Renewable Energy Bill
&
Subsidiary Legislations

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For Discussion

Context: National Renewable Energy Policy

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.

Strategic Thrusts (RE Action Plans):

1. Introduce appropriate regulatory framework.
2. Provide conducive environments for RE businesses.
3. Intensify human capital development.
4. Enhance RE research and development.
5. Design and implement an RE advocacy programme.

- RE Bill -

RE Bill: an Act to provide for the establishment and implementation of a special tariff system to catalyse the generation of renewable energy and to provide for related matters.

- 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

Initial Subsidiary Legislations (SS) under RE Act

SS1	FIAH eligibility criteria and conditions
SS2	Technical and operational requirements
SS3	RE sources criteria
SS4	Allocation to RE Fund (from TNB tariff)
SS5	FiT rates criteria and eligibility
SS7	Recovery of moneys (by DL) Displaced cost (LV, MV) Administration fees (to DL and SEDA)
SS8	REPPAs: • Biogas ≤ 12MW • Biogas > 12MW to ≤ 30MW • Biomass ≤ 12MW • Biomass > 12MW to ≤ 30MW • Small hydro ≤ 12MW • Small hydro > 12MW to ≤ 30MW • Solar PV ≤ 1MW • Solar PV > 1MW to ≤ 30MW

RE Bill - Part I: Key Interpretation

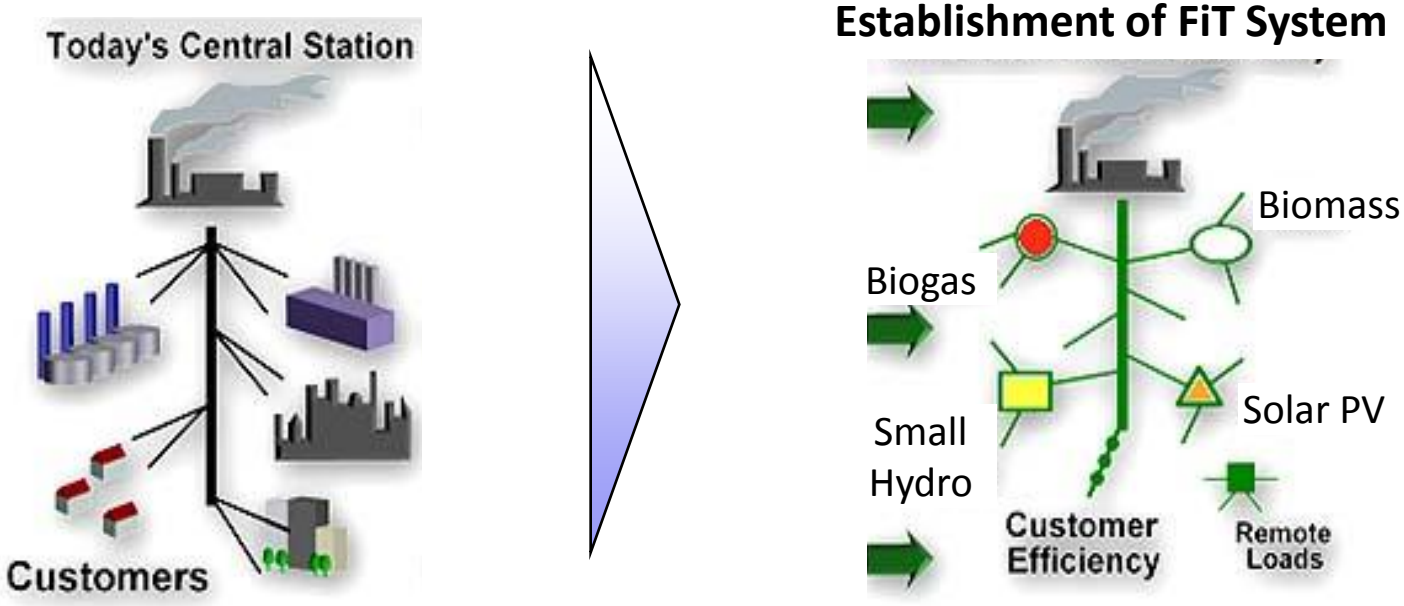
- "renewable energy" means electricity generated or produced from renewable resources.
- "renewable resources" means the recurring and non-depleting indigenous resources or technology as set out in the first column of the Schedule of the RE Bill;
- "renewable energy installation" means an installation 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.

Critical Factors for Effective FiT Mechanism

Must be guaranteed via the **RE Act**, whereby:

- Access to the grid is **guaranteed** – utilities legally obliged to accept all electricity generated by RE private producers. **S12, S13, S14**
- Local approval procedures are **streamlined and clear**. **Part II, S15**
- FiT rates must be **high enough** to produce a ROI plus reasonable profit (not excessively) to act as an incentive. **S16, Schedule**
- FiT rates will be **fixed for a period** (typically 20 years) to give certainty and provide businesses with clear investment environment. **S16, Schedule**
- Adequate "**degression**" for the FiT rates to promote cost reduction to achieve “grid parity” **S17, S18, Schedule**
- Adequate **fund** is created to pay for the FiT rates (incremental cost) and guarantee the payment for the whole FiT contract period. **S23, S24, S25, S19**
- The design of the FiT must be **customized** to suit contextual conditions of the country. **REA**
- Implementation by a competent body in a professional manner that includes constant **monitoring, progress reporting and transparency**. **SEDA, S28, S56**

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

For Discussion

FiT Application Steps (SEDA) – RE & ≤72kW Solar

Step 1	Interest party check/comply with (check at www.seda.gov.my): • SS1: FIAH Eligibility • SS3: RE sources criteria • SS5: FiT rates criteria and eligibility • SEDA: RE quota (application based on SCOD)
Step 2	• Secure sites/intent from site owner • Design RE system (technical specs/details & performance, fuel requirements) - SEDA to prescribe competency (human) and quality (equipment) requirements • Contact DL & conduct Power System Study (PSS) • Check statutory/authority requirements • Contact financier & obtain financing offer letter(s) • Prepare work plan & milestones
Step 3	Apply for FiT (SEDA to prescribe method – online)
Step 4	Pay FiT application fee (SEDA to prescribe method – RM1/kW for >72kW)
Step 5	• Sign REPPA (SEDA to prescribe time period – 2 to 8 weeks) - Register signed REPPA with SEDA – key milestone - Apply RE connection to DL (SEDA to prescribe time period)

For Discussion

FiT Application Steps (SEDA) – RE & ≤72kW Solar

Step 6	• Submit ST license form directly to ST - ST issue provisional license – key milestone
Step 7	Sign financing agreement – key milestone
Step 8	• FIAH issue notice to proceed to EPC • Payment to EPC – key milestone
Step 8	• Complete/satisfy authority requirements, site access/ownership, fuels • Submit ST license form directly to ST - ST issue license
Step 9	Meter installation (SS2: T&O) – key milestone
Step 10	IOD (SS2: T&O) – key milestone - Acceptance test (SEDA to prescribe/REPPA) - Reliability run (SEDA to prescribe/REPPA) - Verification report by IE (SEDA to prescribe IE requirement)
Step 11	COD (SS2: T&O) – key milestone - Commissioning - Start of FiT duration
	1st FiT payment within 30 days after meter reading

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 %

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 %

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 %

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 %
	(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 %

For Discussion

RE Half-Year Quota for FiT Application: ≤30MW
www.seda.gov.my

Year	Biogas	Biogas-Sewage/ Landfill	Biomass	Biomass-Solid Waste	Small Hydro	Solar PV ≤1MW Domestic	Solar PV ≤1MW Non-Domestic	Solar PP >1MW
2011 H2	10	5	70	10	30	4.5	4.5	20
2012 H1	10	5	30	10	30	2.25	2.25	17.5
2012 H2	10	5	30	10	30	2.25	2.25	17.5
2013 H1	10	5	35	15	40	3.25	3.25	25
2013 H2	10	5	35	15	40	3.25	3.25	25

Annual RE Capacity Target (Quota, MW/Year) - ≤30MW
[RE Policy + ETP-EPP10]

Year	Biogas	Biogas-Sewage	Biomass	Biomass-Waste	Small Hydro	Solar PV ≤1MW	Solar PP >1MW	Quota MW/Year	Cum. MW
2011	**10**	**5**	**70**	**10**	**30**	**9**	**20**	154	154
2012	**20**	**10**	**60**	**20**	**60**	**11**	**35**	216	370
2013	**20**	**10**	**70**	**30**	**80**	**13**	**50**	273	643
2014	**25**	**10**	**60**	**40**	**60**	**15**	**80**	290	933
2015	**25**	**10**	**70**	**50**	**60**	**17**	**110**	342	**1,275**
2016	**25**	**10**	**80**	**35**	**60**	**19**	**130**	359	1,634
2017	**30**	**10**	**90**	**30**	**50**	**21**	**145**	376	2,010
2018	**30**	**10**	**100**	**20**	**40**	**24**	**155**	379	2,389
2019	**30**	**10**	**100**	**20**	**30**	**28**	**165**	383	2,772
2020	**25**	**10**	**100**	**10**	**20**	**33**	**170**	368	**3,140**
2021	**25**	**-**	**90**	**6**		**37**	**30**	188	3,328
2022	**25**	**-**	**90**	**5**		**41**	**80**	241	3,569
2023	**20**	**4**	**80**			**47**	**130**	281	3,850
2024	**20**	**3**	**70**			**60**	**250**	403	4,253
2025	**20**		**60**			**80**	**250**	410	**4,663**
2026	**20**		**50**			**105**	**250**	425	5,088
2027	**20**		**50**			**135**	**250**	455	5,543
2028	**20**		**50**			**175**	**250**	495	6,038
2029						**220**	**250**	470	6,508
2030						**280**	**300**	580	**7,088**

Opportunity for Households

Year	Annual Solar Quota <1MW	Annual Solar Quota for Residential	No. of Homes per Annum (eg 5kW/home)	Cumulative No. of Homes
Unit	**MW**	**MW**	**Unit of Homes**	**Unit of Homes**
2011	9	4.5	900	900
2012	11	5.5	1,100	2,000
2013	13	6.5	1,300	3,300
2014	15	7.5	1,500	4,800
2015	17	8.5	1,700	6,500
2016	19	9.5	1,900	8,400
2017	21	10.5	2,100	10,500
2018	24	12.0	2,400	12,900
2019	28	14.0	2,800	15,700
2020	33	16.5	3,300	19,000
2021	37	18.5	3,700	22,700
2022	41	20.5	4,100	26,800
2023	47	23.5	4,700	31,500
2024	60	30.0	6,000	37,500
2025	80	40.0	8,000	45,500

Part II – S.4 & SS1: FiT Eligibility

- Application to SEDA
- RE ≤ 30MW

Subsidiary Legislation 1: Renewable Energy (Feed-In Approval) Rules 2011

1) Individuals (≥ 21 years)
   - Malaysians
   - Foreign individuals: limited to solar ≤ 72 kWp
   - Direct ownership

2) Companies (ROC)
   - All legally registered companies and businesses
   - Direct ownership
   - Shareholding limitations:
     1) DL: ≤ 49% within its distribution area
     2) Foreign companies: ≤ 49%

3) Other entities

SS1: Renewable Energy (Feed-In Approval) Rules 2011

Eligibility of other entities

5. The following other persons shall be eligible to apply for a feed-in approval:

a) local authority as defined in the Local Government Act 1976 [*Act 171*];

b) a body corporate constituted or established under any written law, including a Joint Management Body established under section 4 of the Building and Common Property (Maintenance and Management) Act 2007 [*Act 663*], but excluding the Authority;

c) a registered society as defined in the Societies Act 1966 [*Act 335*];

d) a co-operative society as defined in the Co-operative Societies Act 1993 [*Act 502*];

e) a firm as defined in section 6 of the Partnership Act 1961 [*Act 135*]; and

f) such other persons or classes of persons as may be decided by the Authority from time to time.

SS1: Renewable Energy (Feed-In Approval) Rules 2011

- Application for feed-in approval
- Grant of feed-in approval
- Duration of feed-in approval
- Change in particulars of feed-in approval holder
- Replacement of feed-in approval
- Application to assign or transfer feed-in approval
- Standard conditions of feed-in approvals
- Application fees
- Extension of time
- **Giving false or misleading information or document: Fine ≤ RM300K / ≤ 3 years jail**

SS3: Renewable Energy (Criteria For Renewable Resources) Regulations 2011

Biogas	a gas produced by the anaerobic digestion or fermentation of indigenous organic matter under anaerobic conditions including but not limited to manure, sewage sludge, municipal solid waste and biodegradable waste originating from
Biomass	non-fossilised and biodegradable organic material originating from indigenous plants, animals and micro-organisms including but not limited to products, by-products, residues and waste from agriculture, industrial and municipal wastes originating from
Small hydropower	the production of electricity by harnessing the power of flowing water
Solar photovoltaic	a technology involving the direct conversion of sunlight energy into electrical energy via a photoelectric process

SS5: Renewable Energy (Eligibility Criteria for Feed-in Tariff Rate) Rules 2011

Selected interpretation:

- "buildings" means roofed building structures which can be independently used and entered into by human beings and are primarily designed for the purpose of protecting human beings, animals or objects;
- "use as building material" means, in relation to a renewable energy installation utilising solar photovoltaic technology as its renewable resource, the use of the relevant component of the installation serving the function of a principal building material with no secondary building material beneath such component serving the same function.
- "qualified engineer" means a Professional Engineer or an Engineering consultancy practice, as the case may be, possessing such other qualifications as may be determined by the Authority from time to time pursuant to administrative guidelines;
- "testing and commissioning report" means a report from a qualified engineer setting out the outcome of the testing and commissioning of a renewable energy installation, in such form as may be determined by the Authority from time to time pursuant to administrative guidelines;

SS5: Eligibility Criteria for Feed-in Tariff Rate

- Basic Rate: based on **installed capacity** and renewable resources.
  - If combined multiple renewable resources via same meter: apply **lowest** basic FiT rate & **combined** installed capacity & **shortest** effective period.
  - If uses multiple renewable resources with separate meters: **separate** FiT rates & installed capacity & effective period.
- If installed capacity to increase **via same meter** after FiT approval:
  - shall apply for **new** FiT for new total installed capacity.
  - Shall **surrender** existing FiT.
  - New basic FiT rate is calculated based on lowest rate if multiple renewable resources used & total combined installed capacity & shortest new effective period
- Bonus FiT rate:
  - Eligible if apply to entire RE installation.
  - If not entire RE installation but with separate meter: each is addressed as separate application
- **Giving false or misleading information or document: Fine: ≤ RM300K / ≤ 3 years jail**

Biogas

(a) Use of gas engine technology with electrical efficiency of above 40%	(i) At the time of the application for feed-in approval: Relevant manufacturer's specifications as tested according to international standards by certified testing bodies as may be recognised by the Authority from time to time pursuant to administrative guidelines. (ii) Prior to the feed-in tariff commencement date: Written confirmation by a qualified engineer that the equipment specified in the manufacturer's specifications referred to in subparagraph (i) was installed in the renewable energy installation.
(b) Use of locally manufactured or assembled gas engine technology	(i) At the time of the application for feed-in approval, either— (aa) a certified copy of the manufacturer's licence issued under the Industrial Co-ordination Act 1975 [Act 156]; (bb) a certificate of factory acceptance test or its equivalent; or (cc) a certificate from the manufacturer. (ii) Prior to the feed-in tariff commencement date: Written confirmation by a qualified engineer that the gas engine technology equipment from the manufacturer specified in the relevant document referred to in subparagraph (i) was installed in the renewable energy installation.
(c) Use of landfill or sewage gas as fuel source	(i) At the time of the application for feed-in approval: (aa) either written evidence of the applicant's ownership of a landfill or sewage system, or a certified copy of a conditional or unconditional letter or agreement from or with the relevant municipal council or other entity agreeing to supply the applicant with the relevant fuel source; and (bb) written documentation from a qualified engineer setting out the design of the renewable energy installation utilising the relevant fuel source including the relevant equipment for the combustion process of the fuel source, the calculation of the indicative quantity of fuel source required and the calculation of the indicative quantity of renewable energy to be generated from the installation. (ii) Prior to the feed-in tariff commencement date: Written confirmation by a qualified engineer that the applicable requirements of the Renewable Energy (Technical and Operational Requirements) Rules 2011 relating to the commissioning of the renewable energy installation have been successfully met utilising the fuel source substantially in the manner described in sub-subparagraph (i)(bb).

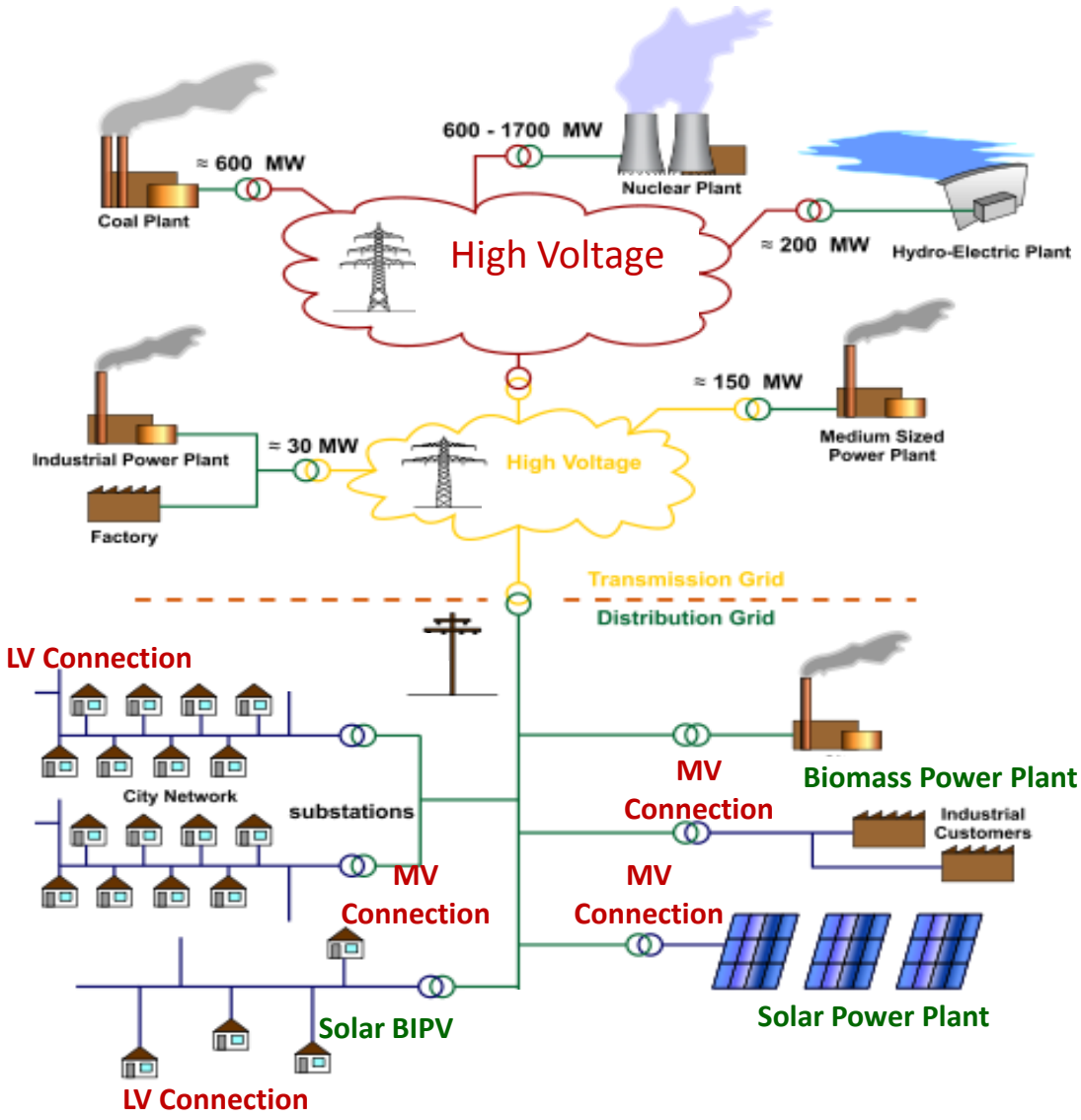
Biomass

(a) Use of gasification technology	(i) At the time of the application for feed-in approval: Relevant manufacturer's specifications and data sheet tested according to international standards by certified testing bodies as may be recognised by the Authority from time to time pursuant to administrative guidelines, providing for the conversion of biomass to gasification through gasification or plasma technology. (ii) Prior to the feed-in tariff commencement date: Written confirmation by a qualified engineer that the applicable requirements of the Renewable Energy (Technical and Operational Requirements) Rules 2011 relating to the commissioning of the renewable energy installation have been successfully met utilising the technology referred to in subparagraph (i).
(b) Use of steam-based electricity generating systems with overall efficiency of above 14%	(i) At the time of the application for feed-in approval: Written confirmation by a qualified engineer verifying that the criteria will be met based on the design efficiency of the renewable energy installation, accompanied by the relevant calculations. (ii) Prior to the feed-in tariff commencement date: Written confirmation by a qualified engineer that the criteria was successfully met during the commissioning of renewable energy installation in accordance with the applicable requirements of the Renewable Energy (Technical and Operational Requirements) Rules 2011.
(c) Use of locally manufactured or assembled gasification technology	(i) At the time of the application for feed-in approval, either— (aa) a certified copy of the manufacturer's licence issued under the Industrial Co-ordination Act 1975 [Act 156]; (bb) a certificate of factory acceptance test or its equivalent; or (cc) a certificate from the manufacturer. (ii) Prior to the feed-in tariff commencement date: Written confirmation by a qualified engineer that the gasification technology equipment from the manufacturer specified in the relevant document referred to in subparagraph (i) was installed in the renewable energy installation.
(d) Use of municipal solid waste as fuel source	(i) At the time of the application for feed-in approval: (aa) either written evidence of the applicant's ownership of a landfill, or a certified copy of a conditional or unconditional letter or agreement from or with the relevant municipal council or other entity agreeing to supply the applicant with the fuel source; and (bb) written documentation from a qualified engineer setting out the design of the renewable energy installation utilising the fuel source including the relevant equipment for the combustion process of the fuel source, the calculation of the indicative quantity of fuel source required and the calculation of the indicative quantity of renewable energy to be generated from the installation. (ii) Prior to the feed-in tariff commencement date: Written confirmation by a qualified engineer that the applicable requirements of the Renewable Energy (Technical and Operational Requirements) Rules 2011 relating to the commissioning of the renewable energy installation have been successfully met utilising the fuel source substantially in the manner described in sub-subparagraph (i)(bb).

Solar Photovoltaic

(a) Use as installation in buildings	(i) At the time of the application for feed-in approval: Design drawings accompanied by the written confirmation by a qualified engineer that the criteria will be met based on such design drawings. (ii) Prior to the feed-in tariff commencement date: Testing and commissioning report .
(b) Use as building material	(i) At the time of the application for feed-in approval: Design drawings accompanied by the written confirmation by a qualified engineer that the criteria will be met based on such design drawings. (ii) Prior to the feed-in tariff commencement date: Testing and commissioning report .
(c) Use of locally manufactured or assembled solar photovoltaic modules	(i) At the time of the application for feed-in approval, either— (aa) a certified copy of the manufacturer's licence issued under the Industrial Co-ordination Act 1975 [Act 156]; (bb) a certificate of factory acceptance test or its equivalent; or (cc) a certificate from the manufacturer. (ii) Prior to the feed-in tariff commencement date: Written confirmation by a qualified engineer that the solar photovoltaic modules from the manufacturer specified in the relevant document referred to in subparagraph (i) was installed in the renewable energy installation.
(d) Use of locally manufactured or assembled solar inverters	(i) At the time of the application for feed-in approval, either— (aa) a certified copy of the manufacturer's licence issued under the Industrial Co-ordination Act 1975 [Act 156]; (bb) a certificate of factory acceptance test or its equivalent; or (cc) a certificate from the manufacturer. (ii) Prior to the feed-in tariff commencement date: Written confirmation by a qualified engineer that the solar inverters from the manufacturer specified in the relevant document referred to in subparagraph (i) was installed in the renewable energy installation.

Part III: Connection, Purchase & Distribution (& Subsidiary Legislations)



For Discussion

SS2: Power System Study (PSS)

- PSS conducted by DL, but paid by FIA
- RE installations:
  - 0kW to 24kW single phase LV: not required
  - >24kW to 180kW 3 phase LV: not required
  - >180kW connected to MV: required
- PSS standardized fees (cost to FIA) to DL:
  - Up to 1MW RE: RM20K to complete within 30 days
  - >1MW to 10MW: RM40K to complete within 30 days
  - >10MW to 30MW: RM60K to complete within 40 days
  - Additional for Insulation Coordination Studies (if required): RM20K within 10 days
- PSS to provide factual and transparent results
  - Technical feasibility
  - Point of connection
  - Cost for connecting RE
  - Any remedial action by DL to accept RE
- PSS result cannot be used by DL to refuse RE connection [S.13(2) REA]

SS2: Technical & Operational Requirements

1. Interpretation
2. Planning
3. Connection
4. Metering
5. Commissioning
6. Operation & Control
7. Billing

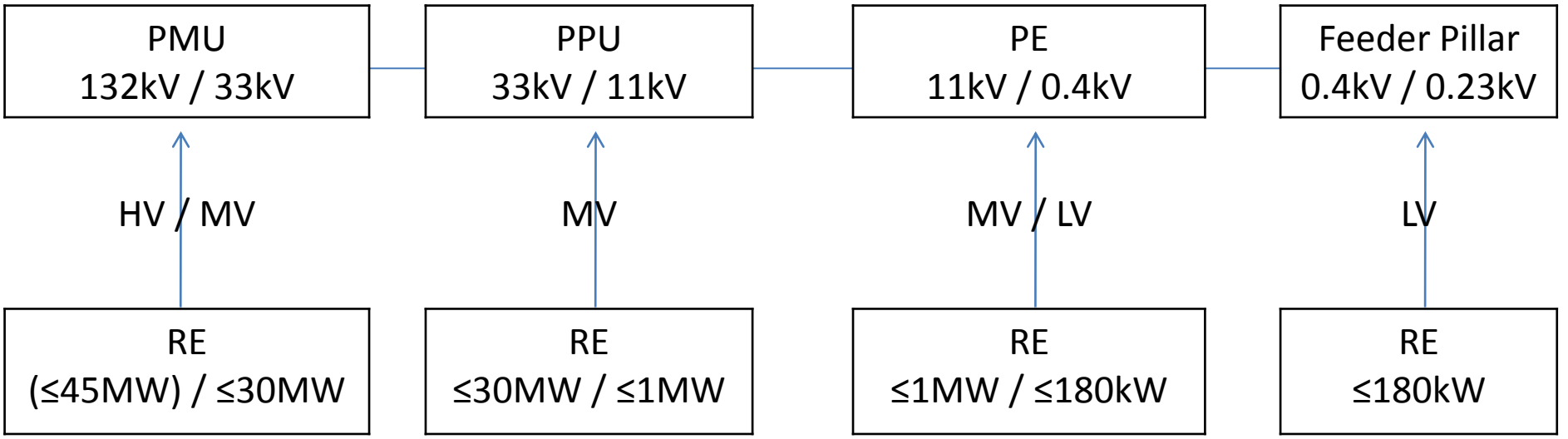
For Discussion

SS2: Planning & Connection Issues

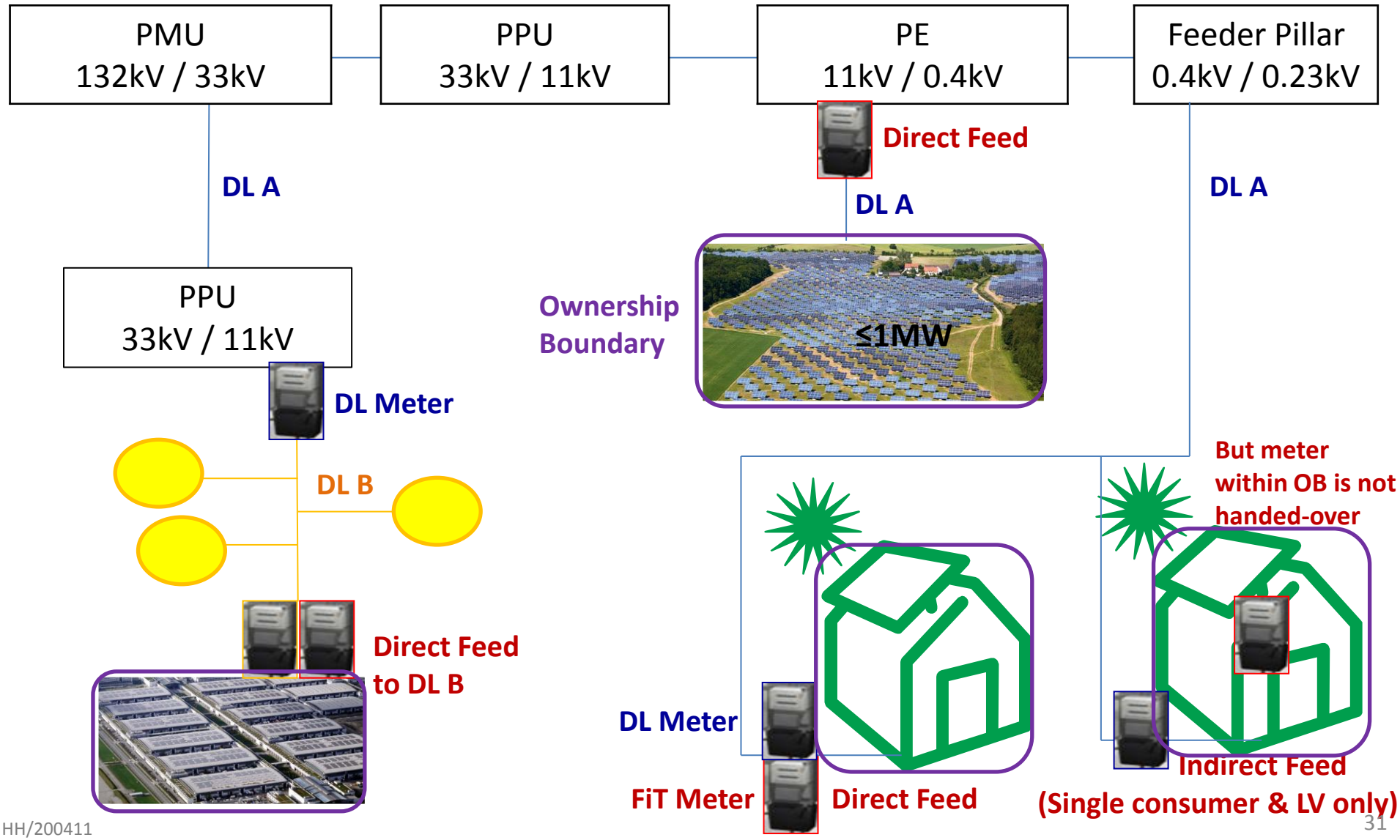
- Determine nearest connection point
- Shallow connection charging method
  - Capex up to connection point by FIAH
  - Capex after connection point by DL
- Plant/apparatus ownership:
  - determined by boundary of ownership
  - meters and cables: handed-over to DL
- Rights of way
- Info to submit
- Requirements: connection, protection and control, operational, power factor, standby supply, etc.
- Competent person, P.E.

For Discussion

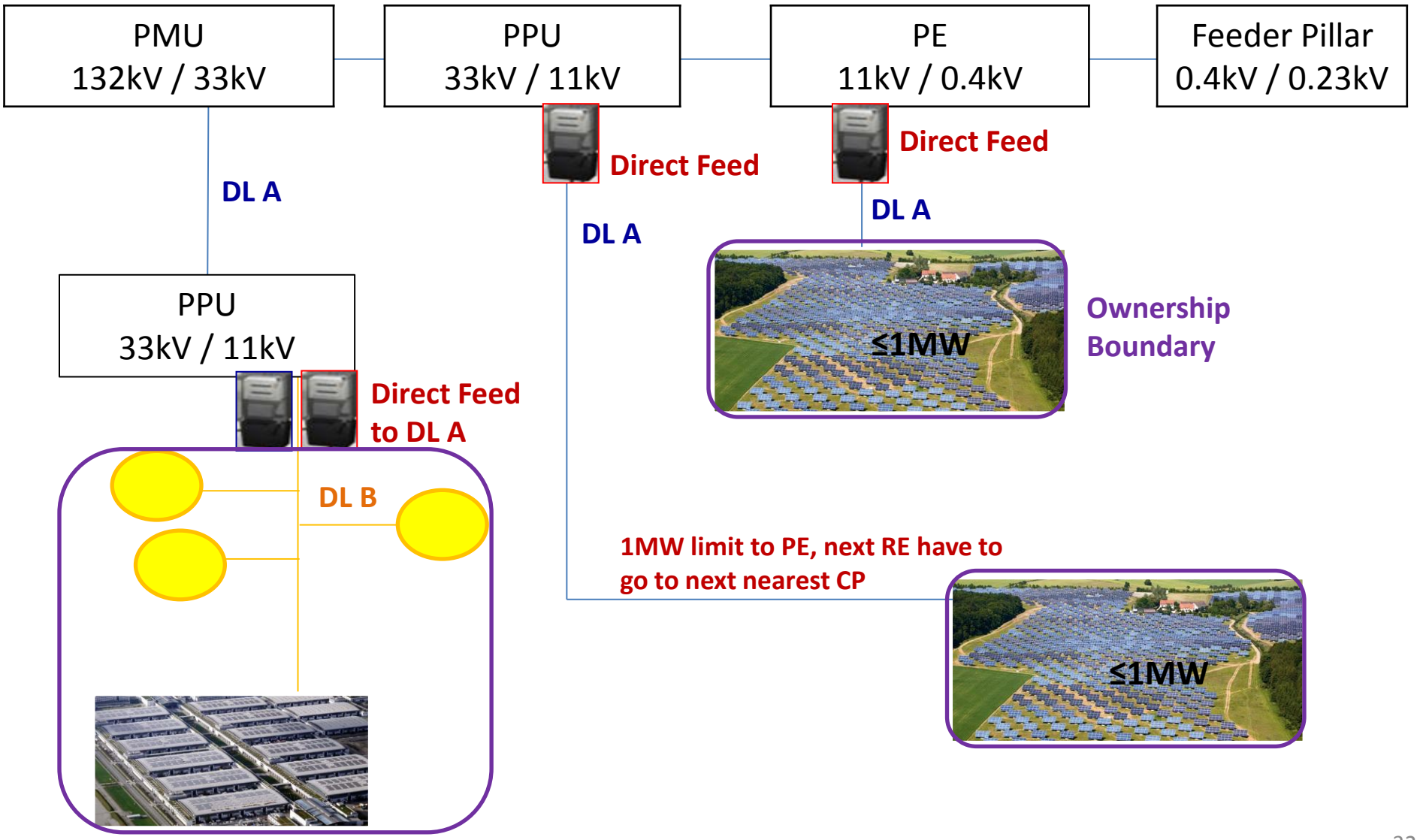
SS2: Nearest Connection Point & Max Limit



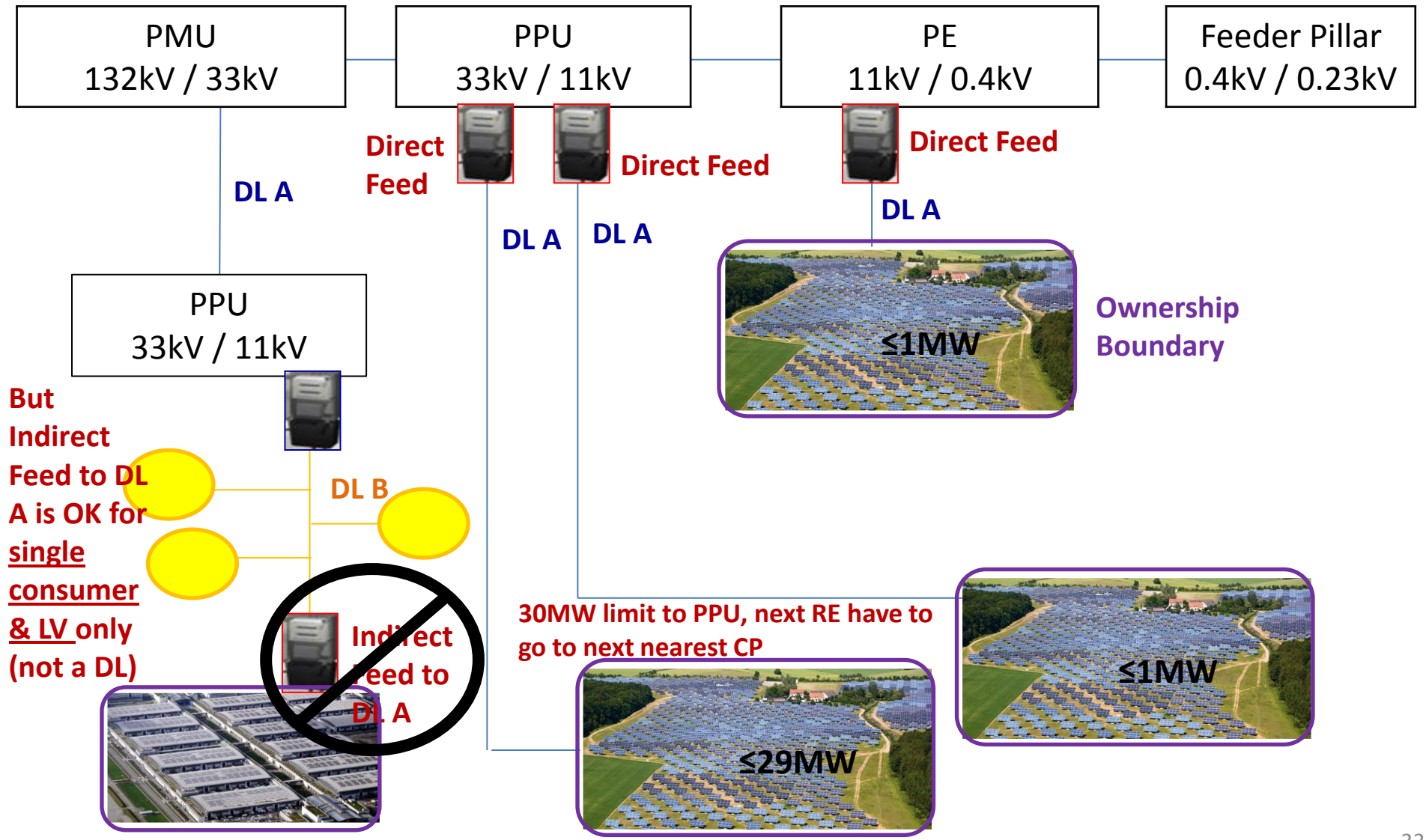
SS2: Connection Point, Ownership Boundary, Metering



SS2: Connection Point, Ownership Boundary, Metering



SS2: Connection Point, Ownership Boundary, Metering



For Discussion

SS2: Metering Issues

- Location of revenue meter closest to connection point determined by DL
- Metering signals => remote reading by DL for LPC (MV connection)
- Meter procurements:
  - By FIAH and comply to (i) Specs & Accuracy, (ii) Test Requirements
  - MV meter: remote signal capable
  - Indirect Feed: FiT revenue meter + 'change' DL meter to import/export type
- Meter readings:
  - Direct Feed: LV (OPC) and MV (LPC) directly by DL (not join reading but FIAH can request to check if in doubt)
  - Indirect Feed: only for LV (OPC), read by FIAH via web based (TNB only?); to read FiT reading, import & export readings
- Meter maintenance: by DL (except for indirect feed FiT meter)

For Discussion

Commissioning

- Competent, P.E.
- Report and evidence
- Declaration

For Discussion

Operation & Control

- Upon application: submit estimated annual energy yield (DAA) for each year of entire effective period.
  - For > 12MW installed capacity: penalty for <70% DAA.
  - No penalty for >DAA, but the following year DAA will be adjusted according to incremental % of actual yield if >110% of DAA (*Or limit actual yield to 130% of DAA* for FiT?).
- Requirements for forecast and despatch, outages, maintenance, communication facilities:
  - for >12MW or >3MW? (Peninsular, Sabah?)

For Discussion

REPPA: Meter readings & FiT Payments

Connection Voltage	Meter Reading	Payment by DL to FIAH Or Payment Advice to be issued with payment?	Recovery by DL from SEDA Data in electronic form for each REPPA – format?	Payment by SEDA to DL
LV Direct Feed	**By DL**: to issue Payment Advice to FIAH upon meter reading in Month 2, for RE generation of Month 1	Before the 7th of Month 3	By the 7th of Month 3	By the end of Month 3
LV Indirect Feed	**By FIAH**: to submit meter readings (RE, import, export) to DL via web based system by the 7th of Month 2, for RE generation and electricity consumption (import & export) of Month 1. DL to issue payment advice within 7 days of readings.	Within 30 days of submission, but not later than the 7th of Month 3)	By the 7th of Month 3	By the end of Month 3
MV Direct Feed	**By DL**: to issue Payment Advice to FIAH upon meter reading in Month 2, for RE generation of Month 1	Before the 7th of Month 3	By the 7th of Month 3	By the end of Month 3

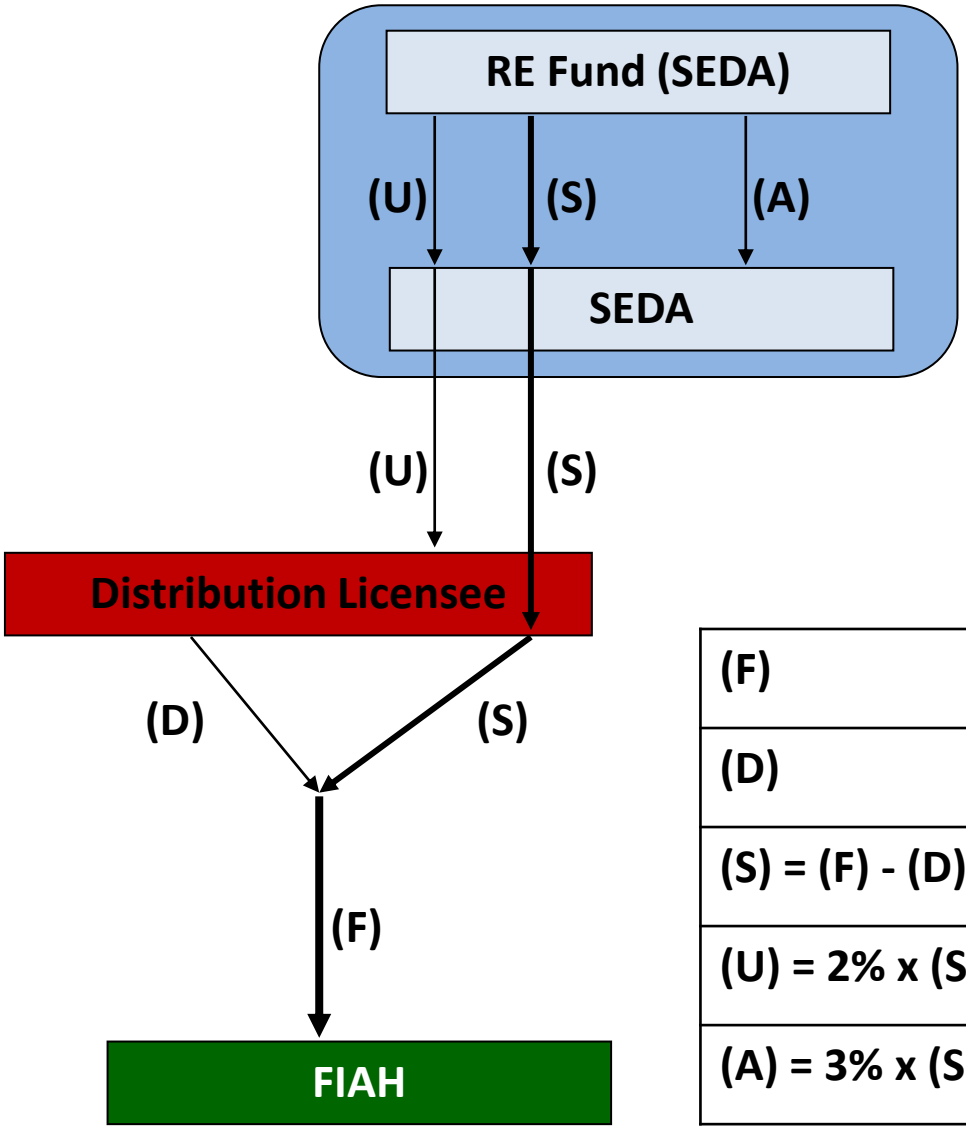
For Discussion

Part IV – S.16: FiT Payment & Duration

SS2: FiT payment is calculated based on actual kWh reading by the revenue meter
[(new kWh reading 'minus' last kWh reading) x FiT rate]

RE installations	Biogas	Biomass	Small Hydro	Solar PV
RE installed capacity [A]	4 MW	10 MW	10 MW	6 kW
RE generation/month [B]	2,044 MWh/month	5,110 MWh/month	4,166.67 MWh/month	600 kWh/month
FiT rate [C]	RM 0.34 per kWh	RM 0.33 per kWh	RM 0.24 per kWh	RM 1.46 per kWh
FiT duration [D]	16 years	16 years	21 years	21 years
FiT payment by TNB to FIAH per month = [C x B]	RM 694,960 per month	RM 1,686,300 per month	RM 1,000,000 per month	RM 876 per month
Capex	RM 40 mil	RM 90 mil	RM 90 mil	RM 90,000
Simple Payback Period	4.8	4.5	7.5	8.6

Part IV – S.19: Recovery of Moneys & S.20: Admin Fees



$$S = \sum [(FiT_n - DC_n) \times kWh_n]$$

Grid Connection Point	Displaced Cost (Subsid)
Medium voltage ≥1kV (2.2kV, 6.6kV, 11kV, 33kV)	0.2047
Low voltage <1kV (0.23kV, 0.4kV)	0.3131

(F)	FiT payment	**IV - S.16 + REPPA**
(D)	Displaced Cost	**IV - S.19 + Subsid**
(S) = (F) - (D)	Recovery of Money	**IV - S.19 + Subsid**
(U) = 2% x (S)	Admin fee to DL	**IV - S.20 + Subsid**
(A) = 3% x (S)	Admin fee to SEDA	**IV - 20 + Subsid**

Displaced Cost Calculation

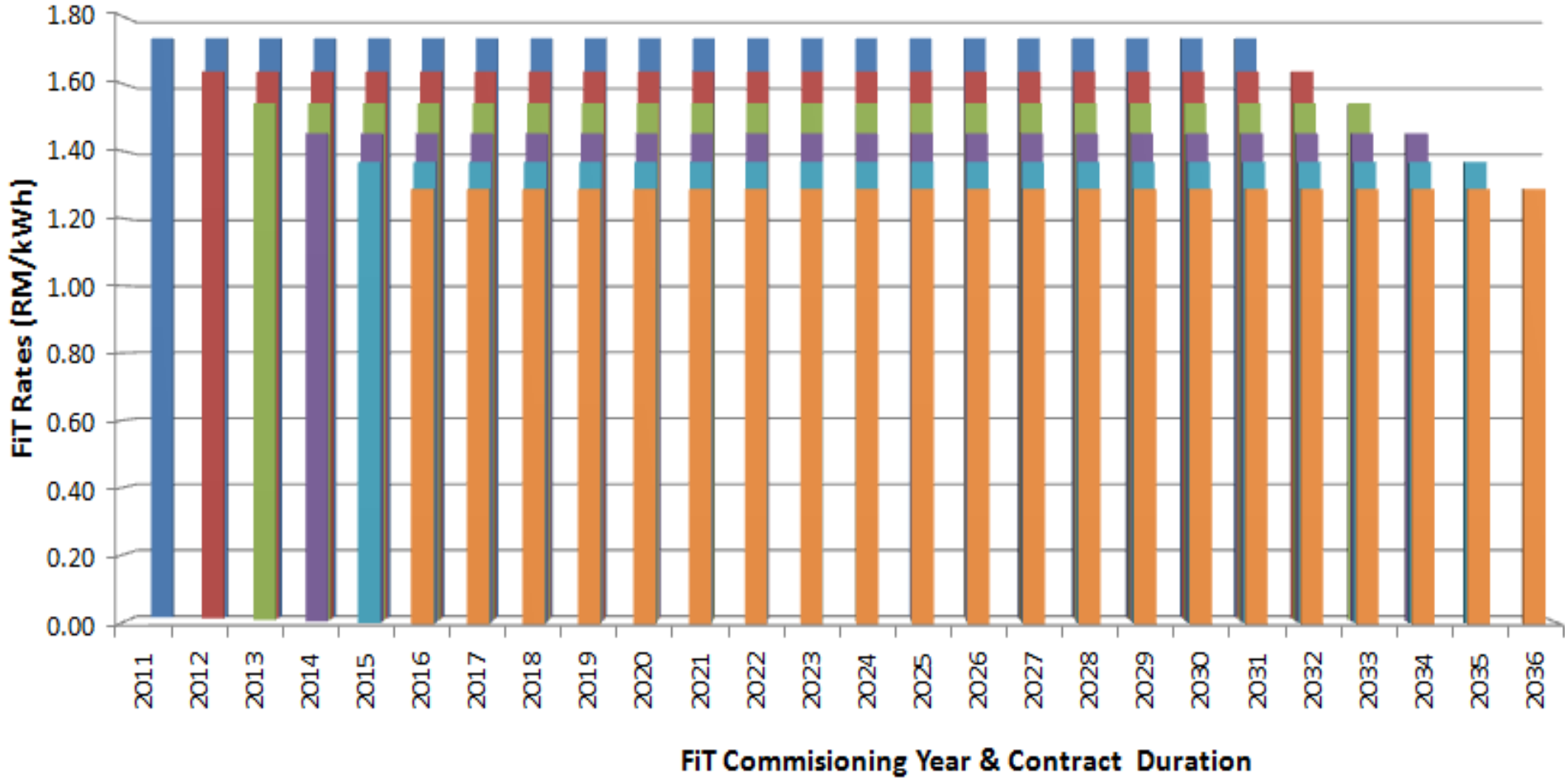
- "displaced cost" means the average cost of generating and supplying one kilowatt hour of electricity from resources other than the renewable resources through the supply line up to the point of interconnection with the renewable energy installation
- The displaced cost will increase/decrease proportionally to incremental/reduction rate of electricity tariff.
- **PDC = DC x (1 ± TRR)**
  - PDC: prevailing displaced cost; TRR: rate of tariff revision in %

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

Part IV – S.16: Payment, S.19: Recovery, S.20: Admin Fees

RE installations	Biogas	Biomass	Small Hydro	Solar PV
RE installed capacity [A]	4 MW	10 MW	10 MW	6 kW
RE generation/month [B]	2,044 MWh/month	5,110 MWh/month	4,166.67 MWh/month	600 kWh/month
FiT rate [C]	RM 0.34 /kWh	RM 0.33 /kWh	RM 0.24 /kWh	RM 1.46 /kWh
FiT duration	16 years	16 years	21 years	21 years
Displaced cost [D]	RM 0.2047 /kWh	RM 0.2047 /kWh	RM 0.2047 /kWh	RM 0.3131 /kWh
FiT payment by TNB to FIAH [E] = [C x B]	**RM 694,960**	**RM 1,686,300**	**RM 1,000,000**	**RM 876**
Simple Payback Period	**4.8 years**	**4.5 years**	**7.5 years**	**8.6 years**
Recovery of money by TNB from RE Fund via SEDA [F] = [(C – D) x B]	**RM 276,553.20**	**RM 640,283.00**	**RM 147,083.33**	**RM 688.14**
Value of 2% Admin Fee paid to TNB [G] = [2% x F]	**RM 5,531.06**	**RM 12,805.66**	**RM 2,941.67**	**RM 13.76**
SEDA payment to TNB = [F + G]	RM 282,084.26	RM 653,088.66	RM 150,025.00	RM 701.90
Value of 3% Admin Fee paid to SEDA [I] = [3% x F]	**RM 8,296.60**	**RM 19,208.49**	**RM 4,412.50**	**RM 20.64**
Total cost to RE Fund (per month) = [F + G + I]	RM 290,380.86	RM 672,297.15	RM 154,437.50	RM 722.55
Ratio of TNB's cost against FiT payment = [D / C]	**60.2%**	**62.0%**	**85.3%**	**21.4%**

Part IV – S.17: FiT Degression

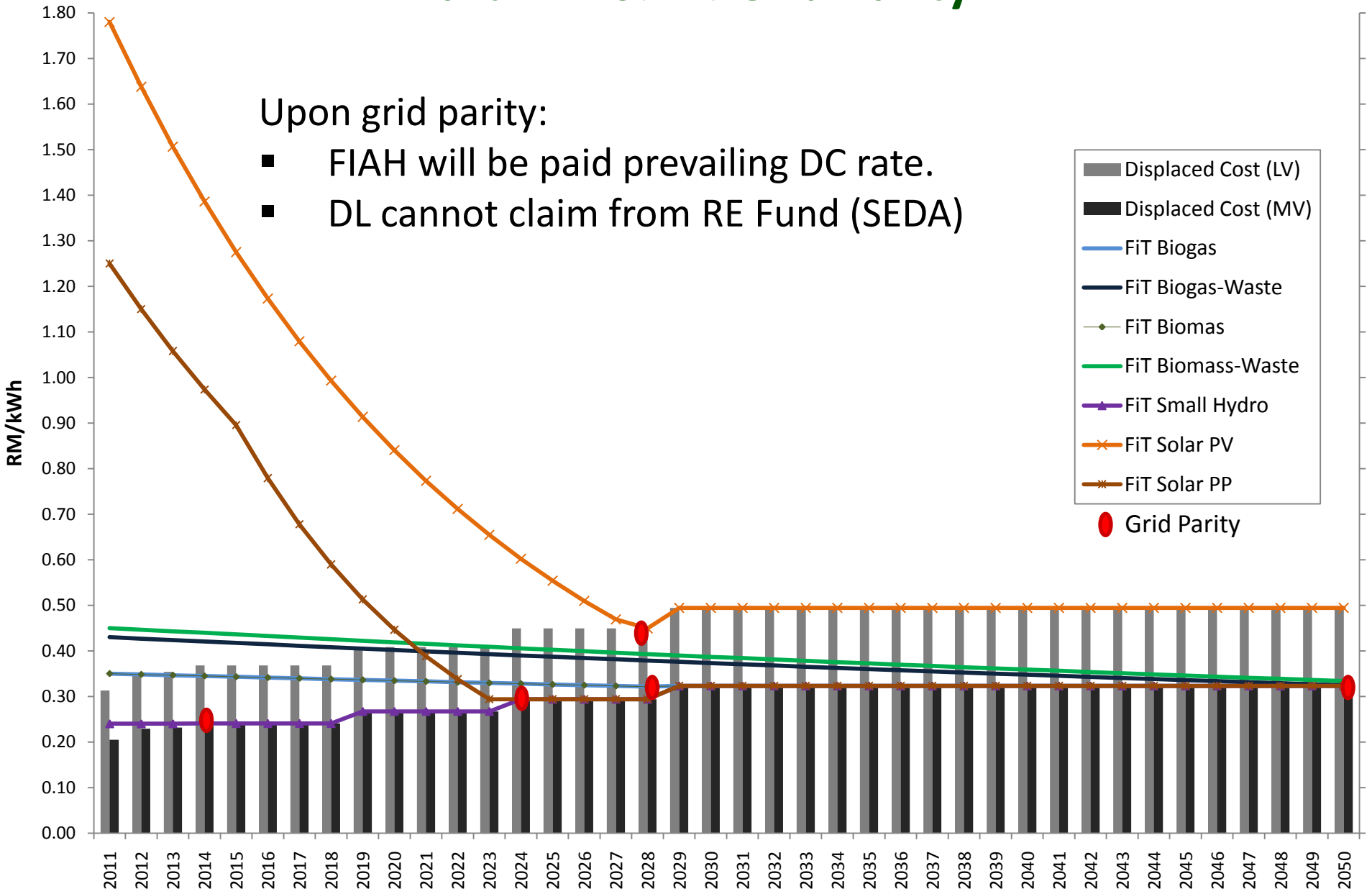


- Degression rate to commence on 1st January every year
- Revision: at least once every 3 years

Part IV – S.21: Grid Parity

Upon grid parity:

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



Part V – S.24: Allocation from Tariff & SS4

2. (1) TNB shall allocate and pay into the Fund a sum equivalent to one per centum of the tariffs levied by it under subsection 26(1) of the Electricity Supply Act 1990 in respect of the supply and sale of electricity in Peninsular Malaysia after the date of coming into operation of this Order, in the manner set out in subparagraph (2).

(2) The payment referred to in subparagraph (1) shall be made monthly in arrears in the following manner:

a) the said payment shall be calculated based on one per centum of Tenaga Nasional Berhad's electricity sales revenue as invoiced to its consumers in Peninsular Malaysia after the date of coming into operation of this Order;

b) the first payment shall be deposited by Tenaga Nasional Berhad into the Fund within three calendar months from the date of coming into operation of this Order; and

c) each subsequent monthly payment shall be deposited by Tenaga Nasional Berhad into the Fund on or before the first day of each month thereafter.

Reconciliation of payments

3. (1) The Authority shall annually reconcile—

(a) all payments made by Tenaga Nasional Berhad under paragraph 2; and

(b) one per centum of its electricity sales revenue as invoiced to its consumers in Peninsular Malaysia after the date of coming into operation of this Order and reflected in its audited financial statements

For Discussion

Part V – S.24: Allocation from Tariff & SS4

Example:

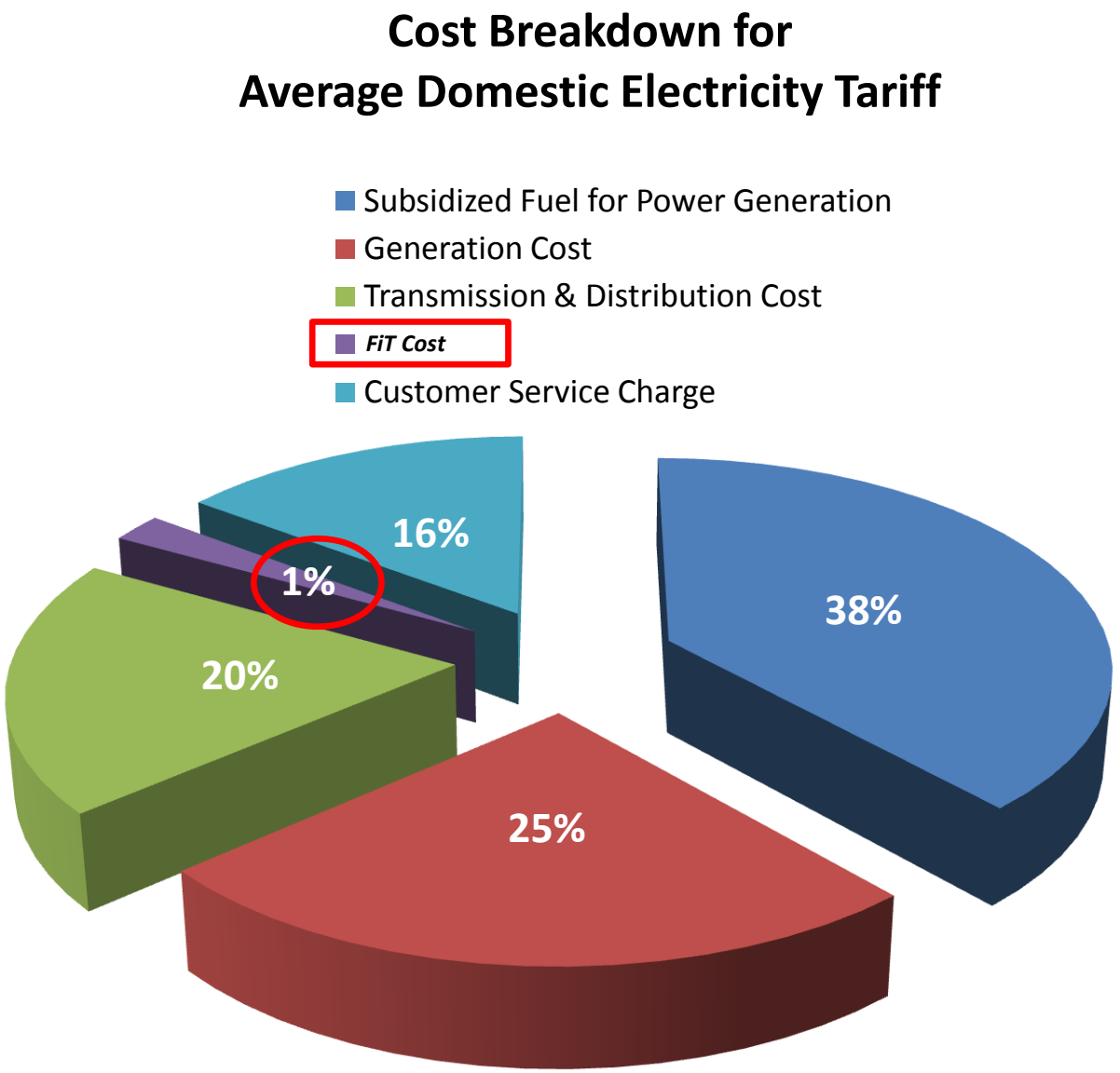
Year	TNB (P.M.) Electricity Sales	Avg. Tariff	Example Tariff Increment	TNB Electricity Sales Revenue	RE Fund % of TNB Sales Revenue	Annual RE Fund Collection
Unit	GWh	RM/kWh	%	RM-mil	%	RM-mil
2010	100,000	0.3131	0%	31,310	0%	0.00
2011	100,000	0.3131	0%	31,310	0%	189.00
2012	100,000	0.3505	11% + 1%	35,045	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 (dates are indicative only):

Jan	Feb	Mar	Apr	May	N month	End of FY
Tariff increment to TNB	1st billing to TNB consumers of new tariff	1st payment of new tariff by consumers to TNB	1st payment by TNB to SEDA	2nd payment by TNB to SEDA	Nth payment by TNB to SEDA	Reconcile based on audited financial statement 1% of electricity sales revenue (of tariff affected due to SS4)
1st Jan	**By 1st Feb**	**By 1st Mar**	**By 1st Apr**	**By 1st May**	**By 1st of N**	**Within 30 days of report**

For Discussion

Part V – S.24: Allocation from Tariff (& Subsid)



Note (subject to decision):

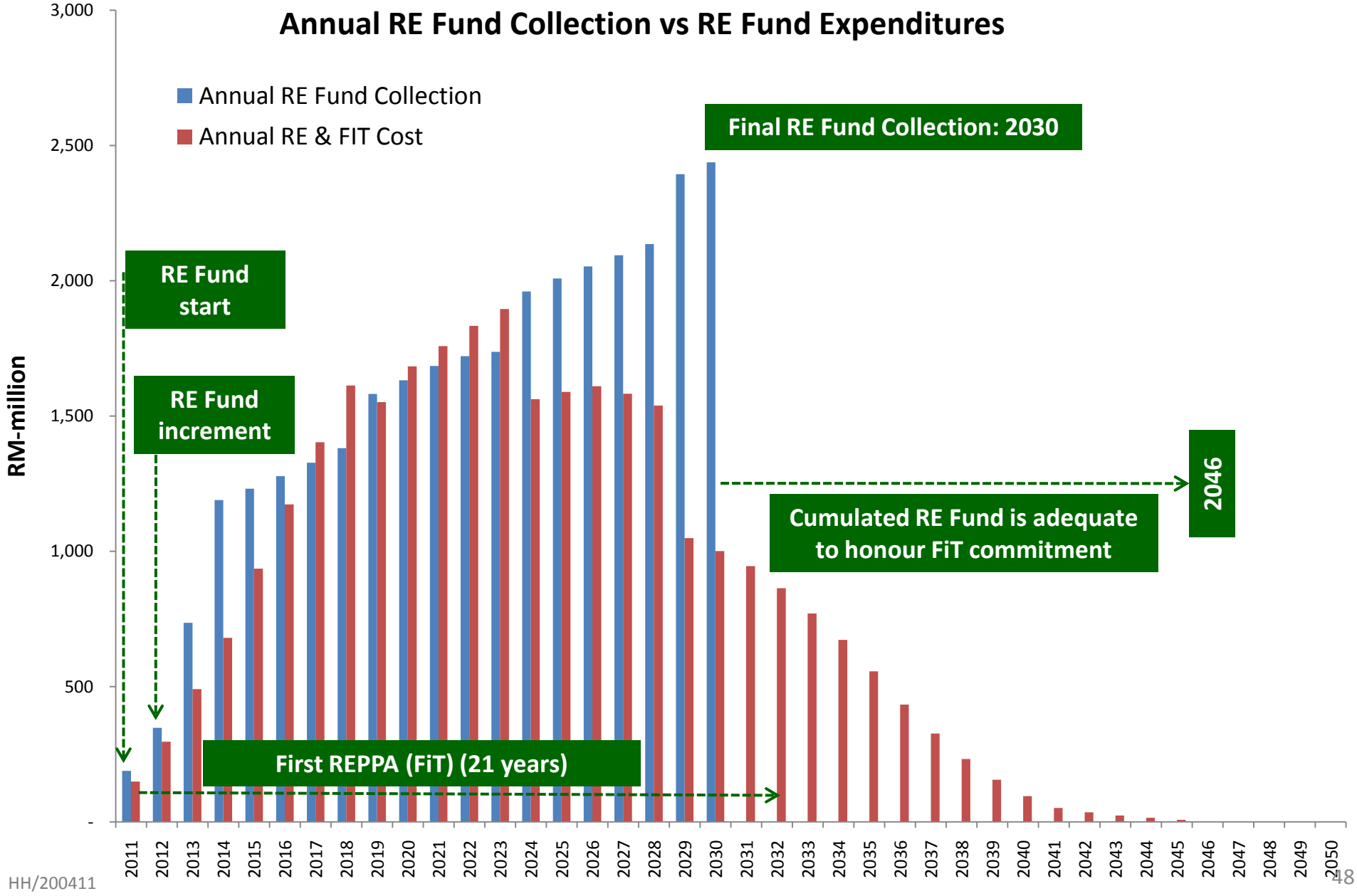
- For 2011, PEMANDU has provided RM189 mil for RE Fund. Thus, 1% tariff increment is only required by Jan 2012.
- **1% of electricity sales revenue (tariffs levied as per ESA S.26).**
- In subsequent tariff reviews:
  - Additional +1% (for RE target) by Jan 2013;
  - Additional +1% (for ETP target) by Jan 2014.
- Thus, total = 2% + 1% by Jan 2014.
- In 2014, 3% ≈ RM0.01/kWh.

For Discussion

Part V – S.24: Allocation from Tariff
Possible Impact to Consumers

Sectors	Annual Electricity Sales (2009)	%	Annual 1% Contribution to RE Fund	No. of Consumers	RE Fund Cost per Consumer per Annum	RE Fund Cost per Consumer per Month
Industrial	RM -mil 11,028.60	41%	RM-mil 110.29	28,502	RM 3,869.41	RM 322.45
Commercial	RM-mil 11,053.20	41%	RM-mil 110.53	1,229,261	RM 89.92	RM 7.49
Domestic	RM-mil 4,924.90	18%	RM-mil 49.25	6,283,166 (34% = 2.14 mil)	34%: RM 23.05	34%: RM 1.92 (RM 0 if ≤200 kWh)
Total	**RM-mil 27,006.70**	**100 %**	**RM-mil 270.07**	**7,540,929**	**Average**	**Average**

Part V – S.23: RE Fund



Penalty

RE Bill	Offender	Offence	Penalty
8(3)	FIAH	Fail to comply with feed-in approval condition	≤ RM500K / ≤ 3 yrs jail
12(9)	DL	Fail to sign REPPA within prescribed period	≤ RM1M
13(4)	DL	Fail to connect RE within prescribed period	≤ RM1M
14(3)	DL	Fail to purchase and distribute RE as a priority	≤ RM1M
22(1)	FIAH	Dishonest RE generation	≤ RM1M / ≤ 5 yrs jail
24(2)	DL	Fail to allocate and pay to RE Fund	≤ RM1M
32(2)	Any person	Fail to to provide access to records	≤ RM200K
35	Any person	Fail to comply to order from Authority	≤ RM50K / ≤ 6 mths jail
39(7)	Any person	Break/tamper/damage seal	≤ RM50K / ≤ 6 mths jail
51	Any person	Obstruction towards auhtorized officer	≤ RM200K / ≤ 2 yrs jail
58(11)	Any person	Fail to comply to directions by the Authority	≤ RM200K / ≤ 2 yrs jail

Others

- **S.56.** (1) The Authority shall monitor all significant matters relating to the implementation and performance of the feed-in tariff system and submit a report thereof to the Minister after the end of each financial year of the Authority.
- **S.60.** The Minister may make regulations for all or any of the following purposes:
- **S.61.** The Authority may make such rules for all or any of the following matters
- **S.63.** The Minister may, by order published in the *Gazette*, amend the S*chedule.*

To be read together with:

S.18. (1) The Authority shall review the degression rates in respect of any category of renewable energy installation at least once every three years after the date this Act comes into operation for the purposes of improving the overall performance of the feed-in tariff system to better achieve the objective of this Act.

Others

Existing renewable energy generators

S.64. (1) An eligible producer who has executed an agreement for the sale and purchase of electricity with a distribution licensee prior to the coming into operation of this Act shall have the option of either—

a) applying to participate in the feed-in-tariff system, terminating any such prior agreement with the distribution licensee with the consent of the distribution licensee and entering into a renewable energy power purchase agreement prescribed under this Act; or

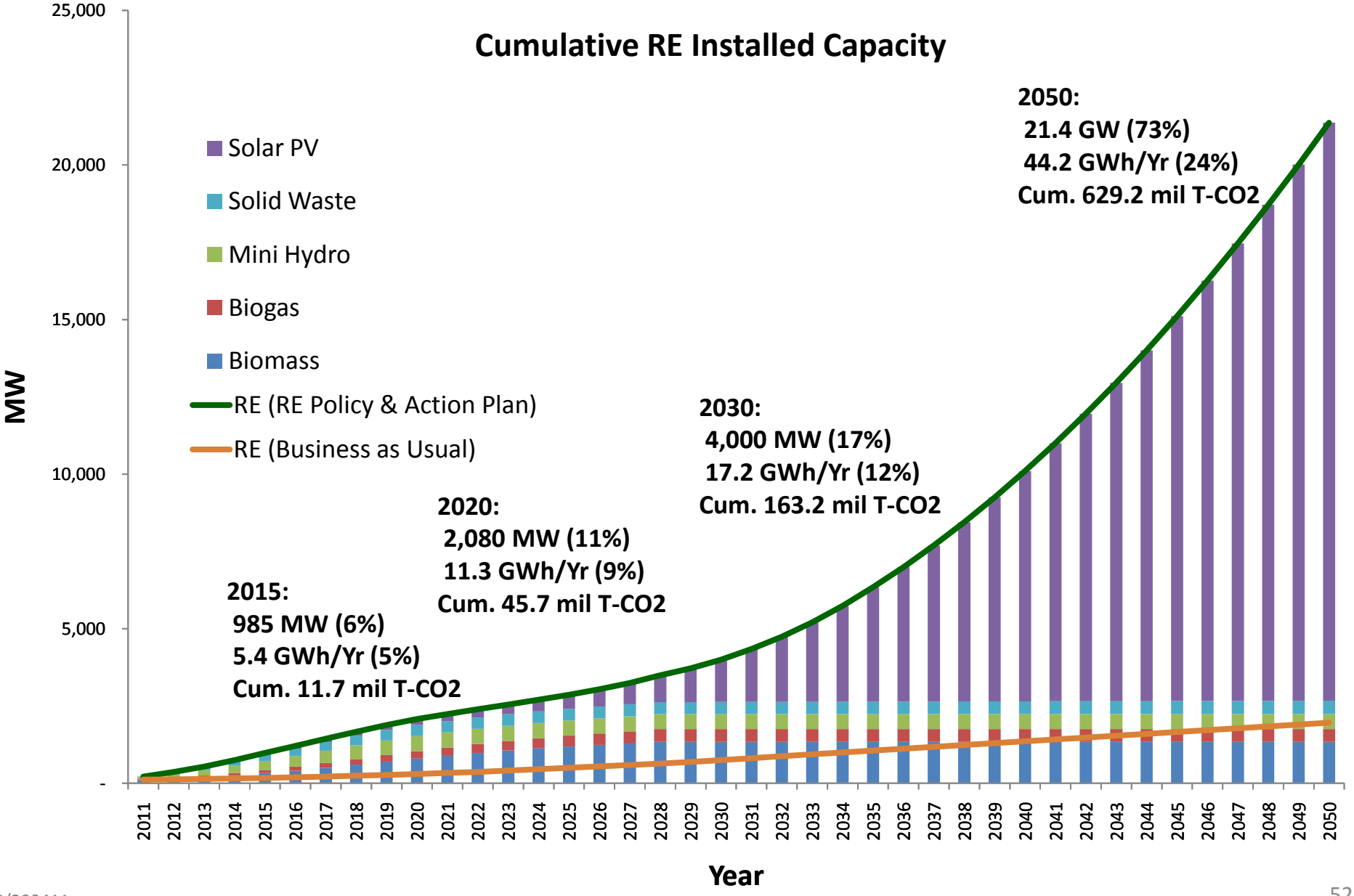
b) continuing under his or its existing agreement with the distribution licensee and not participating in the feed-in tariff system.

(3) …..the effective period applicable to such feed-in approval holder shall be reduced by a period equivalent to the period during which his or its renewable energy installation had generated electricity for commercial sale to the distribution licensee prior to the grant of the feed-in approval.

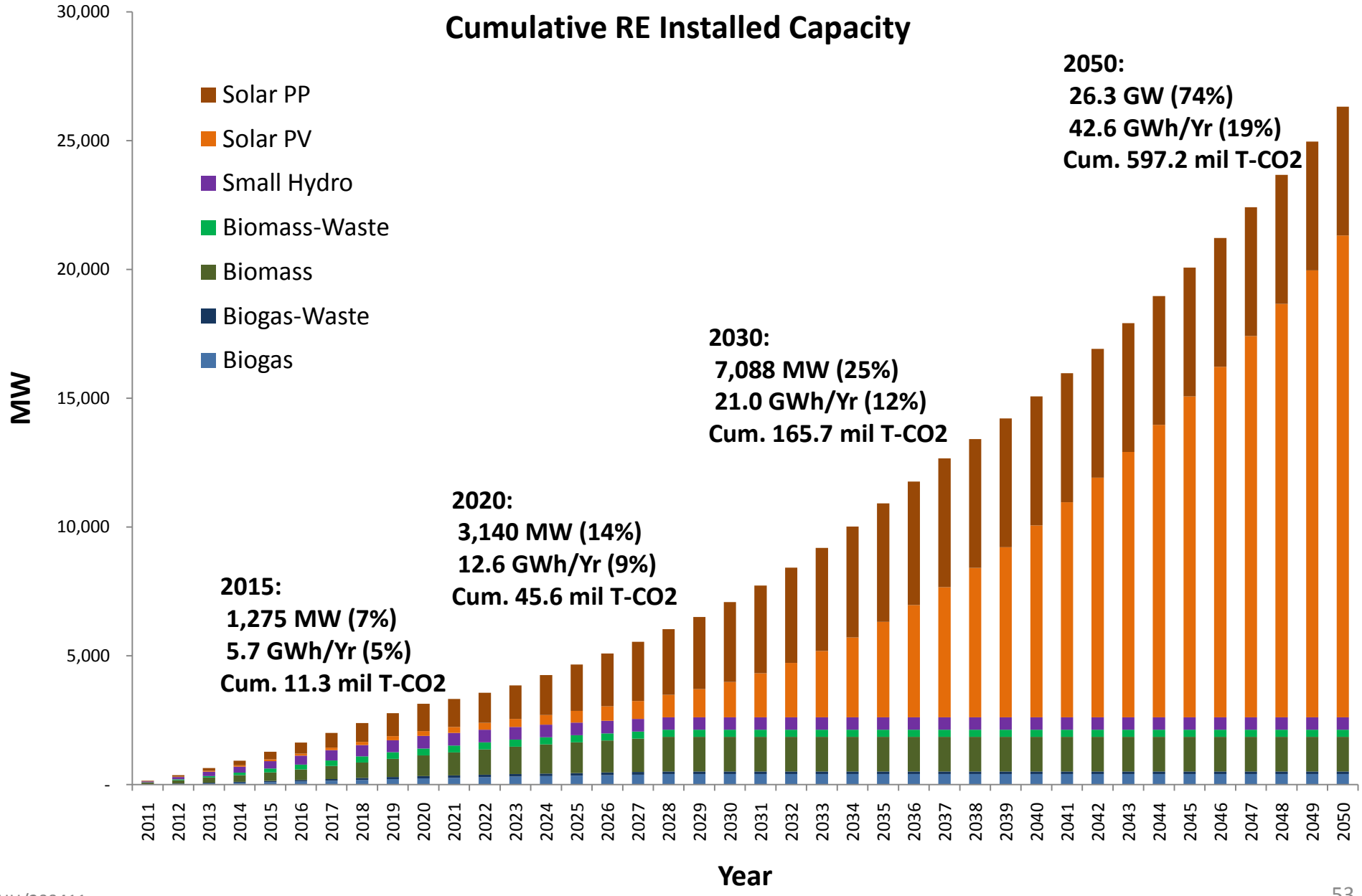
S.65. Existing licences: no change

RE Policy & Action Plan: Goals

[Exclude EPP10]



RE Goals (RE Policy + EPP-10)



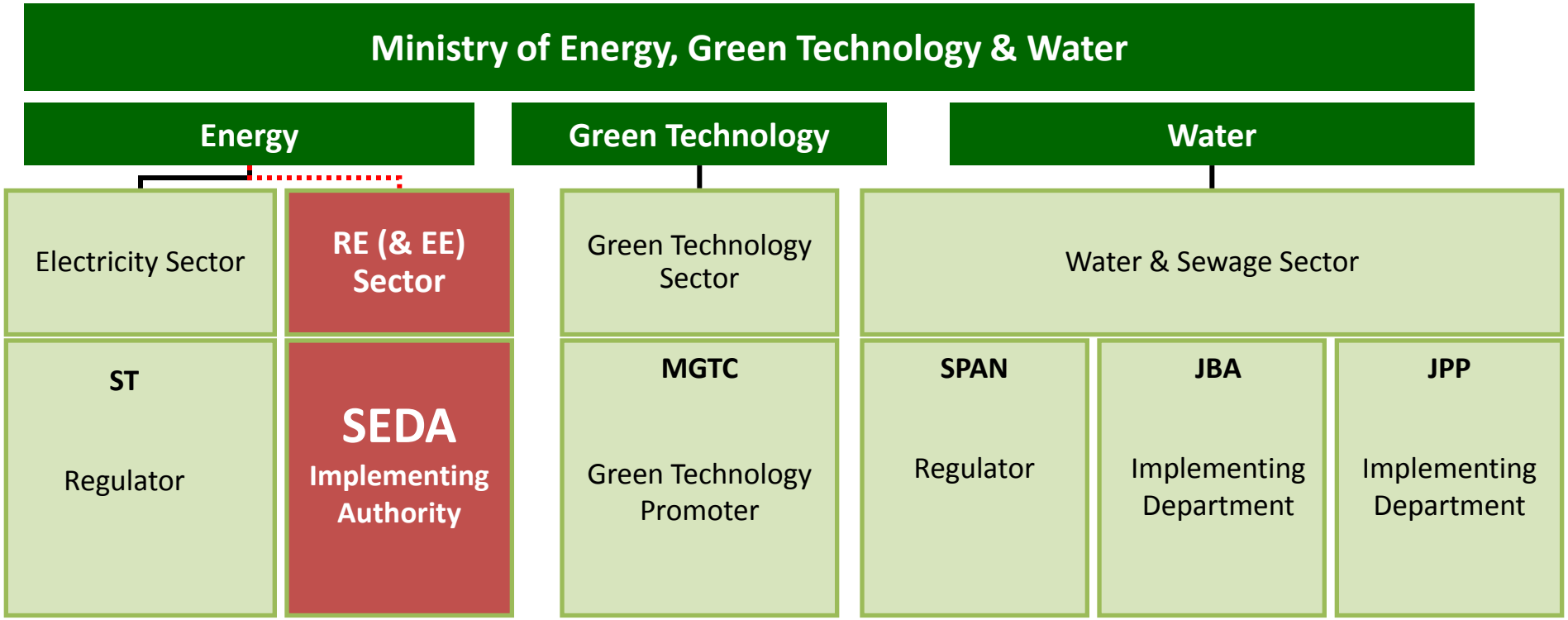
- SEDA Bill -

- SEDA Bill: an Act to provide for the establishment of the Sustainable Energy Development Authority of Malaysia and to provide for its functions and powers and for related matters.

- Part I: Preliminary
- Part II: The Authority
- Part III: Functions and Powers of the Authority
- Part IV: Employee of the Authority
- Part V: Finance
- Part VI: General

"**sustainable energy**" means energy which, in its generation, provision and use, is such that it meets the needs of the present without compromising the ability of future generations to meet their needs, and includes renewable energy.

Sustainable Energy Development Authority of Malaysia (SEDA Malaysia)



Part II – S.5: Membership of Authority

- 1 Chairman;
- 2 to 4 representatives of Federal Government;
- 3 to 5 other members
- 1 Chief Executive Officer

- Shall be persons **who have experience and shown capacity and professionalism in matters relating to sustainable energy, finance, engineering, business or administration**, or are otherwise suitable for appointment because of their **special knowledge, experience or academic qualifications**.
- Office term: 2 years, and eligible for reappointment for maximum 3 consecutive terms.

Part IV - S.22:

(1) The **Minister shall appoint** a Chief Executive Officer on such terms and conditions, and who shall be paid such remuneration and allowances, as he thinks desirable.

(2) The person appointed as the Chief Executive Officer under subsection (1) shall be a person who, in the opinion of the Minister, **has experience and shown capacity and professionalism in matters relating to sustainable energy, finance, engineering, business or administration**, or are otherwise suitable for appointment because of their **special knowledge, experience or academic qualifications**.

(3) The Chief Executive Officer shall be **responsible for the overall administration and management** of the functions and the day-to-day affairs of the Authority.

(6) In discharging his duties, the Chief Executive Officer shall **act under the general authority and direction of the Authority**.

(7) The Chief Executive Officer shall be an employee of the Authority.

Part III – S.15: Functions of SEDA Malaysia

a) Advise the Minister & Government entities on all matters relating to sustainable energy;
b) Promote & implement national policy objectives for renewable energy;
c) Promote, stimulate, facilitate & develop sustainable energy;
d) Implement, manage, monitor & review the Feed-In Tariff system;
e) Implement sustainable energy laws including the Renewable Energy Act & recommend reforms;
f) Promote private sector investment in sustainable energy sector;
g) Carry out / arrange research, advisory services & disseminate information;
h) Conduct, promote & support sustainable energy researches & innovations;
i) Conduct, promote & support sustainable energy training and human capacity development;
j) Implement measures to improve public awareness;
k) Act as focal point to assist the Minister on matters relating to sustainable energy & climate change matters relating to energy;
l) Other function under sustainable energy law.

SEDA: Immediate Functions (Initial Setup: 2011)

Division			Functions
Chief Executive Officer	Deputy Chief Executive Officer / COO	Renewable Energy	Feed In Tariff	▪ RE Act & regulations, RE Fund, RE policy & action plan ▪ FiT procedures, management, administration, enhancements ▪ RE targets, statistics, impact assessments, performance monitoring ▪ NKEA EPP10, Clinton Initiative ▪ National budget incentives and assessments
			RE Industry	▪ RE technologies systems, operations, market development ▪ RE industry development, service providers, SME support ▪ RE financing, services ▪ RE R&D, centres of excellence, standards, codes & quality ▪ RE interconnection, enforcements, T&Cs ▪ Tax exemption assessment ▪ Suria programme, Green Schools, technical support
			External Services	▪ RE & EE: media/public relations, advocacy, communication, publication ▪ ISPQ trainings, capacity development, education programmes ▪ International cooperation, CDM ▪ FiT ICT system, website
		Support	Finance	▪ KPIs, Internal audits, SEDA fund, budget, opex, invoices, payments
			Administration	▪ Internal procedures, terms and conditions, HRMS, trainings, utilities
			ICT	▪ Internal ICT hardwares, softwares, systems, intranet, internet, emails
		Energy Efficiency (NKEA-ETP Project)	*Strategic Planning*	▪ *NKEA EPP9, co-generation, EE Masterplan* ▪ *Statistics, data collection & analysis, impact assessments*
			Strategic Initiatives	▪ *NKEA EPP9: appliances rebates, buildings insulations, Government/ commercial sectors, industrial sector*

Thank You

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