China largest tidal-flat PV power plant

Dongtai 50MW

Dongtai, Jiangsu, China

Agriculture and Solar photovoltaic

| PID | Salt mist | Soft subgrade | 50 MW | 208,400 Modules | 58,512,500 kWh/year |
Currently, Dongtai 50MW Solar Plant was the largest single ground-mounted PV power plant in Dongtai coastal economic zones, Jiangsu, China. This project also is an essential part of Jiangsu Dongtai tidal-flat development demonstration zone. It is a BOT (Build-Operate-Transfer) project run by SUMEC Group, Phono Solar’s parent Company, designed and implemented using combination of agriculture and solar photovoltaic generation. Dongtai offers ideal conditions for large solar plant with abundant sunshine for providing the energy consumption of approximately 1.14 million residents.

Dongtai is rich in land resources with large coastal space and wide tidal-flat area. Besides that, Dongtai also has great potential of solar resource with an average abundant sunshine for 2,232 hours per year, the amount of solar radiation is 5,126 MJ / m2, and it is suitable place of large-scale solar projects.

Project construction started on October 2010 and lasted 14 months. The total project cost is 532 million RMB, 100 inverters convert DC to AC and connect on the nearest grid.

Issue I: Salt mist corrosion certification
This project is 10 Km away from coastline. Due to its special geographical location, modules are highly required for resisting of salt mist corrosion. Phono Solar’s modules had past the salt mist corrosion test based on IEC 61701 standard from Intertek, durability assured highly performed in coastal wide tidal-flat area, to ensure the power plant provides energy constantly and stably in the long-term operation.

Issue II: Anti-PID
PID (Potential Induced Degradation) was the most essential issue for Dongtai 50 MW power plant. PID occurs mostly at negative voltage with respect to the ground potential and is accelerated by high system voltages, high temperatures, and high humidity, not only caused modules damage, but also easily lead generation effectiveness attenuation problems, which lead to the output power of the entire power generation system decreases. In tidal-flat area, modules are in humidity condition for very long time. To solve PID problem, Phono Solar chose ABB PVI-500 model inverters, assuring solar modules could be negative pole grounded. PVI-500 mode inverter had fault detection function, to prevent leakage current on the system and life safety injury.
**Issue III: Piling on the Tidal-flat area**

Tidal-flat area is not easy to pile steadily. Phono Solar engineers chose solid square piles which were sized 250mm(L) x 250mm(W) x 5500mm(H), in order to resist seawater corrosion. For several crooked piles, engineers slightly adjusted the column’s angle to ensure all the piles could install modules with the same angle and height for the same solar radiation without shadow.

The Dongtai Solar Plant occupies approximately 111 acre. The total 208,400 high-efficiency poly crystalline solar modules were assembled by Phono Solar, and they are south-facing, with a 27° angle on an anchored mounting structure for better solar radiation. This project is estimated to generating clean electric power 1,307,092.209kWh for 25 years, reduces 51,813.45 tons CO₂, 354.52 tons SO₂, 174.77 tons NO2 and 19,928.25 tons of standard coal saving every year. In the end of 2015, the plan has been connected to the grid for two years, the actual power output is 121,135,600 kWh, and approximately 5.2% higher than expected, showed Phono Solar solve salt mist corrosion, PID and foundation issues for Dongtai 50MW power plant comprehensively.

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**Project Overview**

**Location:**
**Dongtai, Jiangsu**

**Project type:**
**Ground-Mounted**

**System Size:**
**50 MW**

**Number of Modules:**
**208,400**

**Product:**
**Phono Solar 240Poly Series**

**Completion Date:**
**December, 2013**

**Construction Period:**
**14 months**

**Estimated generating capacity:**
**58,612,500 kWh/year**

**Estimated CO₂ saving:**
**51,813.45 tons/year**

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**Phono Solar Standard Module**

Phono Solar Standard Module is versatile and adaptable; with power output ranging from 190 to 335W. StandardModule benefits with outstanding performance in weak-light conditions; Anti-PID; Excellent temperature coefficient; IP68 connectors enhance the reliability of the PV system; Positive current sorting; Certified to withstand increased loads of up to 5400Pa; 10-year product warranty, 25-year performance warranty; UL Type 1 certification; IEC salt mist corrosion certification.

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