The 53rd Meeting of
APEC Expert Group on New and Renewable Energy Technologies (EGNRET)

"GEOTHERMAL ENERGY IN MALAYSIA"

EDISHAM MOHD SUKOR
CPEX, Seoul, Republic of Korea
22nd – 26th October 2019

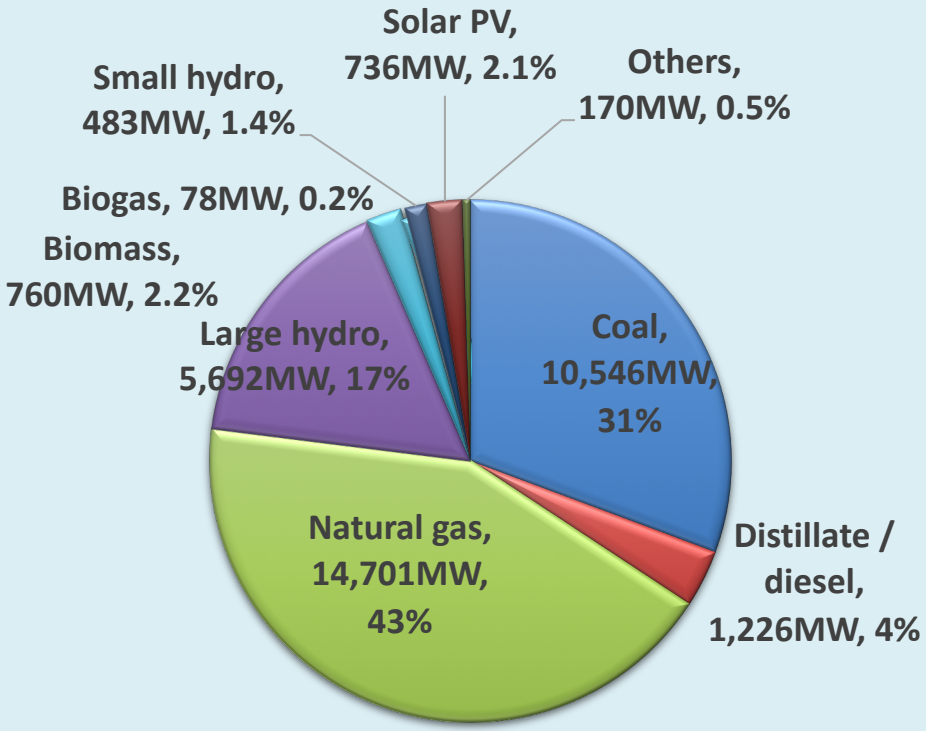
Sustainable Energy Development Authority (SEDA) Malaysia

Renewable Energy Development & Programmes in Malaysia

RE Development in Malaysia

8th Malaysia Plan (2001 - 2005)	• RE introduced as the **5th Fuel** • Implied 5% RE in energy mix
9th Malaysia Plan (2006 - 2010)	• Small Renewable Energy Programme **(SREP)** • Government approved the **National RE Policy & Action Plan (NREPAP)** (Oct. 2010)
10th Malaysia Plan (2011 - 2015)	• Enactment of **RE Act 2011** & SEDA Act 2011 • 2011:Implementation of **Feed-in Tariff (FiT)**
11th Malaysia Plan (2016 - 2020)	• Target RE capacity of 2,080 MW • 2016: Implementation of **Large-Scale Solar (LSS)** programme • 2016:Implementation of **Net Energy Metering (NEM)** scheme

National Installed Capacity Mix (Dec 2018)



As at 2018

Total: 34,392 MW

RE (excl. large hydro) : 6%

RE (incl. large hydro):** 22.5%

* Includes off-grid

**Large hydro > 100 MW

Source: SEDA, ST, MoU Sarawak

RENEWABLE ENERGY PROGRAMMES IN MALAYSIA

SOLAR PHOTOVOLTAIC (PV)

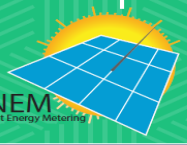
Self Consumption (SELCO)

- Electricity generated is for own use
- Any excess is not allowed to be exported to the grid

Guidelines

Visit www.st.gov.my for Guidelines On The Connection Of Solar Photovoltaic Installation For Self-Consumption

Suruhanjaya Tenaga
Energy Commission



Net Energy Metering (NEM)

- Energy produced from the installed solar PV system will be consumed first, and any excess will be exported to TNB on a "one-on-one" offset basis.
- Restricted to Peninsular Malaysia only

Registration

- Register with SEDA for application visit www.seda.gov.my to engage Service Provider via RPVSP directory

REGISTERED SOLAR PV SERVICE PROVIDER (RPVSP)

Who can apply?

Mode of Purchase

Cash

- One off payment
- Homeowner is the system owner

Bank Loan/Credit Card

- Payment based on system cost and interest rates.

Solar Power Purchase Agreement (PPA)

Payment in Energy (RM/kWh)
You pay based on per kWh for power generated from PV system

Solar Leasing

Fixed Monthly payment (RM)
You pay a fixed amount monthly in return for the use of the PV system and the system will be owned by consumer after lease period ends

Method of Payment

Direct to Solar Investor

Direct to TNB via SARE
(Supply Agreement For Renewable Energy)
TNB will remit the payment to solar investor and collect a service fee of 2 sen per kWh

TENAGA NASIONAL

BIOGAS, BIOMASS & SMALL HYDRO

Feed-in Tariff

- A mechanism that allows electricity produced from indigenous renewable resources to be sold to Distribution Lisensees at a fixed premium price for a specific duration.

How to apply?

Apply via https://efit.seda.gov.my/

Large Scale Solar (LSS)

- Competitive Bidding Program for The Development of Large Scale Solar Photovoltaic Plant (LSS)

Registration

- Register with ST for application visit www.st.gov.my for Guidelines

Who can apply?

- Open to all through competitive bidding process by ST

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RPVI for NEM

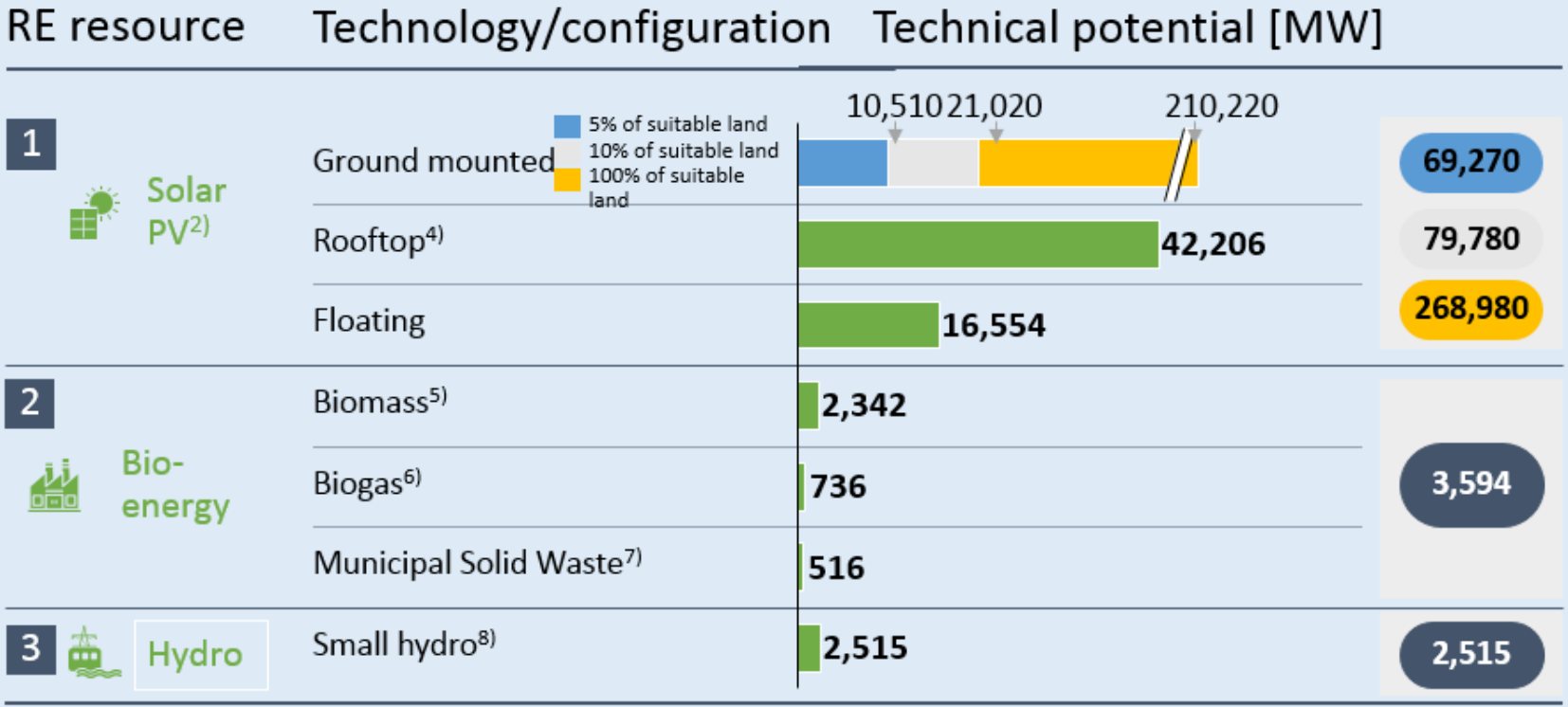
- Investors providing solar PPA/leasing services under the NEM must register with SEDA as a Registered solar PV Investor (RPVI) at https://services.seda.gov.my/rpvi/rpvi/login
- NEM applicants interested in solar PPA/leasing can engage RPVI listed in SEDA's website,www.seda.gov.my.

Licensing and Metering

- Generating Licence from ST is applicable for all renewable energy (RE) installations
- TNB for meter installation

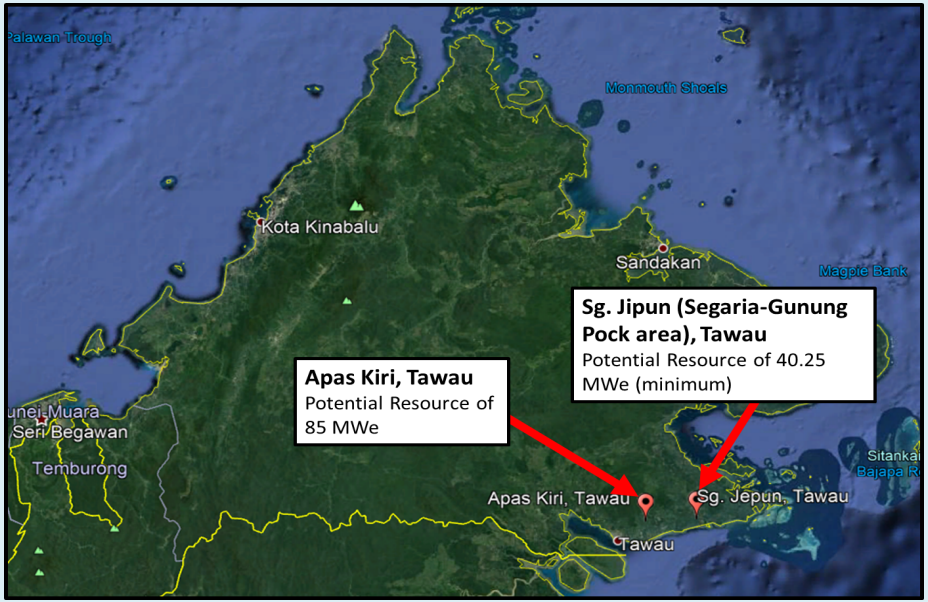
Renewable Energy Resources in Malaysia

Solar PV has by far the highest technical potential



1) Figures may not exactly match detailed calculations due to rounding effect; 2) Technical potential shown are AC rated; 3) Excludes forested, agricultural, mountainous, water bodies, industrial & urban areas; 4) Includes residential, commercial and industrial; 5) Includes palm oil waste (EFB, MF, PKS), rice husk & straw and wood residue; 6) Includes palm oil mill effluent (POME), landfill gas and swine waste; 7) Includes all landfills except inert waste landfills; 8) Small-hydro is defined as capacity less than or equal to 100 MW

Geothermal Resources



Sources:

1) Jabatan Mineral & Geosains Malaysia (JMG), Perak (2016), Report on the assessment of geothermal resource potential for renewable energy in Ulu Slim area
2) Barnett, P. R., S. Mandagi, T. Iskander, Z. Abidin, A. Amadalos, and R. Raad (2015), Exploration and Development of the Tawau Geothermal Project, Malaysia.
3) Javino, F. (2014), Preliminary Magnetotelluric and Gravity Surveys for Geothermal Prospect in Sungai Segaria–Sungai Jipun, Gunung Pock, Kunak

Barrier & Challenges

Policy	Legal
• Limited capital/fund for the survey and research. • R&D fund for exploration phase of the surveyed site.	• Environment matter - most of the potential areas are located at the forest reserve zone

Social-Economic	Technical
• Expertise and manpower in geothermal field. • High cost for survey, exploration and construction of geothermal plant. • Public acceptance, hot spring area is a recreational area and tourism spot	• Limited technical and experience about geothermal technology in Malaysia. • Extreme terrain/site accessibility problem • Depend on energy only, not suitable for heating system in Malaysia

Renewable Energy Transition Roadmap (RETR) 2035

NEW STRAITS TIMES ESTABLISHED 1845

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Govt optimistic of achieving 20 pct RE over next seven years

By Bernama - November 27, 2018 @ 9:57pm

KUALA LUMPUR: The government is optimistic of achieving its target of **20%** electricity generation from **Renewable Energy (RE)** sources, equivalent to 3,991 MW, over the next seven years via various initiatives, programmes and policies.

To realize this target, Energy, Science, Technology, Environment and Climate Change Minister Yeo Bee Yin said the government would engage with industry players and study the relevant policies.

Though the country's clean energy generation is only at two per cent currently, the target could be reached with the implementation of various programmes, including **Net Energy Metering (NEM), Feed-in-Tariff (FiT) and Large-Scale Solar (LSS) programme**, she said.

RENEWABLE ENERGY TRANSITION ROADMAP (RETR) 2035

- To determine the future of electricity system and the RE targets in the electricity mix and total primary energy supply (up to 2035);
- To determine the strategies, comprehensive action plans and resources required to transit to this future of electricity system and achieve the RE targets;
- To determine the impact indicators with measurable economic, social, and environmental benefits of the strategies for RE on annual basis until 2035.

THANK YOU

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