



Malaysia updates on RE programme

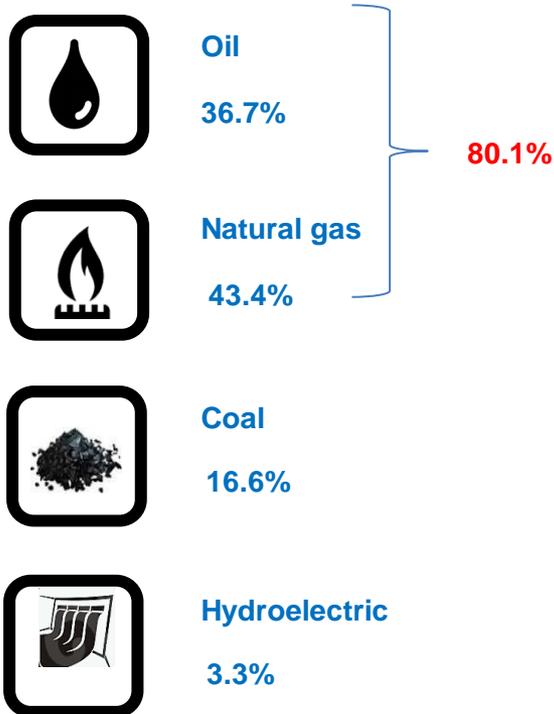
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Sustainable Energy Development Authority Malaysia

13 April 2016
EGNRET 46, Taichung City, Chinese Taipei

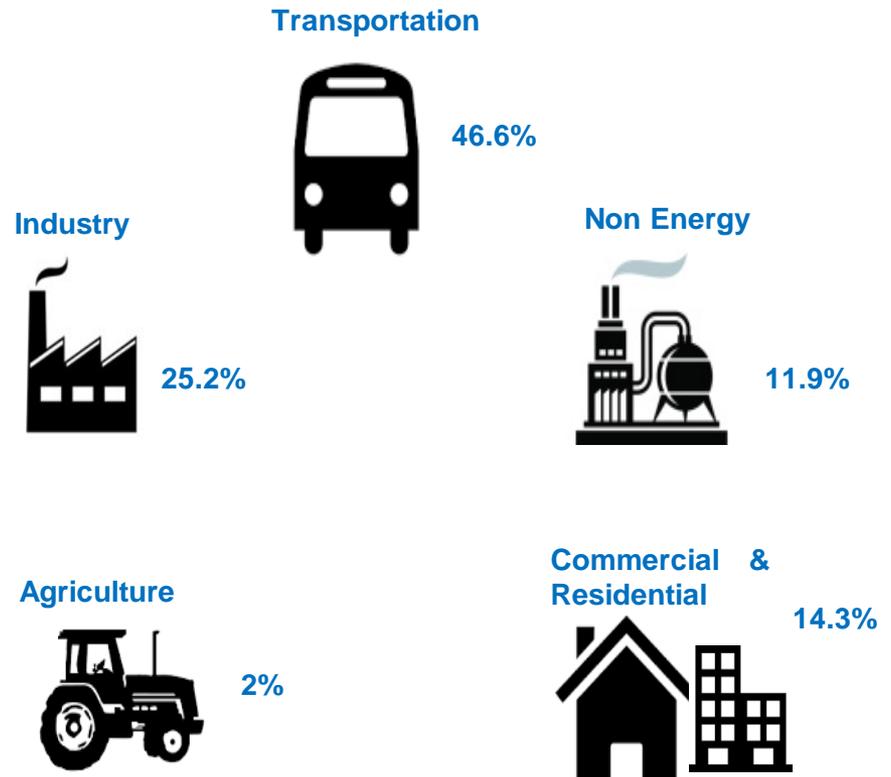


Today, oil and gas accounts for 80.1% of the primary energy supply in Malaysia

Primary Energy Supply

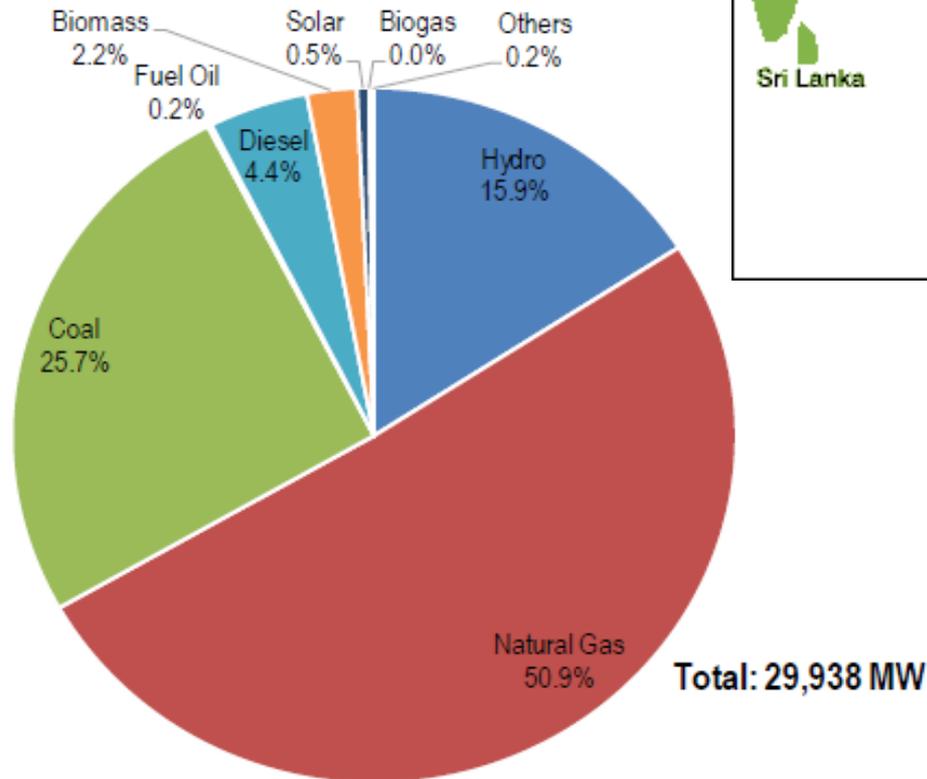


Final Energy Consumption



Electricity Data

- Installed capacity by sources



RE: 16.4% (including hydro)

Electrification rate: Peninsula 99.8%, East Malaysia 93%

Source: Malaysia National Energy Balance 2014

Overall Energy Policy

Major Energy Policies

To meet the energy challenges

National Petroleum Policy (1975)

Efficient utilization of petroleum resources

Ensuring the nation exercises **majority control** in the management and operation of the industry

National Energy Policy (1979)

Supply Objective: Ensure **adequate, secure and cost-effective** energy supply.

Utilization Objective: Promote **efficient utilization of energy and eliminate wasteful and non-productive** usage

Environmental Objective : Minimize **negative impacts** to the environment.

National Depletion Policy (1980)

To prolong the life span of the nation's oil and gas reserves

Four-fuel Policy (1981)

Aimed at ensuring **reliability and security** of supply through **diversification** of fuel (oil, gas, hydro and coal)

Five-fuel Policy (2001)

Encourage the utilization of renewable resources such as biomass, solar, mini hydro etc

Efficient utilization of energy



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Major Milestones in RE Policy Development

8TH Malaysia Plan (2001 - 2005)

- RE as the 5th Fuel
- 5% RE in energy mix

9th Malaysia Plan (2006 – 2010)

- Targeted RE capacity to be connected to power utility grid:
 - 300 MW – Peninsular Malaysia; 50 MW - Sabah
- Targeted power generation mix:
 - 56% natural gas, 36% coal, 6% hydro, 0.2% oil,
 - 1.8% Renewable Energy
- Carbon intensity reduction target: 40% lower than 2005 levels by 2020

RE Status as of Dec 2015

- Connected to the utility grid (as of 2015): 5,070 MW (which include large hydro)
- Off-grid: >500MW (private palm oil millers and solar hybrid)
- All RE including hydro – > 5,000 MW



Strategic Thrusts of the National RE Policy & Action Plan 2010

Strategic Thrust 1

Introduce Legal and Regulatory Framework



Strategic Thrust 2

Provide Conducive Business Environment for RE



Strategic Thrust 3

Intensify Human Capital Development



Strategic Thrust 4

Enhance RE Research & Development



Strategic Thrust 5

Create Public Awareness & RE Policy Advocacy Programs



Renewable Energy Legislations

- **Renewable Energy Act 2011**

- **Sustainable Energy Development Authority Act 2011**
 - ❑ Enabled the establishment of SEDA Malaysia

 - ❑ Launched the Feed-in Tariff Mechanism, 1st Dec 2011

 - ❑ Establish the RE Fund to finance the FiT (1% levy to electricity consumers, 1.6% from 1st Jan 2014)

Feed-in Tariff Rates (effective 1st January 2016)

Technology / Source	FiT Duration (years)	Range of FiT Rates (RM/kWh) {USD/kWh}
Biomass (palm oil waste, agro based)	16	0.27 – 0.31 {0.07– 0.08}
Biogas (palm oil waste, agro based, farming)	16	0.28 – 0.32 {0.08 – 0.09}
Small Hydro	21	0.23 – 0.24 {~0.06}
Solar PV (up to and including 4kW)	21	1.11 {~0.29}
Solar PV (above 4kW, up to and including 24kW)	21	1.09 {~0.29}
Solar PV (above 24kW, up to and including 72kW)	21	0.9 {~0.23}
Solar PV (above 72kW, up to and including 1MW)	21	0.88 {~0.23}

- RM1 =USD 0.27



RE Targets under FiT, RE Policy Action Plan 2010

Year	Cumulative RE Capacity	RE Power Mix (vs Peak Demand)	Cumulative CO ₂ avoided
2015	985 MW	5.5%	11.1 mt
2020	2,080 MW	11%	42.2 mt
2030	4,000 MW	17%	145.1 mt

Note; Target is being revised, to include other initiatives.

New additional RE Quota (beyond FiT) (launched in 2016)

- Limitation in RE fund, unachieved target set in 2010.
- New programme on PV was recently launched

No	Programme	Year	(MW)
1.	Net-metering	2016-2020	500
2.	Large scale solar (1 to 50MW) Bidding process	2017-2020	1000
TOTAL			1500 MW

RE (under FiT) Status as of Dec 2015

NO.	SOURCE	CAPACITY (MW)
1.	Biogas	18
2.	Biomass	75
3.	Small Hydro	18
4.	Solar PV	221
TOTAL		332 MW

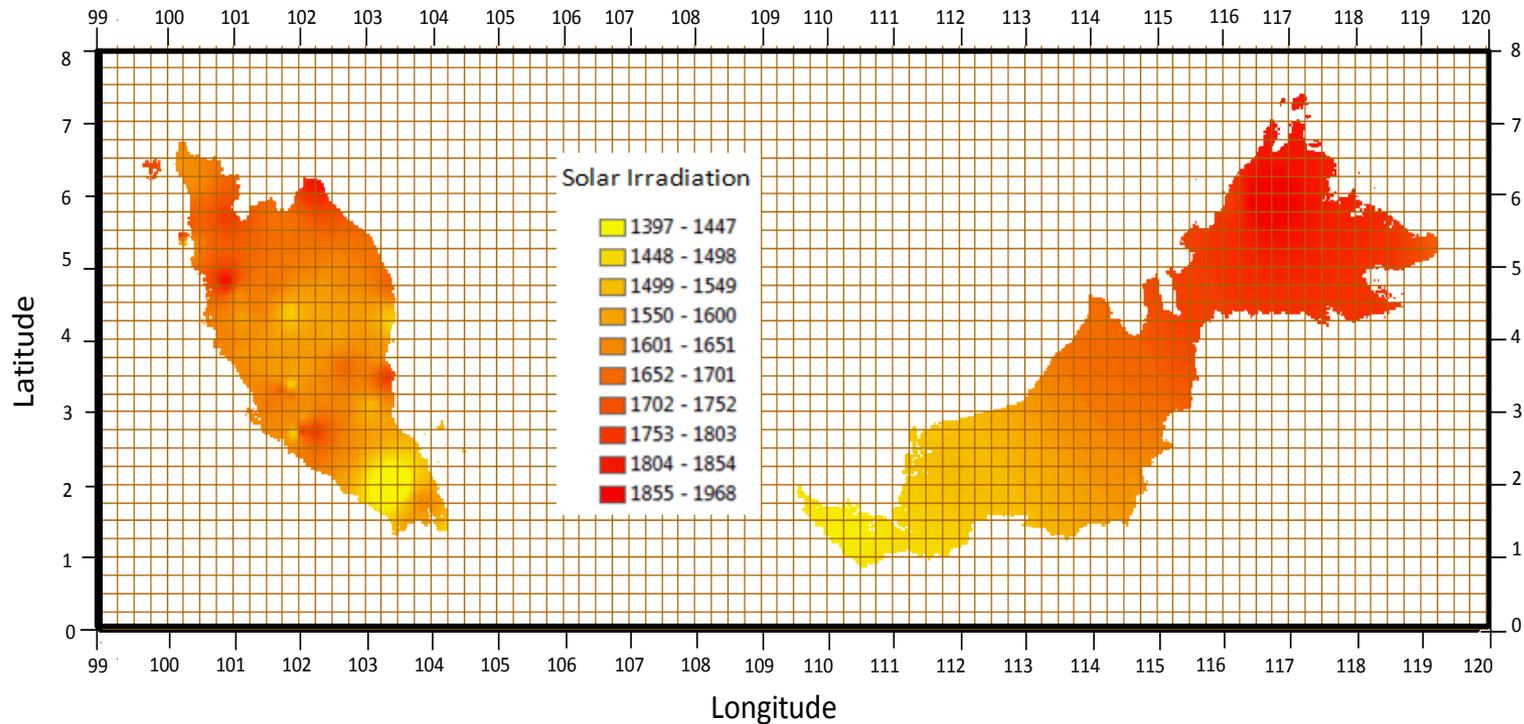
Other incentives

- **GTFS (Green Tech Financing Scheme)**
 - Available until 2017
 - The Govt will bear 2% of the total interest rate of the profit charges by private financial institutions.
 - Financing size up to RM50 mil per company
 - Implementing agency – Malaysia Green Technology Corporation (MGTC)

- **Green Investment Tax Allowance and Green Investment Tax Exemption**
 - Applicable from 2016-2020
 - Certified Green 'Products' under MyHijau Directory
 - Certified company providing 'Services' in green sector
 - Implementing agency – Malaysian Industrial Development Authority (MIDA)



Annual solar irradiation map



Source: SEDA Malaysia, 2015

Target based on technical potential

Year	Cumulative Biomass (MW)	Cumulative Biogas (MW)	Cumulative Mini-Hydro (MW)	Cumulative Solar PV (MW)	Cumulative Solid Waste (MW)	Cum Total RE, Grid-Connected (MW)
2011	110	20	60	9	20	219
2015	330	100	290	65	200	985
2020	800	240	490	190	360	2,080
2025	1,190	350	490	455	380	2,865
2030	1,340	410	490	1,370	390	4,000
2035	1,340	410	490	3,700	400	6,340
2040	1,340	410	490	7,450	410	10,100
2045	1,340	410	490	12,450	420	15,110
2050	1,340	410	490	18,700	430	21,370

Assumptions, RE Technical potential:

Biomass (EFB, agriculture): 1,340 MW will be reached by 2028.

Biogas (POME, agriculture, farm): 410 MW will be reached by 2028.

Mini-hydro (not exceeding 30 MW): **490 MW** will be reached by 2020.

Solar PV (grid-connected): **unlimited.**

Solid waste (RDF, incineration, sanitary landfill): projection of 30,000 tonne/day of Solid Waste as projected by KPKT, followed by 3% annual growth post 2024



RE Initiatives Way Forward

- **FiT is for kick-start. Solar PV will end in 2017, while others will be until 2025.**
- **To revise national targets – existing target was based on FiT (limited fund), to include large scale and net-metering.**
- **Ramp-up Renewable Energy capacity through:**
 - ❑ Large Scale Solar PV (1 to 50MW sizes), Launched in 2016, total of 1000MW by 2020
 - ❑ Net-Metering including self-consumption, Launched in 2016, total of 500MW by 2020
- **Explore & assist with technologies (slow moving)**
 - ❑ Biomass –EFB (technologies)
 - ❑ Small hydro (permit issues)
 - ❑ Other RE (wind)



Thank you



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