

Feed-in Tariff Scheme and Application Procedures

June 2019



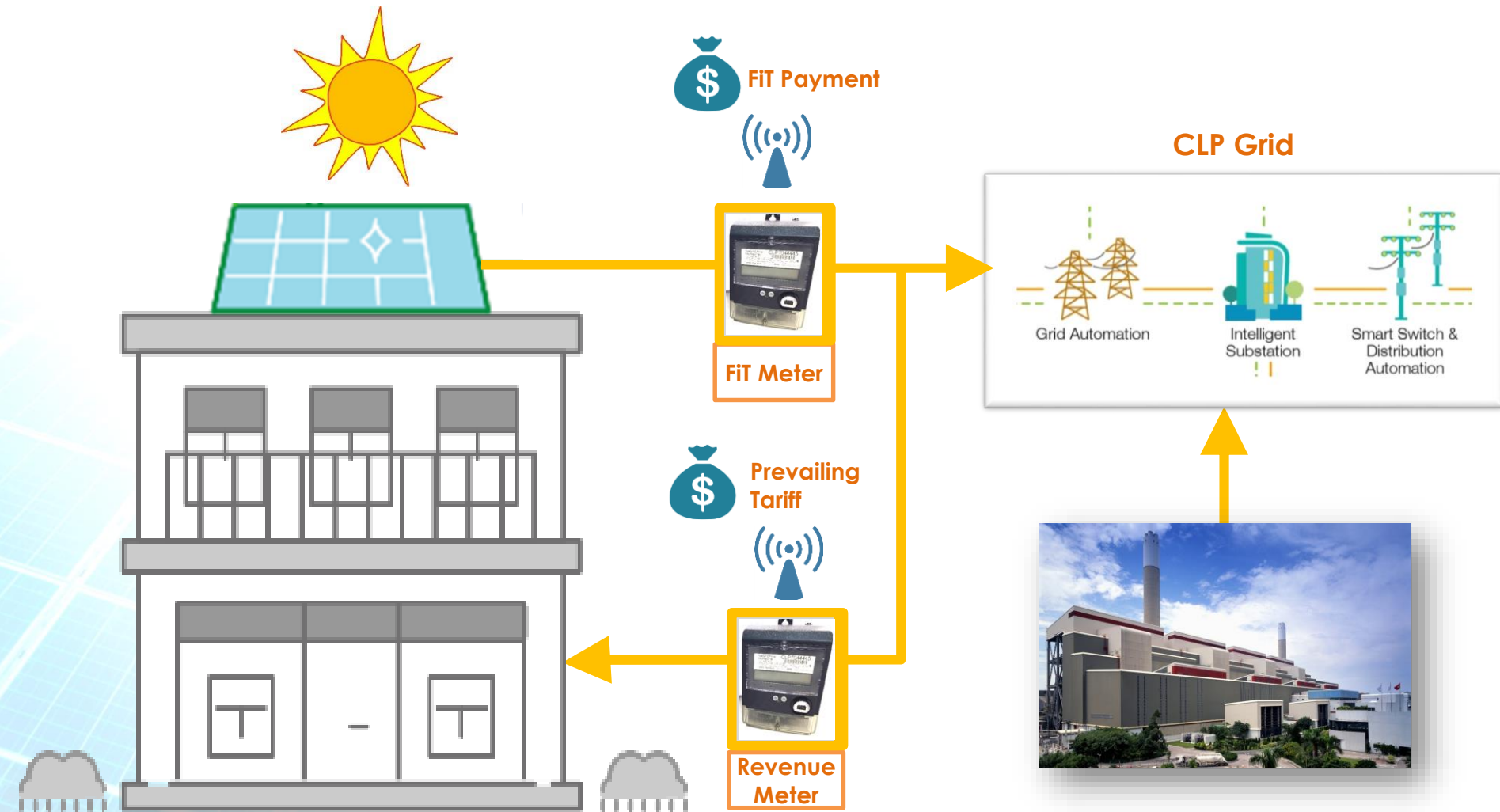
For a clear blue sky, we all have a role to play



You and I. Together we can
bring a clear blue sky

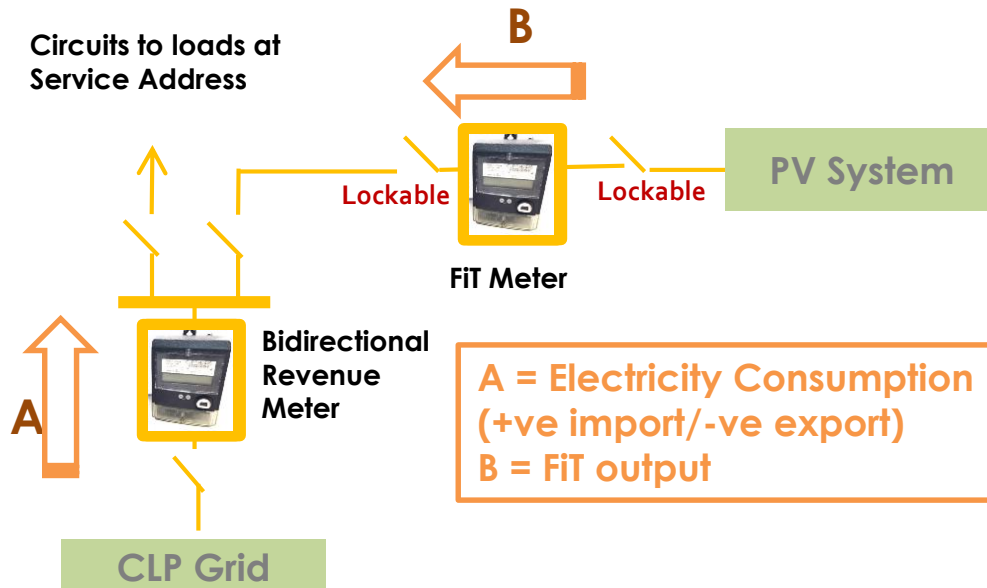


Overview of Feed-in Tariff (FiT) Scheme



Metering Connection of Renewable Energy Systems(RES)

Metering and Accounting :



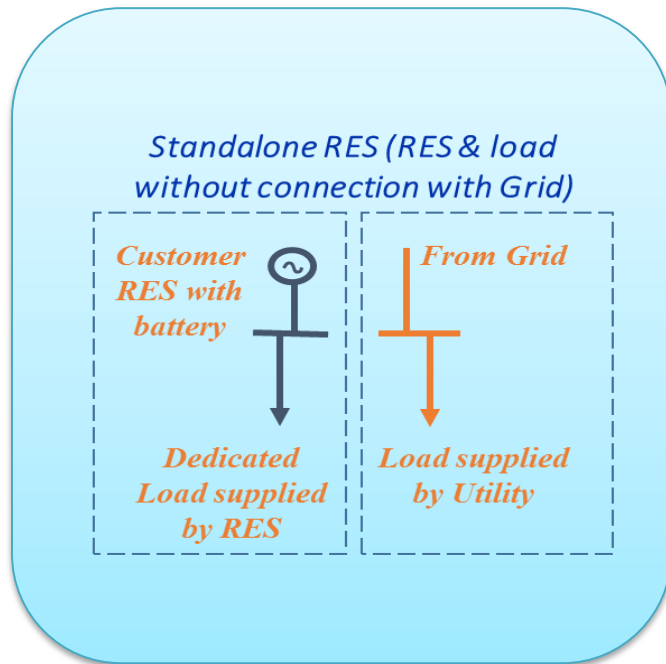
Payment/Charge	Calculation of Energy (in kWh)
FiT Payment	$B \times \text{FiT Rate}$
Electricity Consumption	$(A + B) \times \text{Prevailing Tariff}$

Example of a Village House with 3kW Solar PV RES	Summer 	Winter 
Revenue Meter Reading	A = 800 kWh (Import)	A = -100 kWh (Export)
RE System Output	B = 250 kWh	B = 250 kWh
Billed consumption	A + B = 1,050 kWh	A + B = 150 kWh

Eligible Renewable Energy Systems (RES) under FiT

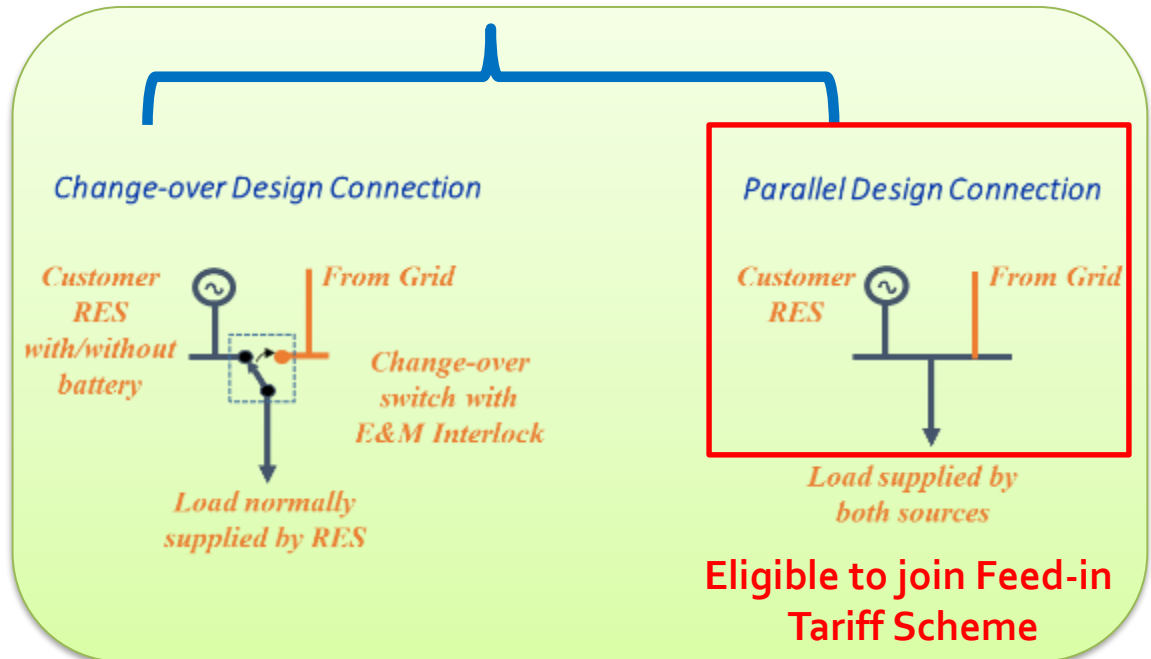
Standalone RES:

- Supply a dedicated load
- Totally isolated to utility's grid
- No Standby supply from utility



Grid connected RES:

- Standby supply from utility
 - Change-over Design Connection
 - Parallel Design Connection



Eligible Renewable Energy Systems (RES) under FiT (Continued..)

Type of RES

- Solar energy
 - Wind energy
 - Hydro energy
 - Geothermal energy
 - Tidal energy
 - Biomass energy
 - Energy from waste
- Eligible to join Feed-in Tariff Scheme**



The Feed-in Tariff Scheme in CLP

CLP Power will **purchase the electricity produced by an approved renewable energy system (RES)** once it is successfully connected to the company's power grid.



Beneficiaries



RE System Capacity	FiT Rate (per unit)
Capacity $\leq 10\text{kW}$	HK\$5/kWh
Capacity $> 10\text{kW} - \leq 200\text{kW}$	HK\$4/kWh
Capacity $> 200\text{kW} - \leq 1\text{MW}$	HK\$3/kWh

Eligibility

- A registered customer of CLP electricity account
- RE Systems (RES) is not owned and operated by the Government

Validity Period

- The validity period of the FiT rate will be applied to the entire project technical lifetime, or until the end of 2033, whichever is earlier
- FiT rates will be reviewed regularly. The new rates will be applied to new RE system application after the effective date of change.

The Feed-in Tariff Scheme in CLP (Continued..)

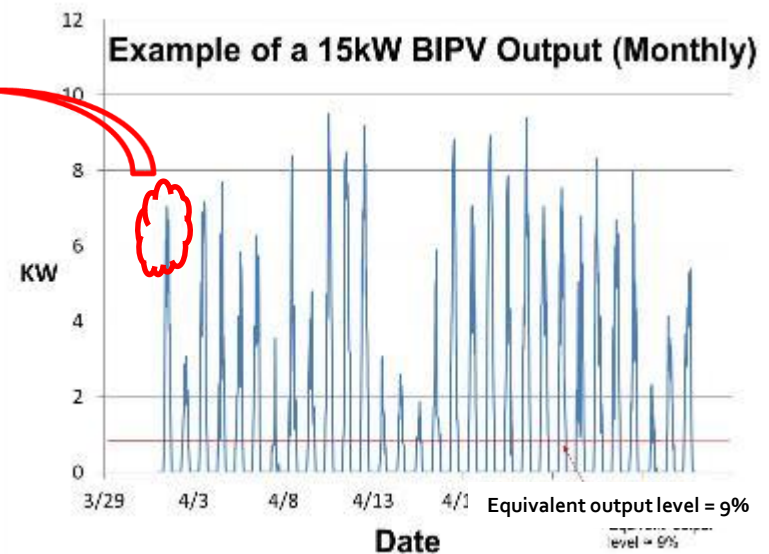
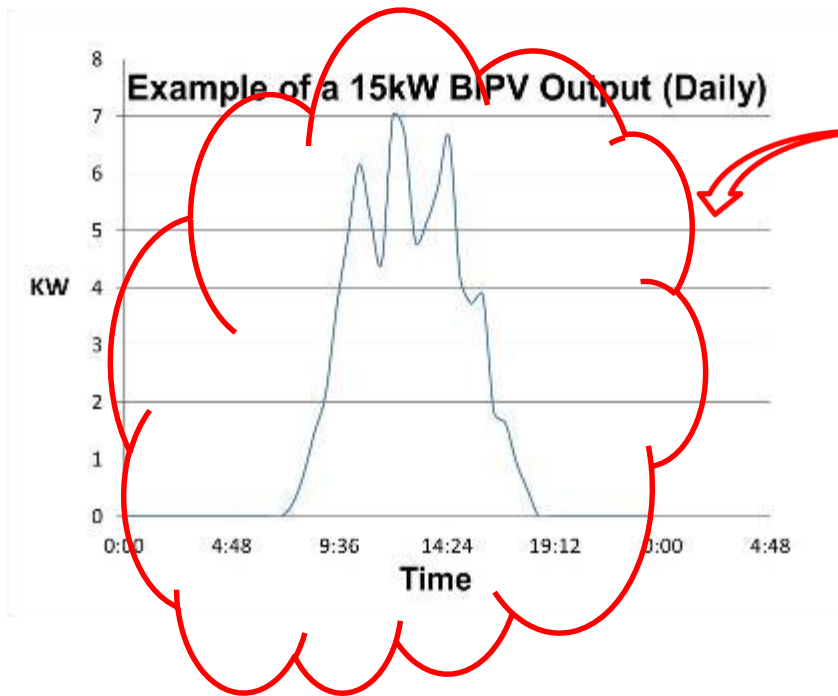


- **Environmental Attributes** associated with RES output **are sold to CLP** under the FiT Scheme
- **Environmental Attributes** means the rights to claim **all greenhouse gas and other pollutant emissions reduction benefits** associated with the unit of renewable electricity when it was generated

Considerations in the design and installation of RES

Characteristics of electricity generated from RES:

- *Intermittent*
- *Unstable & irregular*



Considerations in the design and installation of RES (Continued..)



Size of Solar PV System

- Resources of solar irradiation, tilting angle, type of solar PV panels



Location of Solar PV system

- Land use, lease conditions, floor area, structural loading, associated equipment room, glint and glare, etc.



Shading Analysis

- Nearby tall objects and structures, potential shading objects



Grid Connection

- Utilities connection requirements, system efficiency, voltage problem, and future operation & maintenance

Considerations on Installation Locations for RES (Continued..)

New Territories Exempted Houses (NTEH, Village Houses) Rooftop

Height restriction of Roof relaxed to 2.5 metres. Average loading imposed not exceeding 150kg/m²

Height restriction of Stairhood being 1.5 metres. Average loading imposed not exceeding 75kg/m²



Clusters:
each $\leq 5\text{m}^2$, separated from each other by $\geq 1\text{m}$

Continuous-spread:
 $\leq 50\%$ roofed-over area

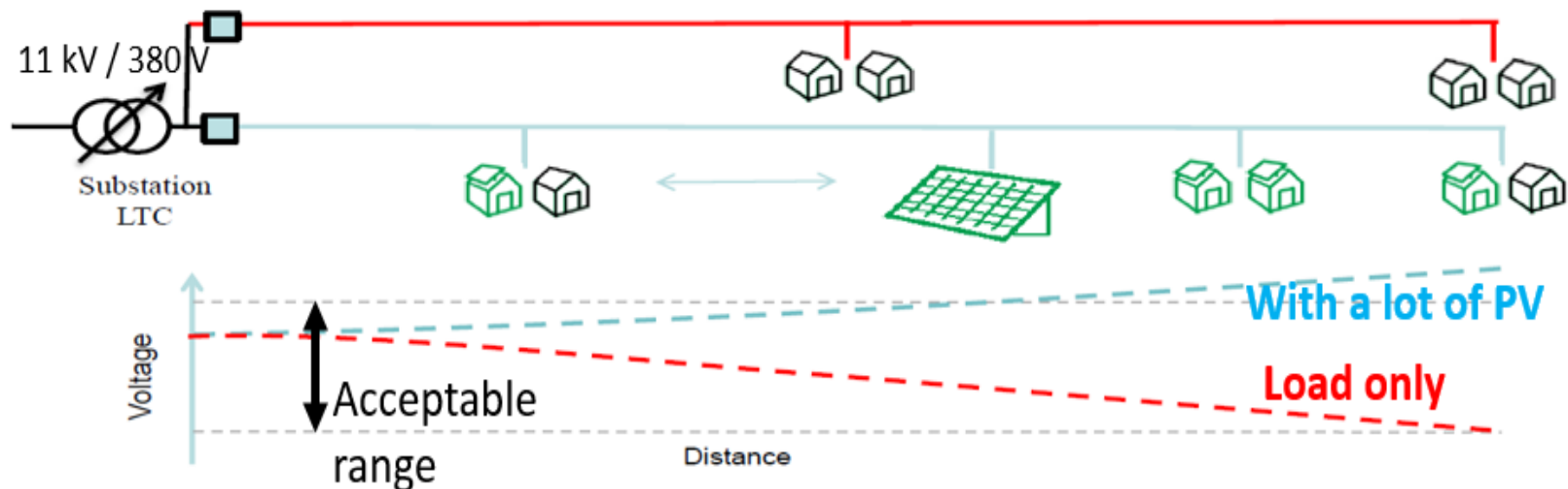


Considerations in the design and installation of RES (Continued..)

- *Sufficient supply capacity*
- *Capability of existing supply network for RES exporting power*

Example: Voltage rise due to excessive power exporting from RES to utility's distribution grid at network remote end

- *Violation of upper voltage limit stipulated by the Supply Rules*
- *Voltage rise limit could be a concern for limiting the capacity of RES grid connection*



Customer's Technical Considerations of Grid Connection of RES

○ Future Operation and Maintenance

- Operation Procedures
- Lockable Isolation Switch

*Lockable Isolation
Switch for safe
working on
Customer's RES and
CLP Systems*



Customer's Operation and Maintenance Contact

Name & registration number of the Registered Electrical Contractor (REC) responsible for maintaining the generating facility in safe working order:

Name	Registration number	Telephone Number	Email Address

REC Signature and Chop: _____

Date (DD/MM/YYYY): _____

Note: RE System owner should keep this RE System information for record. Where any of the particulars provided on this Contact Information change, the owner of the facility shall notify CLP accordingly.

Generating facility registration (click either one)

- ☐ Generating facility is being registered according to the Section 21 of the Electricity Ordinance (Cap. 406) with receipt/registration number: _____
- ☐ Generating facility forms part of an electrical installation that requires a periodic test certificate to be submitted to the Director of Electrical and Mechanical Services under the Electricity Ordinance (Cap. 406).
- ☐ Others: Please state the details here _____

RE System Owner Name and Signature:
(or on behalf of the RE System owner) _____

Date (DD/MM/YYYY): _____

Operation Procedures of RE System at xxxxxx (Name & Address)

Basic information

RE type	PV/Wind Turbine System (Please delete if not applicable)
RE system rating	xxxxxx kW
Installation address	xxxxxx

RE owner/representative	xxxxxx
Contact person	xxxxxx (Please provide position instead of personal name)
Phone number	xxxxxx
Communication Address	xxxxxx

Summary Table for RE Systems

(Please delete this summary table if the premises only with one RE system)

RE System	Inverter Rating	Total PV Panel Rating (kW)	Overall PV System Rating (kW)
PV System	xxxxxx	xxxxxx	xxxxxx
BIPV System	xxxxxx	xxxxxx	xxxxxx

Application Procedures for FiT Scheme

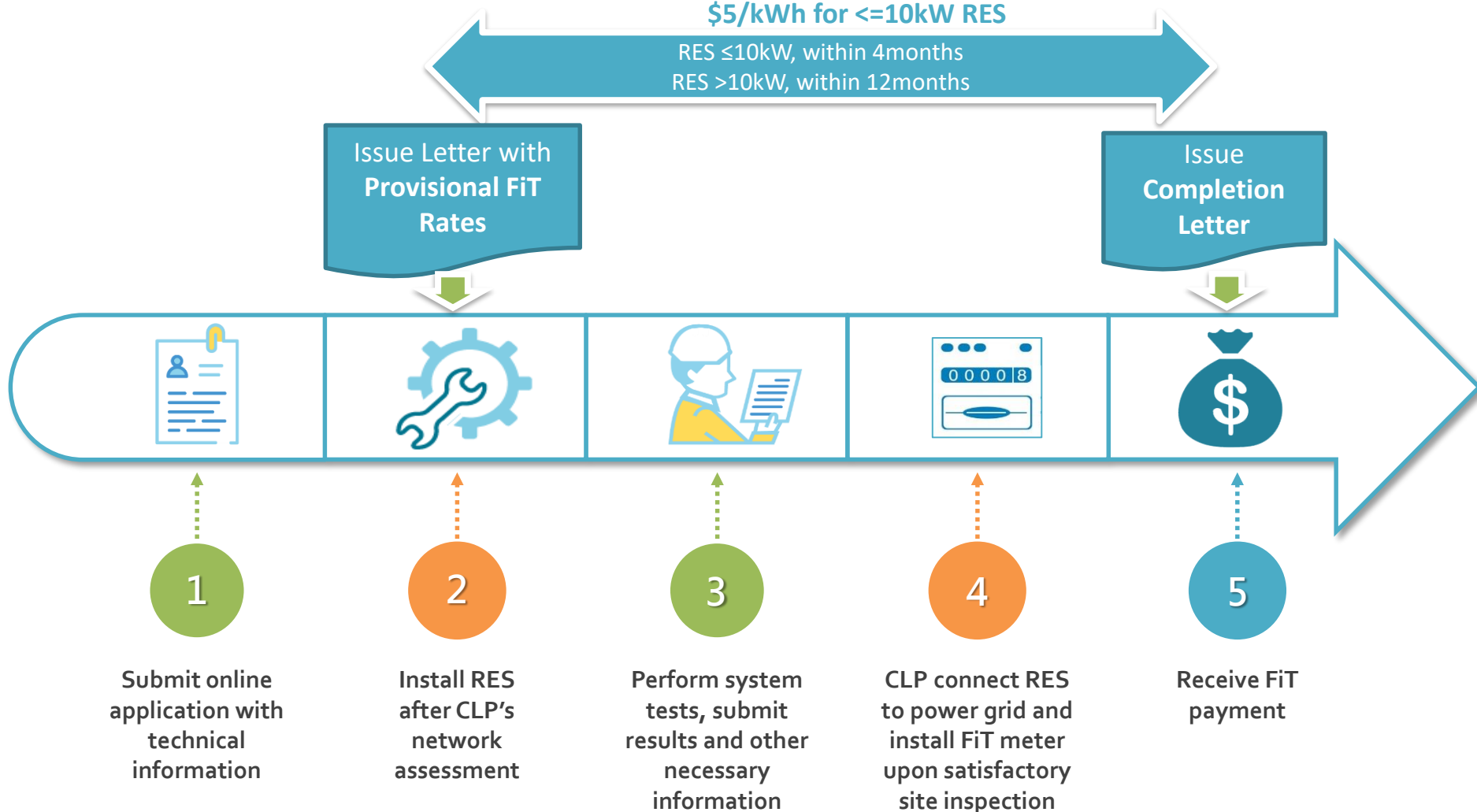
Participation in FiT Scheme :

Validity Period for Provisional FiT Rates, e.g.

\$5/kWh for $\leq 10\text{kW}$ RES

RES $\leq 10\text{kW}$, within 4months

RES $> 10\text{kW}$, within 12months



Application Procedures for FiT Scheme (Continued..)

Required Submission for FiT Application :

1

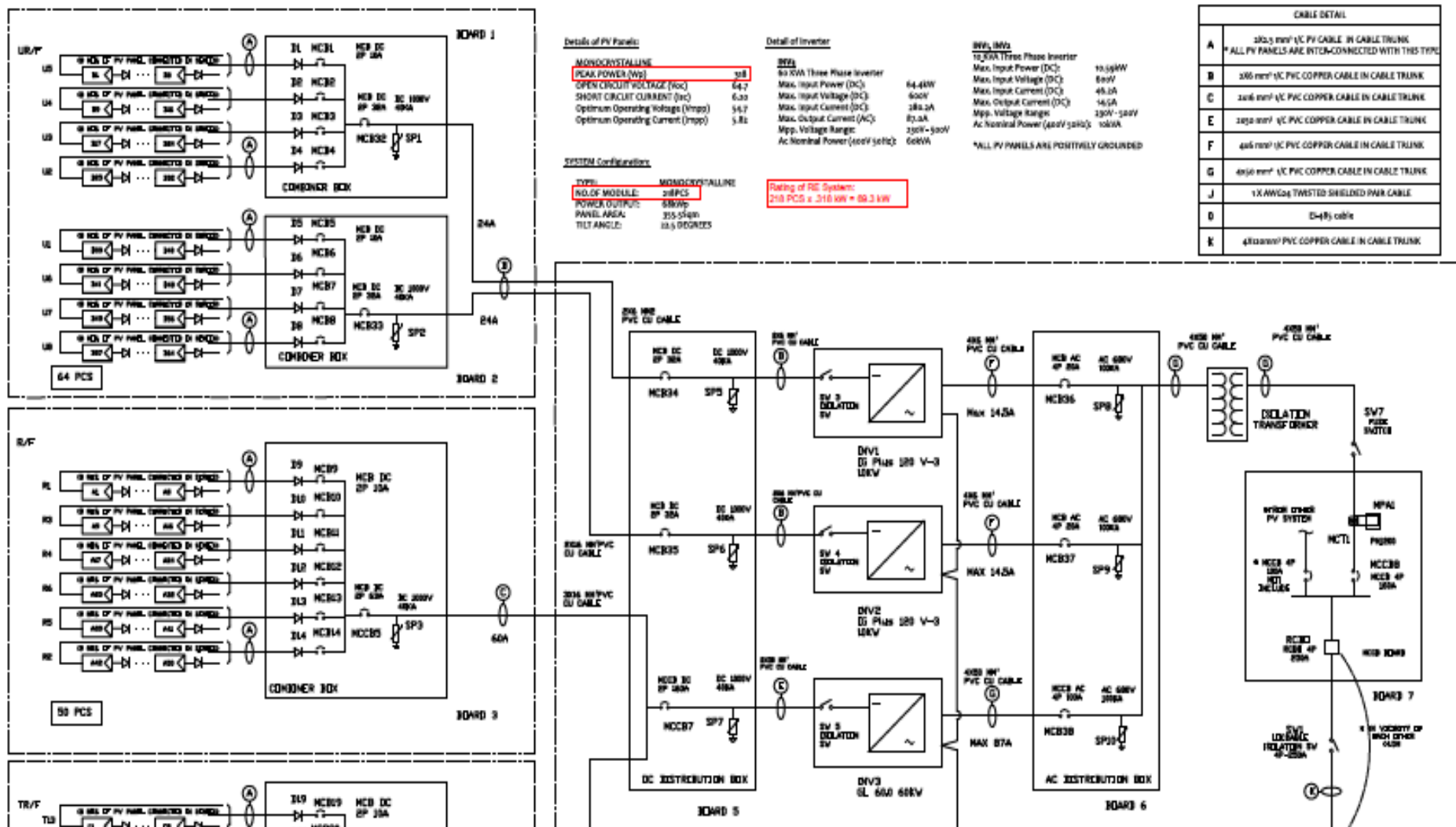


**Online Submit
application with
technical
information**

- Submit Online application
- Identity Verification Document (e.g. ID or Business Registration copy)
- Layout Drawings
- Single-line Electrical Diagrams
- Major Components Technical Information, e.g. specifications

(Application with incomplete documents will not be processed)

Application Procedures for FiT Scheme (Continued..)



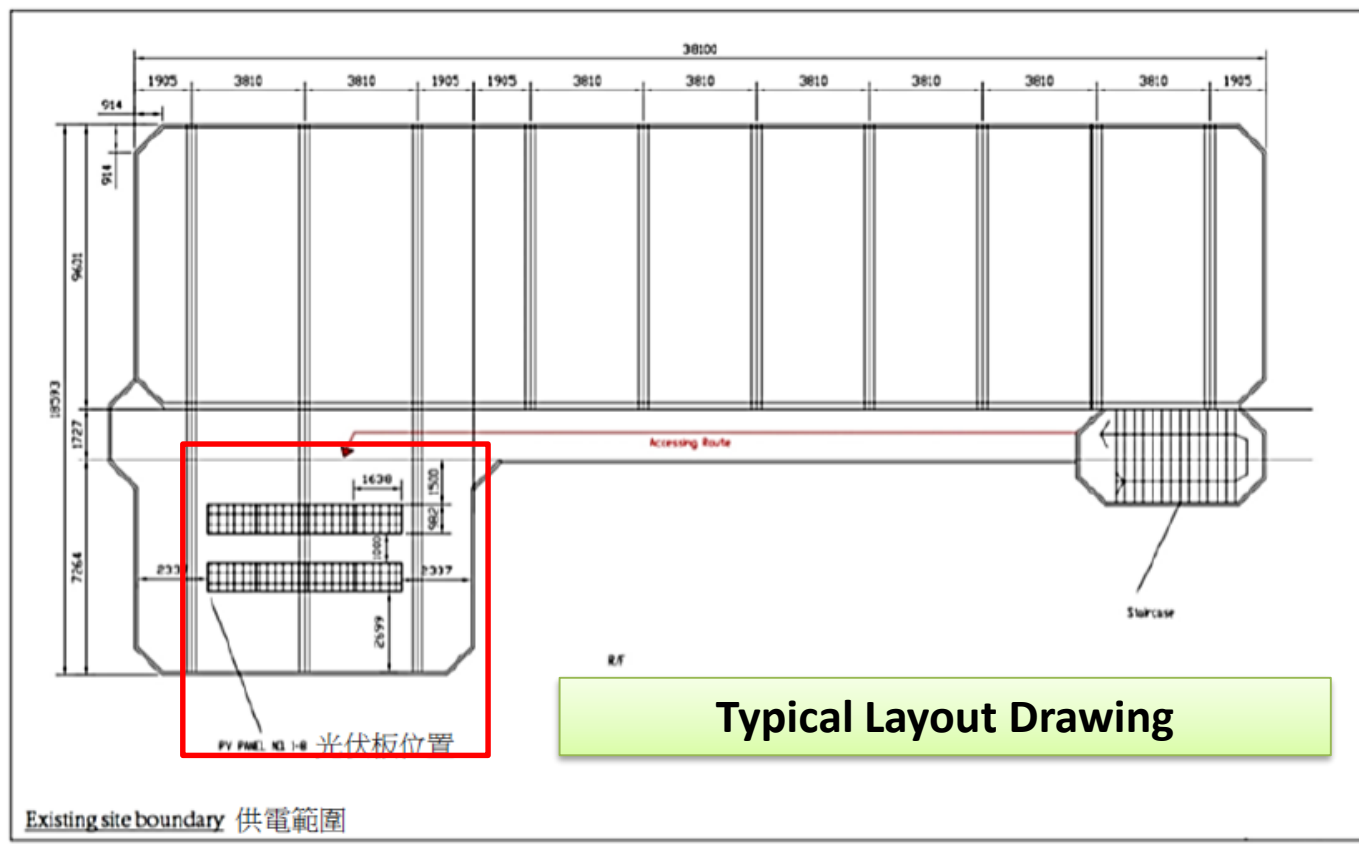
Typical Single-line Electrical Diagrams

Application Procedures for FiT Scheme (Continued..)

Sample of Preliminary Layout Diagram of the Renewable Energy System 可再生能源系統初步佈局圖的樣本

Reference number: _____ 編號: _____

RE System (PV Panel) Location Plan in the Premises 可再生能源系統初步佈局圖



Application Procedures for FiT Scheme (Continued..)

- PV system owner shall ensure the design, installation, operation and maintenance complies with **all applicable laws, regulations, codes of practice, guidelines, safety and technical requirements** including:

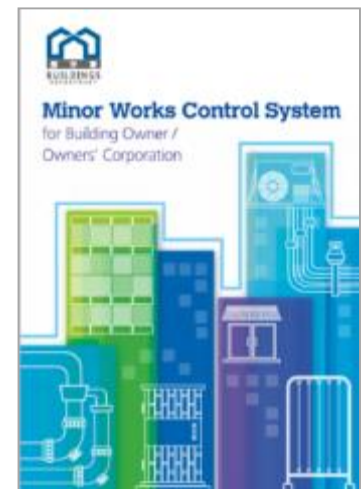
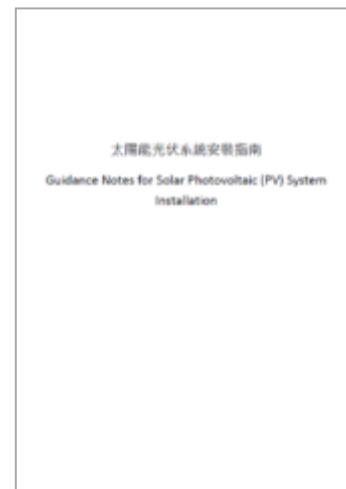
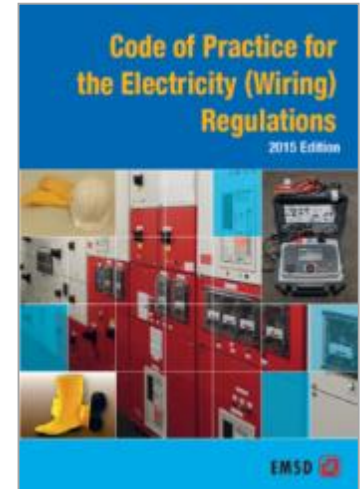
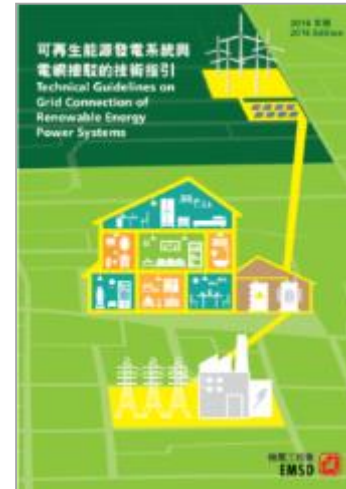
機電工程署
EMSD



- Technical Guidelines on Grid Connection of Renewable Energy Power System
- Registration of Generating Facility in accordance with the Electricity Ordinance
- EMSD Guidance Notes for Solar Photovoltaic (PV) System Installation



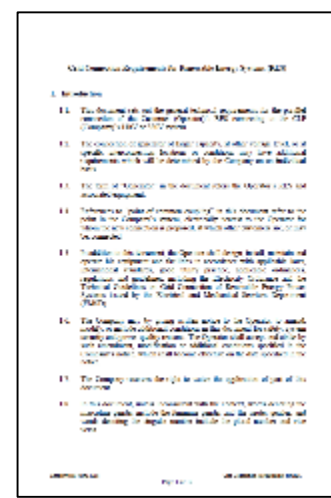
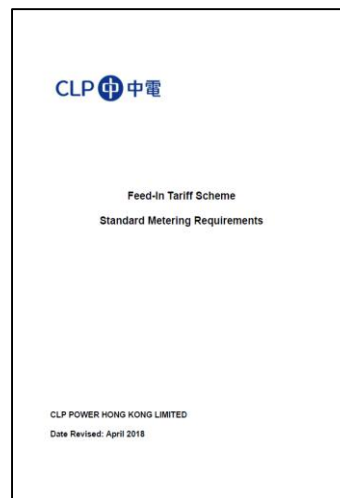
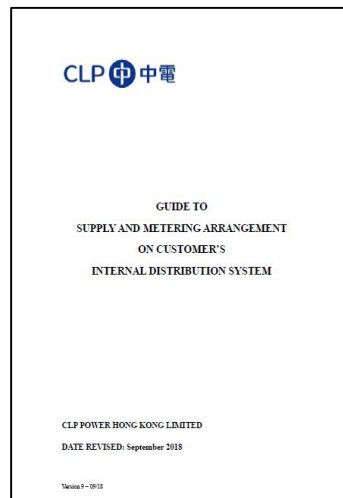
- Minor Works Control System



Application Procedures for FiT Scheme (Continued..)



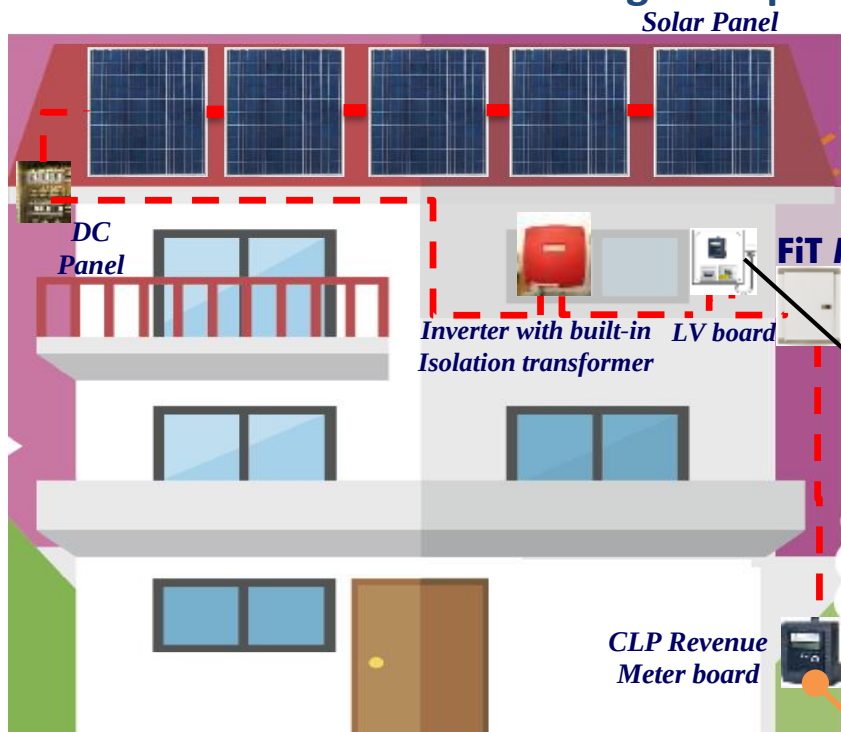
- **Supply Rules**
- **Technical Design Notes for Grid Connection of Small Renewable energy Systems (Up to 200kW)**
- **Grid Connection Requirements (General grid connection requirement from 380V to 11kV RES)**
- **Feed-in Tariff Scheme Standard Metering Requirements**
- **Guide to Supply and Metering Arrangement on Customer's Internal Distribution System**



Chapter	Section	Page
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Grid Connection of RES – Village Houses

Feed-in Tariff Scheme Metering Example



* 2-P (1 Ø) or 4-P (3-Ø) Circuit Breaker /Isolation Switch

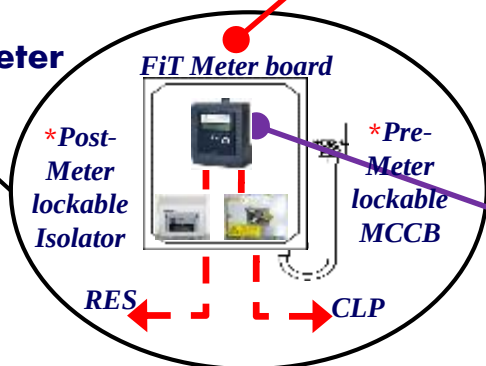
FiT Meter board

Ideal Location

- Near CLP Supply Point
- Readily accessible by CLP's staff for regular check
- No potential safety hazards

FiT Meter

- Determine the amount of electricity generated by the RES
- To be installed inside an existing switch room or meter box (or location agreed by CLP)
- Equipped with automatic reading function
- Communication for FiT meter will be supplied by CLP (Only applied to ≤ 60 Ampere (Single-Phase) or ≤ 100 Ampere (Three-Phase))



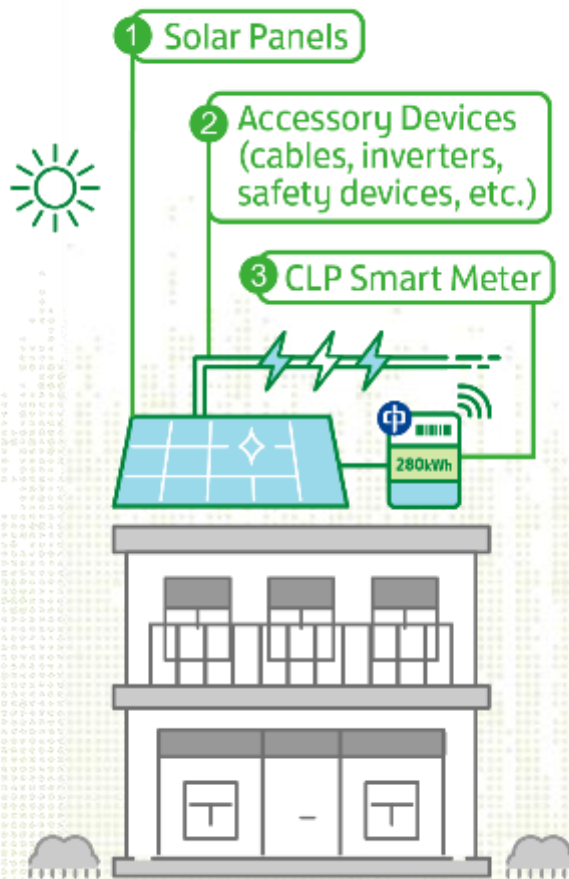
Revenue Meter

- Record the amount of electricity used by the Customer
- Equipped with automatic reading function
- Bi-directional Meter (Single direction meter replaced with bi-directional meter)

A Few Examples...



Typical Case for Village Houses



How to Calculate Your Payback Period

A solar system with a generation capacity of about 1kW in Hong Kong can generate around 1,000 units of electricity a year.

A Solar System in a Typical Village House

Rooftop area	700 square feet
Estimated number of solar panels installed	12pcs (approximately one third of the total rooftop area)
Renewable energy system generation capacity	Around 3kW
Estimated annual renewable energy electricity generated	Around 3,000 units
Applicable FiT rate	HK\$5 / kWh
Estimated annual FiT earning	Around HK\$15,000
Estimated system construction cost	Market rate ranges from around HK\$90,000 to HK\$150,000
Payback period	Approximately 10 years



A Few Examples...



System installed in 2018

2018 system

Capacity: 8kW

Rate: \$5 /kWh



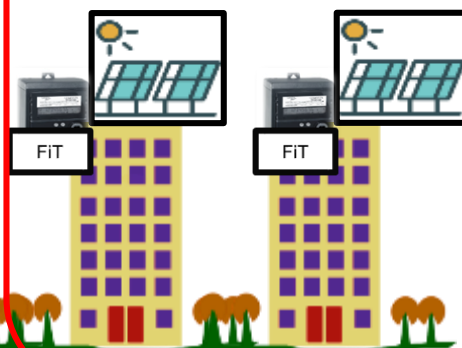
(Pay according to meter)

Additional systems in 2021

Additional systems in 2021

Capacity: 2x 8kW (separate rooftop, count as separate systems)

Rate: \$X /kWh (2021 Rate) for 2x 8kW systems



(Pay according to meter)



FiT Rates

	≤10kW	≤200kW	≤1MW
2018	\$5	\$4	\$3
2021	X	Y	Z

The FiT rate table for illustration purpose only

Renewable Energy Certificate (REC)



Residential and commercial customers who support clean energy will be able to buy RECs which represent electricity generated by local RE sources, generated or purchased by CLP Power, providing a positive platform for RE development in the community.



Each REC represents electricity produced by a **mixture of RE sources in Hong Kong, whether purchased (e.g. through FiT) or generated by CLP Power.**

The price of each REC unit will be **HK\$0.5**, RECs will be available at a **minimum purchase of 100 units.**