

## 5.52% Yield Gain of JinkoSolar's N-type Achieved in the World's Largest Hybrid Solar-Hydro Plant on the Tibetan Plateau

The world's largest hybrid solar-hydro power plant, with an installed capacity of 1 GW of solar panels and 3 GW of hydro-power generators, has begun producing electricity in the eastern Tibetan Plateau. Located in Kela town, Yajiang county, Ganzi prefecture, Sichuan, the plant's first phase is empowered by 287.4 MW of Jinkosolar's N-type TOPCon bifacial panels and was connected to the power grid at the end of June 2023. After the station's operation stabilized, a comparison study was conducted between N-type and P-type modules in the high-altitude area from July 15 to August 15 2023, in order to investigate their outdoor performance.

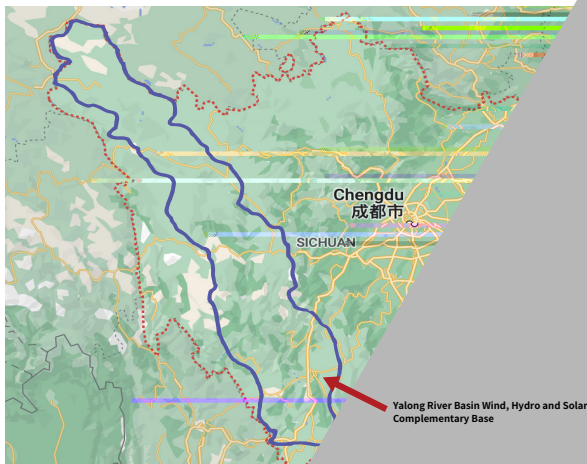
The study revealed a 5.52% yield gain of JinkoSolar's N-type TOPCon bifacial panels (570Wp) over P-type PERC bifacial panels (545Wp) in this massive project.

Situated at an altitude of 4,000 - 4,600 meters (15,000 feet) above sea level, on a mountain in Yajiang county (N29° 56' 50.75", E100° 37' 1.94"), Ganzi prefecture, Sichuan, the Kela solar-hydro power plant is the highest-altitude project of its kind in the world. It benefits from an annual average irradiation of 6434.8 MJ/m<sup>2</sup>.

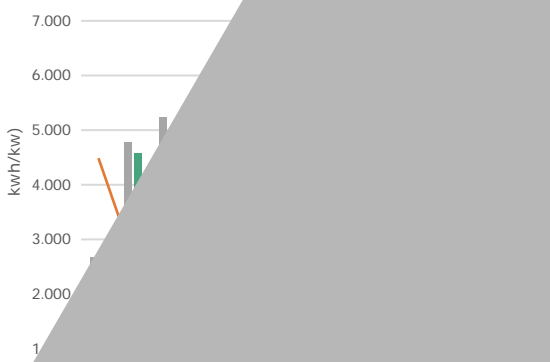
Spanning a total area of 28.57 square kilometers, the plant consists of 149 square meters with single-axis support structures with  $\pm 45^\circ$  tracking tilt angles and 163 fixed-mounted arrays with angles of 26 degrees. The distance between array rows is 10 meters. The plant uses string-type inverters, with a string connection ratio of 1.21 for fixed-mounted arrays and 1.15 for single-axis tracking arrays. Panel temperature is generally above the ground temperature. The study is based on two periods of the same region: one for N-type and one for P-type array, and the other for

Component Models	Total Power Generation (kWh)	Unit Power Generation (kWh/kW)	Relative Gain
N-Type 570Wp Bifacial	532046.15	137.55	5.52%
P-Type 545Wp Bifacial	471000.17	130.35	

Table 1: N-type and P-type module power generation and comparison of yield gain



Pic.1: Project Location



July 15 to August 15 2023. The 5.52% yield gain of N-type TOPCon bifacial panels over P-type PERC bifacial panels can be attributed to the higher power output, high generation efficiency (above), lower temperature coefficient, and lower degradation. The study shows that the investment in N-type technology

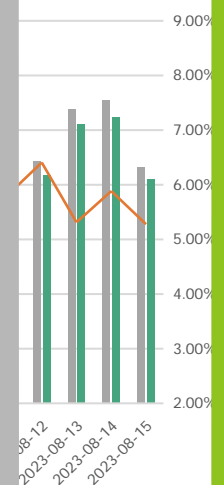


Figure 2: Relative yield gain of single-day power generation of N-type modules compared to P-type modules