Status Of Renewable Energy In Malaysia

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Existing Feed In Tariff

- Caters only to the following technologies:
  - Small Hydro (up to 30 MW only)
  - Biomass (up to 30 MW only)
  - Biogas (normally small and up to 1 or 2 MW for POME and Landfill
    - Max up to 5 MW biogas
- Solar PV was removed in 2015 for commercial and industrial and 2016 for residential
  - It was found that solar PV rates were extremely high

New Rates for non-PV Technologies

- All bidding is now done online by SEDA
  - Bidding rates have been reduced from 46.6 sen/kWh to only 40 sen/kWh for Biogas
  - Small hydro rates have gone up a bit, from 24 sen/kWh and 25 sen/kWh to about 26 sen/kWh
  - SEDA is planning to introduce Biomass by bidding in 2021; we are not sure what the new rates will be

Solar PV 1.0

- Net Energy Metering (NEM 1.0) was introduced in 2016 with a quota of 500 MW
  - There were hardly any takers since the balance energy was paid at displaced cost (31.5 sen/kWh for LV and 22 sen/kWh for MV)
- New Government in 2018 did away with the following by introducing NEM 2.0
  - Quota was replaced with equivalent tariff rate (TNB will pay for whatever electricity generated at tariff rate)
  - No payment to ICPT or RE Fund for any extra energy generation
  - Consultants could do the NEM Assessment Study
- New Government again in 2020 did the following:
  - Reduced the Reppa period to only 10 years (Renewable Energy Power Purchase Agreement)
  - No sign what is going to happen in the next few years

Large Scale Solar PV by Bidding

- Large Scale Solar PV by bidding was introduced in 2016
  - The price was an average of more than 40 sen/kWh, including Sabah
  - The maximum allowed was 1 MWac to 50 MWac
  - By the time bidding of LSS4, average bidding price has come to less than 20 sen/kWh
  - Now, capacity is only at 10 MWac and up to 50 MWac; LSS3, up to 100 MWac was allowed
  - However, not all are able to deliver, many developers failed to deliver the completed project
  - The Reppa is signed with TNB; ST only carries out the bidding process
  - The Reppa is for 21 years

NEM 3.0

- As advisor to MPIA, we have proposed the following:
  - NEM quota for 3000 MW from 2021 to 2025
  - For commercial and industrial, we have proposed 80 % of the existing tariff rate
  - For residential, we have proposed existing tariff rates, also for houses of worship
  - The Reppa will be for 10 years as well

Where is the Nation heading to in terms of RE

- There are many off grid systems in Sabah and Sarawak, including some in Peninsular Malaysia
- These off-grid systems need to be designed properly, with mini grids, so that there is no issue of improper design
- Some can be designed with Biogas and Micro Hydro, while others will need to depend only on diesel
- These systems need proper maintenance in terms of PV and diesel, as well as Biogas and Small Hydro
- I have personally seen systems which have never been used from Day One since launch

Non-PV Systems

- Many systems can be reused again and again
- Non-PV systems can last for many years, especially gas engines which only need to be maintained periodically
- Boilers are another example, including the generator and other auxiliary parts
- These parts can be changed and reused many times
- Non-PV small hydro turbines also last for quite some time.
- Basically, non-PV equipment is meant to last for a very long time

Biomass

- Biomass is defined as non-fossilised and originating from indigenous plants, animals and micro-organisms including but not limited to products biodegradable organic material by-products residues and waste from agriculture industrial and municipal wastes originating from Malaysia.
- Electrical power can be generated by burning biomass which will burn. Burning biomass produces many of the same emissions as burning fossil fuels. However, growing biomass captures carbon dioxide out of the air, so that the net contribution of the cycle to global atmospheric carbon dioxide levels is zero. Although fossil fuels have their origin in ancient biomass, they are not considered biomass by the generally accepted definition because they contain carbon that has been out of the carbon cycle for a very long time. Their combustion therefore is not that hazardous.
- Domestic hazardous waste (also called “household hazardous waste”) & toxic waste like medication, paints, chemicals, light bulbs, fluorescent tubes, spray cans, fertilizer and pesticide containers, batteries, shoe polish can also be burnt to produce power.

Biomass sources

- Biodegradable waste: food and kitchen waste, green waste, paper.
- Recyclable material: paper, glass, bottles, cans, metals, certain plastics, etc.
- Inert waste: construction and demolition waste, dirt, rocks, debris.
- Composite wastes: waste clothing and waste plastics.
- Domestic hazardous waste (also called “household hazardous waste”) & toxic waste : medication, paints, chemicals, light bulbs, fluorescent tubes, spray cans, fertilizer and pesticide containers, batteries, shoe polish.
- All the above can be used to heat water in the boiler and produce power

Biogas

- Biogas is generally generated from methane, used by Palm Oil Mill Effluent (POME)
  - The process to generate methane can be seen in a normal biogas chamber
  - Sometimes they use tanks and sometimes lagoons
  - The methane gas needs to be cleaned first by removing H2S
- Biogas is also generated by landfills which create methane
  - The methane must be captured and directed to the biogas engine
  - It needs to be cleaned first by removing dioxins and other material

Biogas

- Biogas is also generated by food production
  - This project has not been implemented yet by anyone in Malaysia
- Biogas is also generated from waste, i.e., pig waste, cattle waste and chicken waste
  - There are one or two such biogas plants in Malaysia

Small Hydro

- There are more than 30 approvals required for Small Hydro
- SEDA has been planning to meet developers and the agencies responsible but so far nothing has emerged
- One of the major problems is the Forestry Department
- All the trees need to be cut and paid for by the developer; some States impose three times the price of the tree
- If the issues with Forestry Dept could be settled, then there would be many new approvals

Small Hydro

- SEDA has to meet up with the agencies responsible to give approvals
- The meeting can be organized by the Energy Ministry
- The responsible Agencies need to be invited for the discussion
- Foremost among all is the Forestry Department
  - Really need to have a discussion with the Forestry Department so that we can have one standard for Malaysia

NEM 3.0

- MPIA (Malaysian Photovoltaic Industry Association) has proposed NEM 3.0 with the following features:
  - Commercial and Industrial at 80 % of the tariff rate
  - Residential and Houses of Worship remain at tariff rate
  - Reppa to be for 10 years
  - The best solution is still Solar PV
  - We need to find the perfect solution for PV
  - Best to discuss with Suruhanjaya Tenaga; bring TNB and SESB in the discussion
  - MPIA must be involved too

Solar PV

- Solar PV is easy to install on rooftops and empty spaces
- Many roofs are suitable for residential houses
- MPIA plans to have 1,000,000 rooftops by 2025
- Commercial and Industrial spaces also easy to install
- Empty land is also possible; SEDA allows to install on empty land

Biomass, Biogas, Small Hydro and Solar PV

- SEDA needs to increase the 1.6 % levy to 2 % so that more people can get connected.
- The original levy was only 1 %, then increased to 1.6 %; it should have been increased to 2 % long time ago
- TNB should not get free electricity from FiT projects; at present all electricity from FiT projects is being provided free to TNB.
- Time for solar NEM 3.0

Questions

- Please ask questions about Renewable Energy