



OVERVIEW OF MALAYSIA'S RENEWABLE ENERGY (RE) INITIATIVES

AFEO Energy Tour 2016, Malaysia

21st Sept 2016 to 23rd Sept 2016

Organized by: IEM EETD

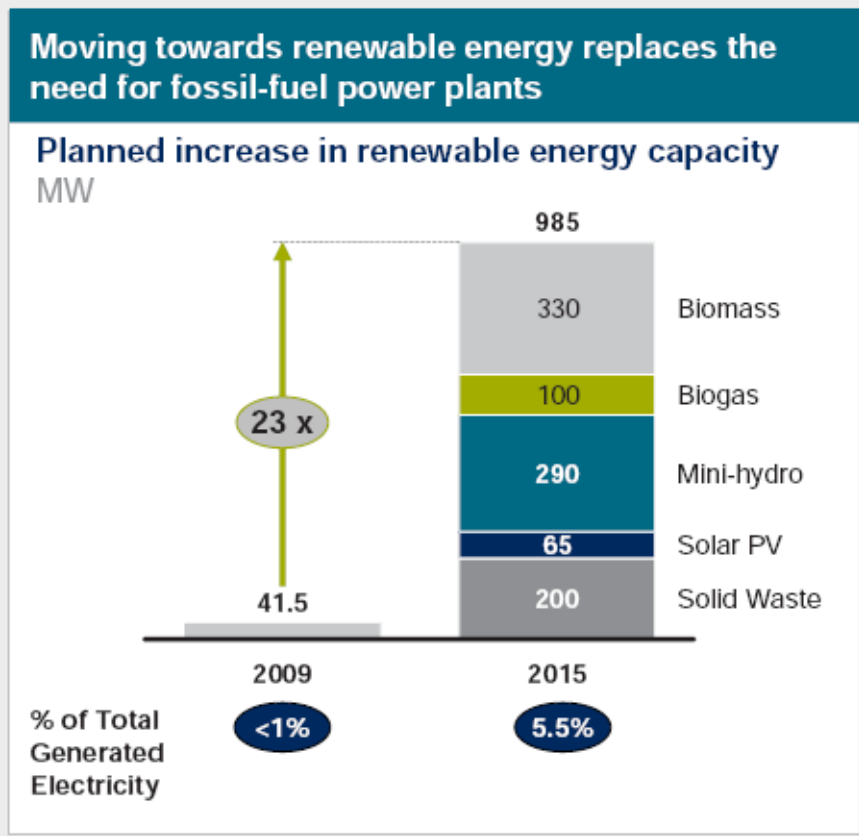
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Renewable energy will increase from <1% in 2009 to 5.5% of Malaysia's total electricity generated by 2015

NATIONAL RE POLICY AND ACTION PLAN



RE investments will receive a huge push through FiT

- Introduction of Feed-in Tariff (FiT) of 1% to be incorporated into the electricity tariffs of consumers
- Establishment of a Renewable Energy Fund from the FiT to be administered by a special agency under KeTTHA
- This provides an annual CO₂ avoidance of 3.2 million tonnes

According to National RE Policy set in 2009, PV only supposed to get 65 MW by 2015, and about 200 MW by 2020

Increased to 1.6 % on Jan 2014

REPAP Targets	Year	Cumulative RE Capacity	RE Power Mix (vs Peak Demand)
	2015	985 MW	5.5%-6%
	2020	2,080 MW	11%
	2030	4,000 MW	17%

RE Act gazetted in June 2011

FiT introduced in Dec 2011

**INSTALLED CAPACITY OF APPROVED RE
PLANTS IN PROGRESS (MW)**
(SEDA WEBSITE ON 20 SEPT 2016)

Year	Biogas	Biogas (Landfill/ Agri Waste)	Biomass	Biomass (Solid Waste)	Small Hydro	Solar PV	Geothermal	Total
2012	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01
2013	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.06
2014	0.00	0.00	0.00	0.00	12.00	2.78	0.00	14.78
2015	0.00	4.00	12.50	0.00	13.94	16.17	0.00	46.61
2016	0.00	49.81	55.25	2.20	49.25	76.68	0.00	233.19
2017	0.00	45.86	43.94	23.20	38.50	0.00	0.00	151.50
2018	0.00	9.45	23.00	2.50	88.15	0.00	0.00	123.10
2019	0.00	0.00	0.00	0.00	60.00	0.00	0.00	60.00
Cumulative	0.00	109.11	134.69	27.90	261.84	95.70	0.00	629.24

**INSTALLED CAPACITY OF COMMISSIONED
RE PLANTS (MW)**
(SEDA WEBSITE ON 20 SEPT 2016)

Year	Biogas	Biogas (Landfill/Agri Waste)	Biomass	Biomass (Solid Waste)	Small Hydro	Solar PV	Geothermal	Total
2012	2.00	3.16	36.90	8.90	11.70	31.53	0.00	94.19
2013	3.38	3.20	0.00	0.00	0.00	106.96	0.00	113.54
2014	1.10	0.00	12.50	0.00	0.00	64.89	0.00	78.49
2015	0.00	7.40	12.00	7.00	6.60	57.82	0.00	90.82
2016	0.00	6.33	7.00	0.00	0.00	8.96	0.00	22.29
Cumulative	6.48	20.09	68.40	15.90	18.30	270.16	0.00	399.33

SUCSESSES OF FIT IMPLEMENTATION

- For PV, end 2015 achieved 240 MW instead of target of 65 MW
- Brought PV to the masses by focusing on residential and community rooftops
- Degressed PV FiT rates by 15-20 % annually instead of planned 8 %, thus reducing the pressure on the RE Fund, and enabling more capacity to be released
- Increased the number of PV contractors from about 20 in 2011 to more than 140 at present
- Trained and certified more than 200 PV design engineers, more than 100 electricians, and more than 100 installers
- Made PV technology commonplace in Malaysia
- Encouraged the design and construction of high quality RE systems by introducing strict Testing and Commissioning requirements for all RE plants
- Encouraged local Industry by introducing and increasing the bonus FiT rates for locally manufactured or assembled products
- Encouraged more interest in biogas and small hydro by increasing the basic or bonus FiT rates

CHALLENGES OF FIT IMPLEMENTATION

- Total RE installed capacity end 2015 only about 350 MW instead of the planned 985 MW, or only about 35 % achievement of RE target
- Apart from PV, all other technologies achieved only a small fraction of the target
- From those commissioned some didn't perform as expected, and some shut down completely, especially biomass (solid waste)
- Limitations of RE Fund prohibited release of more quotas for PV, and recently for biogas, both of which could have increased the installed capacity of RE
- **Most importantly, RE Act limits Seda's authority to implementation of FiT only, and does not allow for other mechanisms to encourage RE**
- If you add the capacity already commissioned, and the capacity under construction, as well as quota planned for release, a total capacity of 1000 MW is possible from FiT by 2020, instead of the planned 2080 MW, or only about 50 % success

2015 Targets

RE	Target	Actual
Biomass	330	61
Biogas	100	21
Small hydro	290	18
PV	65	240
MSW	200	16

ASEAN TARGETS

NEW RE DEFINITIONS AND NEW RE TARGETS

- AMEM (Asean Ministers of Energy Meeting) in 2014 made two important decisions
 - Large hydro and off-grid hybrid RE systems to be classified as RE
 - **Target RE capacity increased to 30 % of installed capacity by 2020 from old target of 15 % of installed capacity by 2015**
- For Malaysia, this has two important implications
 - RE installed capacity has immediately shot up from about 300 MW to almost 4000 MW, by including Temengor, Bakun, and all the other existing large hydros and off-grid systems
 - **RE target for 2020 = 30 % of 30 GW = 9000 MW**
 - Expected RE installed capacity by 2020
 - Existing large hydro & off-grid in 2015: 3700 MW
 - FiT by 2020: approximately 1000 MW
 - Expected new large hydro and off-grid RE: 800 MW
 - Total: 5500 MW
 - **Shortfall: 3500 MW**

PROBLEMS FACED BY RE DEVELOPERS

► Feedstock issues

- Getting a steady and assured supply of EFB (for biomass) or water (for small hydro) at a reasonable price

► Grid connection issues

- Distance from Grid
- Lack of will by the relevant parties to solve technical issues involving grid connection of RE plants
- Delays and other problems with utility connection at local level

► Finance

- Some pioneer failed and failing biomass and small hydro plants give a negative perception of RE
- Long lead time and security of feedstock issues, leading to higher risk
- Attempts by some developers to secure > 100 % financing by artificial inflation of CAPEX

► Permits

- Delays and difficulties in getting State Government, Forestry Dept., DOE, and other agencies

Most of these issues are not faced by PV developers!

INCREASING THE SHARE OF RE THROUGH PV

Thus SEDA had proposed, and the Government has approved, 2 new mechanisms for RE, specifically for PV:

Net Energy Metering (NEM)

- Utility consumers allowed to install PV systems on their roof for self-consumption, with the balance being exported to the Grid, and net-off from the monthly bills at displaced cost
- Total quota of 500 MW till 2020 or 100 MW a year starting from 2016, Commercial and Industrial quota 90 MW, residential 10 MW
- After 500 MW capacity is reached, new entrants might have to pay a monthly fee to remain connected to the Grid
- RE Act only talks about FiT, so NEM doesn't fall under SEDA
- Energy Commission (EC) has been given the authority to implement but wants to appoint SEDA as the implementing agency.
- Although supposed to kick-off in January 2016, now postponed to 2017

Large Scale Solar (LSS)

- Another proposal by Seda which was accepted by the Government but again EC was chosen as the implementing agency since RE Act limits Seda to FiT only
- PV plants with capacity ≤ 50 MW selected through open bidding process and connected to either the Distribution or the Transmission network
- Total capacity of 1000 MW by 2020 or 250 MW a year starting from 2017
- EC has called for RFQ and qualified applicants to submit detailed bids by 23 Sept 2016
- EC appears committed and excited to implement LSS

THE NATURE OF PV

Advantages

- Short construction time, low project risk, easy financing
- For Net Metering can be installed on existing roofs – residential, commercial or industrial buildings
- For Large Scale, can be installed on idle or less productive land or even large roofs of warehouses, etc.
- For Net Metering, always installed near load centres
 - Easy grid connection
 - Reduced network losses
- For Large Scale, interconnection at Transmission levels, optimum injection points can be determined by Grid System Operator
- Cost reduction over time

POTENTIAL FOR NEM

- As PV prices continue to fall, and electricity tariffs rise, it will make sense for more consumers to reduce their bills and hedge further increases in tariffs by installing PV on their rooftops, either on their own, or through PV leasing companies
- Loss to the utility due to reduction in sales will be compensated by reduction in utility costs due to reduced T&D losses
- The nation will gain due to reduction in use of subsidized gas, as well as some energy security and autonomy
- Therefore, from commercial aspects alone, there will be a high penetration of PV under NEM mechanism
- Success of NEM depends to a great extent on the financing available; the applicants will not be getting a lucrative payment from the utility but will only be reducing their electricity bills.
- Government can help by providing tax incentives like ITA

LARGE SCALE SOLAR

- ▶ Plants will be spread out over Peninsula and Sabah and limited to max of 50 MWac each
 - Most plants will be < 30 MWac each since the Government would want to spread out the cake
- ▶ PV power coincides with daily peak demand
 - Will offset some OCGT and CCGT generation using subsidized gas
 - Review the need for future peaking plants using gas
- ▶ Overall generation costs should remain unaffected by addition of PV, more probably some reduction of generation costs
- ▶ Provide some energy security to the country
- ▶ The success of the LSS depends on the availability of financing
- ▶ If no local financing, foreign players with foreign financing will get a big share of the market although LSS rules limit foreign ownership to 49 % of the plant

THE BIGGEST CHALLENGE TO RE DEVELOPMENT IN MALAYSIA

THE RE ACT!

- SEDA was set up to be the custodian of RE development in the country
- However, provisions of the RE Act limit Seda only to implementation of FiT
 - RE Act talks only about FiT!
- Seda proposed the two new mechanisms of NEM and LSS to the Government, both of which were accepted and approved
- Seda has in-depth knowledge of the PV Industry as well as passion for RE
 - Both of which are essential for the successful implementation of NEM and LSS



Thank you for your
attention



**Facilitating Grid connection,
safeguarding Grid integrity**

