

ANHUI SINE NEW ENERGY CO., LTD.

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FOREWORD

Climate change is a global problem faced by mankind. With the emission of carbon dioxide in various countries, the greenhouse gas has soared, posing a threat to life systems.

In this context, countries around the world signed the "Paris Climate Change Agreement" to reduce greenhouse gas emissions in the form of a global agreement.

As a "world factory", China's industrial chain is improving day by day, its domestic manufacturing and processing capabilities are increasing day by day, and carbon emissions are accelerating. However, my country's oil and gas resources are relatively scarce. It is of great significance to develop a low-carbon economy and reshape the energy system.

As a result, my country proposes carbon peaking and carbon neutrality goals.



ABOUT US

Founded in 2020, SINE ENERGY is a national high-tech enterprise dedicated to the research and development, manufacturing and sales of solar photovoltaic modules. At the same time, the company has a professional team engaged in the design, construction, operation and maintenance of solar photovoltaic power plants. At present, the company's annual production capacity is 500Mw, with a standard dust-free workshop of 5,000 square meters, equipped with two latest automatic production lines. The factory has passed ISO9001, ISO14001 and ISO45001 management system certification.

Our main products include 166, 182 half-cell modules, Bifacial and full black solar photovoltaic modules, the main product power covers 370W to 670W; products have passed IEC61215, IEC61730, IEC61701, IEC62716, CE and Inmetro and other international certifications, and provide 12 years of materials and Workmanship Warranty, and a 25-year Linear Output Power Warranty. Photovoltaic modules are the basis for the normal operation of photovoltaic power plants. Suneng modules are developed and produced using the latest research results in the industry, and high-quality materials and advanced equipment and processes are selected to ensure that our modules can maximize the power generation during the life cycle. Our components are tested according to stringent international standards to ensure that our customers receive components of reliable quality and superior performance.

SINE ENERGY photovoltaic modules are currently exported to dozens of countries and regions such as Germany, Spain, Italy, Poland, Sweden, Ukraine, Eastern Europe, Southeast Asia, Brazil, Chile, etc. And expand partners around the world, realize the localization of distribution and service, and make every effort to provide a better purchase experience-level service for the majority of users.



We firmly believe that solar energy will become the world's most important energy source in the near future, and we will work with our customers, partners, suppliers, and all employees to devote ourselves to the development of photovoltaic industry, providing high-quality and low-cost photovoltaic modules, Make a little contribution to the green home of mankind.



5,000 m²

Workshop size



500Mw

Annual output capacity



3,000 +

Panels per day



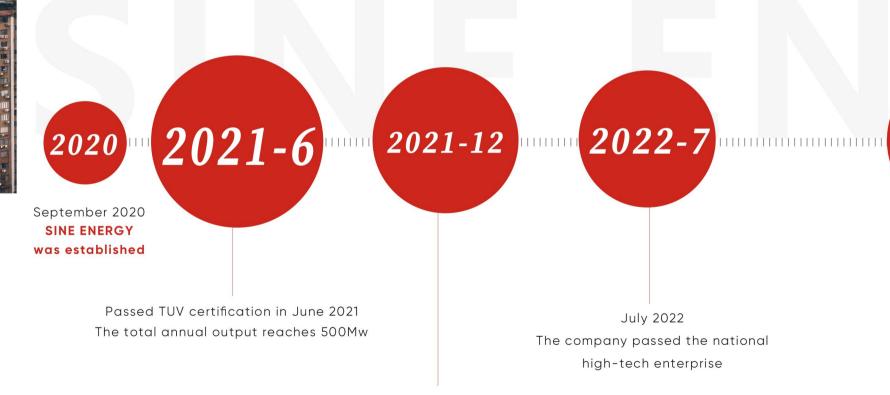
2GW

Total shipment





DEVELOPMENT PATH



December 2021
The annual export volume reached 22 million US dollars

In 2023, the company will continue to invest heavily in new annual production capacity of 500Mw Fully automatic N-type Topcon

module production line

September 2022
The total sales in the first three quarters exceeded RMB 500 million

In the next 5 years, the annual production capacity will exceed 3GW Achieved sales of 5 billion RMB yuan.

GLOBAL DISTRIBUTION



BUSINESS FOOTPRINT

No 1, Hudong Road, Feixi County, Hefei, Anhui Province, China

SINE ENERGY photovoltaic modules are currently exported to dozens of countries and regions such as Germany, Spain, Italy, Poland, Sweden, Ukraine, Eastern Europe, Southeast Asia, Brazil, Chile, etc. And expand partners around the world, localize distribution and service, and ensure that SINE ENERGY partners have access to the right solar products.

Anhui Sine New Energy Co., Ltd.

GLOBAL HEADQUARTERS















QUALIFICATION HONOR

The quality of SINE ENERGY products has been continuously upgraded, and has won a number of recognitions from authoritative institutions. Such as TUV, Rheinland IEC and CE certification, can provide salt spray, ammonia resistance, PID report, 12 years product quality assurance, 25 years linear power output quality assurance. These tests guarantee outstanding product performance of SINE ENERGY PV modules even under the harshest conditions: strong winds, heavy snow loads, salt misT, drought or high temperatures, etc.

Certification

IEC61215 | IEC61730 | IEC 61701 | CE | INMETRO

ISO 9001

2015 Quality Management System

ISO 14001

2015 Environmental Management System

ISO45001

2018 Occupational Health and Safety Management System















QUALITY RELIABILITY EMBODIMENT

SINE ENERGY starts from the source of production, strictly controls every link, uses professionalism and rigor, and strictly demands itself. Every component delivered to customers can withstand strict monitoring and harsh environment inspections.



Incoming test

100% raw material inspection

Using high-efficiency batteries and first-line brand BOM materials, strict incoming inspection. All production batches have material records.



Standardized production

A team of more than 20 experienced engineers and technicians adopts strict industry standard operating practices, and each module is double tested to ensure ultra-high quality.



Advanced tester for the whole production line

100% of the production lines are equipped with industry-leading performance testers, online quality control, and minimized cells cracking.



Appearance

100% visual inspection.



MANUFACTURING STRENGTH

The production plant of SINE ENERGY is equipped with perfect temperature and humidity control equipment. All production lines are controlled by centralized software, and each production equipment can detect and report faults online, improving production efficiency while ensuring product quality.



Automated manufacturing

SINE ENERGY is equipped with new high-efficiency component production equipment, which is adapted to the production requirements of various advanced technologies and realizes the transition from manufacturing to "intelligent" manufacturing.

Real-time interactive system

SINE ENERGY SAP and ERP business platforms can achieve real-time interaction, real-time planning, real-time execution, real-time reporting and analysis, and have the advantages of modernization, informationization and intelligence.

High compatibility

The new production line of SINE ENERGY is compatible with multi-busbar cells of various sizes from 166 to 182 mm, and can be matched with 78 large-sized module. At the same time, it has an upgrade space for 210 mm super-sized cells, covering all mainstream product technologies on the market.

R & D strength

SINE ENERGY has always been committed to the improvement of product conversion efficiency, constantly strengthening the research and development of new technologies and the improvement of production processes. With its excellent technical advantages and manufacturing level, it wholeheartedly provides customers with high-quality and high-reliability photovoltaic products.









PRODUCTION PROCESS





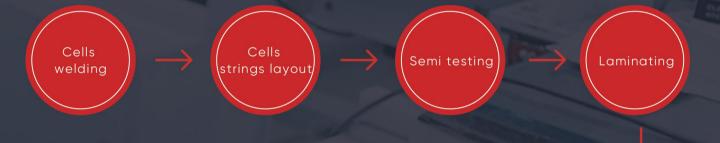








MAIN PRODUCTION STEPS OF COMPONENTS







SINE ENERGY has always been committed to improving the conversion efficiency of products, continuously strengthening the research and development of new technologies, and improving the production process. With its excellent technical advantages and manufacturing level, it wholeheartedly provides customers with high-quality and high-reliability photovoltaic products.

PRODUCT SERIES & FEATURES



High conversion efficiency

The application of leading gallium-doped PERC technology, the conversion efficiency is up to 23.2%, and the first year reduction is ≤2%



Low light performance

The application of glass and cells surface treatment technology enables the module to obtain excellent performance in low light environment



High reliability

First-line brand BOM material, excellent sealing and insulation, guarantee 30 years of performance, TUV Rheinland, International certifications such as CE and INMETRO, and strict quality control ensure high reliability of components



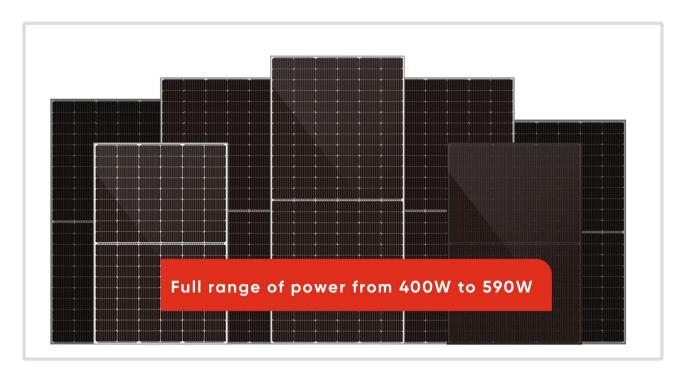
Mechanical load design

Cutting edge design allows components to be certified for 5400Pa frontal snow load and 2400Pa wind load



Excellent anti-PID performance

Innovative cells technology that protects components from potential difference-induced degradation



Solar panel series	s Module Type	Number of cells	Component size	Effciency
	SN(400-415W)-108M	108 cell	1722*1134*30mm	21.25%
	SN(400-410W)-108MF	108 cell	1722*1134*30mm	21.00%
	SN(440-455W)-120M	120 cell	1916*1134*35mm	21.32%
	SN(490-505W)-132M	132 cell	2094*1134*35mm	21.27%
182mm	SN(540~555W)-144M	144 cell	2279*1134*35mm	21.47%
	SN(540-555W)-144MB	144 cell	2279*1134*35mm	21.47%
	SN(580~600W)-156M	156 cell	2464*1134*35mm	21.46%
	SN(580-600W)-156MB	156 cell	2464*1134*35mm	21.46%
166mm	SN(360-380W)-120M	120 cell	1755*1038*30mm	20.86%
100111111	SN(440-460W)-144M	144 cell	2095*1038*35mm	21.15%
210mm	SN(590-610W)-120M12	120 cell	2172*1303*35mm	21.55%
	SN(650-670W)-132M12	132 cell	2384*1303*35mm	21.57%
210111111	SN(590-610W)-120MB12	120 cell	2172*1303*35mm	21.55%
	SN(650~670W)-132MB12	2 132 cell	2384*1303*35mm	21.57%

▶ 166 mm Series



- · M6 wafer MBB half cut technology
- · High efficiency cells & high module yield
- · Twin panels parallel connection
- · Excellent industry size compatibility, optimal size & weight for residential rooftop system & commercial projects
- · Stable generation capacity and power loss guarantee
- · Excellent anti-PID, sand-dust, salt-mist & ammonia resistance ability;2400Pa wind load & 5400Pa snow load approved

UP TO

380W



Mono Half Cut

SN(360-380W)-120M / Monoficial

Module Size: 1755×1038×30mm

Weight: 19.5kg

Glass: 3.2mm templed, high transimission ART coating

Back Sheet : White KPF

Frame : Silver Anodized Aluminium Alloy

Junction Box : IP68 No. of Diodes : 3pcs

Output Cable: 4.0mm² 400/400mm (custmized available)
Connector: MC4 Compatible (MC4 Original optional)

Wind/Snow Load: 2400pa/5400pa
Packing: 36pcs/pallet, 1001pcs/40HQ

UP TO

460W



Mono Half Cut

SN(440~460W)-144M / Monoficial

Module Size: 2095×1038×35mm

Weight: 23.5kg

Glass: 3.2mm templed, high transimission ART coating

Back Sheet : White KPF

Frame: Silver Anodized Aluminium Alloy

Junction Box : IP68
No. of Diodes : 3pcs

Output Cable : 4.0mm² 400/400mm (custmized available)

Connector: MC4 Compatible (MC4 Original optional)

Wind/Snow Load: 2400pa/5400pa Packing: 31pcs/pallet, 682pcs/40HQ

▶ 182 mm Series



- · M10 wafer plus MBB half cut technology
- · High effciency cells & high module yield guarantee
- · Special cells strings array layout
- · Excellent industry size compatibility, suitable for ultra power plant & commercial projects, effectively reducing LCOE & transportation costs
- · Stable generation capacity and power loss guarantee
- · Excellent anti-PID, sand-dust, salt-mist & ammonia resistance ability;2400Pa wind load & 5400Pa snow load approved

UP TO

415W



Mono Half Cut

SN(400-415W)-108M / Monoficial

Module Size: 1722×1134×30mm

Weight: 20.5kg

Glass: 3.2mm templed, high transimission ART coating

Back Sheet: White KPF

Frame: Silver Anodized Aluminium Alloy

Junction Box: IP68 No. of Diodes: 3pcs

Output Cable: 4.0mm² 400/400mm (custmized available) Connector: MC4 Compatible (MC4 Original optional)

Wind/Snow Load: 2400pa/5400pa Packing: 36pcs/pallet, 936pcs/40HQ UP TO

410W



Mono Half Cut

SN(400-410W)-108MF / Monoficial

Module Size: 1722×1134×30mm

Weight: 20.5kg

Glass: 3.2mm templed, high transimission ART coating

Back Sheet : Balck KPF

Frame: Silver Anodized Aluminium Alloy

Junction Box: IP68 No. of Diodes: 3pcs

Output Cable: 4.0mm² 400/400mm (custmized available)

Connector: MC4 Compatible (MC4 Original optional) Wind/Snow Load: 2400pa/5400pa

Packing: 36pcs/pallet, 936pcs/40HQ

UP TO



Mono Half Cut

SN(440-460W)-120M / Monoficial

Module Size: 1916×1134×30mm

Weight: 22kg

Glass: 3.2mm templed, high transimission ART coating

Back Sheet: White KPF

Frame: Silver Anodized Aluminium Alloy

Junction Box: IP68 No. of Diodes: 3pcs

Output Cable: 4.0mm² 400/400mm (custmized available) Connector: MC4 Compatible (MC4 Original optional)

Wind/Snow Load: 2400pa/5400pa

Packing: 36pcs/pallet, 864pcs/40HQ

UP TO



Mono Half Cut

SN(490-505W)-132M / Monoficial

Module Size: 2094×1134×35mm

Weight: 25.5kg

Glass: 3.2mm templed, high transimission ART coating

Back Sheet: White KPF

Frame: Silver Anodized Aluminium Alloy

Junction Box: IP68 No. of Diodes: 3pcs

Output Cable: 4.0mm² 400/400mm (custmized available)

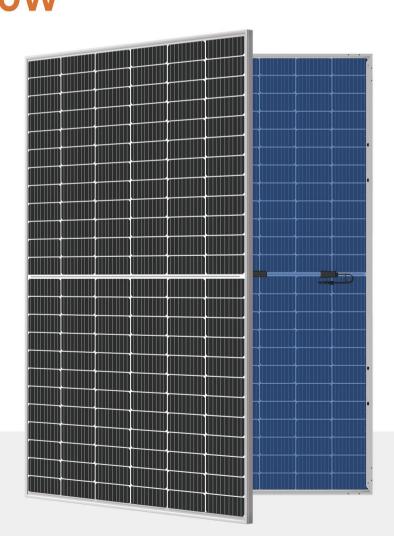
Connector: MC4 Compatible (MC4 Original optional)

Wind/Snow Load: 2400pa/5400pa Packing: 31pcs/pallet, 682pcs/40HQ



▶ 182 mm Series

UP TO **550W**



Mono Half Cut

SN(540-550W)-144M / Monoficial

Module Size: 2279×1134×35mm

Weight: 27.5kg

Glass: 3.2mm templed, high transimission ART coating

Back Sheet : White KPF

Frame: Silver Anodized Aluminium Alloy

Junction Box: IP68 No. of Diodes: 3pcs

Output Cable: 4.0mm² 400/400mm (custmized available) Connector: MC4 Compatible (MC4 Original optional)

Wind/Snow Load: 2400pa/5400pa Packing: 31pcs/pallet, 620pcs/40HQ

SN(540-550W)-144MB / Bifacial

Module Size: 2279×1134×35mm

Weight: 27.5kg

Glass: 3.2mm templed, high transimission ART coating

Frame: Silver Anodized Aluminium Alloy

Junction Box: IP68 No. of Diodes: 3pcs

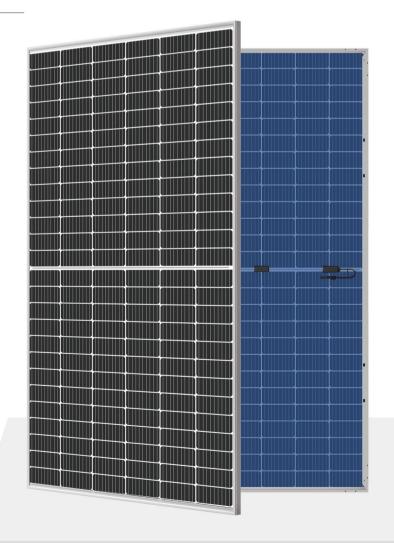
Output Cable: 4.0mm² 400/400mm (custmized available) Connector: MC4 Compatible (MC4 Original optional)

Wind/Snow Load: 2400pa/5400pa



590W

Key Features



· M10 wafer plus MBB half cut technology

· Special cells strings array layout

snow load approved

reducing LCOE & transportation costs

· High effciency cells & high module yield guarantee

· Stable generation capacity and power loss guarantee

Mono Half Cut

SN(575-590W)-156M / Monoficial

Module Size: 2464×1134×35mm

Weight: 31kg

· Excellent industry size compatibility, suitable for ultra power plant & commercial projects, effectively

· Excellent anti-PID, sand-dust, salt-mist & ammonia resistance ability;2400Pa wind load & 5400Pa

Glass: 3.2mm templed, high transimission ART coating

Back Sheet: White KPF

Frame: Silver Anodized Aluminium Alloy

Junction Box: IP68 No. of Diodes: 3pcs

Output Cable: 4.0mm² 400/400mm (custmized available)

Connector: MC4 Compatible (MC4 Original optional)

Wind/Snow Load: 2400pa/5400pa Packing: 31pcs/pallet, 558pcs/40HQ

SN(575-590W)-156MB / Bifacial

Module Size: 2464×1134×35mm

Weight: 31kg

Glass: 3.2mm templed, high transimission ART coating

Frame: Silver Anodized Aluminium Alloy

Junction Box: IP68 No. of Diodes: 3pcs

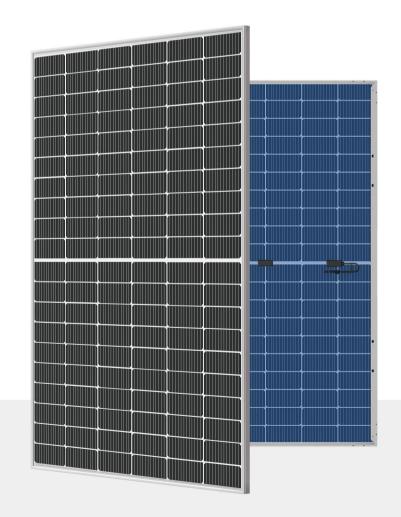
Output Cable: 4.0mm² 400/400mm (custmized available) Connector: MC4 Compatible (MC4 Original optional)

Wind/Snow Load: 2400pa/5400pa Packing: 31pcs/pallet, 558pcs/40HQ



▶ 210 mm Series

UP TO



Mono Half Cut

SN(590-610W)-120M12 / Monoficial

Module Size: 2172×1303×35mm

Weight: 30.5kg

Glass: 3.2mm templed, high transimission ART coating

Back Sheet: White KPF

Frame: Silver Anodized Aluminium Alloy

Junction Box: IP68 No. of Diodes: 3pcs

Output Cable: 4.0mm² 400/400mm (custmized available) Connector: MC4 Compatible (MC4 Original optional)

Wind/Snow Load: 2400pa/5400pa Packing: 31pcs/pallet, 558pcs/40HQ

SN(590-610W)-120MB12 / Bifacial

Module Size: 2172×1303×35mm

Weight: 30.5kg

Glass: 3.2mm templed, high transimission ART coating

Frame: Silver Anodized Aluminium Alloy

Junction Box: IP68 No. of Diodes: 3pcs

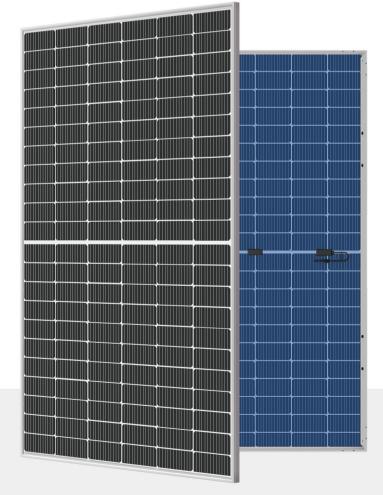
Output Cable: 4.0mm² 400/400mm (custmized available) Connector: MC4 Compatible (MC4 Original optional)

Wind/Snow Load: 2400pa/5400pa Packing: 31pcs/pallet, 558pcs/40HQ





Kev Features



Mono Half Cut

SN(650-670W)-132M12 / Monoficial

Module Size: 2384×1303×35mm

Weight: 33.5kg

· Adopt latest 210mm half cut cells technology, upto 23.1% cells effciency and low degradation rate

· 0~+5W power output guarantee, 1st year power degradation≤2%, 2nd year to 25th year power

·Anti-PID material, sand-dust, salt-mist, and ammonia resistance, meet all kinds of different installing

12bb cells with powerful optical conversion rate

· Super high power output monofacial panel

· Twin panels parallel connection

degradation≤0.6%

requirements

Glass: 3.2mm templed, high transimission ART coating

Back Sheet: White KPF

Frame: Silver Anodized Aluminium Alloy

Junction Box: IP68 No. of Diodes: 3pcs

Output Cable: 4.0mm² 400/400mm (custmized available)

Connector: MC4 Compatible (MC4 Original optional)

Wind/Snow Load: 2400pa/5400pa Packing: 31pcs/pallet, 558pcs/40HQ

SN(650~670W)-132MB12 / Bifacial

Module Size: 2384×1303×35mm

Weight: 33.5kg

Glass: 3.2mm templed, high transimission ART coating

Frame: Silver Anodized Aluminium Alloy

Junction Box: IP68 No. of Diodes: 3pcs

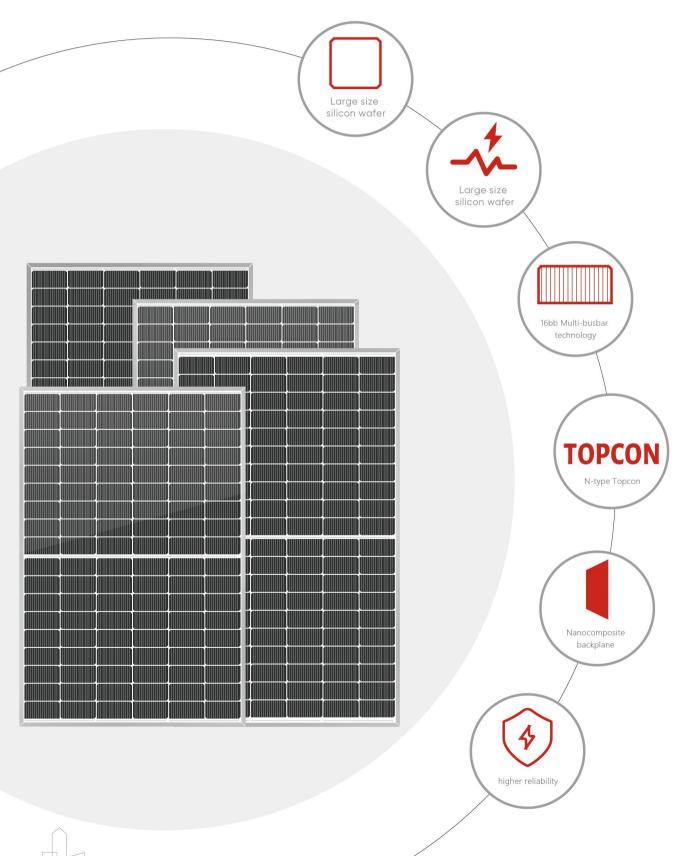
Output Cable: 4.0mm² 400/400mm (custmized available)

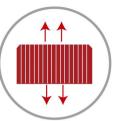
Connector: MC4 Compatible (MC4 Original optional)

Wind/Snow Load: 2400pa/5400pa Packing: 31pcs/pallet, 558pcs/40HQ



TOPCON SERIES PRODUCTS





Extra power gain

With a life cycle of at least 30 years and a bifacial design, the additional power generation is about 10%-30% higher than that of conventional modules



Better temperature coefficient

N Type Topcon cells technology module, higher power generation in operation than conventional components



No LETID No LID

N type topcon modules has better reliability in harsh environment and lower LID/LETID.



Better low light response

N type Topcon solar cells makes longer life span,lower degradation and better performance in week light conditions



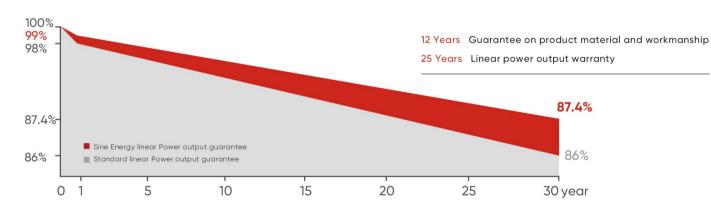
Lower electricity cost

5–25w higher than Perc modules with the same size result in lower LCOE and O/M cost.



PID Resistance

Selected encapsulating materials and stringent production process controls ensures highly PID resistant.



Model type	Number of cells	Component size	Conversion efficiency	weight	Glass
SN(410~430W)-108MT	108cell	1722*1134*30mm	22.02%	19.5kg	3.2mm
SN(460-480W)-120MT	120cell	1916*1134*35mm	22.09%	22.5kg	3.2mm
SN(510~530W)-132MT	132cell	2094*1134*35mm	22.32%	24kg	3.2mm
SN(560~580W)-144MT	144cell	2279*1134*35mm	22.44%	26.5kg	3.2mm
SN(560~580W)-144MTB	144cell	2279*1134*35mm	22.44%	26.5kg	3.2mm

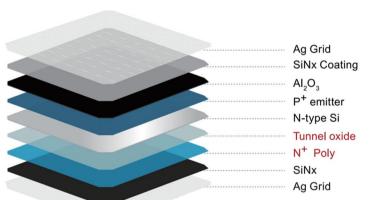
N型 TOPCON cells Technology



Advantages of N-type TOPCon cells

- Better chemical passivation and field passivation can be achieved simultaneously with polysilicon passivation

 Effect:
- The majority carrier is tunneled and transported through the ultrathin tunneling oxide layer, and it is possible to obtain low. The contact resistance can be significantly reduced while the metal-semiconductor recombination;



Advantages of N-type module power generation cost

Under the same lighting conditions, N-type module can gain more additional gain than P-type module

P-type module power generation time

N-type module power generation time

-0.30%
Temperature coefficient as low as

22.44%

Conversion efficiency up to



85%

Double-sided ratio up to

PHOTOVOLTAIC SYSTEM SOLUTIONS

Ultra Solar Plant

Large and medium-sized ground photovoltaic power stations are generally large in scale, and usually use ground resources such as coastal beaches, Gobi wasteland, and open suburban areas without shading. In the west, there are more ground power stations with complementary sand and light, which combine the development of photovoltaics with desert governance and water-saving agriculture, combine. The outside of the power station is composed of grass checkered sand barriers and sand-fixing forests to form a shelter forest system. Water-saving drip irrigation facilities are installed under the photovoltaic panels, and green economic crops are planted to achieve a win-win situation of economic and ecological benefits.

solution

The photovoltaic grid-connected power station is fully optimized to realize the optimal configuration of system economy and reliability and ensure the maximum power generation.

For various complex geology and landforms such as deserts, barren mountains, deep pits, rocks, etc., we provide customized support foundation construction and support installation solutions according to local conditions.

🛘 The links of engineering design, equipment supply, construction and installation were carried out in a reasonable manner, and the construction period of the project was greatly shortened.

Actively strive for the national on-grid electricity price subsidy, and the investment rate of return is high.

Distributed photovoltaic power station

Distributed power stations are mainly installed on residential roofs, small commercial roofs and industrial plants. Due to the differences in various on-site environments and roof structures, it is difficult to unify the installation methods. According to engineering experience, a roof structure with higher versatility is selected for design.

flat roof

Such power stations are mainly built on flat roofs, and are mainly installed by means of concrete foundations, chemical anchor bolts or self-weight brackets.

pitched roof

This type of power station is built on a sloping roof building. It is mainly installed in a tiled form according to the slope of the roof. Special pendants are fixed on the roof bearing beams, sandalwood strips are installed, and finally photovoltaic modules are fixed.

Color steel tile roof

This type of power station is built on the roof of color steel tiles. According to the different cross-sectional shapes of the color steel tiles, different special pendants are used as the foundation to fix, and then sandalwood strips and module are installed.

Distributed photovoltaic power generation features:

- Simple access, high security and reliability.
- The user side is connected to the grid, mainly for self-use, and







20Mw

Anhui Tongling - fishery and light complementary power station





4.3Mw 2 Anhui Hefei -Industrial/Commercial Project



SINE ENERGY



3.2Mw



Anhui Hefei

Industrial/Commercial Project

1.5Mw



Anhui Hefei

Industrial/Commercial Project



5_{Mw}

Hubei China

Ultra Solar Plant

0





500_{Kw}

0

Austra Ultra Solar Plant





2_{Mw}

Q

Ukraine Ultra Solar Plant

250_{Kw}

0

Brazil

Ultra Solar Plant



20_{kw}

Estonia User Distributed Project







Thailand User Distributed Project





10_{Kw}

0

Poland User Distributed Project



10_{Kw}

28_{Kw}

Anhui Feixi

User Distributed Project



Sri Lanka

User Distributed Project

User Distributed Project

4.4_{Kw}

9

Brazil

DEVELOPMENT GOALS

Anhui Sine New Energy Co., Ltd.

The development of photovoltaic industry continues to rise

my China's PV module production accounts for more than 3/4 of the world's total, and the cumulative installed capacity ranks first in the world. At the same time, the construction of large-scale wind power photovoltaic bases focusing on deserts, Gobi and desert lands is being vigorously promoted.

Since the beginning of this year, my China's photovoltaic industry has achieved rapid growth as a whole, and the main links of the industry chain have maintained a strong momentum of development.

According to data from the China Photovoltaic Industry Association, in the first half of the year, the output of polysilicon, silicon wafers, cells and modules in my China increased by more than 45% year-on-year. At the same time, the overseas photovoltaic market demand continued to be strong, the volume and price of photovoltaic products showed a trend of rising, and the export volume reached a new high.

SINE ENERGY Photovoltaic is ushering in a new stage of development

In order to meet the increasing demand for domestic and foreign orders, Shangneng plans to continue to invest in the construction of a fully automatic N-type Topcon battery module production line with an annual production capacity of about 500Mw in 2023. In the next 5 years, the annual production capacity will exceed 3GW, and the sales will reach 5 billion yuan.

Due to the large number of orders in the global market, it is imperative to increase production lines and expand production capacity. Shangneng invests in photovoltaic smart industrial parks and brings together upstream and downstream enterprises to meet development needs with lower costs and higher production capacity.

The necessity of building a photovoltaic smart industrial park

01

Bring together business partners and production bases in the upstream and downstream of the industrial chain to expand the scale of the enterprise and increase production capacity volume and production efficiency;

02

Introduce excellent scientific research teams and high-tech talents, reduce R&D costs, and master the most advanced technology in the industry And technology.

03

Create a large number of local employment opportunities, bring considerable tax revenue, and avoid local encounters in the future "Power shortage" affects the production and operation of other industries.





