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CNBM | JETION SOLAR
Visionary Green Energy

HJT

Open a new era of ultra-high efficiency

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Jeniüs N-HJT technology brochure 2025_05

JETION SOLAR

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JETION SOLAR

GLOBAL LEADER IN SOLAR PRODUCT MANUFACTURING AND ENGINEERING SERVICES EXPERT

As a world-class solar products manufacturer, Jetion Solar specializes in research, development, production, and sales of solar PV products. Since its foundation in 2004, Jetion Solar has accomplished significant achievements which outpaced most of our main competitors in terms of production capacity and in the number of innovative designs. Jeiton Solar upholds its belief that innovation is the key driver behind advancement by pursuing new technologies and higher efficiencies.

In 2014, Jetion Solar joined CNBM (China National Building Materials Group Corporation) to better extend our value chain. So far more than 20 GW Jetion Solar's products have been widely applied in over 60 countries and regions, earning a coveted "Tier 1" rating on BloombergNEF Module Maker Tiering System. And as backed by CNBM, Jetion Solar also provide global EPC service and project financing. Currently, Jetion Solar has an annual production capacity of 4.4 GW of cells, 2.5 GW of modules with 5 manufacturing plants worldwide. Furthermore, there are plans for an additional 2.6 GW of HJT cells. Jetion Solar serves worldwide customers with high-quality products and professional services.

CNBM's Solar Value Chain

From raw materials to project development, CNBM provides the whole PV value chain integration.

PV glass | PV Cell | PV Module | Thin-film Module | Utility/Commercial Project Development | Financing | EPC | Operation & Maintenance

Luoyang Glass	**Jetion Solar (China)**	AVANCIS	China Triumph International Engineering
CNBM (Yixing) New Energy Resources		CTF SOLAR	**CNBM New Energy Engineering (subsidiary of Jetion Solar)**
CNBM (Hefei) New Energy Resources			CNBM (Chengdu) Optoelectronic Materials
CNBM (Tongcheng) New Energy Materials		Triumph Photovoltaic Materials	

HJT TECHNOLOGY PLATFORM

MAN OF ACTION IN PROMOTING APPLICATIONS

As a world-renowned solar photovoltaic enterprise, Jetion Solar attaches great importance to technology innovations, always adhering to the R & D philosophy of "Commercialize One Generation, Develop One Generation, and Reserve One Generation", and continuously promoting technology iterations and upgrades to provide customers with higher efficiency, higher quality photovoltaic products and better one-stop solutions.

Jetion Solar's stunning R&D team has been deeply involved in solar cell technology for many years, and with the accumulation of technology in silicon-based cells and the spirit of open innovation, significant breakthroughs have been made in exploring passivation technology, carrier selective conduction, metal-semiconductor contact, etc., and the HJT technology was born.

Jetion Solar R&D center is one of the most advanced photovoltaic laboratories in the industry. The laboratory has acquired TÜV SÜD TMP laboratory qualification, CSA WMTC laboratory qualification and China CNAS laboratory accreditation.

Jetion Solar has obtained more than 280 technology patents.

EXCELLENT R&D TEAM

3 PhDs, National 863/973 Project & First HJT industrialization Projects in China

50+ Leading Talents

20+ years of experience in the development of photovoltaic technology

TECHNOLOGY LEADS THE FUTURE

HJT HIGH-EFFICIENCY PHOTOVOLTAIC INDUSTRY LEADER

Jetion Solar R&D team has always been committed to the development and commercialization of new cell technologies. Based on silicon-based cells, the company started with Al-BSF polycrystalline silicon, transitioned to PERC cells and finally realized the industrialization of HJT on the ground. At the same time, the R&D team has also laid out advanced technologies such as microcrystalline, BC structure and shingled, and is always ready for technology upgrade. The clear technical route allows us to face each round of technological impact with ease.

HJT 210 target power

800 W+

Planning target capacity

5 GW+

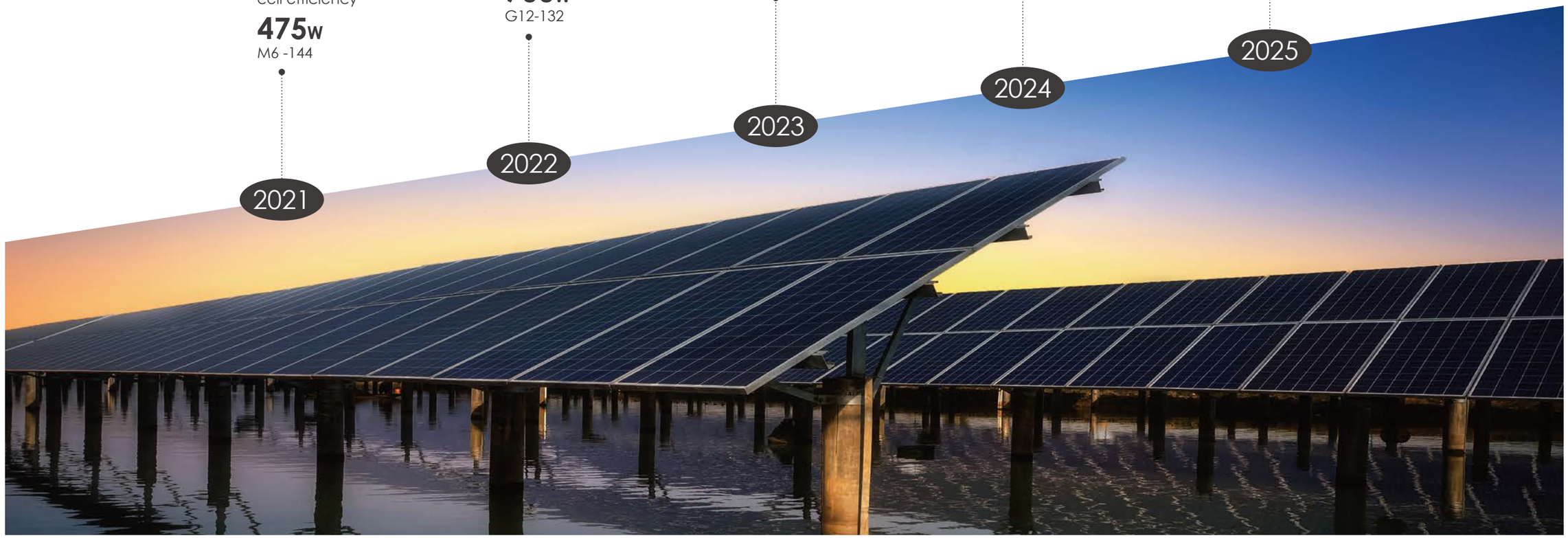
2021
- **24.5%** cell efficiency
- **475W** M6 -144

2022
- **25%** cell efficiency
- **700W** G12-132

2023
- **25.5%** cell efficiency
- **710W** G12-132

2024
- **26%** cell efficiency
- **725W** G12-132

2025
- **28%** cell efficiency
- **800W+** perovskite tandem cells

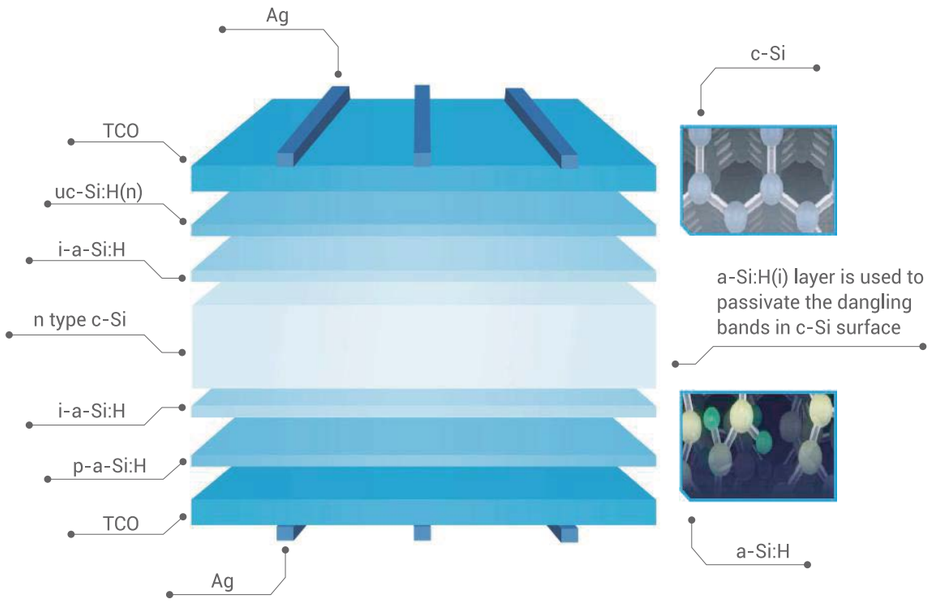


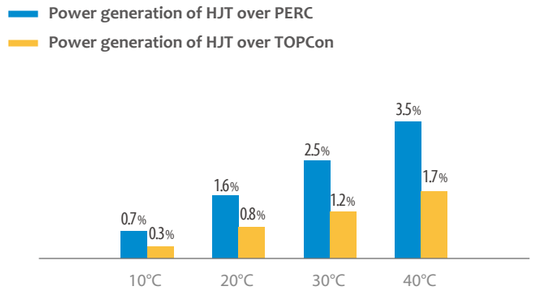
EXTREME INCREASE IN POWER GENERATION

HJT cells offer breakthrough improvements in efficiency and performance compared to traditional PERC technology. In addition, compared to other solar cell technologies, Jetion solar's HJT cell manufacturing requires only four low-temperature process steps, resulting in higher production efficiency and lower losses.

FOUR-STEP PROCESS

1. Texturing
2. A-si Front & Rear side deposition
3. TCO Front & Rear side deposition
4. Metallization



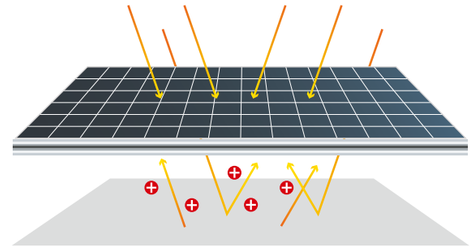


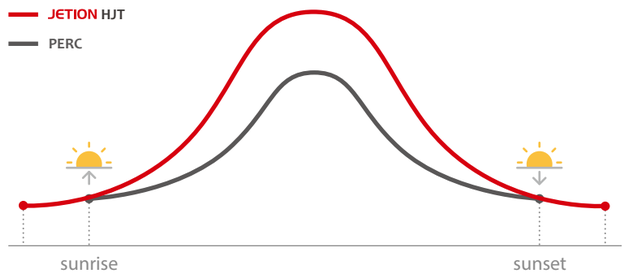
Extreme temperature coefficient

HJT cells have extreme temperature coefficients with improved power generation by **2-4%** compared to PERC and **1-2%** compared to TOPCon at high temperatures in summer.

Bifaciality 90%

HJT comes with the fundamental advantage of the highest bifaciality, about **2-4%** higher than bifacial PERC.





Excellent low light performance

Extend power generation in low light conditions such as early morning and late afternoon, average daily power generation is approximately **0.5-1%** higher than bifacial PERC.

HJT CELLS

HJT cells combine the advantages of crystalline silicon and amorphous silicon thin-film technology, marking them as one of the solar industry's premier cell technologies today. Jetion Solar is fully committed to the HJT technology pathway, and has successfully elevated mass production efficiency through the employment of numerous core technologies, including wafer absorption, high cleanliness cleaning, intrinsic amorphous silicon passivation, doped layer microcrystalline silicon, MBB and half cut.

-0.24%/℃

NO LID&PID

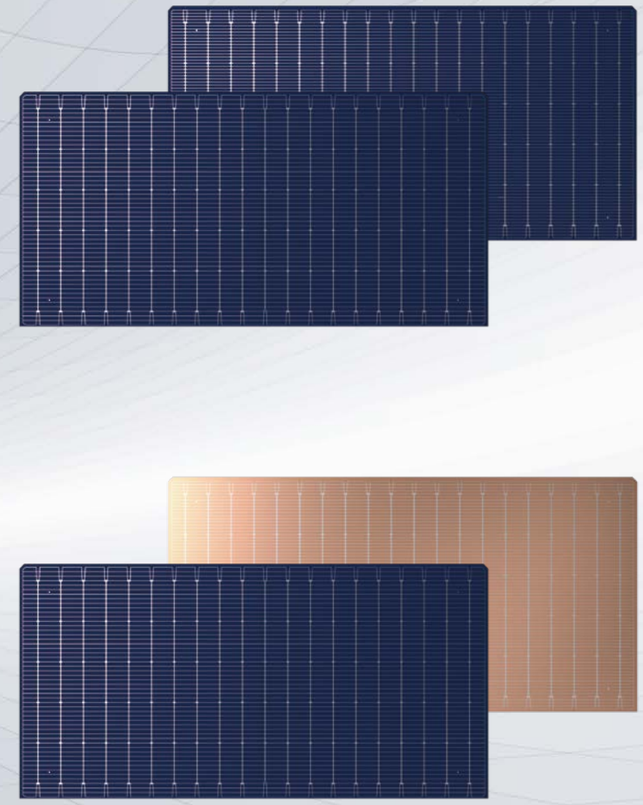
wafer	N-type wafer
Dimension	210×105±0.35mm
thickness	110±20μm
busbars	0BB/20BB

5.625W

Maximum power for mass production

26.5%

Maximum efficiency for mass production



-0.22 %/K

Temperature Coefficient of Voc (βVoc)

+0.04 %/K

Temperature Coefficient of Isc (αIsc)

Higher generation gain

HJT cells can increase module bifaciality to over 90%, ensuring higher power output.

Better power generation

The ultra-low temperature coefficient, excellent low light response, guarantees module power generation performance.

Lower power degradation

HJT modules have the first year power degradation of ≤1% and the annual power degradation of ≤0.3%.

HJT MODULES

Jeniüs N-HJT Bifacial modules

- Non-destructive smooth cutting surfaces with no heat affected areas and low impact on cell efficiency ;
- Dual-glass design with front/back loads up to 5400/2400 Pa ;
- Low water permeability packaging, high reliability and lower full life cycle degradation rates ;
- The extreme increase in efficiency thanks to the application of trans-light technology .

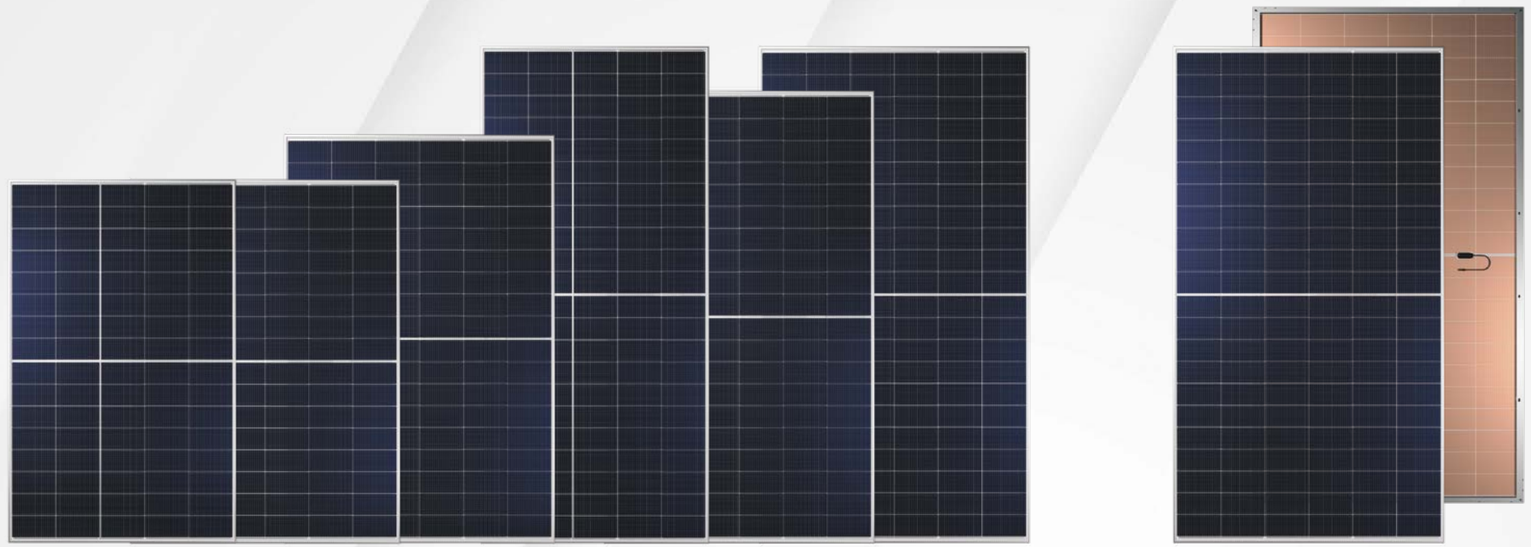
Curved surface packaging technology

Flexible packaging technology

High reliability packaging technology

Highly accurate and reliable SMBB stringing technology

Low loss cell cutting technology / half cell technology



80-cell 96-cell 108-cell 110-cell 120-cell 132-cell

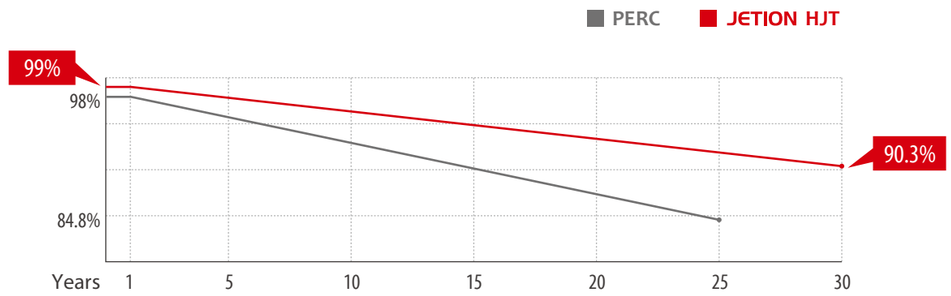
	440 W	525 W	590 W	600 W	650 W	730 W
Number of cells	80 [2 x (8 x 5)]	96 [2 x (8 x 6)]	108 [2 x 9x 6)]	110 [2 x (11 x 5)]	120 [2 x (10 x 6)]	132 [2 x (11 x 6)]
Max-efficiency	22.9 %	22.8 %	23.1 %	23.0 %	23.0 %	23.5 %
Dimension	1750×1096×30 mm	1750×1303×35 mm	1961×1303×35 mm	2384×1096×35 mm	2172×1303×35 mm	2384×1303×33 mm
Weight	23 kg	27.4 kg	30.7 kg	32.6 kg	35.3 kg	36.4 kg
Application	Residential & Commercial	Residential & Commercial	Residential & Commercial	Residential & Commercial	Utility	Utility

QUALITY FIRST

LEADING PRODUCT WARRANTIES & COMPLETE PRODUCT CERTIFICATION

In order to meet our customers' expectations of high quality, we constantly invest in state-of-the-art equipment and the most professional training of our staff. We have absolute confidence in the quality and performance of our products, even under the most extreme circumstances.

Jetion Solar's HJT modules are covered by a 15-year product warranty, with a 30-year output power degradation of <10% and a lower full life-cycle degradation rate to ensure optimal power generation yield.



Jetion Solar has been awarded the following mainstream market certificates:

CE · TÜV SÜD · TÜV NORD · MCS · KG · CQC · CLEAN ENERGY COUNCIL · INMETRO · RETIE REGLAMENTO TÉCNICO DE NSTALACIONES ELÉCTRICAS · PV CYCLE · PICC · Munich RE

DISTRIBUTED APPLICATIONS

1000KW PV power station (simple model, no discount&loan)

Local peak sunshine hours are 1500h and the system efficiency is 85%, at a tariff of RMB 0.8/kWh (All self-use, or pro-rata conversion).

HJT modules are 0.1 RMB/W more expensive than P-type modules and 0.05 RMB/W more expensive than TOPCon, while HJT and TOPCon modules are 0.02 RMB/W cheaper when flat installed on colour steel tiles and 0.04 RMB/W cheaper when installed off the ground with a tilt angle.

Flat roofing installation (poor heat dissipation, high working temperature)

	P-type	TOPCon	HJT
Investment per watt (yuan/W)	3.5	3.53	3.58
Total installed capacity (KW)	1000	1000	1000
Total investment (RMB thousand)	3500	3530	3580
First year power generation increased	standard	2%	4%
First year total power generation (kWh)	1275000	1300500	1326000
Payback period (years)	3.49	3.42	3.41
Total revenue (RMB thousand)	24645	25817	26343

With inclination off-ground installation (bifacial power generation)

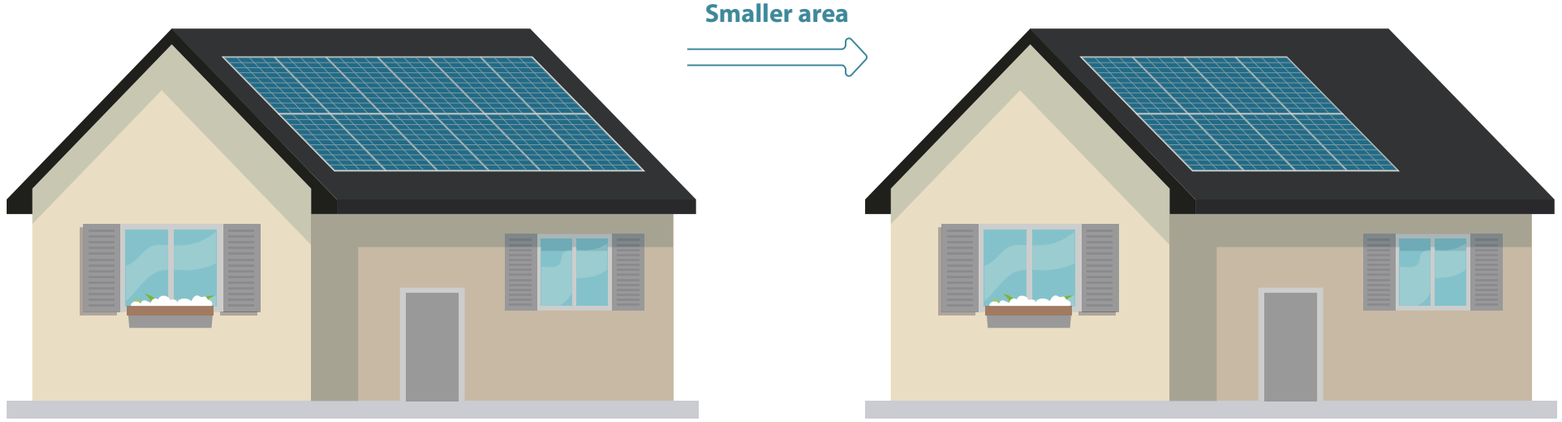
	P-type	TOPCon	HJT
Investment per watt (yuan/W)	3.8	3.81	3.86
Total installed capacity (KW)	1000	1000	1000
Total investment (RMB thousand)	3800	3810	3860
First year power generation increased	standard	4%	6%
First year total power generation (kWh)	1428000	1485120	1513680
Payback period (years)	3.38	3.25	3.23
Total revenue (RMB thousand)	27722	29531	30122

HJT has a small footprint for the same installed capacity, with a fast payback period and high returns

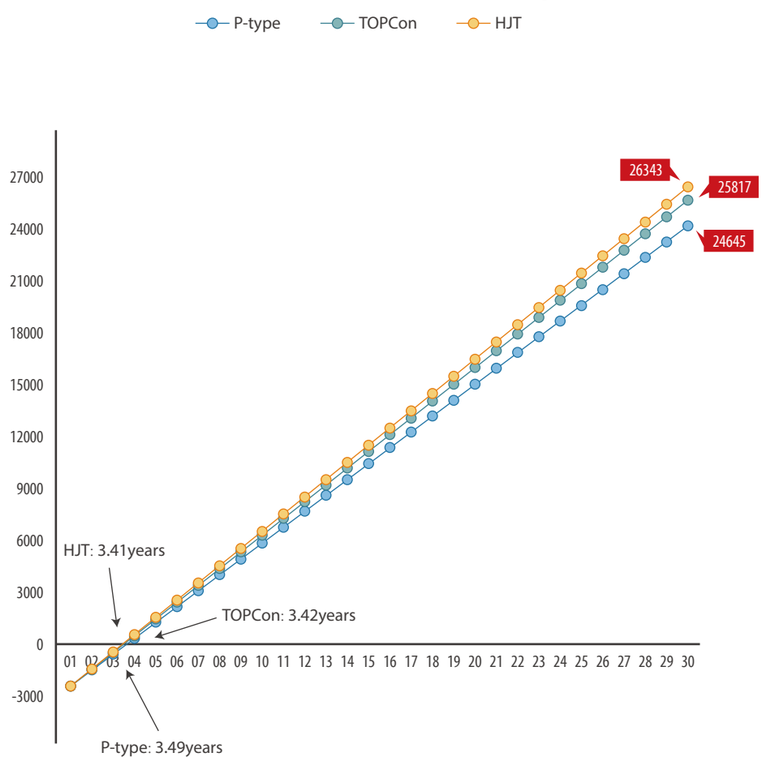
P-type 1000KW

Smaller area

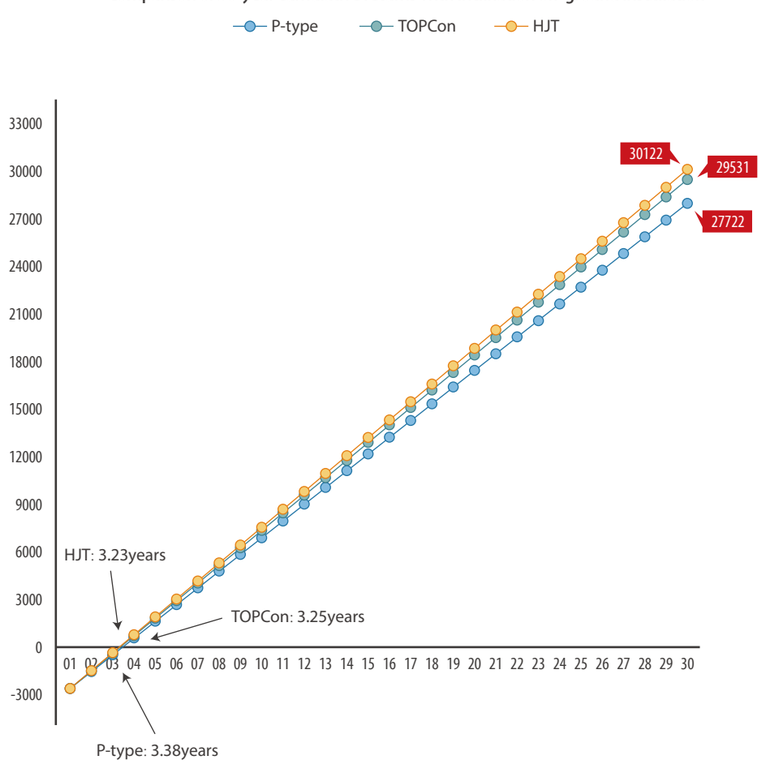
HJT 1000KW



Comparison of 30-years cumulative benefits of flat roofing installation



Comparison of 30-year cumulative returns with inclination off-ground installation



Fixed area rooftop (simple model, no discount&loan)

Local peak sunshine hours are 1500h and the system efficiency is 85%, at a tariff of RMB 0.8/kWh (All self-use, or pro-rata conversion).

HJT modules are 0.1 RMB/W more expensive than P-type modules and 0.05 RMB/W more expensive than TOPCon, while HJT and TOPCon modules are 0.02 RMB/W cheaper when flat installed on colour steel tiles and 0.04 RMB/W cheaper when installed off the ground with a tilt angle.

Flat roofing installation (poor heat dissipation, high working temperature)

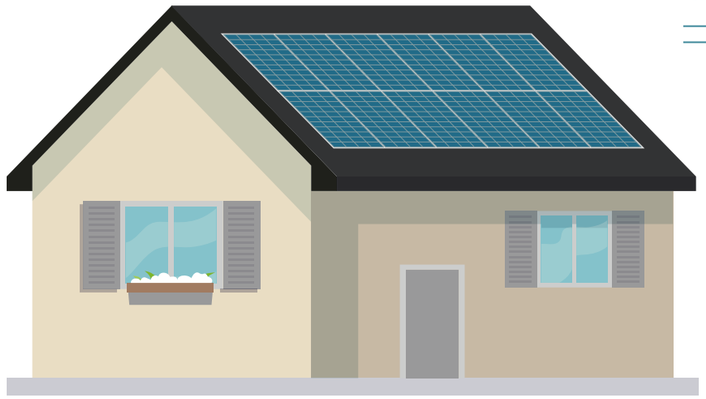
	P-type	TOPCon	HJT
Investment per watt (yuan/W)	3.5	3.53	3.58
Total installed capacity (KW)	1000	1060	1060
Total investment (RMB thousand)	3500	3742	3795
First year power generation increased	standard	2%	4%
First year total power generation (kWh)	1275000	1378530	1405560
Payback period (years)	3.49	3.42	3.41
Total revenue (RMB thousand)	24645	27366	27923

With inclination off-ground installation (bifacial power generation)

	P-type	TOPCon	HJT
Investment per watt (yuan/W)	3.8	3.81	3.86
Total installed capacity (KW)	1000	1060	1060
Total investment (RMB thousand)	3800	4039	4092
First year power generation increased	standard	4%	6%
First year total power generation (kWh)	1428000	1574227	1604500
Payback period (years)	3.38	3.25	3.23
Total revenue (RMB thousand)	27722	31303	31929

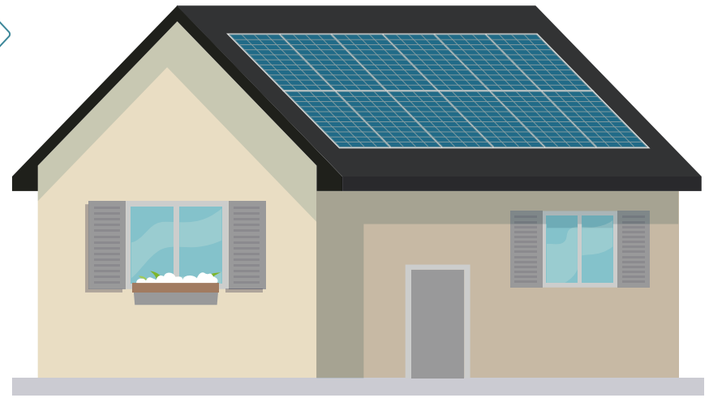
HJT has more installed capacity for the same area, faster payback period and higher returns

P-type 1000KW

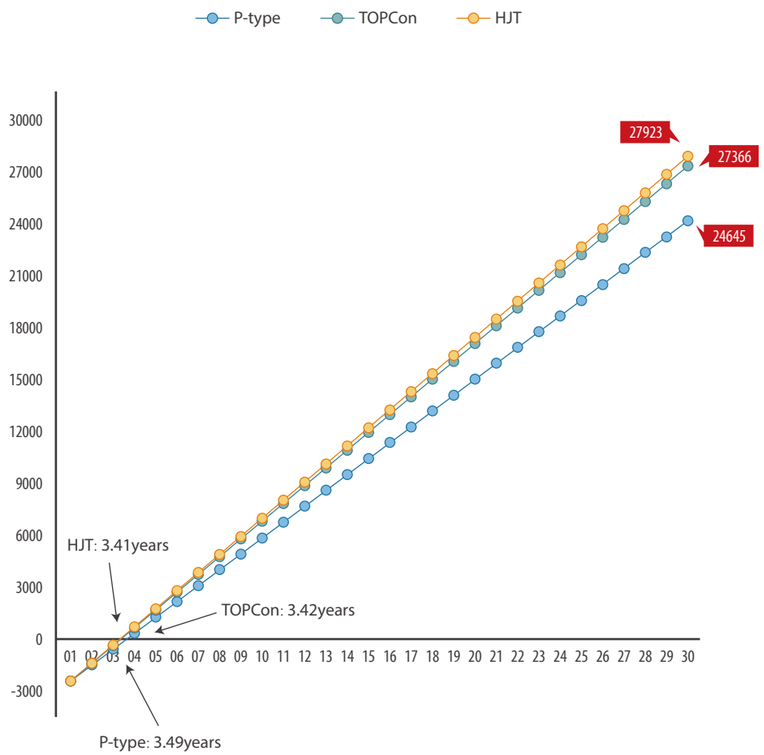


More capacity

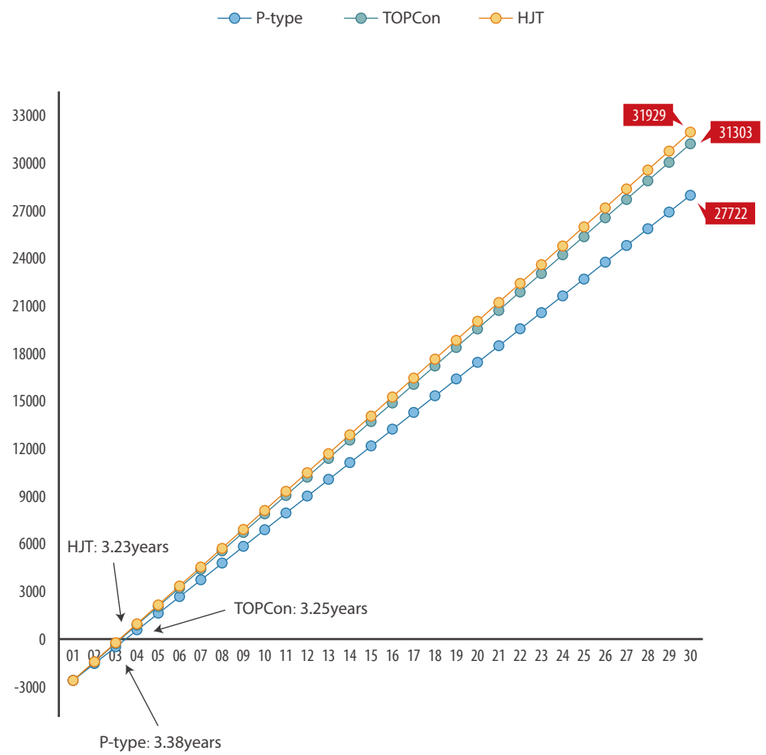
HJT 1060KW



Comparison of 30-years cumulative benefits of flat roofing installation

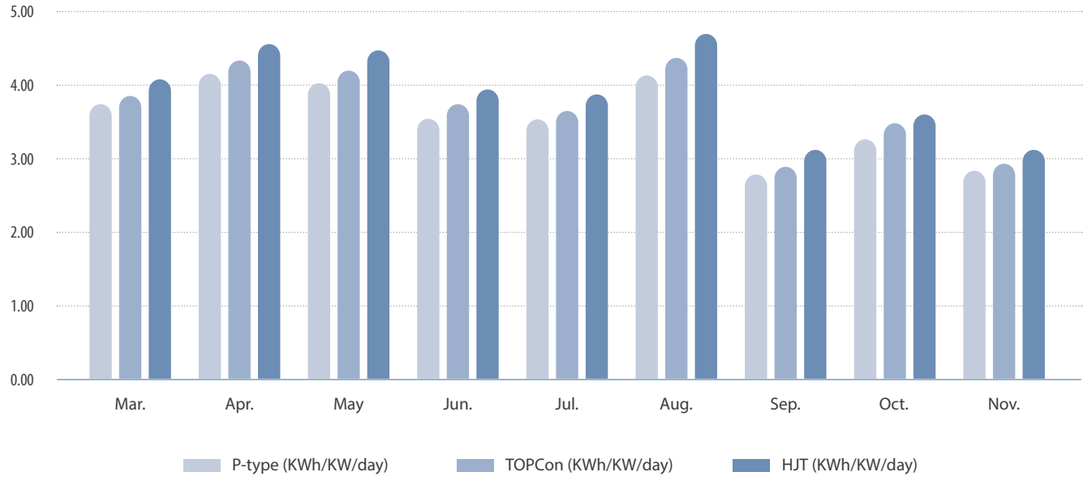


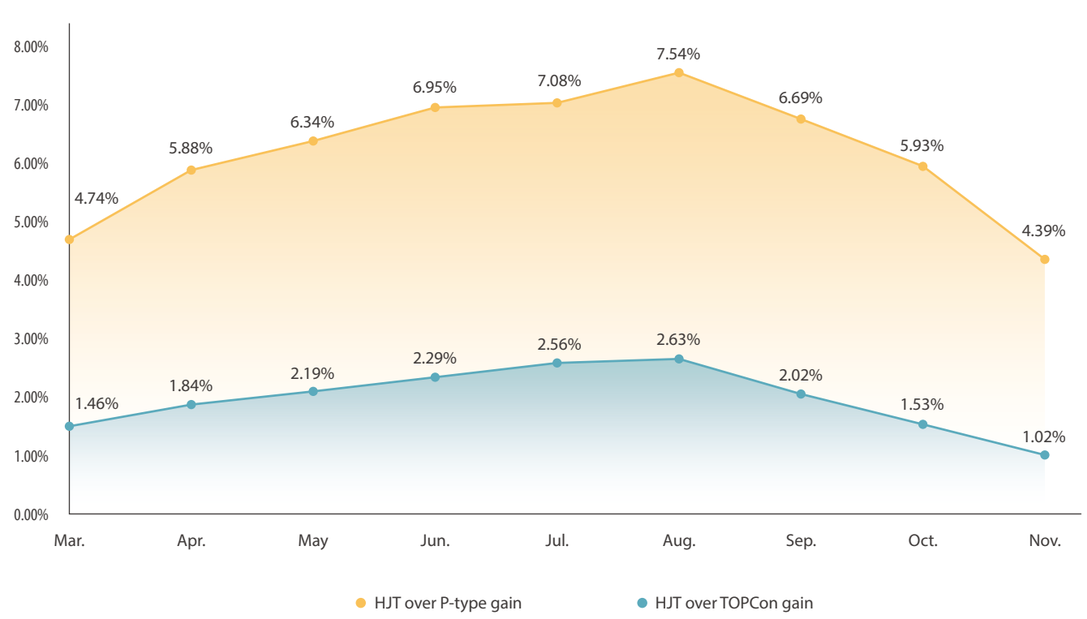
Comparison of 30-year cumulative returns with inclination off-ground installation



PRACTICE TESTS THE TRUTH

Jiangyin, Jiangsu (31°53′ N, 120°10′ E) Optimum inclination 23° installation Mar. - Nov.





	P-type power generation (kWh/kW/day)	TOPCon power generation (kWh/kW/day)	HJT power generation (kWh/kW/day)	HJT over P-type gain	HJT over TOPCon gain
Mar.	3.75	3.90	4.09	4.74%	1.46%
Apr.	4.17	4.34	4.57	5.88%	1.84%
May	4.02	4.20	4.44	6.34%	2.19%
Jun.	3.54	3.74	3.96	6.95%	2.29%
Jul.	3.53	3.70	3.93	7.08%	2.56%
Aug.	4.16	4.37	4.65	7.54%	2.63%
Sep.	2.79	2.93	3.09	6.69%	2.02%
Oct.	3.32	3.47	3.64	5.93%	1.53%
Nov.	2.85	2.96	3.09	4.39%	1.02%

The empirical data shows that HJT generated **6%** more electricity than P-type and **2%** more electricity than TOPCon.

DATA SPEAKS FOR ITSELF

HJT modules have superb power generation gains in all regions of the world and are much higher than PERC and TOPCon modules, with the higher the temperature, the more significant the increase in power generation.

Under comprehensive conditions: HJT improves power generation by **3-7%** compared to PERC modules and **1-3%** compared to TOPCon modules.

High temperature areas
Average temperature ≥20°C

Medium temperature areas
Average temperature 15~20°C

Low temperature areas
Average temperature ≤15°C