

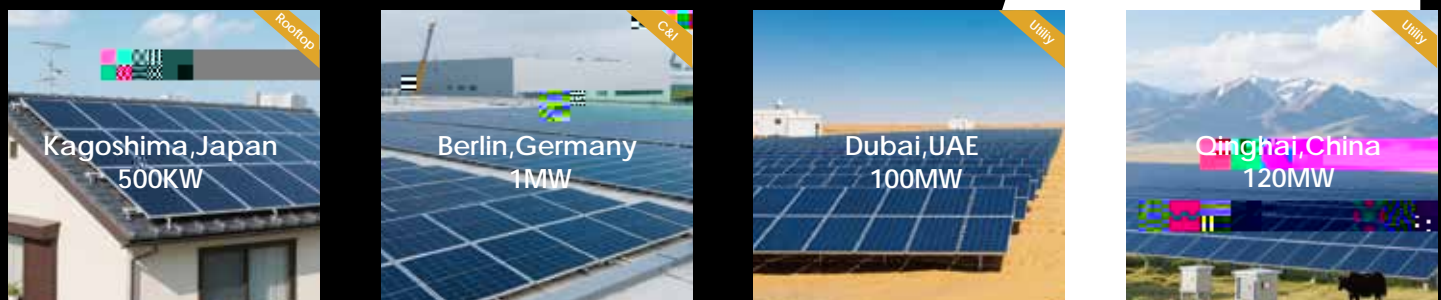
The PV industry has never stopped its pursuit of higher energy efficiency, as TOPCon becoming dominant technology, Jinkosolar continue bleeding edge to raise the bar of cell efficiency over 27%. Its latest Tiger Neo 3.0 claimed of 650-670Wp power output, 85+/- 5% Bifaciality coefficient, -0.35% linear degradation, 96.77% low irradiance performance (200W/m²), etc., provides chance of lowering the levelised cost of electricity than traditional TOPCon and N-type BC.

This paper is purposed to compare the LCOE of Tiger Neo 3.0 and its N-type BC in different scenarios as follows, based in the supposition that Tiger Neo 3.0 is same with N-BC module, module information is listed in Table 1. We chose four project scenarios (two rooftop, two utility) in four locations with typical climate features, irradiance levels and balance of system (BOS) cost levels.

Product Type	Tiger Neo 3.0	N-Type BC
Module #	132	132
Module Length (mm)	2382	2382
Module Width (mm)	1134	1134
Nominal Power (W)	670	670
Module Efficiency (%)	24.8%	24.8%
Voc (V)	50.98V	50.12V
Temperature Coefficient (%)	85±5%	75±5%
Temperature Coefficient (1/°C)	-0.26%/°C	-0.26%/°C
Low Irradiance Performance (200W/m ²)	96.77%	94.28%
First-Year Degradation (%)	1%	1%
Annual Degradation (%)	0.35%	0.35%

Energy generation is simulated with the PVSyst software. The Tiger Neo 3.0 and N-type BC module PAN file is based on the data provided by Jinkosolar while the PAN files of N-type BC are based on a general industry-wide performance level.

We chose four typical locations, including Kagoshima (Japan), Berlin (Germany), Dubai (UAE), Qinghai (China) for comparison. The average temperature are listed in Table 2.



Location	Kagoshima (Japan)	Berlin (Germany)	Dubai (UAE)	Qinghai (China)
Annual Average Irradiance	1387-1460kWh/m ²	1100-1300kWh/m ²		
Annual Average Temperature	18.8°C	10.1°C	27.5°C	6.1°C

The calculation for LCOE is the net present value of total life cycle costs of the project, divided by the total electricity generated over the project's lifetime. The total life cycle costs can be disaggregated as initial investment, annual operation and maintenance, and financing costs. Investment (US\$/Wdc) is the sum of the BOS cost and the module price. Module price is assumed to be the same at each location.

The AC capacity of the utility-scale plant is designed to be 100MW, 1500V system voltage, fixed mounted, 20% albedo in Qinghai. The system lifetime is 30 years.

