Barren Mountain + PV Power Plant

Sishui 20MW

Sishui, Shandong, China

Barren Mountain and Solar Photovoltaic

20MW
85,008
24,733,700

Layout and Base Design Electric Design System Modules kWh/year
Sishui has great potential of solar resource with an average abundant sunshine for more than 2,200 hours per year. It is an optimal area for developing solar energy in eastern China. Sishui 20MW solar plant was designed in barren mountain area for covering the energy consumption of approximately ten thousand rural families.

**Layout and Base Design**  
**Shading Control & Array Control**

The successful of Sishui 20MW project is designed based on mountain particular region. Rolls-and-swells are barren mountain area’s characteristics, the big challenge was how to increase land utilization and maximize the performance of solar plant. Array was designed based on Sishui contour and topographic map, all the modules were south-facing installed. Every 22 pieces modules were for a string, each string was installed with 33° angle on a single support anchored mounting structure for better solar radiation and more balanced power generation for each month.

**Project Location**

**Sishui Layout Design (Partial)**

**Phono Solar Standard Module (Products Used)**

Phono Solar Standard Module is versatile and adaptable; with power output ranging from 190 to 335W. Standard Module 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.
Maximize the performance of solar plant is the most essential issue for Sishui project. Besides shading control and array control, Phono Solar engineers divided Sishui into 18 parts, and chose four different types inverters for different mountain topographic feature.

TRIED TPV1-600-N30 inverter included large traditional central inverter and multiple maximum power point (MPPT) intelligent combiner boxes. This was to optimize and increase energy output from PV systems by constantly tracking the MPPT of each string. For some flat terrain area, Phono Solar chose Sungrow SG40KTL / SG 500MX inverter and Huawei SUN2000-28 inverter which tracked the MPPT of every two or four strings.

Sishui project construction started on July 2014 and lasted 5 months. The total project cost is $30.48 million, occupies approximately 100 acre, installed Phono Solar 85008 pieces high-efficiency polycrystalline solar modules. This project is estimated to generating clean electric power 621,533,583 kWh in the following 25 years, reduces 7,933 tons CO₂, 8.58 tons SO₂ every year.

### Project Overview

**Location:**

**Sishui, Shandong, China**

**Project type:**

**Ground-Mounted**

**System Size:**

**20 MW**

**Number of Modules:**

**85,008**

**Product:**

**Phono Solar 250/255 Poly Series**

**Completion Date:**

**December, 2014**

**Construction Period:**

**5 months**

**Estimated generating capacity:**

**24,733,700 kWh/year**

**Estimated CO₂ saving:**

**7,932.9 tons/year**