

## RENEWABLE ENERGY (RE)

### What is renewable energy?



Useful **energy** that is collected from **renewable resources**, that won't run out, including carbon neutral **sources** like:

- Sunlight
- Wind
- Rain
- Tides and waves
- Geothermal heat

We can use renewable energy to provide electricity and heat for homes and businesses.

#### Why do we need renewable energy?

Most of the electricity we use derived from non-renewable sources, such as coal and gas. These "fossils fuels" are running out. Factually them to provide energy also release gas that contribute to climate change.

"Renewable sources of energy don't run out or pollute the environment"

#### Why don't we get all our electricity from RE?

It is important to have mix of energy source. So if one fails, another will substitute. Indeed, many renewable technology are still being develop.

### Source of RE



#### SOLAR

Energy from the sunlight and heat can be captured by solar panel and turned into electricity.



#### HYDROELECTRIC

Water flowing from a reservoir to river through a hydroelectric dam generates electricity.



#### HYDROGEN FUEL CELLS

Make 'clean' electricity from hydrogen gas. They work like batteries and power cars/busses.



#### BIOMASS

Biomass plant and animal matter (e.g. wood, straw, sewerage and waste food) or tree grown for fuel. We can burn biomass to produce heat and electricity.



#### GEOTHERMAL

Natural heat from the Earth. Geothermal power stations use heat from deep underground to generate electricity.



#### WAVE/WIND

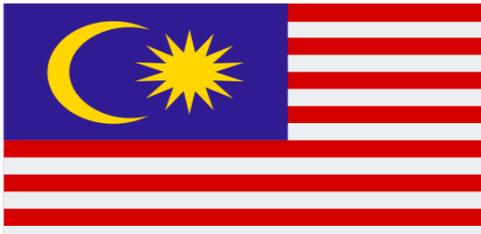
Energy waves are produced when wind blows across the sea that can be used to generate electricity. (e.g. polemic waves machine).



#### TIDAL

Marine turbines use the seaside tide movement to generate electricity.





# MALAYSIA'S RE

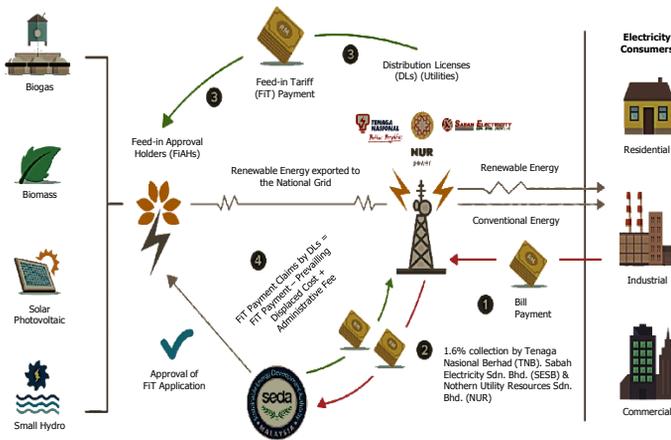
## POLICY VISION

# ACHIEVING 31% RE CAPACITY MIX BY 2025

## RENEWABLE ENERGY PROGRAMMES

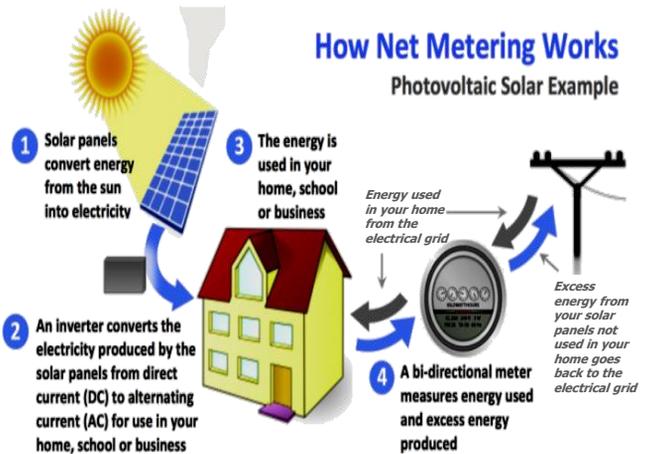
### MALAYSIA'S FEED-IN TARIFF (FIT)

This system obliges Distribution Licensees (DLs) to buy from Feed-in Approval Holders (FIAHs) the electricity produced from renewable resources and sets the FIT rate.



### NET ENERGY METERING (NEM)

Adopting the true NEM concept and this will allow excess solar PV generated energy to be exported back to the grid on a "one-on-one" offset basis.



### LARGE SCALE SOLAR (LSS)

- Competitive bidding programme to drive down the Levelized Cost of Energy (LCOE) for the development of LSS.
- Energy Commission is the implementing agency for this scheme.



### SELF-CONSUMPTION (SELCO)

- Applies when electricity is being generated for own usage and any excess is not allowed to be exported to the grid.
- Looking to hedge against the rising cost of electricity – Government encourage to install Solar PV.

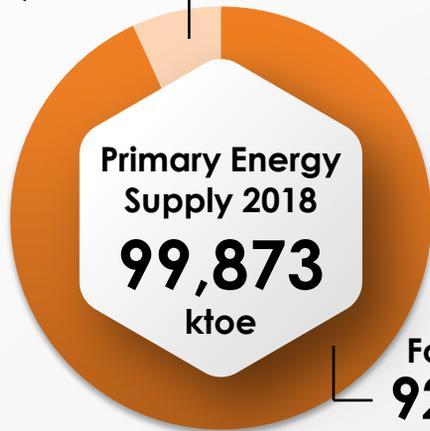


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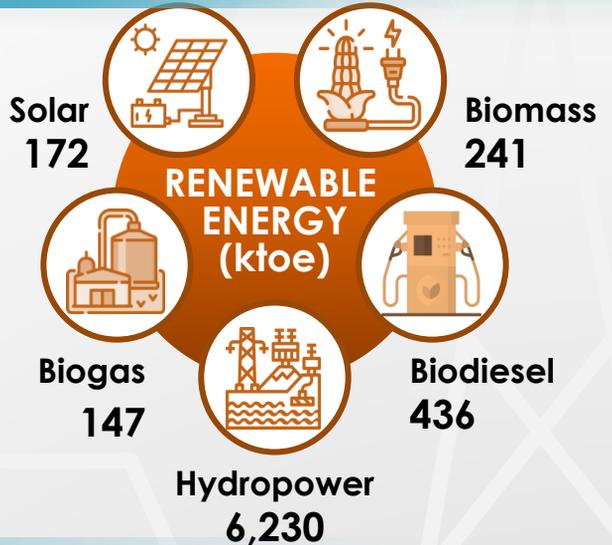
# POWER GENERATION USING RE

Renewable Energy  
7,226



Fossil fuels  
**92,647**

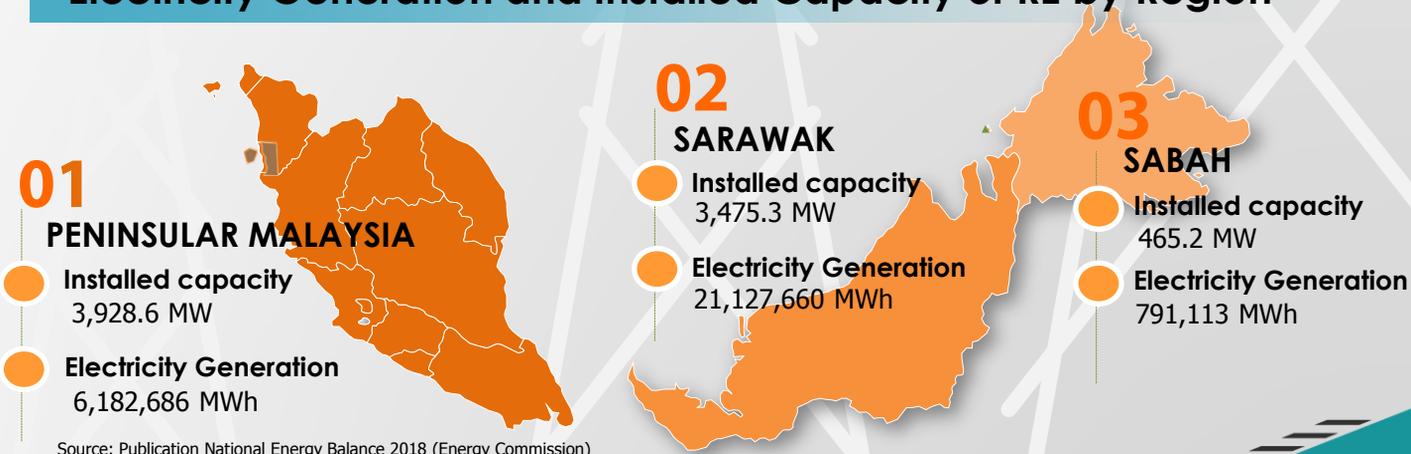
## Total RE by category



## Energy Input in Power Stations by Category (ktoe)



## Electricity Generation and Installed Capacity of RE by Region



Source: Publication National Energy Balance 2018 (Energy Commission)

Note:

- The data covers public and private licensee only
- Public Licensee is the licensee that generates electricity not only for its own use but to supply to others
- Private Licensee is the licensee that generates electricity for its own use only



# RENEWABLE ENERGY: TOP 6 COUNTRIES ON ELECTRICITY GENERATION



## CANADA

Renewable energy sources currently provide about 16% of Canada's total primary energy supply. Wind and solar energy are the fastest growing sources of electricity in Canada.

**(2018 RE: 527,970 GWh)**

## GERMANY

You might not think Germany has the weather to be a solar energy hotspot. However, they are one of the world's leaders in the sector. Currently, RE in Germany provides more electricity than its coal and nuclear output combined.

**(2018 RE: 224,768 GWh)**

## CHINA

China is among the most prominent investors in RE. They produce around 25% of their total energy from renewable sources. However, they still use huge volumes of energy from non-renewable sources.

**(2018 RE: 1,811,173 GWh)**

## USA

The United States has the best renewable energy resources in the world, with the potential to meet a rising and significant share of the nation's energy demand. A quarter of the country's land area has winds, strong enough to generate electricity at the same price as natural gas and coal.

**(2018 RE: 743,177 GWh)**

## BRAZIL

A great deal of Brazil's renewable energy comes from hydroelectric power plants. However a significant share of the country's renewable energy arises from prior public policies that tried to enhance the share of non-traditional renewables.

**(2018 RE: 495,945 GWh)**

## INDIA

Total RE which includes large hydro with pumped storage generation, is nearly 17.5% of total utility electricity generation in India during the year 2017-18.

**(2018 RE: 235,723 GWh)**

Source: <https://www.climatecorecard.org/2019/11/brazil-leads-the-way-in-the-use-of-renewable-energy/>  
<https://www.nrcan.gc.ca/science-data/data-analysis/energy-data-analysis/energy-facts/renewable-energy-facts/20069>  
 Research carried out by scientists at Stanford University  
 Data from International Renewable Energy Agency (IRENA)

