TONGWEI WHITE PAPER
OF PV MODULES


TW SOLAR

Contents

Company Profile

Tongwei Co.,Ltd is a large-scale listed company of the private sector held by Tongwei Group, deeply involved in green agriculture and green energy. Tongwei now has more than 200 branches and subsidiaries worldwide, with more than 50,000 employees in total. Tongwei entered the industry of photovoltaics (PV) in 2006 and has experienced rapid development for over l0 years. Currently, its business scope covers high-purity crystalline silicon production in upstream, high-efficiency solar cell production in midstream, and photovoltaic power plant construction and operation. It has formed a complete PV new energy industry chain with independent intellectual property rights and leading scale, technology, cost, and quality advantages, building up the vertical integration layout of the whole PV industry chain.

Tongwei started its module business in 2013 and established the High-efficiency Module R&D Department in 2016, gradually starting the module technique development. After more than 10 years of investment in technology and R&D, Tongwei has formed a module product matrix covering differentiated market needs with Tongwei characteristics. The module products of Tongwei have been widely used in residential rooftop, industrial and commercial distributed power generation projects, and utility-scale PV power stations, meeting the growing needs for PV of the international clients. Tongwei accelerated its layout of the module business in the second half of 2022, with years of accumulation in technology and market, Tongwei has formed a competitive scaled module business system by virtus of the collaborative advantages of high-purityilicon and solar cell production in the upstream. It's clients have covered major central and state-owned power generation enterprises in China and more than 40 countries and regions worldwide. The current production capacity of the Hefei, Jintang, and Yancheng production bases is 55GW, and the Nantong Base is under high-efficiency construction and is expected to be put into production in the end of this year.

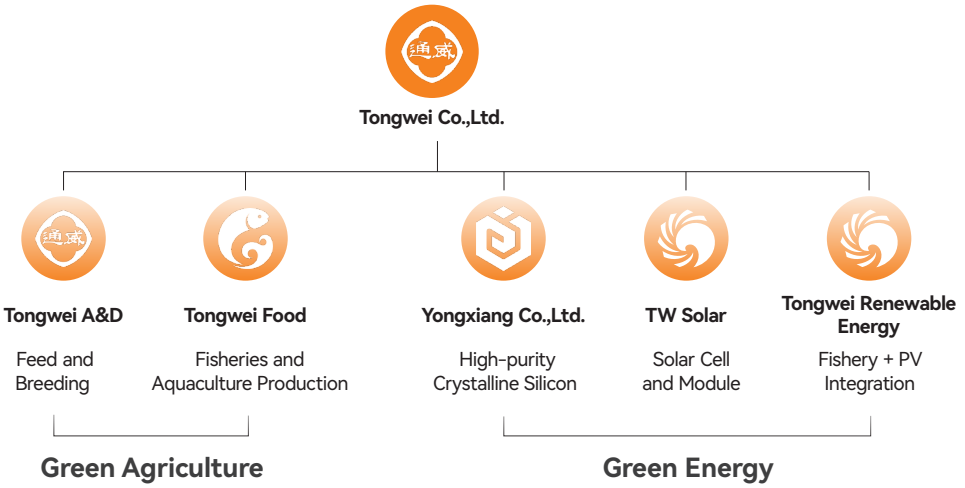
476th of Fortune Top 500

94th of Fortune Top 500 Listed Companies in China

494th of Forbes Top 2,000 Global Enterprises

State-level Green Factory

State-level Enterprise Technology Center



Production capacity

420,000 tons

永祥股份 YONGXIANG CO.,LTD.

High-Purity Crystalline Silicon

To build a world-class leading enterprise of high-purity crystalline silicon, the product purity in terms of key impurities reaches 99.999999999%.

Production capacity

15GW

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High-Quality Silicon Wafers

Tongwei is an indeperdent manufacturer of premium silicon wafel, fortified by our superior silicon materials and enduring collaboations with esteemed wafer manufacturers, assuring reliable product quality.

Production capacity

90GW

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Crystalline Silicon Cells

The cells are all made by the “Industry 4.0” intelligent manufacturing system.

Production capacity

55GW

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High-efficiency Modules

Tongwei's module products cover various application scenarios.

Accumulated on-grid installed capacity

3.7GW

通威新能源 TW NEW ENERGY

Fishery & PV Integration

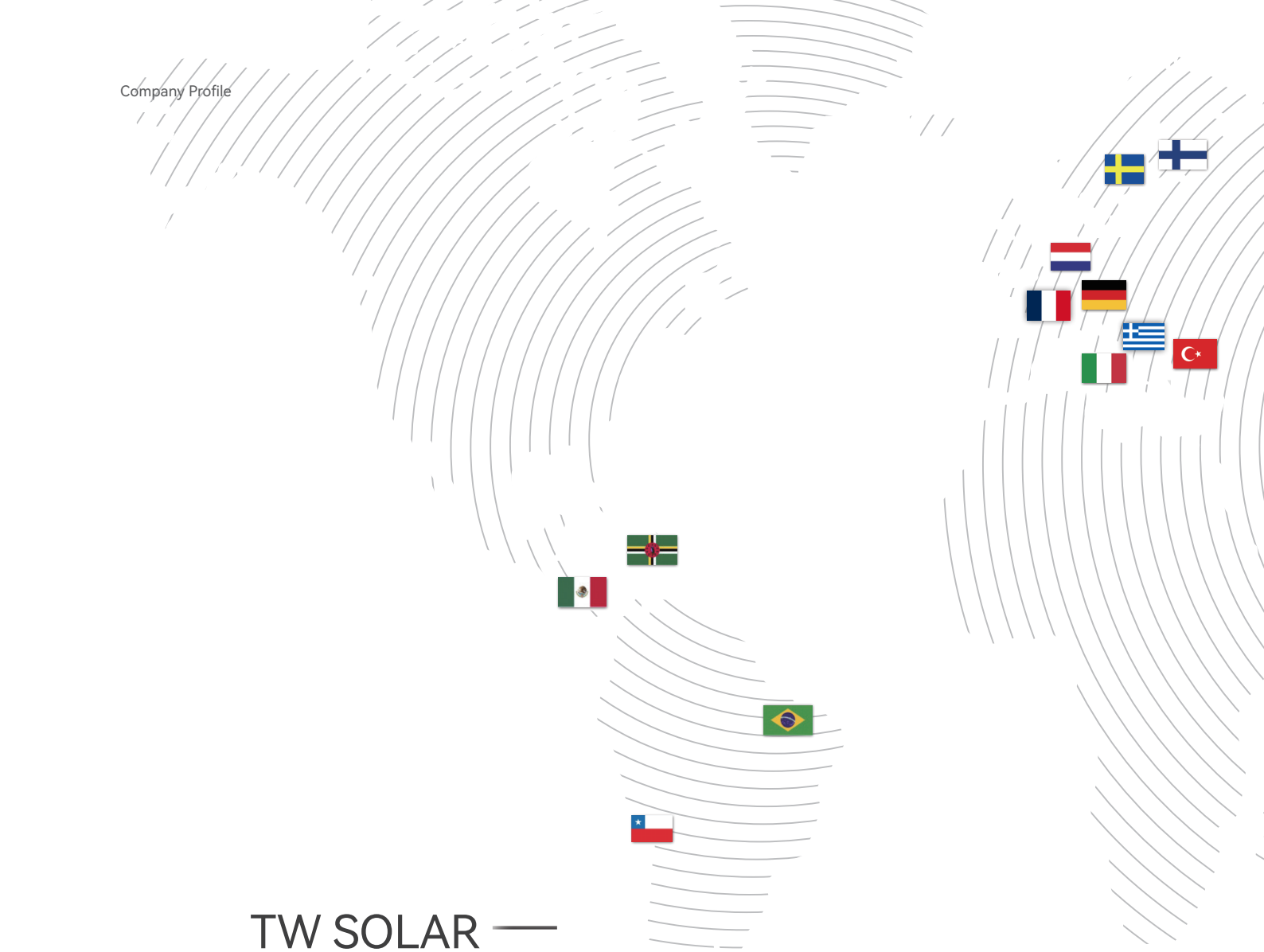
The world's first innovative "Fishery & PV Integration" development mode can realize triple the benefits of "fishery, electricity, and environmental protection."

Planned Annual Production

High-purity Crystalline Silicon
800,000 - 1000, 000 tons

Solar Cell
130-150GW

Photovoltaic Modules
100GW



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Bloomberg New Energy Finance (BNEF) Tier 1 Module Suppliers

TIER 1 Bloomberg

10

Tongwei formally entered the module industry in 2022 with its shipments ranking among the **top 10 worldwide**

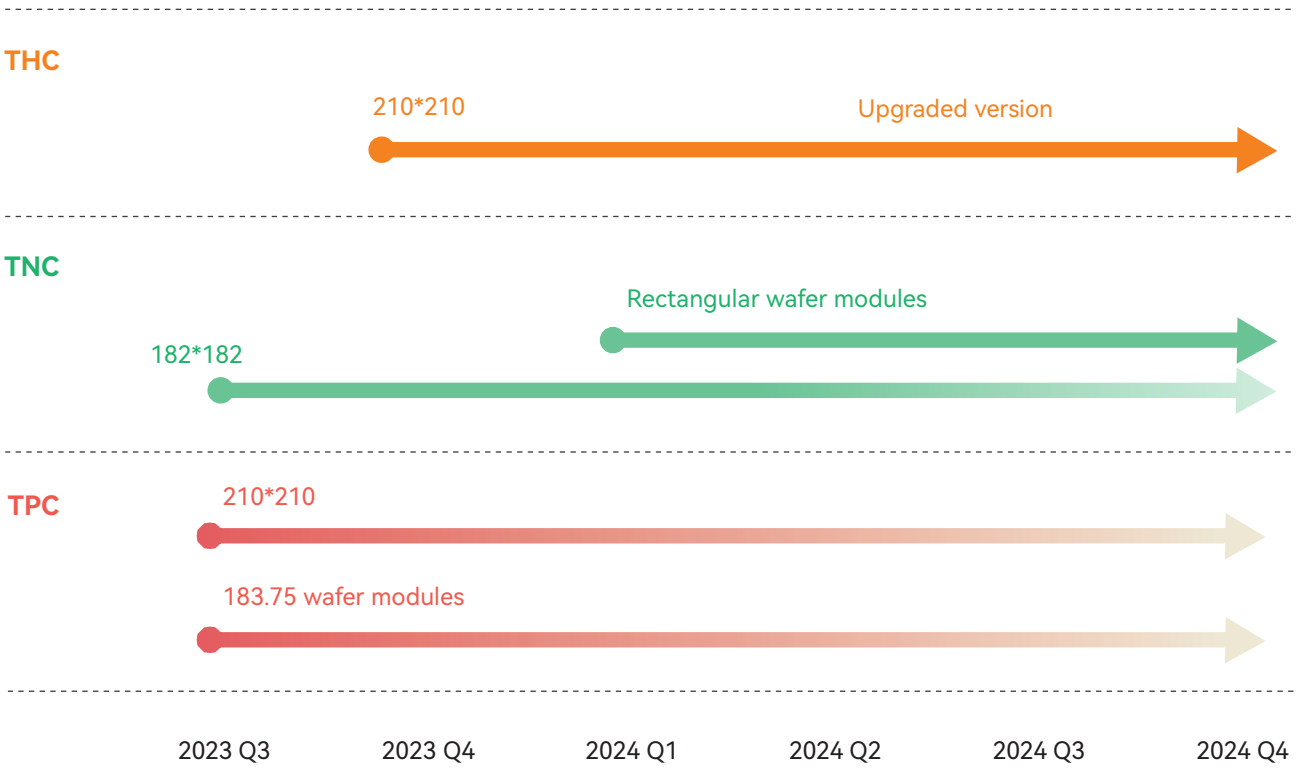
40+

With excellent performance of cells&modules and comprehensive high-quality services, Tongwei's products reach **more than 40 countries and regions around the world**

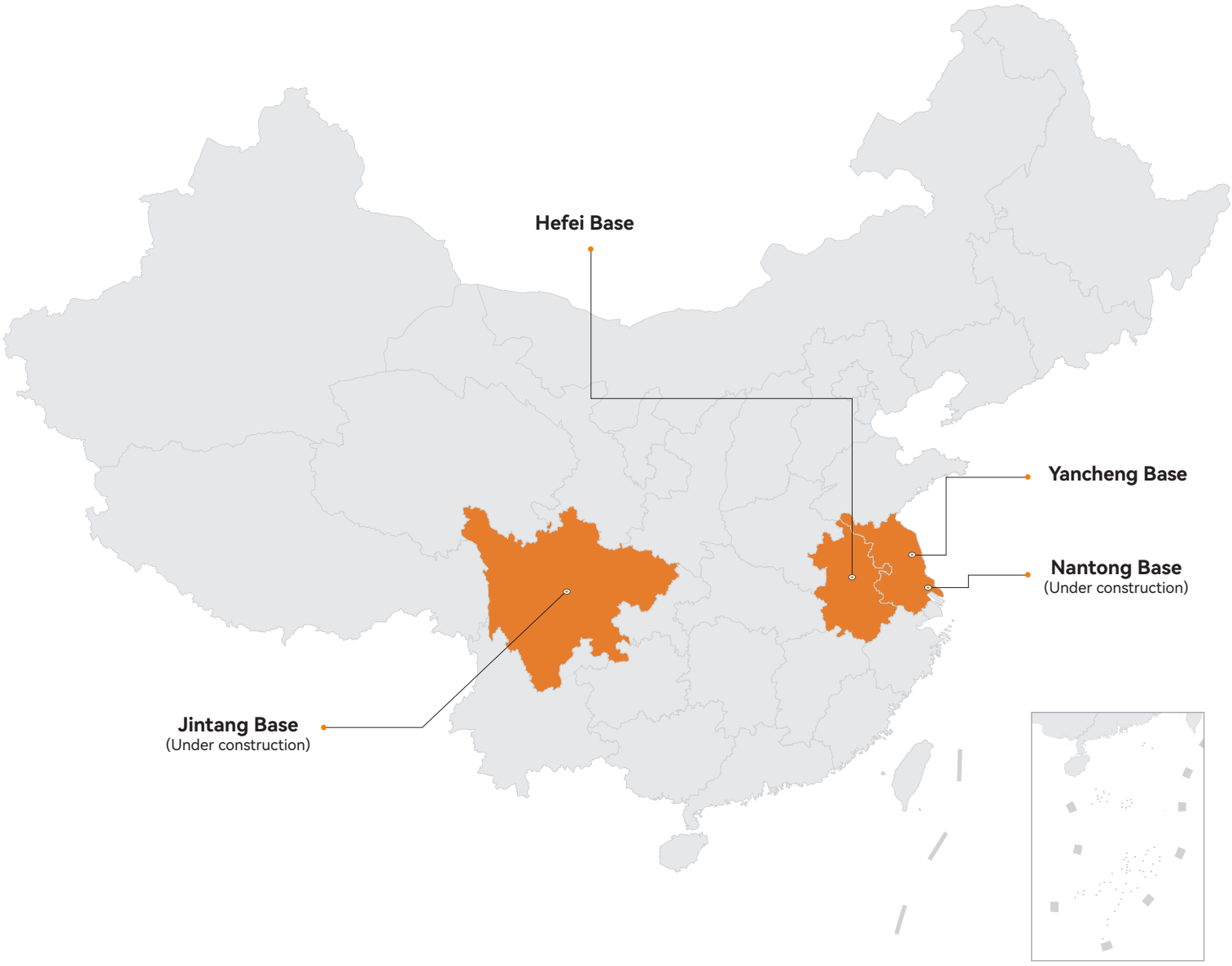
Product Roadmap

Now: During 2023, Tongwei will focus on both TNC (TOPCon) and TPC (PERC) products. In 2024, Tongwei will still focus on TNC product while gradually reducing TPC production and increasing THC (HJT) production according to the market.

Future: TNC (TOPCon) series products will be gradually upgraded to rectangular wafer modules in Q1 2024. At the same time, THC (HJT)products are expected to be launched in Q4 2023 and upgraded in Q2 2024.



Module Production Capacity



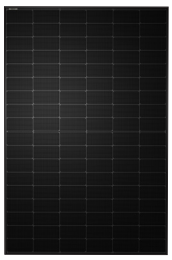
Production capacity of modules is 55GW

The Jintang and Nantong bases are under construction, and the total production capacity will be updated based on the actual production progress. Due to the compatibility of module production capacity, specific matching needs to be made based on cell resources and order requirements.

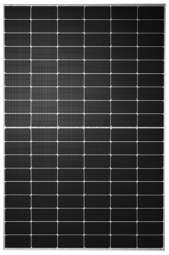
Product Introduction

Tongwei now has 11 module products, including 6 of the TPC (PERC) series and 5 of the TNC (TOPCon) series.

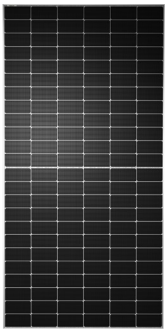
TPC (PERC) series (6 Products)



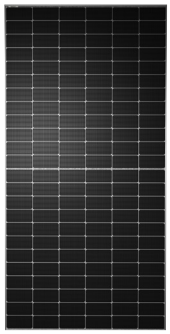
182-54 All-black



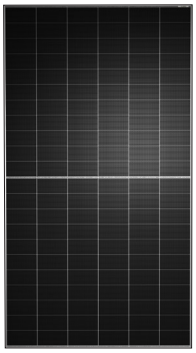
182-54 White



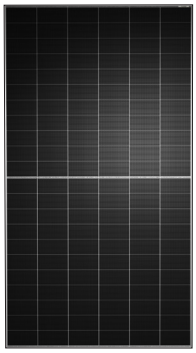
182-72 Monofacial



182-72 Bifacial

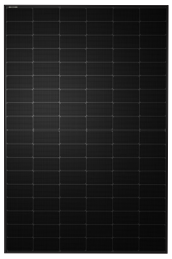


210-66 Monofacial

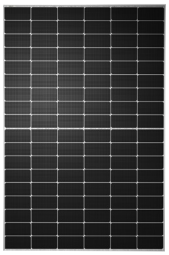


210-66 Bifacial

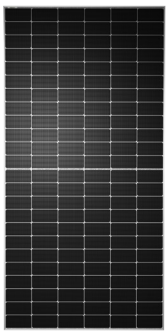
TNC (TOPCon) series (5 Products)



182-54 All-black

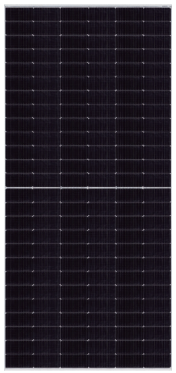


182-54 White



182-72 Monofacial

182-72 Bifacial



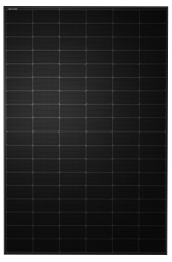
182-78 Bifacial

Core Products

Tongwei has 5 core products, including the TNC (TOPCon) series and TPC (PERC) series products, with power ranging from 425W+, 575W+, 620W+ to 665W+, which are widely used in scenarios such as residential rooftops, industrial & commercial distributed rooftops, and utility-scale power plants.

TNC (TOPCon) series

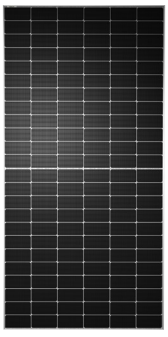
Residential



N-type Half-cell All black Monofacial Modules (182-54)

TWMND-54HB
1722*1134*30mm
415-435W

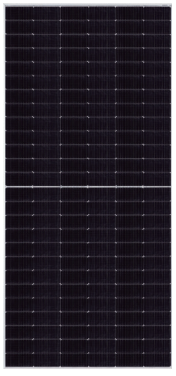
Industrial& Commercial Distributed Rooftops



N-type Half-cell Monofacial Modules (182-72)

TWMND-72HS
2278*1134*35mm
570-590W

Industrial & Commercial Distributed Rooftops



N-type Half-cell Bifacial Modules (182-78)

TWMND-78HD
2465*1134*30mm
615-635W

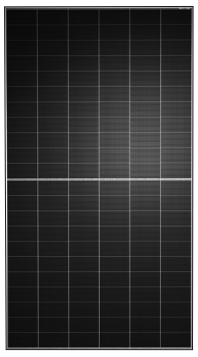
Utility-Scale Power Plants

N-type Half-cell Bifacial Modules (182-72)

TWMND-72HD
2278*1134*30mm
565-585W

TPC (PERC) series

Utility-Scale Power Palnts



P-type Half-cell Bifacial Modules (210-66)

TWMPF-66HD
2384*1303*35mm
655-675W

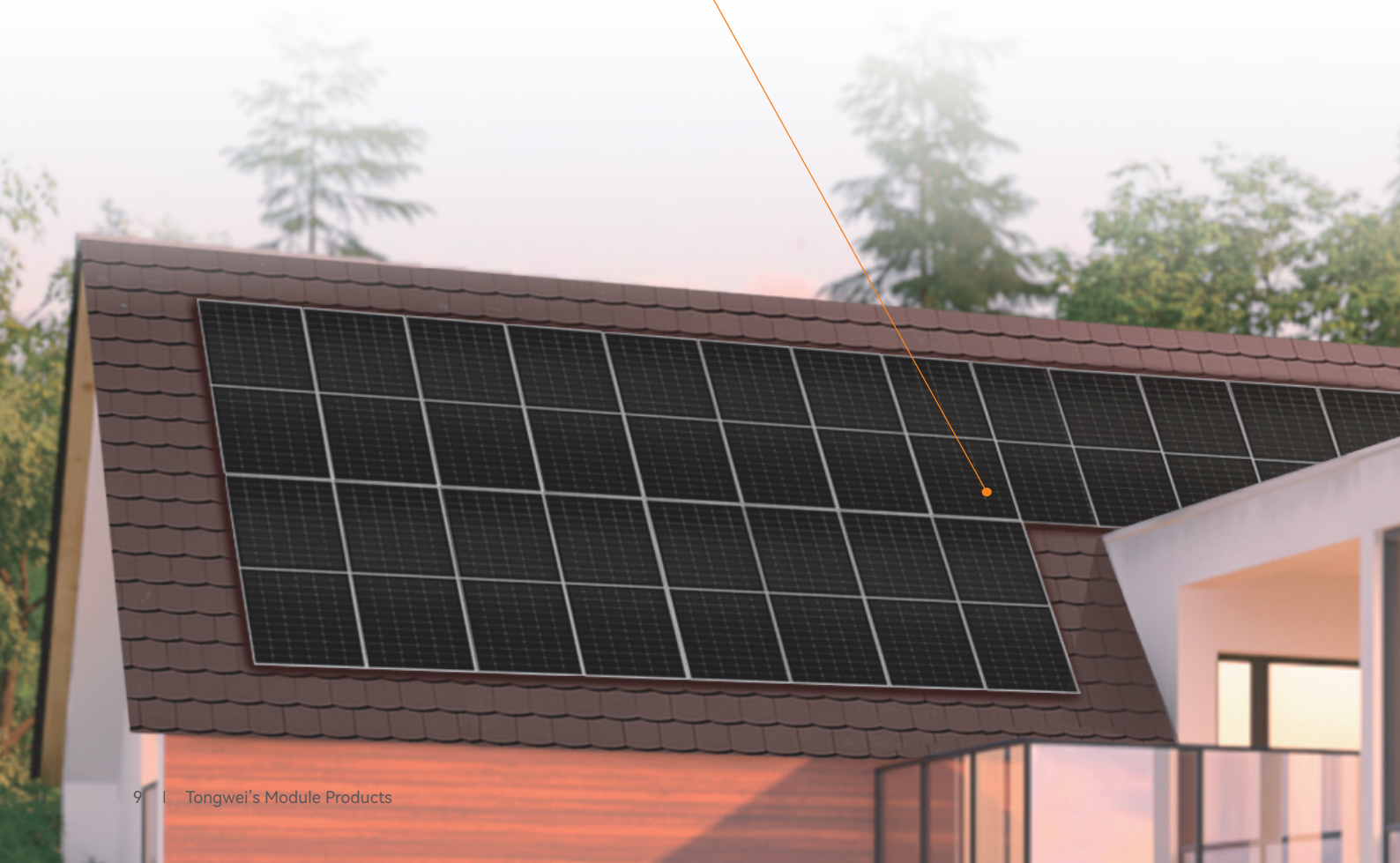
Application Value

Residential Rooftops

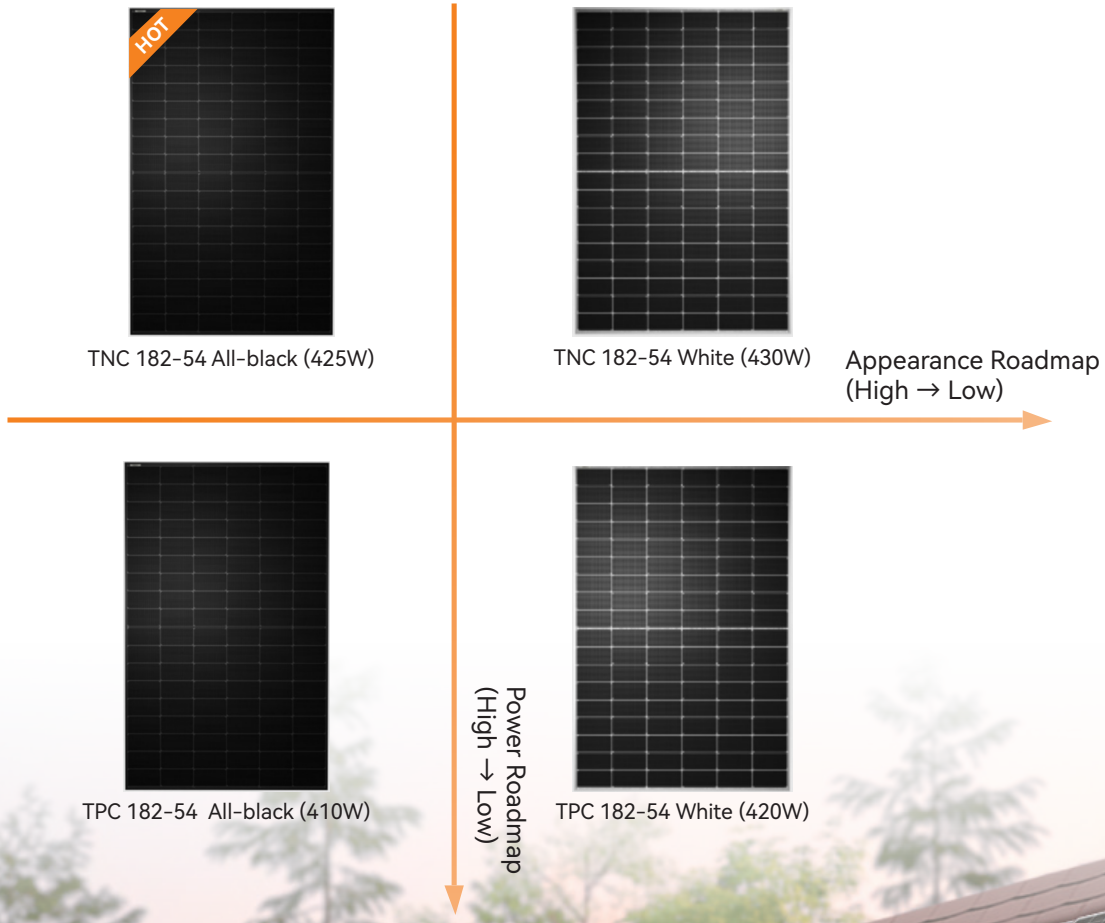
Recommendation: TNC 182-54 All-black

Market Factors: Regulation and policies, the features of application scenarios -- roof mounting, limited installed capacity, and high requirements for aesthetic appearance;
Market Demand Features: Small size, aesthetic appearance, and higher power.

The perfect integration of PV modules and buildings brings aesthetic pleasure.



Considering the market demand, the TNC 182-54 All-black products are highly recommended, and other products are optional according to the needs and preferences of customers.



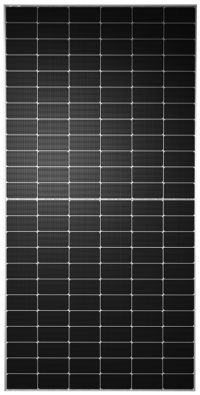
Commercial & Industrial Distributed

Recommendation:
C&I rooftops covered by color steel tiles: TNC 182-72 Monofacial
Cemented C&I rooftops: TNC 182-78 Bifacial

Market Factors: ① There are strict requirements for the size and power of modules applied on commercial and industrial rooftops, and such modules are normally vertically installed;
② Rooftop type: Color steel tile type and cemented type;

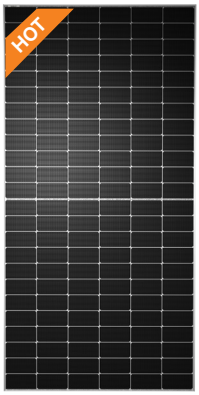
Market Demand Features: lightweight (color steel tiles), long-narrow proportion, and high power

TPC 182-72 Monofacial



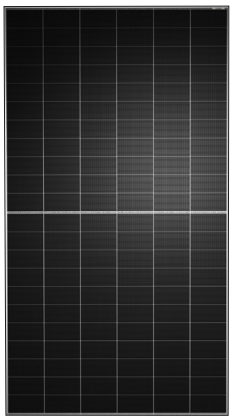
2278*1134mm (27.8KG)
560W

TNC 182-72 Monofacial



2278*1134mm (27.8KG)
580W

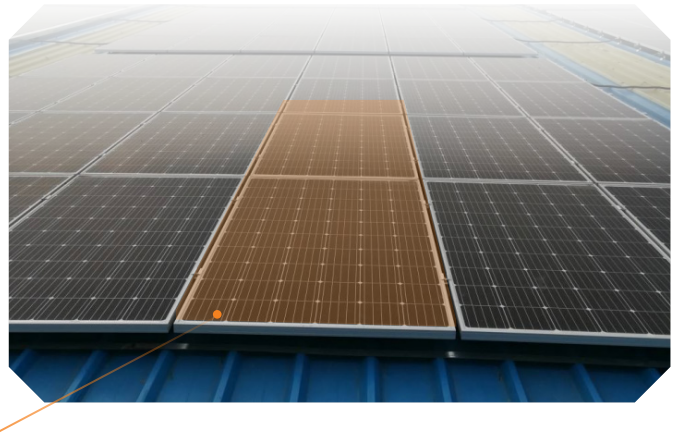
TPC 210-66 Monofacial



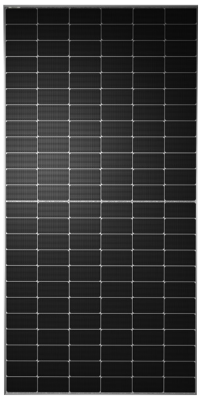
2384*1303mm (34.2KG)
670W

Product Type	Installation Size	Power	Weight
TPC 182-72 Monofacial	Great		Great
TNC 182-72 Monofacial	**Great**	**Good**	**Great**
TPC 210-66 Monofacial		Great	

C&I rooftops covered by color steel tiles: Such rooftops have low load-bearing capacity, and the modules on them need to be installed flat, so the back side of bifacial modules cannot be exposed to the sun to achieve optimal performance on them. This makes the lighter single-glass modules an ideal choice. Due to the limitation of module size on such rooftops, the market prefers modules with long-narrow proportion and high power output. All being considered, the TNC 182-72 monofacial modules are highly recommended.

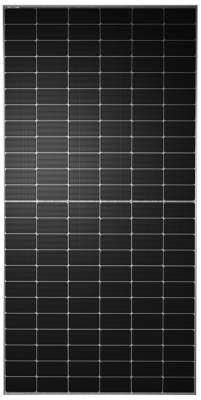


TPC 182-72 Bifacial



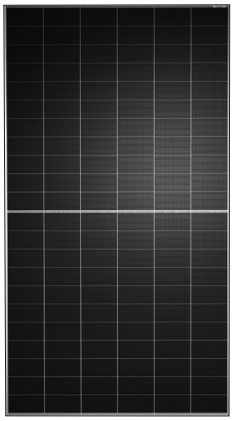
2278*1134mm
555W

TNC 182-72 Bifacial



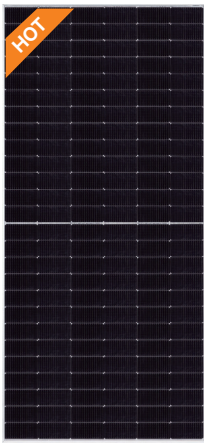
2278*1134mm
575W

TPC 210-66 Bifacial



2384*1303mm
665W

TNC 182-78 Bifacial



2465*1134mm
625W

Product Type	Installation Size	Power
TPC 182-72 Bifacial	Great	
TNC 182-72 Bifacial	Great	
TPC 210-66 Bifacial		Great
TNC 182-78 Bifacial	**Great**	**Good**

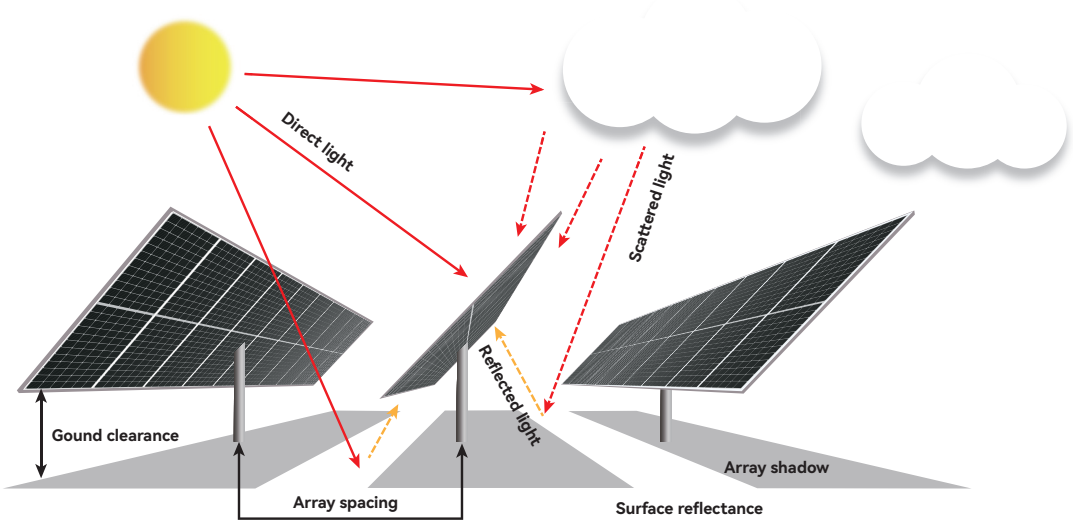
Cemented industrial and commercial rooftops: Such rooftops have high load-bearing capacity, and the modules on them need to be installed on fixed tilt racking, so the back side of bifacial modules can be exposed to the sun to achieve optimal performance. Due to the limitation of module size on such rooftops, the market prefers modules with long-narrow proportion and high power output. All being considered, the TNC 182-78 bifacial modules are highly recommended.

Utility-Scale Power Plants

Recommendation: TNC 182-72 Bifacial and TPC 210-66 Bifacial

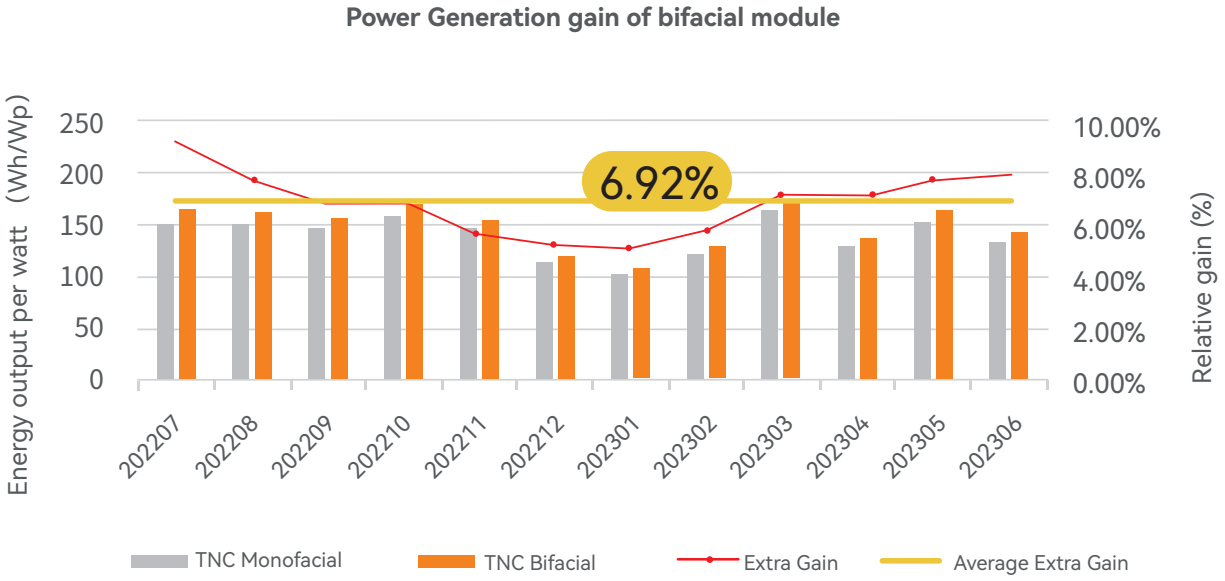
Market Demand Features: Low LCOE and high systematic yield;

Able to generate electricity on both sides, the bifacial modules offer prominent system advantages and are therefore more suitable to be applied in this scenario.



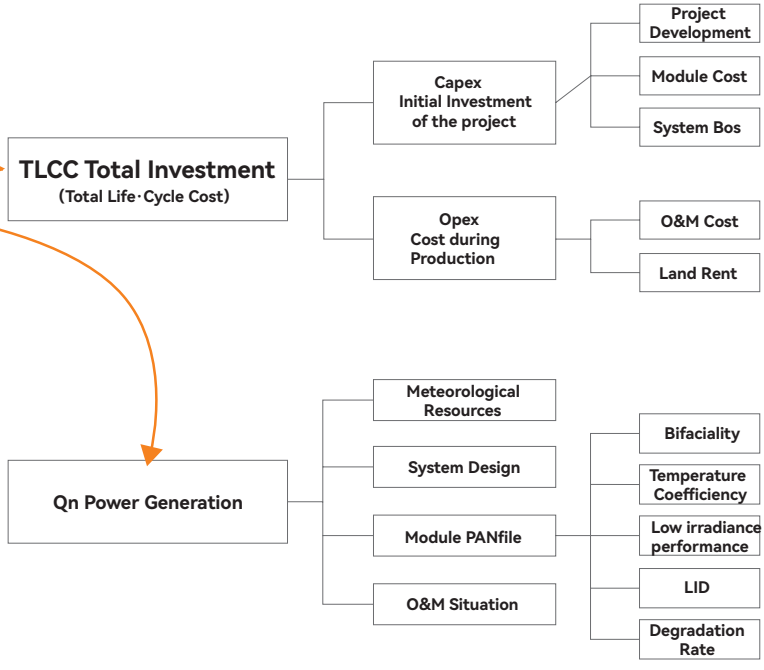
The Schematic for the Power Generation of Bifacial Modules

Project introduction
Location: Haixi Mongol and Tibetan Autonomous Prefecture, Qinghai Province (Temperate Continental Climate)
System type: Fixed racks
Bracket spacing: 11m
Land surface type: Sandy soil
Module type and quantity: TNC 182-72 Bifacial 570W*8, TNC 182-72 Monofacial 575W*8



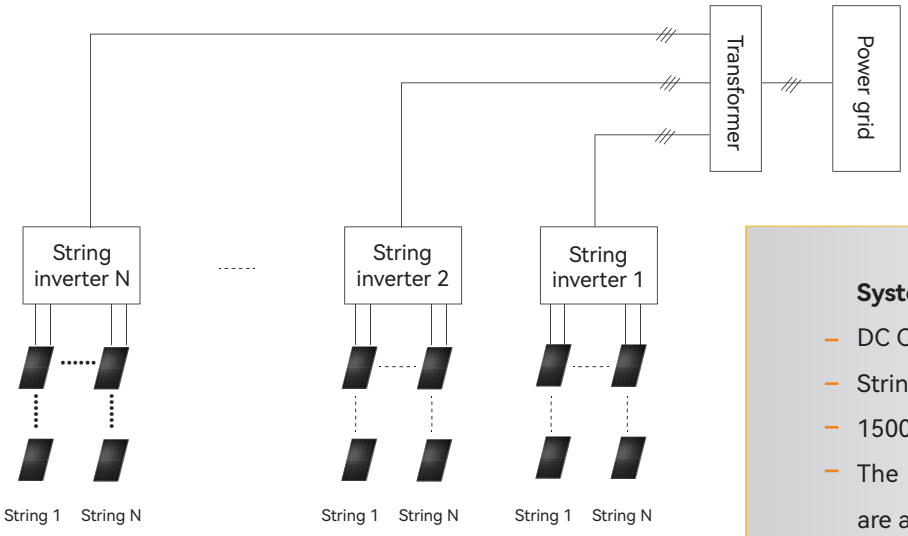
LCOE (Levelized Cost of Energy) is a critical indicator for measuring the economic efficiency of PV systems.

$$LCOE = \frac{TLCC}{\sum_{n=1}^{N}\left[\frac{Q_n}{(1+d)^n}\right]}$$



System Measurement and Analysis

System design



System Design Conditions

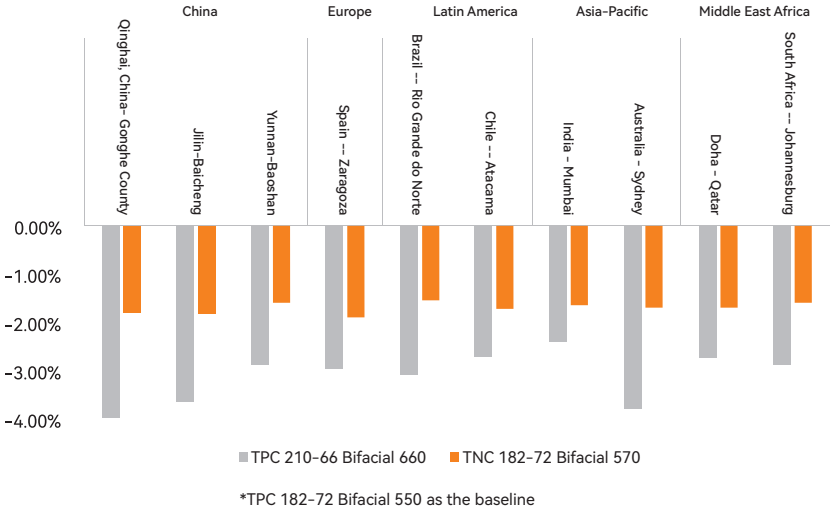
- DC Capacity of 100MW
- String Inverter matrix
- 1500V system installed with fixed racks
- The BOS margins for overseas projects are all measured in domestic conditions

Typical project sites selected from the top regions of this year's market installed forecast, covering various climate types, as follows:

BOS Analysis

TPC 210-66 Bifacial < TNC 182-72 Bifacial < TPC 182-72 Bifacial

Thanks to the advantage of module layout, TPC 210-66 Bifacial Modules have higher power and lower open circuit voltage and need less PV cable and bracket rails; TNC 182-72 Bifacial Modules enjoy the advantage of high efficiency.

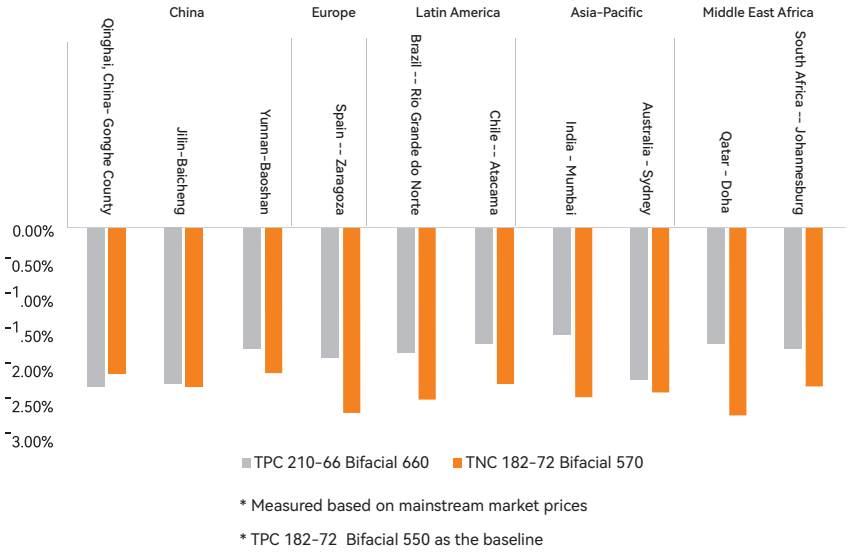


BOS Analysis

LCOE Analysis

TNC 182-72 Bifacial and TPC 210-66 Bifacial products have better LCOE performance

Benefit by the excellent layout of the bifacial module, TPC 210-66 Bifacial Modules have better BOS performance; TNC 182-72 Bifacial Modules have the merits of higher efficiency, lower temperature coefficient and lower power degradation.

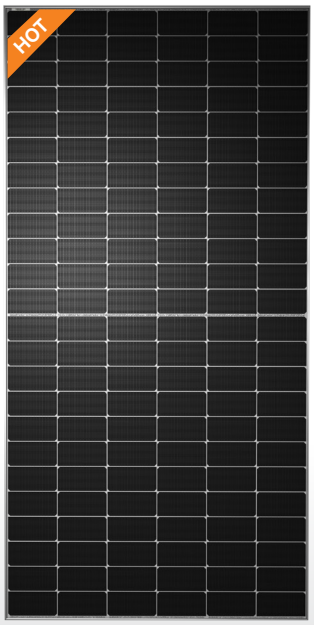


LCOE Analysis

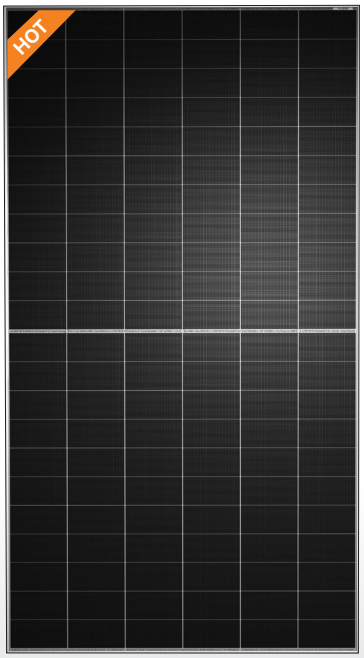
Utility-Scale power plants

Recommendation: TNC 182-72 Bifacial and TPC 210-66 Bifacial

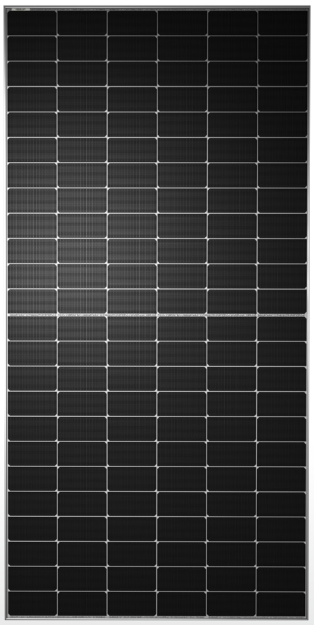
TPC 210-66 Bifacial Modules and TNC 182-72 Bifacial Modules have basically the same LCOE performance. TNC 182-72 Bifacial Modules have better LCOE performance in high-temperature areas thanks to their low-temperature coefficient, high bifaciality, lower light-induced degradation, etc. Therefore, for Utility-Scale power plants, these two products are recommended as the best choices, with other options also available to meet customers' needs.



TNC 182-72
Bifacial



TPC 210-66
Bifacial

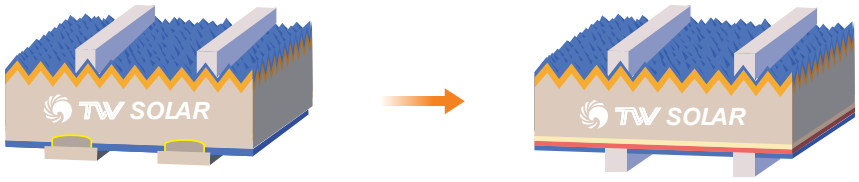


TPC 182-72
Bifacial

Product Advantages > Technical Advantages

High-Efficiency Cell Technology

Based on traditional TPC cell technology, Tongwei has developed a new and efficient N-type TNC cell technology. The TNC cell adopts a self-developed and industry-leading PECVD multi-crystalline silicon layer stacking technology route. This technology increases the average efficiency of cell about 1% compared to TPC cell.

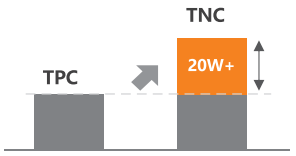


TPC Cell Structure Schematic

TNC Cell Structure Schematic

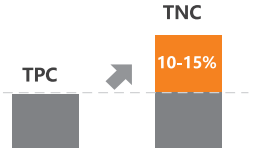
Comparison of performance advantages between TNC modules and TPC modules

Higher power output



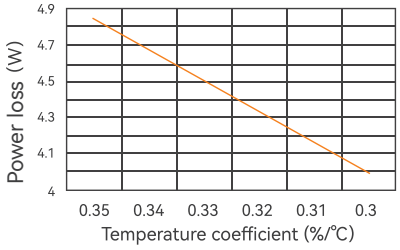
For the 182-72 bifacial type, TNC modules' power output is 20W+ higher than that of TPC modules

Higher bifaciality

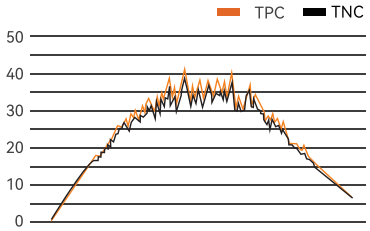


For the 182-72 bifacial type, TNC modules' bifaciality is 10%-15% higher than that of TPC modules

Better temperature coefficient



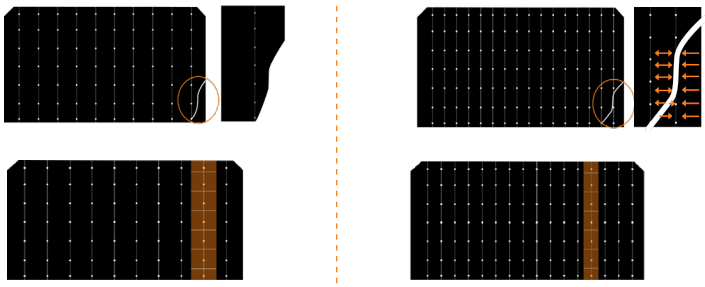
Real-time operating temperature of TNC and TPC modules



The temperature coefficient of TPC modules is -0.33%/℃ , while that of TNC modules has been optimized to -0.30%/℃ , ensuring a better power output in high-temperature environments.

Multi-busbar (MBB) and Super Multi-busbar (SMBB) Design

The thinner fingers are introduce to reduce the current conduct distance and make cell bear uniform force. This technology effectively reduce the series resistance and the micro-crack loss of cells.



Multi-busbar (MBB)

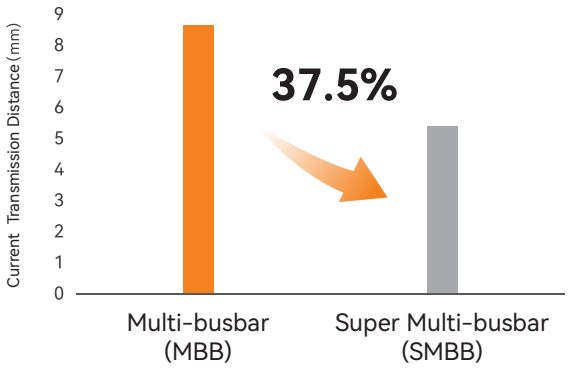
Super Multi-busbar (SMBB)

P

Lower power loss due to hidden cracks

I

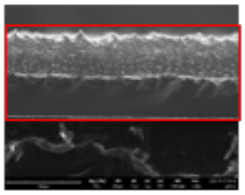
Shorten the distance of current transmission



Significantly Reduced Current Transmission Distance

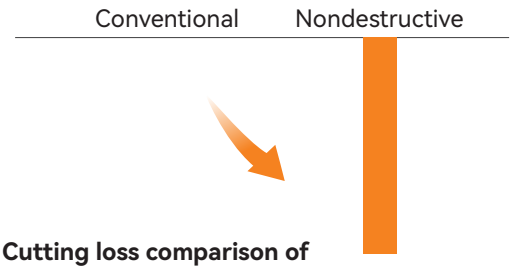
Nondestructive Cutting Technology

- The technology reduce laser cutting depth on the cell surface, inducing thermal stress to fracture the cell, resulting in a smooth and uniform cutting surface, reducing the risk of microcracks by over 50%, enhancing product reliability.
- The efficiency loss of high-efficiency cells is decreased by more than 0.15%, effectively improving the CTM of module encapsulation and product efficiency.



Cross-section by conventional cutting

Cross-section by nondestructive cutting



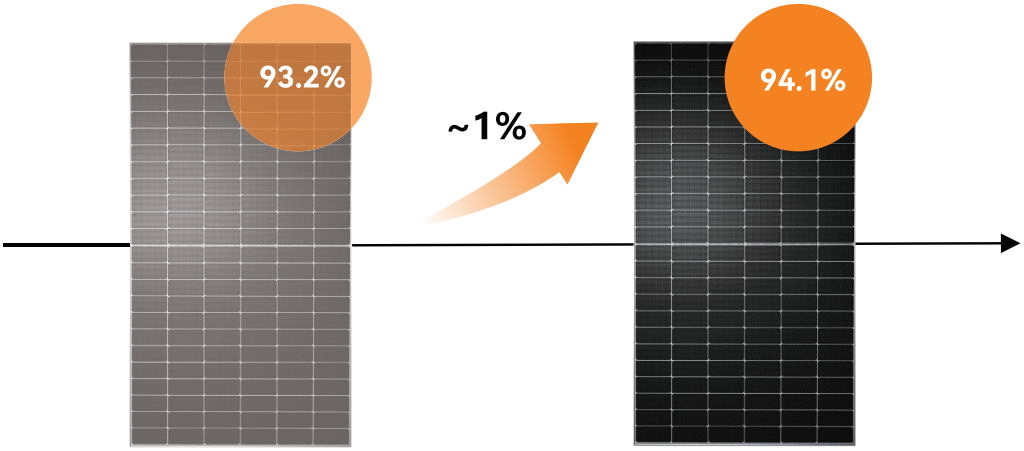
Cutting loss comparison of high-efficiency cell

High-density Packaging Technology

The 182 rectangular wafer modules and 210 wafer modules adopt small-pitch packaging technology, which can increase the effective power generation area and improve the efficiency of the modules under the same area, ensuring the perfect balance between efficiency and reliability.

Conventional module　　High-density module

High-density packaging technology increases the effective power generation area (take 182-72 type as an example)

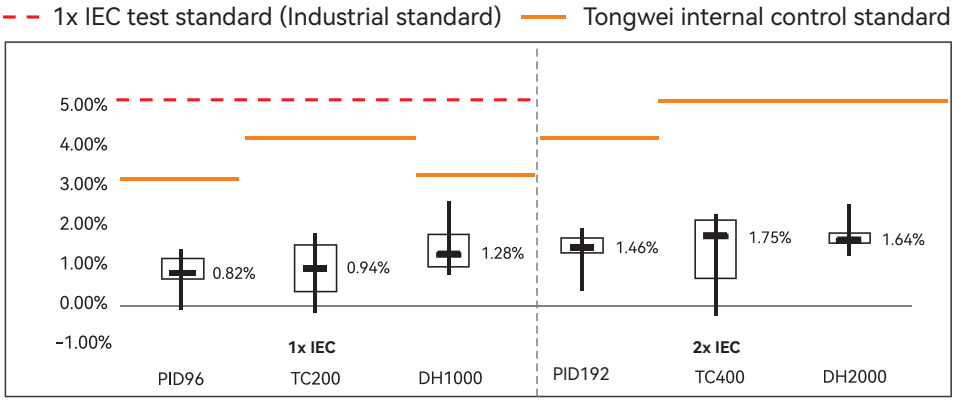


Conventional packaging technology　　High-density packaging technology

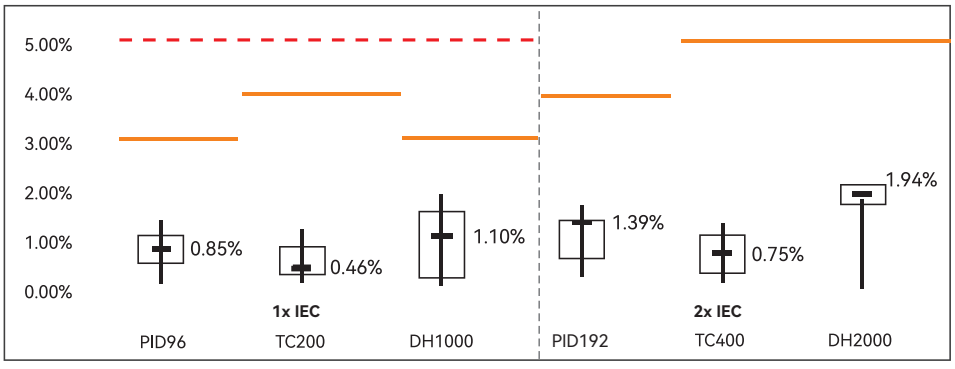
Product Advantages > Product Reliability

Double IEC Standard Test

Tongwei's half-cell modules have passed the double times IEC standard test, proving their excellent reliability performance.



TPC Monofacial & Bifacial Modules



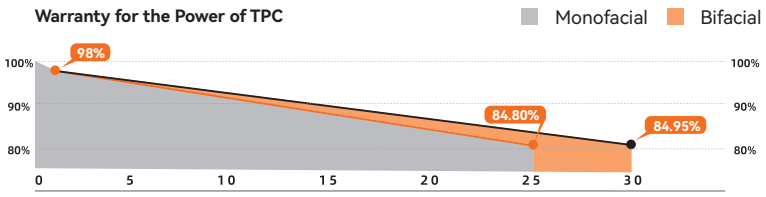
TNC Monofacial & Bifacial Modules

International Certification

Tongwei's half-cell modules have obtained IEC61215/IEC61730 basic certification from TUV agency. Additionally, the modules have obtained access certifications in multiple countries and regions worldwide, such as CQC, Japan JPEA, Brazil INMETRO, and Italy fire resistance. Furthermore, it also has successfully passed other individual test such as PID, salt mist, ammonia, and sand. The acquisition of these international authoritative certifications validates the outstanding product reliability of Tongwei's modules.

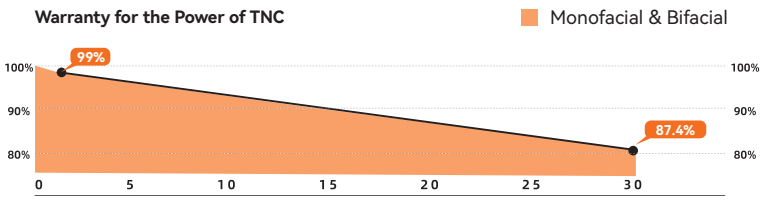
Warranty for Product Materials and Technique: 15 years for Tongwei's TPC and TNC series 182-54 products, and 12 years for other types of modules.

Warranty for Linear Power Output: 25 years for TPC series monofacial modules, and 30 years for TPC series bifacial modules and TNC series modules.



Degradation in the first year: 2%, 2nd-25th years: 0.55% (monofacial), 2nd-30th years: 0.45% (bifacial)

- The 1st year degradation of monofacial and bifacial modules is ≤ 2%
- The annual degradation of monofaical modules is ≤ 0.55%
- The annual degradation of bifacial modules is ≤ 0.45%

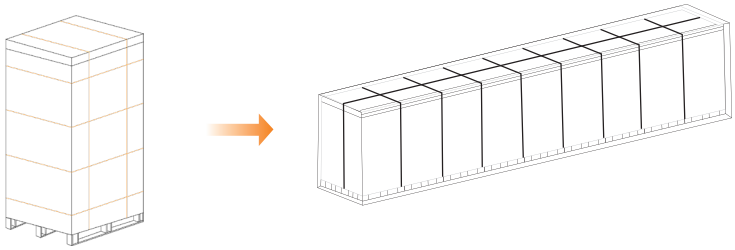


Degradation in the first year: 1%, degradation in the 2nd-30th years: 0.4%

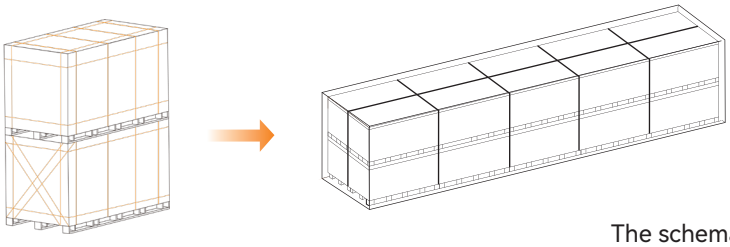
- The 1st year degradation is ≤ 1%
- The annual degradation is ≤ 0.4%

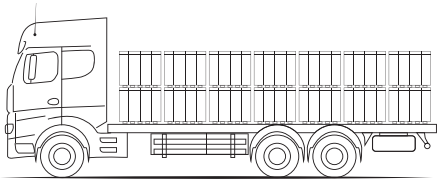
Transportation

Vertical portrait package
(long-side vertically palced)



Vertical landscape package
(short-side vertically placed)





The schematics of the package transportation are all above

Module Type	Module Size	Packaging Style	Package Quantity PCS/Pallet	40HQ PCS/vehicle	17.5M Flat PCS/vehicle	13M Flat PCS/vehicle
182-54 Monofacial	1722*1134*30	Landscape	36	936	1296	1008
182-72 Monofacial	2278*1134*35	Landscape	31	620	930	682
182-72 Bifacial	2278*1134*30	Landscape	36	720	864	792
182-78 Bifacial	2465*1134*30	Landscape	36	576	792	720
210-66 Monofacial	2384*1303*35	Landscape	31	248	744	558
		Portrait	31	558	806	558
210-66 Bifacial	2384*1303*35	Landscape	31	248	744	558
		Portrait	31	558	744	558

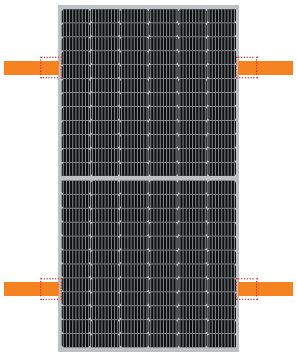
System Compatibility

Racks

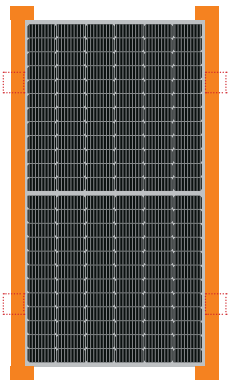
Tongwei's modules consist with the industry's mainstream in terms of size and provide multiple installation options, compatible with various types of racks.

- **Standard Mounting Method by Tongwei**

Long side mounting
(Screw/Clamp)

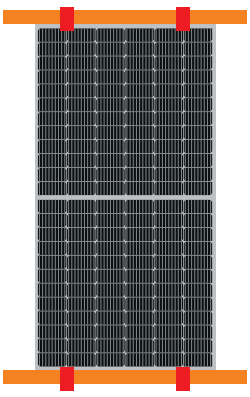


(+5400/-2400Pa)

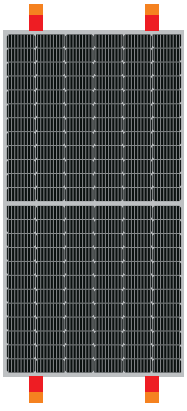


(+3600/-2400Pa)

Short side mounting
(Clamp)



(See the installation manuals of Tongwei's modules for details)



(See the installation manuals of Tongwei's modules for details)

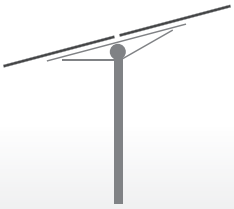
System Compatibility

Racks

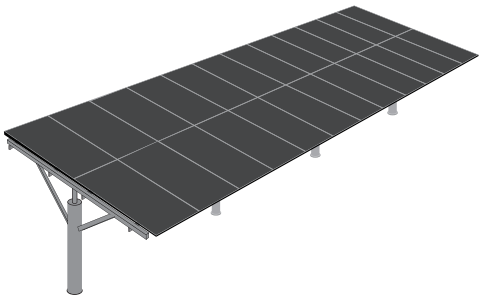
- **Mainstream racks work for Tongwei's modules.**

Fixed rack

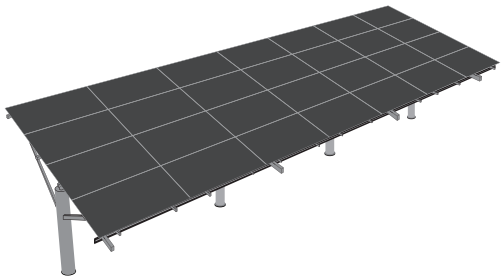
1P Tracker



2P Tracker



Vertical Mounting



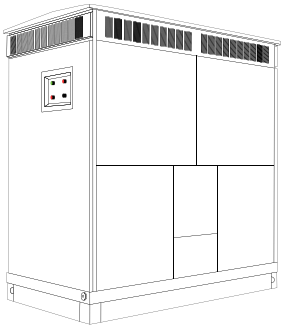
Horizontal Mounting

nextracker ARRAY TECHNOLOGIES Soltec PVH ARCTECH 中信博

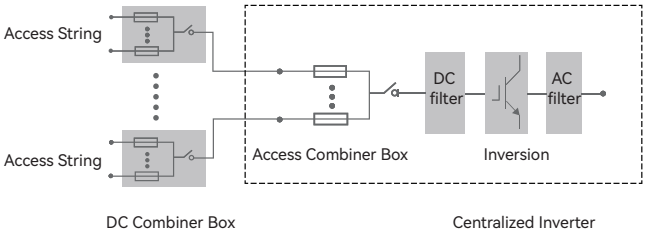
Inverter

- **Centralized Inverter**

Tongwei's half-cell modules can perfectly match centralized inverters by selecting the correct combiner box.



Centralized Inverter



Schematic Diagram Of Centralized Inverter System

- **String Inverter**

Tongwei's modules can match the string inverters made by mainstream manufacturers in the market.

Application Scenarios	Short-circuit current of modules	Single string current of inverters	Matching mainstream inverter brands
Residential Distributed	~14A	≥ 15A	HUAWEI, SUNGROW, 锦浪科技, GOODWE, 上能电气, GROWATT
Utility-Scale power plants and Commercial &Industrial	182：~14A	≥ 15A	
	210：~18A	≥ 20A	HUAWEI, SUNGROW, 锦浪科技, 上能电气, GOODWE

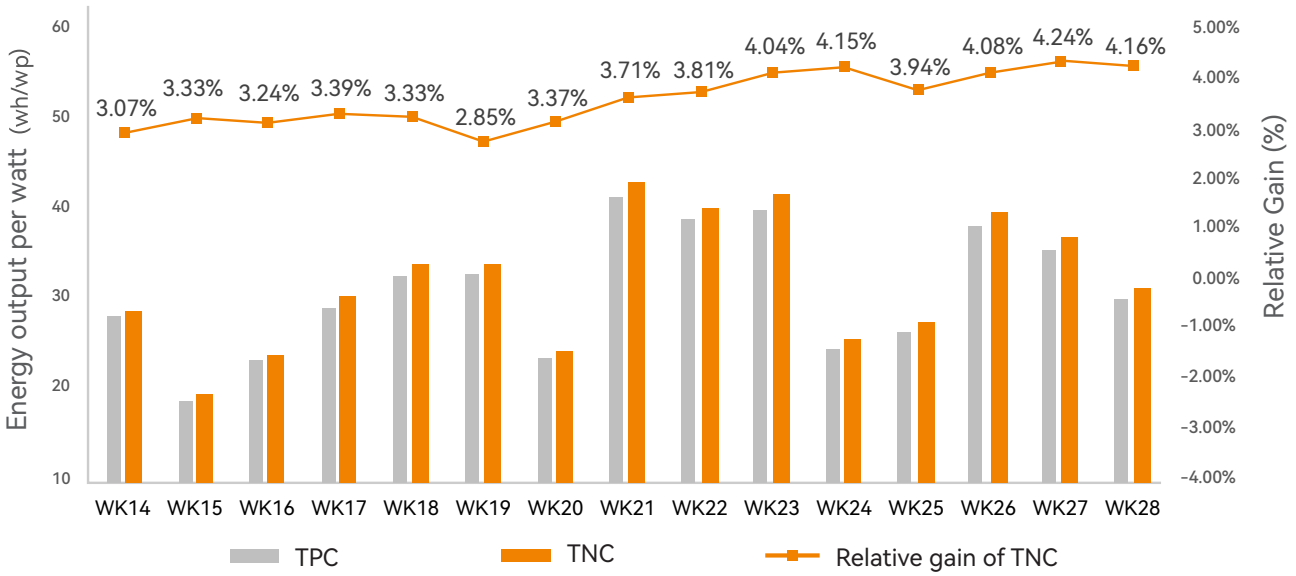
Energy Yield Performance

Due to its low degradation and low temperature coefficient, the energy yield of TNC highefficiency module is 3% higher than that of TPC module in per watt.

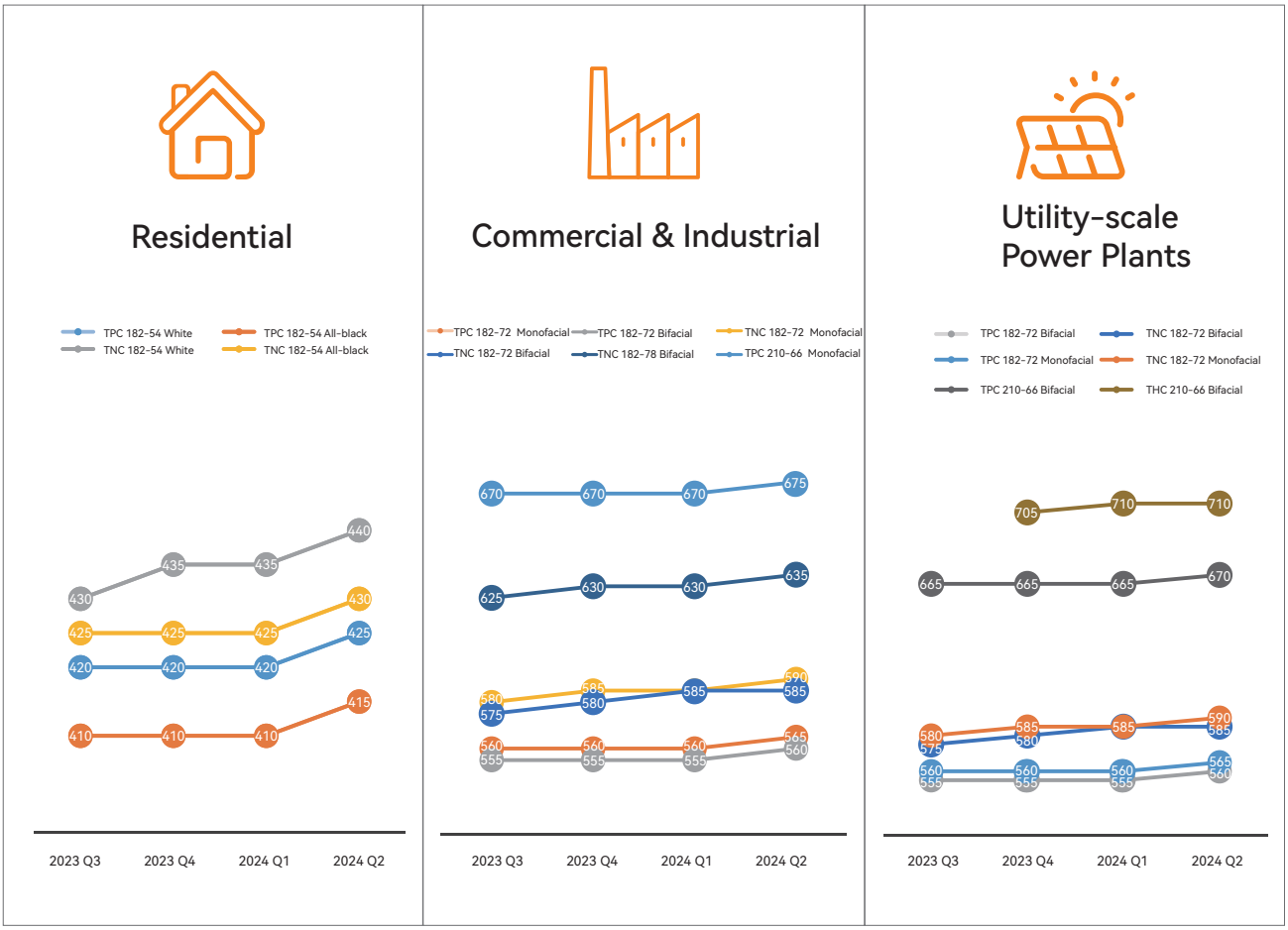
Project Introduction

Location:	Sanya, Hainan (Tropical Monsoon Oceanic Climate)
System type:	Horizontal single-axis
Land surface type:	Sand
Module type and quantity:	TPC 182-72 Bifacial * 8, TNC 182-72 Bifacial* 8

Comparison of Field Test Performance between TNC and TPC Modules



Power Roadmap

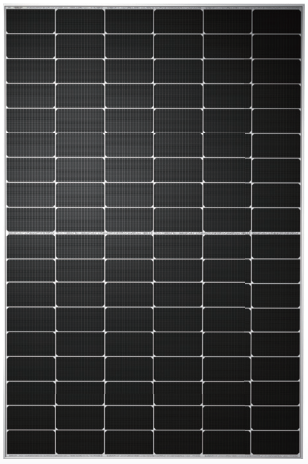


Other Products

To meet the diversified needs of customers, Tongwei also provides other six products.

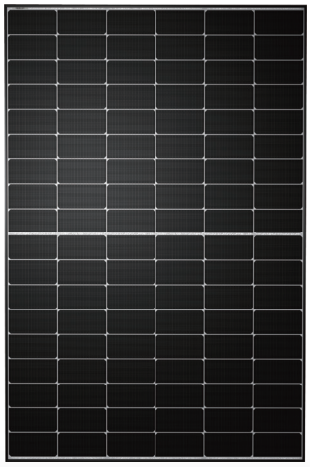
TNC (TOPCon) Series Products

N-type half-cell monofacial modules (182-54)



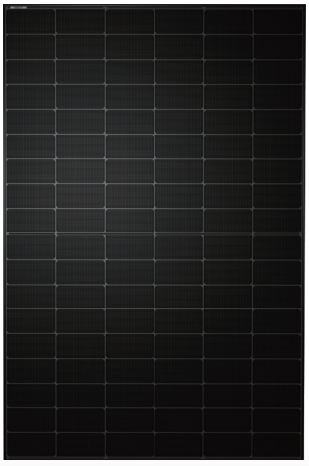
TWMND-54HS
1722*1134*30mm
420-440W

P-type half-cell monofacial modules (182-54)



TWMPD-54HS
1722*1134*30mm
405-425W

P-type half-cell all black monofacial modules(182-54)



TWMPD-54HB
1722*1134*30mm
395-415W

TPC (PERC) Series Products

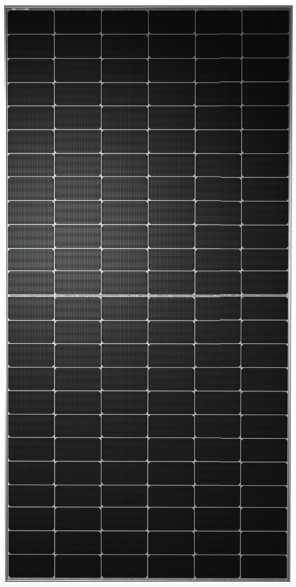
P-type half-cell monofacial modules (182-72)

TWMPD-72HS

2278*1134*35mm

545-565W

P-type half-cell bifacial modules (182-72)

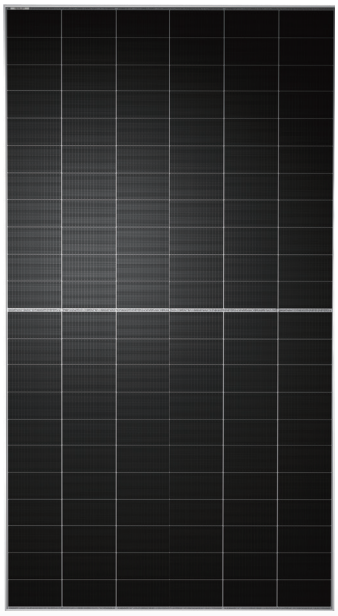


TWMPD-72HD

2278*1134*30mm

540-560W

P-type half-cell monofacial modules (210-66)



TWMPF-66HS

2384*1303*35mm

660-680W

Next Generation

Tongwei continues to pursue product leadership, in the nearly future we wil launch more competitive products as TNC (TOPCon) rectangular wafer module and THC (HJT) series products in the next generation.

TNC (TOPCon) Rectangular Wafer Series Products

TNC Rectangular Wafer Modules
(Large size)
2382*1134*30/35mm
590~615W

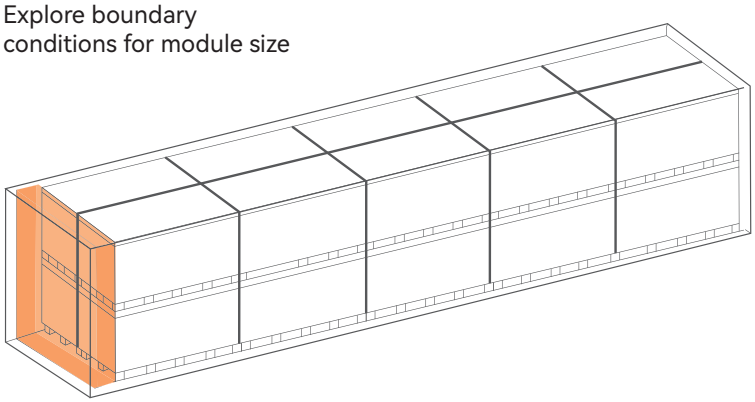
THC (HJT) Series Products

TWMHF-66HD
2384*1303*35mm
695-725W

Next Generation > Advantage

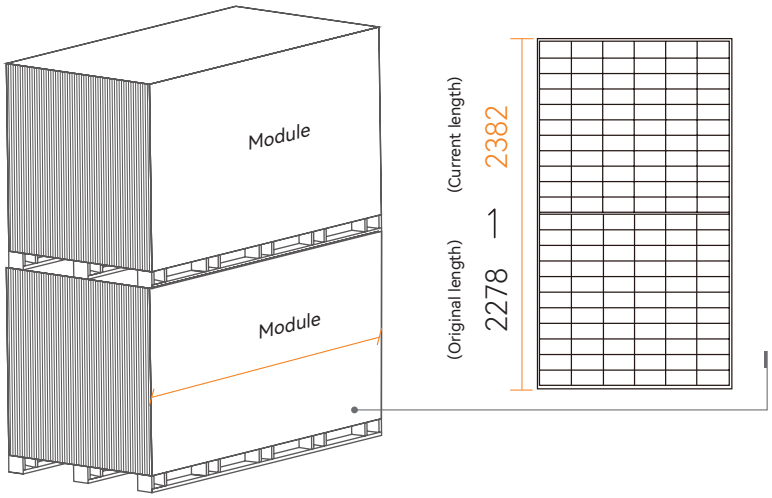
Designed towards optimization based on the traditional 182-72 products, rectangular wafer modules are equipped with Tongwei's high-efficiency TNC technology and excellent design, thus bringing bigger product value and better customer value.

Explore boundary conditions for module size

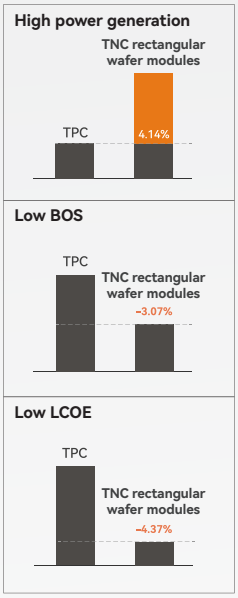


Container Packing Schematic

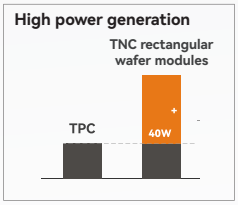
Optimize the Module Design



Higher value for customers



Higher Product Competitiveness

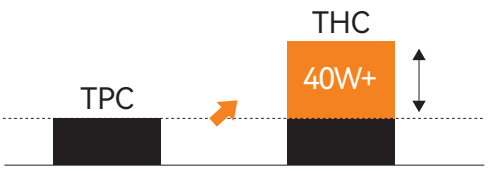


*TPC 182- 72 (550W) Modules

Next Generation > Advantage

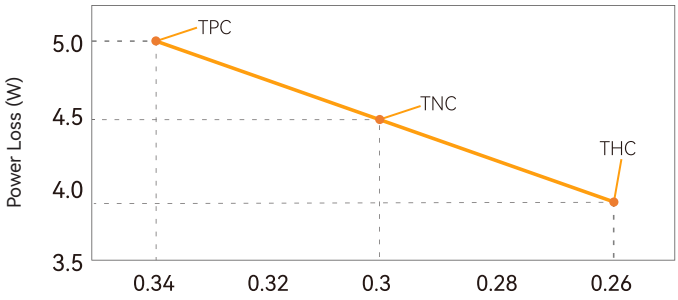
THC series products adopt industry-leading THC cell technology, which has higher power output, excellent temperature coefficient, higher bifaciality and lower power degradation.

01 Higher Power Output



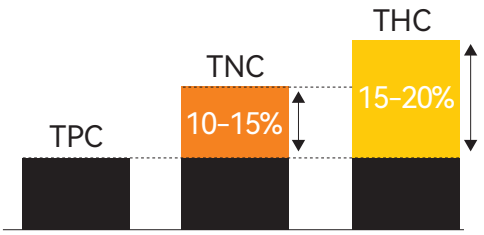
For the 210-66 bifacial modules, the power of THC modules is 40W+ higher than that of TPC modules.

02 Excellent Power Temperature Coefficient



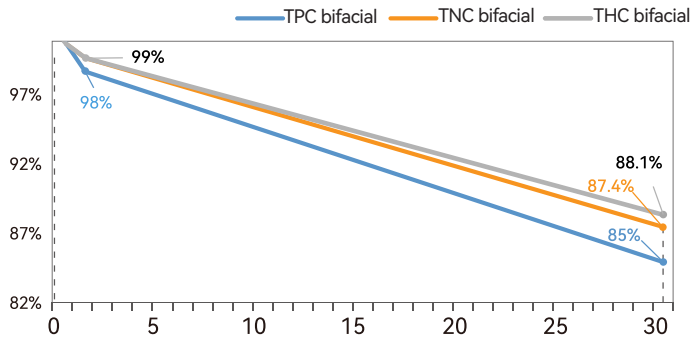
Regarding temperature coefficient, TPC modules is -0.33%/° C, TNC modules is -0.3%, and THC module is as low as -0.26%/° C, which bring superior high temperature energy yield performance.

03 Higher Bifaciality



In terms of bifaciality, compared to TPC modules, TNC modules are 10-15% higher, and THC are 15-20% higher.

04 Lower Power Degradation



In contrast with TPC and TNC modules, THC modules have a lower power degradation with 1% degradation in the first year and no more than 0.375% annual degradation in following years , thus it will allow no less than 88% of rated power after 30 years.

Application Cases

Utility Scale Project Case I (PV + Desertification Control)

Project Name	200,000KW PV Desertification Control Project of HangTai New Energy Development Co., Ltd. in Liangzhou District, Wuwei
Project Location	Wuwei, Gansu Province
Installed Capacity	100MW
Model Number	TWMPD-72HD545/550
Project Profile	200,000KW PV Desertification Control Project of HangTai New Energy Development Co., Ltd. in Liangzhou District, Wuwei: Located in the PV Desertification Control Demonstration Park in Jiuduntan, Liangzhou District, Wuwei, Gansu Province at the edge of the Tengri Desert, The continuous array of photovoltaic power generation matrix extends all the way covering the vast desert with lavers of blue "armor".

Application Cases

Utility Scale Project Case II (PV & Fishery)

Project Name	Shandong Dongying Kenli (China Resources) Solar Farm 800MW PV Power Generation Project
Project Location	Dongying, Shandong Province
Installed Capacity	400MW
Model Number	TWMPD-72HD540/545/550
Project Profile	Located in the Hongguang Fishery Demonstration Zone in Kenli District, Dongying, Shandong Province, the Shandong Dongying Kenli (China Resources) Solar Farm 800MW PV Power Generation Project is divided into eight phases and is one of the renewable energy base construction projects in Shandong Lubei Saline-alkali Tideland with a capacity of tens of millions of kilowatts of wind and solar energy storage integration during the "14th Five-Year Plan" period.

Distributed Project Case（Commercial&Industrial）

Project Name	Jinan Shizhong District Whole County Photovoltaic Project
Project Location	A capacity of 20MW distributed in 40 schools and public places of Shizhong District, Jinan, such as Quanrun Elementary School and Yuxiu Elementary School
Installed Capacity	20MW
Model Number	TWMPD-72HS550
Developer	Shandong Fanhai Energy Co., Ltd.
Project Features	This project is the pilot project of distributed PV for the green campus in Shizhong District, Jinan.

Distributed Project Case（Residential）

Project Name	Zhejiang Xinsheng Hainan Lingshui Distributed Residential Project
Project Location	Lingshui County, Hainan Province
Installed Capacity	4MW
Model Number	TWMPD-72HD550
Developer	Zhenjiang Xinsheng New Energy Science & Technology Co., Ltd.
Project Features	The project is run by Xinsheng and reports handsome overall income and a fast cycle of grid connection.

ESG Honors

Fortune China ESG Influential Listing	2022 Forbes China Sustainable Industrial Enterprise
China Top 100 ESG Listed Companies	China ESG Golden Awards 2022 Best Environmental Responsibility Award (E)
ecovadis SUPPLIER SUSTAINABILITY RATINGS Silver Medal	2023 Golden Bee CSR China Honor Roll “Influential Leading Enterprise” Award
2022 China Top 10 “Carbon Neutrality” Demonstration Cases	TNC High-efficiency Cell Innovation Technology was Awarded 2022 “Zero-Carbon China” Top 10 Innovative Technologies

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