



ECO GREEN ENERGY EU

The Future is Now



*Product Presentation*  
**ECO GREEN ENERGY - SUNOVA**  
**Solar Panels 2024**

# Content

- 1 About ECO GREEN ENERGY - Sunova
- 2 Modules components
- 3 TOPCon technology
- 4 Portfolio Sunova Solar
- 5 Case study
- 6 Certificates
- 7 New developments 2024
- 8 Project references



*1 About ECO GREEN ENERGY - Sunova*

# Company Profile



**SUNOVA SOLAR**

Pv Tech Expert.

**TIER 1**

BloombergNEF



**5.5GW**

**4.5GW**

**4.3GW**

**9GW**

**10+**

**20+**

**100+**

Global Module  
Capacity

Under  
Construction

Global  
Accumulative  
Shipment

Cell Capacity

Global Sales &  
Service Offices

Shipping  
Countries

Global  
Partners

# Milestone



Sunova Solar Technology Co., Ltd



200 MW production line



Expand production capacity



Sunova Group AUS PTY LTD



Brazilian branch



Signing contracts with insurance companies



Vietnam factory



Signing contracts with Munich RE



YIBIN Cell Factory

2016

2017

2018

2019

2021

2022

2023

2024

- Sunova Solar Technology Co., Ltd founded in Wuxi, China.
- Setting up 1st 200 MW production facility.
- Sunova Group AUS PTY LTD founded in Australia.

- Sunova set up the second 200 MW production line.
- Production capacity expanded to 1 GW.
- The annual cumulative shipment reached to 2 GW.
- Sign with PINGAN, Ariel-Re and LLYOD'S.


- Production capacity expanded to 1 GW.
- The annual cumulative shipment reached to 2 GW.
- Sign with PINGAN, Ariel-Re and LLYOD'S.


- Produced TOPCON modules and expanded to 2.5 GW capacity..
- Expanding 1.5 GW production capacity in Vietnam factory.

- Became BNEF Tier 1 player
- Building warehouses in Rotterdam / Itaja / Milan.
- Signed performance guarantee insurance with Munich RE.

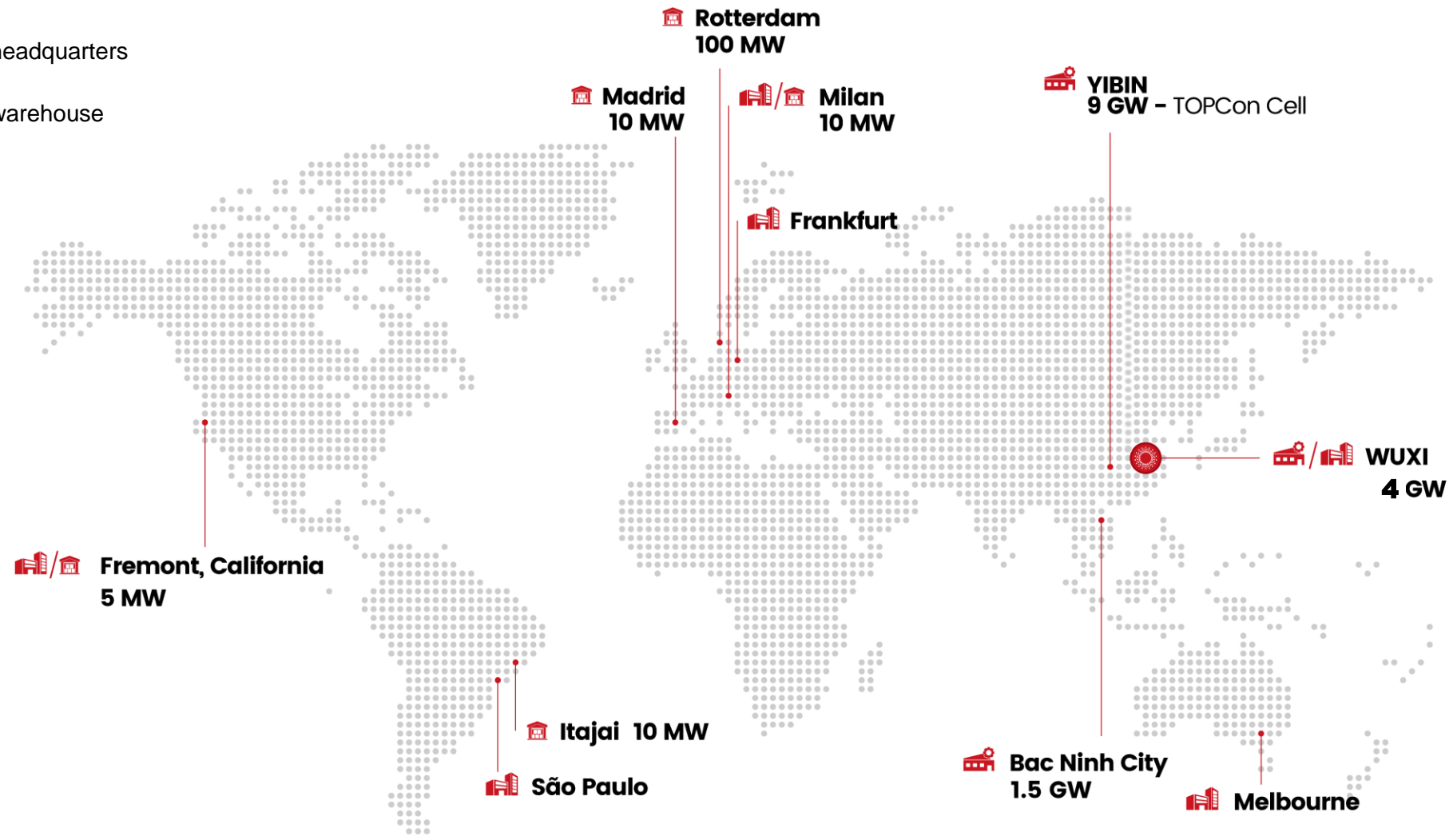
- Set up 1GW differentiated product line.
- Expand 9GW cell capacity.
- Started construction of new HQ at Wuxi Yanqiao

# Global Networking

 Regional headquarters

 Regional warehouse

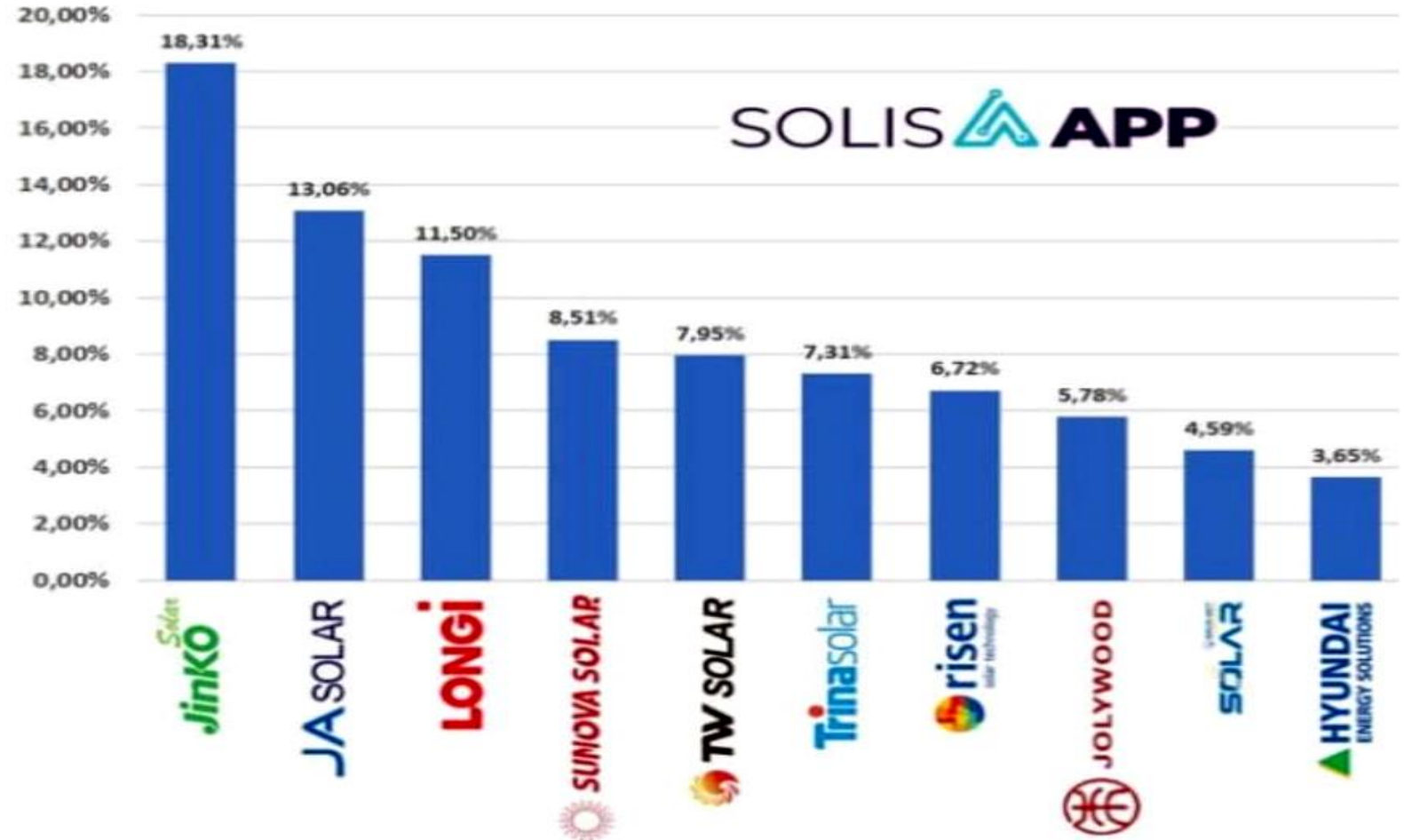
 Factory



# Europe success case: Polish Market Ranking



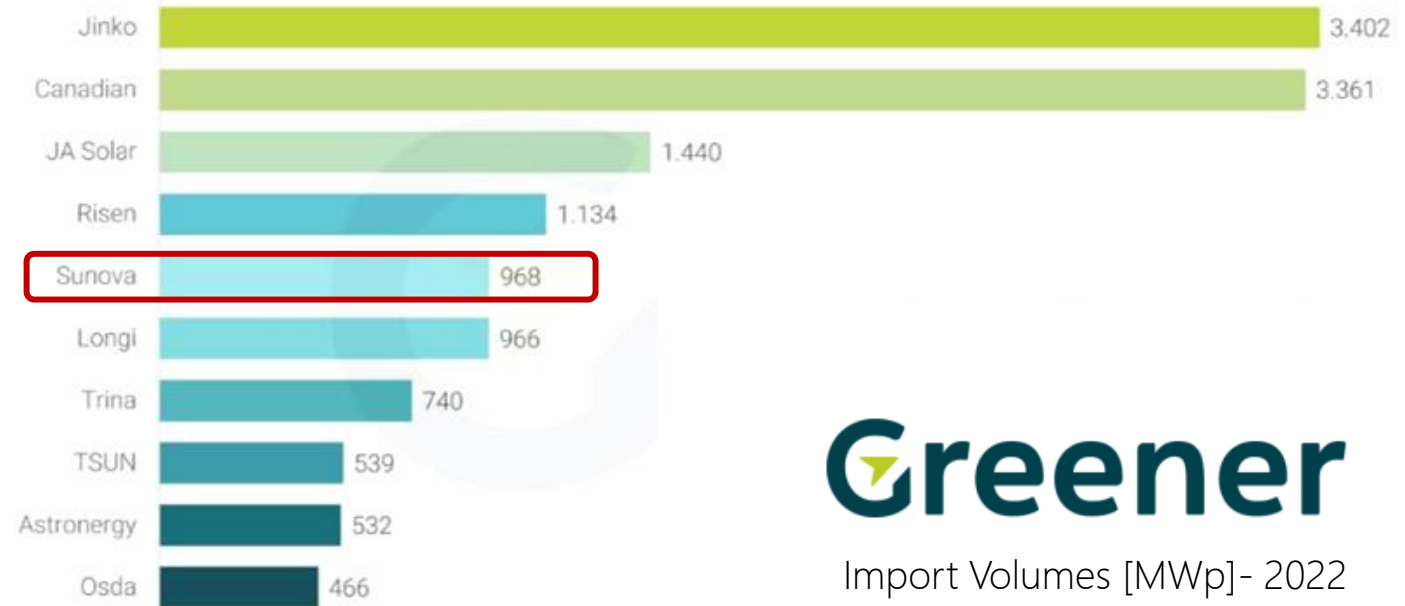
**NO. 4**



# South American Market Greener Report



Of the 90 module brands for Brazil, the top 10 accounted for 77% of the total import volumes.



**Greener**  
Import Volumes [MWp]- 2022

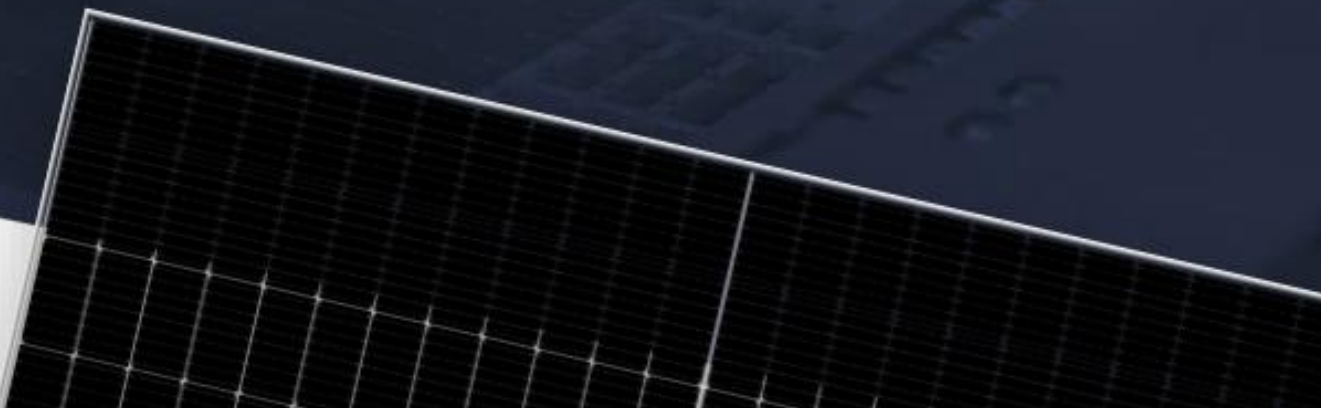


**THORNOVA** solar

 **SUNOVA SOLAR**

# Sunova Solar becomes Thornova Solar

Our way forward



**THORNOVA** solar

 **SUNOVA SOLAR**

## Our brand map

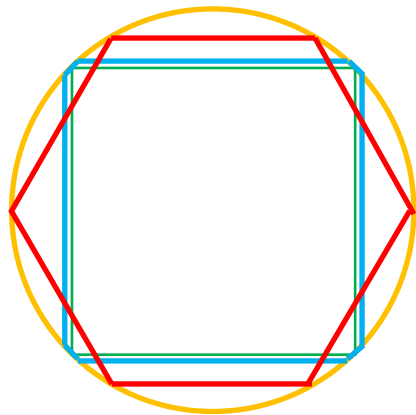
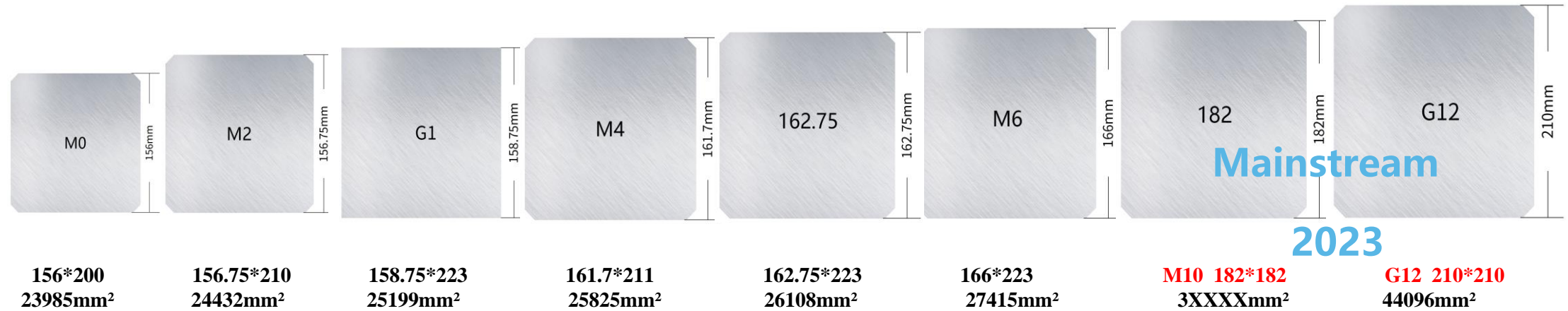


# *1 Module components*

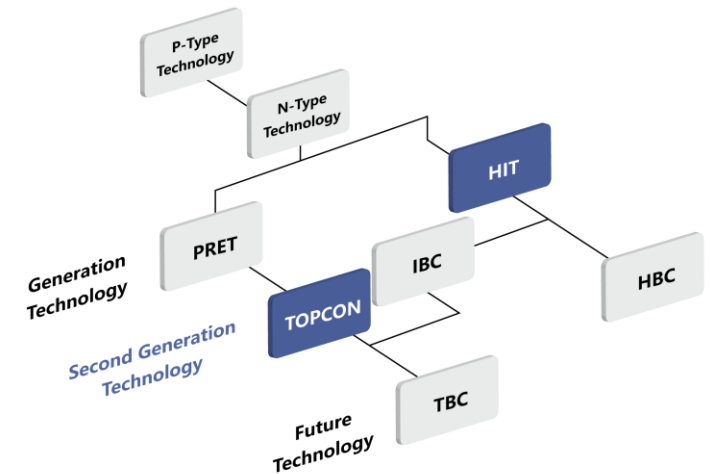
# PV Module components



# Cell technologies and sizes



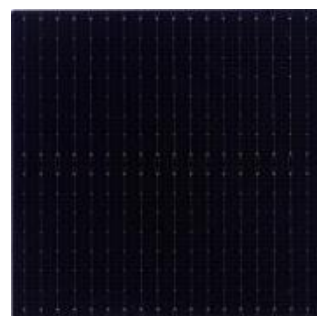
Silicon ingot



# Sunova production process

## Cell trends

**High-Efficiency Cell Products:** Reliable and Stable Power Guarantee



210\*210 mm



182\*199 mm



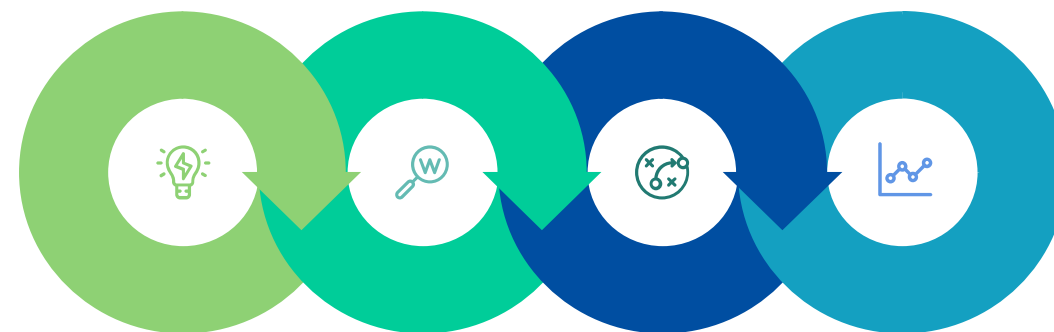
182.2\*191.6 mm



182.2\*182.2 mm



182.2\*183.75 mm



Higher  
conversion  
efficiency

Better low  
irradiation  
response

Lower  
temperature  
coefficient

Lower  
LID

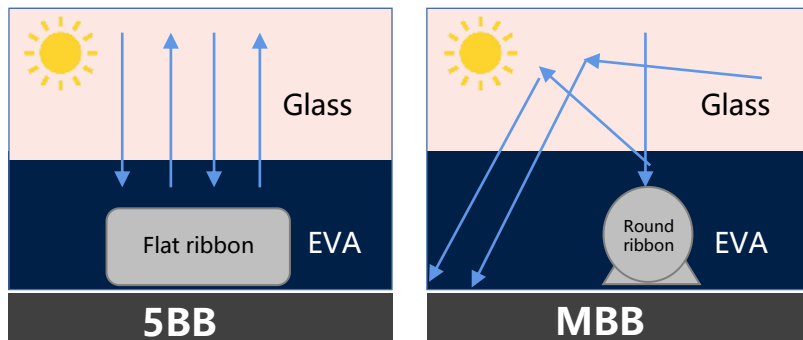
Mass Production efficiency **25.6%**

## *2 New technologies in modules*

# New technology application: Multi Bus Bar (MBB)

Optical Performance

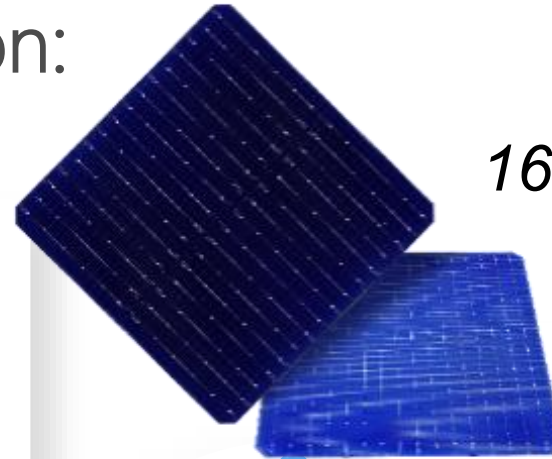
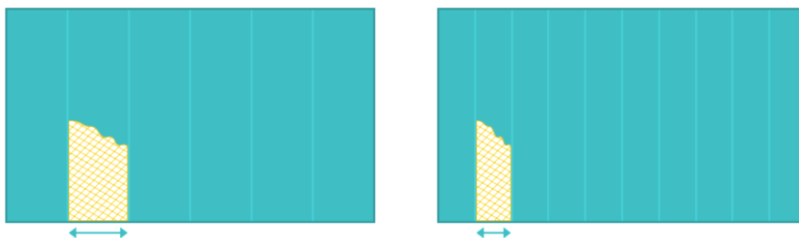
Power Improvement 1%~1.5%



➤ Shadowing reduction

➤ Higher Light trapping effect

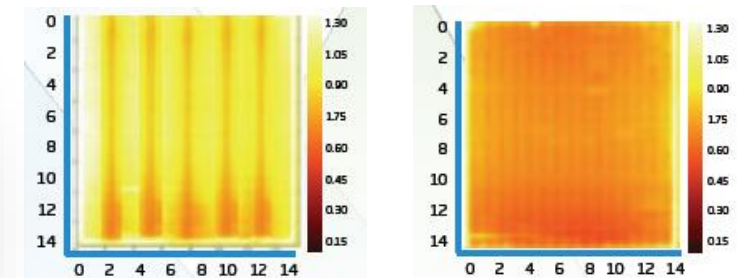
Thin ribbons 0,23-0,26mm



16BB TOPCon cell

Electrical Performance

Power Improvement 1%~1.5% (4-5Wp)



5BB

MBB

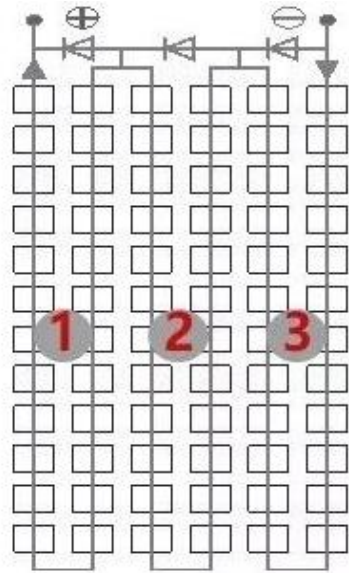


➤ Shorten current path ➤ Lower cells resistance

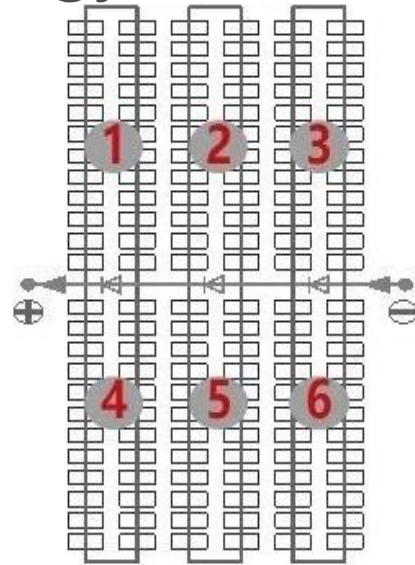
Module Efficiency Improvement  
0.4~0.6%



# New technology application: Half-cut Technology



Full-cell



Half-cut

$$P_{\text{Hot spot}} \approx \frac{1}{3} P_{\text{Module}}$$

$$P_{\text{Hot spot}} \approx \frac{1}{6} P_{\text{Module}}$$



- By using half-cut cell, the electrical current (i) flowing in each busbar is halved. Therefore, the amount of internal losses in a half-cut module is 1/4 of the full-cell module. High generating power, **low risk of hot spot**.
- Lower operating temperature (~2 centigrade), smaller temperature coefficient (~0.02% lower than full-cell), more power generation (3~4% more than full-cell module);
- The hot spot temperature is reduced by 10~ 20 centigrade, which greatly reduces the risk of hot spots.



# New technology application: Non-destructive cutting process

**THORNOVA** solar

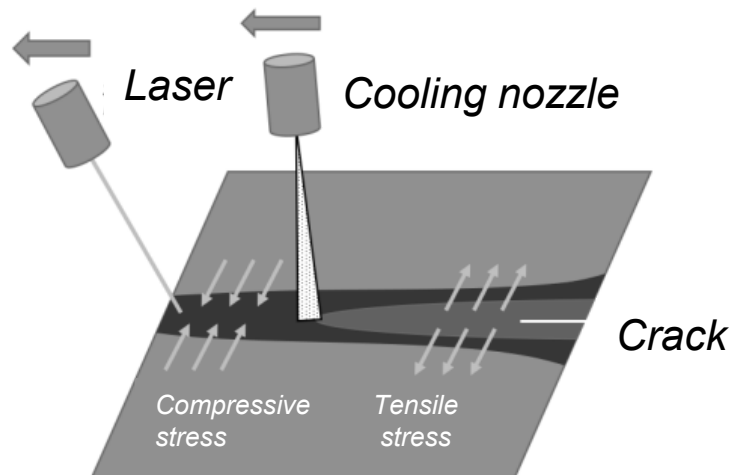


**SUNOVA SOLAR**

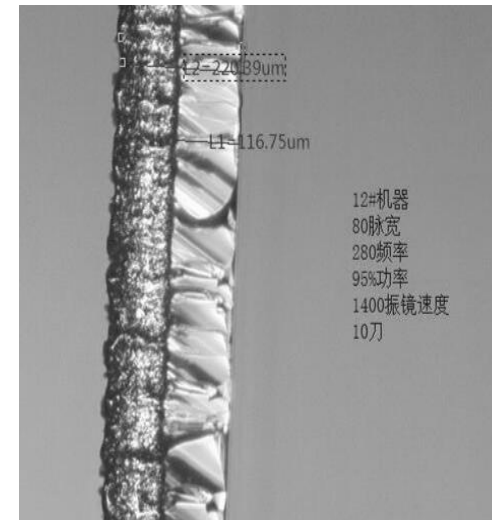
Pv Tech Expert.

- The product design of the module uses the smaller cell-to-cell distance, which reduces the distance from 2mm to 0.8mm, and it needs to implement the non-destructive cutting process.
- Non-destructive cutting technology does not form a cutting surface on the cutting edge of the cell, which can minimize the damage to the cell, reduce the welding crack and fragment, and improve the yield of the process.

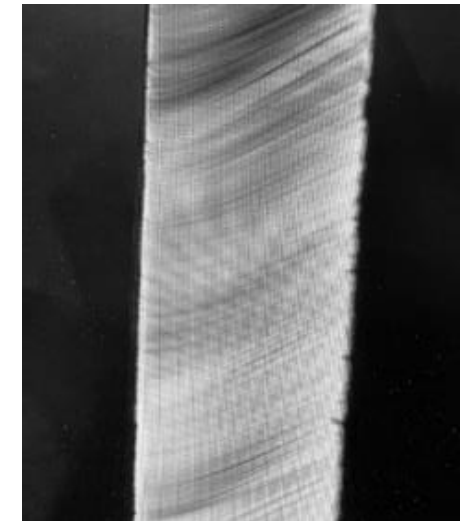
- *Non-destructive cutting process*



- *Normal laser cutting*



- *Non-destructive cutting*



# *3 TOPCon technology*

# TOPCon technology

## Advanced Technology:

A Mutually Beneficial Situation of Cost Reduction and Efficiency Improvement.

## Why TOPCon?

### 01 Investment Economics:

- More advanced technological processes
- Improved key equipment
- The investment economics of the current technology are more pronounced.

### 03 Cost Reduction:

- Use of thinner wafer  $\leq 130\mu\text{m}$
- Further cost reduction through optimization of BOM
- Can increase the potential for cost reduction.

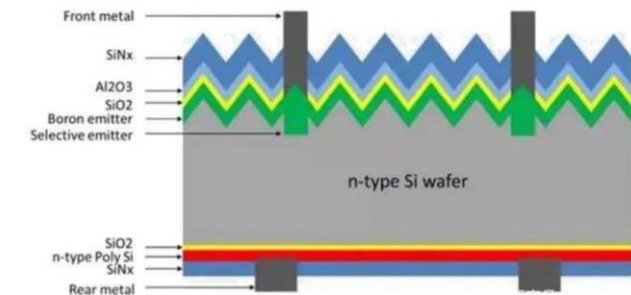
### 02 Significant Power Generation:

- Mass production cell conversion efficiency  $> 26\%$ .
- First-year degradation rate is  $\leq 1\%$ , and annual degradation is  $\leq 0.4\%$ .
- Bifacial rate of up to 85%.
- Increased power generation.

### 04 Great Potential for Improvement:

- Can be combined with x BC and other platform technologies.
- Theoretical efficiency of 28.7%.
- Has vast room for expansion and development potential

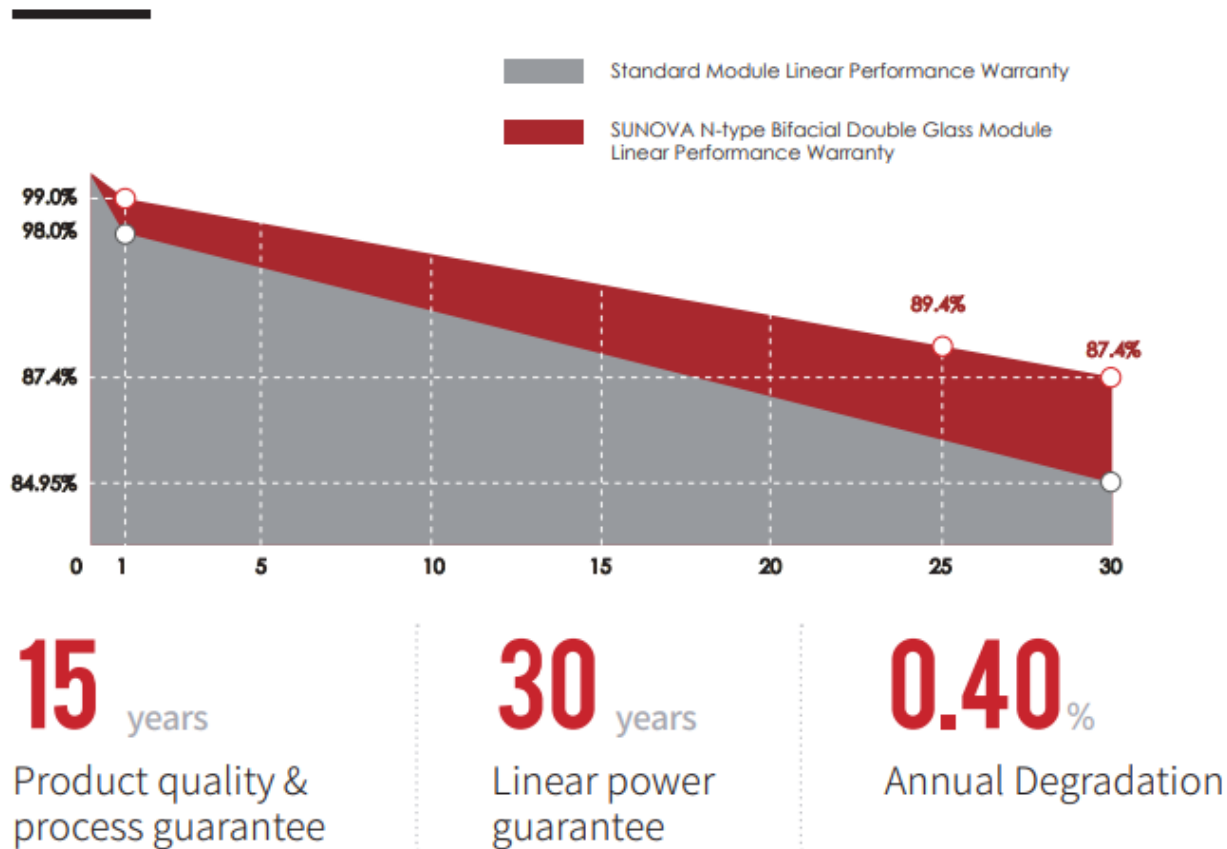
## Introduction of TOPCon Technology



Tunnel Oxide Passivated Contact Cell

# TOPCon advantages I: Better linear power

## LINEAR PERFORMANCE WARRANTY



*Lower degradation,  
better warranty,  
greatly increase the power  
generation (~1.8%).*

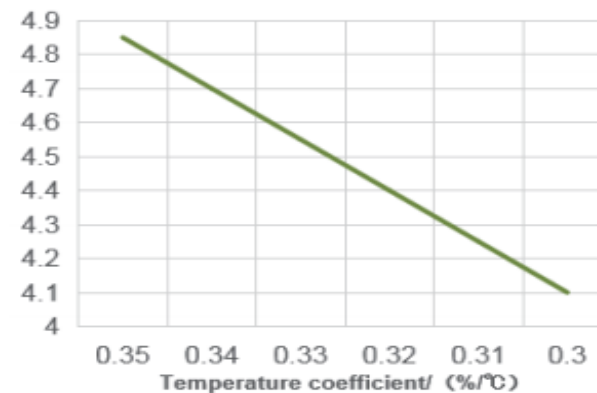
- Performance warranty for the N-TOPCon modules: 1<sup>st</sup> year degradation is 1%;
- The annual degradation over the next 29 years is 0.4%, ending with 87.4% power generation.

# TOPCon advantages II: Lower temperature coefficient

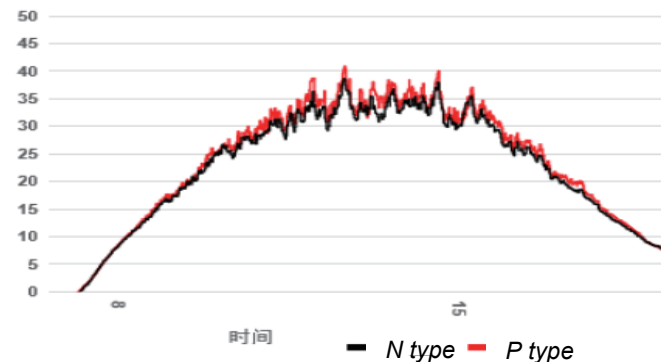
➤ The temperature coefficient of P type module is  $-0.33\%/^{\circ}\text{C}$ , and N-TOPCon module is  $-0.30\%/^{\circ}\text{C}$ .

- The output power decreases with the increase of temperature, and the N-type temperature coefficient is better than PERC (with an average increase of 0.75%);
- In the same external environment, the daily average working temperature is lower than PERC ( $<1\text{ }^{\circ}\text{C}$ ), and the heat loss is reduced;
- The power generation is particularly prominent in high temperature environment ( $\sim 2\%$  is higher than P type).

Temperature coefficient affects power loss



Operating temperature comparison



# TOPCon advantages III: The highest bifaciality is 85%



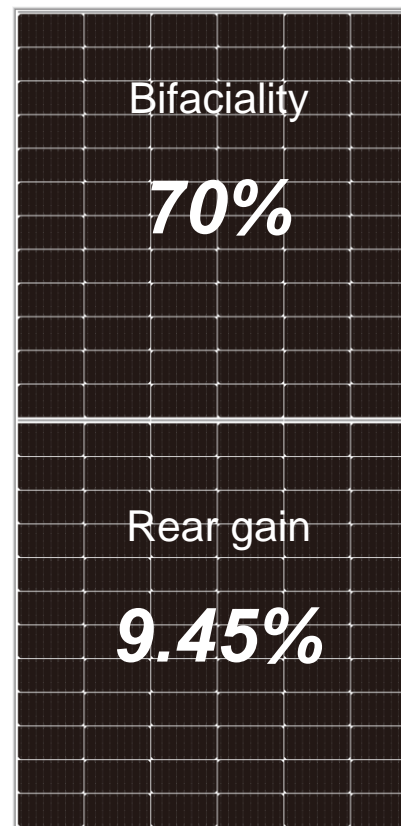
- The bifaciality of P-type bifacial PERC module is 70%;
- The bifaciality of N-type TOPCon module is as high as 85%;
- According to the following theoretical calculation formula, in a standard operating environment, the back gain of traditional PERC module is 9.45%;
- The N-type TOPCon is 11.48%;
- The power generation gain of N-type module is about 2%.

- Comparison of power generation gain caused by the increased bifaciality:
- PERC: BSI\*Bifi (70%) ≈9.45%
- TOPCon: BSI\*Bifi (80%) ≈11.48%

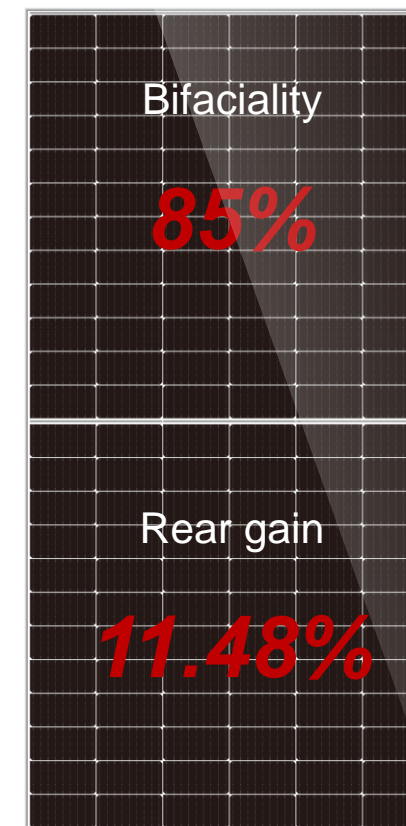
$$P_{\text{Integrated power}} = P_{\text{Front side}} * (1 + \text{BSI} * \text{Bifi})$$

\*Bifi: Module bifaciality

\*BSI: Irradiation coefficient under the bifacial stress environment (It depends on the actual irradiation and ground reflectivity)



*P-Type*



*N-Type*

# TOPCon advantages IV: Better low light performance



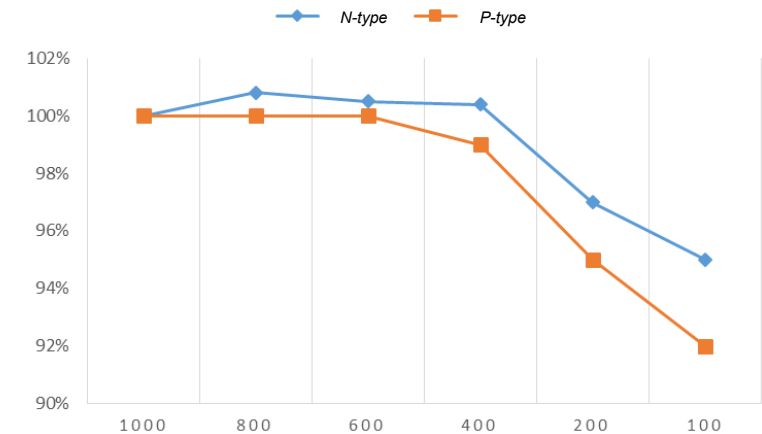
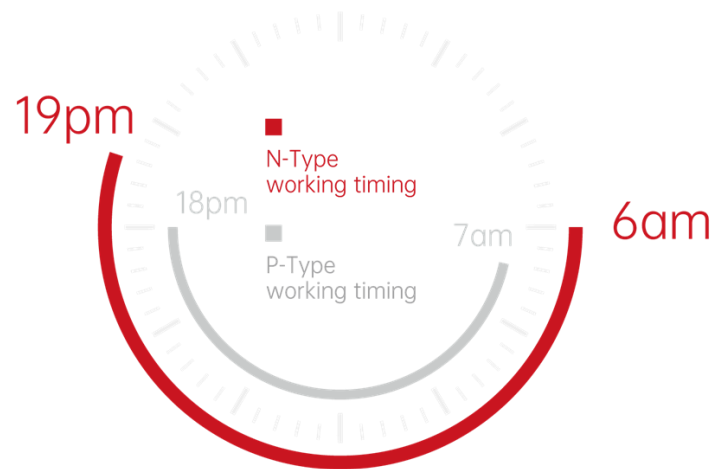
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*N-type cell, higher internal resistance, longer minority carrier life, naturally with better weak light response.*

# THE DIM WHITE LIGHT

- Compared with the traditional PERC module, N-type module has better responsive ability to weak light, and the power generation time is extended by around 1h in the morning and evening;
- For the weak light system, especially under  $600\text{W}/\text{m}^2$ , the weak light performance of N-type products is better than P-type products, more 98.5% under  $200\text{W}/\text{m}^2$ ;
- The power gain is more than **0.25%**.





# *4 Portfolio Sunova Solar*

# PORTFOLIO IDENTIFICATION



**Zosma™**

PERC modules

**Tangra™**

TOPCon modules

**Pro**

BIFACIAL modules (Double glass)

**HD**

TANGRA HD modules (TOPCON rectangular cells)

**Pro Alpine**

ALPINE (Residencial Bifacial - Heavy Snow Load – 8000Pa)

**Black**

FULL BLACK modules

# Sunova Perc Series: **Zosma™**



## A Rich Product Portfolio to Meet the Diversified Needs of Customers



Excellent low irradiance performance.



Optimized electrical design and lower operating current for reduced hot spot loss and better temperature coefficient.



Industry leading lowest thermal co-efficient of power.



Better light trapping and current collection to improve module power output and reliability.

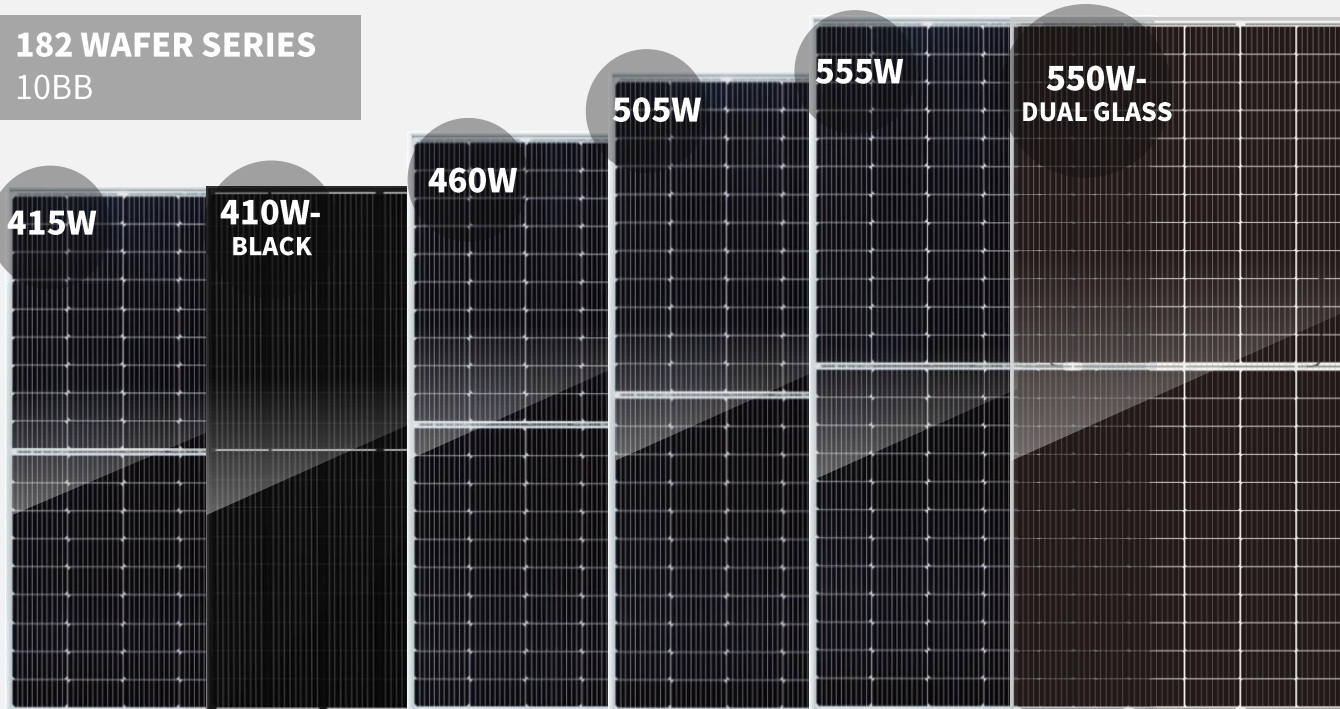


Certified to withstand: wind load (2400 Pa) and snow load (5400 Pa).



100% triple EL test enabling remarkable reduction of hidden crack rate of modules

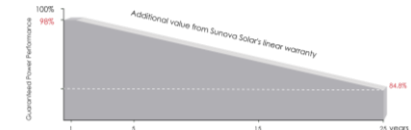
### 182 WAFER SERIES 10BB



**S** Light weight, small design, the best match for residential PV system.

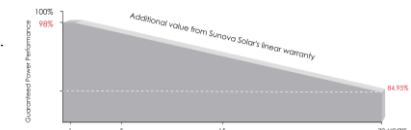
- Zosma S (400-415) 54MDH
- Zosma S Pro (400-415) 54MDH
- Zosma S Black (395-410)-54MDH
- Zosma S Pro Black (400-420)-54MDH
- Zosma S Pro Alpine Black (400-420)-54MDH
- Zosma S (440-460) 60MDH
- Zosma S Pro (445-465) 60MDH

#### Half-Cell Mono PERC Module



**15 YEARS** Product Warranty    **25 YEARS** Linear Warranty

#### Bifacial Dual Glass Module



**15 YEARS** Product Warranty    **30 YEARS** Linear Warranty

**M** Fully compatible with C&I roof-top and small scale ground-mounted solar station.

- Zosma M (490-505) 66MDH
- Zosma M Pro (490-510)-66MDH
- Zosma M Black (480-495)-66MDH
- Zosma M Pro (490-505) 66MDH
- Zosma M (540-555)-72MDH
- Zosma M Pro (540-560)-72MDH

#### Performance Insurance



**L** High power output, high efficiency, can effectively reduce the LCOE, suitable for utility solar projects.

#### Certifices

- Zosma L (580-595) 78MDH
- Zosma L (590-605) 60MDH G12
- Zosma L (650-670) 66MDH G12
- Zosma L Pro (595-610) 60MDH G12
- Zosma L Pro (650-670) 66MDH G12



# Sunova N-Type Series: **Tangra™**



Bifacial technology enables additional energy harvesting from rear side. (up to 30%)



Excellent low irradiance performance.



Optimized electrical design and lower operating current for reduced hot spot loss and better temperature coefficient.



30 years lifespan brings 10-30% additional power generation comparing with conventional P-type module.



Better light trapping and current collection to improve module power output and reliability.



Certified to withstand: wind load (2400 Pa) and snow load (5400 Pa).



N-type solar cell has no LID naturally which can increase power generation.

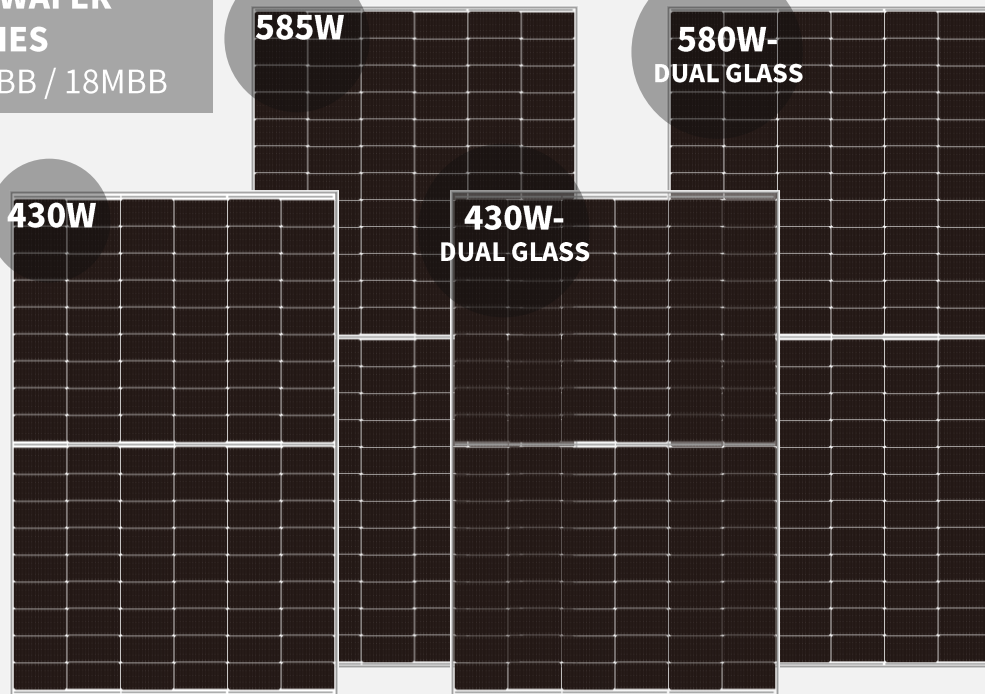


Industry leading lowest thermal co-efficient of power.



100% triple EL test enabling remarkable reduction of hidden crack rate of modules.

**182 WAFER SERIES**  
16MBB / 18MBB

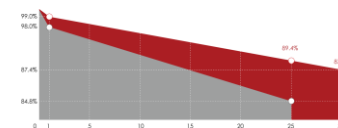


**S** Light weight, small design, the best match for residential PV system.

- Tangra S (420-440) 54MDH
- Tangra S Pro (420-440) 54MDH
- Tangra S Pro Alpine (420-440)-54MDH
- Tangra S Pro Black (420-440)-54MDH
- Tangra S (465-485) 60MDH
- Tangra S Pro (470-490) 60MDH

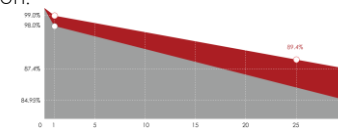
## Half-Cell Mono Module

Standard Module Linear Performance Warranty  
SUNOVA N-type High Efficiency Half-Cell Mono Module Linear Performance Warranty



## Bifacial Dual Glass Module

Standard Module Linear Performance Warranty  
SUNOVA N-type Bifacial Double Glass Module Linear Performance Warranty



**15** years Product quality & process guarantee  
**30** years Linear power guarantee  
**0.40%** Annual Degradation

**M** Fully compatible with C&I roof-top and small scale ground-mounted solar station.

- Tangra M (510-530) 66MDH
- Tangra M Pro (520-540) 66MDH
- Tangra M (560-580) 72MDH
- Tangra M Pro (570-590) 72MDH

## Performance Insurance



**L** High power output, high efficiency, can effectively reduce the LCOE, suitable for utility solar projects.

- Tangra L (610-630) 78MDH
- Tangra L Pro (600-635) 78MDH
- Tangra L Pro (620-645) 60MDH G12(T)
- Tangra L Pro (680-710) 66MDH G12(T)



# Residential full-black bifacial

**THORNOVA** solar



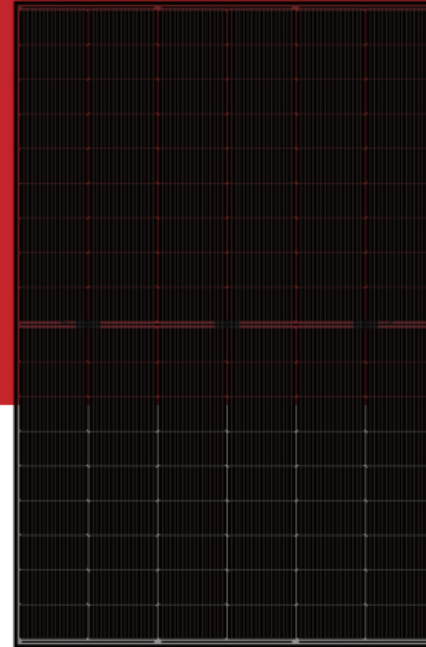
**SUNOVA SOLAR**

Pv Tech Expert.

## Tangra™ S Pro Black

### 425-440W (Full Black)

N-type TOPCon Bifacial Double Glass Mono Module



SS-BG430-54MDH(T)  
182 TOPCon 54 cells  
double glass  
24.2 Kg (1.95m<sup>2</sup>)

#### Maximum Power

440W

Current recommended power 430W

#### Better Temperature Coefficient

Power temperature coefficient  
( -0.30% -> -0.29%)

#### Linear Power Guarantee

30 years

#### Highest Efficiency

22.53% during 2024 up to 440W  
22,02%(Current efficiency)

#### Size

Cell Size: **M10 182x182 mm** half-cut  
Module Size: 1722 x 1134 x 30 mm

#### Lower Power Degradation:

First-year degradation  $\leq 1\%$ ,  
Annual degradation  $\leq 0.4\%$

#### Bifacial

Up to 85% bifacial rate  
Also available in mofacial, silver or black frame.

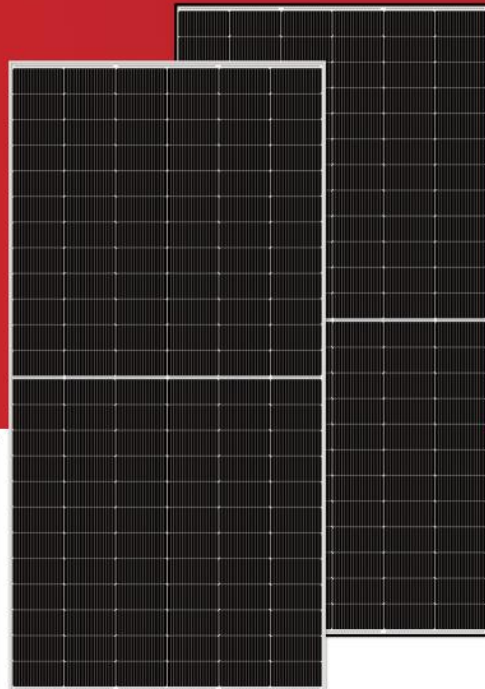
#### Resistant to severe conditions

HW4 HAIL TEST (IEC 61215) and fire protection  
class A

## Tangra™ M Pro

### 565-585W

N-type TOPCon Bifacial Double Glass Mono Module



#### Maximum Power

585W

580W(current recommended power)

#### Better Temperature Coefficient

Power temperature coefficient

( -0.30% -> -0.29%)

#### Linear Power Guarantee

30 years

SS-580-72MDH(T) / SS-BG580-72MDH(T)  
182 TOPCon 72 single / double glass  
27.6kg / 32.3Kg

#### ◀ Highest Efficiency

22.7%

22,5%(Current efficiency)

#### ◀ Size

Cell Size: M10 182x182 mm half-cut

Module Size: 2278 x 1134 x 30 mm

#### ◀ Lower Power Degradation:

First-year degradation  $\leq 1\%$ ,

Annual degradation  $\leq 0.4\%$

#### ◀ Bifacial

Up to 85% bifacial rate

Also available in single glass, silver or black frame.

# High Efficiency N-Type Utility

## Maximum Power

710W  
690 or 700W (Current recommended)

## Higher Bifacial Rate

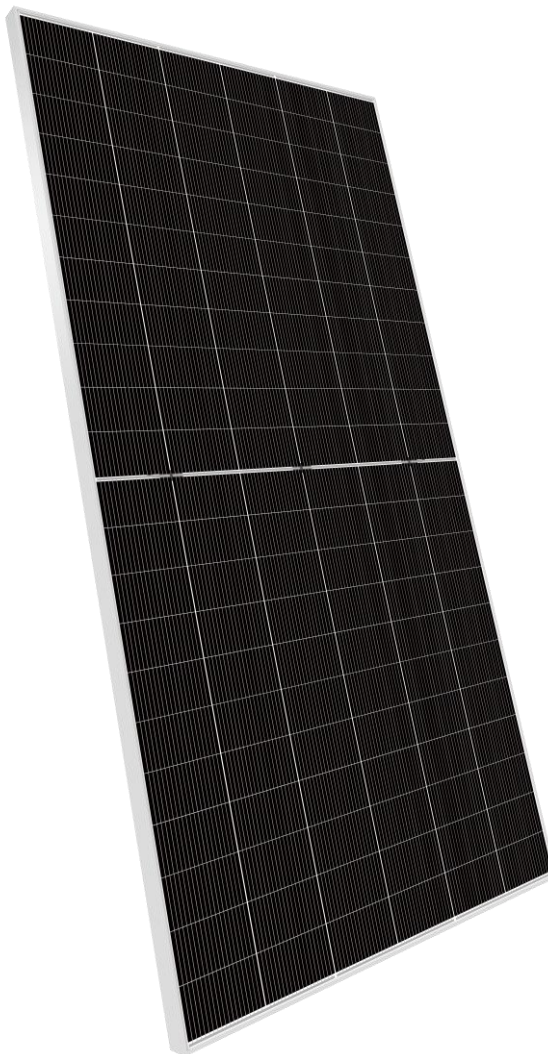
Up to 85%

## Better Temperature Coefficient

Power temperature coefficient  
( -0.30% -> -0.29%)

## Linear Power Guarantee

30 years



## Highest Efficiency

22,9%  
22.5 - 22.7% (current efficiencies)

## Size

Cell Size: G12 cells 210 \* 210 mm  
Module Size: 2384 \* 1303 \* 35 mm

## Lower Power Degradation:

First-year degradation  $\leq 1\%$ ,  
Annual degradation  $\leq 0.4\%$

## Improved Low Irradiation Response

Excellent long and short-wave spectral response ensures continuous power generation

# N-Type Series: **Tangra™ HD**



Bifacial technology enables additional energy harvesting from rear side. (up to 30%)



Excellent low irradiance performance.



Optimized electrical design and lower operating current for reduced hot spot loss and better temperature coefficient.



30 years lifespan brings 10-30% additional power generation comparing with conventional P-type module.



Better light trapping and current collection to improve module power output and reliability.



Certified to withstand: wind load (2400 Pa) and snow load (5400 Pa).



N-type solar cell has no LID naturally which can increase power generation.

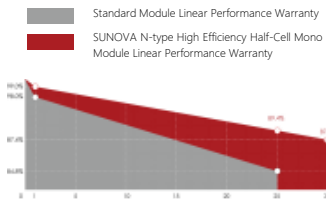


Industry leading lowest thermal co-efficient of power.

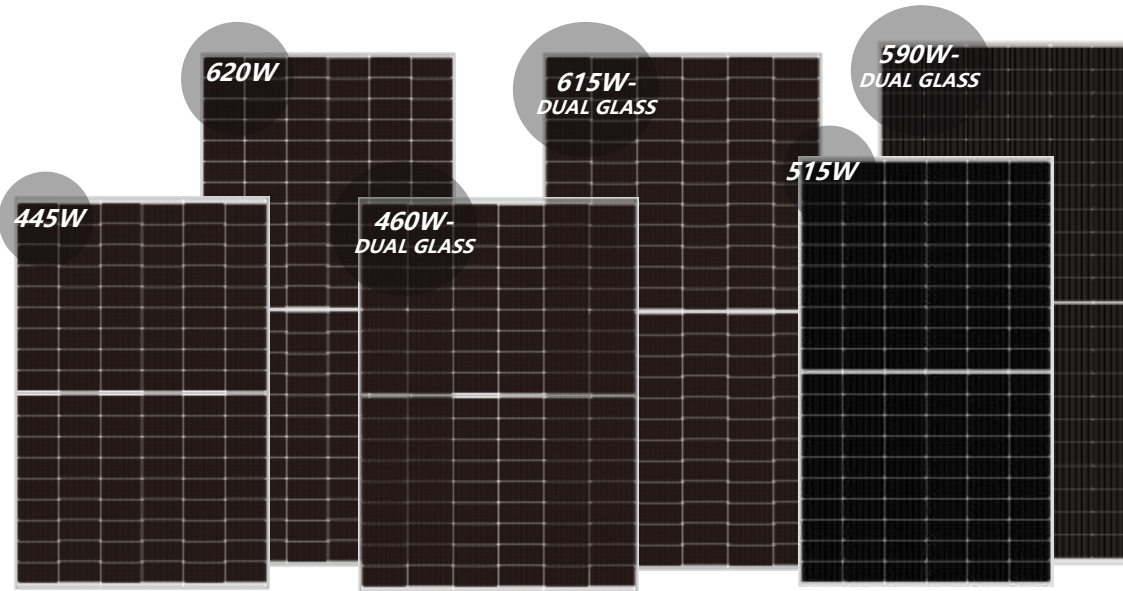
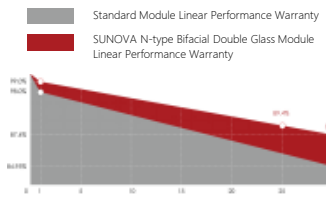


100% triple EL test enabling remarkable reduction of hidden crack rate of modules.

Half-Cell Mono Module



Bifacial Dual Glass Module



**S** **182x186mm**  
 Tangra S HD (425-445)-54MDH  
 Tangra S HD Black (425-445)-54MDH  
 Tangra S Pro HD (425-445)-54MDH

**S** **182x191.6mm**  
 Tangra S HD (445-465)-54MDH-G10  
 Tangra S Pro HD (445-460)-54MDH-G10  
**M** Tangra M HD (495-515)-60MDH-G10  
 Tangra M Pro HD (495-510)-60MDH-G10  
 Tangra M HD (545-565)-66MDH-G10  
 Tangra M Pro HD (545-560)-66MDH-G10

**L** Tangra L HD (600-620) 72MDH-G10  
 Tangra L Pro HD (595-615) 72MDH-G10

**M** **182x199mm**  
 Tangra M Pro HD (565-590)-66MDH-G13

**15** years Product quality & process guarantee  
**30** years Linear power guarantee  
**0.40%** Annual Degradation



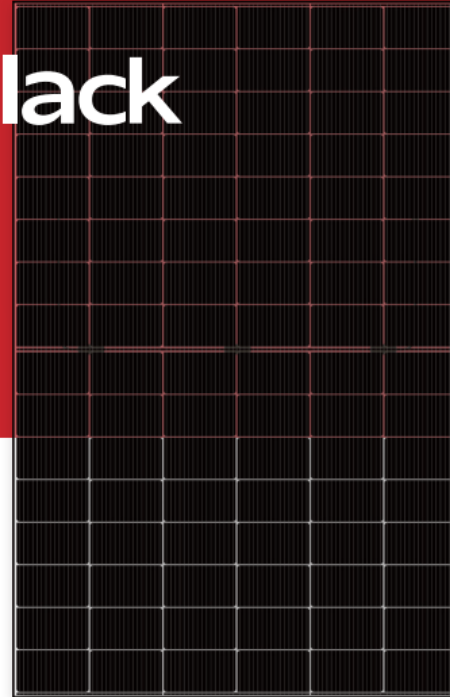


# Residential Full-black

## Tangra™ S Pro HD Black

### 435-445W

N-type TOPCon High Density Bifacial Double Glass Mono Module (FULL BLACK)



SS-BG445-48MDH-G11(T)  
Rectangular TOPCon 48 cells  
Double glass  
25.9Kg (2.04m<sup>2</sup>)

#### Maximum Power ▶

445W

#### Better Temperature Coefficient ▶

Power temperature coefficient  
( -0.30% -> -0.29%)

#### Linear Power Guarantee ▶

30 years

#### ◀ Highest Efficiency

22,3%

#### ◀ Size

Cell Size: G11 182x210mm half-cut  
Module Size: 1762 x 1134 x 30 mm

#### ◀ Lower Power Degradation:

First-year degradation ≤1 %,  
Annual degradation ≤ 0.4%

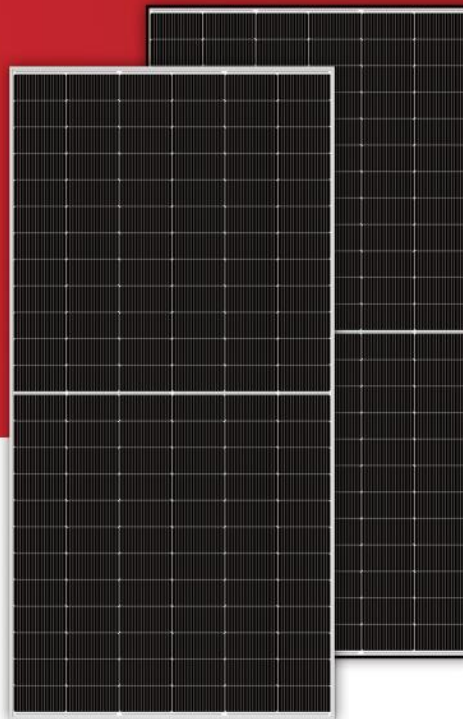
#### ◀ Double glass

Up to 85% bifacial rate

## Tangra™ L Pro HD

### 600-620W

N-type TOPCon High Density Bifacial Double Glass Mono Module



#### Maximum Power

620W

610W (Current recommended power)

#### Better Temperature Coefficient

Power temperature coefficient  
( -0.30% -> -0.29%)

#### Linear Power Guarantee

30 years

SS-610-72MDH-G10(T)  
Rectangular TOPCon 72 cells  
Double glass  
32,5Kg

#### ◀ Highest Efficiency

23%

22,6% (Current efficiency)

#### ◀ Size

Cell Size: G10 182x191 mm half-cut

Module Size: 2382 x 1134 x 30 mm

#### ◀ Lower Power Degradation:

First-year degradation  $\leq 1\%$ ,

Annual degradation  $\leq 0.4\%$

#### ◀ Bifacial

Up to 85% bifacial rate

Also available in bifacial, silver or black frame.

# Example for installation 57.2Kw



**SUNOVA SOLAR**

Pv Tech Expert.

Compared with PERC modules, Ntype TOPCon can increase up to **10,5%** our installation peak power

<b>Module Cell size</b>	<b>182-72P M10</b>	<b>182-72N M10</b>	<b>191-72N G10</b>
Maximum power (W)	550	580	610
Isc(A)	14.04	13.61	14.59
Voc(V)	49.6	51.9	52.64
Quantity/String(max)	26	26	26
String/Tracker	4	4	4
Total modules	<b>104</b>	<b>104</b>	<b>104</b>
Total power (KW)	<b>57.20</b>	<b>60.32</b>	<b>63.44</b>
Power increase	<b>Benchmark</b>	<b>+5,4%</b>	<b>+10,5%</b>

# *5 Case study*

# Case 1 – UTILITY 2MW



*Small utility (2 MW), in Suzhou city, Jiangsu province, China as example.*



## *Small Utility*

**PERC 550 W**

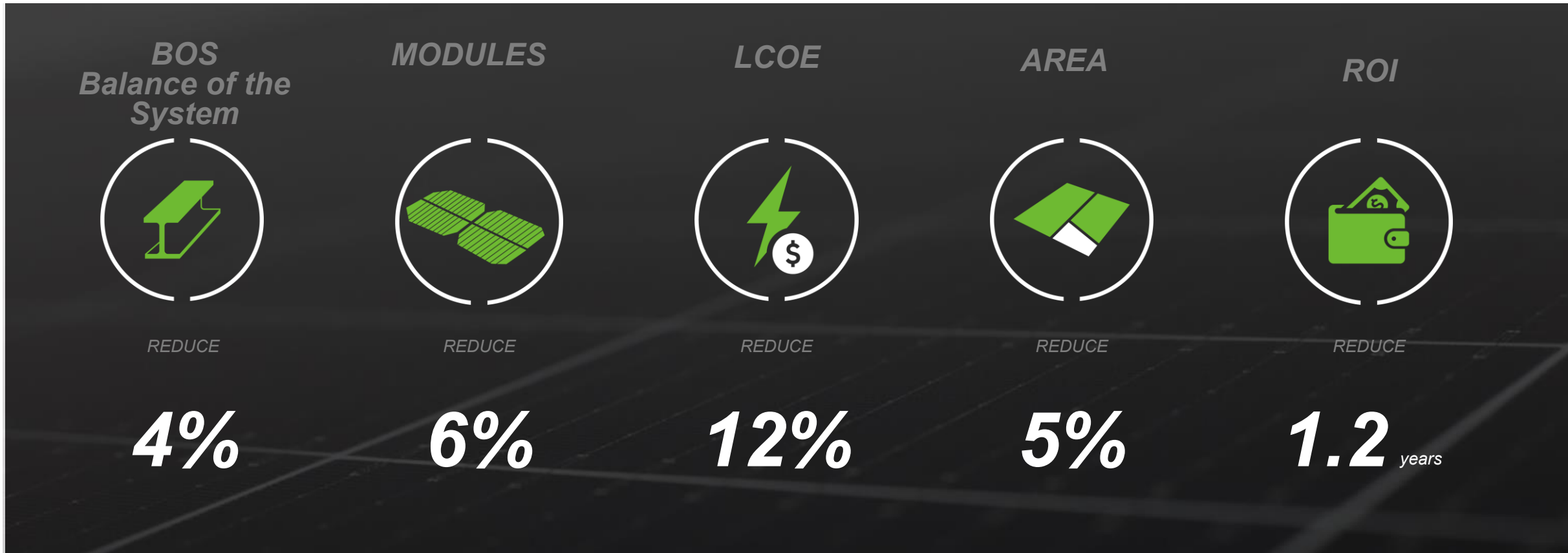
*Upgrade To*

**N-type 575 W**

**Tangra™**

# Case 1 – UTILITY 2MW

*Small utility (2 MW), in Suzhou city, Jiangsu province, China as example.*



# 6 *Certificates*

# Certificates



- IEC 61215 – PV Module Safety
- IEC 61730 – PV Design qualification and type approval
- Previous standard 2016-2018 and newest standard 2022-2023
- IEC 61701 - SALT MIST
- IEC 62804 - PID
- IEC 60068 - DUST AND SAND
- IEC 62716 - AMMONIA
- CE certificate / declarations
- Rohs and REACH
- Other certificates:
- Fire resistance class A (IEC), fire class 1 (Italy), CO2 footprint (France), MSC (UK), UL (USA y Canada), local certifications for Colombia, Pakistan, Chile, Japón, india, Brasil, etc..

The collage features several key certificates:
 

- Occupational Health and Safety Management System Certification:** Issued to Sunova Solar Technology Co., Ltd. for their production and sales of solar photovoltaic modules.
- Environmental Management System Certification:** Issued to Sunova Solar Technology Co., Ltd. for their production and sales of solar photovoltaic modules.
- TÜV NORD Type Tested Certificate:** For Crystalline Silicon Terrestrial Photovoltaic (PV) Modules, covering IEC 61215-1-2016, IEC 61215-2-2016, IEC 61730-1-2016, and IEC 61730-2-2016.
- CE and REACH Declarations:** Confirming compliance with European standards.

Three green DEKRA certified logos for Type Approved Photovoltaic modules, each with a unique certification ID:
 

- DEKRA certified Cert. ID: 31-125889**
- DEKRA certified Cert. ID: 31-125890**
- DEKRA certified Cert. ID: 31-125880**



# Sustainable Development

*Awarded the title of Green Factory*





# Sustainable Development

## ESG REPORT

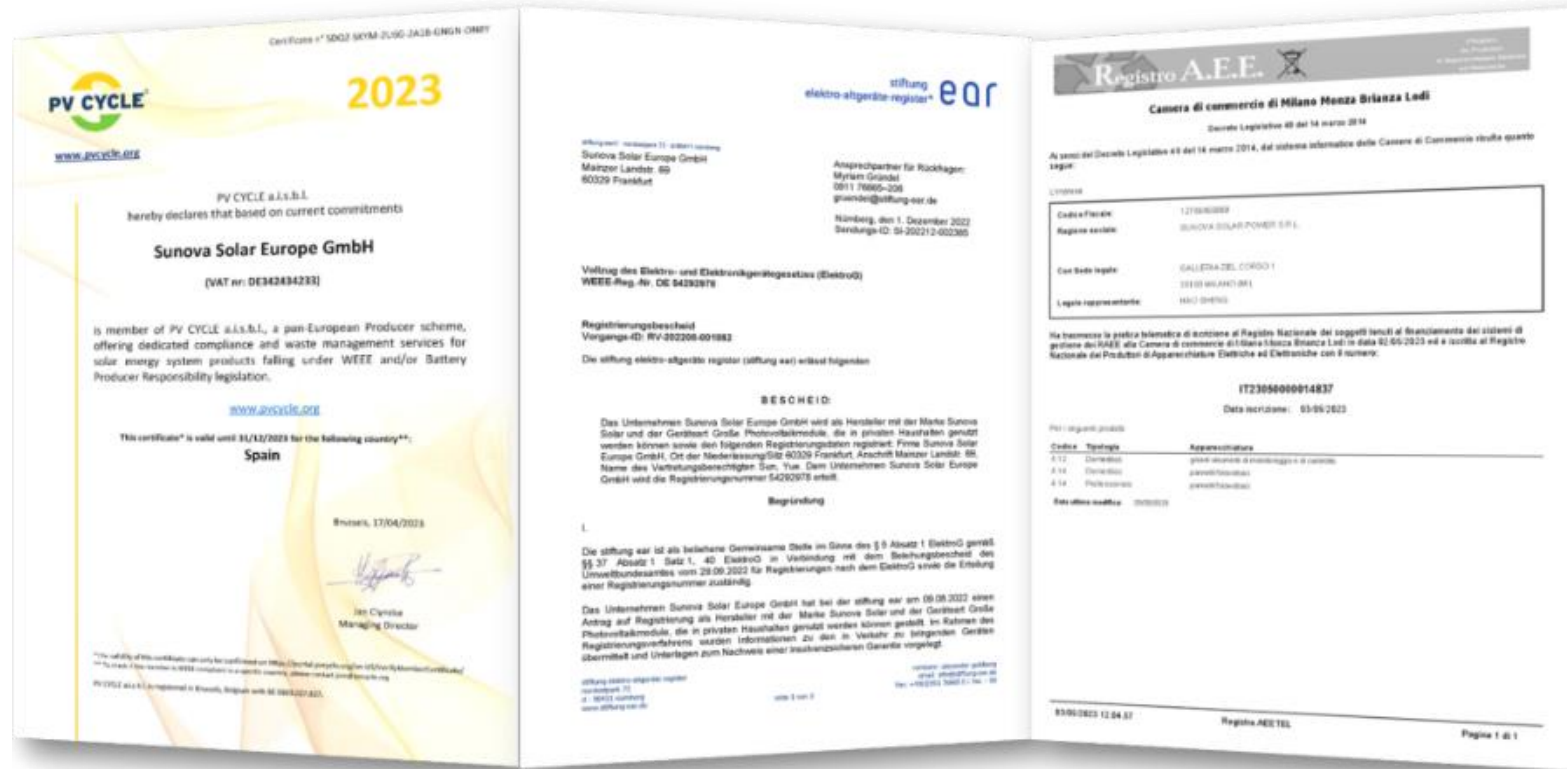
Certificate Authority



Acquisition Time  
December 2023



# Sustainable Development



PV CYCLE

WEEE

A.E.E.

# Anti-Forced Labour

SocialAccountability8000 (SA8000)

**THORNOVA** solar



**SUNOVA SOLAR**

Pv Tech Expert.



## SUNOVA SOLAR ANTI-FORCED LABOR DECLARATION

Here, in Sunova Solar Technology Co., Ltd, human rights are always a top priority for us. We have a zero-tolerance policy for human trafficking or slavery. For whom works at or with Sunova Solar, we are committed to treating everyone with respect, and takes seriously and fully supports national and international efforts to end any forms or kinds of modern slavery, servitude, forced or compulsory labor, and human trafficking in any places.

As always, Sunova Solar strictly follows the "ISO 45001 occupational health and safety management system", we devoted in being a company that provides our employees with a free, fair and just platform for self-growth, and strive to transmit the highest moral, ethical and legal values to the public; Besides, we devoted in fair recruitment, promotion and compensation; illegal forced labor and child labor are prohibited.

At the same time, we opposed resolutely to discriminate on the basis of race, color, religion, gender identity, sexual orientation, national origin, age, disability or genetic information.

This commitment also extends to the use of any factory or sub-vendors who make or assemble Sunova Solar products.

We are **not** using below companies' poly silicon in Sunova Solar cells and modules production.

- Hoshine Silicon Industry (Shanshan) Co., Ltd
- Xinjiang Daqo New Energy Co., Ltd
- Xinjiang East Hope Nonferrous Metals Co., Ltd
- Xinjiang GCL New Energy Materials Technology Co., Ltd
- Xinjiang Production and Construction Corps (XPCC)

Wuxi, China, Oct 8th 2022



# *7 New developments 2024*

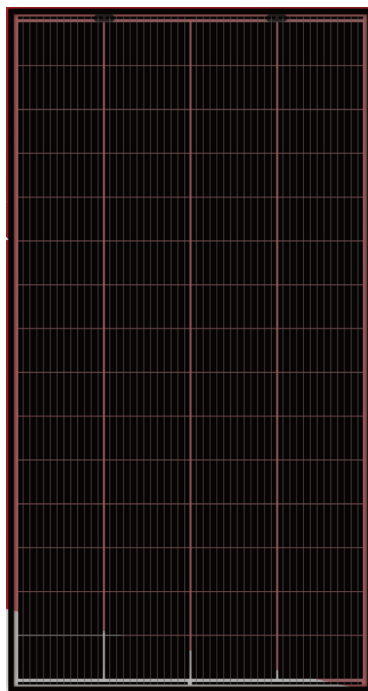
# Differentiated Products

➤ Small PV module (300-325W) PERC/TOPCON G12 (210mm) **(1650 x 880 x 30 mm) BIFACIAL - FULL BLACK**

Very light and easy to handle by only 1 person. Fire class A (IEC)

**Ideal for small roofs, façade integration and balcony applications**

**Repowering / revamping or rural projects**



**Zosma™ S Pro Black**  
**300W**

**Tangra™ S Pro Black**  
**310-325W** (Full black)

Module size (L*W*H)	1650 x 880 x 30 mm
Weight	18.5 kg
Cell	60 monocrystalline half cut cells (4x15)
Front Glass	2.0mm, Anti-Reflection Coating
Back Glass	2.0mm, Heat Strengthened Glass
Frame	Black anodized aluminum alloy
Junction box	IP68
Output wire	4.0 mm <sup>2</sup>
Wire length	300mm/1200mm/customized
Connector	MC4 Compatible
Allowable Hail Load	25 mm iceball with velocity of 23 m/s
Packing Specification	36 pcs/Pallet; 1008 pcs/40'HQ

# Differentiated Products

**THORNOVA** solar



**SUNOVA SOLAR**

Pv Tech Expert.

# HEAVY SNOW

**SCENE**



Snow Load

**8000 Pa**

*Alp3 / Alp3 (DIBT)*

*Maximum Power: 425 W*

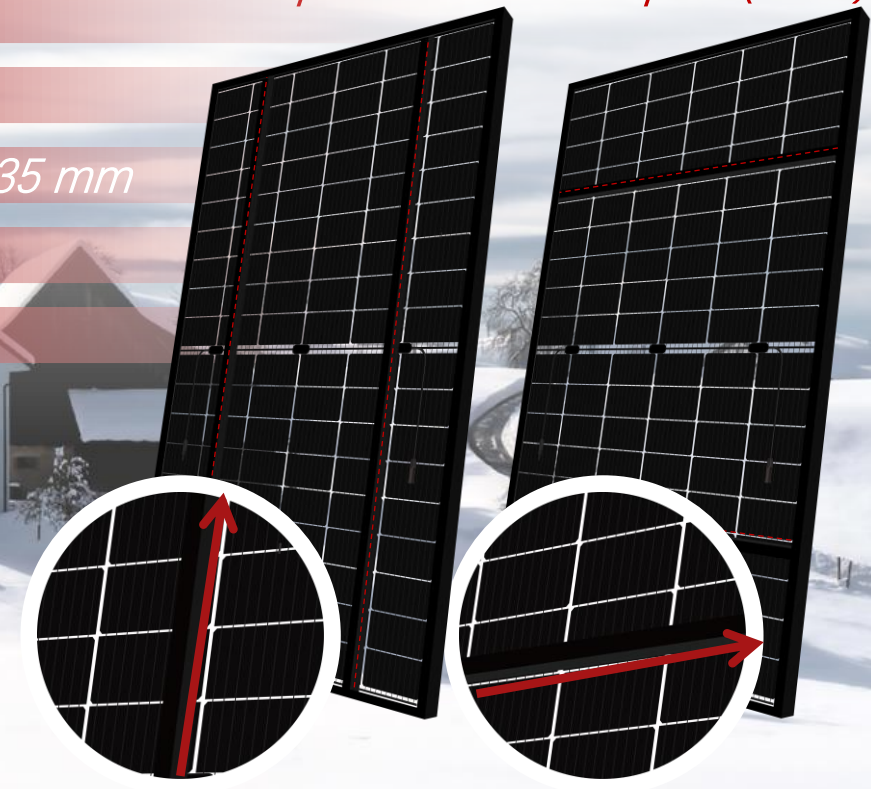
*Module Size: 1722 \* 1134 \* 35 mm*

*Module Efficiency: 21.8%*

*Product Warranty: 25 Years*

*Alp3*

*Alp3 (DIBT)*



# Differentiated Products

## *Agricultural PV SCENE*

*Brilliant (DIBT)*

*Maximum Power: 235 W*

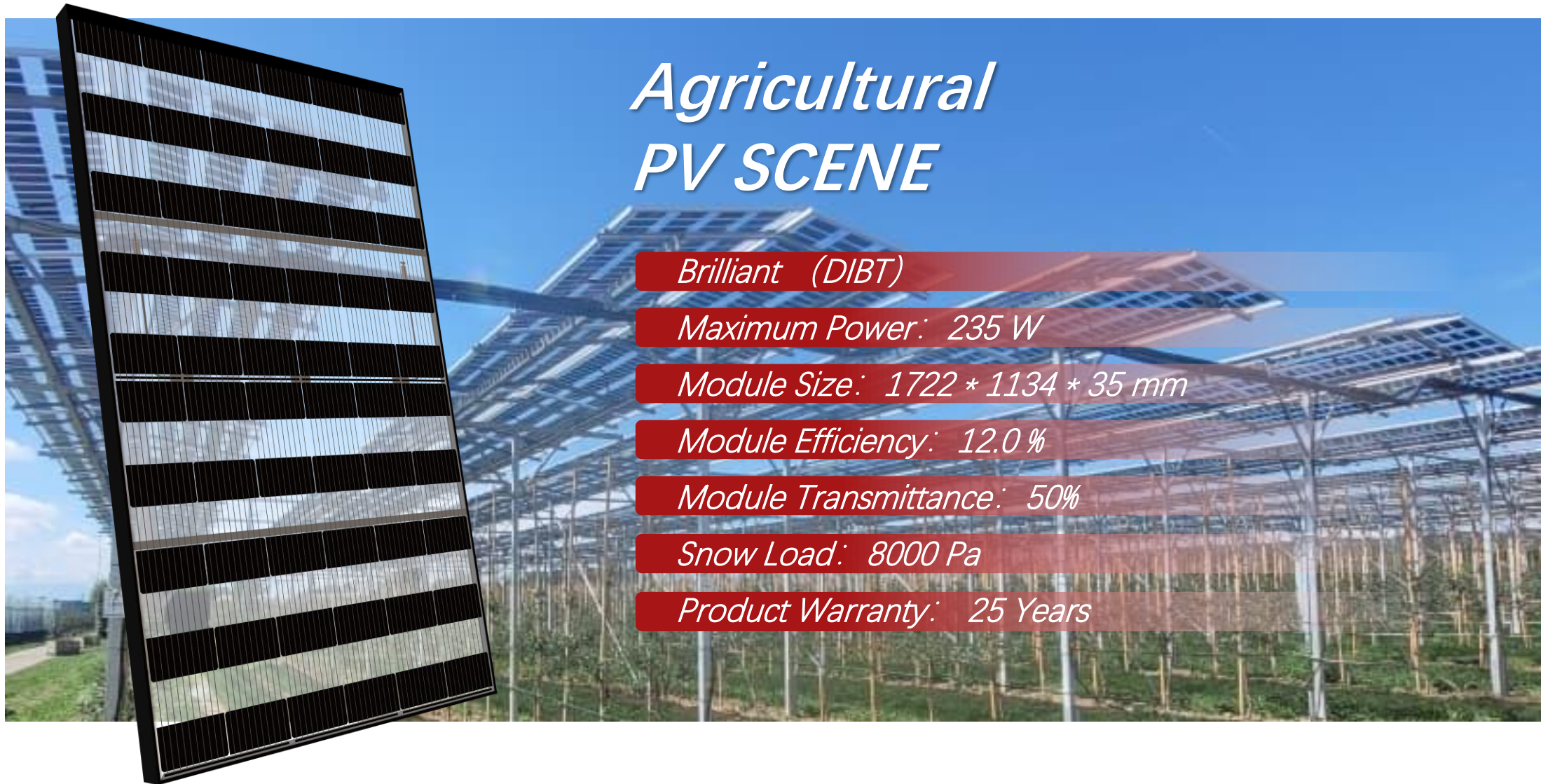
*Module Size: 1722 \* 1134 \* 35 mm*

*Module Efficiency: 12.0 %*

*Module Transmittance: 50%*

*Snow Load: 8000 Pa*

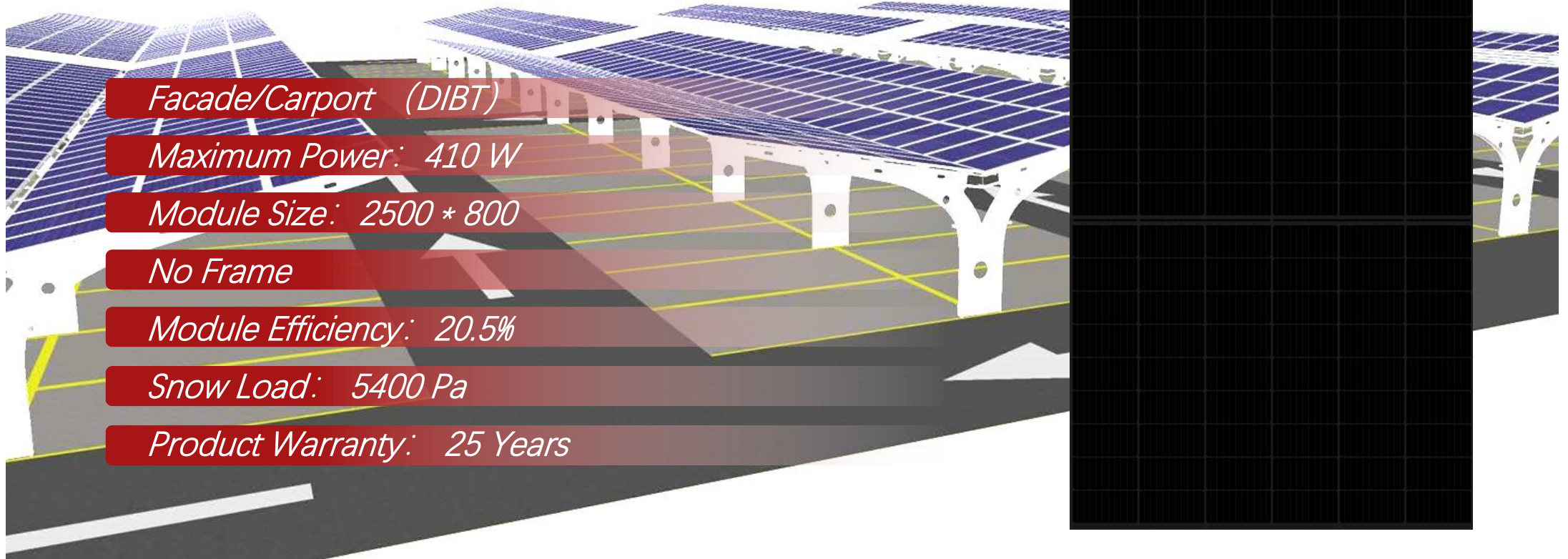
*Product Warranty: 25 Years*





# Differentiated Products

## *CARPORT PV SCENE*



*Facade/Carport (DIBT)*

*Maximum Power: 410 W*

*Module Size: 2500 \* 800*

*No Frame*

*Module Efficiency: 20.5%*

*Snow Load: 5400 Pa*

*Product Warranty: 25 Years*

# Differentiated Products

## *Smart Balcony Solar Kit*

*410W Solar Panel × 2*

*+600W/800W Microinverter × 1*

*+PV Balcony Mount ( Optional) × 2*

*+AC Cable ( 5m × 1 )*

*+DC Cable ( 1m × 1 pair )*

# Differentiated Products

## *Smart Garden Solar Kit*

*440W Solar Panel × 1*

*+400W Microinverter × 1*

*+PV Garden Mount × 1*

*+AC Cable ( 5m × 1 )*

*+DC Cable ( 1m × 1 pair )*



***8 Project  
References  
Commercial &  
Industrial***

# Project References



1.5 MW / 410 W

Neuhausen, Germany

# Project References



900 kW / 450 W

Czech

# Project References



990 kW / 550 W

Madrid, Spain

# Project References



500 kW / 410 W

Sweden



# Project References



300 kW / 410 W

Germany

# Project References



300 kW / 410 W

San Simon, Philippines

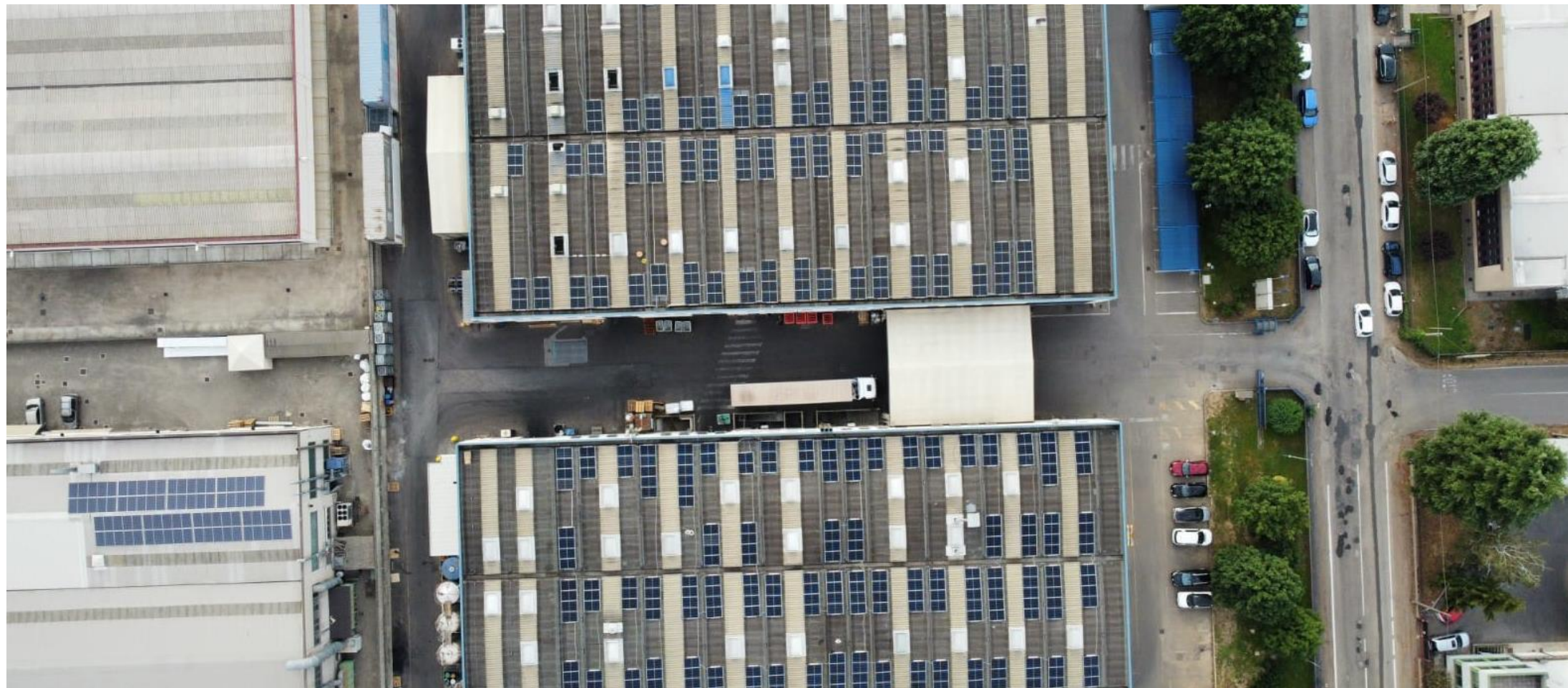
# Project References



220.14 kW

Germany

# Project References



200 kW

Italy

# Project References



107.8 kW / 550 W

Elias Fausto – São Paulo, Brazil

***8 Project  
References  
Utility***

# Project References



Module: SS-550-72MDH



中国华能集团有限公司  
CHINA HUANENG GROUP CO., LTD.

300 MW

Liaoning · China



# Project References



Module: SS-545-72MDH

**Powerfield**

Financial  
Bank

**LB≡BW** & *Rabobank*

33.4 MW (of 122.8 MW)

Wolvega, The Netherlands





# Project References



8.93 MW

Calarasi County, Romania



# Project References



16.368 MW

40090 Uchacq et Parentis, France



# Project References



Financial  
Bank

INTESA  SANPAOLO

9.99 MW

92026 Favara Sicilia, Italy



# Project References



6.28 MW

Município de Erval Seco RS



# Project References



Module: SS-550-72MDH

**Âmbar**  
ENERGIA

Financial  
Bank

btg pactual

5.17 MW

São Paulo, SP, Brazil



# Project References



5.63MW

Gegharkunik province, Armenia



# Project References



6.7 MW

Vauxhaul, Alberta, Canada



# Project References



5.34 MW

2.190 Greycourt Rd, Chester, NY 10918, US







Make It Happen

