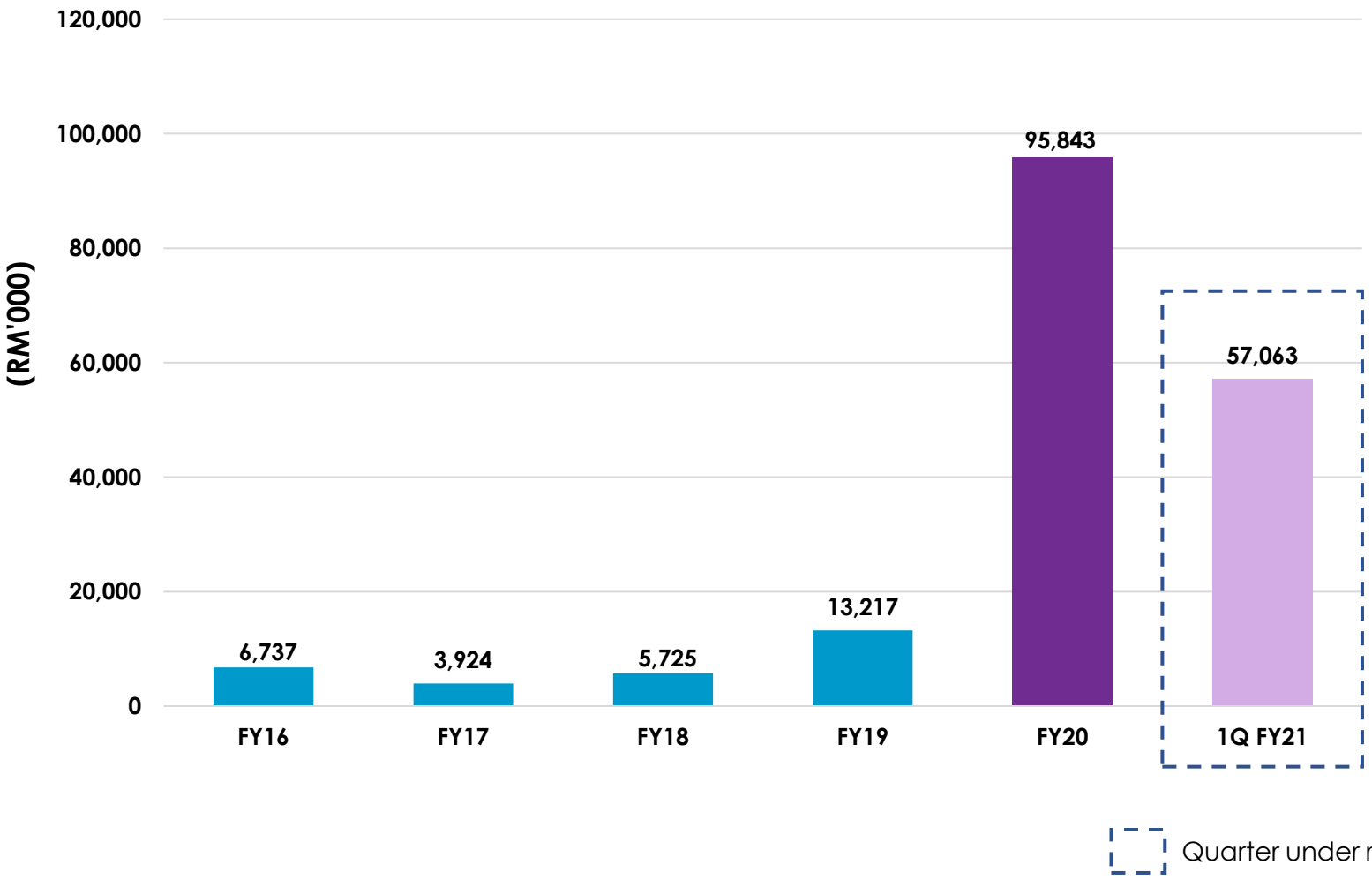
Middle East
RM1.35 Billion



Nepal
RM602 Million

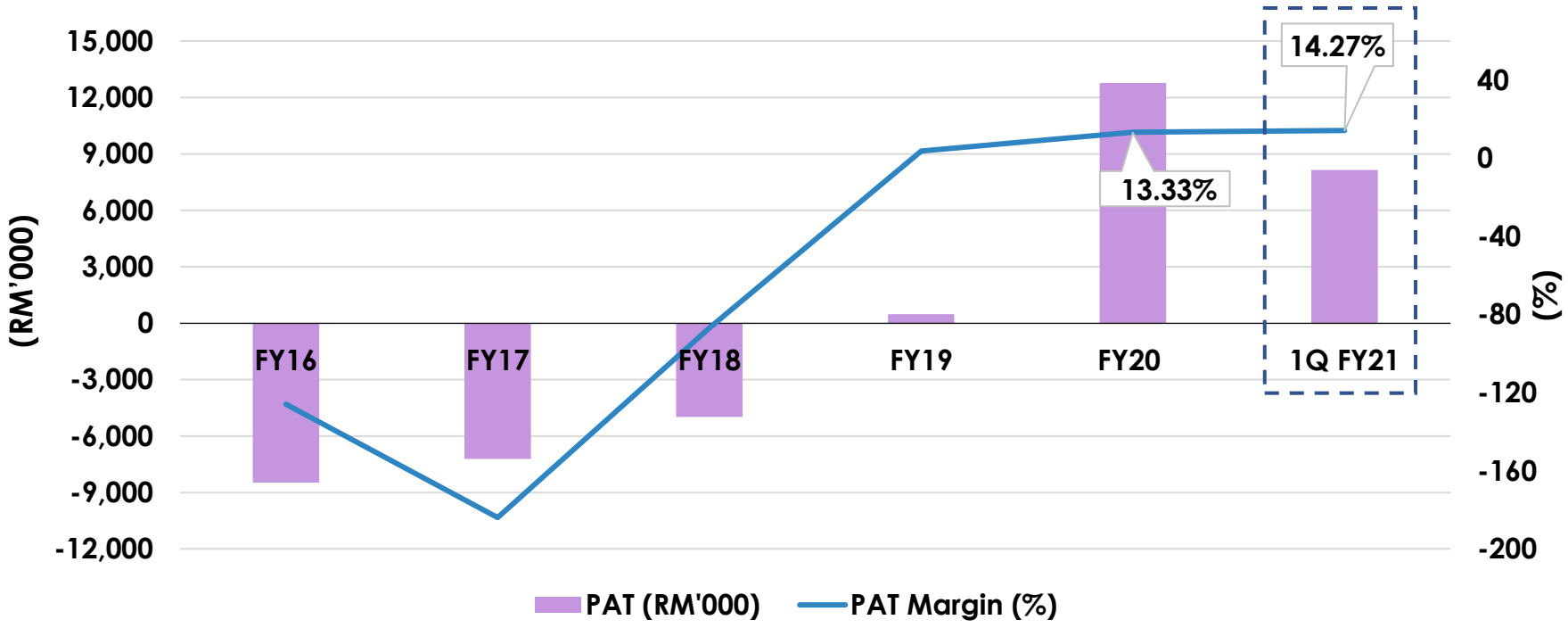
Indonesia
RM1.169 Billion

TOTAL REVENUE



PROFITABILITY

PROFIT AFTER TAX ("PAT") AND PAT MARGIN



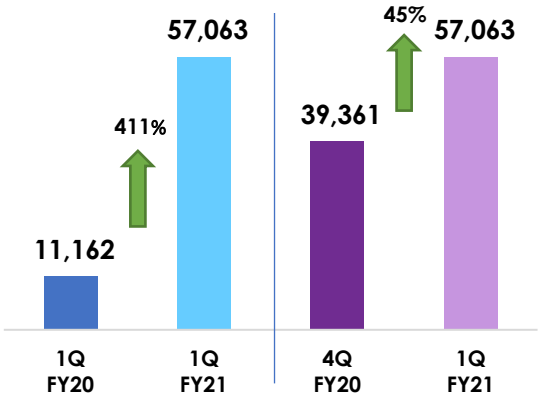
	FY16	FY17	FY18	FY19	FY20	1Q FY21
PAT (RM'000)	(8,481)	(7,218)	(4,977)	481	12,776	8,143
PAT Margin (%)	(125.89)	(183.94)	(86.94)	3.64	13.33	14.27

Quarter under review

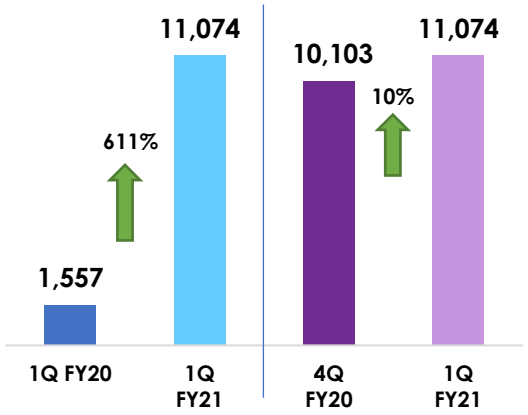
FINANCIAL PERFORMANCE

Improved Quarter-on-Quarter Performance

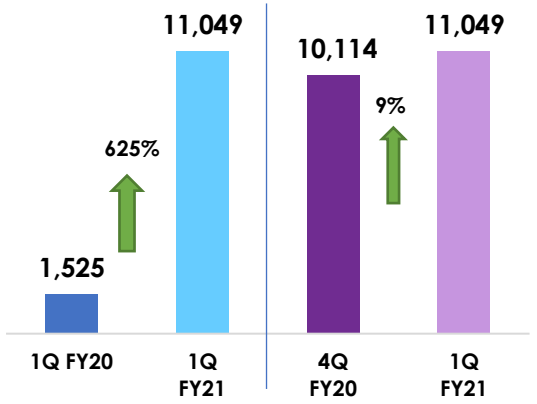
Revenue (RM'000)



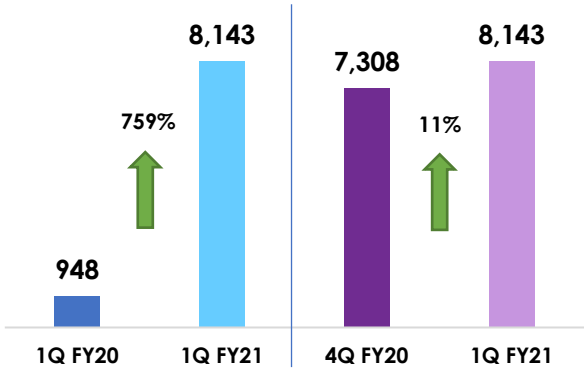
Operating profit/(loss) (RM'000)



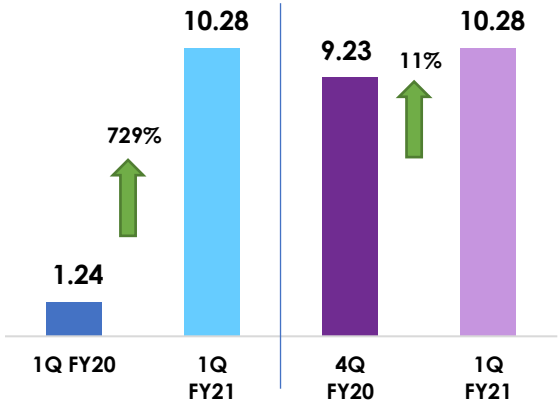
Profit/(loss) before tax (RM'000)



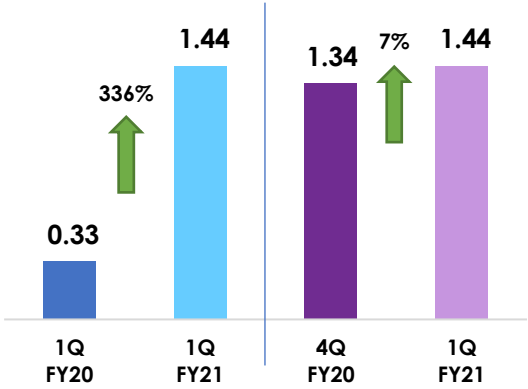
Profit/(loss) after tax (RM'000)



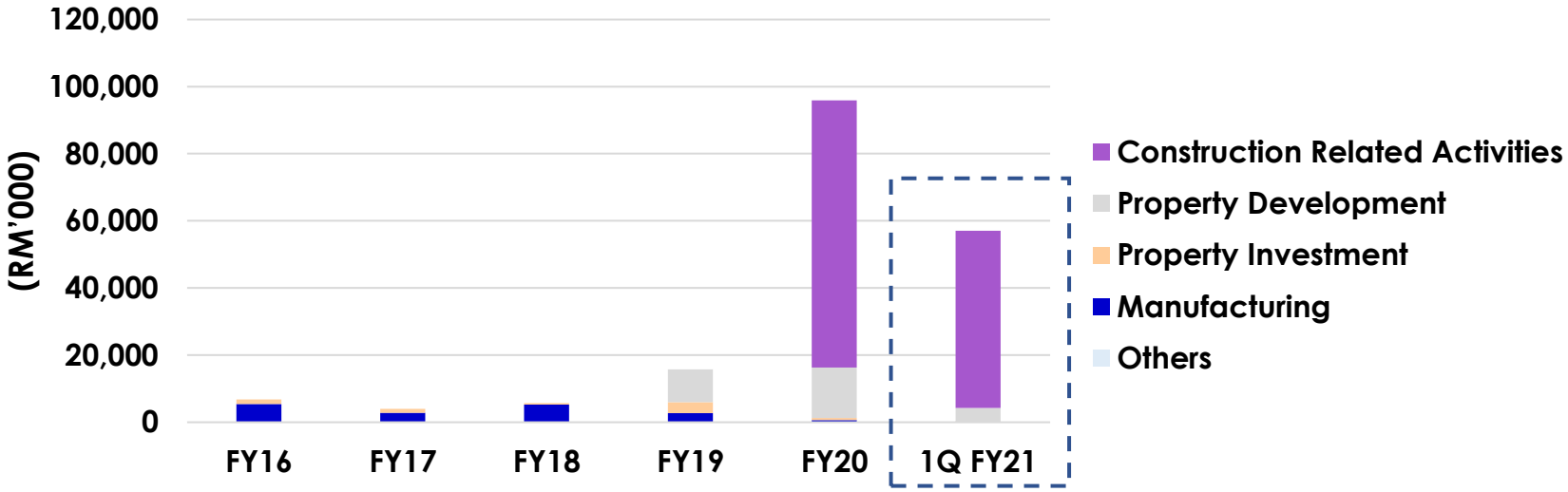
Basic earnings/(loss) per share (sen)



Net asset per share (RM)



SEGMENTAL BREAKDOWN



Segments	FY (RM'000)					1Q FY21	
	2016	2017	2018	2019	2020	RM'000	% Contribution
Construction Related Activities	-	-	-	-	79,571	52,809	92.54
Property Development	-	-	-	9,802	15,010	4,092	7.17
Property Investment	1,321	1,156	519	3,275	606	21	0.04
Manufacturing	5,435	2,768	5,209	2,669	656	141	0.25
Others	8	-	-	-	-	-	-

Quarter under review

KPOWER - KEY TAKEAWAYS

Shareholders and Management Strong track Record & Experience

- ✓ Combined experience across various discipline and region.
- ✓ Proven track record from various industries.

Regionally Ready to ride on the:

- ✓ Existing regional presence to ride on the growth of the industry.
- ✓ Existing partners and resources on the ground across various countries.
- ✓ Already bidding, involved and currently constructing projects across various countries.

Steadily progressing the growing path

- ✓ Achieved RM1.2 billion order book of works in FY2020 which provides the earnings visibility for next 3-4 years.
- ✓ Out of RM2.0 billion order book target in FY2021, RM568 million is secured.
- ✓ Exploring potential mergers and acquisitions to enhance business prospects.
- ✓ Major shareholders are committed to support the capital requirements of the Group.

THANK YOU

KPOWER
Sustainability Through Diversity