



40th APEC EGNRET Meeting

The Development and Prospective of Renewable Energy Grid Integration in Chinese Taipei

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Bureau of Energy

Ministry of Economic Affairs

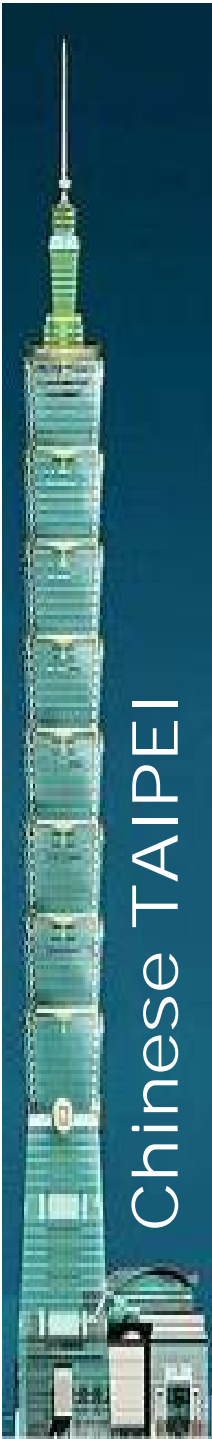
Chinese Taipei

2-5 April , 2013 Ha Noi, Viet Nam

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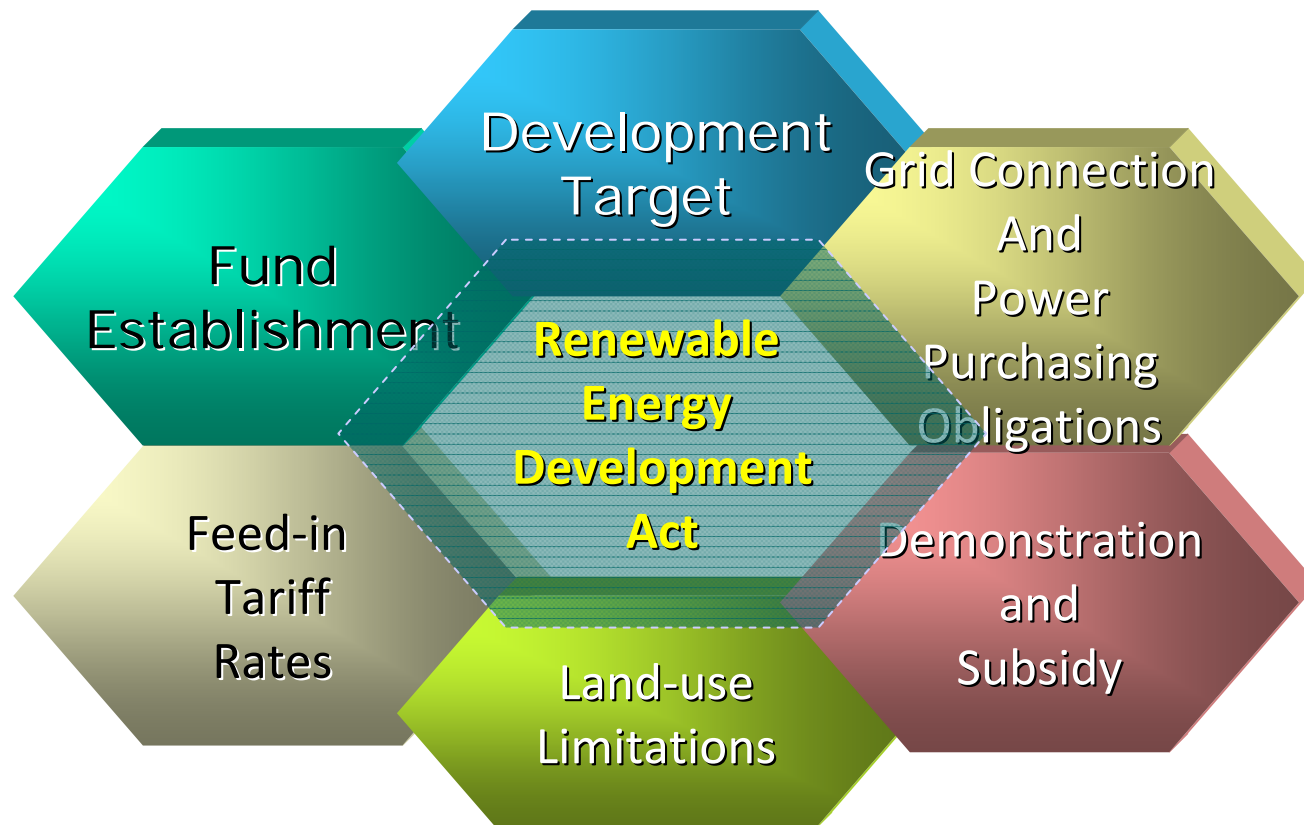
Outline

- **Renewable Energy Development Act in Chinese Taipei**
- **Transmission and Distribution Systems in Chinese Taipei**
- **Laws and Regulations for Grid Integration in Chinese Taipei**
- **Classification of Renewable Energy Equipments**
- **Conclusion**



Renewable Energy Development Act in Chinese Taipei

- Enacted on July 8, 2009, and 23 Articles are Included.
- Purposes of The Act are for RE Promotion, Pluralistic Energy Utilization, Environmental Quality Improvement, Enhancement of Industries Development and Sustainable Development.



An Overview of the RE Act

Target	Increase of renewable energy installation capacity by 6.5 GW to 10 GW
Feed-in Tariff	<ol style="list-style-type: none"> 1. Fixed rate in 20 years and different RE categories are proposed different rates. 2. Tariffs are reviewed and adjusted by the Committee annually. 3. The committee are organized of 17-21 members who are government officers, scholars and experts, and other groups.
Targeted Technologies	Solar energy, biomass energy, geothermal energy, ocean power, wind power, hydropower and waste energy, excluding non-stream based hydropower and direct incinerating technologies
Power Purchase	Compulsory grid connection and power-purchasing obligations
Subsidies for Thermal Utilization	Solar water heating, biomass, and other renewable thermal technologies
Fund Source	<ol style="list-style-type: none"> 1. Electricity generation by fossil fuels and nuclear energy 2. Government budget 3. Others including the Petroleum Fund and agriculture development fund
Supplementary Measures	<ol style="list-style-type: none"> 1. Capital subsidy and Demonstration grants 2. import tax free, various licensing and land-use requirements 3. Dispute mediation mechanism

FIT Variations in Recent Years

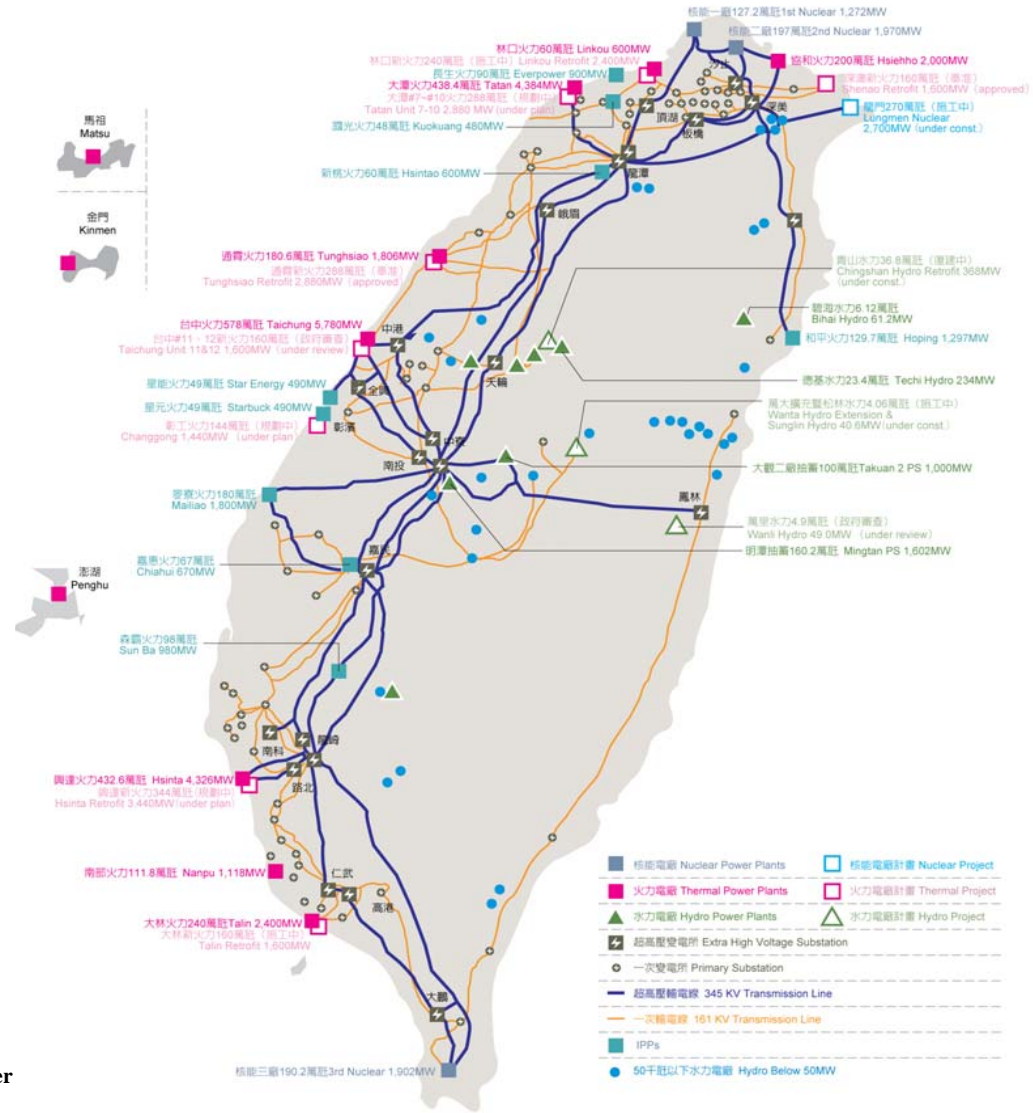
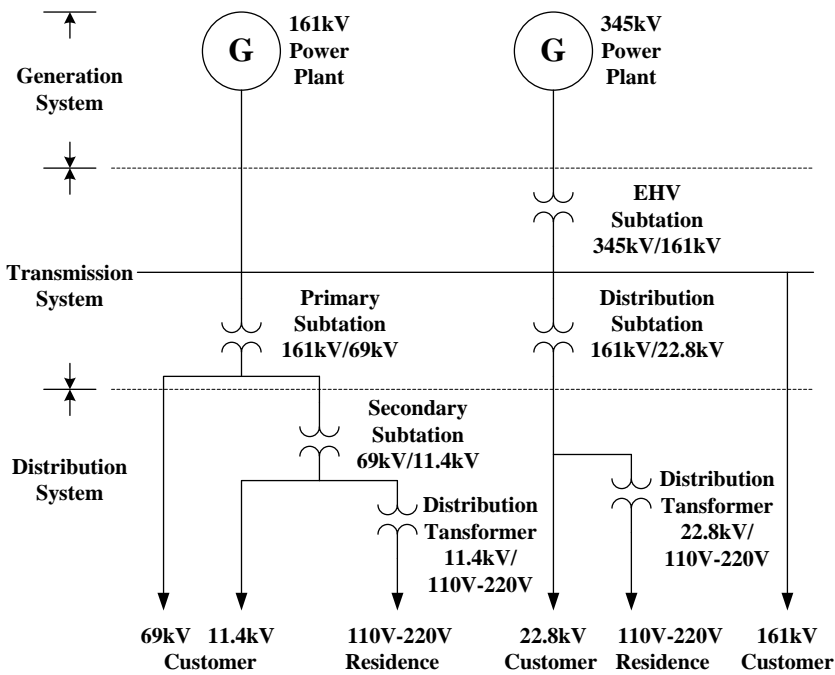
RES Type	Differentiation	Brackets (kW)	2010 Tariff Rates (NTD/kWh)	2011 Tariff Rates (NTD/kWh)	2012 Tariff Rates (NTD/kWh)		2013 Tariff Rates (NTD/kWh)	
					period 1	period 2	period 1	period 2
Solar PV	Roof Mounted	1~<10	11.1883* (equivalent to 14.6030 without receiving capital grants)	10.3185	9.4645	9.2510	8.3971	8.1836
		10~<100	12.9722	9.1799	8.5394	8.3259	7.5432	7.3297
		100~<500		8.8241	8.1836	7.9701	7.1162	6.9027
	≥500	11.1190	7.9701	7.3297	7.1873	6.3334	5.9776	
Ground	Single Bracket		7.3297	6.9027	6.7604	5.9776	5.6218	
Wind	On-shore	1~<10	7.2714	7.3562	7.3562		7.3562	
		≥10**	2.3834	2.6574	2.6427 (with LVRT)		2.6258 (with LVRT)	
	Off-shore	-	4.1982	5.5626	5.5626		5.5626	
Stream Hydro	--	Single Bracket	2.0615	2.1821	2.3302		2.4652	
Geothermal	--	Single Bracket	5.1838	4.8039	4.8039		4.8039	
Biomass	--	Single Bracket	2.0615	2.1821	anaerobic digestion	without anaerobic digestion	anaerobic digestion	without anaerobic digestion
					2.6995	2.3302	2.8014	2.4652
Waste	--	Single Bracket	2.0879	2.6875	2.8240		2.8240	
Others	--	Single Bracket	2.0615	2.1821	2.3302		2.4652	

* 1 kW~10 kW Solar PV Installations in 2010 were qualified for 50k NTD/KW Capital Grant, which was terminated in 2011.

** Tariffs for those without LVRT installed are NTD 2.6138/ kWh in 2011, NTD 2.5971/kWh in 2012 and NTD 2.5924/kWh in 2013.

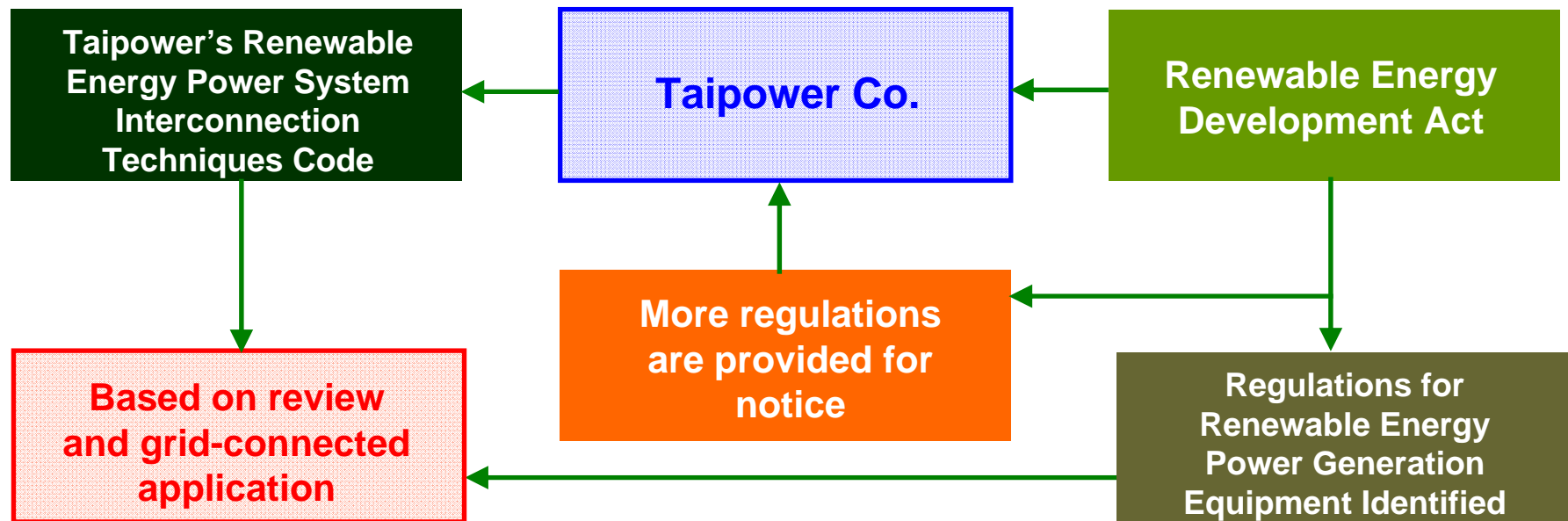
Transmission and Distribution Systems in Chinese Taipei

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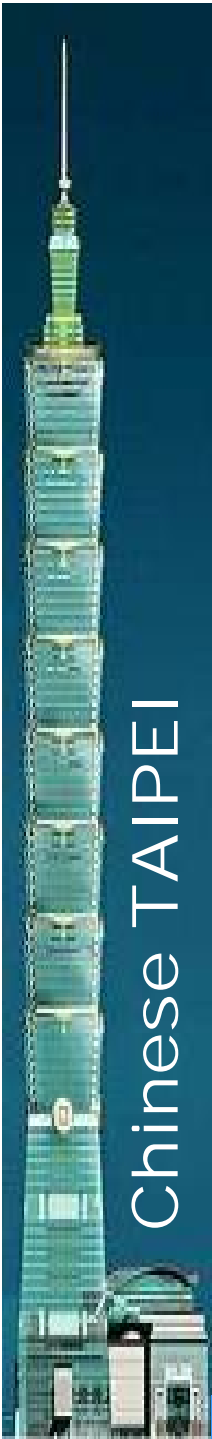


Laws and Regulations for Grid Integration in Chinese Taipei

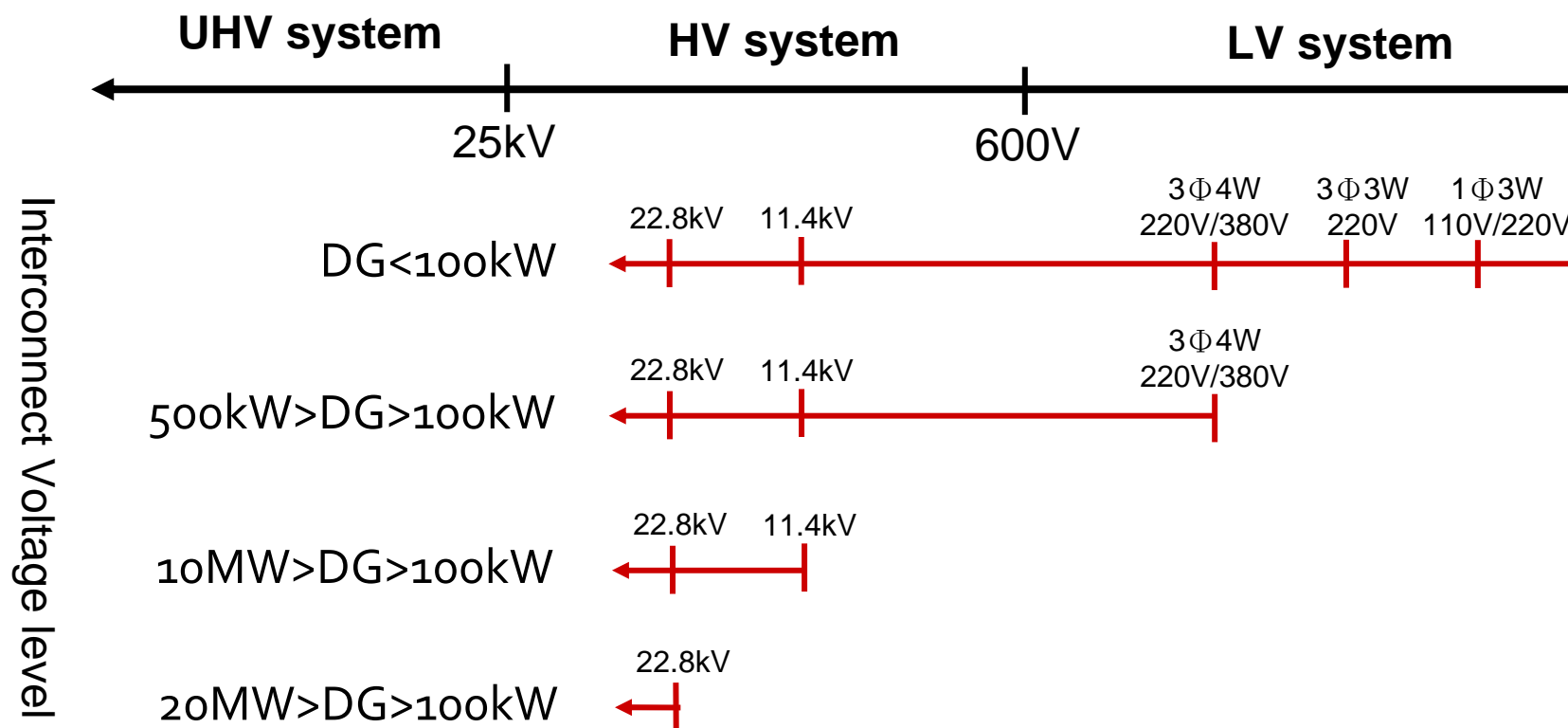
- Renewable Energy Development Act (Jul. 8, 2009)
- Renewable Energy Power System Interconnection Techniques Code (Dec. 31, 2009) were enacted by Taipower company.



Type I, II, and III Applicants



Renewable Energy Generation Equipment Parallel System



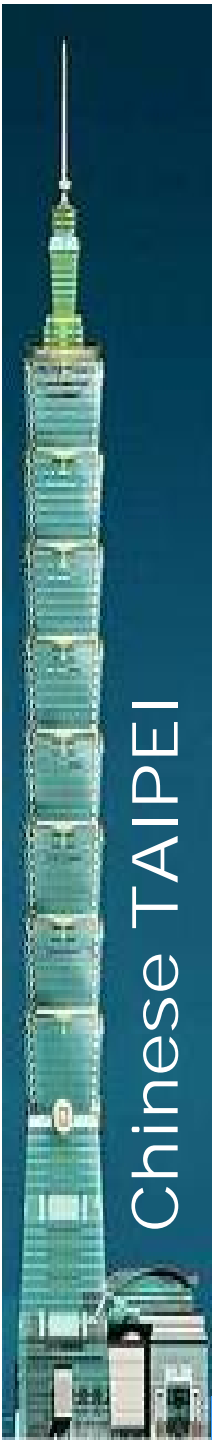
- The interconnection to the UHV system happens to the following conditions would be reviewed the voltage level : **1) 10MW < DG < 20MW and no 22.8kV high-voltage power distribution system; 2) DG > 20MW**

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Classification of Renewable Energy Equipments

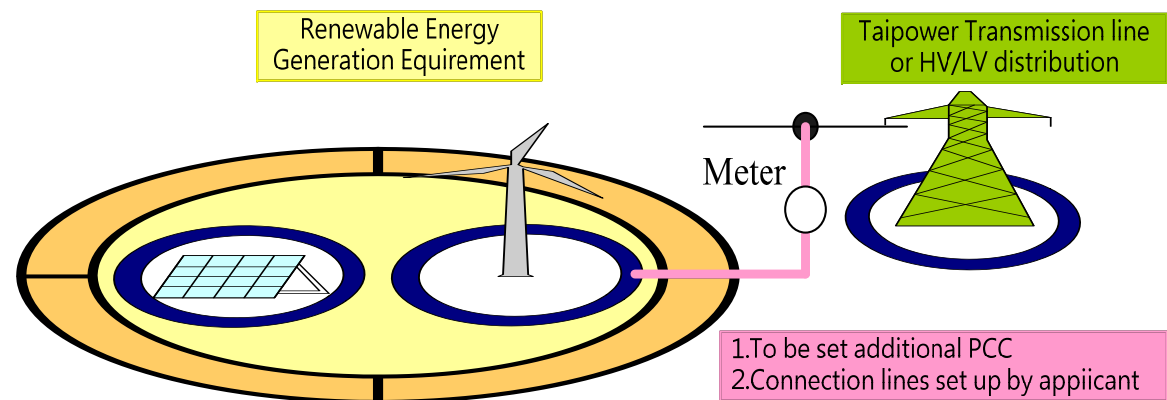
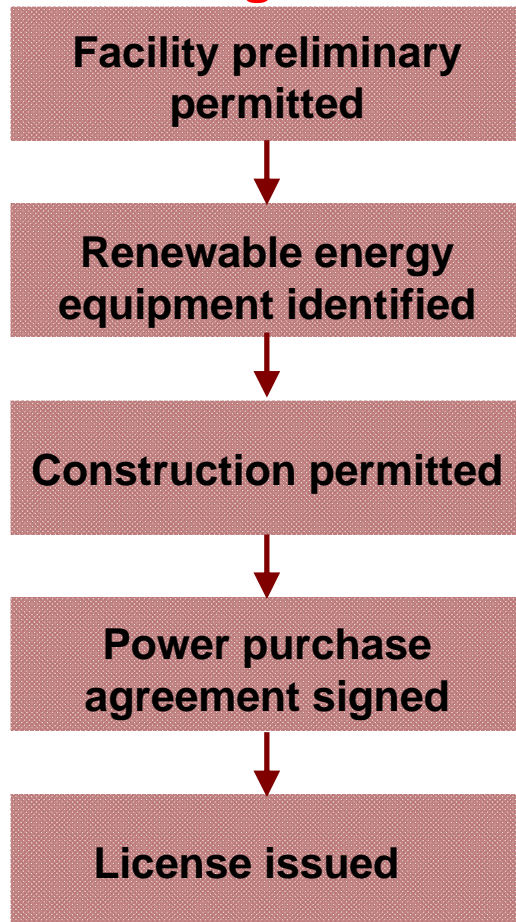
- **Regarding the Renewable Energy Power Generation Equipments' identification, it is classified into three types:**

Type I Applicant	<ul style="list-style-type: none">•Based on the Electricity Management Law.•It is applicable to the power producers installing renewable energy power generation equipments.
Type II Applicant	<ul style="list-style-type: none">•Based on the Electricity Management Law.•Renewable energy power generation capacity to hold more than 500 kW.
Type III Applicant	<ul style="list-style-type: none">•Based on the Renewable Energy Development Act.•Renewable energy power generation capacity to hold less than 500 kW.



Installation of Renewable Energy Equipments Type I

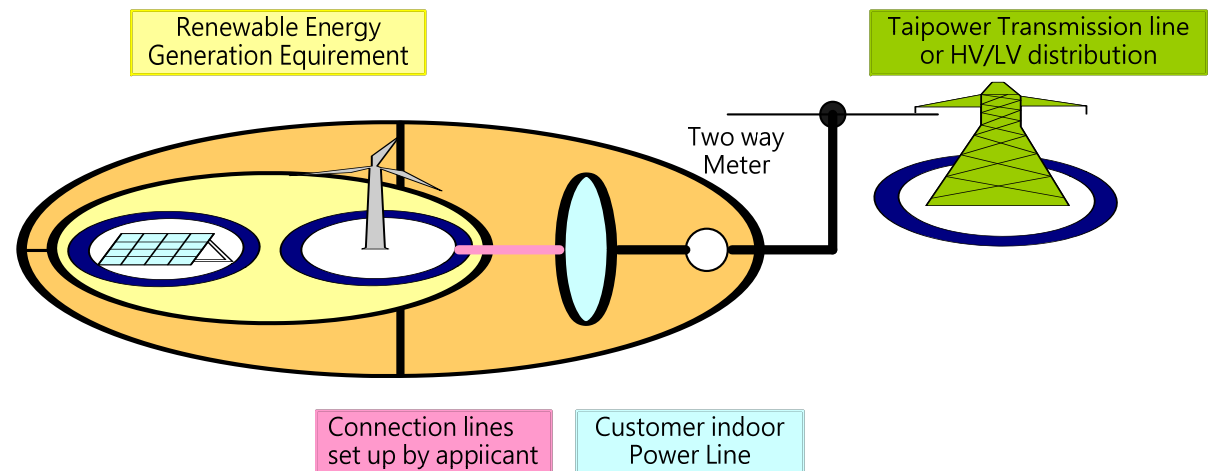
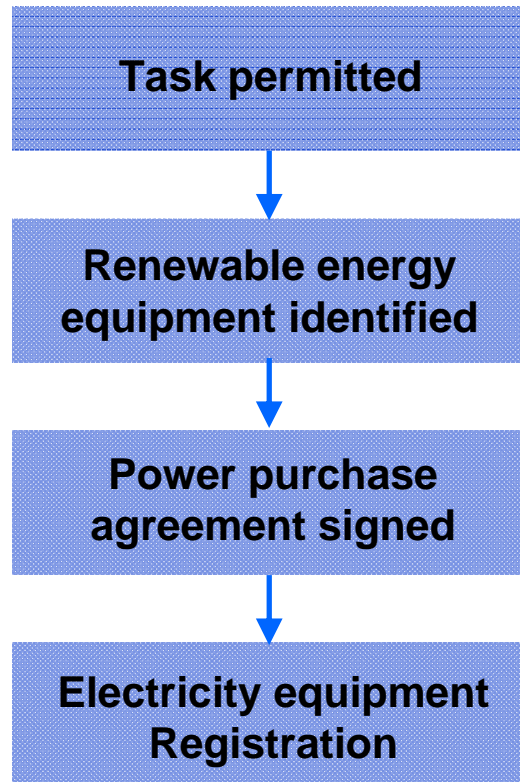
Program



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Installation of Renewable Energy Equipments Type II

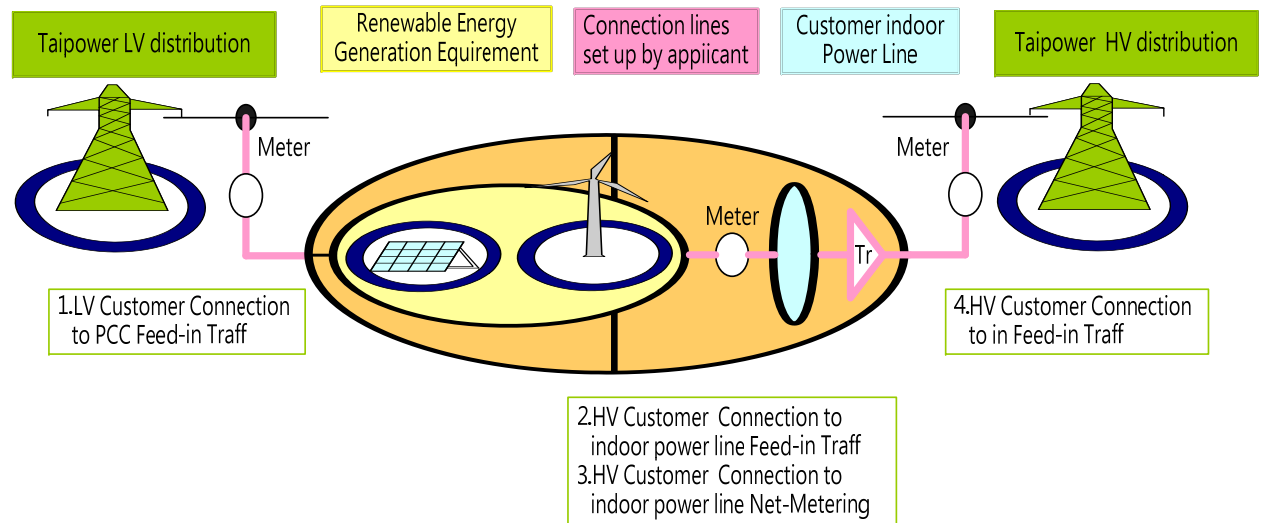
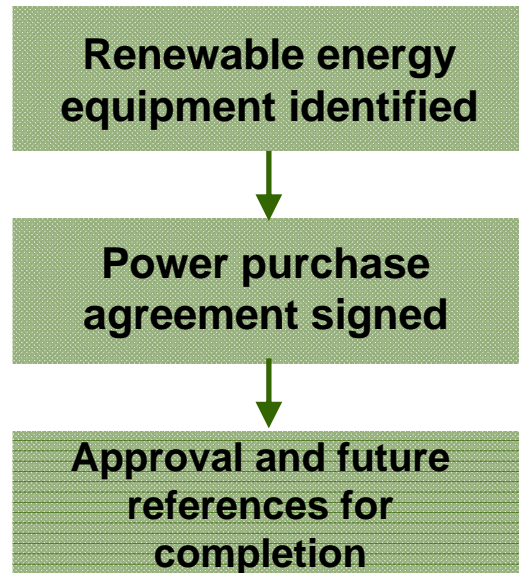
Program



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Installation of Renewable Energy Equipments Type III

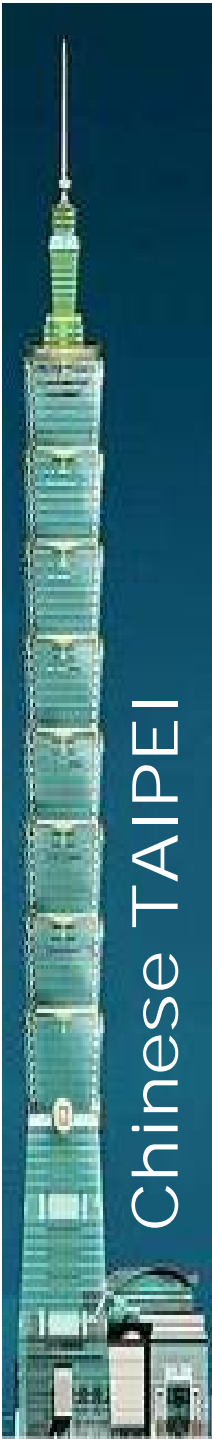
Program



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Conclusion

- The purposes of enacting RE Development Act are for RE Promotion, Pluralistic Energy Utilization, Environmental Quality Improvement, Enhancement of Industries Development and Sustainable Development.
- The suitable laws and regulations of renewable energy power system interconnection techniques code was enacted in 2009. It also specified the programs of application and investigation. Several grid integration types can meet RE developers demand.
- There is the platform to discuss and negotiate among government, RE developers and Taipower company. The problems would be solved rapidly.



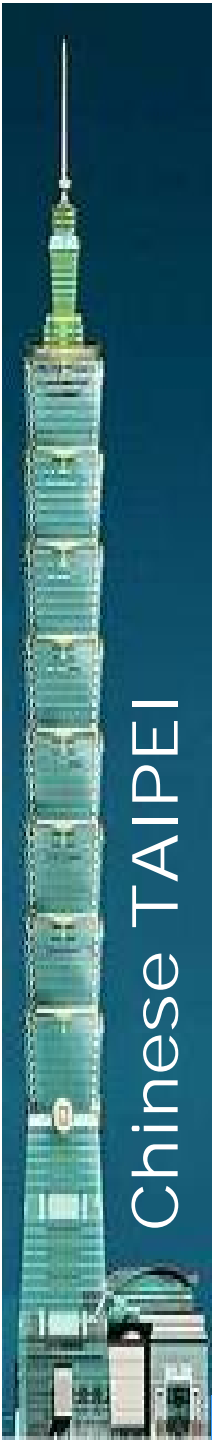
Thank you for your attention

Contact: Dr. Chung-Hsien Chen (ctchen@moeaboe.gov.tw)

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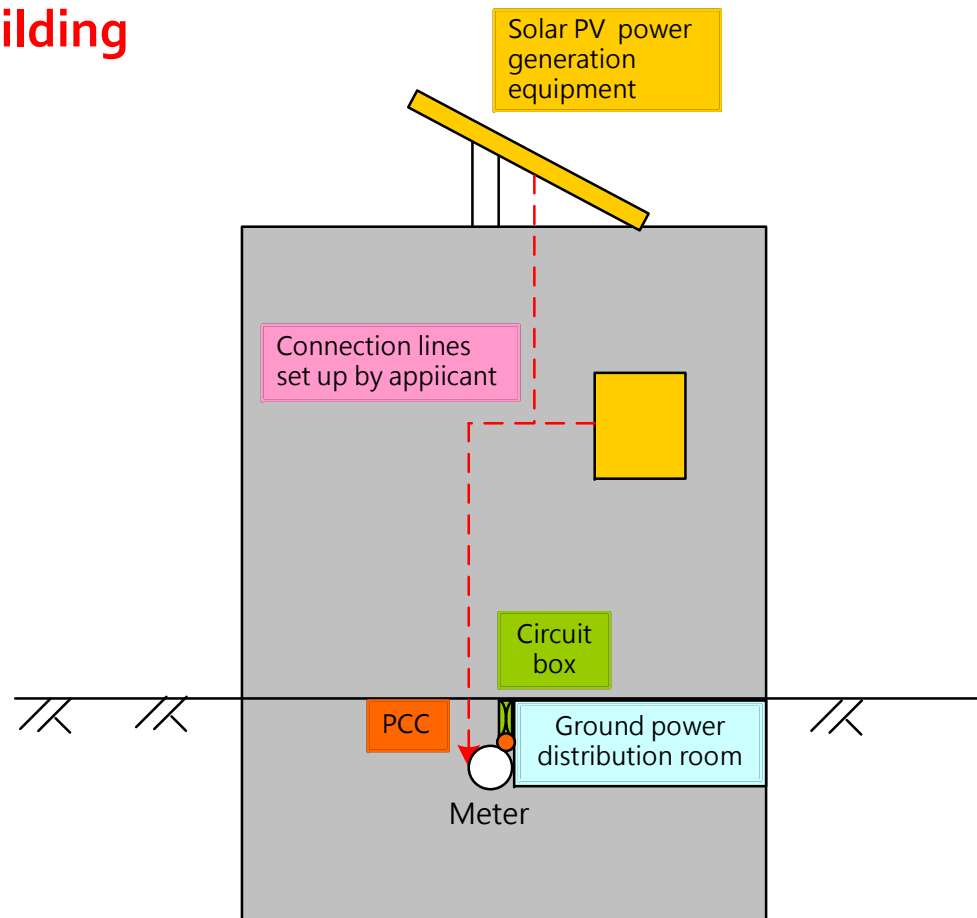
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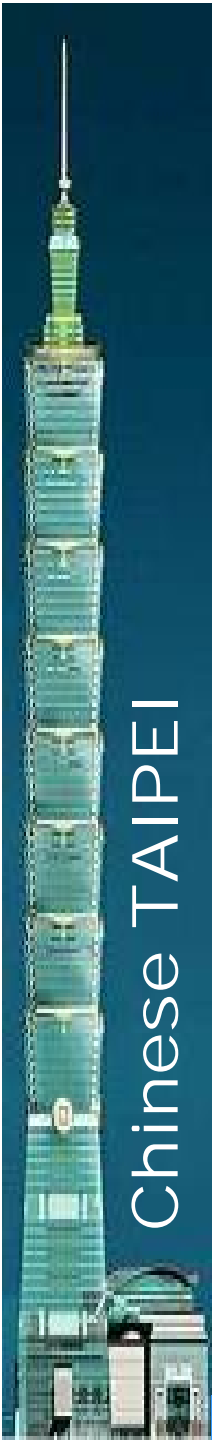


Installation of Renewable Energy Equipments Type III

➤ Applicant : Low Voltage Customer

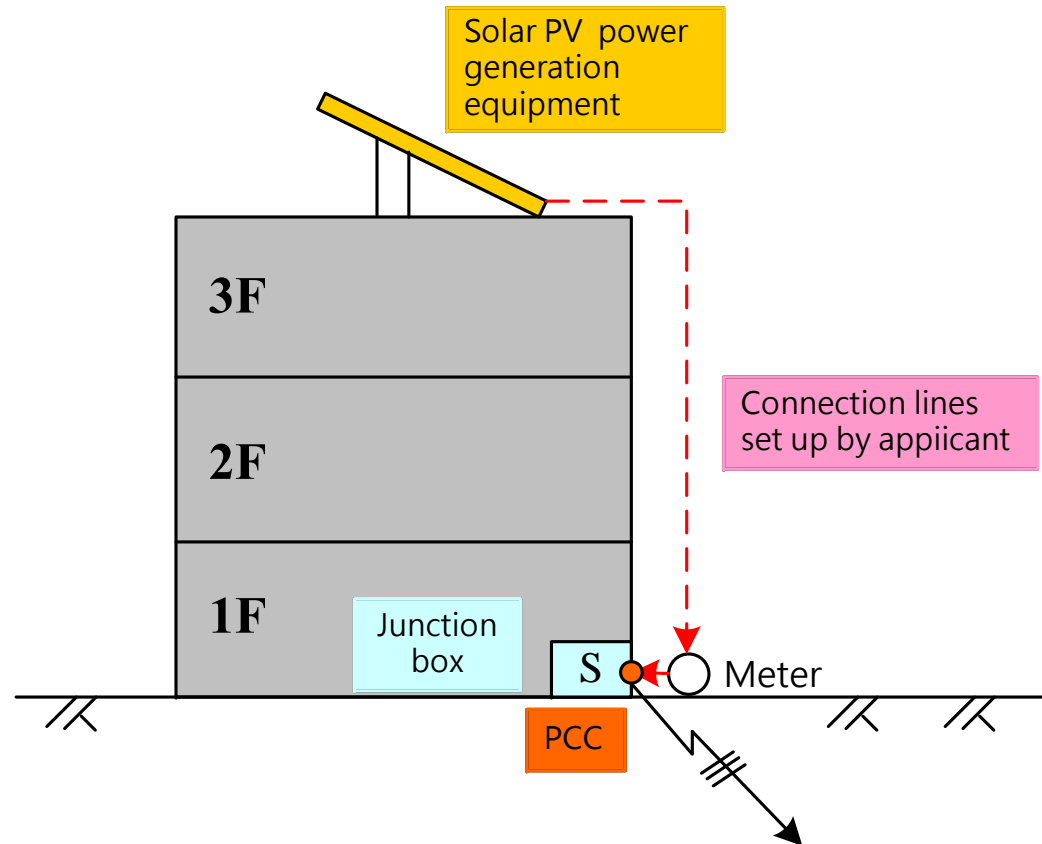
1. tall building





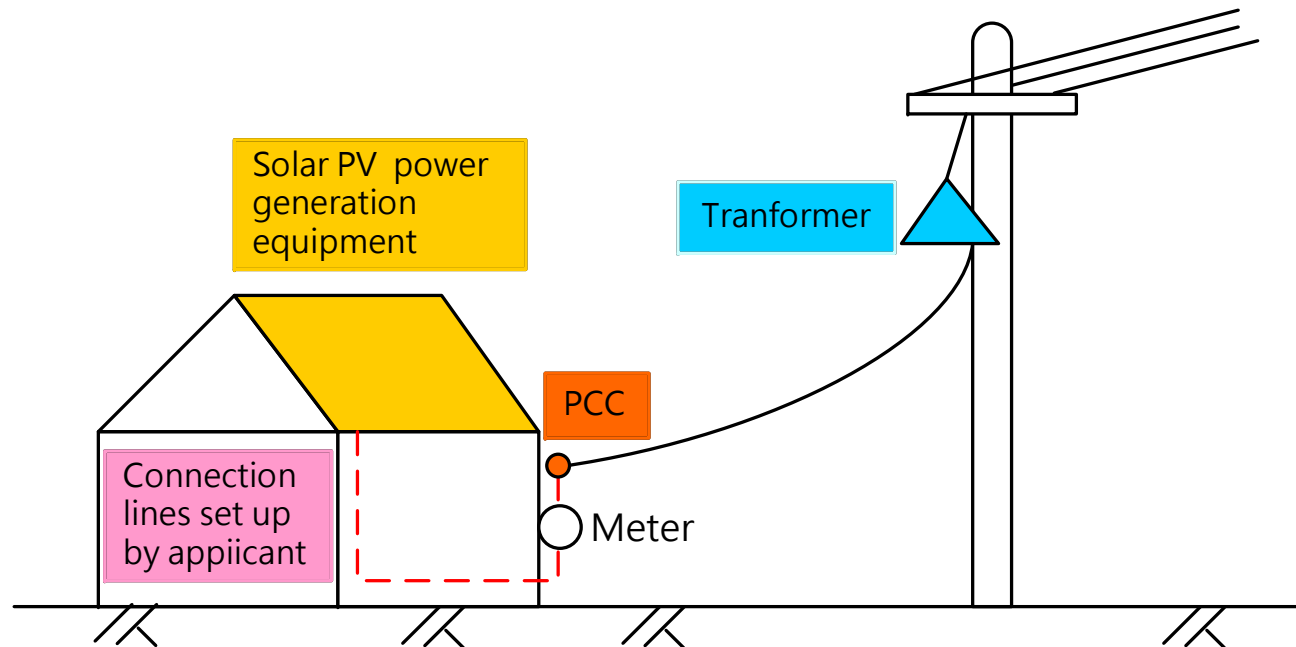
➤ Applicant : Low Voltage Customer

2. apartment



➤ Applicant : Low Voltage Customer

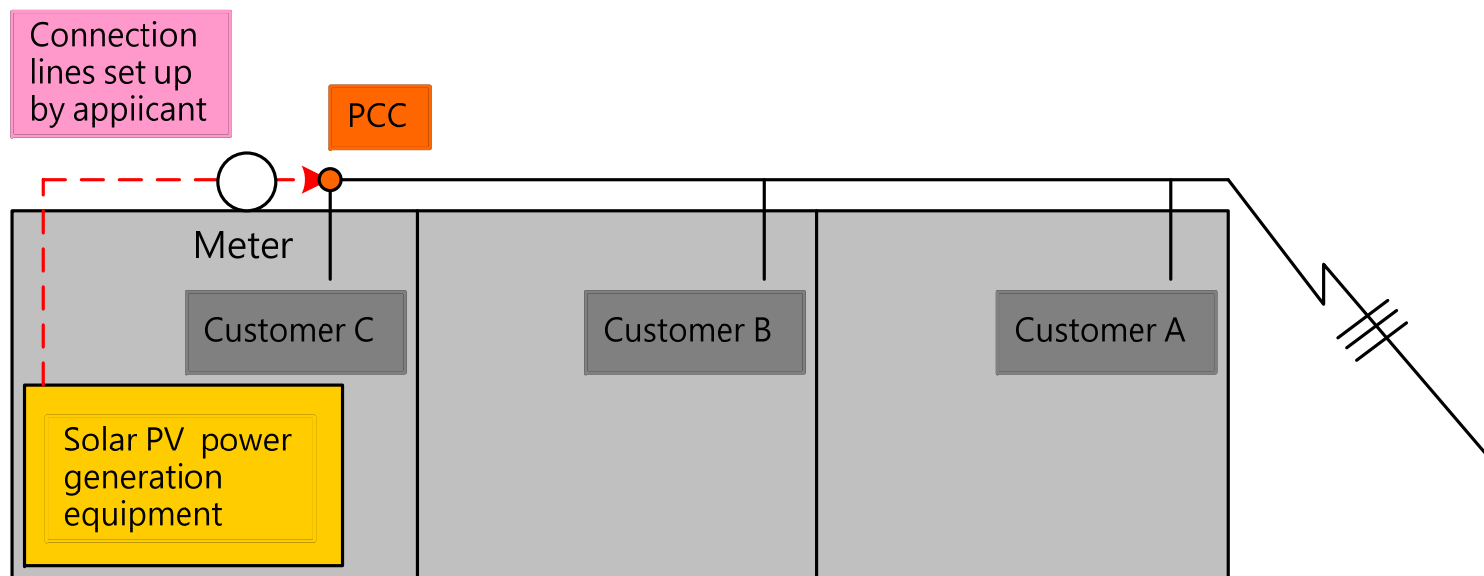
3. single residence



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➤ Applicant : Low Voltage Customer

4. integrated residences



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➤ Applicant :High Voltage Customer

- (1)low voltage distribution, (2)high voltage ground distribution, (3)high voltage overhead distribution, or (4)low voltage indoor power line.

