



Feed-in Tariff Updates

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Disclaimer

The information provided is within the context of the National Renewable Energy Policy & Action Plan, the Renewable Energy Bill, and the Sustainable Energy Development Authority Bill currently tabled in the Parliament, and the Economic Transformation Programme (EPP-10: Building Up Solar Power Capacity).

The information has been compiled in good faith. However, the information may change without prior notice.

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ANNOUNCEMENTS

- Workshop on REPPA Discussion, 27th January 2011
- **Feed-in Tariff Updates**
We have relocated our office to the Ministry of Energy, Green Technology and Water, Malaysia (KeTTHA). Please check web page on contact us
- BIPV Tender of 3 kWp at a Private Residence in Sungai Penchala
- Renewable Energy Bill 2010 was first read by YB Minister in Dewan Rakyat on 15th December 2010

LATEST PV SYSTEM INSTALLATIONS



Sek. Men, Keb. St. John
5.04 kWp

KANEKA GEA060 (Thin Film)

60 Wp x 84 units

SMA SB1700 and SB3300

LATEST NEWS

- 1,400 megawatts solar power annually by 2013 15 Dec 2010
- Renewable Energy Bill 2010 was first read by YB Minister in Dewan Rakyat on 15th December 2010
- Inauguration of AUO SunPower in Malaysia 15 Dec 2010
- Electricity price increase. if any. likely to be 1%-2% 10 Dec



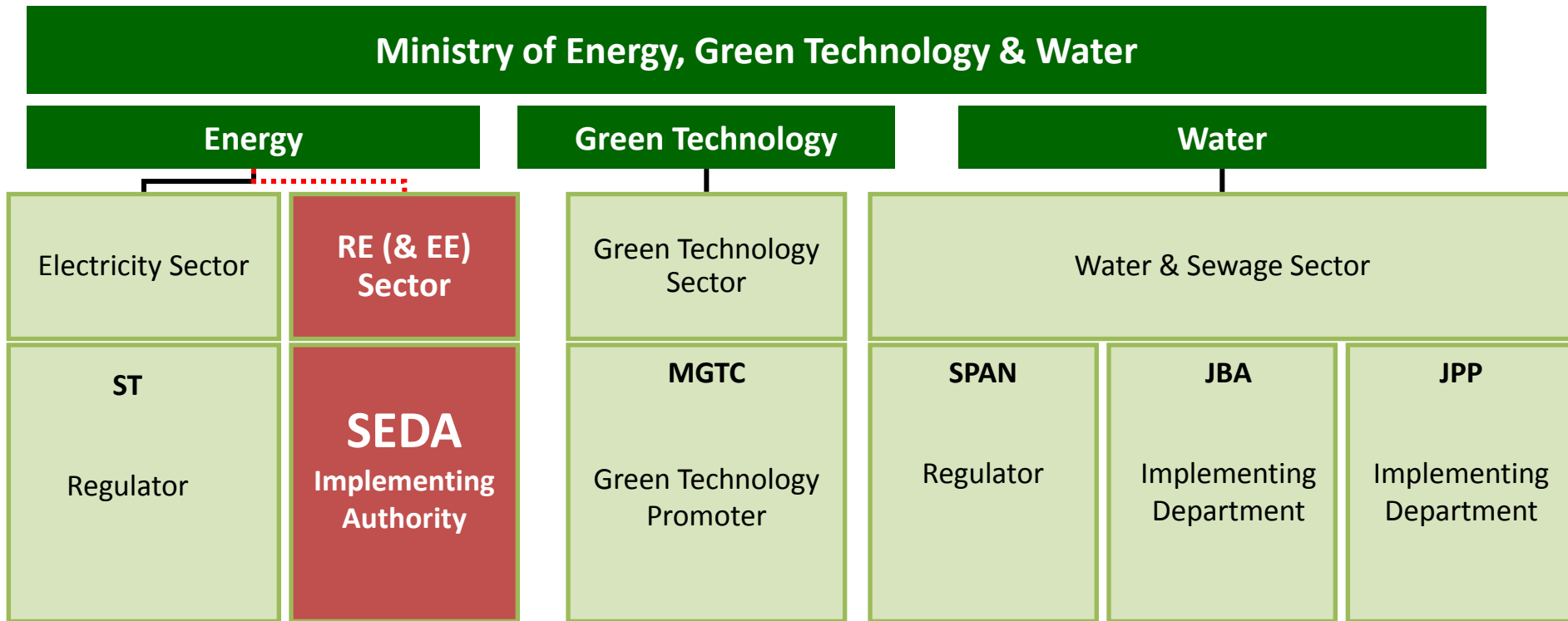
Private Bungalows, Bandar Eco Setia
10.29 kWp

Mitsubishi PV-AD 180MF5
(Polycrystalline)

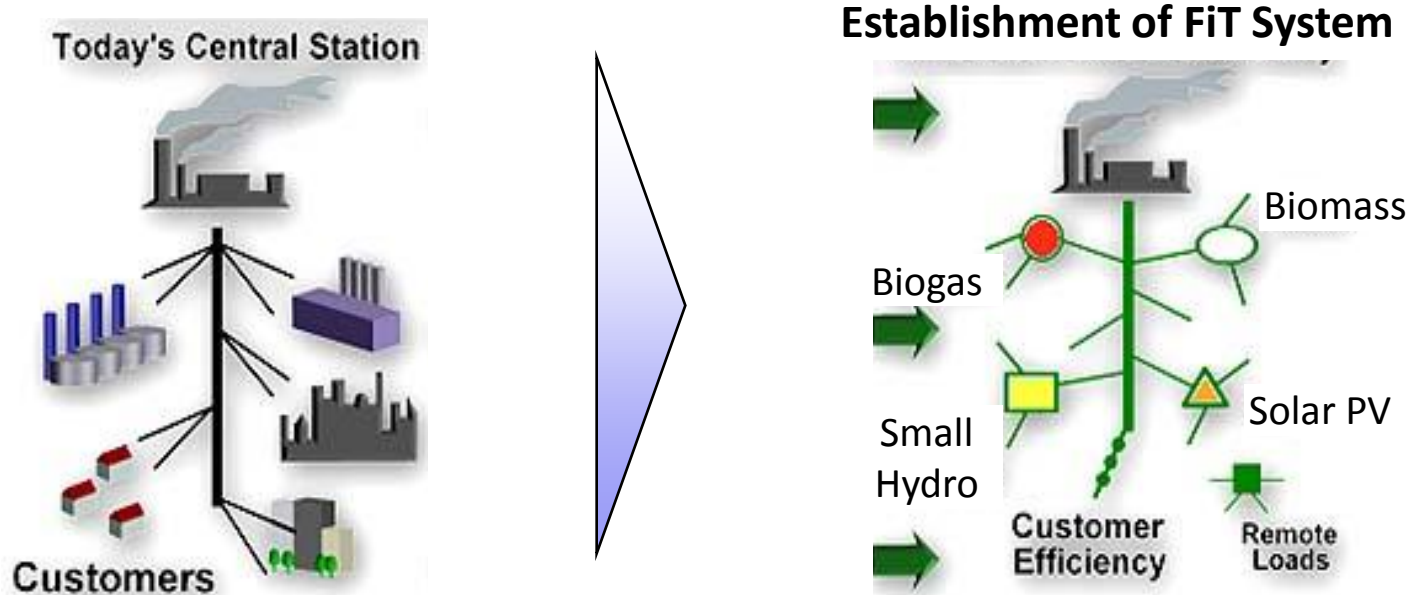
Part I: Key Interpretation

- “renewable energy” means electricity generated or produced from renewable 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 Bill;
- “renewable energy installation” means an installation which generates renewable energy and includes any technical facility of that installation which converts mechanical, chemical, thermal or electromagnetic energy directly into electricity;
- “feed-in approval holder” means a person who holds a feed-in approval;
- “distribution licensee” means the holder of a license to distribute issued by the Commission under section 9 of the Electricity Supply Act 1990;
- “Authority” means the Sustainable Energy Development Authority of Malaysia established under the Sustainable Energy Development Authority Act 2010;
- “displaced cost” means the average cost of generating and supplying one kilowatt hour of electricity from resources other than the renewable resources through the supply line up to the point of interconnection with the renewable energy installation;
- “grid parity” means, in relation to a particular renewable energy installation, the time at which the feed-in tariff rate applicable to that renewable energy installation is equal to or cheaper than the displaced cost.

Sustainable Energy Development Authority of Malaysia (SEDA Malaysia)



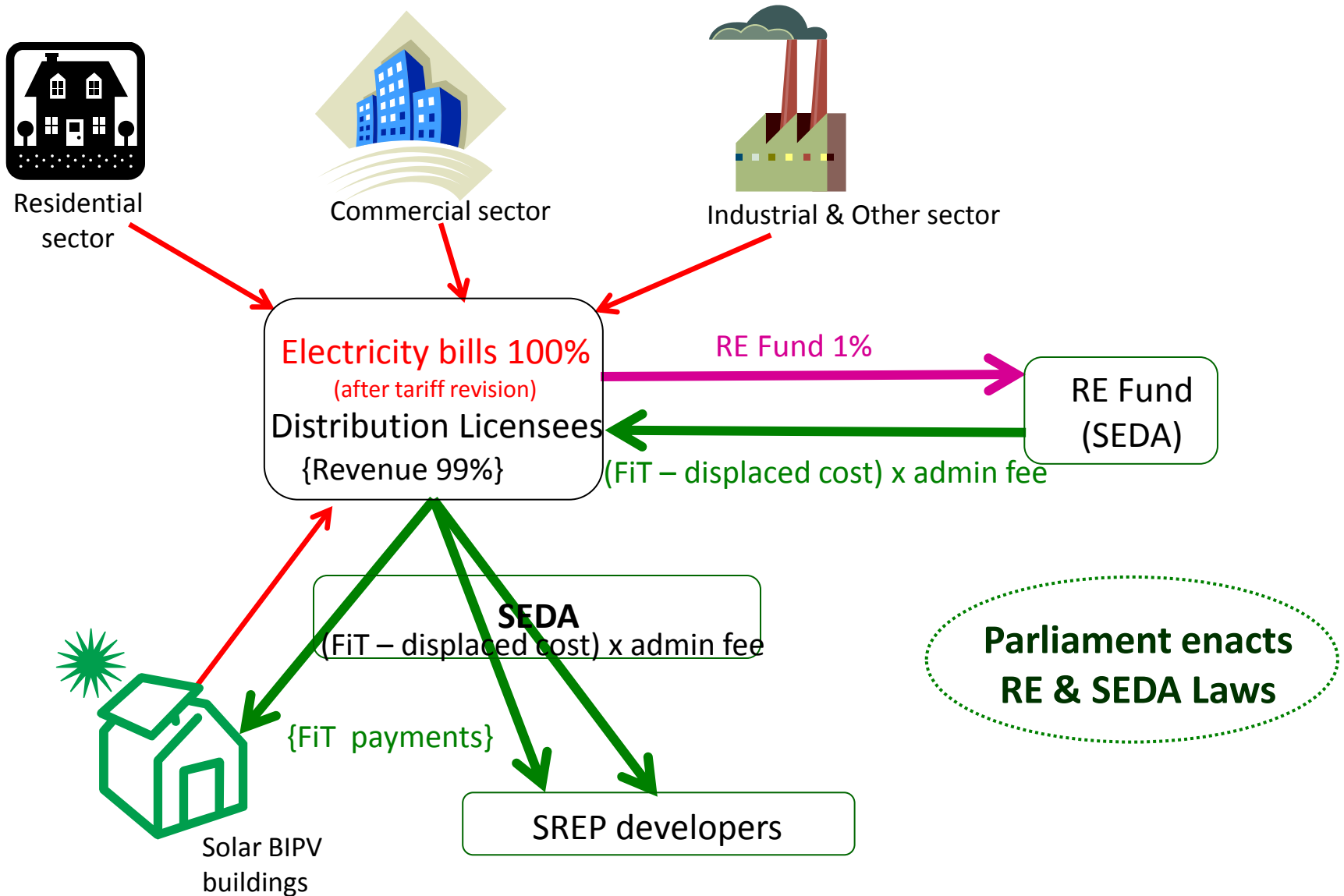
Part II – S.3: Feed-in Tariff System



Feed-in Tariff (FiT) system provides:

- Connection to supply line by RE installations
- Priority of purchase and distribution by DL
- Payment by DL to FIAH according to FiT rates

FiT Mechanism



Part II – S.4: FiT Eligibility

- RE \leq 30MW

Individuals

- Malaysians
- Foreign individuals: limited to solar \leq 72 kWp
- Direct ownership

Companies

- All legally registered companies and businesses
- Direct ownership
- Shareholding limitations:
 - 1) DL: \leq 49% within its distribution area
 - 2) Foreign companies/businesses: \leq 49%

Schedule: Biogas & FiT Rates

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:	<i>Basic feed-in tariff rate</i>		
	(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:	<i>Bonus feed-in tariff rate in addition to basic feed-in tariff rate</i>		
	(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 %

Schedule: Biomass & FiT Rates

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:	<i>Basic feed-in tariff rate</i>		
	(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:	<i>Bonus feed-in tariff rate in addition to basic feed-in tariff rate</i>		
	(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 %

Schedule: Small Hydropower & FiT Rates

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 %

Schedule: Solar PV & FiT Rates

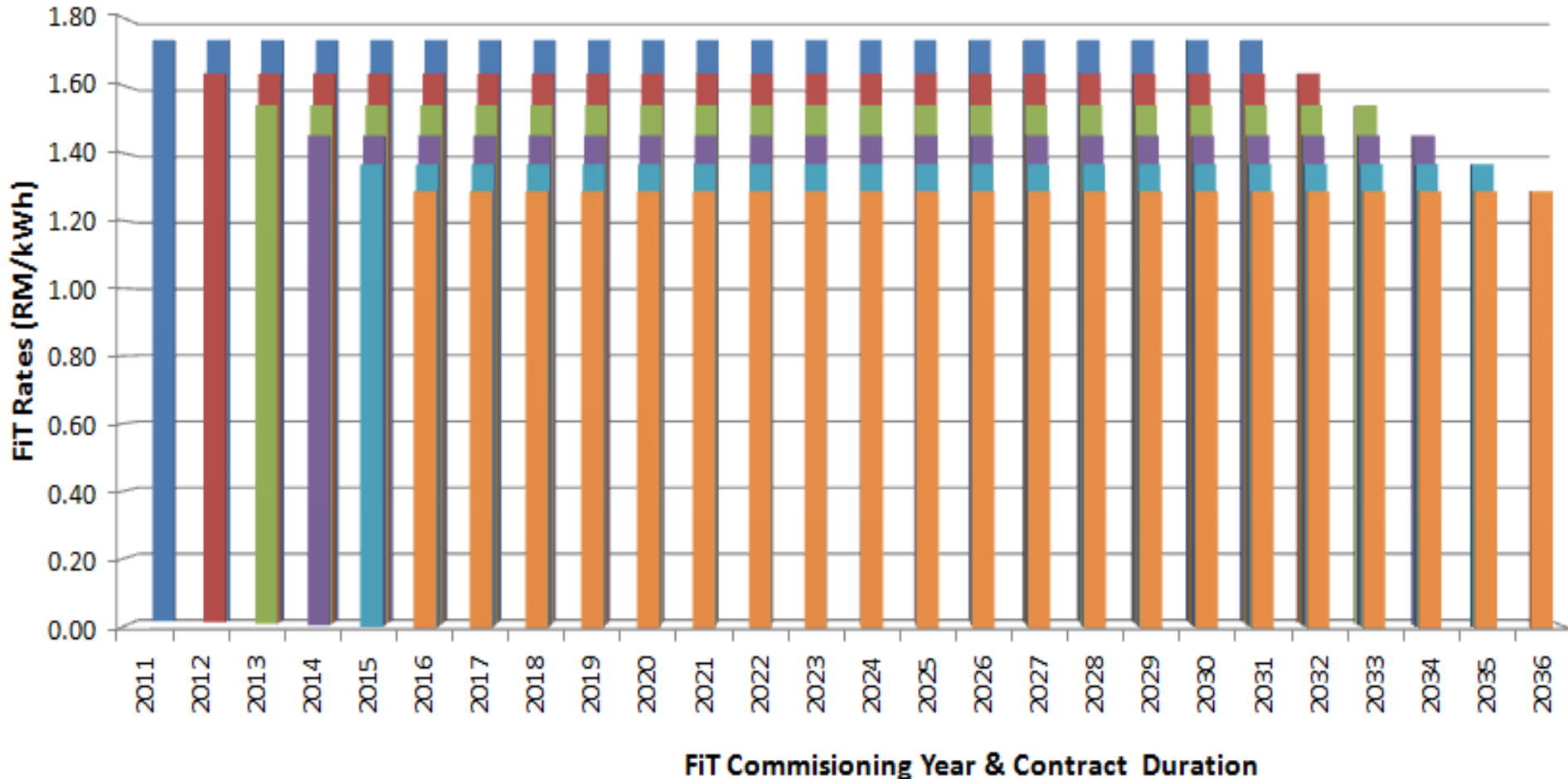
First Column	Second Column	Third Column	Fourth Column	Fifth Column
Renewable resource	Description of qualifying renewable energy installation	Feed-in tariff rate (in ringgit per kilowatt hour)	Effective period (commencing from the feed-in tariff commencement date)	Annual degression rate
Solar photovoltaic	(a) Renewable energy installation having an installed capacity of:	<i>Basic feed-in tariff rate</i>		
	(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 %
	(b) Renewable energy installation having any one or more of the following criteria in addition to (a) above:	<i>Bonus feed-in tariff rate in addition to basic feed-in tariff rate</i>		
	(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 %

Annual RE Capacity Target (Quota, MW/Year)

[RE Policy + EPP10]

Year	Biogas	Biogas-Sewage	Biomass	Biomass-Waste	Small Hydro	Solar PV ≤1MWp	Solar PP	TOTAL
2011	20	5	90	15	60	9	20	219
2012	15	10	50	20	50	11	35	191
2013	15	10	60	30	60	13	50	238
2014	25	10	60	40	60	15	80	290
2015	25	10	70	50	60	17	110	342
2016	25	10	80	30	60	19	130	354
2017	30	10	90	30	50	21	145	376
2018	30	10	100	20	40	24	155	379
2019	30	10	100	20	30	28	165	383
2020	25	10	100	10	20	33	170	368
2021	25	-	90	6		37	30	188
2022	25	-	90	5		41	80	241
2023	20	4	80			47	130	281
2024	20	3	70			60	250	403
2025	20		60			80	250	410
2026	20		50			105	250	425
2027	20		50			135	250	455
2028	20		50			175	250	495
2029						220	250	470
2030						280	300	580

Part III – S.17: FiT Degression



- Degression rate to commence on 1st January every year
- Revision: at least once every 3 years

Part IV – S.19: Recovery of Moneys by DL

Connection Voltage	Meter Reading	Invoice Deadline to DL	Payment by DL to FIAH	Claim by DL from SEDA	Payment by SEDA to DL
LV	By DL	-	By 21 st month	By 21 st month	By 28 th month
MV	By FIAH	By 7 th month	By 21 st month	By 21 st month	By 28 th month

DL to claim from SEDA:

- *RM FiT paid by DL to FIAH (ie FiT rate x kWh)*

Less

- *Displaced cost (ie DC rate x kWh)*

Multiply by admin fee (%) => suggest 2% (TNB proposed 1.5%)

Example:

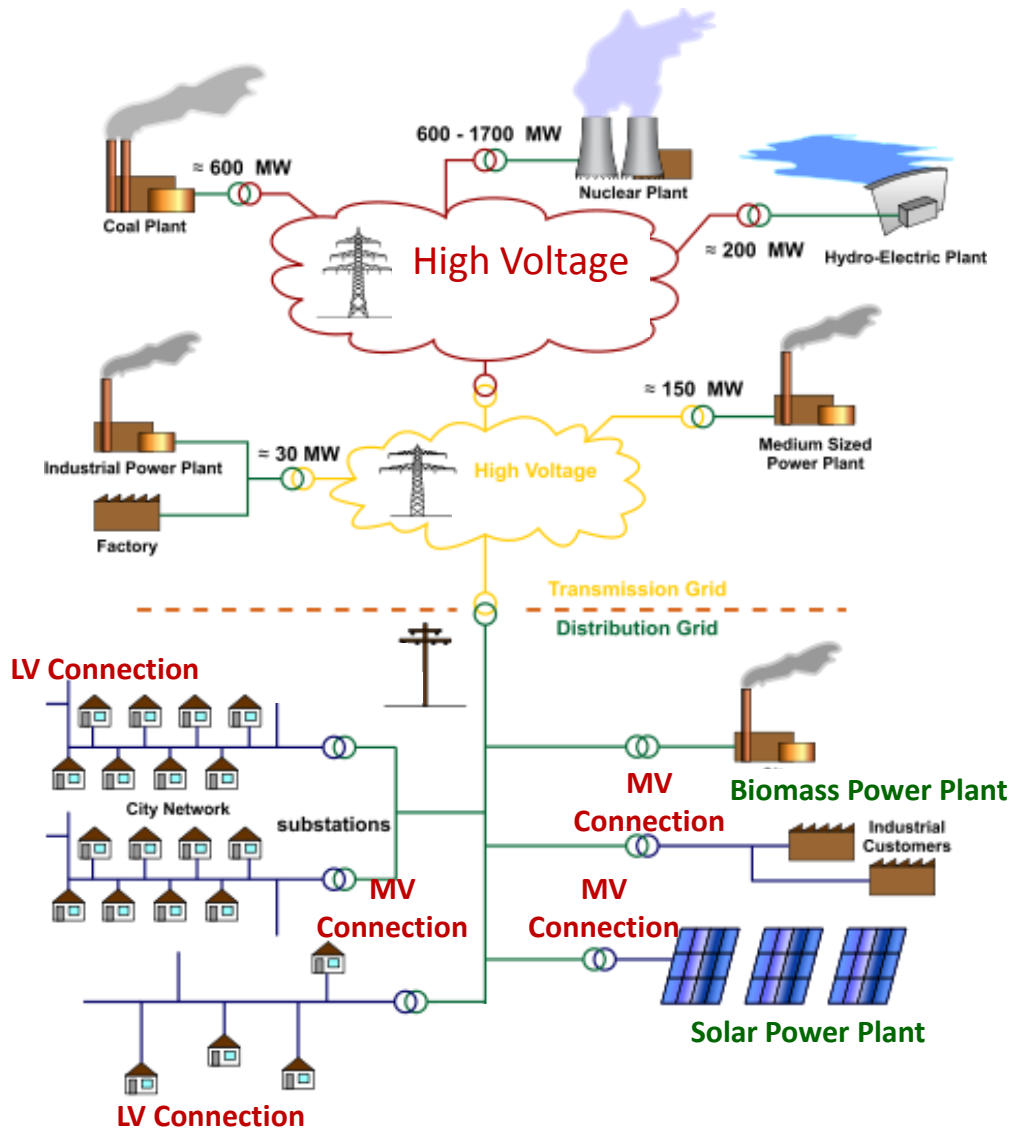
Connection Voltage	Meter Reading	Invoice (Bill) Deadline	Payment by DL to FIAH	Claim by DL from SEDA	Payment by SEDA to DL
LV	Solar PV: 100 kWh/mth	Meter read by DL	100 kWh x 1.50 RM/kWh = RM150/mth	100 kWh x (RM1.50 – RM0.3131) = RM 118.69	RM 118.69 x 102% = RM121.06

Displaced Cost Calculation

- “displaced cost” means the average cost of generating and supplying one kilowatt hour of electricity from resources other than the renewable resources through the supply line up to the point of interconnection with the renewable energy installation
- The displaced cost will increase/decrease proportionally to incremental/reduction rate of electricity tariff.

Year	Tariff Revision	LV Displaced Cost [Average Tariff] (RM/ kWh)	MV Displaced Cost (RM/kWh)
2005	-	0.2322	0.1518
2006	+ 12% (1 st June 2006)	0.2600	0.1700
2008	+ 25% avg (1 st July 2008)	0.3250	0.2125
2009	- 3.7% (1 st March 2009)	0.3131	0.2047
2011	-	0.3131	0.2047

Displaced Cost

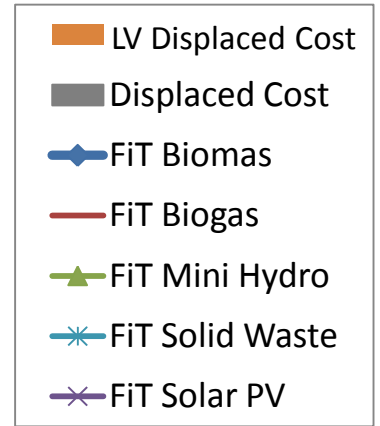


Grid Connection Point	Prevailing Displaced Electricity Cost, as at January 2011 (RM/kWh)
Medium voltage (2.2kV, 6.6kV, 11kV, 33kV)	0.2047
Low voltage (0.23kV, 0.4kV)	0.3131

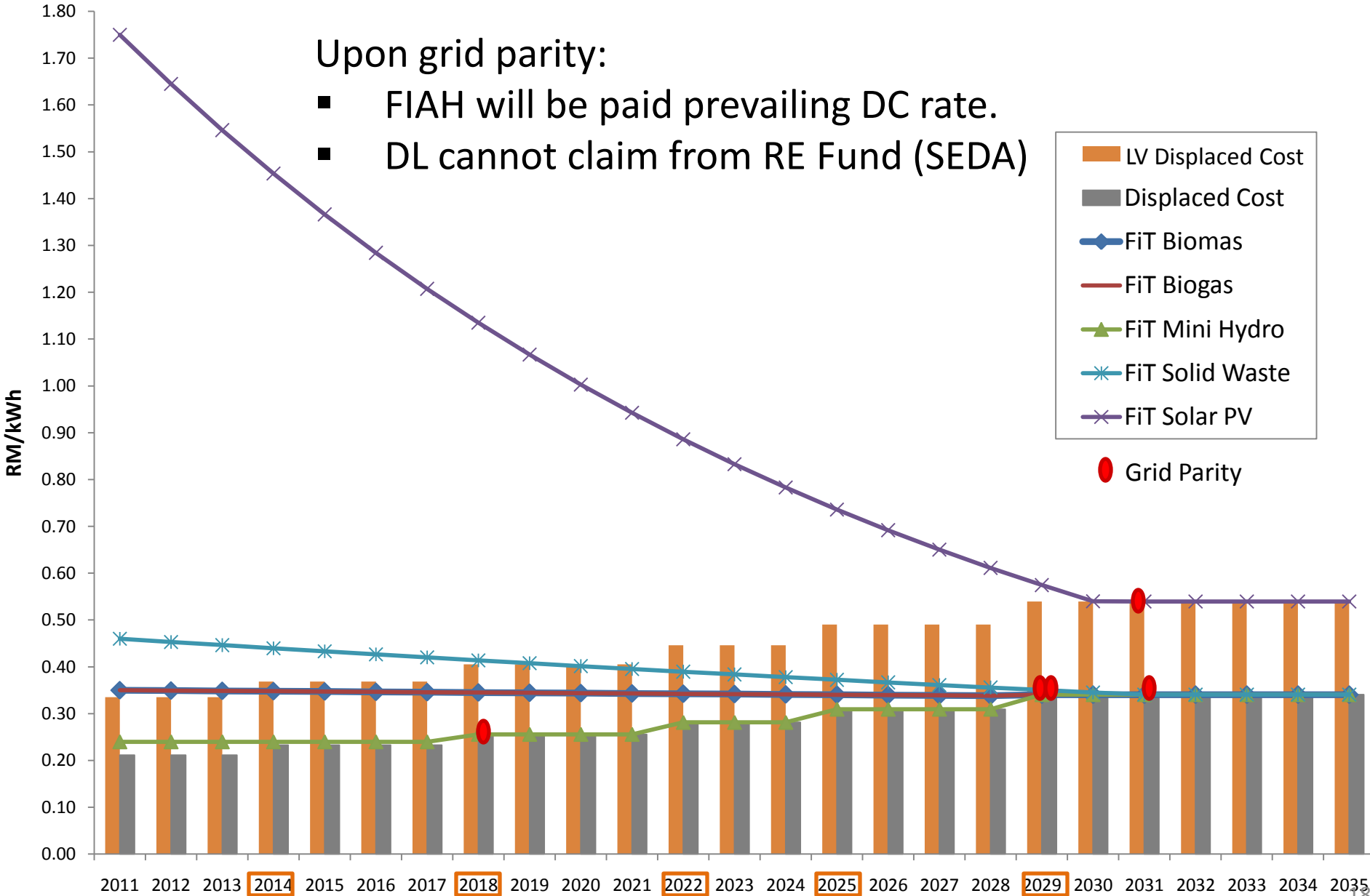
Part IV – S.20: Grid Parity

Upon grid parity:

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



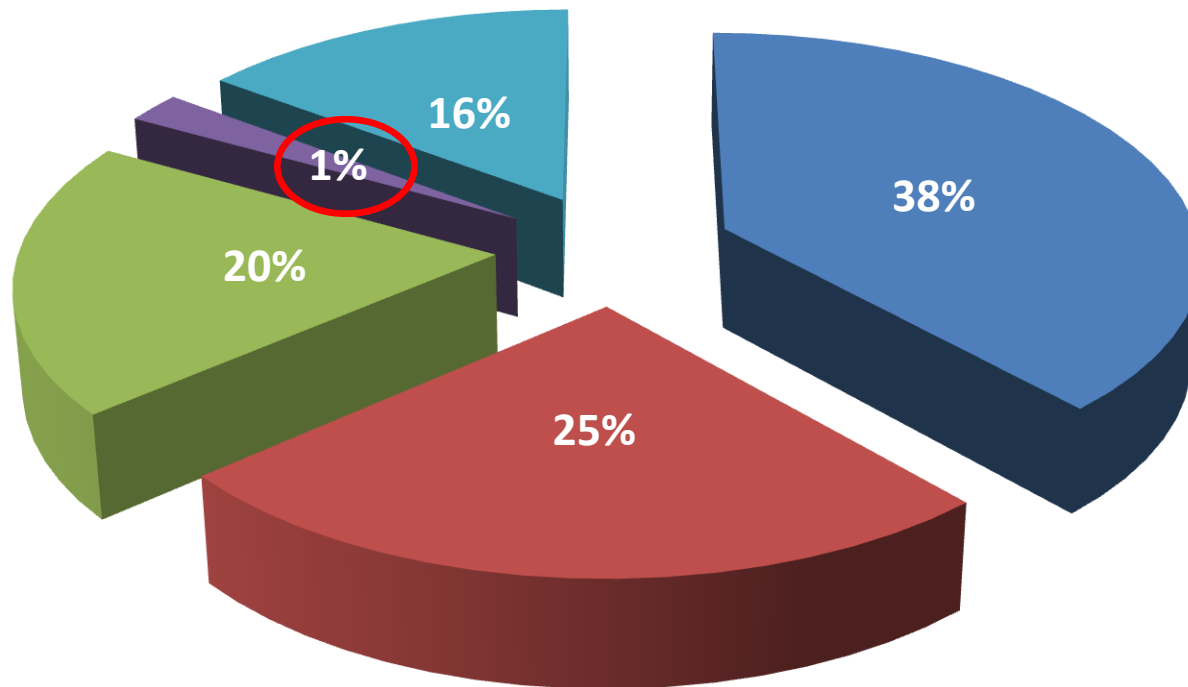
● Grid Parity



Part V – S.23: RE Fund

Cost Breakdown for Average Domestic Electricity Tariff

- Subsidized Fuel for Power Generation
- Generation Cost
- Transmission & Distribution Cost
- *FIT Cost*
- Customer Service Charge



RE Fund:

- **After tariff revision: 1% of TNB's electricity sales revenue (eg. 1% of RM28 billion = RM 280 mil)**
- In 2010, 1% = 0.31 sen/kWh
- For every RM100 per month, RM1 goes to RE
- Exempted consumers: <200 kWh/month
- Polluters pay concept
- Encourages EE and DSM

Note: Additional 1% (for RE target) + 1% (for ETP target) in subsequent tariff reviews = 3% total

Part V – S.24: Allocation from Tariff

Example:

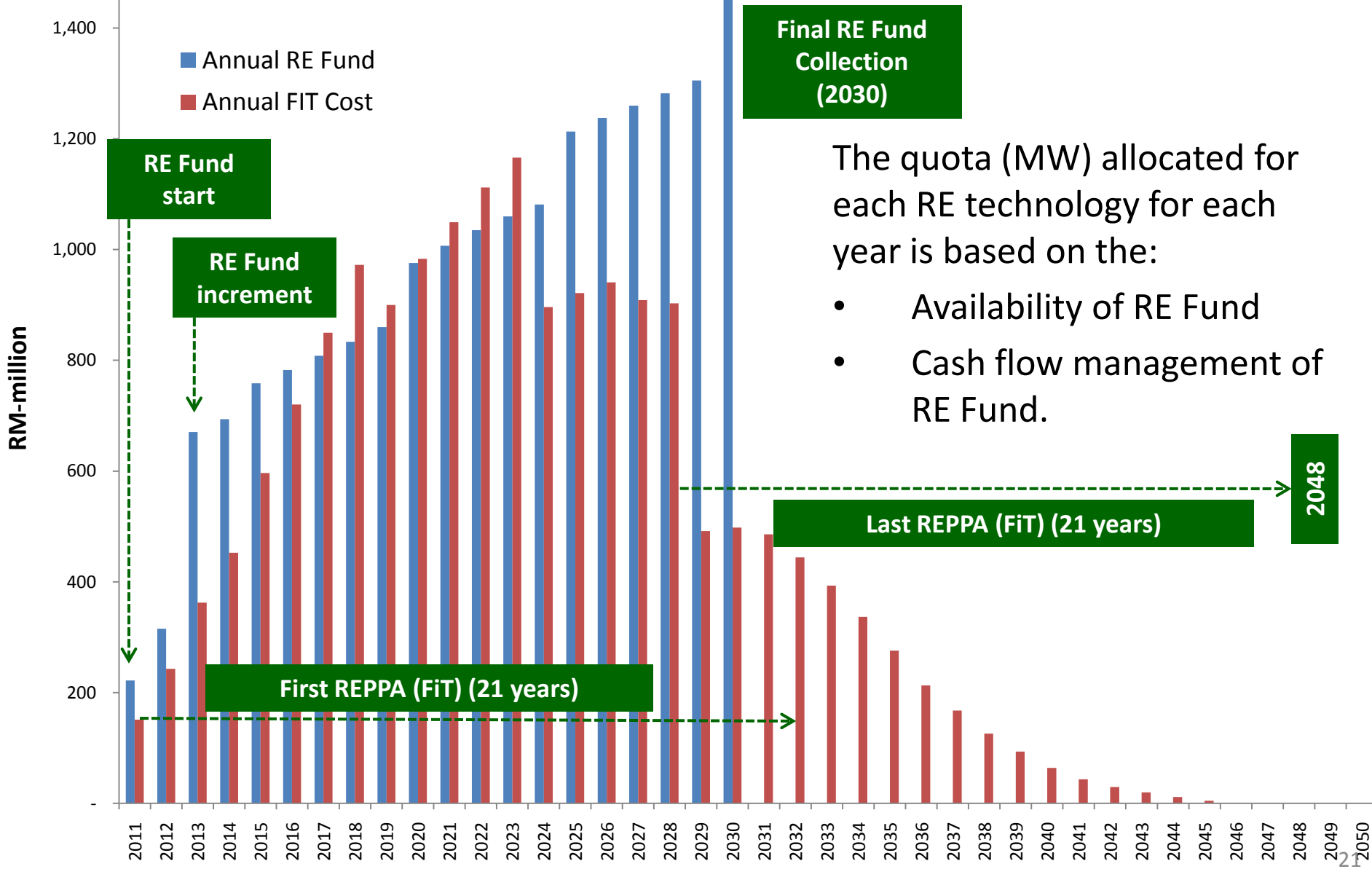
Year	TNB (P.M.) Electricity Sales	Avg. Tariff	Example Tariff Increment	TNB Electricity Sales Revenue	RE Fund % of TNB Sales Revenue	Annual RE Fund Collection
Unit	GWh	RM/kWh	%	RM-mil	%	RM-mil
2010	100,000	0.3131	0%	31,310	0%	0.00
2011	100,000	0.3131	0%	31,310	0%	189.00
2012	100,000	0.3505	11% + 1%	35,045	1%	350.45
2013	100,000	0.3505	0%	35,045	1%	350.45
2014	100,000	0.3680	5%	36,797	1%	367.97
2015	100,000	0.3680	0%	36,797	1%	367.97

Procedures:

Jan	Feb	Mar	Apr	May	Jun	Jul
Tariff increment to TNB	1st billing to TNB consumers of new tariff	1 st payment of new tariff by consumers to TNB	1 st payment by TNB to SEDA	2 nd payment by TNB to SEDA	3 rd payment by TNB to SEDA + Q1 reconciliation	4 th payment by TNB to SEDA
1 st Jan	By 1 st Feb	By 1 st Mar	By 1 st Apr	By 1 st May	By 1 st Jun	By 1 st Jul

Balancing Act: RE Fund VS FiT Transaction Cost

Annual RE Fund vs Annual FiT Transaction Cost



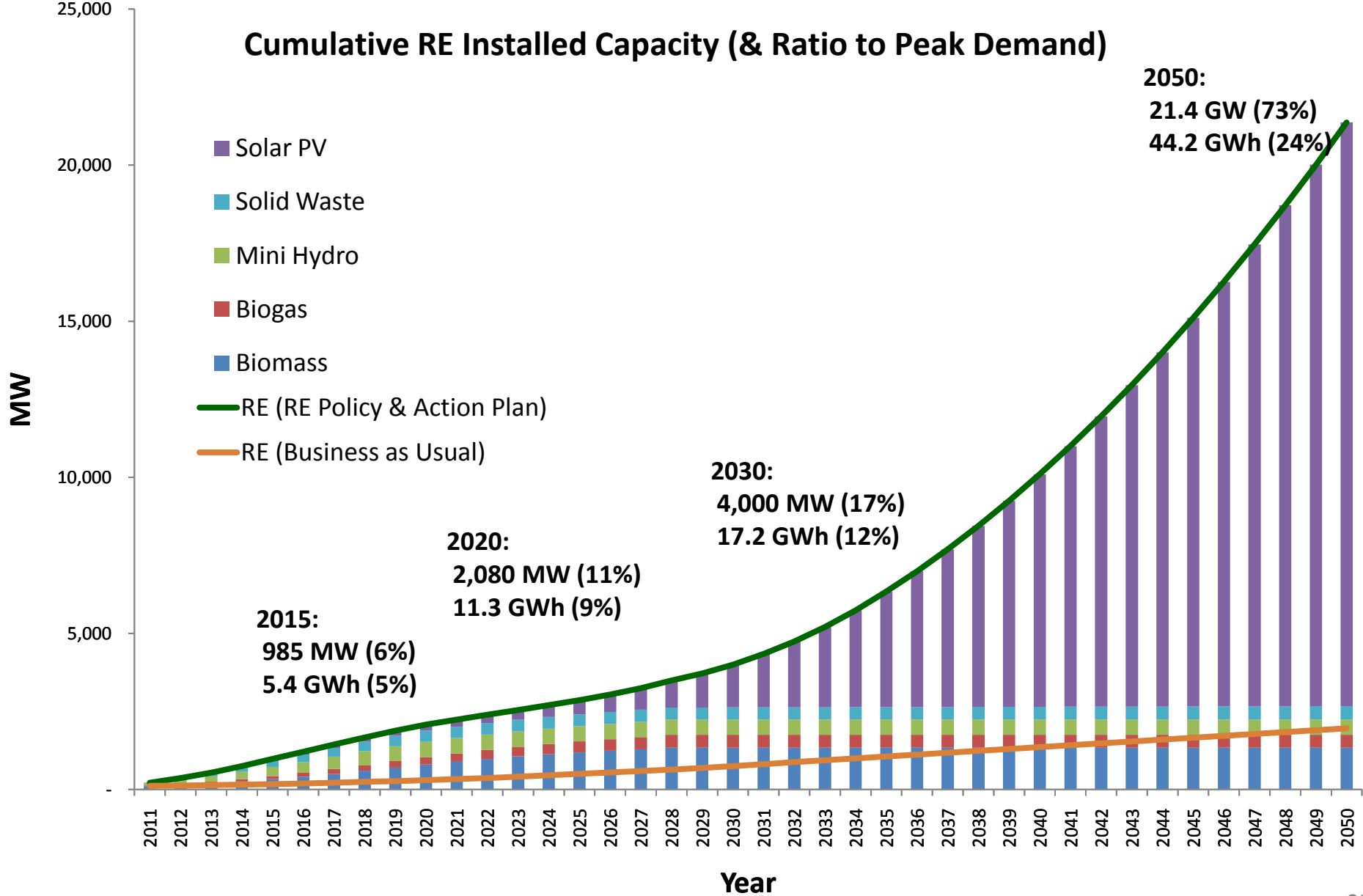
The quota (MW) allocated for each RE technology for each year is based on the:

- Availability of RE Fund
- Cash flow management of RE Fund.

2048

RE Policy & Action Plan: Goals

[Exclude EPP10]



Thank You

**More info on feed-in tariff is available from
www.mbipv.net.my**