FiT – Current Status and Future Trend in Malaysia

Empowering Green Markets
In conjunction with IGEM 2013

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COO SEDA Malaysia
Definition of Sustainable Energy

**Sustainable energy** is the sustainable provision of energy that meets the needs of the present without compromising the ability of future generations to meet their needs.

Energy efficiency & renewable energy are said to be the *twin pillars* of sustainable energy

- **Renewable Energy (RE)** is any form of primary energy from recurring & non-depleting indigenous resources or technology as set out in the First Column of the Schedule of the RE Act 2011

- **Energy Efficiency (EE)** is the efficient use of energy to produce better or same level of output without compromising comfort level

Approved by GOM 2 April 2010

- 10th Jun 2010: 10th Malaysia Plan (chapter 6)
- 25th Oct 2010: Economic Transformation Programme (chapter 6)

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

Moving towards renewable energy replaces the need for fossil-fuel power plants

Planned increase in renewable energy capacity MW

<table>
<thead>
<tr>
<th></th>
<th>2009</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>41.5</td>
<td>98.5</td>
</tr>
<tr>
<td>Biomass</td>
<td>330</td>
<td>100</td>
</tr>
<tr>
<td>Biogas</td>
<td></td>
<td>290</td>
</tr>
<tr>
<td>Mini-hydro</td>
<td></td>
<td>65</td>
</tr>
<tr>
<td>Solar PV</td>
<td></td>
<td>200</td>
</tr>
<tr>
<td>Solid Waste</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

% of Total Generated Electricity

- 2009: <1%
- 2015: 5.5%

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

SOURCE: Ministry of Energy, Green Technology and Water
Strategic Thrusts of the National RE Policy & Action Plan

**Strategic Thrust 1:** Introduce Legal & 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 Programmes
## Malaysian National RE Targets

<table>
<thead>
<tr>
<th>Year</th>
<th>Cumulative RE Capacity</th>
<th>RE Power Mix (vs Peak Demand)</th>
<th>Cumulative CO₂ avoided</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>985 MW</td>
<td>5.5%-6%</td>
<td>11.1 mt</td>
</tr>
<tr>
<td>2020</td>
<td>2,080 MW</td>
<td>11%</td>
<td>42.2 mt</td>
</tr>
<tr>
<td>2030</td>
<td>4,000 MW</td>
<td>17%</td>
<td>145.1 mt</td>
</tr>
</tbody>
</table>

Note: RE capacity achievements are dependent on the size of RE fund
RE Act: an Act to provide for the establishment & implementation of a special tariff system to catalyze the generation of renewable energy and to provide for related matters.

Comprises of 9 Parts and 65 Clauses

- Part I: Preliminary
- Part II: FiT System
- Part III: Connection, Purchase and Distribution of RE
- Part IV: Feed-in Tariff
- Part V: Renewable Energy Fund
- Part VI: Information Gathering Powers
- Part VII: Enforcement
- Part VIII: General
- Part IX: Savings and Transitional

Passed in Parliament: 27th April 2011
Enforced: 1 December 2011
Functions of SEDA Malaysia

- SEDA Malaysia established on 1st September 2011
  - enforcement of Sustainable Energy Development Authority Act 2011

Functions

i. to advise the Minister & relevant Government Entities on all matters relating to sustainable energy, including recommendations on policies, laws & actions to be applied to promote sustainable energy

ii. to promote and implement the national policy objective for renewable energy;

iii. to promote, stimulate, facilitate and develop sustainable energy;

iv. to implement, manage, monitor and review the feed-in tariff system;

v. to implement sustainable energy laws and to recommend reform to such laws to the Federal Government;

vi. to promote private sector investment in the sustainable energy sector, including to recommend to the relevant Government Entities incentives in relation to taxes, customs and excise duties and other fiscal incentives applicable to such investment;
A mechanism that allows electricity produced from indigenous RE resources to be sold to power utilities at a fixed premium price and for specific duration.

- Provides a conducive and secured investment environment
  - Enable to make financial institutions be comfortable in providing loan with longer period (>15 years)

- Provides incentives to RE producers as it only pays for electricity produced
  - Promotes system owner to install good quality & maintain the system
  - Provides fixed revenue stream for installed system

- degression – annual reduction of tariffs for FiT rates for each technology/RE source
  - Promotes reduction of RE costs
  - Higher portfolio in energy mix
Source of Funding

- 2011 - additional tariffs collection from electricity bills
  - Every RM100/Month - RM1 for RE
- Additional 1% (proposed in 2013)

The size of RE fund will determine the RE target for Malaysia

Benefit

- polluters pay concept
- will not affect 75% of electricity consumers (≤ 300 kWh/mth)
- encourages EE and DSM
FiT Implementation: Accounts & Payments

2 separate accounts with TNB & 2 separate contracts:

- **Consumption Meter - Electricity consumption bill**: consumer pays to TNB for kWh electricity consumed.
- **Generation Meter - FiT bill**: TNB pays to consumer for gross kWh electricity generated.
Conceptual Framework for FiT

Electricity Bills = 100% + 1% (RE Fund Contribution)\(^*\)

(RE Fund)

SEDA Malaysia

RE Act 2011

RE Act 2011

Solar BIPV buildings

Commercial sector

Industrial sector

Residential sector

License + Fee

{FiT application}

{FiT payment}

SEDA Malaysia

RE developers

Bank

Bank

FiT fee

"displaced cost" = electricity supply cost at interconnection point

(RE Fund)

1% for RE Fund

{FiT payment}

((FiT – displaced cost) + admin fee)
## Feed-in Tariff Rates

<table>
<thead>
<tr>
<th>Technology / Source</th>
<th>FiT Duration</th>
<th>Range of FiT Rates (RM/kWh)</th>
<th>Annual Degression</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biomass (palm oil waste, agro based)</td>
<td>16</td>
<td>0.26 – 0.35</td>
<td>0.5%</td>
</tr>
<tr>
<td>Biomass (Solid waste)</td>
<td>16</td>
<td>0.36 – 0.42</td>
<td>1.8%</td>
</tr>
<tr>
<td>Biogas (palm oil waste, agro based, farming)</td>
<td>16</td>
<td>0.27 – 0.42</td>
<td>0.5%</td>
</tr>
<tr>
<td>Small Hydro</td>
<td>21</td>
<td>0.23 – 0.24</td>
<td>0%</td>
</tr>
<tr>
<td>Solar PV (individual)</td>
<td>21</td>
<td>1.10 – 1.64</td>
<td>8%</td>
</tr>
<tr>
<td>Solar PV (non-individual)</td>
<td>21</td>
<td>0.69 – 0.95</td>
<td>20%</td>
</tr>
</tbody>
</table>
FiT Implementation & Outcome
SEDA Malaysia’s Portal & FiT Dashboard
www.seda.gov.my

Fit Dashboard

<table>
<thead>
<tr>
<th>Fit Rates</th>
<th>RE Quota</th>
<th>RE Capacity</th>
<th>RE Generation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biogas</td>
<td>Biomass</td>
<td>Small Hydro</td>
<td>Solar PV</td>
</tr>
</tbody>
</table>

Available MW installed capacity for FiT Applications

<table>
<thead>
<tr>
<th></th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individual</td>
<td>2.97</td>
<td>3.98</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Non-individual (≤ 500 kW)</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Non-individual (&gt; 500 kW)</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
</tbody>
</table>

Allocated MW installed capacity

<table>
<thead>
<tr>
<th></th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individual</td>
<td>5.23</td>
<td>1.98</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Non-individual (≤ 500 kW)</td>
<td>1.98</td>
<td>14.44</td>
<td>0.72</td>
<td>0.00</td>
</tr>
<tr>
<td>Non-individual (&gt; 500 kW)</td>
<td>32.26</td>
<td>26.24</td>
<td>29.53</td>
<td>0.00</td>
</tr>
</tbody>
</table>

Quick Links

1% charge not aimed at unwary clients
13/05/2013

SEDA Malaysia Buka Semula Permohonan Kuota Solar Fotovolta
10/05/2013

SEDA Malaysia Re-opens Solar PV Quota Applications
10/05/2013

SEDA Malaysia Clarifies On One-Off Process
e-FiT Online

- FiT quota approvals on ‘first come, first served basis’ – upon submission of complete application & document
- FiT quota is dynamic
Overview of FiT Application Framework

1. User Registration
2. Feed-in Tariff Application
3. Feed-in Approval
4. REPPA signing with DL

5. Construction / Installation
6. Financing & Procurement
7. ST Provisional License
8. Register REPPA with SEDA

9. ST Permanent Generating License
10. Testing & Commissioning
11. FiTCD – SEDA’s verify
12. Actual CAPEX & OPEX

13. Monitor Energy Production
14. Distribution Licensee Pay
15. FiT Commence
16. FiTCD – SEDA’s confirmation
<table>
<thead>
<tr>
<th>Year</th>
<th>Biogas</th>
<th>Biogas - Sewage</th>
<th>Biomass</th>
<th>Solid-Waste</th>
<th>Small Hydro</th>
<th>Solar PV &lt; 1MW</th>
<th>Solar PV &gt; 1MW</th>
<th>Total (MW)</th>
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</thead>
<tbody>
<tr>
<td>2011/2012</td>
<td>20</td>
<td>10</td>
<td>60</td>
<td>20</td>
<td>30</td>
<td>10</td>
<td>40</td>
<td>190</td>
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<tr>
<td>2012</td>
<td>20</td>
<td>10</td>
<td>50</td>
<td>30</td>
<td>30</td>
<td>10</td>
<td>40</td>
<td>190</td>
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<tr>
<td>2013</td>
<td>20</td>
<td>10</td>
<td>50</td>
<td>30</td>
<td>30</td>
<td>10</td>
<td>40</td>
<td>190</td>
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<tr>
<td>2014</td>
<td>20</td>
<td>10</td>
<td>50</td>
<td>30</td>
<td>90</td>
<td>10</td>
<td>40</td>
<td>250</td>
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<tr>
<td></td>
<td>60</td>
<td>30</td>
<td>160</td>
<td>80</td>
<td>150</td>
<td>30</td>
<td>120</td>
<td>630</td>
</tr>
<tr>
<td>Category</td>
<td>Total</td>
<td>Capacity (MW)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Applications received</td>
<td>3,497</td>
<td>748.66</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Approved Applications</td>
<td>2,590</td>
<td>520.48</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Commissioned</td>
<td>656</td>
<td>118.19</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Under construction</td>
<td>1,871</td>
<td>365.84</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Revoked</td>
<td>10</td>
<td>17.96</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Withdrawn</td>
<td>52</td>
<td>14.49</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Applications in process</td>
<td>198</td>
<td>9.56</td>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>
E-FiT – status & updates

- E-FiT – system enables FiT quota approvals on ‘first come, first served basis’
- upon submission of complete application & document

**Status as at 30 Sept 2013:**

<table>
<thead>
<tr>
<th>Bil.</th>
<th>Sources</th>
<th>Number Of Applications</th>
<th>Capacity (MW)</th>
<th>Percentage %</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Biogas</td>
<td>18</td>
<td>27</td>
<td>5.19%</td>
</tr>
<tr>
<td>2</td>
<td>Biomass</td>
<td>18</td>
<td>166</td>
<td>31.99%</td>
</tr>
<tr>
<td>3</td>
<td>Small Hydropower</td>
<td>19</td>
<td>119</td>
<td>22.87%</td>
</tr>
<tr>
<td>4</td>
<td>Solar PV</td>
<td>2,535</td>
<td>208</td>
<td>39.95%</td>
</tr>
<tr>
<td></td>
<td>Individual</td>
<td>2,283</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Non Individual</td>
<td>252</td>
<td>183</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>2,590</strong></td>
<td><strong>520</strong></td>
<td><strong>100.00%</strong></td>
</tr>
</tbody>
</table>
Future Trends
Total global operating capacity of solar PV reached the 100 GW milestone

Prices of solar PV modules fell by more than 30% in 2012

Source: REN21 Renewables 2013 Global Status Report
Steeper degression rates for solar PV
  - Revised from 8% to 20% for commercial systems in 2013
  - Proposed 10% for all PV systems in 2014
Zero degression for biomass and biogas systems from 2014
Increase in bonus rates for biomass and biogas systems
Alternative Mechanism to support development of RE

- **FiT is a temporary feature**
  - FiT is designed to kick start the RE Industry, not become a permanent feature
  - SEDA has already reduced FiT for PV only to residential homes (max 12 kW) and small commercial rooftop systems (max 425 kW)
  - FiT will be completely phased out over the next few years for PV systems

- **Net Metering**
  - As electricity tariffs rise and PV prices fall, more people will install PV on Net Metering basis
  - SEDA is already in discussions with TNB to implement Net Metering

- **Utility Scale PV**
  - Kettha is planning development of utility scale PV plants (> 30 MW) through a bidding process