

Exploring the infinite possibilities of N-type TOPCon

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N-type Topcon ignites engine of future energy revolution

Powitt Solar Co., Ltd

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Premium Quality Solar PV & Energy Integrator

18 YEARS

Solar Industry Experience

2.1 GW

PV Module Capacity

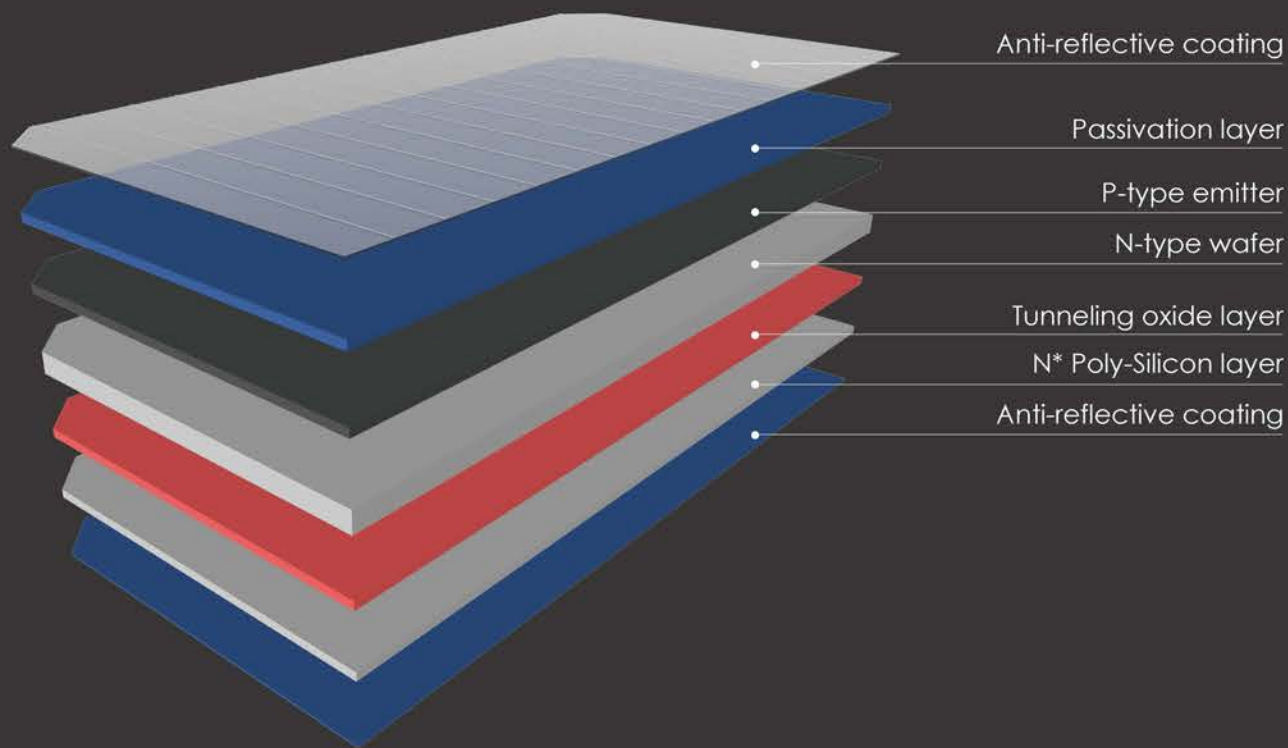
8.5 GW

Shipment of PV Module

90 +

Export Countries

The design of TOPCON cell structure minimizes the recombination losses and enhances electron flow, leading to higher conversion efficiencies.



N-Type TOPCon is Maturing

In the realm of photovoltaic technology, N-type TOPCon (Tunnel Oxide Passivated Contact) solar cells are rapidly advancing from innovative research to mainstream application. As the solar industry continues its relentless pursuit of higher efficiency and lower costs, N-type TOPCon technology stands out as a game-changer, promising significant improvements in performance and durability over traditional P-type cells.


Higher efficiency


Uniform electrical performance


Low-temperature coefficient


High reliability


Weak hot spot effect


Low LETID, LID

Excellent Efficiency and Performance

The N-type solar panel adopts the most advanced semiconductor technology and has higher photoelectric conversion efficiency. Compared with traditional P-type solar cells, N-type solar cells perform better in low-light and high-temperature environments, providing more stable and higher energy output. This means that regardless of the weather, the N-type solar cell panel can provide you with reliable power support.



Longer Power Output Warranty

N-type solar panels have lower light-induced decay (LID) and higher resistance to light-induced decay (LETID), making them highly efficient in long-term use. Its unique design and high-quality materials ensure the durability of the solar cell, making it have a longer service life and lower maintenance costs.

N-type solar modules have **30 years** linear power warranty,





Renewable Energy Plant



Solar Irrigation Pump



Solar Floating System



Commercial Rooftop



Residential PV System



Agricultural Projects

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Wide Range of Application Scenarios

Whether it's the residential roof, commercial building, or large solar power plant, N-type solar panels can provide the best solution. Its high efficiency and reliability make it an ideal choice for various application scenarios, meeting the energy needs of different users.



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Economic Benefits

Although the initial investment may be slightly higher, N-type solar panels, with their high efficiency and long lifespan, can significantly reduce energy costs and improve investment returns throughout their entire life-cycle. For businesses and households who hope to achieve energy conservation and emission reduction through renewable energy, this is a wise investment.

Environmental Protection

The production process of N-type solar panels is more environmentally friendly, reducing the usage and emissions of harmful substances. By adopting this advanced technology, you can not only reduce your carbon footprint but also contribute to environmental protection and promote sustainable development goals.



N-Type VS P-Type

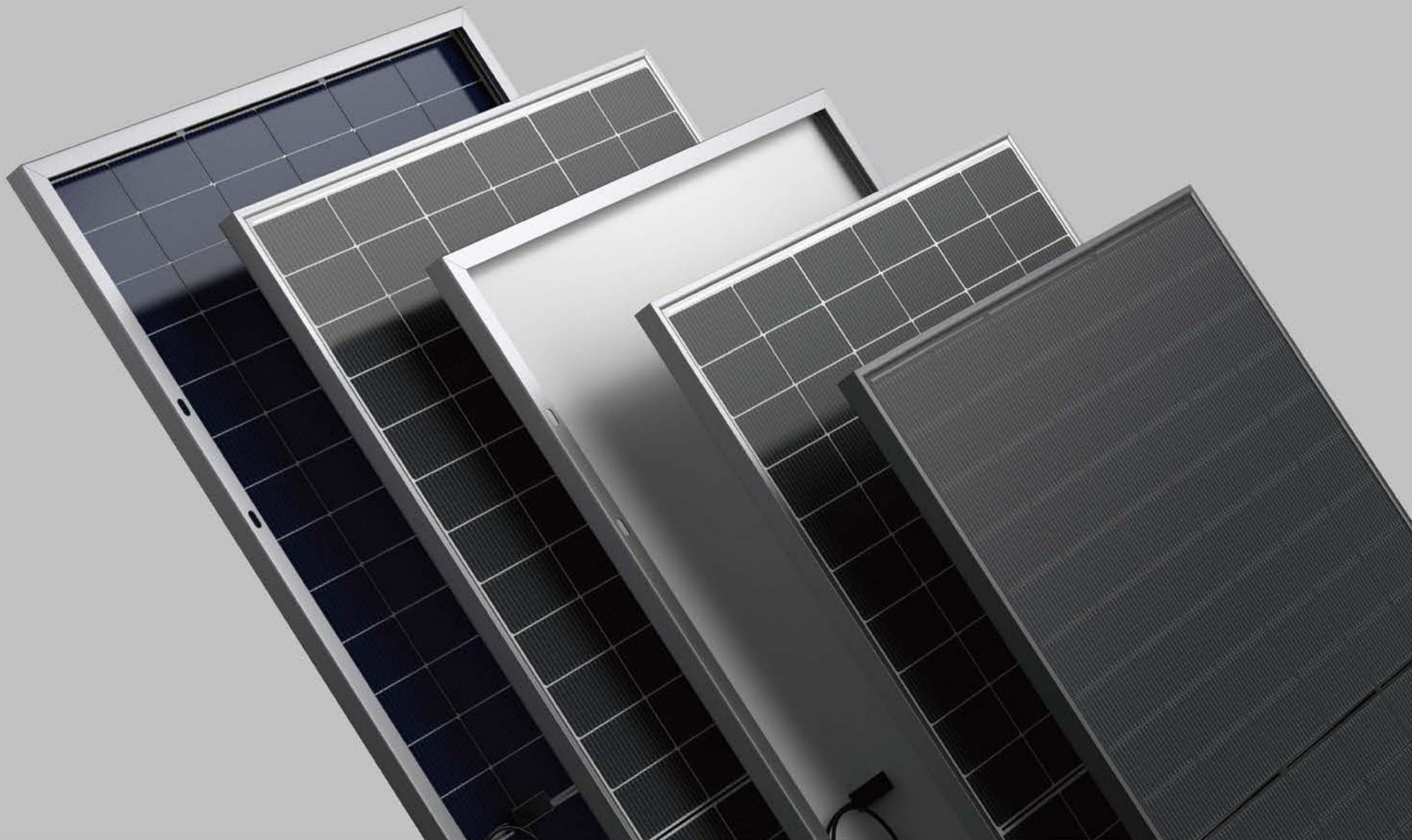
► Degradation:

Solar Module	First-year degradation	Linear degradation
N-Type(TOPCON)	1%	0.40%
P-Type(PERC)	2%	0.45%

► Power Temperature Coefficient:

N-Type(TOPCON): **-0.30%/°C**

P-Type(PERC): **-0.35%/°C**



Powitt N-type Series

Product Type	PW-54M440HM10	PW-72M585HM10	PW-60M635HG12	PW-66M700HG12-BD
Module dimension [mm]	1722x1134x30	2278x1134x30	2172x1303x35	2384 x1303 x35
Maximum power (Pmax)[W]	440	585	635	700
Maximum power voltage (Vmpp)[V]	32.28	45.25	36.3	41.78
Maximum power current (Impp)[A]	13.64	12.93	17.5	16.77
Open-circuit voltage (Voc)[V]	39.07	53.00	43.5	49.83
Short-circuit current (Isc)[A]	14.41	13.54	18.46	17.82
Module efficiency [%]	22.53	22.65	22.44	22.53
Weight [kg]	20	27	30.5	38.4
Temperature coefficient of Pmax		-0.30%/C		
Temperature coefficient of Isc		+0.046%/C		
Temperature coefficient of Voc		-0.25%/C		



N-type LCOE Analysis

1.5MW Project, Thailand

Under the same site area, installed capacity, installation method, and system life conditions, the LCOE of the power plant system using PERC 670W components is estimated to be approximately 0.029 USD/kWh; The LCOE of the power plant system using N-type TOPCon 630W components is approximately 0.027 USD/kWh. Being compared with the PERC components, TOPCon components can reduce the LCOE of the power plant by approximately 6.29%.

N-type LCOE Analysis

500KW Project, Romania

Below is a comparison of the LCOE analysis for a 500 kW project using N-type 580W versus P-type 660W solar panels.

	182N-72M	210P-66M
Power Class (W)	580	660
Cost per watt (USD)	0.35	0.3
Initial Capital Cost (USD)	375,000	350,000
Annual Energy Production (kWh in Year 1)	637,500,000	600,000,000

This comparison highlights the cost-effectiveness of N-type panels in terms of LCOE, making them a potentially better choice for projects prioritizing long-term economic benefits.





N-type LCOE Analysis

50KW Project, Thailand

	182P-72M-Bifacial	182N-72M-Bifacial
Power Class (W)	555	585
△BOS Cost	-	▼0.80%
△LCOE	-	▼2.48%

- Over 30 years, N-type panels produce more energy than P-type panels due to their lower degradation rate.
- The LCOE is lower for N-type panels compared with P-type panels, reflecting better performance over time.

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12KW | N-TYPE 580W
kenya, 2023

N-type solar panels can be used in livestock management to help farmers embrace renewable energy while meeting the needs of their livestock and maintaining profitability.

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20KW | N-TYPE 580W
South Africa, 2023

N-type solar panels are very suitable for photovoltaic systems on home roofs. They can maintain efficient operation even under low light conditions, providing a stable electricity supply for households and reducing household electricity bills.





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2.5MW | N-TYPE 700W
Vietnam, 2024

Installing N-type solar panels on the roofs of factories and warehouses can significantly reduce industrial power consumption and improve energy efficiency.



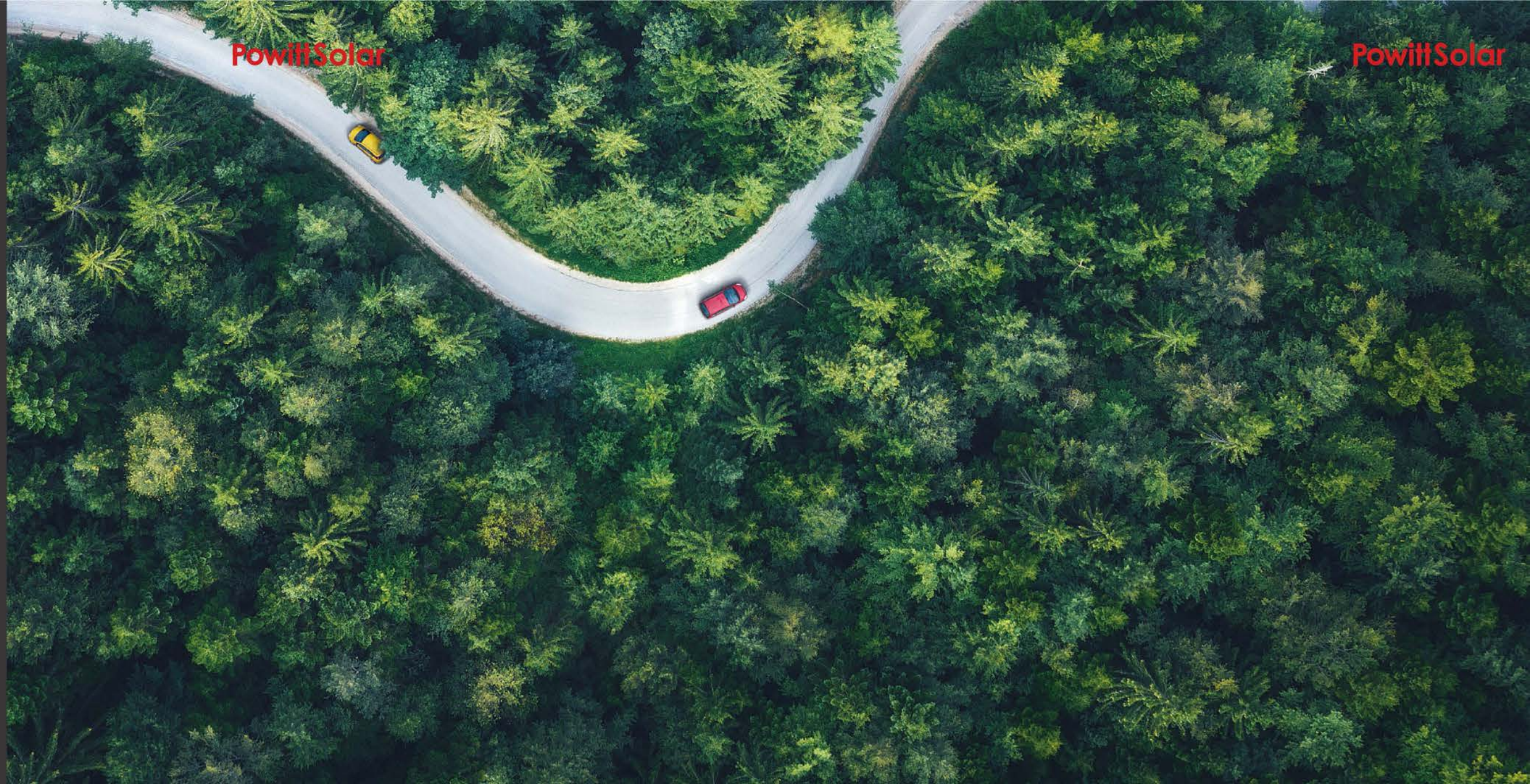
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18KW | N-TYPE 450W
Philippines, 2024

N-type solar panels represent a forward-thinking approach to modern agriculture by offering efficient solutions such as improving crop yields and conserving water.

Future Energy Solutions

Choosing N-type solar panels is not only a choice for efficient energy solutions, but also a commitment to sustainable development in the future. Its wide range of application scenarios and excellent performance will lead the energy revolution, bringing more possibilities and a better future to our lives.



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