

Introduction of Solar Power

2010年9月30日



Solar Power installation case (HUIS TEN BOSCH, Nagasaki 900kW)



Flow of Proposal

Find an appropriate location for solar power



Decide the way of construction



Estimate expected power generation



**Calculate construction cost
(Rough estimate)**

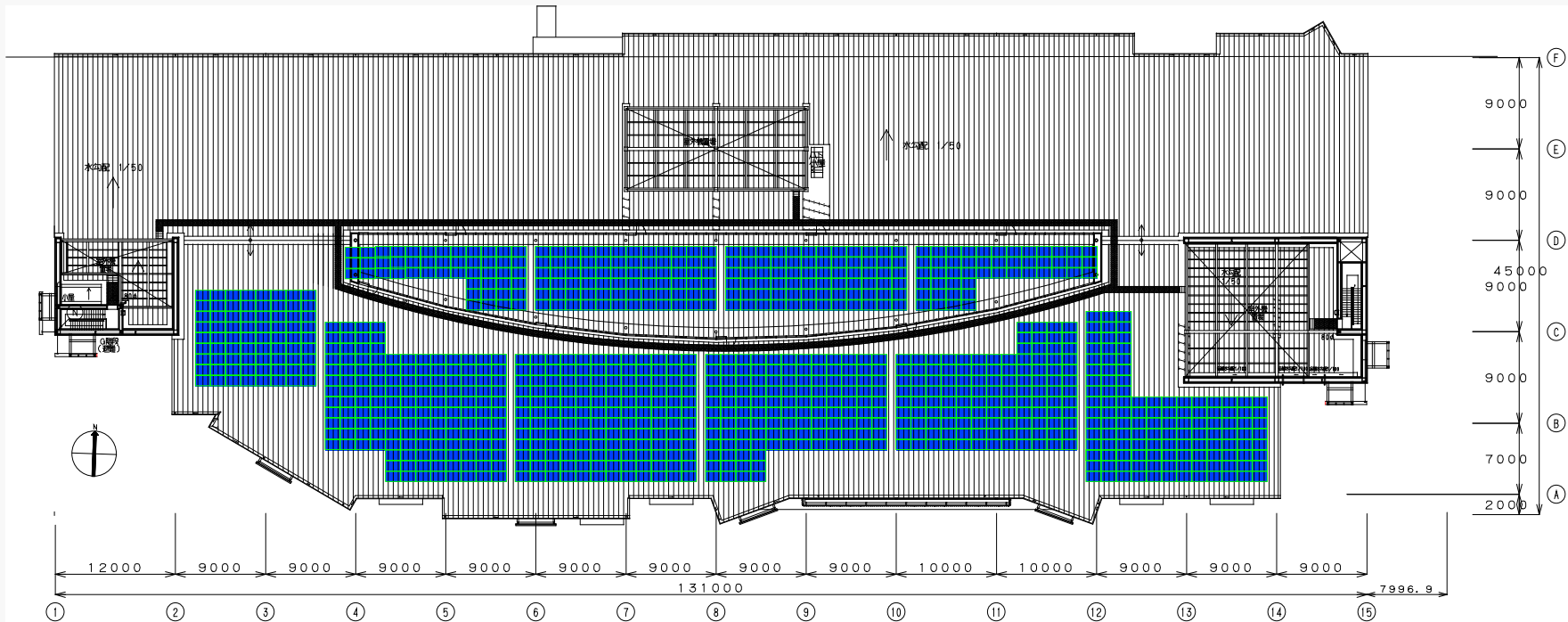
Conditions for Appropriate Locations in installing Solar Power

- 1. Unused land where the part facing south has no obstacles**
- 2. Good climate conditions**
 - **A location with sunny climate**
 - **A location with few typhoons, rain and snow**
- 3. Good environmental condition**
 - **A location where volcanic ashes, leaves and sands do not cover the solar battery.**
 - **A location where sea water does not wet the solar battery.**
- 4. Good logistical access (Port and Road)**

Type and features of Solar Battery

Type	Monocrystal silicon	HIT Type	Polycrystal silicon	Amorphous silicon	Crystallite silicon	CIS CIGS
Structure	Silicon crystal	Silicon crystal	Silicon crystal	Thin film	Thin film	Thin film
Manufacturing process	Solar battery with High quality silicon	Solar battery with monocrystal and amorphous silicon	Solar battery made from hardened and polycrystal silicon wafer	Solar battery, silicon glass is glued on glass base	Solar battery with crystallite and amorphous silicones	Solar battery which consists of copper, indium, and selenium on its glass base
Generation Efficiency	○	◎	○	△	△	○
Ground contact area	○	◎	○	△	△	○
Cost	△	△	○	○	◎	○
Strength	Long-term performance	High efficiency Small ground contact area	Many productions Good cost performance	Fewer energy cost in the processing Low cost	Fewer energy cost in the processing Low cost	Fewer degradations of conversion efficiency at hot temperature
Weaknesses	Expensive	Expensive	Too popular to Purchase	-Large Ground contact area -Light degradation	-Large Ground contact area -Light degradation	Fewer previous results

Installation Figure of Solar Battery



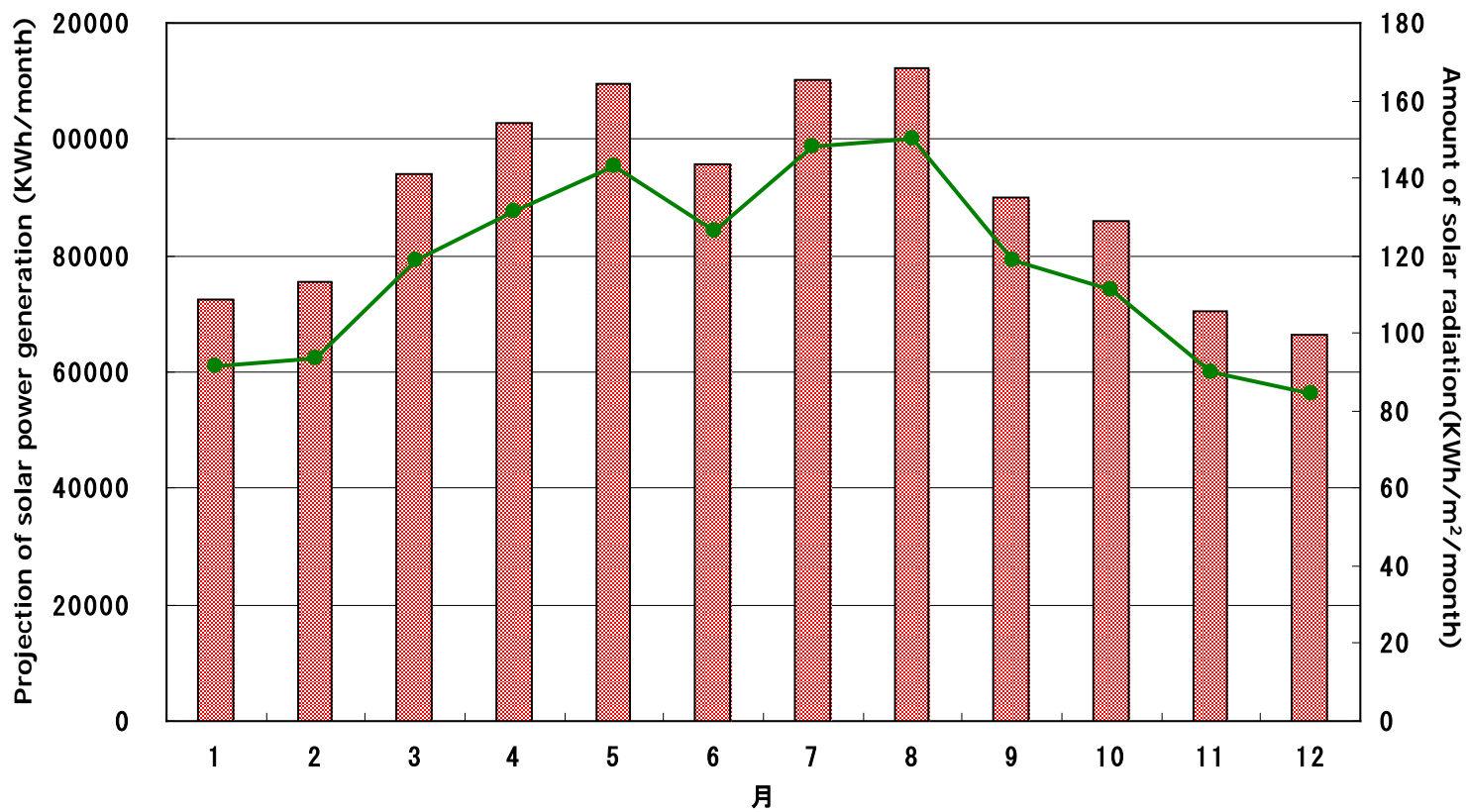
Installation of Solar Battery (Southern side on the roof)



Installation of Solar Battery (North side of the roof)



Projection of Solar Power Generation (1,000kW)



Projection of Solar Power Generation (1,000kW)

項 目		1月	2月	3月	4月	5月	6月	7月	8月	9月	10月	11月	12月	Ave.	Annual amount
Average temp.	°C	6.1	4.9	9.3	14.2	18.8	21.8	28.4	27.3	24.4	19.1	12.3	8.0	16.2	—
Amount of solar radiation	kWh/m ²	91.31	93.72	118.61	131.33	142.93	126.21	148.00	150.13	118.79	111.31	90.19	84.36	117.24	1406.89
Projection of solar power generation	kWh	72,601	75,404	94,052	102,722	109,624	95,604	110,334	112,098	90,132	85,848	70,429	66,356	90,434	1,085,204
Unit Price	Yen/kWh	8.79	8.79	8.79	8.79	8.79	8.79	9.58	9.58	9.58	8.79	8.79	8.79		
The equivalent price of electricity	Thousand yen	638	663	827	903	964	840	1,057	1,074	863	755	619	583	815	9,786

予想発電量は、過去の気象観測データを元に、影等の影響が無い状況で算出した予測値です。
 実際の発電量は、設置環境や気象及び太陽電池表面の状態等により変化します。
 本予想発電量及び電力量料金換算値は弊社が保証するものではありません。

Contribution to Environment

《1,000kWシステムで発電した電力量の換算例》

	Solar	Wind	Conversion
Annual power generation	1,085,204 kWh	2,321,000 kWh	
Reduction on CO2	410,207 kg-CO2	877,338 kg-co2	0.378 kg-CO2/kWh
Equivalent forest area	198 ha	422.42 ha	0.182 ha・年/MWh
Reduction on oil	275,642 ℓ	589,534 ℓ	0.254 ℓ/kWh

Introduction of Clean Energy utilizing Sunlight

国名	設置場所	供与限度額
Nepal	Water reservoir near Kathmandu	7.8 Mill USD
East Timor	East Timor University and school	5.8 Mill USD
Cambodia	Phnom Penh City	8.5 Mill USD
Philippines	Taguig City, Metro Manila	7.1 Mill USD

Thank you

