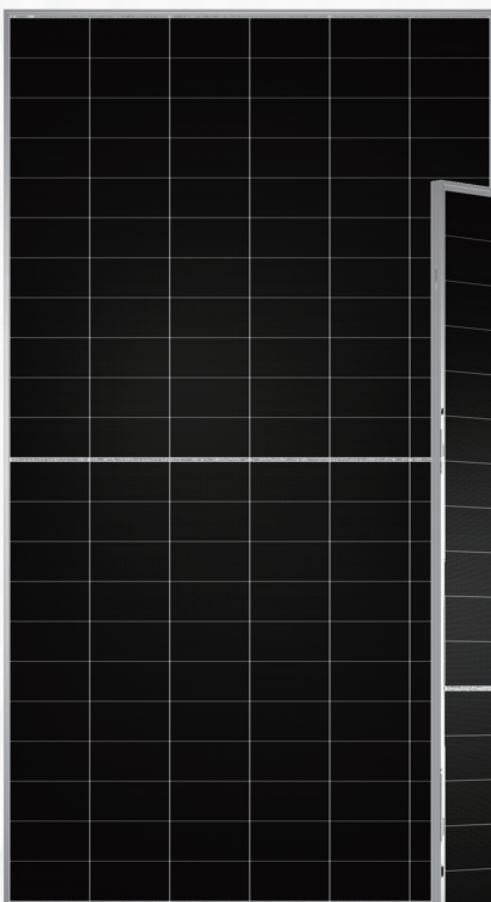


WHITE PAPER OF **TNC<sup>2.0</sup>** PRODUCT

# TNC 2.0

## — FLAGSHIP MODULES —



Superior Module Power



Ultra-high Bifaciality



Superior Reliability



Greater Economic Revenue

# 01 About Tongwei

## 1.1 Introduction

# 500

FORTUNE GLOBAL

The first, and the only Fortune Global 500 company in the photovoltaic industry



• **60000+** Employees

• **200+** Over 200 Subsidiaries

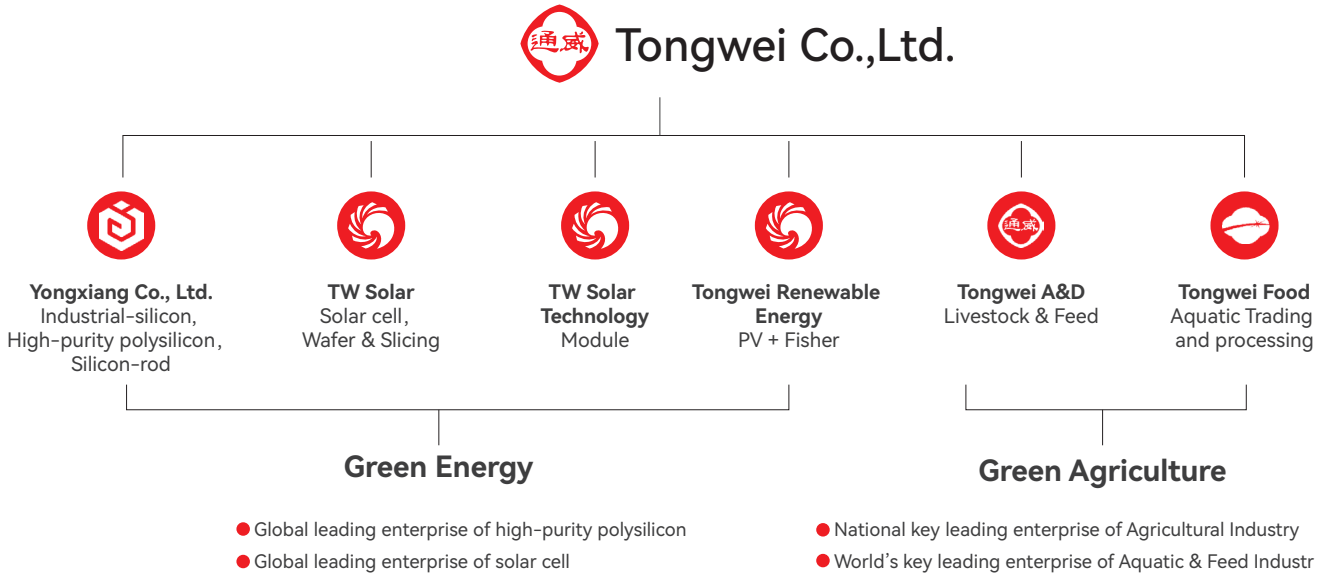
• **43** years of operating history, established in 1982

• **TOP 1** "TOP1" high-purity polysilicon, with the world's No.1 market share and shipment volume for four consecutive years.

• **TOP 1** "TOP 1" high-efficiency cell, with the world's No.1 shipment volume for eight consecutive years

• **TOP 5** "TOP 5" high-efficiency modules, with global shipment volumes ranking in the top five for two consecutive years.

## 1.2 Integrated PV Industry Chain Strategy



### High-purity Polysilicon

Polysilicon with a purity level of 99.999999999%, deployed with Yongxiang's 8th-generation patented technology. Product is now being shipped to customers worldwide.



Production capacity  
**90+tons**  
永祥股份  
YONGXIANG CO.,LTD.

### High-quality Wafers

Not only Tongwei fabricates high quality wafers, but also collaborated with esteemed wafer manufacturers by virtue of advantages of superior polysilicon materials, assuring reliable supply and quality



Production capacity  
**40+GW**  
TW SOLAR

### High-efficiency Cells

The cells are produced with World-leading intelligent manufacturing system (5G+).



Production capacity  
**150+GW**  
TW SOLAR

### High-efficiency Modules

Tongwei module products are applicable for various kinds of scenarios.



Production capacity  
**90+GW**  
通威太阳能科技  
TW SOLAR TECHNOLOGY

### PV + Fisher

The world's first innovative "PV+Fishery" development mode. One move, triple-gains of "fishery, electricity, and environmental protection at once."



Total On-grid Scale  
**4.670GW**  
通威新能源  
TW NEW ENERGY

# 02 Tongwei TNC Product

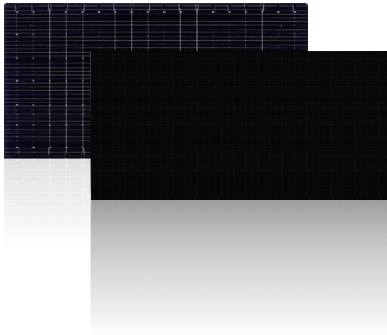
## 2.1 TNC Product Background

Tongwei TNC Technology (Tongwei N-type passivated Contact Technology) is an independently developed N-type passivated contact technology by Tongwei. The technology covers both the cell and module platforms, forming an industry-leading photovoltaic product solution.

Since initiating the deployment of TNC technology in 2020, Tongwei has reached multiple milestone achievements.

Tongwei established the world's first pilot line for PECVD-Poly TNC cells deployed with G12 (210 mm) large-size silicon wafers, Tongwei is also the first PV enterprise to achieve mass production of G12-size TNC-PECVD cells. Since the second half of 2022, Tongwei has expanded its module business and positioned TNC modules as its flagship modules products. By fostering seamless synergy between TNC cell & module technologies, the company has built a closed-loop innovation model "Manufacturing process upgrading---Manufacturing system enhancement---Product performance advancement", and continuously leading technological iteration and product evolution.

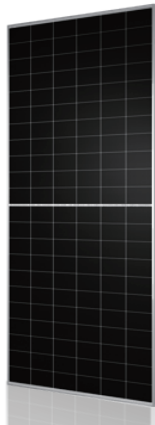
### TNC Cell Platform



Between 2021 and 2025, Tongwei deployed multiple advanced process technologies in solar cell manufacturing, significantly enhancing product performance and reliability.

- Advanced Texturing Technology
- Stacked Tunneling Technology
- High-Resistance Fine Grid Technology
- Metallization Process Optimization
- Advanced MCR Cell

### TNC Modules Platform

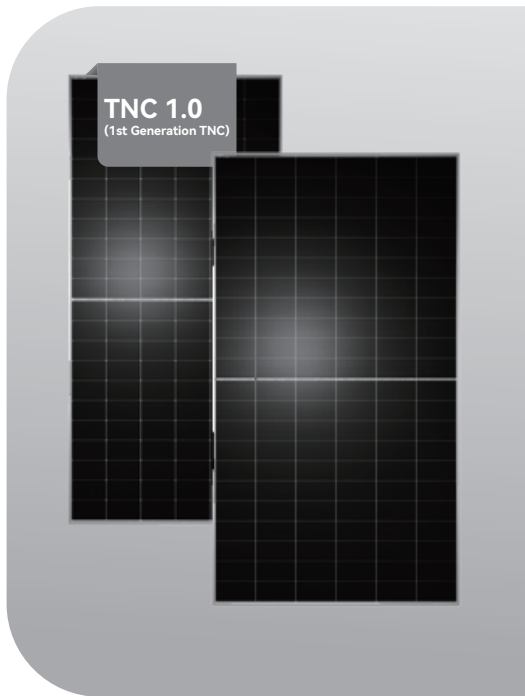


From 2022 to 2025, Tongwei R&D team has continuously upgraded its TNC module encapsulation technology and manufacturing processes to reduce CTM (Cell to Module) power loss. Meanwhile, both module reliability and power output have been significantly improved.

- Double-layer AR Coating Glass
- SLTT (Superior Light Trapping Technology)
- Smart Modules Packing Technology
- Optimization of Module Structural Design

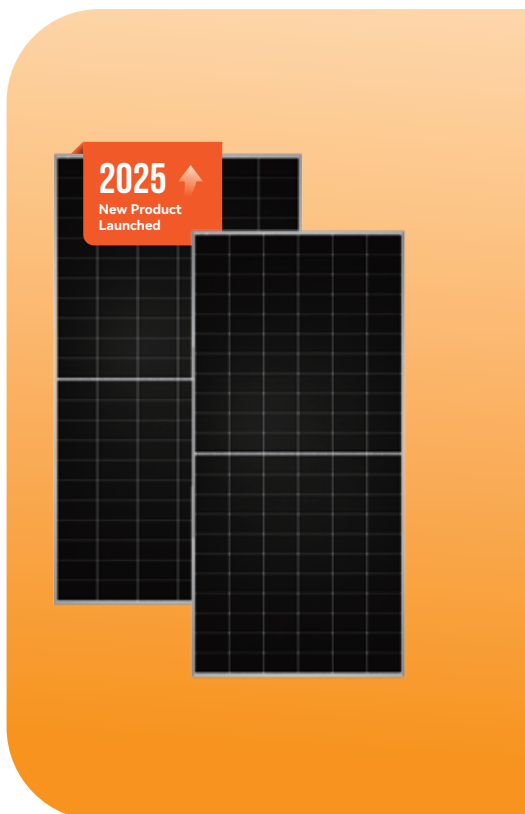
※ For detailed information on TNC module & cell platform technologies, please refer to the "Technical White Paper of Tongwei TNC Modules"

## 2.2 Tongwei TNC Product Introduction



### TNC 1.0 Module Product

TNC 1.0 modules are designed based on SMBB (Super Multi-Busbar) technology and deployed the core technologies of the TNC cell and module platforms developed from 2022 to 2025. Since entering mass production in 2022, TNC 1.0 products have fully covered mainstream module sizes, including G12R-66 and G12-66. At present, Tongwei's R&D team continues to advance the TNC 1.0 product series, promoting ongoing core technology iterations and further improving product performance.

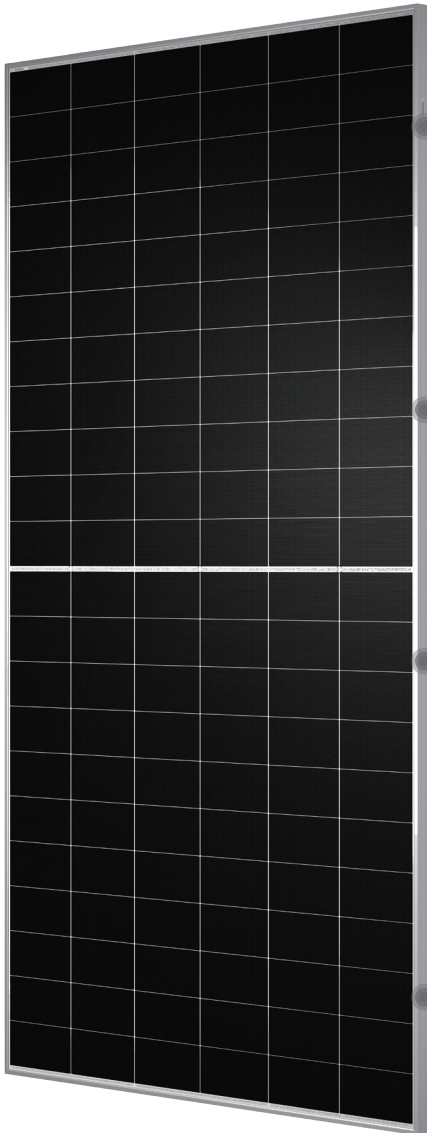


### TNC 2.0 Module Product

Tongwei officially launched the TNC 2.0 product in early 2025. TNC 2.0 deploys the latest core technological innovations in the photovoltaic industry. The new TNC product is developed based on Tongwei's proprietary Type 908 cell & module design (0BB technology independently developed by Tongwei), incorporating performance-enhancing technologies such as TPE, stencil printing, and Poly Tech. TNC 2.0 significantly improves module power output, bifaciality, and reliability performance. Compared to conventional modules, TNC 2.0 delivers enhanced lifecycle energy yield and improved return on investment for solar power plants, and delivering higher-value photovoltaic solutions for customers worldwide.

# 03 Core Innovation of TNC 2.0

TNC 2.0 modules incorporate four core innovations, product will continue to be upgraded and optimized by Tongwei's R&D team, to achieve higher module efficiency and product reliability.



## Type 908 Cell

### "0BB Technology with Tongwei own patent"

Adopts a multi-fingers (Ultra-narrow busbars) interconnection design to achieve higher module power.; The cells feature a flexible interconnection design, which significantly reduces internal stress and significantly reduces cell microcrack risk.

## TPE

### TPE, enhanced quality and efficiency

The application of TPE significantly improves the electrical performance of the cells compared to conventional half-cut cells.

## Stencil Printing

### Precision Screen Printing Technology

Full opening cell printing technology enhances current collection capability, resulting in superior electrical performance.

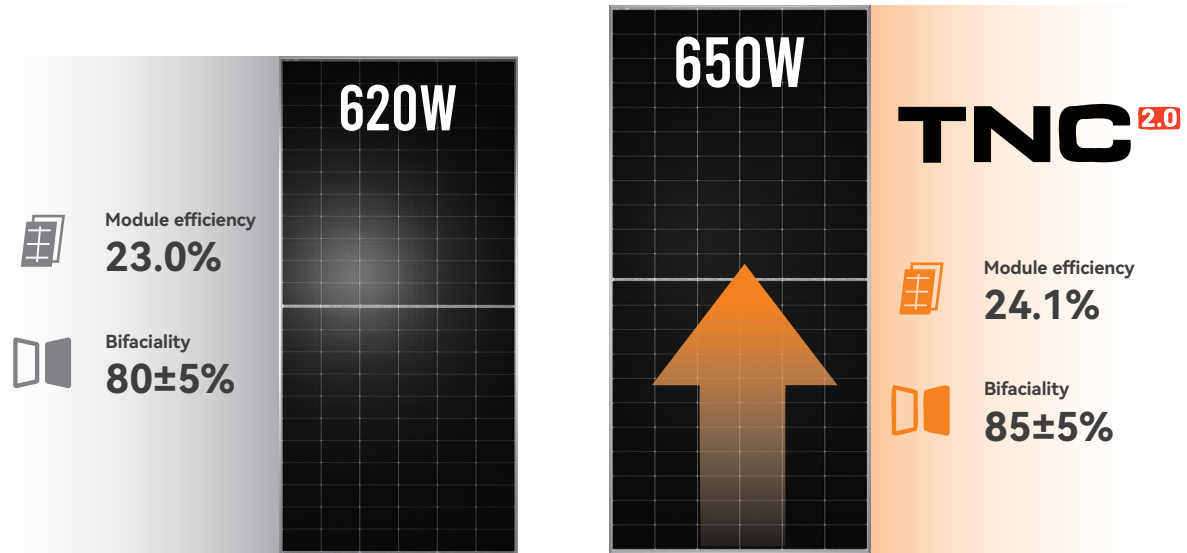
## Poly Tech

### Higher bifaciality, Higher Power Generation

By removing polycrystalline silicon from non-contact areas, cell efficiency losses are reduced. As a result, overall cell efficiency is significantly improved, with bifaciality increased by approximately 5-10 PCT.

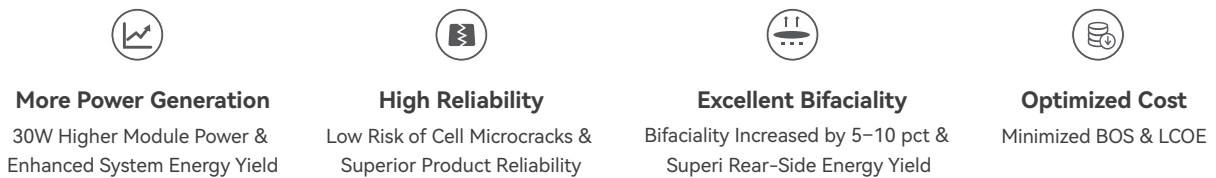
**TNC 2.0 product compare with conventional TOPCon modules:**

- Module power increased by **30W** (G12R-66)
- Module bifaciality increased by **5-10** PCT
- Risk of cell microcracks reduced; module reliability improved.
- Higher system value with total system total cost reduced by **1.21%**, and LCOE lowered by **1.32%**.

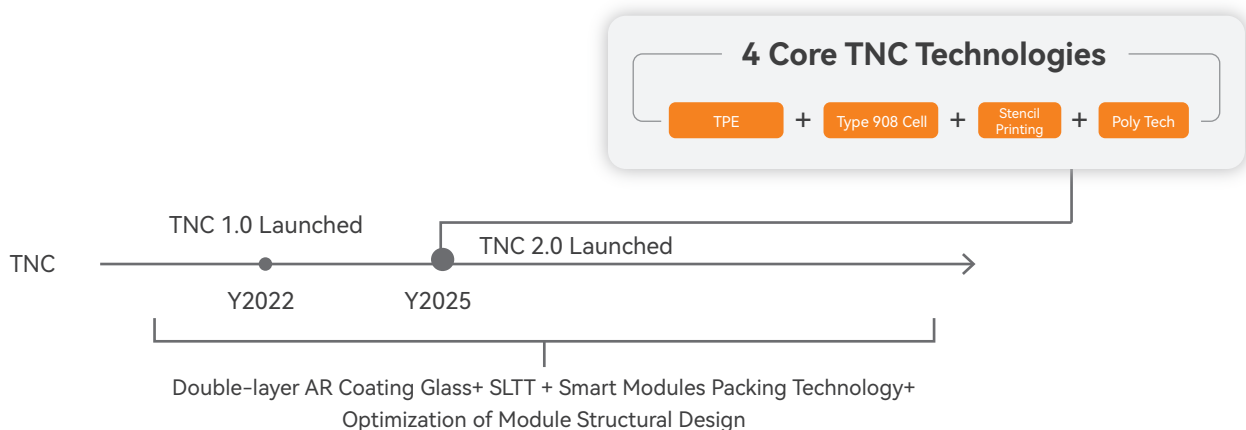


TIPS: System value calculated by Tongwei R&D team.

**TNC 2.0 Product Value Model**



**TNC Product Roadmap**



# 04 TNC 2.0 Product Overview

## 4.1 TNC 2.0 High-Efficiency Residential Modules

Small Size · Attractive Appearance · Outstanding Performance



### Architectural Aesthetics

< 2m<sup>2</sup> design; Light weight modules; Modules can achieve high integration with rooftops and carports; Enhance and reshape the architectural aesthetics.



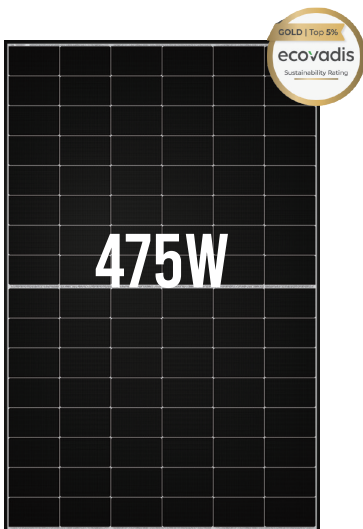
### Ultra-high Reliability

Ultra-high mechanical load: Supports extreme loads of +6000/-4000 Pa, against hurricanes and storms, ensuring long-term stable operation

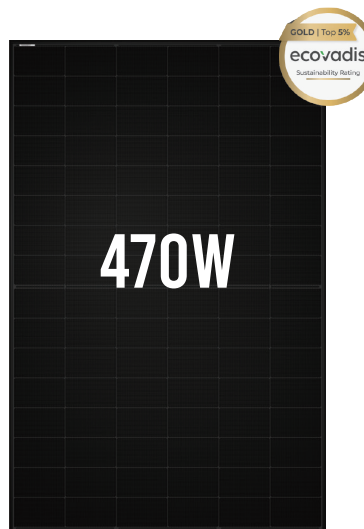


### Scenario Adaptation

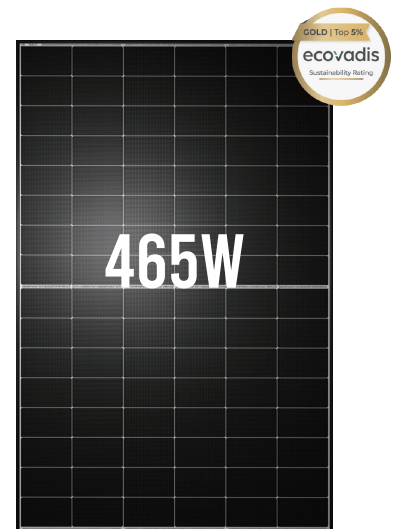
Scenario	Solution	Advantages
Residential / Small C&I Rooftops	Dual-glass monofacial module	Maximized modules power output
Carport & PV	Dual-glass transparent module	Power generation + Daylighting



**TNC 2.0 Dual Glass Monofacial (White)**  
**(G12R-48)**  
 TWMNH-48HW  
 1762\*1134\*30mm  
 455-475W



**TNC 2.0 Dual Glass Monofacial (Black)**  
**(G12R-48)**  
 TWMNH-48HE  
 1762\*1134\*30mm  
 450-470W



**TNC 2.0 Dual Glass (Transparent Glass)**  
**(G12R-48)**  
 TWMNH-48HD  
 1762\*1134\*30mm  
 445-465W

## 4.2 TNC 2.0 Utility and C&I Modules

High Module Power · High Bifaciality · Lower System Costs



### Leading-tier Energy Performance

Module power > 650W  
(+30W Compared with Conventional TOPCon Products)  
Highest Bifaciality is About 90% (Improved 5-10 PCT)



### Obvious High System Value

Ultra-low investment per watt & significant reduction  
in LCOE. BOS Cost Optimization



Passed Multiple Enhanced Reliability Tests, Adaptable to Multiple Scenarios

### Designed for Multiple Scenarios



Desert



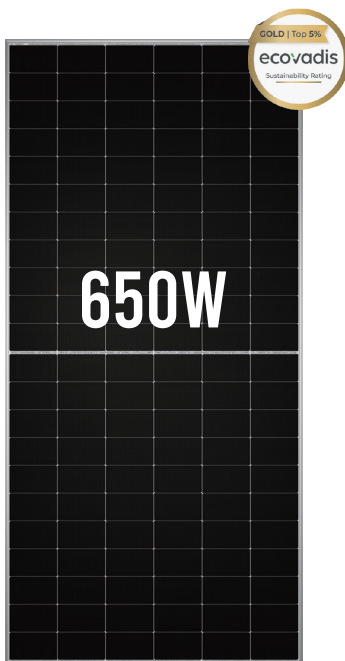
High-Ground & Snowy



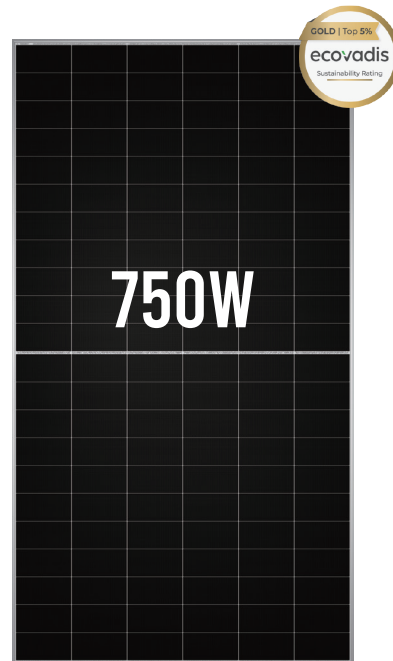
Offshore



Mountains



**TNC 2.0 Dual Glass  
(G12R-66)**  
TWMNH-66HD  
2382\*1134\*30mm  
630-650W



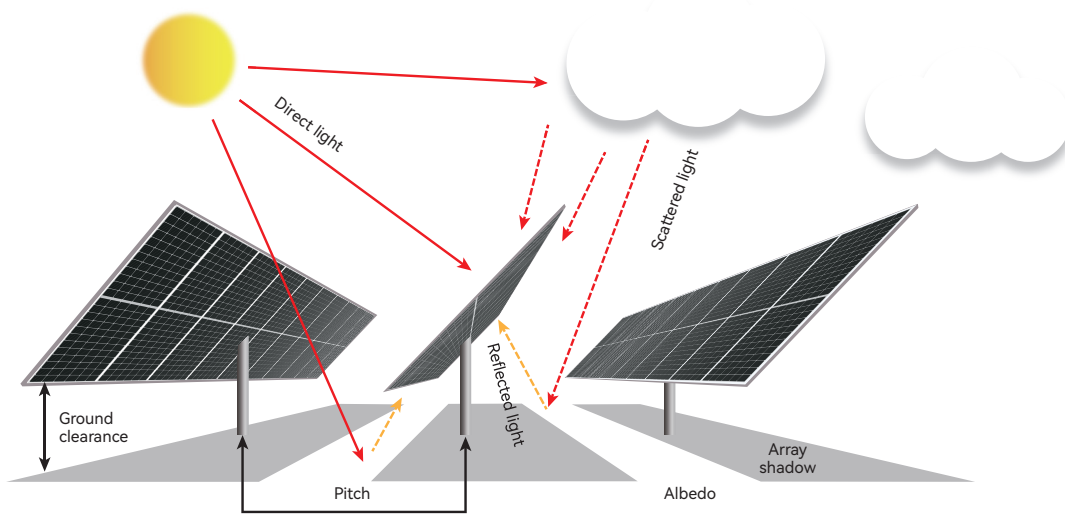
**TNC 2.0 Dual Glass  
(G12-66)**  
TWMNF-66HD  
2384\*1303\*33mm  
730-750W

# 05 Outstanding Energy Yield per Wat

## 5.1 Analysis of TNC 2.0's High Energy Yield Advantages

The core factors affecting module energy yield include module power, bifaciality, installation tilt angle, ground albedo, installation height, and climatic conditions. Compared to conventional TOPCon products, TNC 2.0 modules achieve a 5–10 PCT increase in bifaciality. In open-array utility-scale solar plants, this higher bifaciality significantly increases total system energy yield. Moreover, the advantage is further amplified in environments with higher ground reflectivity.

### How Bifacial Modules Work



Desert regions feature ground albedo of 0.25–0.30. High-bifaciality modules achieve significantly better energy yield.



## TNC 2.0

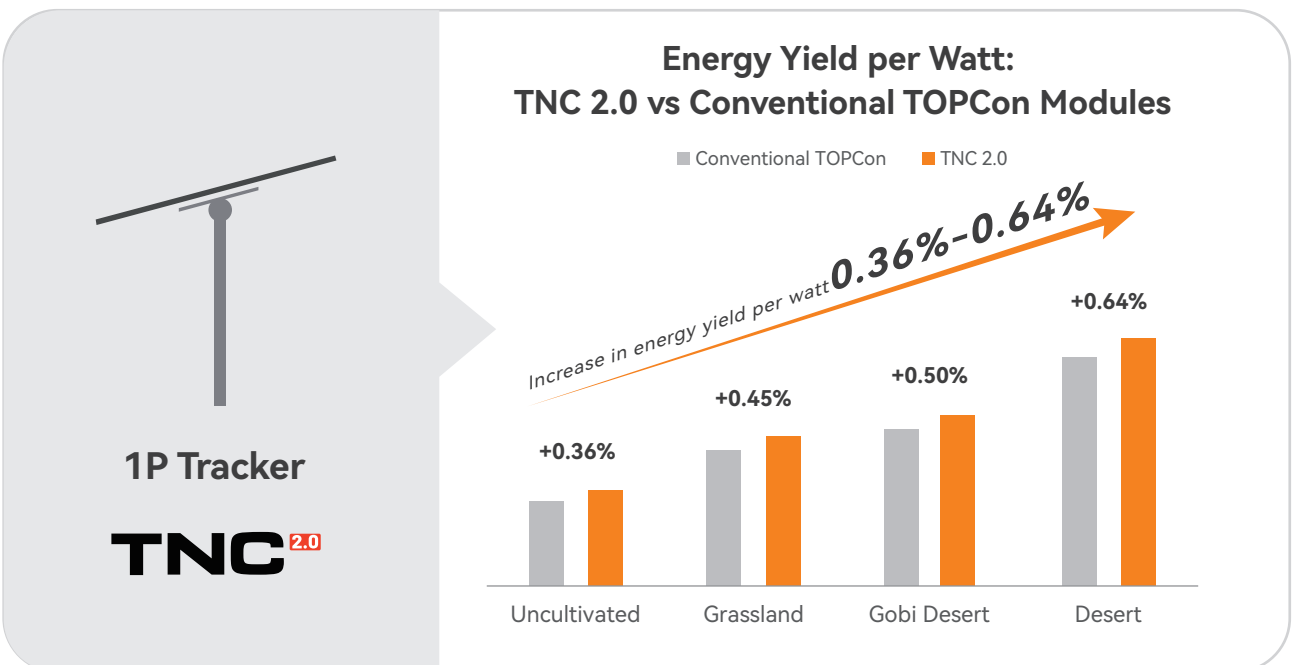
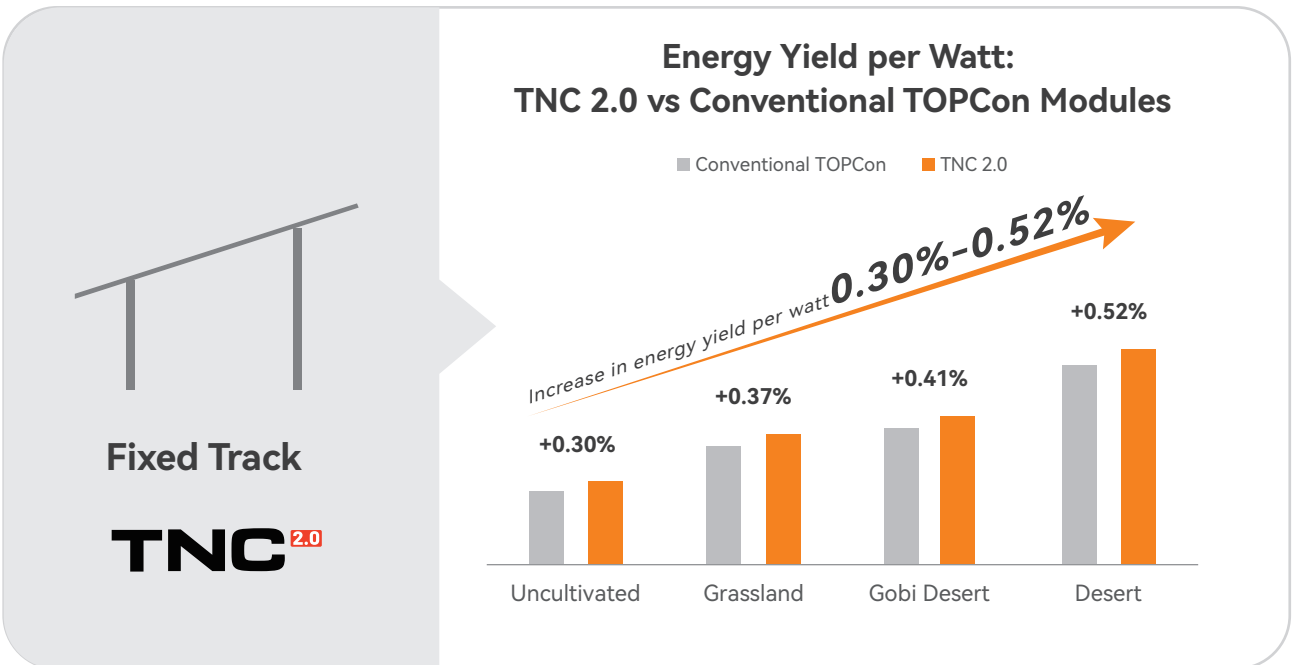
### TÜV Rheinland Certification for Ultra-High Bifaciality Modules

<b>Produkt</b> Produkt-Nr.: CN25POBB 003      Auftrag-Nr.: 306003720      Seite 1 von 13 Teil-Nr.:      Einzel-Nr.:      Page 1 of 13		
Kunde/Referenz-Nr.: 2564968      Auftragsdatum: 24.01.2025 Client:      Order date:		
Auftraggeber: Tongwei Solar (Chengde) Co., Ltd. No.888, Longze Road, Huangshi Subdistrict, Shuangxi District, Chengde City, 610000 Sichuan, P.R. China		
Prüfgegenstand: Photovoltaic (PV) Modules Test item:		
Bezeichnung / Typ-Nr.: Not provided Identification / Type No.:		
Prüfverfahren: IEC 61215-2:2016, IEC 61701 Performance at STC IEC 60904-1:2002, IEC 61851-1:2018, IEC 60904-3:2019, IEC 60904-7:2019, IEC 60904-8:2014, IEC 60904-9:2020		
Waverungsdatum: 17.01.2025 Date of issue:		
Prüfserie-Nr.: 2 Test sample No.:		Detaillierte Fotodokumentation siehe Anlage zu diesem Bericht
Prüfdatum: 24.01.2025 Testing period:		
Ort der Prüfung: Suzhou Place of testing:		Detailed photo documentation see appendix to this report
Prüfaber: TÜV Rheinland (Suzhou) Co., Ltd. Test laboratory:		
Prüfbericht: Refer to the verdict of test report Test report:		
geprüft von / tested by: 21/01/2025      Name: Dr. J.      Unterschrift / signed: J.      Datum:      Name:      Position:      Unterschrift / signed:      Datum:      Name:      Position:      Unterschrift / signed:		
bearbeitet von / reviewed by: 21/01/2025      Name: Dr. J.      Unterschrift / signed: J.      Datum:      Name:      Position:      Unterschrift / signed:      Datum:      Name:      Position:      Unterschrift / signed:		
Zustand des Prüfgegenstandes bei Ablieferung:      Prüfmuster vollständig und unbeschädigt Condition of the test item at delivery:      Test item complete and undamaged		
Dieser Prüfbericht bezieht sich nur auf die o. g. Prüfmaster und darf ohne Genehmigung der Prüfstelle nicht weitergegeben werden. Dieser Bericht bezieht sich nur auf die in diesem Bericht aufgeführten Prüfgegenstände. This report only refers to the o. g. test samples. Without permission of the test center this report is not permitted to be distributed or released. This test report does not create an express test result.		
TÜV Rheinland (Shanghai) Co., Ltd. TÜV Rheinland Building, No. 117, Lane 771 West Guangsheng Road, Zhabei District, Shanghai 200072, P.R. China		

## 5.2 TNC 2.0 Power Generation Estimation

Compared to conventional TOPCon modules, TNC 2.0 achieves a 5-10 PCT increase in bifaciality, resulting in better rear-side power generation. System calculations show that under various installation conditions and ground scenarios, the system's power generation gain per watt brought by TNC 2.0's high bifaciality is as follows:

TNC 2.0 and conventional TOPCon modules involved in the generation estimation utilize the G12R-66 module design.



TIPS: Data from Tongwei R&D Team

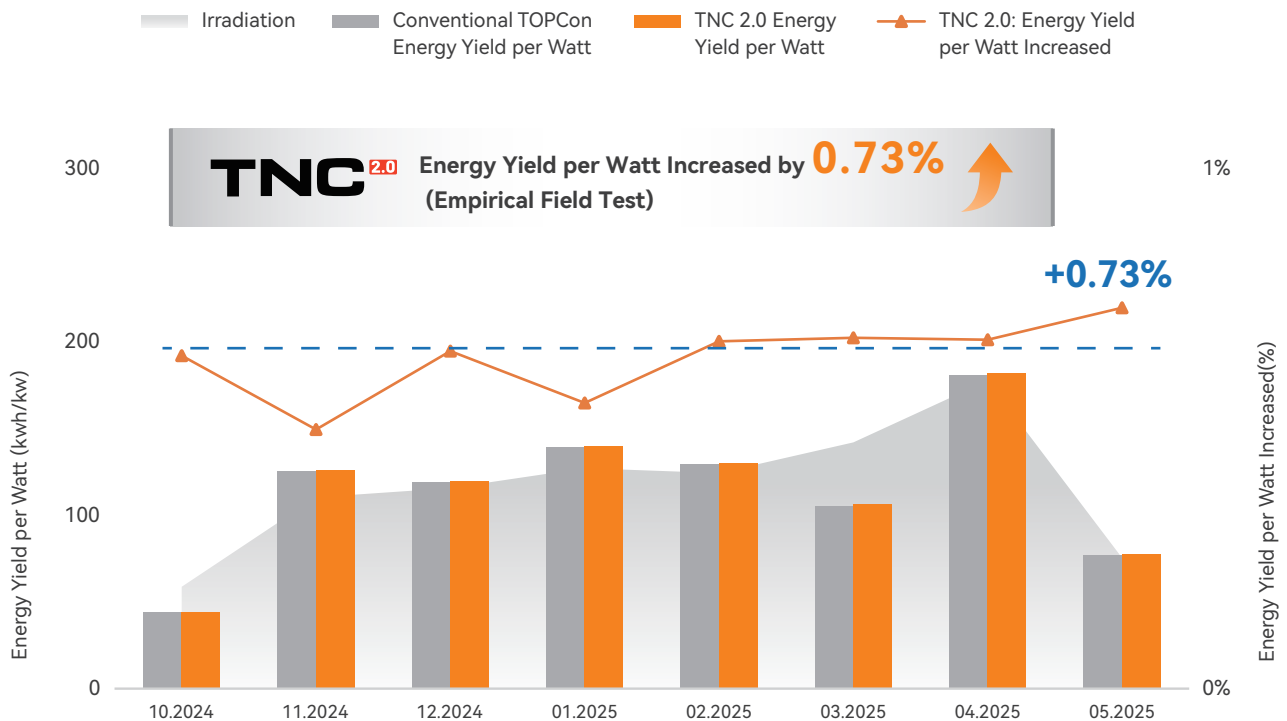
### 5.3 Empirical Power Generation Performance of TNC 2.0 Modules

Compared to conventional TOPCon modules, TNC 2.0 modules achieve a 5-10 PCT increase in bifaciality, resulting in higher power generation performance per watt. Taking TNC 2.0 module with 5% higher bifaciality as an example (Bifaciality=85%), an outdoor empirical field test was conducted in Yancheng. After six months of monitoring, the system using TNC 2.0 modules demonstrated a 0.73% increase in energy yield per watt compared to conventional TOPCon modules. TNC 2.0 and conventional TOPCon modules involved in Yancheng empirical field test utilize the G12R-66 module design.

Yancheng empirical field test



#### Energy Yield per Watt(Empirical Test): TNC2.0 vs Conventional TOPCon Modules



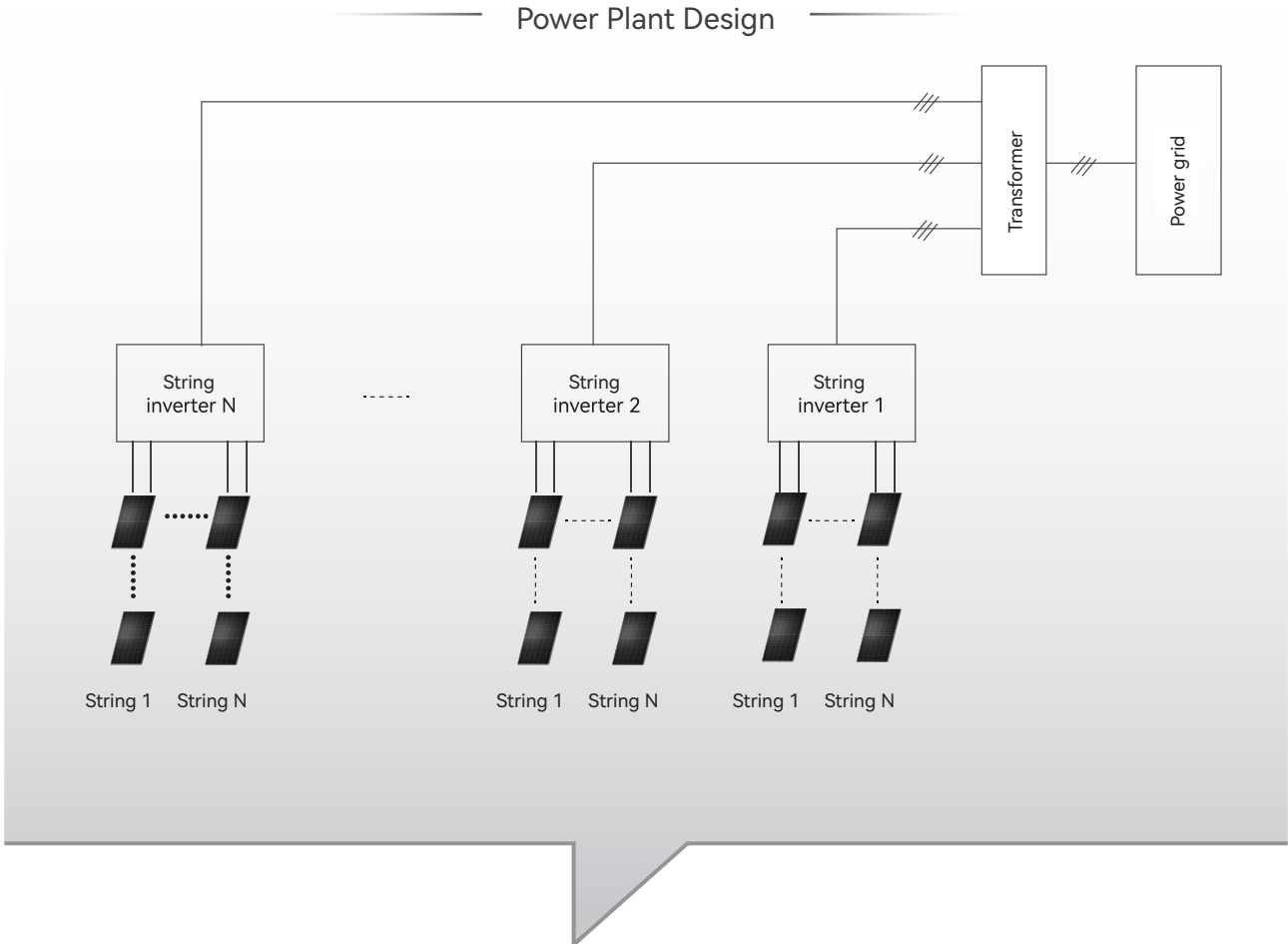
TIPS: Data from Tongwei Yancheng Empirical Field Test

# 06 Higher System Value

Compared to conventional TOPCon products, TNC 2.0 products deliver higher module power and superior module bifaciality, resulting in greater system returns for both power plant investors and operators.

## 6.1 System Design Model and Conditions

Tongwei has selected ten representative typical power plant project sites based on actual market demand, covering various climatic conditions and geographical environments in both China and overseas regions. A systematic evaluation of the system value performance of TNC 2.0 products across different application scenarios has been conducted.



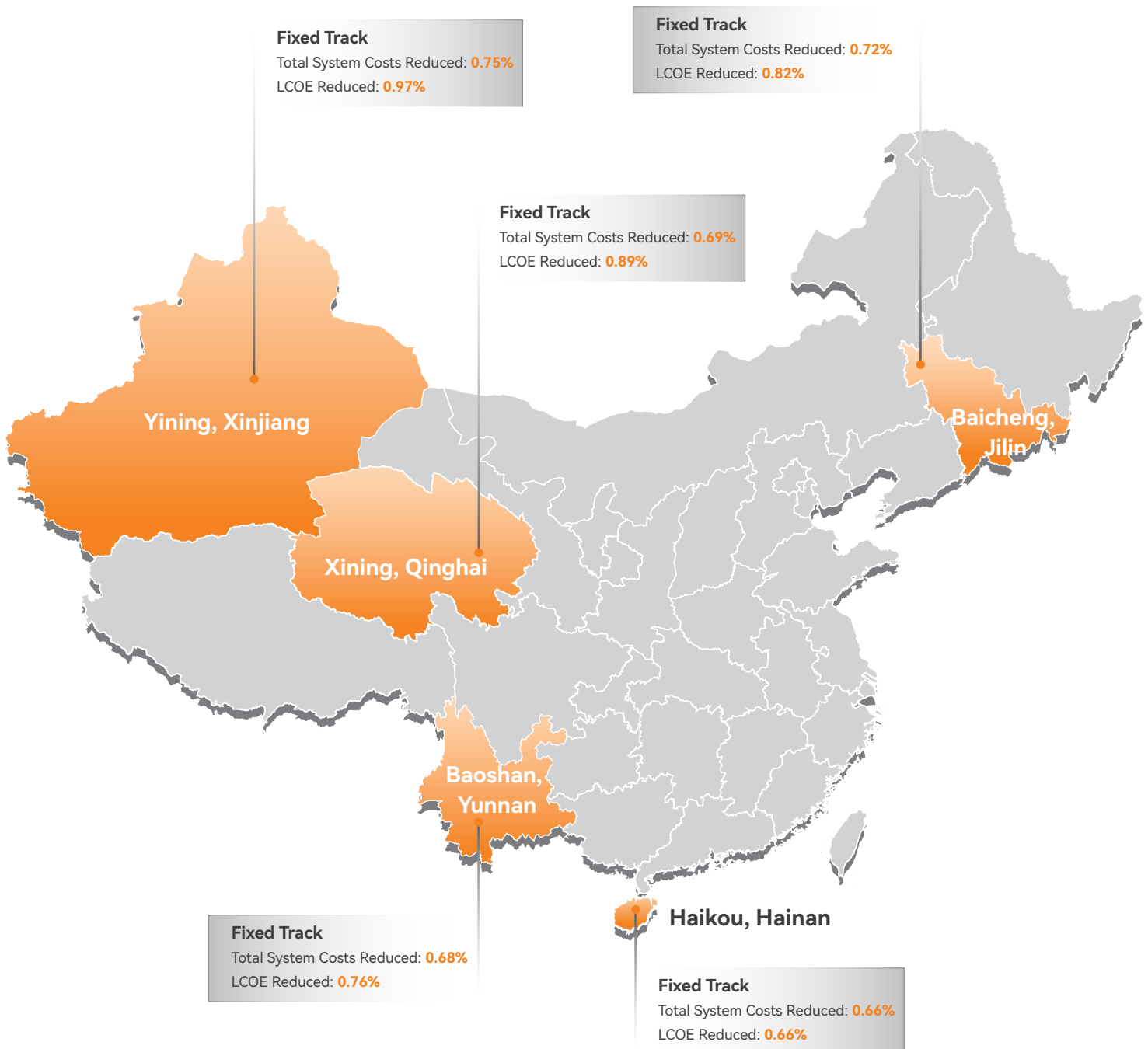
**System Design**  
 AC side installed capacity: 100 MW  
 Using 1500V string inverter arrays with DC/AC of 1.2

**Modules involved in systematic evaluation**  
 TNC 2.0 Modules (G12R-66 640W bifaciality 85%)  
 Conventional TOPCon Modules (G12R-66 620W bifaciality 80%)

## 6.2 System Value Estimation (China)

In fixed track scenario (China), compared with conventional TOPCon products, TNC 2.0 products reduce total system costs by **0.66% to 0.75%**, and lower LCOE by **0.66% to 0.97%**.

TNC 2.0 vs Conventional TOPCon: System Value Estimation (China)



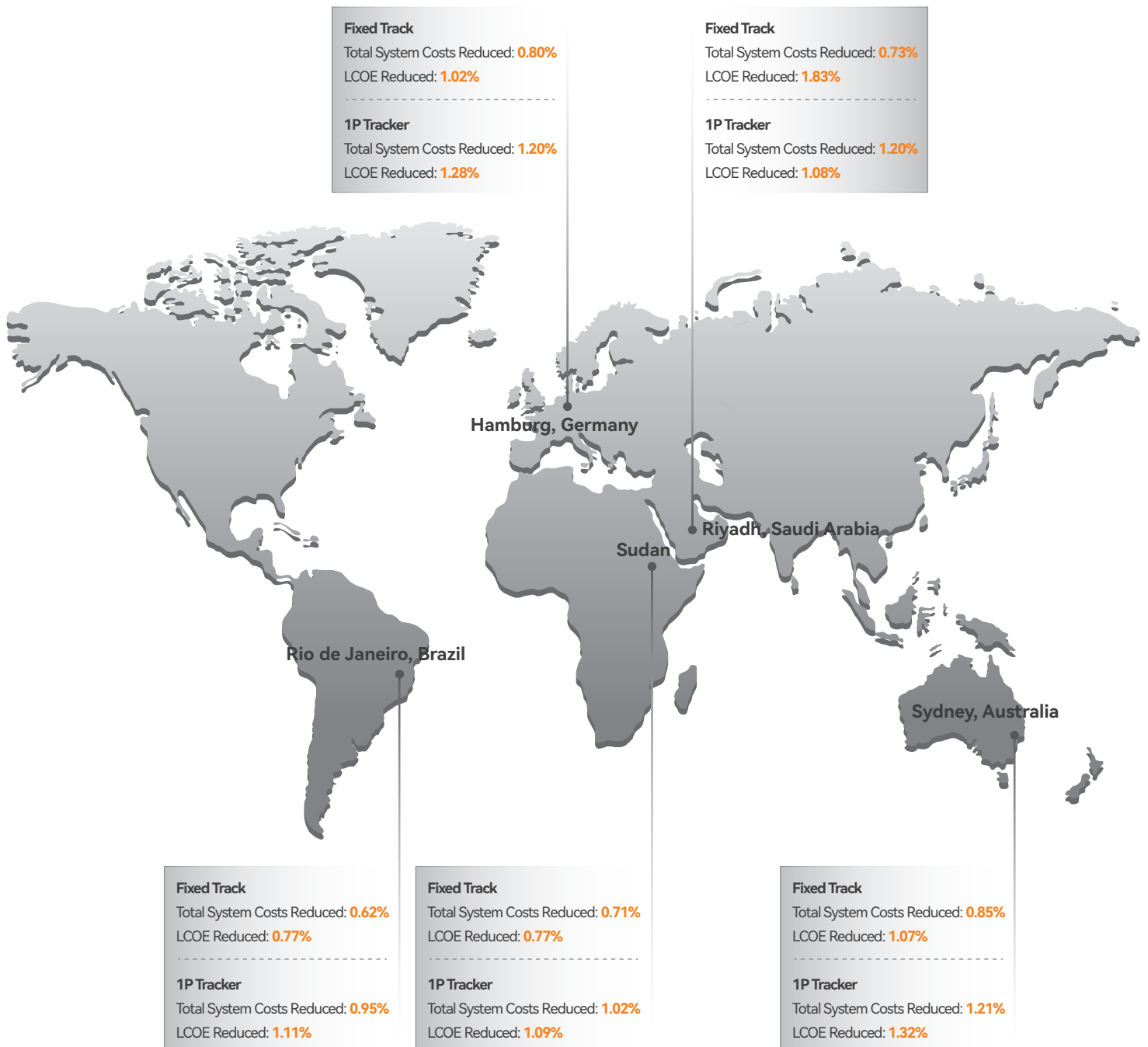
TIPS: Data from Tongwei R&D Team

### 6.3 System Value Estimation (Global)

In fixed track scenario (Global), compared with conventional TOPCon products, TNC 2.0 products reduce total system costs by **0.62% to 0.85%**, and lower LCOE by **0.77% to 1.07%**.

In 1P tracker scenario (Global), compared with conventional TOPCon products, TNC 2.0 products reduce total system costs by **0.95% to 0.21%**, and lower LCOE by **1.08% to 1.32%**.

TNC 2.0 vs Conventional TOPCon: System Value Estimation (Global)



TIPS: Data from Tongwei R&D Team

## 07 System Compatibility

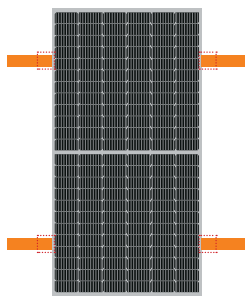


TNC 2.0 module dimensions and design are consistent with main-stream half-cell modules in the PV industry, ensuring compatibility with various installation methods.

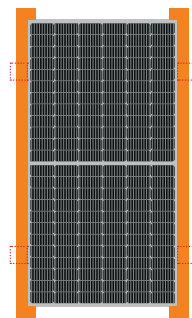
### 7.1 TNC 2.0 modules are compatible with various types of fixed track

Taking the TNC 2.0 G12R-66 module (2382×1134 mm) as example, under standard fixed track installation methods (four-point bolt or clamp installation along the long side), the module supports a load capacity of +5400 Pa / -2400 Pa. For other installation methods, please refer to the Tongwei Module Installation Manual or contact Tongwei technical support.

#### Long Side Mounting (Bolt/Clamp)

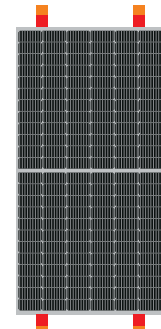
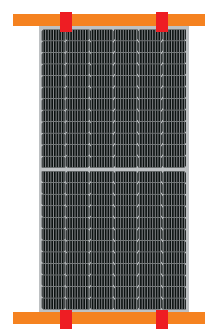


(+5400/-2400Pa)



(+3600/-2400Pa)

#### Short Side Mounting (Clamp)



(More Details refer to Tongwei Installation manual)

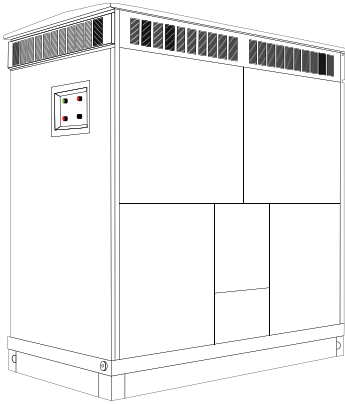
## 7.2 TNC 2.0 modules compatible with mainstream industry 1P tracking systems.



The 1P tracker brands shown are compatible with Tongwei modules; the order does not imply any ranking.

TNC 2.0 modules have undergone compatibility testing with mainstream 1P tracker from leading manufacturers. For detailed information on 1P tracker compatibility and load capacity (with Tongwei modules product), please contact Tongwei technical support. (Tracker compatibility statements available upon request.)

### 7.3 TNC Modules (Including TNC 2.0) and central inverters could be compatible by proper selection of DC combiner box.



Central Inverters

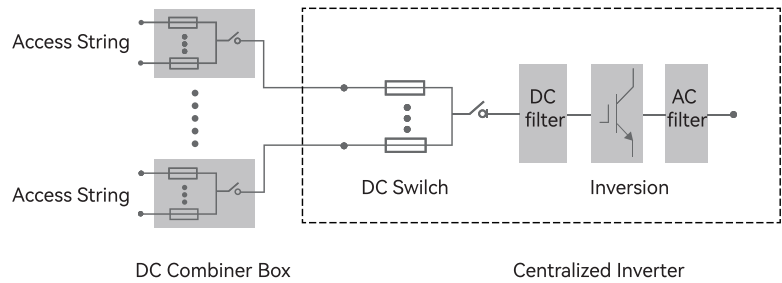


Diagram of Central Inverter System

### 7.4 TNC 2.0 modules are compatible with mainstream string inverters.

# TNC<sup>2.0</sup>

## INVERTER COMPATIBILITY RESEARCH

For any inverter compatibility issues, please consult Tongwei's technical support team.

#### Residential / Small C&I Single String Imp ≥ 16A

Modules Size  
**G12R-48**

Modules Imp  
**≈ 15.0A**

Modules Isc  
**≈ 16.0A**

#### Large C&I / Utility Single String Imp ≥ 20A

Modules Size  
**G12R-66**

Modules Imp  
**≈ 15.5A**

Modules Isc  
**≈ 17.8A**

Modules Size  
**G12-66**

Modules Imp  
**≈ 16.3A**

Modules Isc  
**≈ 18.8A**

#### Compatible Inverters



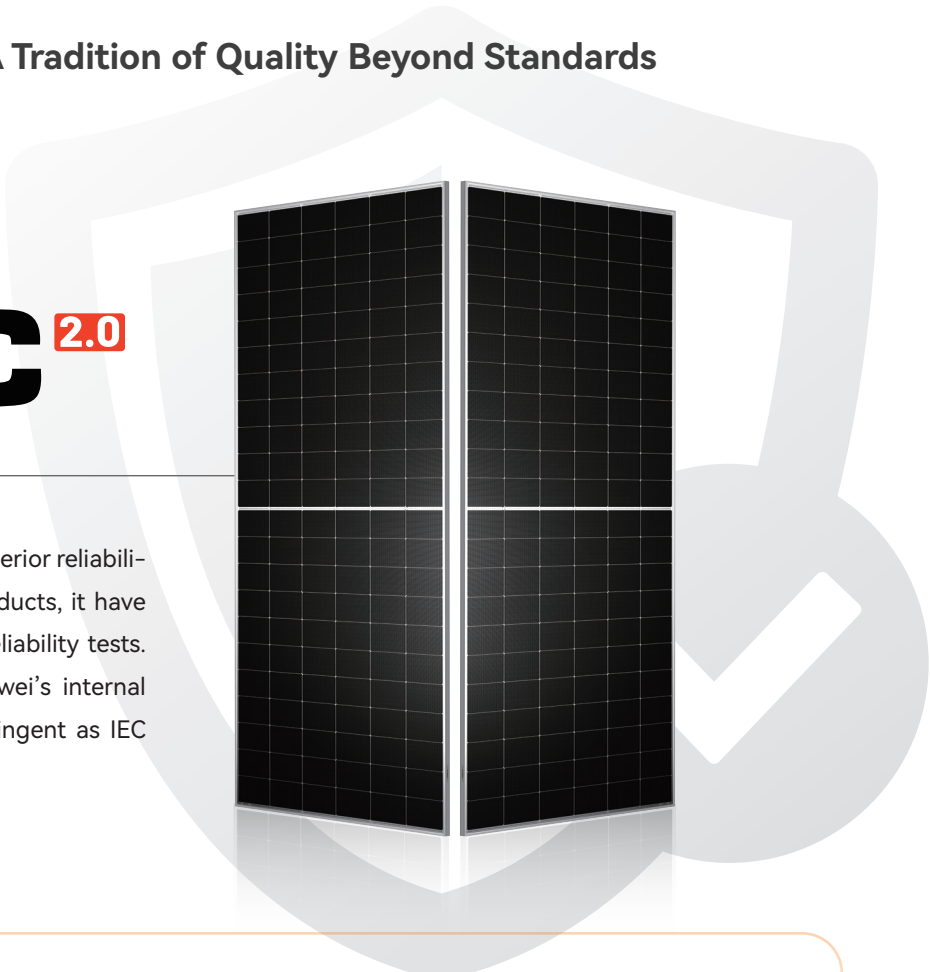
TIPS: Selection of compatible inverter brands is shown; the order does not imply any ranking.

# 08 Product Reliability and Certification

## 8.1 TNC 2.0 Reliability: A Tradition of Quality Beyond Standards

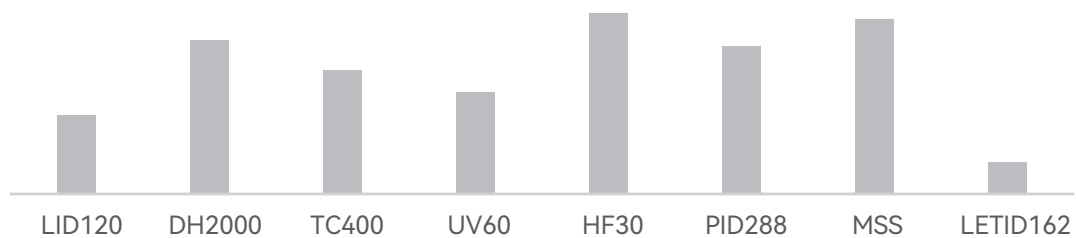
### TNC 2.0

TNC 2.0 modules inherit the superior reliability performance of TNC 1.0 products, it have passed a series of enhanced reliability tests. Products already passed Tongwei's internal quality standards (twice as stringent as IEC requirements).



5% IEC Standard

3% Tongwei standards



TNC 2.0 Product Reliability Performance (Power Degradation: %)

## 8.2 TNC 2.0 Reliability: Strong Proof from International Certifications

# TNC<sup>2.0</sup>



Tongwei modules drive innovation and quality with high standards.

**TNC 2.0 products have successfully passed multiple extended reliability test sequences, including PVEL and IEC 63209, earning numerous international awards and certifications for product reliability.**

The IEC 63209 test sequence is designed to simulate the operating conditions of photovoltaic modules under high temperatures and intense UV exposure. Tongwei's TNC 2.0 modules developed wurg UV-resistant design, have successfully passed IEC 63209 test sequence with outstanding performance, demonstrating Tongwei's industry-leading manufacturing capabilities.

Tongwei's TNC product (G12-66) has successfully passed all 7 extended reliability tests by PVEL with high definition grade , and was honored with the “Top Performers” award in the Kiwa PVEL 2025 PV Module Reliability Scorecard Report. This marks Tongwei's second consecutive year receiving this prestigious recognition since Tongwei fully entering the module business.



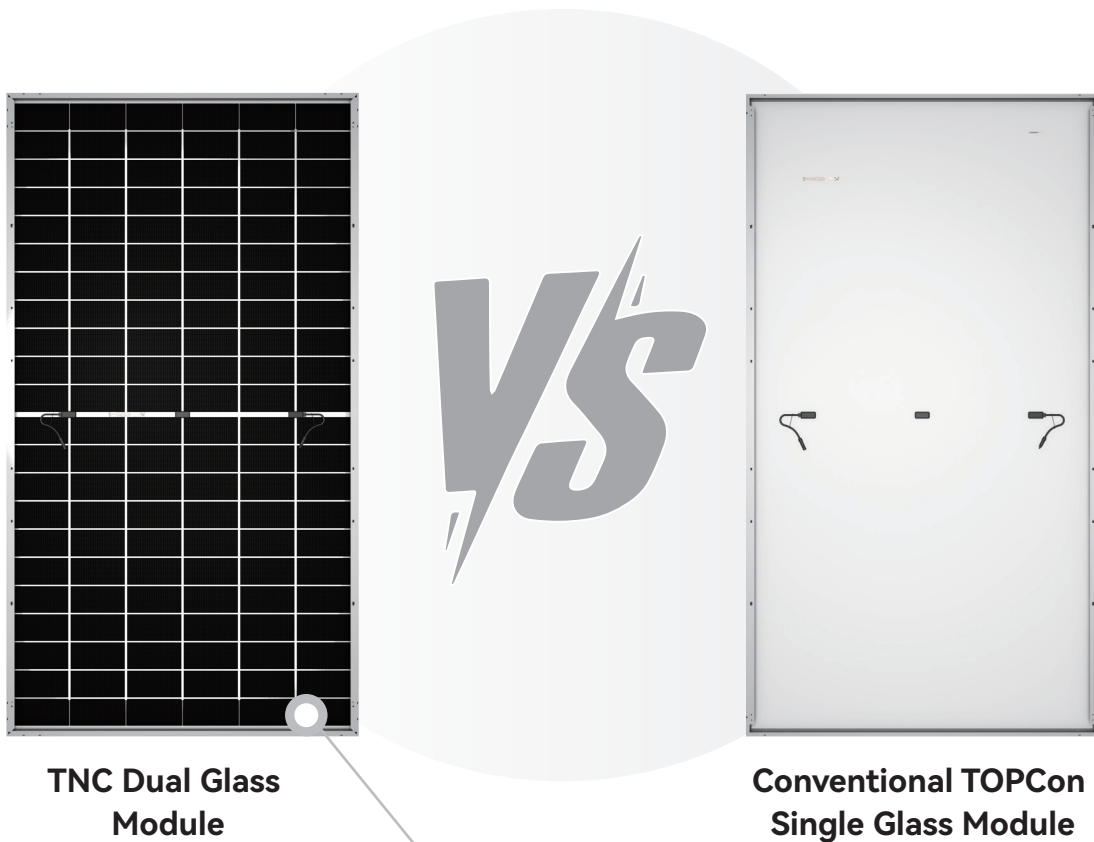
IEC 63209: Module Extended Reliability Certification



2025 KIWA-PVEL Extended Reliability Testing Award

### 8.3 Dual-Glass Structure: The Core of TNC Module Reliability

Dual glass design in all TNC modules underscores Tongwei's commitment to superior reliability.



**Optimized Structural Design**

Tongwei TNC modules adopt a dual side 2.0 mm semi-tempered glass design (25% thicker than conventional single-glass design module). Dual side glass design provide superior moisture barrier and stronger corrosion resistance.



**Designed for extreme environments**

TNC dual-glass modules perform exceptionally in extended damp heat tests and are well-suited for salt mist, hot and humid climates, and desert conditions.

## TNC Modules (Dual Glass)

### TNC Modules vs Conventional TOPCon Single Glass Module

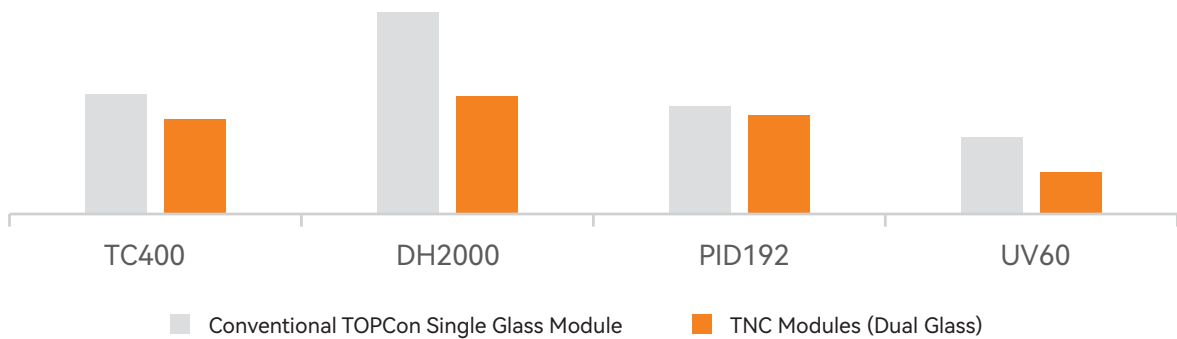


Power Degradation in Damp Heat Test

**1.09** PCT

5% IEC Standard

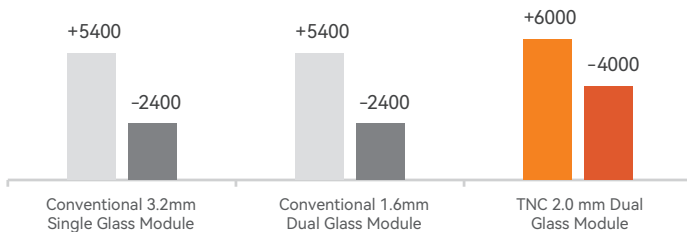
3% Tongwei standards



**Reliability Between Dual Glass and Single Glass Products (Power Degradation: %)**

TIPS: Data from Tongwei R&D Team

For residential scenario, TNC 2.0 modules (designed under 2 m<sup>2</sup>) adopt dual glass monofacial or dual glass design (dual side with 2.0 mm semi-tempered glass). Compared with lightweight residential modules on the market, Tongwei's TNC 2.0 products deploy high-strength encapsulant materials, with module load capacity extended to +6000/-4000 Pa, ensuring greater reliability in high wind load scenario.



**TNC**<sup>2.0</sup>

TNC 2.0 Residential Modules



**Load Capacity Extended!**

# 09 TNC 2.0 Full Scenario Solution

TNC modules are widely applicable to residential, commercial & industrial (C&I), and utility-scale solar projects. The new generation TNC 2.0 modules are designed to meet diverse customer needs across various application scenarios, and providing customers with higher-value product solutions.



### Desert and Gobi

- ✔ **High Temperature:**  
Passed IEC-63126 Test Sequence
- ✔ **High UV Exposure:**  
Passed UV120 Extended Test
- ✔ **High Wind Load:**  
Obtained IEC 62782 Mechanical Load Test Certification



### Snowfield

- ✔ **Heavy Snow:**  
Obtained Uneven Snow Load Test
- ✔ **Low Temperature**  
Passed Static & Dynamic Load Tests in Ultra-low Temperature (-40°C)
- ✔ **Cold & Wet**  
Passed HF40 Extended Test



### Mountain Terrain

- ✔ **Severe Hail**  
Passed 45mm Hail Test
- ✔ **High-altitude**  
Passed 27.55 kV High-pulse Test
- ✔ **Strong Wind**  
Passed 62 m/s Wind Tunnel Test



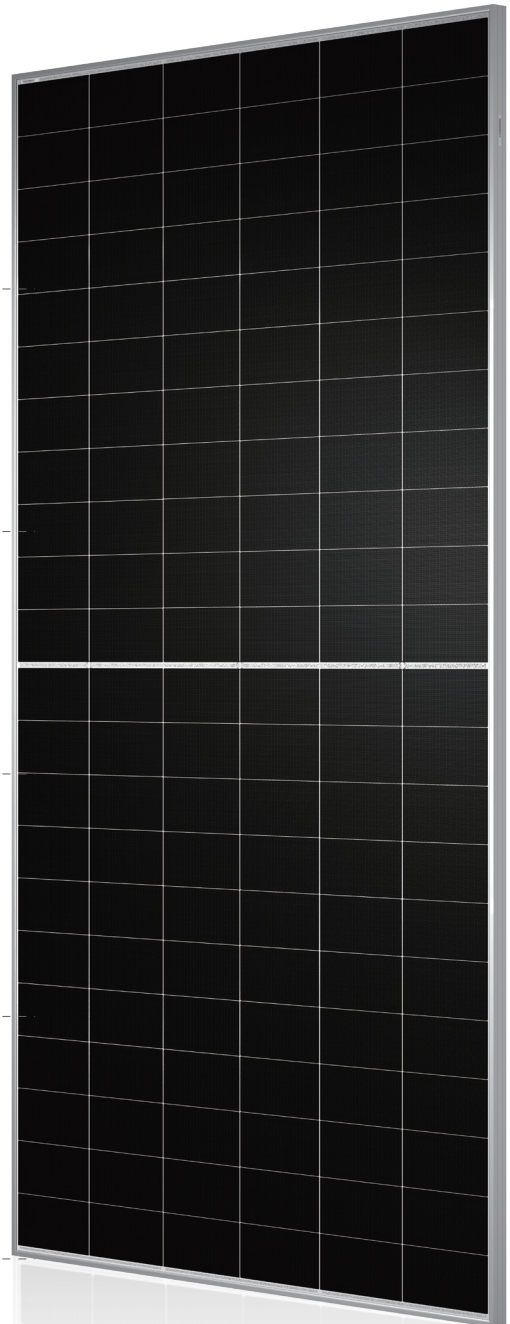
### Offshore & Marine

- ✔ **Salt Mist**  
Certified with Salt Mist Level 8
- ✔ **Marine Environment**  
Obtained "Deep Blue Ocean" Certification
- ✔ **Sea Corrosion**  
Passed Extended PID Test (Water Immersion & Extended Damp Heat )



### High-humidity

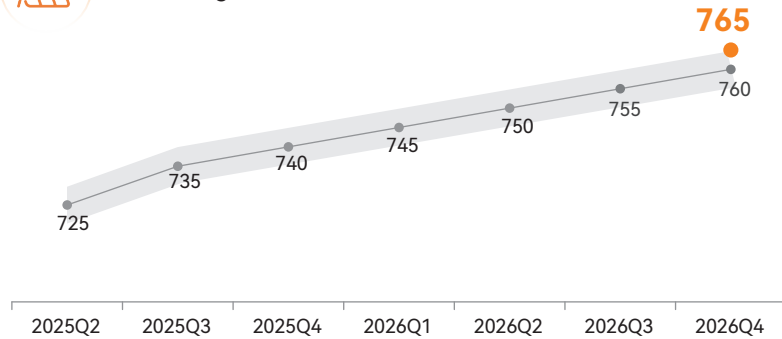
- ✔ **High Humidity:**  
Passed DH2000 Extended Test
- ✔ **Storm**  
Obtained Tornado Certification
- ✔ **Wet & High Temperature**  
Passed PID 288 Extended Test



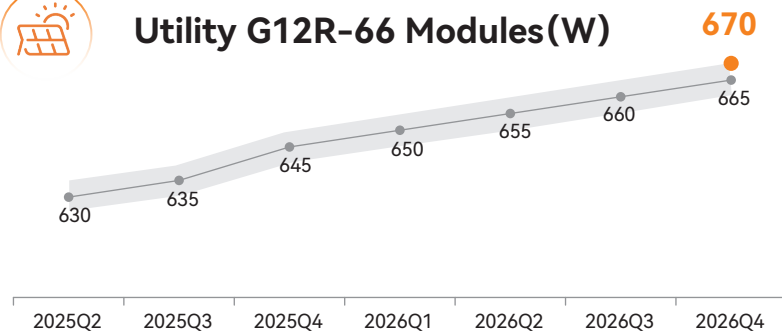
# 10 TNC 2.0 Product Power Road Map



## Utility G12-66 Modules(W)

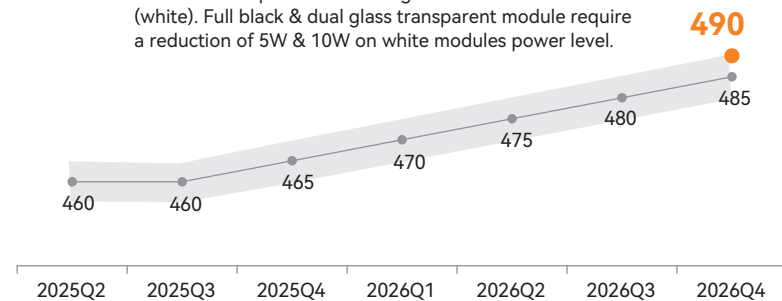


## Utility G12R-66 Modules(W)



## Residential G12R-48 Modules(W)

Power roadmap based on dual glass monofacial modules (white). Full black & dual glass transparent module require a reduction of 5W & 10W on white modules power level.



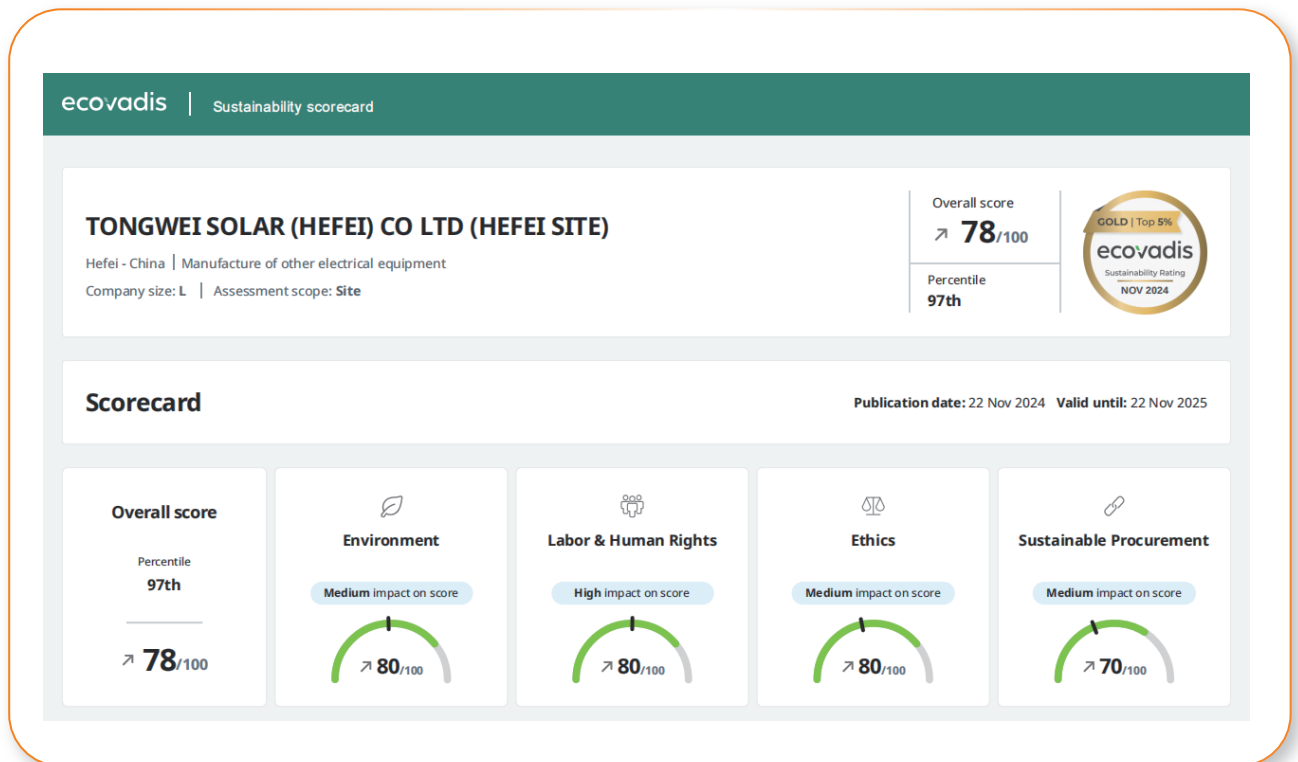
TIPS: The actual module power will be determined according to Tongwei's published power forecast. For any other inquiries, please contact Tongwei's technical support team.

# 11 Sustainability

## 11.1 The first photovoltaic manufacturing enterprise awarded the Ecovadis Gold Medal, industry leading in corporate social responsibility among PV manufacturers.

EcoVadis is a globally recognized standard for assessing corporate sustainability. Its framework, based on international benchmarks like ISO 26000 and the Global Reporting Initiative (GRI), evaluates companies across four areas: environment, labor and human rights, ethics, and sustainable procurement. Covering over 220 industries and 180 countries, EcoVadis is trusted by 600+ multinational corporations for supplier evaluation and responsible sourcing.

Tongwei Solar (Hefei) Co, Ltd, a subsidiary of Tongwei Co., Ltd., has been awarded the Ecovadis Gold Medal for 2024, achieving a score of 78. While the Gold Medal is awarded to companies in the top 5% globally, Tongwei further distinguishes itself by ranking in the top 3% among over 130,000 companies worldwide across various industries. Notably, Tongwei is the only company in the PV manufacturing industry to receive the EcoVadis Gold Medal, cementing its position as the top performer in corporate sustainability.



## 11.2 Key Measures and Annual Achievements in Tongwei's Sustainable Supply Chain Management

Key measures	2024 outcome
 <p>Establish a circular and green supply chain</p>	<p>Obtained <b>4</b> Environmental Product Declarations (EPDs)</p>
 <p>Drive carbon reduction across the supply chain</p>	<p>Secured <b>22</b> carbon footprint certifications</p>
 <p>Build responsible partnerships</p> <hr/> <p>Enhance supply chain social responsibility oversight</p> <hr/> <p>Over <b>200</b> PV suppliers completed ESG self-assessments, Over <b>60</b> agriculture suppliers completed ESG self-assessments</p> <hr/> <p>Over <b>100</b> PV suppliers passed on-site ESG audits, Achieved top-level supply chain traceability from TÜV Rheinland Certification</p> <hr/> <p>Implement the supply chain partner empowerment plan</p> <hr/> <p>Ensure compliant, ethical procurement</p>	<p><b>100%</b> of major and auxiliary raw material suppliers signed the Conflict Minerals Commitment, and all key metal suppliers confirmed free of conflict minerals</p> <hr/> <p><b>100%</b> of major raw-material and auxiliary suppliers in the PV division signed the Social Responsibility Commitment</p> <hr/> <p>Over <b>200</b> PV suppliers completed ESG self-assessments, Over <b>60</b> agriculture suppliers completed ESG self-assessments</p> <hr/> <p>Over <b>100</b> PV suppliers passed on-site ESG audits, Achieved top-level supply chain traceability from TÜV Rheinland Certification</p> <hr/> <p>Delivered approximately <b>536</b> hours of ESG training to suppliers</p> <hr/> <p><b>100%</b> of major raw and auxiliary material suppliers in the PV industry signed both Compliance Commitments and Integrity Commitments</p>

### 11.3 Participation in International Initiatives



Tongwei Co., Ltd. joins the United Nations Global Compact (UNGC)



Tongwei Co., Ltd. joins the RE100



Tongwei Co., Ltd. signs UN Women's Empowerment Principles (WEPEs)



China ESG Alliance

Tongwei Co., Ltd. joined the China ESG Alliance



Tongwei Co., Ltd. joined the "ISSB International Sustainability Disclosure Standards Early Learner Partner Program"



Tongwei Co., Ltd. joins the Corporation Carbon Neutral Action (CCNA)



Tongwei Solar (Hefei) Co., Ltd. joins the Science Based Targets initiative (SBTi)

- Tongwei Co., Ltd. participated in the initiation and signed the Digital Ecological Civilization International Climate Action Initiative.
- Tongwei Co., Ltd co-initiated the "China Renewable Energy Enterprise Empowerment Africa Co-creation Plan".
- Tongwei Co., Ltd. has participated in the initiation and signed the "Pollution Reduction and Carbon Emission Reduction Synergy Empowerment Plan" initiative.

## 11.4 Mainstream Ratings Performance in 2024



MSCI ESG Ratings

**2024** **BB** Grade  
2023 **B** Grade



Market Intelligence

S&P Global Corporate Sustainability Assessment

**2024** **57** Score  
2023 **53** Score



EcoVadis Sustainability Rating  
(Tongwei Solar (Hefei))

**2024** **78** Score  
2023 **67** Score



Wind ESG Rating

**2024** **AA** Grade  
2023 **A** Grade



CSI ESG Rating

**2024** **AA** Grade  
2023 **AA** Grade



IIGF ESG Rating

**2024** **A+** Grade  
2023 **A+** Grade



CDP Global Environmental Disclosure

<b>2024</b>	Climate Change <b>B</b> Grade	<b>2024</b>	Water Security <b>B</b> Grade
2023	Climate Change <b>B</b> Grade	2023	—



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