RENEWABLE ENERGY & FEED-IN TARIFF IN MALAYSIA

16th October 2013

Sustainable Energy Development Authority Malaysia
(SEDA Malaysia)

Background

Definition of Renewable Energy

Renewable Energy (RE) is any form of primary energy from recurring and non-depleting indigenous resources.

"Renewable resources" means the recurring and non-depleting indigenous resources or technology as set out in the first column of the Schedule of the RE Act 2011

Renewable Energy Development in Malaysia

8TH Malaysia Plan (2001 - 2005)

- RE as the 5th Fuel
- Implied 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:**
  - 51 % natural gas, 26 % coal, 9 % hydro, 8 % oil, diesel 5 %, biomass 1 % (2010)
- Carbon intensity reduction target: 40% lower than 2005 levels by 2020

RE as of 31st December 2010

- Connected to the utility grid: 61.2MW (17% from 9th MP target through Small Renewable Energy Programme (SREP)
- Off-grid**:** >1GW (private palm oil millers and solar hybrid)

Malaysian National Renewable Energy Policy & Action Plan

Approved by Cabinet on 2nd April 2010

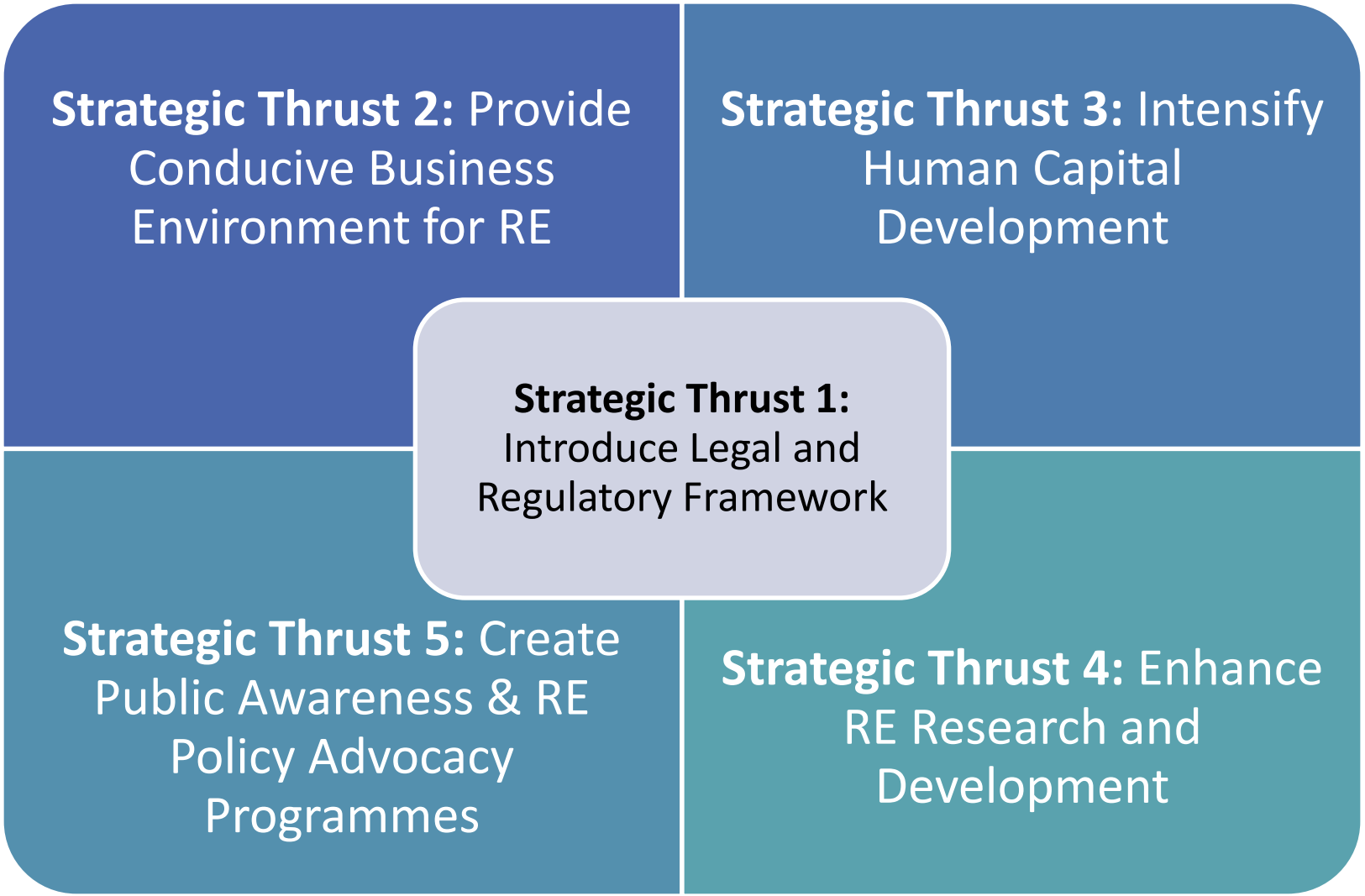
Policy Statement:

Enhancing the utilisation of indigenous renewable energy resources to contribute towards national electricity supply security and sustainable socio-economic development.

Objectives:

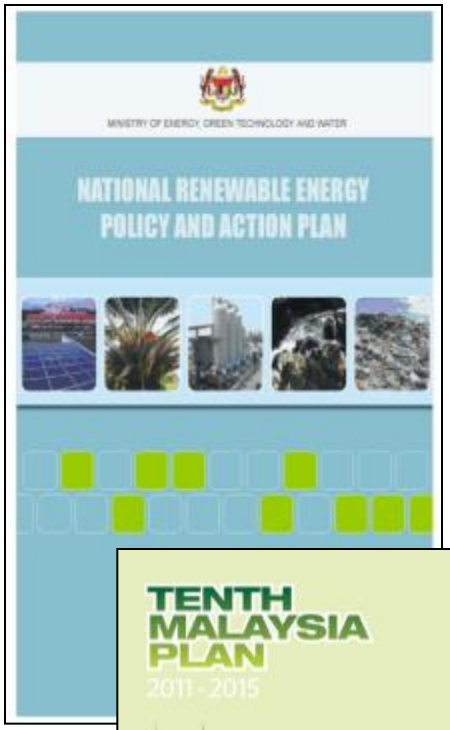
- To increase RE contribution in the national power generation mix;
- To facilitate the growth of the RE industry;
- To ensure reasonable RE generation costs;
- To conserve the environment for future generation; and
- To enhance awareness on the role and importance of RE.

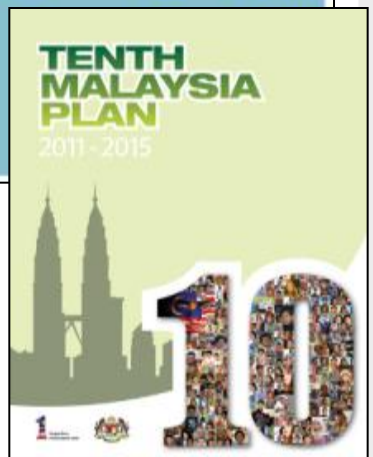
Strategic Thrusts of the National RE Policy



Feed-in Tariff: Government Policy

- 10th Jun 2010: 10th Malaysia Plan (chapter 6)
- 15th Oct 2010: National Budget 2011 (paragraph 34)
- 25th Oct 2010: Economic Transformation Programme (chapter 6)



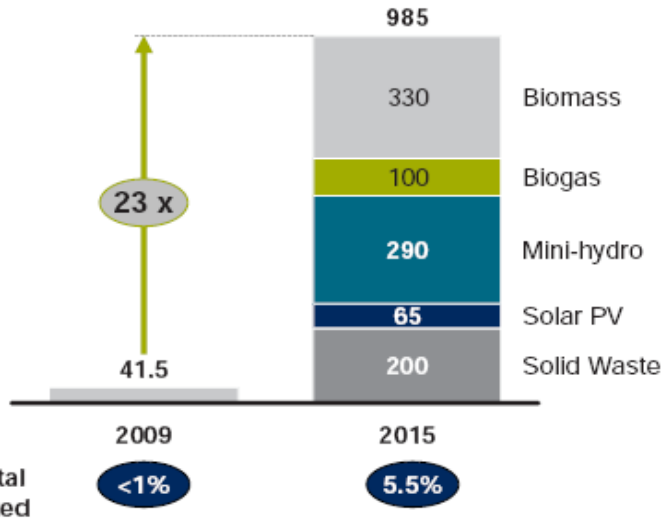


Renewable energy will increase from <1% in 2009 to 5.5% of Malaysia's total electricity generated by 2015

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

Planned increase in renewable energy capacity

MW

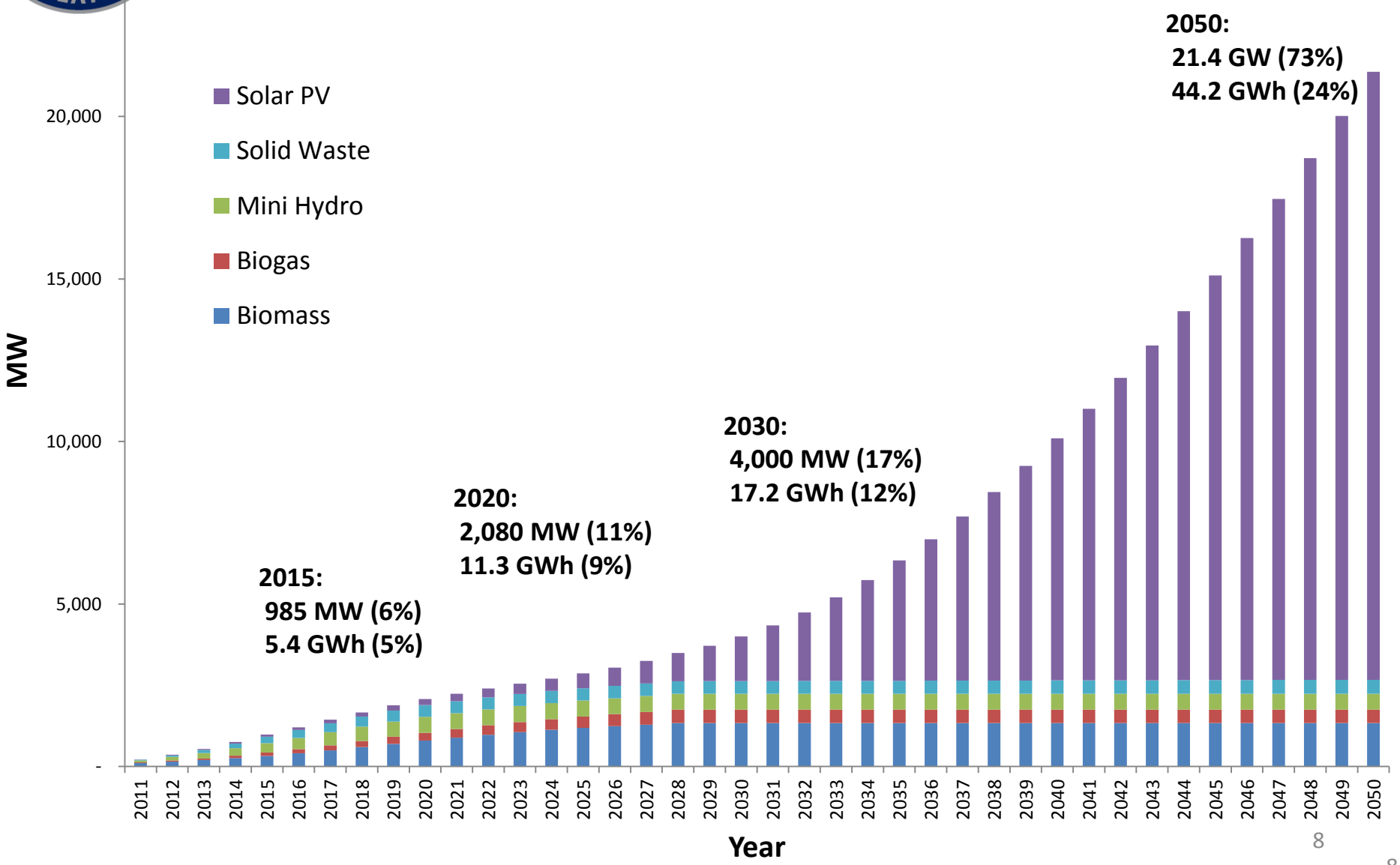


SOURCE: Ministry of Energy, Green Technology and Water

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 CO_2 avoidance** of 3.2 million tonnes

National RE Goals [excl Entry Point Project (EPP)-10]



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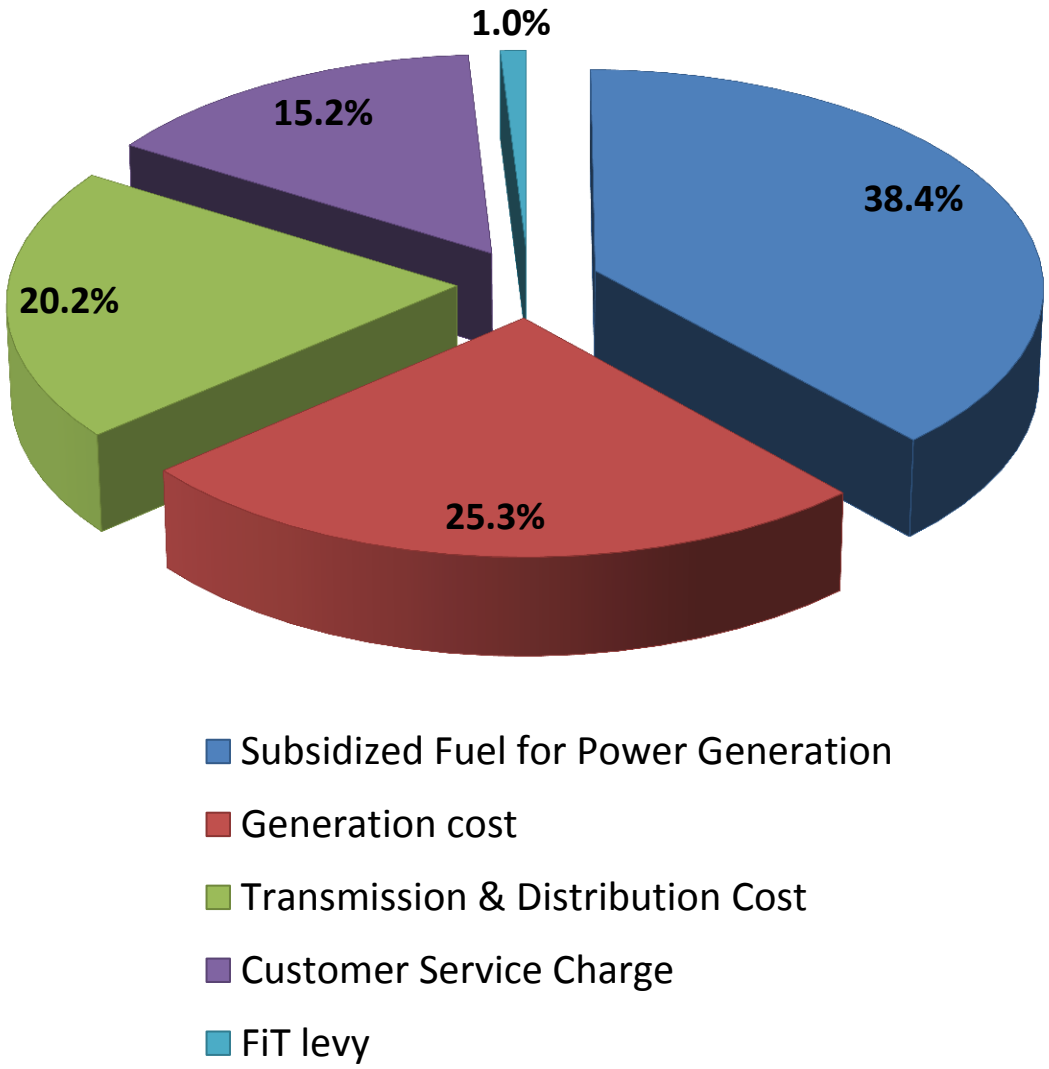
Concept of FiT

Concept of the Feed-in Tariff (FiT)

- A mechanism that allows electricity that is 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 which will make financial institutions to be comfortable in providing loan with longer period (>15 years).
  - Provides fixed revenue stream for installed system
  - Only pays for electricity produced: promotes system owner to install good quality and maintain the system
  - With suitable degression rate, manufacturers and installers are promoted to reduce prices while enhancing quality

Source of Fund for FiT



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

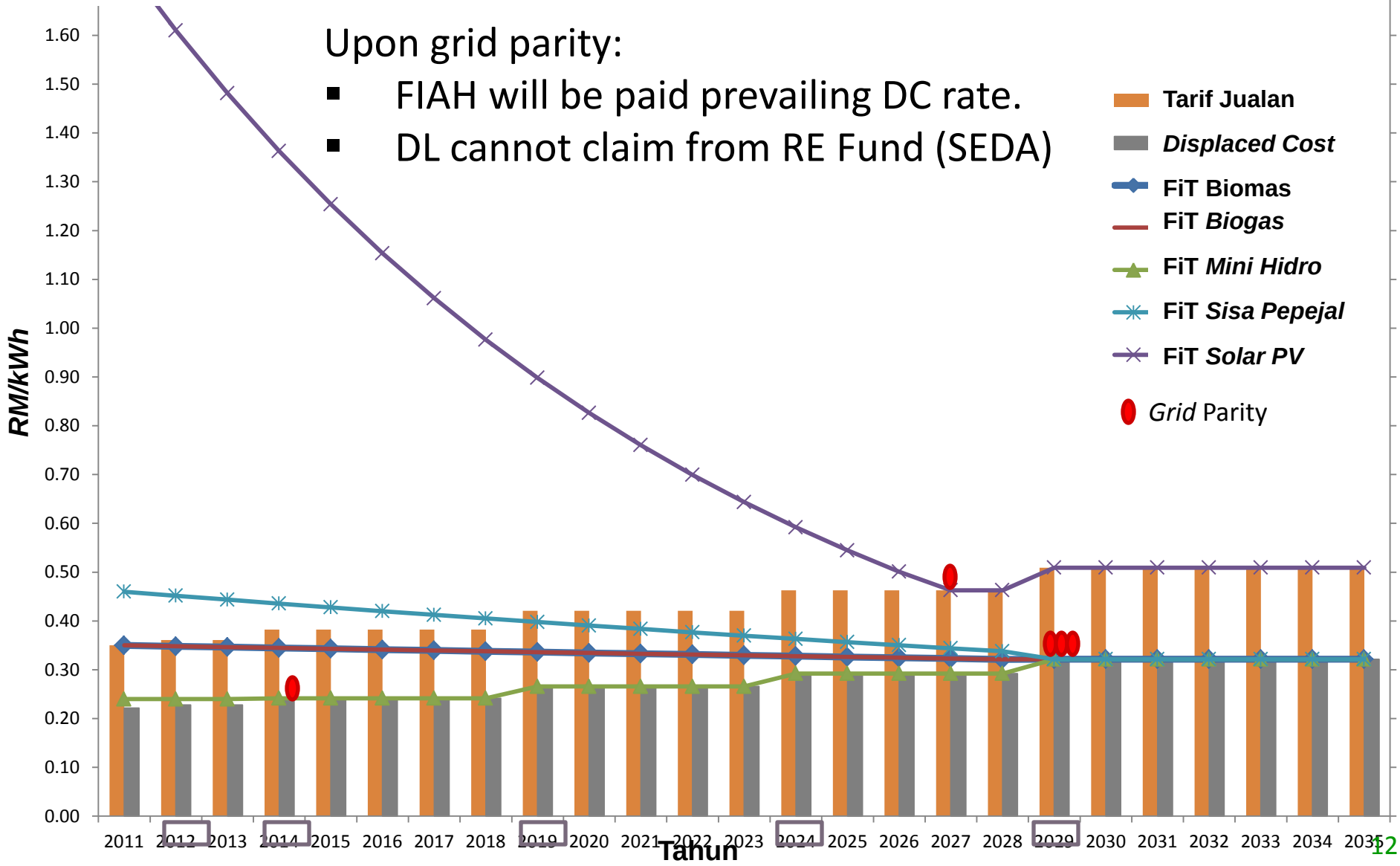
Benefit

- polluters pay concept
- will not affect 75% of electricity consumers (≤ 300 kWh/mth)
- encourages EE

Degression & Grid Parity (Projected)

Upon grid parity:

- FIAH will be paid prevailing DC rate.
- DL cannot claim from RE Fund (SEDA)



Potential Impact of National RE Policy by Year 2020

- Minimum **RM 2.1 billion savings of external cost** to mitigate CO2 emissions (total 42 million tonnes avoided from 2011 to 2020, on the basis of RM 50 per tonne of external cost);
- Minimum **RM 19 billion of loan values** for RE projects, which will provide local banks with new sources of revenues (at 80% debt financing for RE projects);
- Minimum **RM 70 billion of RE business revenues** generated from RE power plants operation, which can generate **tax income of minimum RM 1.75 billion to Government;**
- > 50,000 **jobs created** to construct, operate and maintain RE power plants (on the basis of 15-30 job per MW).

Design of FiT & Degression Rates

RE Law Schedule: Biogas

First Column	Second Column	Third Column	Fourth Column	Fifth Column
Renewable resource	**Description of qualifying renewable energy installation**	**Feed-in tariff rate (in ringgit per kilowatt hour)**	**Effective period (commencing from the feed-in tariff commencement date)**	**Annual degression rate**
Biogas	*(a)* Renewable energy installation having an installed capacity of:	*Basic feed-in tariff rate*		
	(i) up to and including 4 megawatts	0.32	16 years	0.5 %
	(ii) above 4 megawatts, and up to and including 10 megawatts	0.30	16 years	0.5 %
	(iii) above 10 megawatts, and up to and including 30 megawatts	0.28	16 years	0.5 %
	(b) Renewable energy installation having any one or more of the following criteria in addition to *(a)* above:	*Bonus feed-in tariff rate in addition to basic feed-in tariff rate*		
	(i) use of gas engine technology with electrical efficiency of above 40%	+ 0.02	16 years	0.5 %
	(ii) use of locally manufactured or assembled gas engine technology	+ 0.01	16 years	0.5 %
	(iii) use of landfill or sewage gas as fuel source	+ 0.08	16 years	1.8 %

RE Law Schedule: Biomass

First Column	Second Column	Third Column	Fourth Column	Fifth Column
Renewable resource	**Description of qualifying renewable energy installation**	**Feed-in tariff rate (in ringgit per kilowatt hour)**	**Effective period (commencing from the feed-in tariff commencement date)**	**Annual degression rate**
Biomass	*(a)* Renewable energy installation having an installed capacity of:	*Basic feed-in tariff rate*		
	(i) up to and including 10 megawatts	0.31	16 years	0.5 %
	(ii) above 10 megawatts, and up to and including 20 megawatts	0.29	16 years	0.5 %
	(iii) above 20 megawatts, and up to and including 30 megawatts	0.27	16 years	0.5 %
	(b) Renewable energy installation having any one or more of the following criteria in addition to *(a)* above:	*Bonus feed-in tariff rate in addition to basic feed-in tariff rate*		
	(i) use of gasification technology	+ 0.02	16 years	0.5 %
	(ii) use of steam-based electricity generating systems with overall efficiency of above 14%	+ 0.01	16 years	0.5 %
	(iii) use of locally manufactured or assembled gasification technology	+ 0.01	16 years	0.5 %
	(iv) use of municipal solid waste as fuel source	+ 0.10	16 years	1.8 %

RE Law Schedule: Small Hydropower

First Column	Second Column	Third Column	Fourth Column	Fifth Column
Renewable resource	**Description of qualifying renewable energy installation**	**Feed-in tariff rate (in ringgit per kilowatt hour)**	**Effective period (commencing from the feed-in tariff commencement date)**	**Annual degression rate**
Small hydropower	Renewable energy installation having an installed capacity of up to and including 10 megawatts	0.24	21 years	0 %
	Renewable energy installation having an installed capacity of above 10 megawatts, and up to and including 30 megawatts	0.23	21 years	0 %

RE Law Schedule: Solar PV

First Column	Second Column	Third Column	Fourth Column	Fifth Column
Renewable resource	**Description of qualifying renewable energy installation**	**Feed-in tariff rate (in ringgit per kilowatt hour)**	**Effective period (commencing from the feed-in tariff commencement date)**	**Annual degression rate**
Solar photovoltaic	*(a)* Renewable energy installation having an installed capacity of:	*Basic feed-in tariff rate*		
	(i) up to and including 4 kilowatts	1.23	21 years	8.0 %
	(ii) above 4 kilowatts, and up to and including 24 kilowatts	1.20	21 years	8.0 %
	(iii) above 24 kilowatts, and up to and including 72 kilowatts	1.18	21 years	8.0 %
	(iv) above 72 kilowatts, and up to and including 1 megawatt	1.14	21 years	8.0 %
	(v) above 1 megawatt, and up to and including 10 megawatts	0.95	21 years	8.0 %
	(vi) above 10 megawatts, and up to and including 30 megawatts	0.85	21 years	8.0 %

Rates valid until 27th March 2013

RE Law Schedule: Solar PV .. cont

First Column	Second Column	Third Column	Fourth Column	Fifth Column
Renewable resource	**Description of qualifying renewable energy installation**	**Feed-in tariff rate (in ringgit per kilowatt hour)**	**Effective period (commencing from the feed-in tariff commencement date)**	**Annual degression rate**
	(b) Renewable energy installation having any one or more of the following criteria in addition to *(a)* above:	*Bonus feed-in tariff rate in addition to basic feed-in tariff rate*		
	(i) use as installations in buildings or building structures	+ 0.26	21 years	8.0 %
	(ii) use as building materials	+ 0.25	21 years	8.0 %
	(iii) use of locally manufactured or assembled solar photovoltaic modules	+ 0.03	21 years	8.0 %
	(iv) use of locally manufactured or assembled solar inverters	+ 0.01	21 years	8.0 %

Rates valid until 27th March 2013

Solar PV Revised Degression : Basic Rate

Rates effective from 28th March 2013

Renewable energy installation having an installed capacity of	Basic rate	Annual Degression	Proposal	
			2013	2014
1. up to and including 4 kilowatts	RM 1.23	8%	8%	8%
2. above 4 kilowatts, and up to and including 24 kilowatts	RM 1.20	8%	8%	8%
3. above 24 kilowatts, and up to and including 72 kilowatts	RM 1.18	8%	20%	20%
4. above 72 kilowatts, and up to and including 1 megawatts	RM 1.14	8%	20%	20%
5. above 1 megawatts kilowatts, and up to and including 10 megawatts	RM 0.95	8%	20%	20%
6. above 10 megawatts kilowatts, and up to and including 30 megawatts	RM 0.85	8%	20%	20%

Solar PV Revised Degression: Bonus Rate

Rates effective from 28th March 2013

Renewable energy installation having any one or more of the following criteria in addition to basic rate	Bonus rate	Annual degression	Proposal	
			2013	2014
1. use as installation in building or building structures	+RM 0.26	8%	8%	8%
2. use as building materials	+RM 0.25	8%	8%	8%
3. use as locally manufactured or assembled solar photovoltaic module	+RM 0.03	8%	0%	0%
4. use of locally manufactured or assembled solar inverters	+RM 0.01	8%	0%	0%

RE Law Schedule: Solar PV (Effective 28 March 2013)

Description of Qualifying Renewable Energy Installation	FiT Rates (RM per kWh)	
(a) Basic FiT rates having installed capacity of :	2013	2014
(i) up to and including 4kW	1.1316	1.0411
(ii) above 4kW and up to and including 24kW	1.1040	1.0157
(iii) above 24kW and up to and including 72kW	0.9440	0.7552
(iv) above 72kW and up to and including 1MW	0.9120	0.7296
(v) above 1MW and up to and including 10MW	0.7600	0.6080
(vi) above 10MW and up to and including 30MW	0.6800	0.5440
(b) Bonus FiT rates having the following criteria (one or more) :	2013	2014
(i) use as installation in buildings or building structures	+0.2392	+0.2201
(ii) use as building materials	+0.2300	+0.2116
(iii) use of locally manufactured or assembled solar PV modules	+0.0300	+0.0300
(iv) use of locally manufactured or assembled solar inverters	+0.0100	+0.0100

FiT Implementation & Outcome

SEDA Malaysia's Portal & FiT DashBoard
www.seda.gov.my

ANNOUNCEMENTS

- The e-FiT system will not be available from 10.00 p.m. 22nd May 2013 till 12.00 noon 23rd May 2013 *20/05/2013*
- Request for Quotation (RFQ) - Development of Standard Operating Procedures for Implementation of the Feed-inTariff mechanism *14/05/2013*
- SEDA MALAYSIA Will Re-open Solar PV Quota for Non-Individual under 500kW Category at 12pm, 23rd May, 2013 *09/05/2013*
- Slide Presentation for the Dialogue on Solar PV Application , FiT Application and FiA Profile Submission checklist were UPLOADED! *09/05/2013*
- Important Notice to all Solar PV FiA applicants who submitted applications on 2nd April 2013 *03/05/2013*

MORE

LATEST NEWS

- 1% charge not aimed at unwary clients *13/05/2013*
- Seda Malaysia Buka Semula Permohonan Kuota Solar Fotovolta *10/05/2013*

FiT DASHBOARD

FiT Rates | RE Quota | RE Capacity | RE Generation

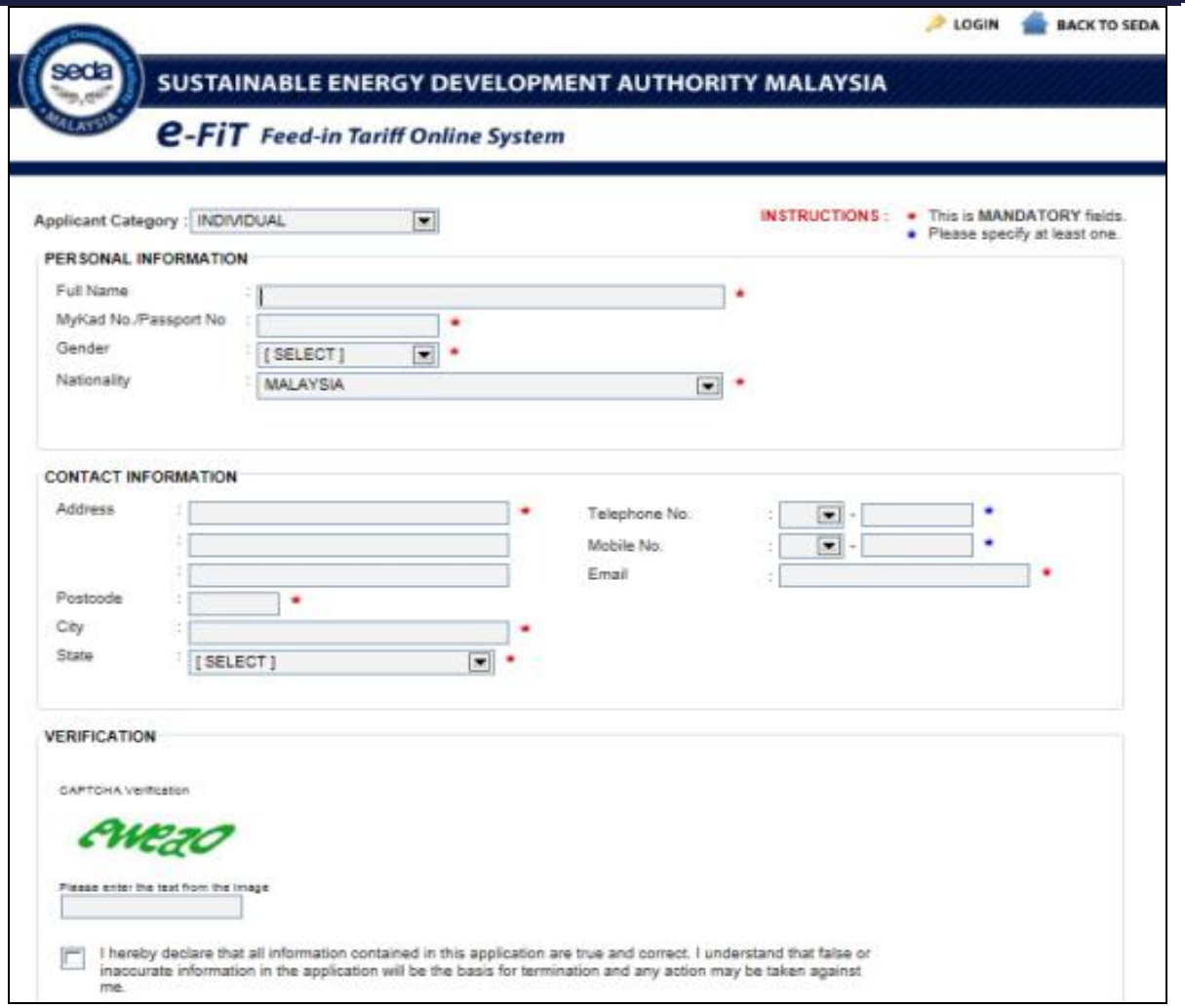
Biogas | Biomass | Small Hydro | **Solar PV**

Available MW installed capacity for FiT Applications	2013		2014		2015		2016	
	H1	H2	H1	H2	H1	H2	H1	H2
Individual	2.97	3.98	0.00	0.00	0.00	0.00	TBA	TBA
Non-individual (≤ 500 kW)	0.00	0.00	0.00	0.00	0.00	0.00	TBA	TBA
Non-individual (> 500 kW)	0.00	0.00	0.00	0.00	0.00	0.00	TBA	TBA

Allocated MW installed capacity	2013		2014		2015		2016	
	H1	H2	H1	H2	H1	H2	H1	H2
Individual	5.23	1.98	0.00	0.00	0.00	0.00	0.00	0.00
Non-individual (≤ 500 kW)	1.98	14.44	0.72	0.00	0.00	0.00	0.00	0.00
Non-individual (> 500 kW)	32.26	26.24	29.53	0.00	0.00	0.00	0.00	0.00

QUICK LINKS

e-FiT Online System



- FiT quota approvals on 'first come, first served basis' – upon submission of complete application & document
- FiT quota is dynamic

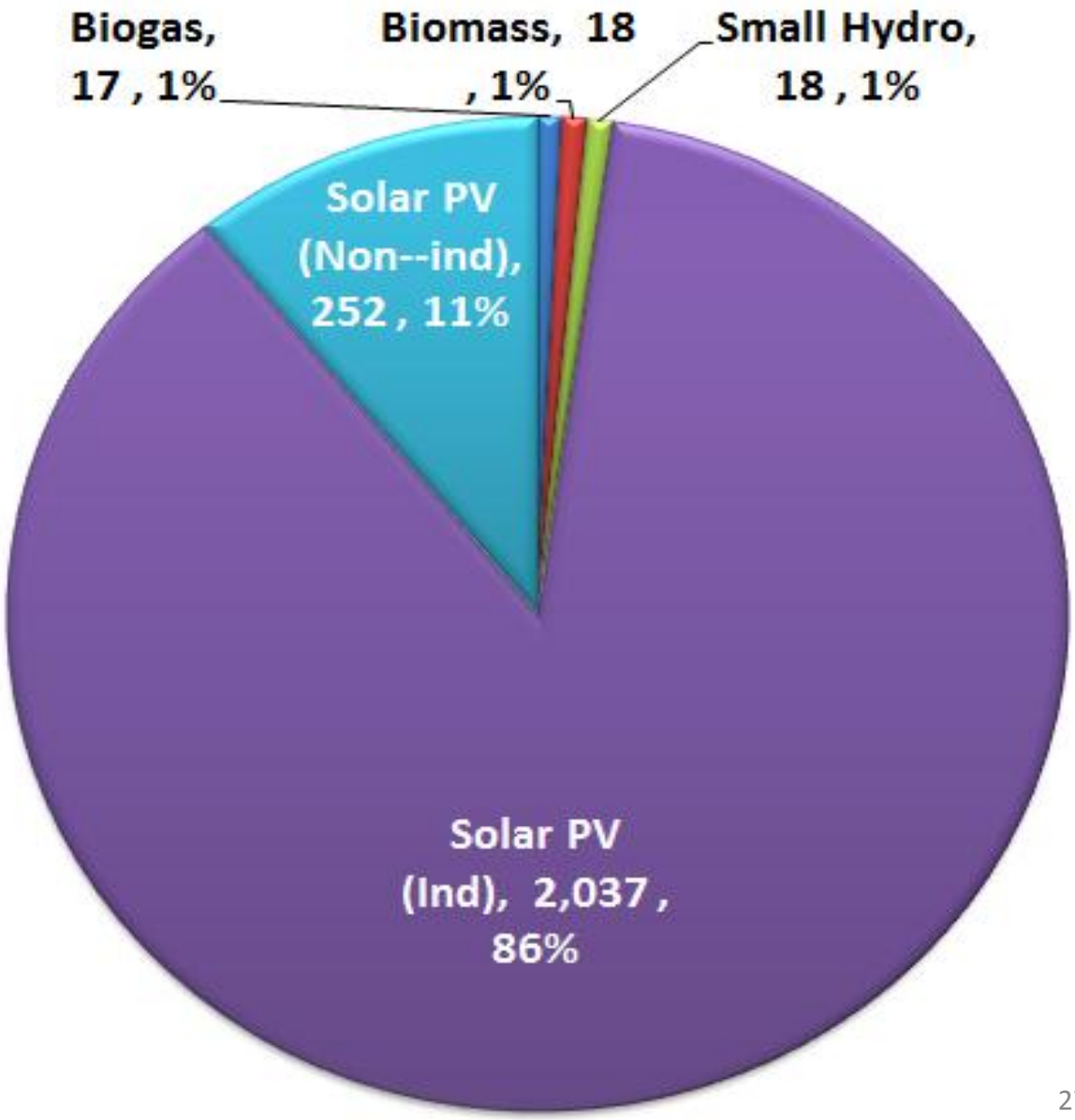
Annual RE Quota as on 1st Dec 2011 (Up to 2014)

Year	Biogas	Biogas - Sewage	Biomass	Solid-Waste	Small Hydro	Solar PV < 1MW	Solar PV > 1MW	Total (MW)
	MW	MW	MW	MW	MW	MW	MW	
2011/ 2012	20	10	60	20	30	10	40	**190**
2013	20	10	50	30	30	10	40	**190**
H1 2014	10	5	25	15	45	5	20	125

Source: www.seda.gov.my

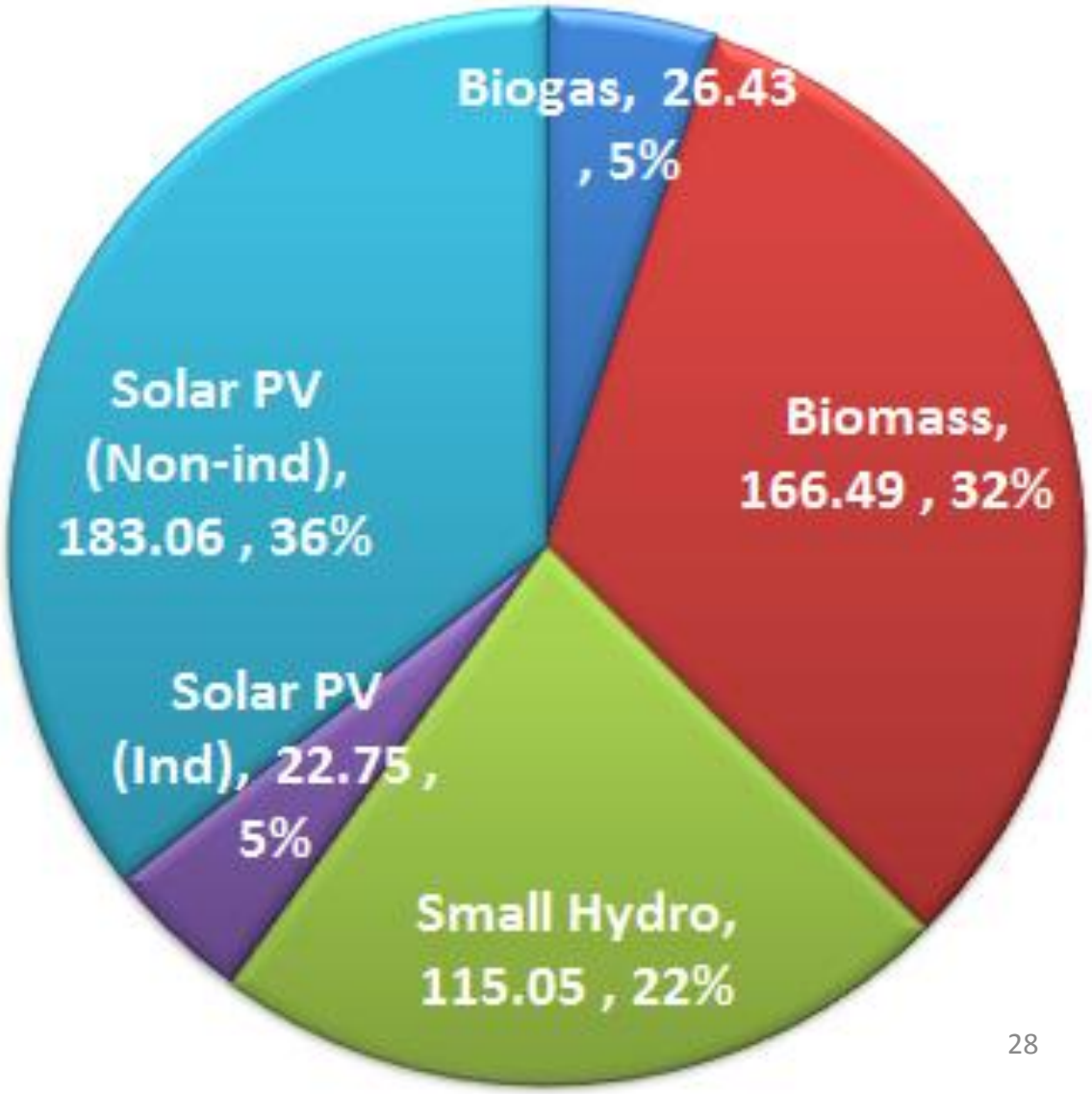
Number of Approved Applications 2012-2014 (31st August 2013)

Renewable Resource	Approved Applications
Biogas	17
Biomass	18
Small Hydro	18
Solar PV (Ind)	2,037
Solar PV (Non-ind)	252
Total	**2,342**



Approved Capacities (MW) 2012-2014 (31 July 2013)

Renewable Resource	Capacity (MW)
Biogas	26.43
Biomass	166.49
Small Hydro	115.05
Solar PV (Ind)	22.75
Solar PV (Non-ind)	183.06
Total	**513.78**



Installed Capacity (MW)

No.	Renewable Resource	Applications	Capacity (MW)
1	Biogas	4	6.41
2	Biomass	5	50.40
3	Small hydro	5	15.70
4	Solar PV (Individua)	526	8.18
5	Solar PV (Non-individual)	46	34.48
Total		586	115.16

Challenges

Challenges faced in FiT implementation (Cont)

- RE developers facing delays in implementing their projects
- Administrative barriers beyond the jurisdiction of federal gov't (e.g. small hydro projects)
- Teething matters to resolve with TNB on interconnection issues, meter reading, FiT payment to FiAHs, FiAHs changing their conditions of FiA (e.g. year of FiTCD, DAA, bonus criteria)
- Mad rush for FiAHs to achieve commercial operation by year end; be considerate – Distribution licensees (e.g. TNB) have limited resources to tend to all requests.

Challenges faced in FiT implementation

- Electricity tariff in Malaysia is highly subsidized and past studies have shown that the low electricity tariff is one of the biggest barriers towards RE & EE implementation
- RE quota is limited by availability of RE fund, currently only 1% contribution by electricity consumers (1st December 2011).
- 1% contribution is not well received by the public .
- Accusations hurled at SEDA Malaysia on the allocation of solar PV quota (2012) which obliged SEDA Malaysia to impose more stringent rules (2013).

Thank you

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