



Solar N Plus 旭合科技

高效N型电池及组件制造商

The TOPCon Cells and Modules Manufacturing Expert



安徽旭合新能源科技有限公司 Solar N Plus New Energy Technology Co., LTD

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旭日东升·合作共赢
Rising Sun In The East, Cooperation For Mutual Benefit



企业愿景 *Our Vision*

成为温暖人心的企业
Business that Cares.



企业使命 *Our Mission*

做开放包容的平台，为员工、客户、社会创造共同价值
An Open and Inclusive Platform Cultivating Shared Values for Employees, Customers, and Society.



核心价值观 *Essence of Values*

和谐共处、协同共生、价值共创、合作共赢
Harmonious coexistence, synergistic symbiosis, Sharing value with trust, collaborating for mutual benefits.





01

关于旭合
About Us

关于旭合科技 About Solar N Plus

安徽旭合新能源科技有限公司是一家由蓝丰生化（A股上市公司，股票代码002513）控股的专注于高效N型晶硅光伏产品的研发、制造、销售和服务为一体的制造商和新能源项目开发企业。公司于2022年7月在滁州成立，拥有一支院士领衔的行业一流技术研发和运营管理团队。

公司位于安徽省滁州市中新苏滁高新技术产业开发区，一期项目占地256亩。现拥有2GW PERC电池和组件生产线和5GW高效N型硅片、电池及组件产能；公司在云南、宁夏、吉林正在建设生产基地，在西南、西北、东北和华东地区陆续开发光伏、风电等新能源资源。

旭日东升，合作共赢；旭合将秉承“诚信、高效、合作、共赢”的价值观，持续创新发展，以卓越成就客户；助力清洁能源，共建美好环境；采用小步快跑模式，成为高效N型电池及组件技术的领跑者。



一体制造商

Integrated Manufacturer



垂直产业链

Vertical Industry Chain



技术领跑者

Technology Leader

Solar N Plus is a new energy project development enterprise and manufacturer focusing on the research and development, manufacturing, sales and service of high-efficiency N-type crystalline silicon photovoltaic products, which is held by Jiangsu Lanfeng Bio-chemical Co., Ltd. (A-share listed company, stock code 002513). Founded in July 2022 in Chuzhou, Solar N Plus boasts an industry-leading team of R&D and operation management, led by professional academicians.

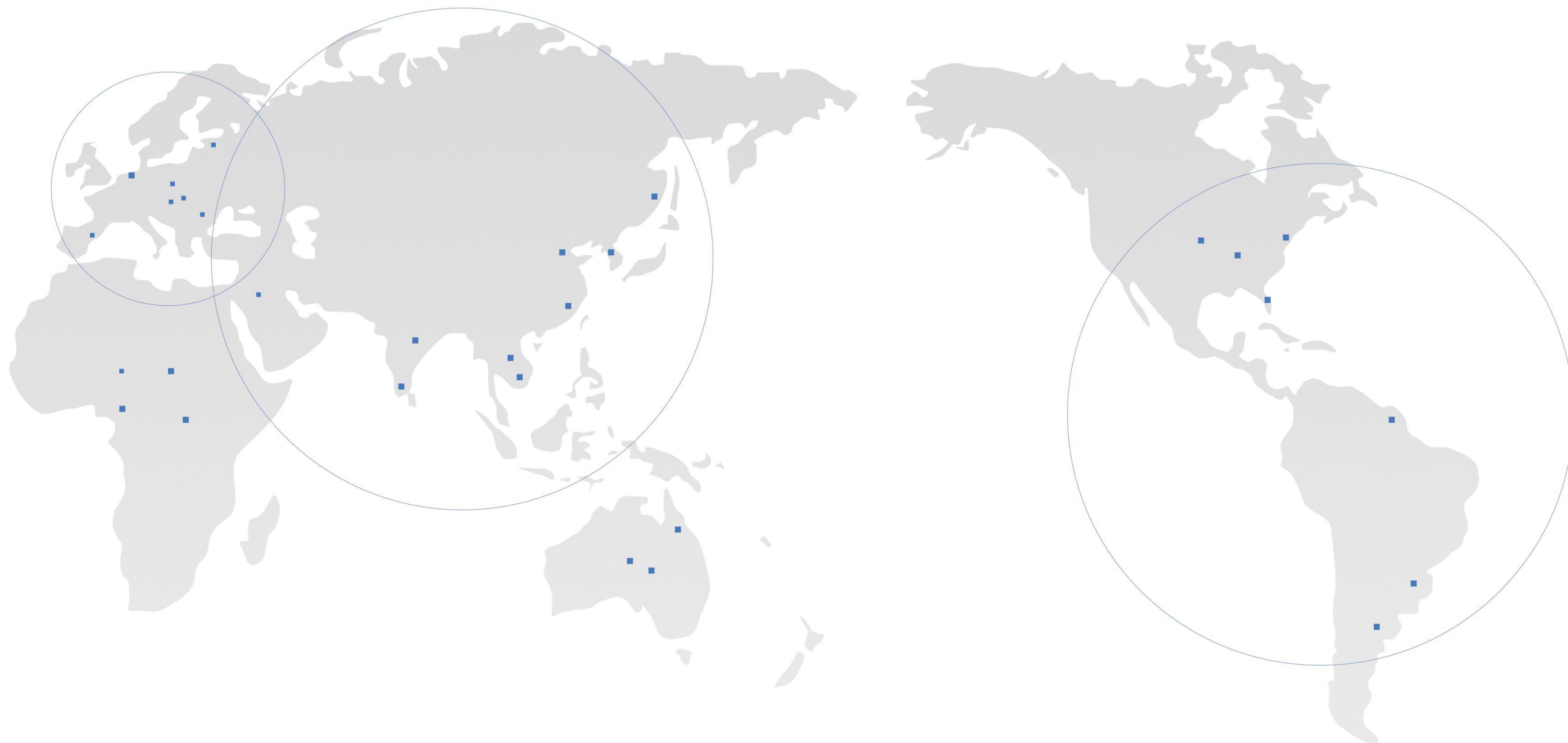
Located at No.1 Jianye Road, Suchu High-Tech Industrial Park, Chuzhou City, Anhui Province, Solar N Plus's first intelligent manufacturing factory covers an area of 256 acres. Solar N Plus is constructing production bases in Yunnan, Ningxia, and Jilin, and is gradually developing new energy resources such as photovoltaic and wind power in the Southwest, Northwest, Northeast, and East China regions.

Rising sun in the east, cooperation for mutual benefit. Solar N Plus is driven by the values of "integrity, high efficiency, cooperation and win-win". With our top-notch products, comprehensive management systems, and exceptional service, we aim to exceed expectations and lead the industry toward a brighter and greener future. Never stop moving forward, Solar N Plus is dedicated to become a leader in ultra high-efficiency N-type cells and modules technology.

全球化视野 Global Vision

以技术为支撑，以产品为核心，致力于打造全球化的高效N型晶硅光伏市场。旭合科技将以国内市场为先导，同时积极在欧洲、亚太和美洲等区域开拓布局，设立组合机构，以全球化的视野，超高效的节奏，快速拓展国内和国际业务。

Supported by technology and centered on products, we are committed to creating a global market for ultra-efficient N-type crystalline silicon photovoltaic. Solar N Plus will lead with the domestic market while actively expanding in regions such as Europe, APAC. By establishing integrated institutions, we aim to rapidly expand both domestic and international business with a global perspective and ultra-efficient pace.



智能制造 品质保证

Smart Manufacturing and Quality Assurance

旭合科技秉承现代化的建厂理念和精益化管理思想、通过先进的网络安全技术、软件技术（OA/ERP/MES/WMS/SRM），智能设备（智能机台、AGV、监控），从而实现企业管理流程移动化，各种数据共享化透明化、车间作业少人化自动化、仓库存储节约化、物料拉动无人化、产品质量分级智能化、生产全流程追溯等。

Solar N Plus adheres to modern plant construction concepts and lean management principles. By utilizing advanced cybersecurity technologies, software technologies (OA/ERP/MES/WMS/SRM), intelligent equipment (smart machines, AGV, supervisory control), we achieve mobile enterprise management processes, transparent and shared data, minimally-manned and automated workshop operations, optimized warehouse storage, unmanned material pulling, intelligent product quality grading, and full production process traceability.



原料控制 Raw Material Control

对原材料供应商进行严格实力筛选及资质筛查，并在生产前对原材料进行全面的质量检测。

We rigorously screen and qualify raw material suppliers and conduct comprehensive quality inspections of raw materials before production.



生产监控 Production Monitoring

通过先进的自动化生产设备和智能信息采集分析系统，我们对生产过程的每一个环节进行监控，有效避免生产环节的潜在质量问题和故障。

Through advanced automated production equipment and intelligent information collection and analysis systems, we monitor every step of the production process, effectively preventing potential quality issues and failures.



出厂检测 Pre-delivery Inspection

我们在生产后/交货前进行严格的出厂质量控制，以最大程度地降低产品故障风险有效保证用户的利益。所有产品数据和信息都会在MES系统中存储至少10年。

We conduct strict post-production and pre-delivery quality control to minimize product failure risks and protect user interests. All product data and information are stored in the MES system for at least 10 years.

完善的质量管理体系 Comprehensive Quality Management System

旭合科技顺利通过了三体系认证，其中包括ISO9001：2015质量管理体系认证、ISO14001：2015环境管理体系认证和ISO45001：2018职业健康安全管理体系认证。

此外，旭合科技还引入了“GB/T 19580-2012 卓越绩效评价准则”。该体系不仅适用于国家质量奖的评选，还对企业组织者、顾客、员工、供方、合作伙伴等提出了更高要求，引导企业的自我学习，追求卓越绩效，提高产品、服务和经营质量，增强竞争优势。

Solar N Plus has successfully passed three system certifications, including ISO 9001:2015 Quality Management System Certification, ISO 14001:2015 Environmental Management System Certification, and ISO 45001:2018 Occupational Health and Safety Management System Certification.

Additionally, Solar N Plus has adopted the "GB/T 19580-2012 Criteria for Performance Excellence." This system not only applies to the evaluation for the National Quality Award but also sets higher requirements for business organizers, customers, employees, suppliers, and partners. It guides the company towards self-improvement, the pursuit of performance excellence, enhancement of product, service, and operational quality, and the strengthening of competitive advantage.



邓白氏认证 Dun & Bradstreet Certification

通过全方位调查，邓白氏赋予旭合科技4A1高分评级。其中4A和1分别代表优秀的财务实力和综合信用。邓白氏商业信息报告反映，旭合科技运营稳健、经营状况良好、信誉度高、企业风险低，在风险综合评估矩阵中，评估等级为AA，属于优质企业群体，在同行业企业中，资信水平较高，资质优良。

Through a comprehensive investigation, Dun & Bradstreet has awarded Solar N Plus a high rating of 4A1. The "4A" and "1" represent excellent financial strength and comprehensive credit, respectively. The Dun & Bradstreet business information report indicates that Solar N Plus operates steadily, maintains good business conditions, has a high level of credibility, and exhibits low enterprise risk. In the risk comprehensive assessment matrix, Solar N Plus is rated as AA, belonging to the group of high-quality enterprises. Among its peers, it boasts a high credit level and excellent qualifications.





02

公司实力

Company Strength

行业顶尖的专家团队 Top Industry Expert Team

都有为 院士、旭合科技高级顾问

Academician Du Youwei, Senior Advisor at Solar N Plus

南京大学物理系教授，博士生导师，中国科学院院士。任中国物理学会专业委员会副主任，中国电子学会委员会委员，中国电子学会会士，中国仪表材料学会副理事长等职；曾任南京大学纳米科学技术研究中心主任，国家973计划“纳米材料科学”首席科学家等职。

都院士是我国凝聚态物理学先驱和学术泰斗，应邀在旭合担任公司高级顾问，制定公司技术路线和发展方向，指导公司技术研发博士团队研发工作。

Professor Du Youwei, a professor in the Department of Physics at Nanjing University, doctoral advisor, and academician of the Chinese Academy of Sciences, serves in multiple esteemed positions: deputy director of the Professional Committee of the Chinese Physical Society, member of the Chinese Electronics Society Committee, fellow of the Chinese Institute of Electronics, and vice-chairman of the China Society of Instrument and Control Engineers. He has also been the director of the Nanoscience and Technology Research Center at Nanjing University and the chief scientist of the national 973 Program "Nanomaterials Science."

As a pioneer and leading figure in condensed matter physics in China, Academician Du has been invited to serve as a senior advisor at Solar N Plus. He is responsible for formulating the company's technology roadmap and development direction, and he guides the company's team of PhD researchers in their development work.

26.5%

电池量产效率突破26.5%
Cell mass production efficiency
breakthrough of 26.5%

100+

在申专利100余项
Over 100 patents pending

5%

研发投入占销售收入5%
R&D investment accounts
for 5% of sales revenue

25%

研发人员占员工总数25%
25% of employees are
research personnel

7

博士人数7人
7 PhD holders

80%

研发团队硕士以上比例占比80%
80% of the R&D team holds a
master's degree or higher



行业一流的证券和资本力量

Top-tier Securities and Capital Power in the Industry

郑旭 董事长

Zheng Xu Chairman

青岛天能重工股份有限公司（股票代码300569）创始人。曾任青岛天能重工股份有限公司董事长、总经理。天能重工是国内领先的新能源发电装备制造和投资建设的上市公司，在风电装备和新能源光伏电站开发建设方面业绩斐然。

现任蓝丰生化董事长、旭合科技董事长

蓝丰生化（股票代码002513）是国内较大的农化产品研发、生产、销售和服务为一体的企业，2023年10月成功完成对旭合科技的控股，发展成为农化产品和光伏新能源为双主业的多元化企业。

Zheng Xu is the founder of Qingdao Tianneng Heavy Industry Co., (stock code 300569). He previously served as the chairman and general manager of Tianneng, a leading company in the manufacturing of new energy power generation equipment and investment in construction. The company has achieved remarkable success in wind power equipment and the development and construction of new energy photovoltaic power plants.

Currently, Zheng Xu is the chairman of Lanfeng Bio-chemical Co., Ltd. (stock code 002513) and the chairman of Solar N Plus.

Lanfeng is one of the largest integrated companies in China specializing in the research, production, sales, and service of agricultural chemical products. In October 2023, it successfully completed the acquisition of a controlling stake in Solar N Plus, transforming into a diversified enterprise with dual main businesses in agricultural chemicals and photovoltaic new energy.

行业一流的资源开发能力

Top-tier Resource Development Capability

崔海峰 副董事长

Cui Haifeng Vice Chairman

吉林大学历史学硕士研究生。

历任大安市副市长、常委、宣传部长、市委秘书长；镇赉县常务副县长；白城市经济技术合作局局长；一直分管新能源工作。

三众能源副总裁；成来电气总裁；

具有极强的电站开发能力，已先后开发10GW风光电站。

现任蓝丰生化副董事长、旭合科技副董事长

Cui Haifeng holds a Master's degree in History from Jilin University. He has held various significant positions, including Vice Mayor, Standing Committee Member, Minister of Publicity, and Secretary General of the Municipal Party Committee in Da'an City; Executive Deputy County Chief of Zhenlai County; and Director of the Economic and Technological Cooperation Bureau in Baicheng City. Throughout his career, he has consistently overseen new energy projects.

He has served as Vice President of Sanzen Energy and President of Chenglai Electric, demonstrating exceptional power station development capabilities, having developed a total of 10GW of wind and solar power stations.

Currently, Cui Haifeng is the Vice Chairman of Lanfeng Bio-chemical and the Vice Chairman of Solar N Plus.

行业顶尖的技术及运营团队

Top-tier Technical and Operations Team



李质磊 董事、CEO
Li Zhilei Director and CEO

哈尔滨工业大学硕士，复旦大学EMBA硕士。自2007年起先后在中电光伏、天威新能源等知名企业担任技术和运营经理，2013年起作为共同创始人创建日托光伏并先后担任运营副总和销售副总等职，业绩斐然。具备15年光伏制造业行业经验，累计负责生产制造和销售光伏产品超过20GW。

现任蓝丰生化董事、总经理；旭合科技董事、CEO

Li Zhilei holds a Master's degree from Harbin Institute of Technology and an EMBA from Fudan University. Since 2007, he has held positions as a technical and operations manager at well-known companies such as China Sunergy and Tianwei New Energy. In 2013, as a co-founder, he established Sungrow PV and served successively as Vice President of Operations and Vice President of Sales, achieving remarkable results. With 15 years of experience in the photovoltaic manufacturing industry, he has been responsible for the production and sales of over 20GW of photovoltaic products.

Currently, Li Zhilei is a Director and General Manager at Lanfeng Bio-chemical and a Director and CEO at Solar N Plus.

路忠林 博士 董事、CTO
PhD.Lu Zhonglin Director and CTO

南京大学物理学博士，先后在东南大学、台湾成功大学和天威新能源控股有限公司任职，2013年起作为共同创始人创建了日托光伏并全面负责公司研发及产业化工作，承担包括国家863项目和国家自然科学基金在内的多个重大科技攻关项目，发表高水平SCI学术论文30多篇，申请和获得专利近200项，入选多个省市级人才计划。

现任蓝丰生化董事；旭合科技董事、常务副总、CTO

Dr. Lu Zhonglin holds a PhD in Physics from Nanjing University. He has held positions at Southeast University, National Cheng Kung University in Taiwan, and Tianwei New Energy Holdings Co., Ltd. In 2013, as a co-founder, he established Sungrow PV, where he was fully responsible for the company's research and development and industrialization efforts. He has led numerous major scientific research projects, including those under the National 863 Program and the National Natural Science Foundation of China. Dr. Lu has published over 30 high-level SCI academic papers and has applied for and obtained nearly 200 patents. He has been selected for multiple provincial and municipal talent programs.

Currently, Dr. Lu Zhonglin is the Director at Lanfeng Bio-chemical and the Director, Executive Vice President, and CTO at Solar N Plus.





03

产品中心

Products Centre

产品中心——P型单双面电池

P-type Monofacial and Bifacial Cells



P-type 182

P-type 210



高转换效率
Higher conversion efficiency



光致衰减为“0”
PID “0”



更优异的机械性能
Better mechanical properties



温度系数低
Low temperature coefficient



较弱的热斑效应
Low hot spot effect

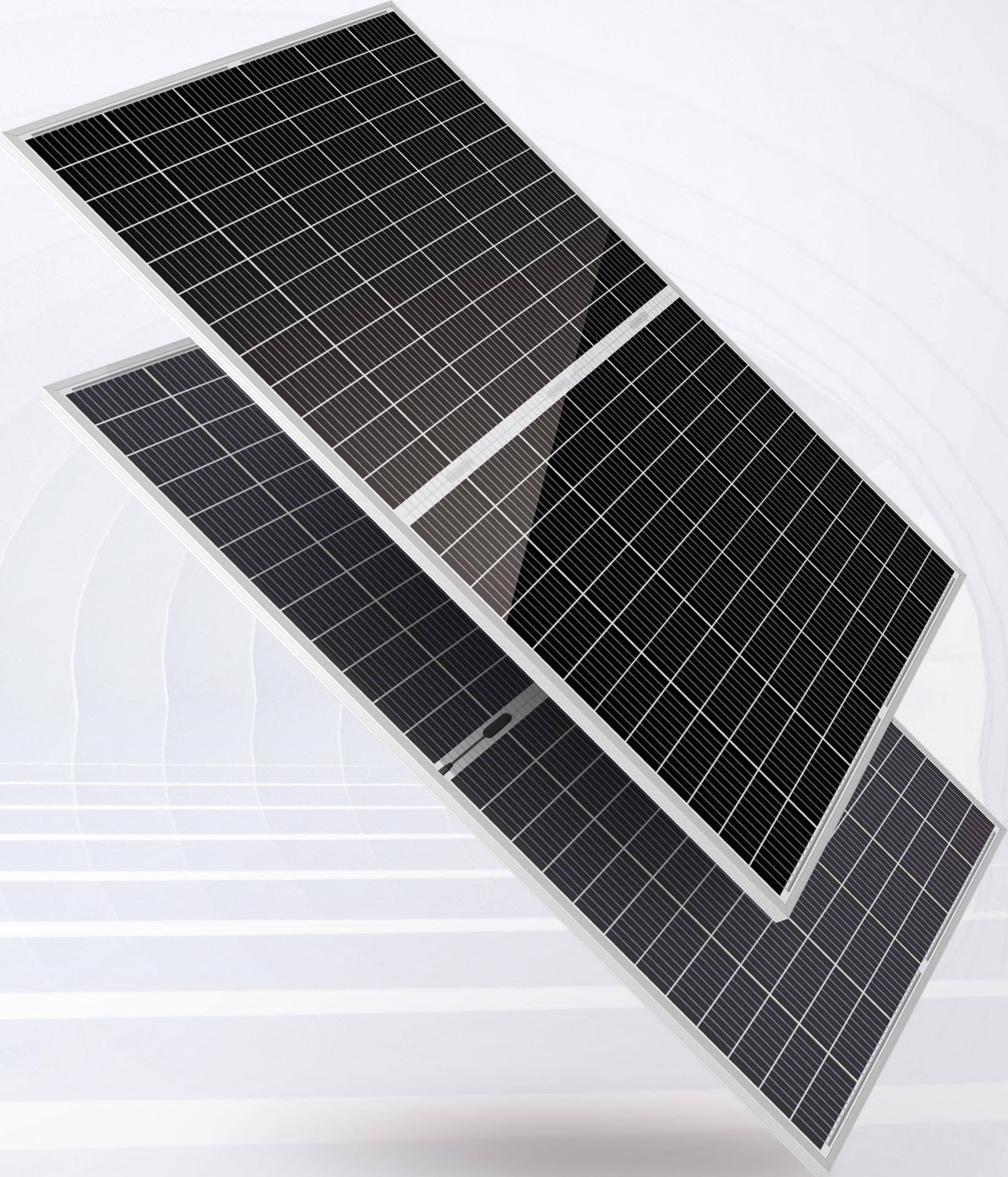


更低的封损
Lower CTM loss

产品中心——P型单双面组件

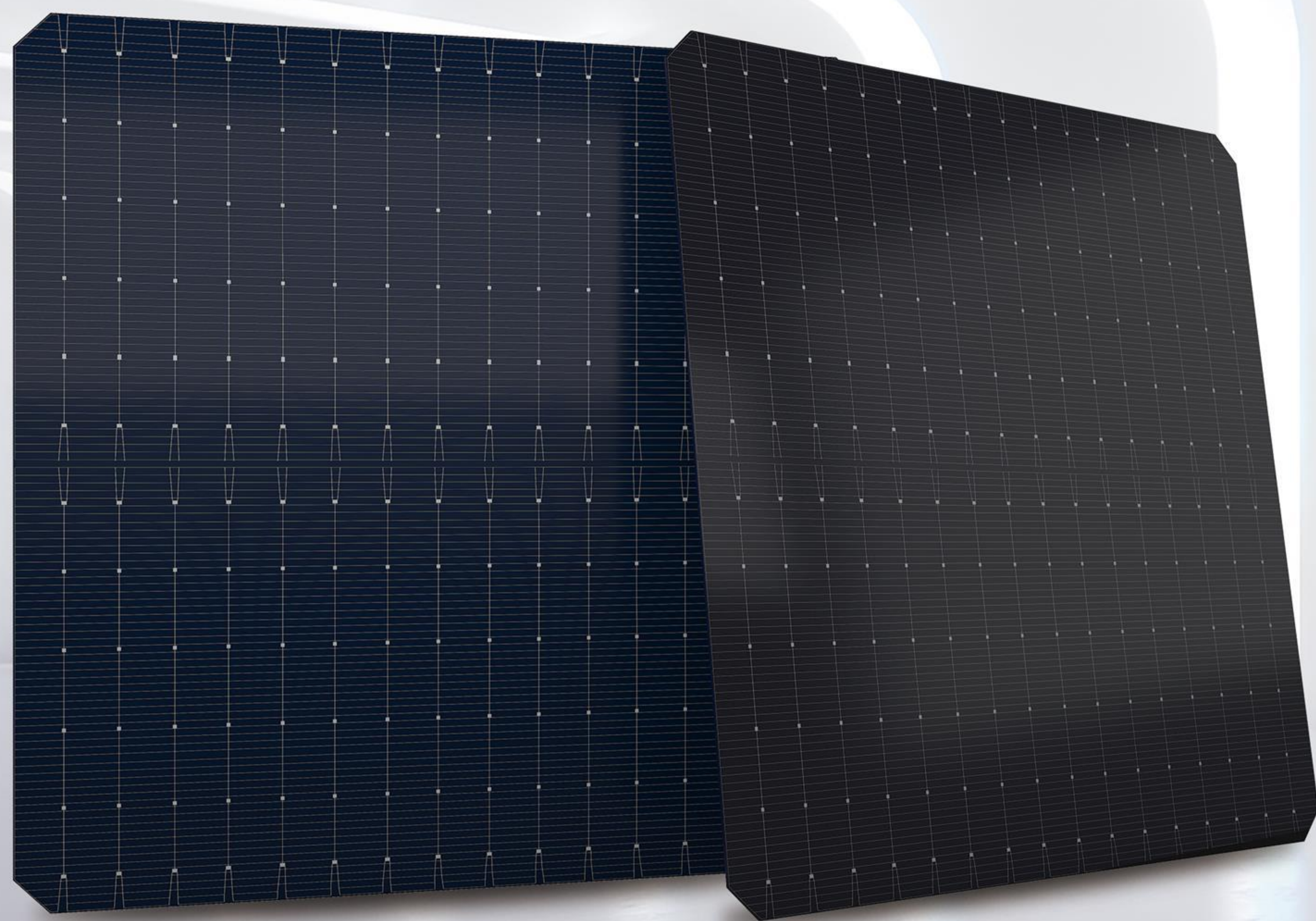
P-Type Monofacial and Bifacial Modules

-  高可靠性
High Reliability
-  抗PID
Anti-PID
-  低隐裂风险
Low risks of Invisible Cracks
-  耐候性
Weatherability
-  载荷能力强
High Load Capacity



产品中心——N型双面电池

N-Type Bifacial Cells



高转换效率

Higher conversion efficiency



更低的温度系数，低至-0.31%/°C

Lower temperature coefficient, down to -0.31%/°C



光致衰减，光致衰减为“0”

Low temperature coefficient, PID “0”



优越的抗PID性能

Excellent Anti-PID



更优的弱光特性

Superior low irradiance performance



更低的封损，更适合高效组件

Lower CTM loss, More suitable for high-efficiency modules

产品中心——N型双面组件

N-Type Bifacial Modules



额外发电增益
Extra Power Gain



无光致衰减
PID “0”



更低度电成本
Lower LCOE



更优弱光响应
Superior Low Irradiance Performance



更优的温度系数
Lower Temperature Coefficient



更广泛的应用性
Suitable for Multi-type Projects



电站业务

Power Station Business



光伏电站业务

Photovoltaic Power Station Business



智慧分布式能源解决方案

Smart Distributed Energy Solutions

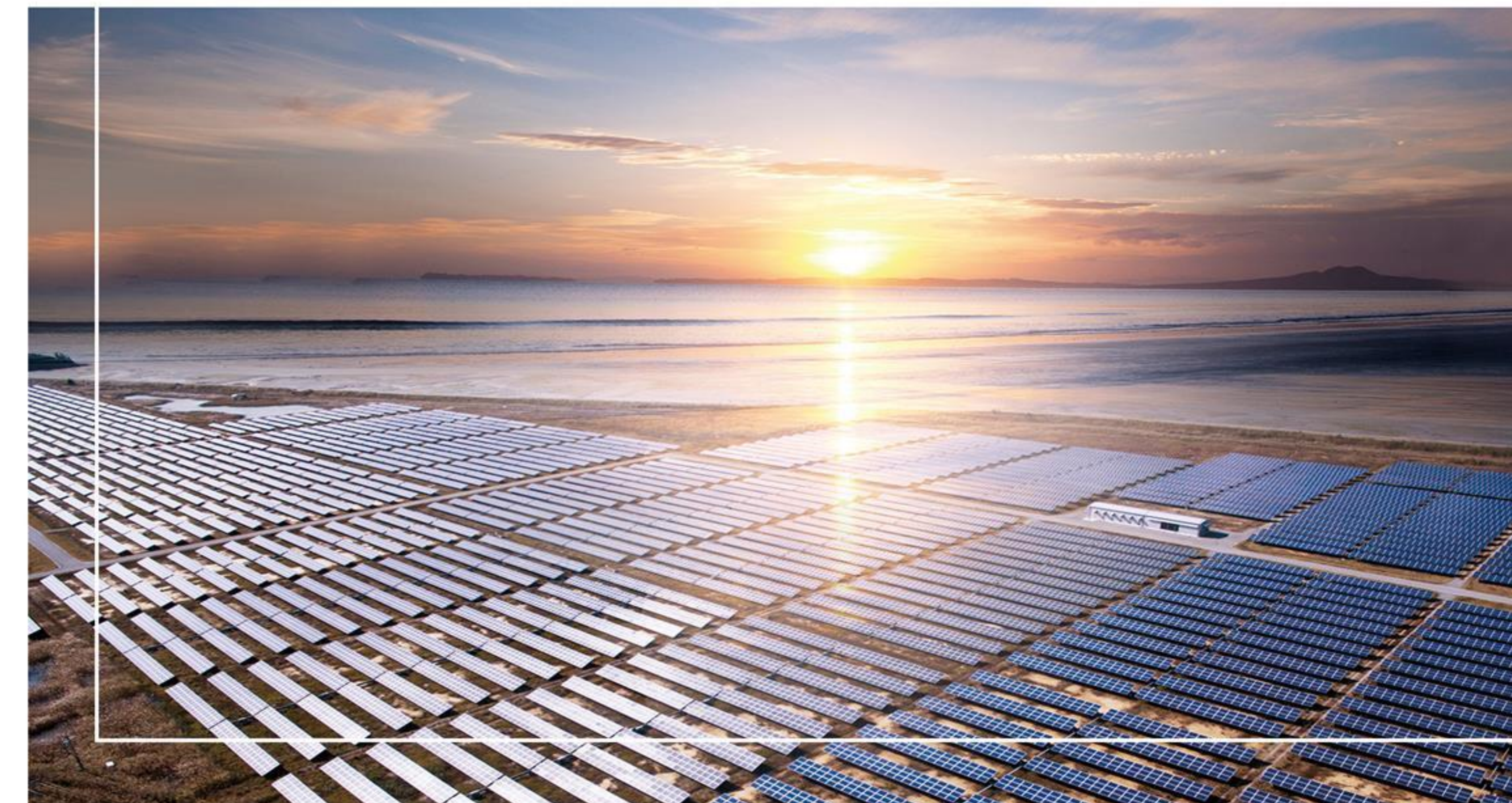


电站业务——光伏电站业务

Photovoltaic Power Station Business

在光伏电站市场，旭合科技是投资者最值得信赖的终身合作伙伴，为客户提供开发、融资、设计、施工、运维、一站式系统集成解决方案。旭合科技拥有一支实力雄厚、专业完备、能力出众的光伏电站设计团队，严谨的采购流程，成熟的施工管理团队，多年的光伏电站开发建设经验，超GW的电站实践积累，用品质与真诚铸就辉煌。

In the photovoltaic power station market, Solar N Plus is the most trusted lifelong partner for investors, providing customers with one-stop system integration solutions, including development, financing, design, construction, and operations and maintenance. Solar N Plus boasts a strong, professional, and highly capable photovoltaic power station design team, a rigorous procurement process, a mature construction management team, years of experience in photovoltaic power station development and construction, and over a gigawatt of practical power station implementation. Quality and sincerity are the foundations of our success.



大型地面电站
Utility

工商业屋顶
Commercial and
Industrial Rooftops



户用分布式
Residential Distributed
Project

电站业务——智慧分布式能源解决方案

Power Station Business - Photovoltaic Power Station Business

自主研发的智慧运维管理服务平台，线上管控，线下维护。通过大数据技术和智能分析平台的应用，为光伏电站提供一站式、智慧运维解决方案。

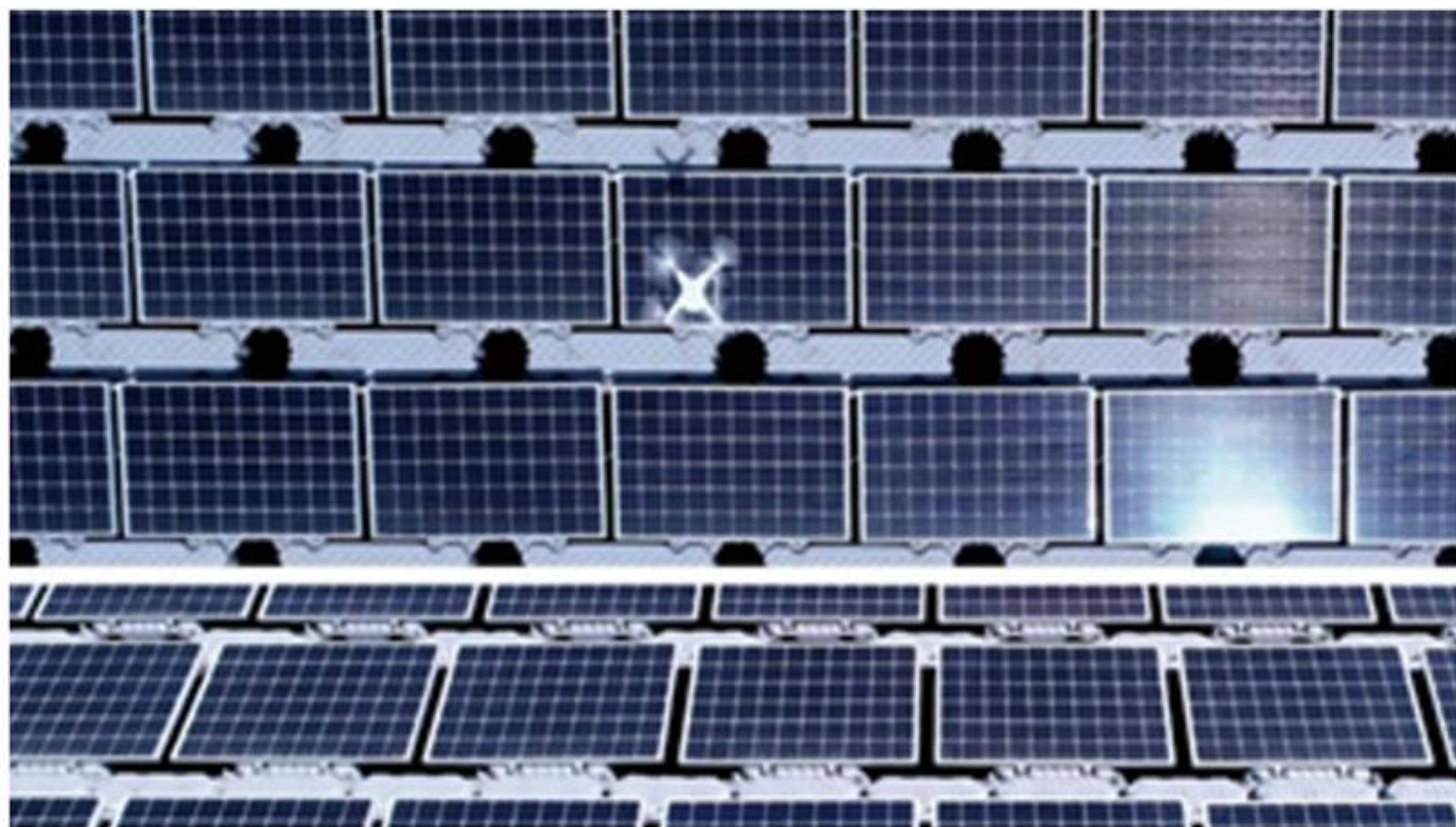
Independently developed intelligent operation and maintenance management service platform, online control, offline maintenance. Through the application of big data technology and intelligent analysis platform, it provides one-stop and intelligent operation and maintenance solutions



智能监控中心（Fusionsolar系统）
Intelligent Monitoring Center (FusionSolar System)
O2O运管平台（自主研发）
O2O Operations Management Platform (Independently Developed)



手机 APP
APP Mobile App



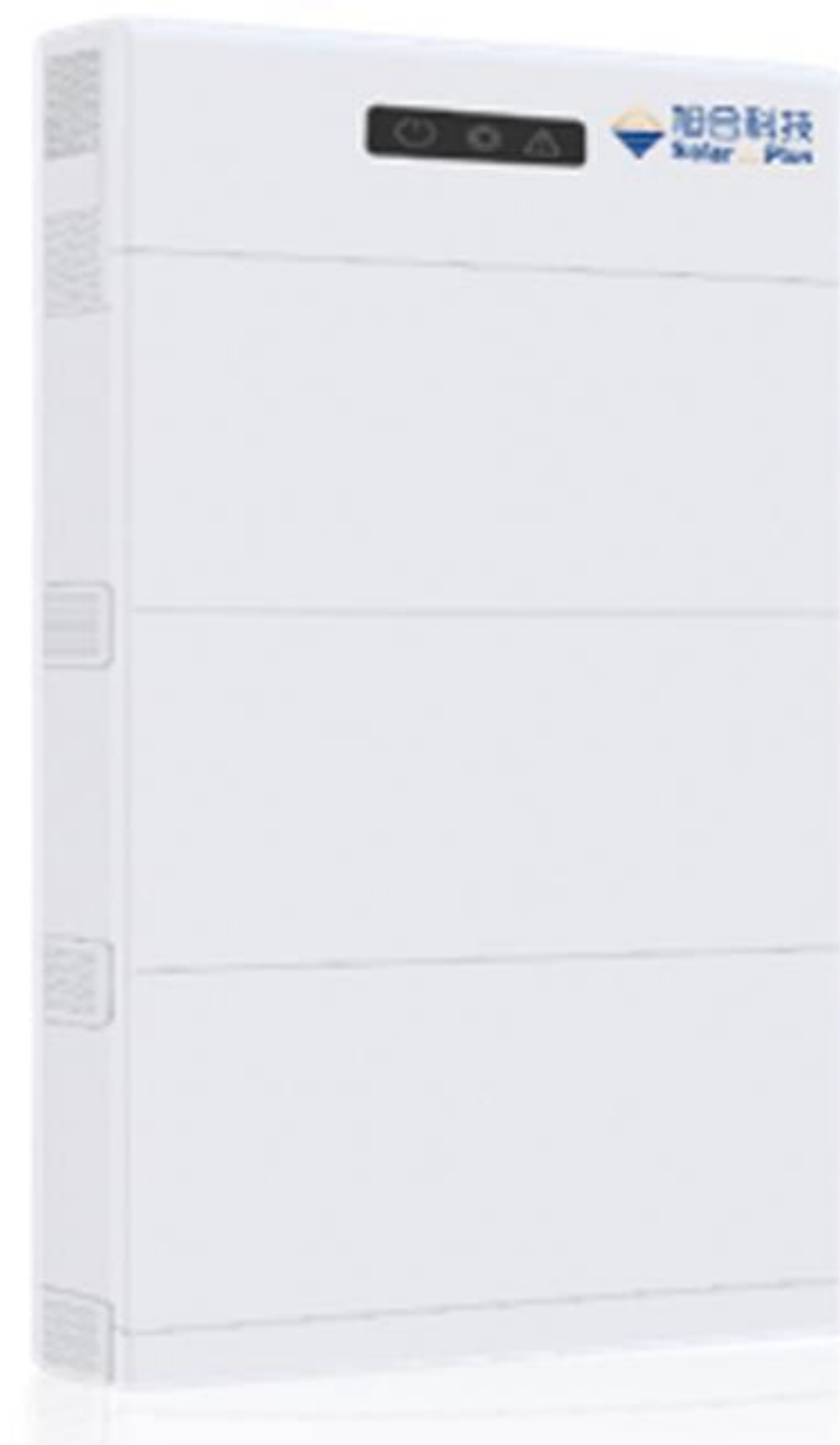
无人机运维
Unmanned Aerial Vehicle (UAV) Maintenance

<div>在线监控 Online Monitoring</div> <div>数据分析 Data Analysis</div>	<div>在线监控 Online Monitoring</div> <div>数据识别与清洗 Data Identification and Cleaning</div> <div>数据分析评估 Data Analysis and Evaluation</div> <div>数据建模 Data Modeling</div>
<div>技术支持 Technical Support</div>	<div>故障处理指导与评估 Fault Handling Guidance and Assessment</div> <div>设备性能参数识别 Equipment Performance Parameter Identification</div> <div>平台逻辑完善 Platform Logic Enhancement</div> <div>设备性能提升探索 Exploration of Equipment Performance Improvement</div>
<div>电站评估 Power Station Evaluation</div>	<div>检测分析及评估电气试验的实施</div> <div>Implementation of Detection Analysis and Evaluation of Electrical Tests</div>
<div>平台开发 Platform Development</div>	<div>平台维护 Platform Maintenance</div> <div>应用开发及管理 Application Development and Management</div> <div>新模型导入与平台完善 Importing New Models and Platform Enhancement</div>

<div>自产保值 Self-production Preservation</div>	<div>收益保障 Revenue Assurance</div>	<div>决策支持 Decision Support</div>	<div>管理高效 Efficient Management</div>
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储能业务

Energy Storage Business

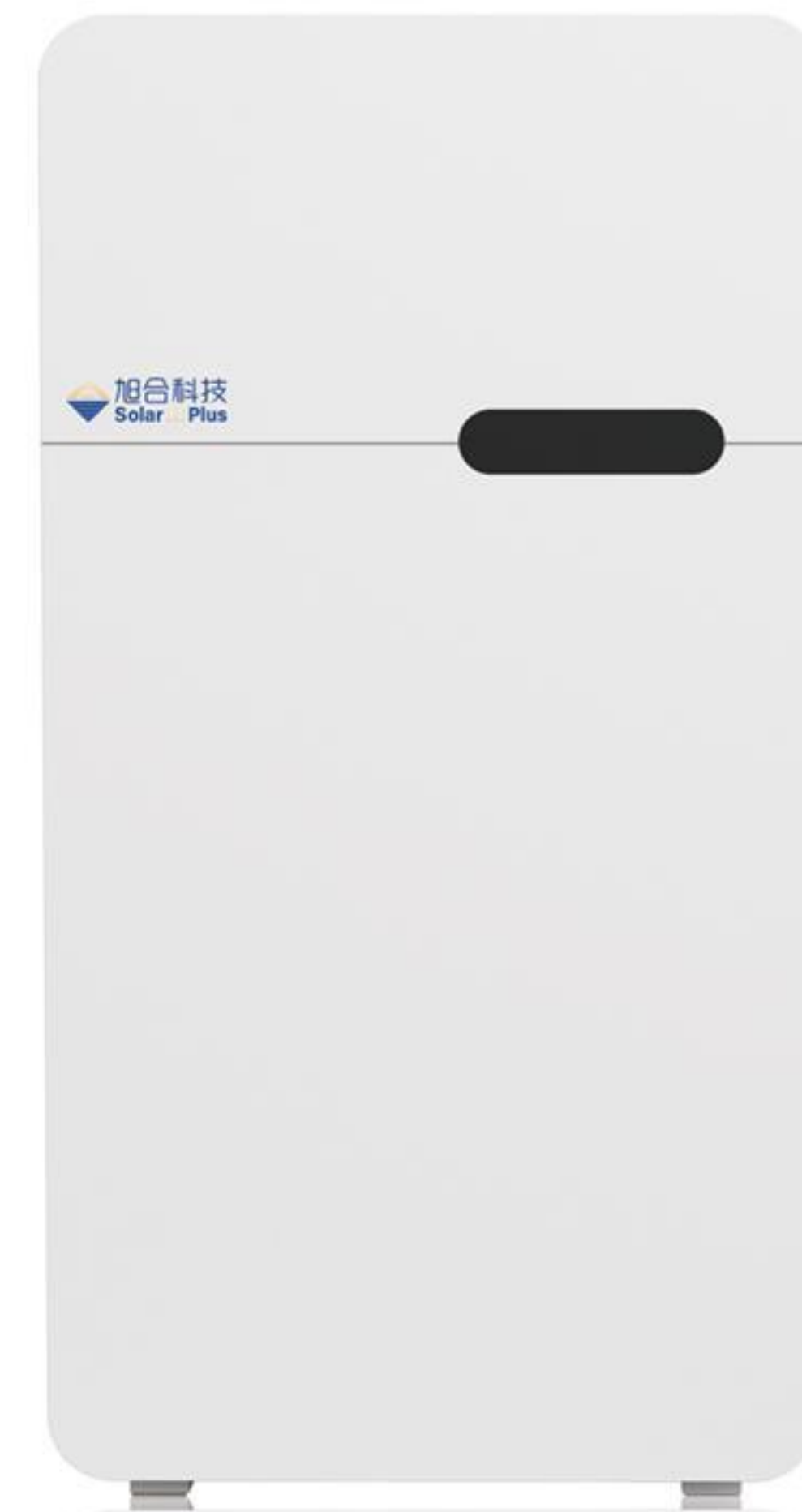


户用储能柜

Residential Energy Storage Cabinets
15.36~25.6KWh

储能电池柜

Energy Storage Battery Cabinets
100KW/200KWh



便携式移动储能

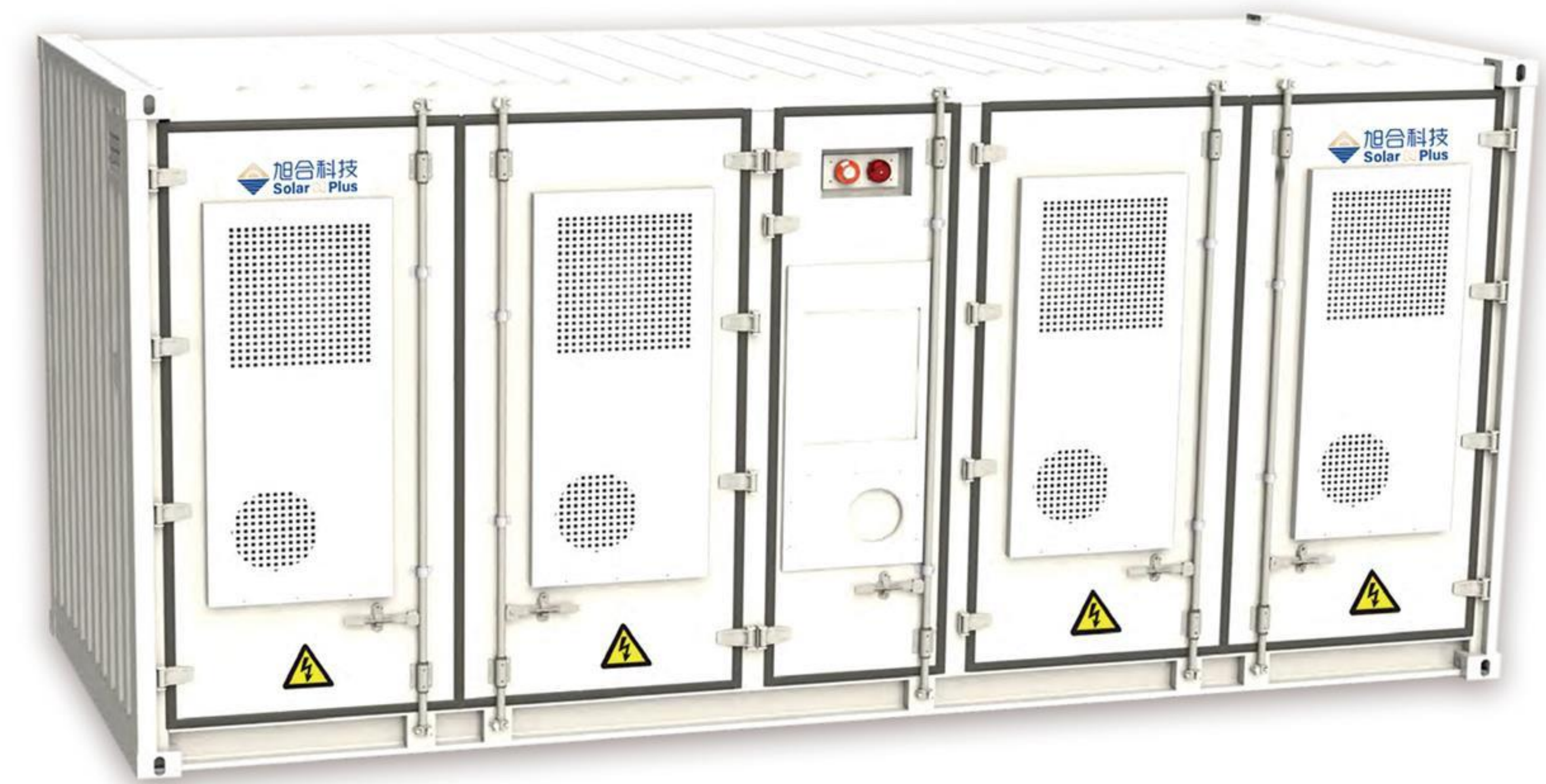
Portable Mobile Energy Storage Containers
3600~25000Wh

储能业务——SolBank 储能系统解决方案

SolBank Energy Storage System Solutions

3MWh 1500V SNP 集装箱液冷储能系统

3MWh 1500V SNP Container liquid cooling energy storage system



LFP 280Ah电芯
使用寿命长、高性价比、安全可靠
LFP 280AH Batteries
Long lifespan, cost-effective, safe and reliable



电池包IP65 密封
避免灰尘、湿气和冷凝
IP65 sealed battery packs prevent dust, moisture, and water condensation



高能量密度储能:201kWh/m²
High energy density storage: 201kWh/m²



多级热扩散保护技术
有效防止电池热扩散，提高安全性
Multi-level thermal diffusion protection effectively prevents thermal spread, enhancing safety



主动/被动BMS
释放更多能量并延长系统寿命
Active/Passive BMS
Releases more energy and extends system lifespan



多级火灾探测，监测电池的早期热失控
Multi-level fire detection monitors early thermal runaway of the battery

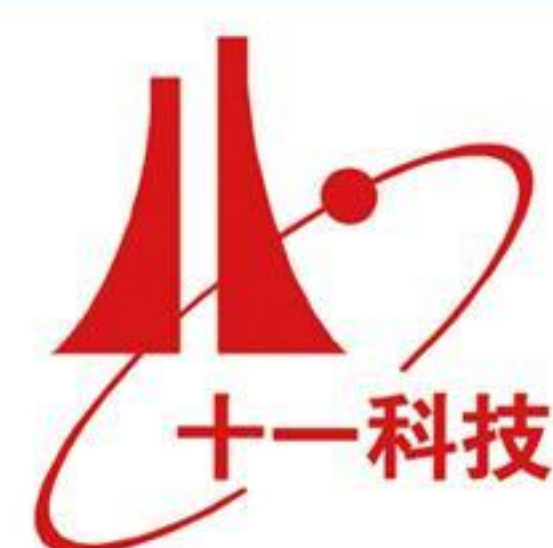


液冷技术
电池温度控制在最佳工作范围内
Liquid Cooling Technology
Maintains battery temperature within optimal operating range



所有部件均在工厂预制安装
减少运输和项目现场工作量
All components are factory pre-installed to reduce transportation and on-site project workload

合作伙伴 Cooperation partners





04

未来展望

Future Outlook

旭合科技五年发展规划

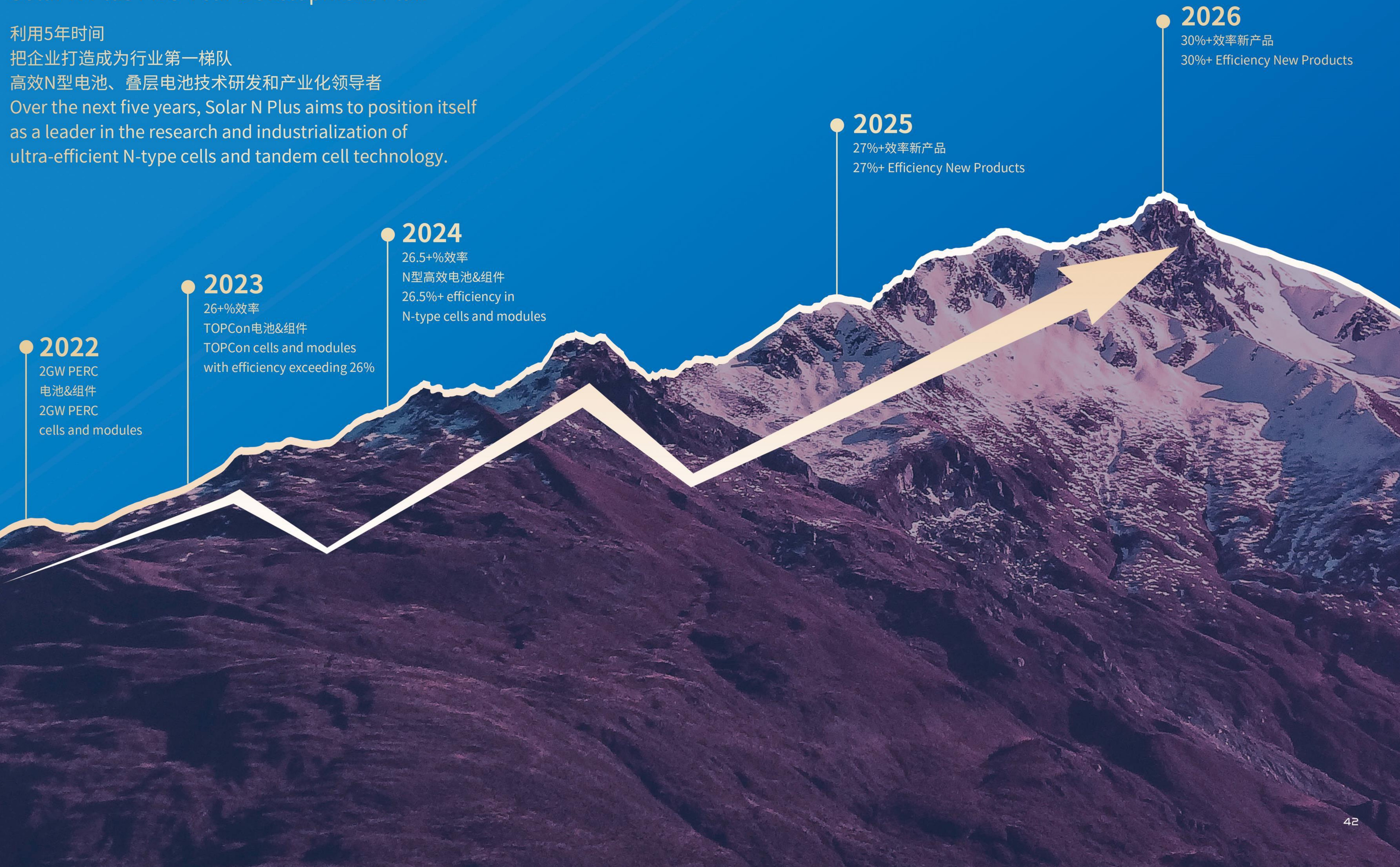
Solar N Plus Five-Year Development Plan

利用5年时间

把企业打造成为行业第一梯队

高效N型电池、叠层电池技术研发和产业化领导者

Over the next five years, Solar N Plus aims to position itself as a leader in the research and industrialization of ultra-efficient N-type cells and tandem cell technology.



合作共赢 *Win-Win Cooperation*

以开放的心态接纳，以尊重的前提做事，以互惠的标准衡量，以共赢的目标发展

To embrace with an open-minded attitude, to conduct business with the premise of respect, to measure with the standard of mutual benefit, and to develop with the goal of win-win.

技术领先 *Advanced Technology*

行业一流技术及运营团队高效N型电池及组件技术领跑者

Top Technical Team in PV Industry Trailblazer of High Efficiency N-type Solar Cell and Module.

卓越产品 *Excellent products*

产品领先、持续创新、卓越品质、成就客户

Leading in products and continuous in-novation, achieving outstanding quality and customer success.