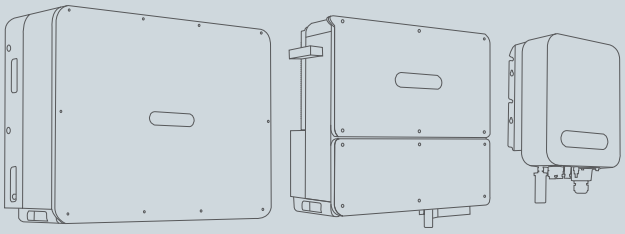


BLUESUN SOLAR BROCHURE

PV Solutions (Bulgaria)

TOP1

30KW Grid-tied Solar Power System Components List			
Item	Model	Description	Quantity
1	Solar Panel	Mono 455w solar panel	68pcs
2	Grid-tied Inverter	30KW 3/N/PE	1 pc
3	Monitoring device	WiFi Module	1 pc
4	Mounting Support	Roof/Ground	1 set
5	Cable	4mm² PV cable	400 m
6	Connector	Solar connector	10 pairs

30KW Grid-tied Solar Power System Components List			
Item	Model	Description	Quantity
1	Solar Panel	Shingled 500w solar panel	60pcs
2	Grid-tied Inverter	30KW 3/N/PE	1 pc
3	Monitoring device	WiFi Module	1 pc
4	Mounting Support	Roof/Ground	1 set
5	Cable	4mm² PV cable	400 m
6	Connector	Solar connector	10 pairs

30KW Grid-tied Solar Power System Components List			
Item	Model	Description	Quantity
1	Solar Panel	Mono 415w solar panel	76pcs
2	Grid-tied Inverter	30KW 3/N/PE	1 pc
3	Monitoring device	WiFi Module	1 pc
4	Mounting Support	Roof/Ground	1 set
5	Cable	4mm² PV cable	600 m
6	Connector	Solar connector	10 pairs

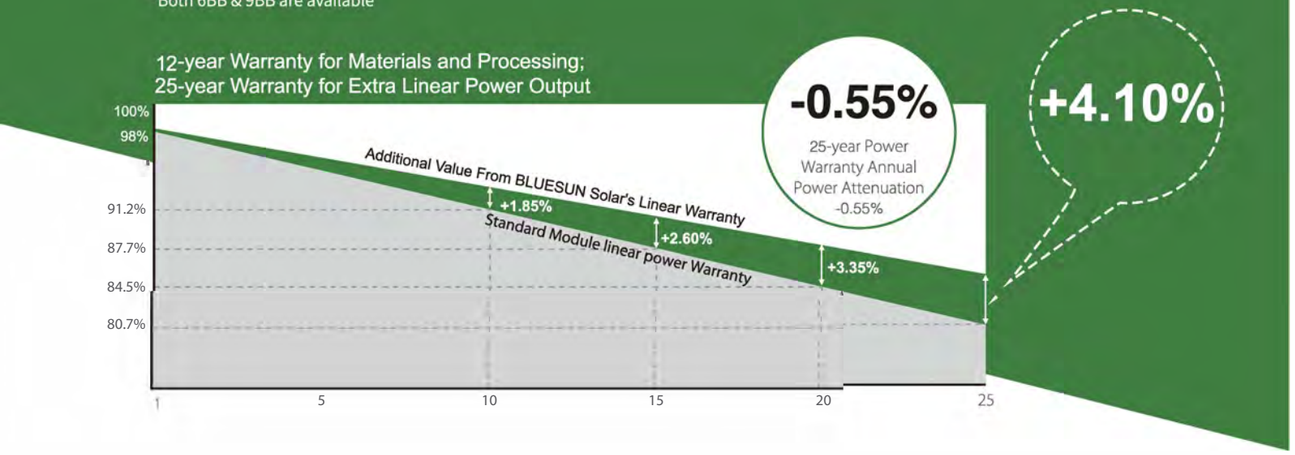
30KW Grid-tied Solar Power System Components List			
Item	Model	Description	Quantity
1	Solar Panel	Poly 355w solar panel	85pcs
2	Grid-tied Inverter	30KW 3/N/PE	1 pc
3	Monitoring device	WiFi Module	1 pc
4	Mounting Support	Roof/Ground	1 set
5	Cable	4mm² PV cable	600 m
6	Connector	Solar connector	10 pairs

BSM455M-72HPH
425~455W

PERC
NEW

High Efficiency
Low LID Mono PERC with
Half-cut Technology

*Both 6BB & 9BB are available



Complete System and Product **Certifications**
IEC61215, IEC61730/UL61730
ISO9001:2008: ISO Quality Management System
ISO14001:2004: ISO Environment Management System
TS62941: Guideline for module design qualification and type approval
OHSAS18001:2007 Occupational Health and Safety

* Specifications subject to technical changes and tests.
BLUESUN Solar reserves the right of interpretation.

Positive power tolerance (0 - +5W) guaranteed

High module conversion **efficiency** (up to 20.9%)

Slower power **degradation** enabled by Low LID Mono PERC technology: first year <2%, 0.55% year 2-25

Solid PID resistance ensured by solar cell process optimization and careful module BOM selection

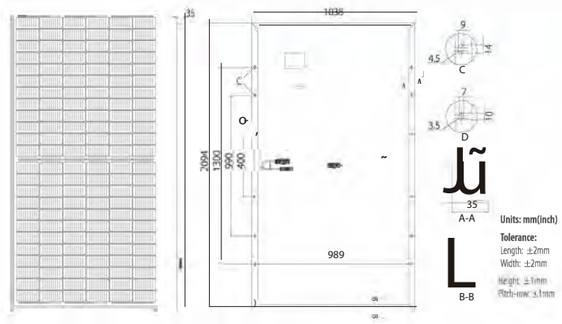
Reduced **resistive** loss with lower operating current

Higher energy yield with lower operating temperature

Reduced hot spot risk with optimized electrical design and lower operating current

BSM455M-72HPH425~455W

Design (mm)



Mechanical Parameters

Cell Orientation: 144 (6x24)
Junction Box: IP68, three diodes
Output Cable 4mm², 300mm in length, length can be customized
Glass Single glass 3.2mm coated tempered glass
Frame: Anodized aluminum alloy frame
Weight: 23.5kg
Dimension: 2094x1038x35mm
Packaging: 260pcs per 20'GP 660pcs per 40'HC

Operating Parameters

Operational Temperature: -40C - +85C
Power Output Tolerance: O~+5W
Voe and Isc Tolerance: ±3%
Maximum System Voltage: DC1500V (IEC/UL)
Maximum Series Fuse Rating: 20A
Nominal Operating Cell Temperature: 45±2C
Safety Class: Class II
Fire Rating: UL type1 or 2

Electrical Characteristics

Test uncertainty for Pmax ±3%

Model Number	BSM425M-72HPH		BSM430M-72HPH		B5M435M-72HPH		B5M440M-72HPH		B5M445M-72HPH		B5M450M-72HPH		B5M455M-72HPH	
Testing Condition	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT
Maximum Power (Pmax/W)	425	314.8	430	318.5	435	322.2	440	326.0	445	329.7	450	333.4	455	337.1
Open Circuit Voltage (Voc/V)	48.3	45.1	48.5	45.3	48.7	45.5	48.9	45.6	49.1	45.8	49.3	46.0	49.5	46.2
Short Circuit Current (Isc/A)	11.23	9.06	11.31	9.12	11.39	9.18	11.46	9.24	11.53	9.30	11.60	9.35	11.66	9.40
Voltage at Maximum Power (Vmp/V)	40.5	37.4	40.7	37.6	40.9	37.8	41.1	38.0	41.3	38.1	41.5	38.3	41.7	38.5
Current at Maximum Power (Imp/A)	10.50	8.42	10.57	8.47	10.64	8.53	10.71	8.59	10.78	8.64	10.85	8.70	10.92	8.75
Module Efficiency(%)	19.6		19.8		20.0		20.2		20.5		20.7		20.9	

STC (Standard Testing Conditions): Irradiance 1000W/m², Cell Temperature 25 C, Spectra at AM1.5

NOCT (Nominal Operating Cell Temperature): Irradiance 800W/m², Ambient Temperature 2o-c, Spectra at AM1.5, Wind at 1m/S

Temperature **Ratings** (STC)

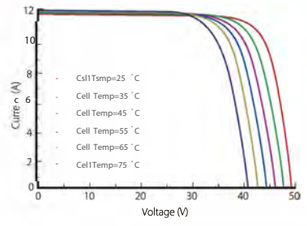
Temperature Coefficient of Isc	+0.048%/C
Temperature Coefficient of Voe	-0.270%/°C
Temperature Coefficient of Pmax	-0.350%/°C

Mechanical Loading

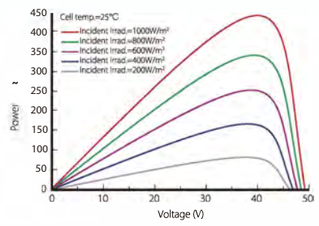
Front Side Maximum **Static** Loading	5400Pa
Rear Side Maximum **Static** Loading	2400Pa
Hailstone Test	25mm Hailstone at the speed of 23m/s

1-V Curve

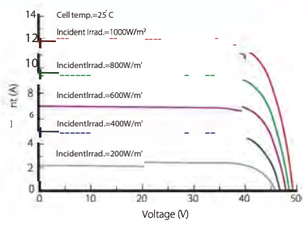
Current-Voltage Curve (BSM440M-72HPH)



Power-Voltage Curve (BSM440M-72HPH)

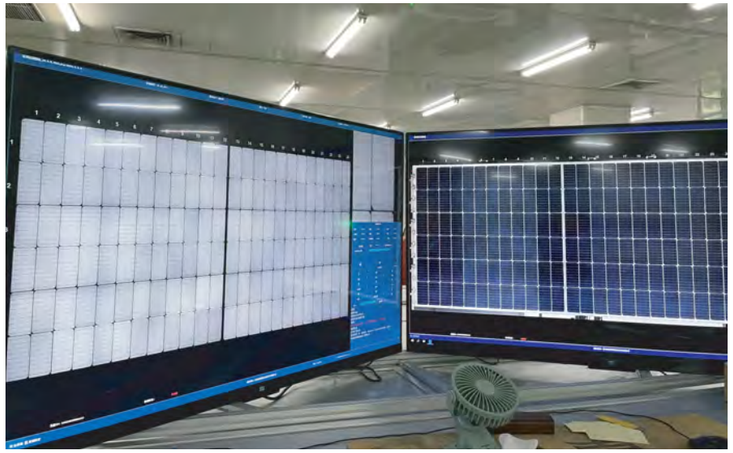


Current-Voltage Curve (BSM440M-72HPH)



1

2



3

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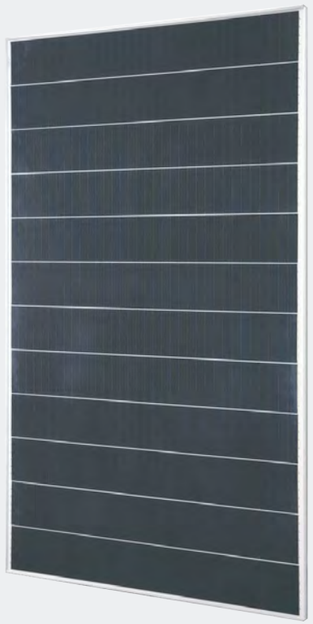
9

BSM500PM5-72SB

Shingled 500W

PERC



500W
Maximum Power Output

21.3%
Maximum Module Efficiency

0~+5W
Power Output Guarantee

YOUR BEST PV SUPPLIER

Ideal choice for large scale ground installation

Shingled cells use flexible adhesives instead of metal alloys to achieve interconnections between the cells, which has better flexibility

Selected encapsulating material and stringent production process control ensure the product is highly PID resistant and snail trails free

Lower LID due to lower oxygen and carbon content

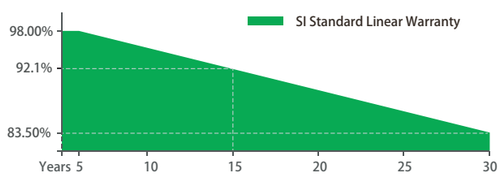
Special cell process ensures great performance under low irradiance conditions

Provides higher module efficiency under low irradiance conditions, and achieves greater installation capacity in a limited space.

Key features

- World-class manufacturer of crystalline silicon photovoltaic modules
- Fully automatic facility and world-class technology
- Rigorous quality control to meet the highest standard: ISO9001:2015, ISO14001: 2015 and OHSAS: 18001 2007
- Tested for harsh environments (salt mist, ammonia corrosion and sand blowing test: IEC 61701, IEC 62716, DIN EN 60068-2- 68)
- Long term reliability tests
- 2×100% EL inspection ensuring defect-free modules

Linear Performance Warranty



15 Years Product Warranty 30 Years Linear Power Warranty

* Please refer to Bluesun standard warranty for details

Certificate

TUV NORD CERT GmbH TUV Tested

CE

ELECTRICAL PARAMETERS AT STC

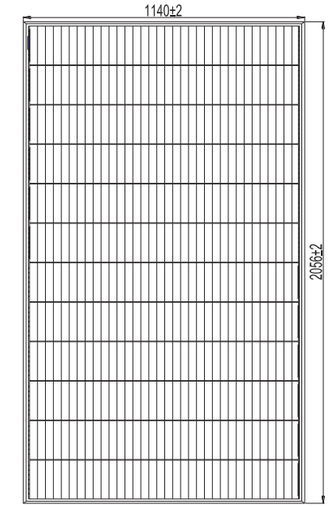
Model	BSM500PM5-72SB
Max Power(Pmax) [W]	500
Open Circuit Voltage(Voc) [V]	46.8
Short Circuit Current(Isc) [A]	13.40
Max Power Voltage(Vmp) [V]	39.0
Max Power Current(Imp) [A]	12.82
Module Efficiency [%]	21.3
Power Tolerance	0-5W
Max System Voltage	1000V/1500V/DC(IEC)
Max Series Fuse Rating	20A
Operating Temperature	-40℃ to + 85℃
STC	Irradiance 1000W/m², cell temperature 25℃, AM1.5G

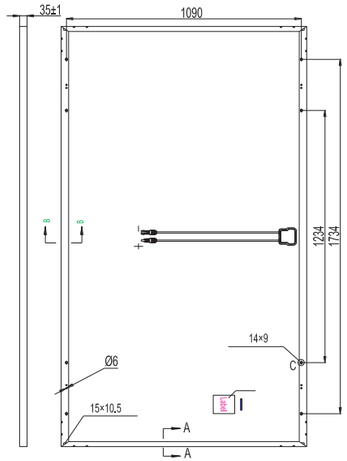
*For mechanical loading performance: front side maximum static loading 5400Pa, rear side maximum static loading 2400Pa; hailstone test: 25mm hailstone at the speed of 23m/s

NMOT

Model Number	BSM500PM5-72SB
Max Power(Pmax) [W]	376
Open Circuit Voltage （Voc）	44.6
Short Circuit Current (Isc)	10.81
Maximum Power Voltage (Vmp)	37.2
Maximum Circuit Current (Imp)	10.13
NMOT	42.3℃ （±2℃）

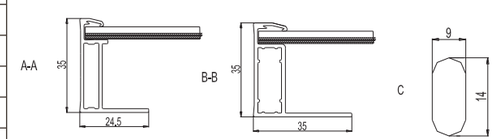
*Irradiance 800 W/m²,ambient temperature 20 °C, wind speed 1m/s





Mechanical Characteristics

Solar Cells	Mono Perc 166mmx166mm
Dimensions	2056*1140*35mm / 1969*1140*35mm
Weight	25kg
Front Load	5400Pa
Connector Type	PV Connector
Junction Box	Rated Current:20A, IP67
Cables	4mm² (IEC)
Glass	3.2mm White Toughened Safety Glass
Frame	Anodized Aluminium Alloy
Withstanding Hail	Maximum diameter of 25 mm with impact speed of 23 m·s-1
Packing	31pcs/box;682pcs/40'container;992pcs/flat car

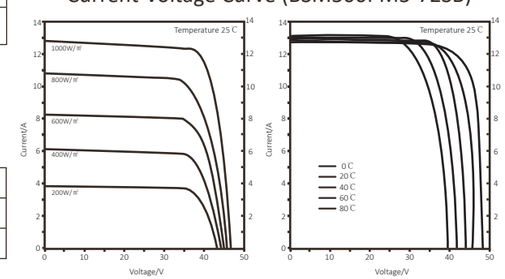


Temperature Characteristics

Temperature Coefficient of Pmax	γ (Pm)	-0.34%/℃
Temperature Coefficient of Voc	β (Voc)	-0.27%/℃
Temperature Coefficient of Isc	α (Isc)	0.04%/℃

I-V Curves

Current-Voltage Curve (BSM500PM5-72SB)



Reinterpreting High-efficiency Solar Panel

TÜV NORD CERT GmbH
Type Tested

IEC/EN 61215-1:2016

IEC/EN 61730-1:2016

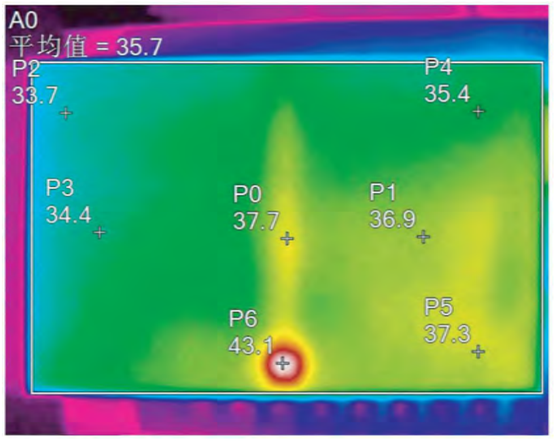
IEC TS 62804-1:2015

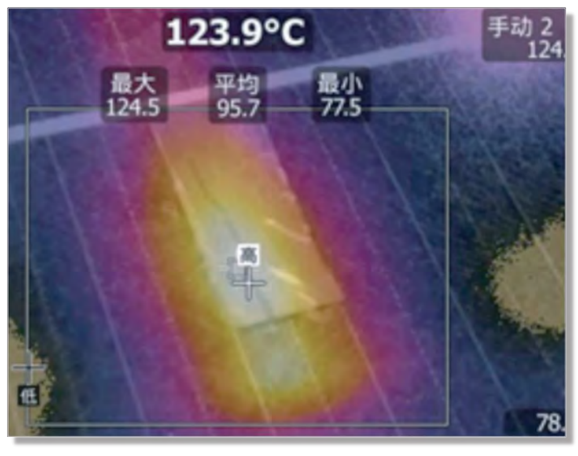
IEC/EN 61701:2011

IEC/EN 62716:2013

The brief introduction of shingled module advantages

Reporter:Efficient module r&d project Department





- Shingled module has lower operating temperature and higher output power than normal modules.
- Without occlusion, the experimental data show that the operating temperature of shingled modules is about 4℃ lower than normal modules, and the output power/generating capacity is about 2% higher than normal modules.
- The current is only 1/5 of that of the whole cell, about 1.8A
- Heat can be transmitted to adjacent cells through electric conductive adhesive to accelerate heat dissipation

Bulgaria installation recommendation ★★★★★

- Vertical installation, shingled module cells series and parallel structure, as soon as the snow on one string of cells melts, the module is ready to work, the temperature rise during work further accelerates snow melting. It can effectively increase module power generation time.

- The Load resisting capacity of shingled modules is verified by simulating the maximum deformation of the module (the maximum deformation of the module glass & frame)
- Experimental results show that there is no new micro-crack and power attenuation (0.26%)

Commercial Medium Power Inverter

High Efficiency

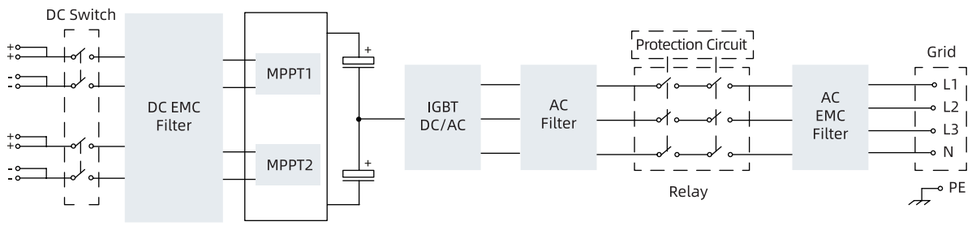
Max. DC voltage 1100V.
Max efficiency 99.0%.
Double channels MPPT.
High precision & intelligent string detection.

Reliable

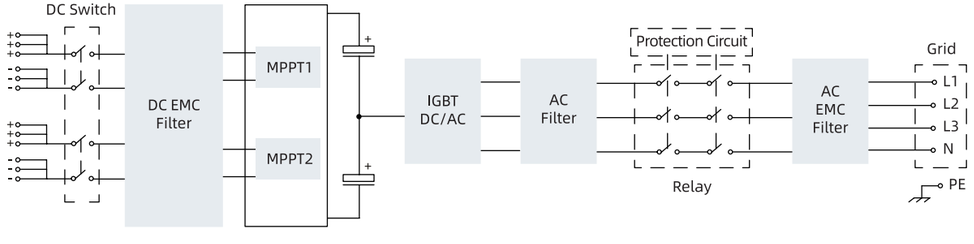
10K~22K natural cooling, 25K~33K smart air cooling.
Compact structure, easy for installation and maintenance.
Reliable under/over voltage protection, anti-islanding.
Built-in AC and DC lightning protection module and provide full range of lightning protection.
Mobile phone APP and check the status information of inverter.

Topological Graph

20~25K



30/33K

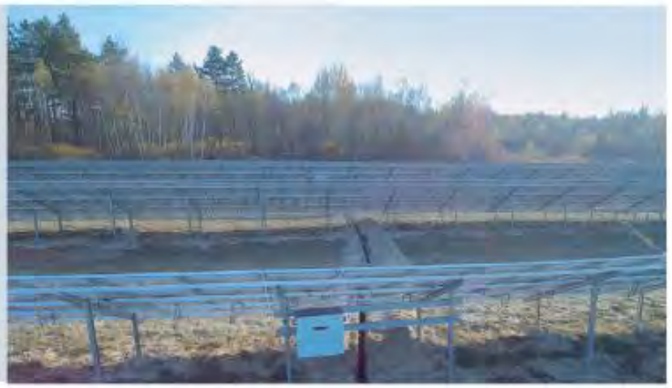


Technical Parameters

Model		BSM10K-B	BSM12K-B	BSM15K-B	BSM17K-B	BSM20K-B	BSM22K-B	BSM25K-B	BSM30K-B	BSM33K-B
DC Input	Max. DC Voltage	1100V								
	MPPT Voltage Range	250V ~ 1000V								
	Max. Input Current of Each MPPT	13A		26A / 13A		26A			39A	
	Number of DC Inputs	2		3		4			6	
	MPPT Number	2								
AC Output	Rated Output Power	10kW	12kW	15kW	17kW	20kW	22kW	25kW	30kW	33kW
	Max. Active Power (cosθ=1)	11kW	13.2kW	16.5kW	18.7kW	22kW	24.2kW	27.5kW	33kW	36.3kW
	Rated Output Voltage	400V (Three Phase)								
	Operating Voltage Range	400V±20%								
	Rated Output Current	14A	17A	22A	25A	29A	32A	36A	43.3A	47.6A
	Max. Output Current	16A	19A	24A	27A	32A	35A	39.7A	47.6A	
	Rated Grid Frequency	50Hz / 60Hz								
	Power Factor	0.8(Leading) ~ 0.8(Lagging)								
	THD	<3%								
System Parameters	Max. Efficiency	98.60%		98.61%	98.62%	98.63%	98.65%	98.94%	99.00%	98.80%
	European Efficiency	98.30%						98.26%	98.50%	98.26%
	AC/DC SPD	Support								
	Insulation Impedance Detection	Support								
	Residual Leakage Current Detection	Support								
	PV String Fault Detection	Support								
	Output Overcurrent Protection	Support								
	Protection Level	IP65								
	Operating Temperature Range	-40℃ ~ +60℃								
	Cooling System	Natural Cooling						Smart Air Cooled		
	Standby Power Consumption	<1W								
	Topology Structure	Transformerless								
	Operating Altitude	5000m (Derating above 4000m)								
	Display	LED Indicator + APP								
	Communication	RS485 / WiFi / GPRS								
	Certification	IEC62109, IEC61000, IEC62116, IEC61727, EN50549, CQC, CGC								
Mechanical Parameters	Dimensions (W*H*D)	485*485*266mm								
	Weight	<30kg						<35kg		

Project Cases

Ukraine 15MW Solar Plant



Brazil 500kW Rooftop Project

Residential PV Project in China

Roof-top PV Project in Hunan China

Poverty Alleviation PV Project in Hebei

Rooftop PV Project in Shandong