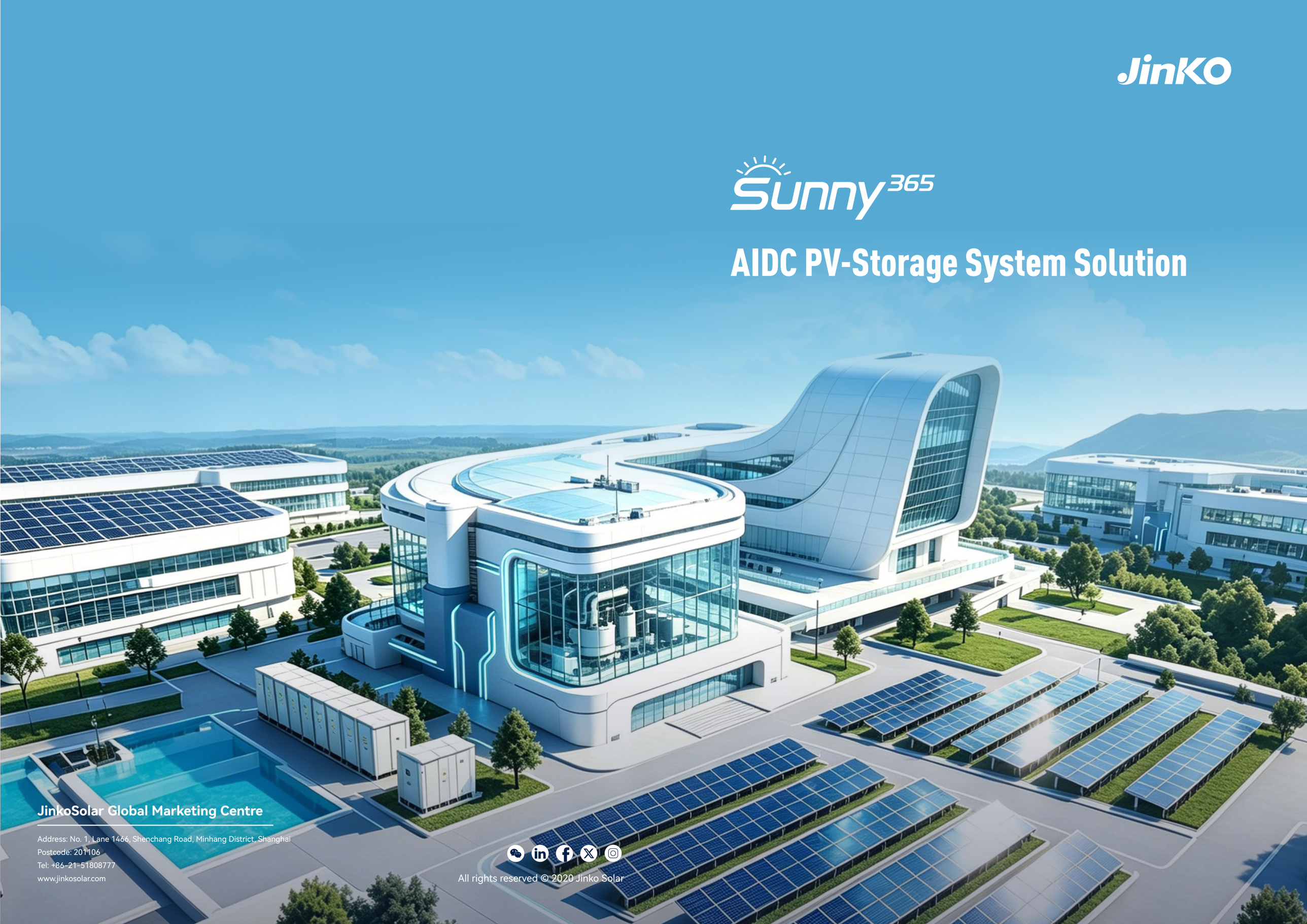
Sunny 365

AIDC PV-Storage System Solution



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AIDC PV-Storage System Solution

Key challenges facing the market

How to choose storage systems for PV?
complex pre-sales, O&M, warranty?

How to choose PV modules for storage?
multiple suppliers to coordinate?

Complex system design and installation.

Finger-pointing among suppliers when faults occur

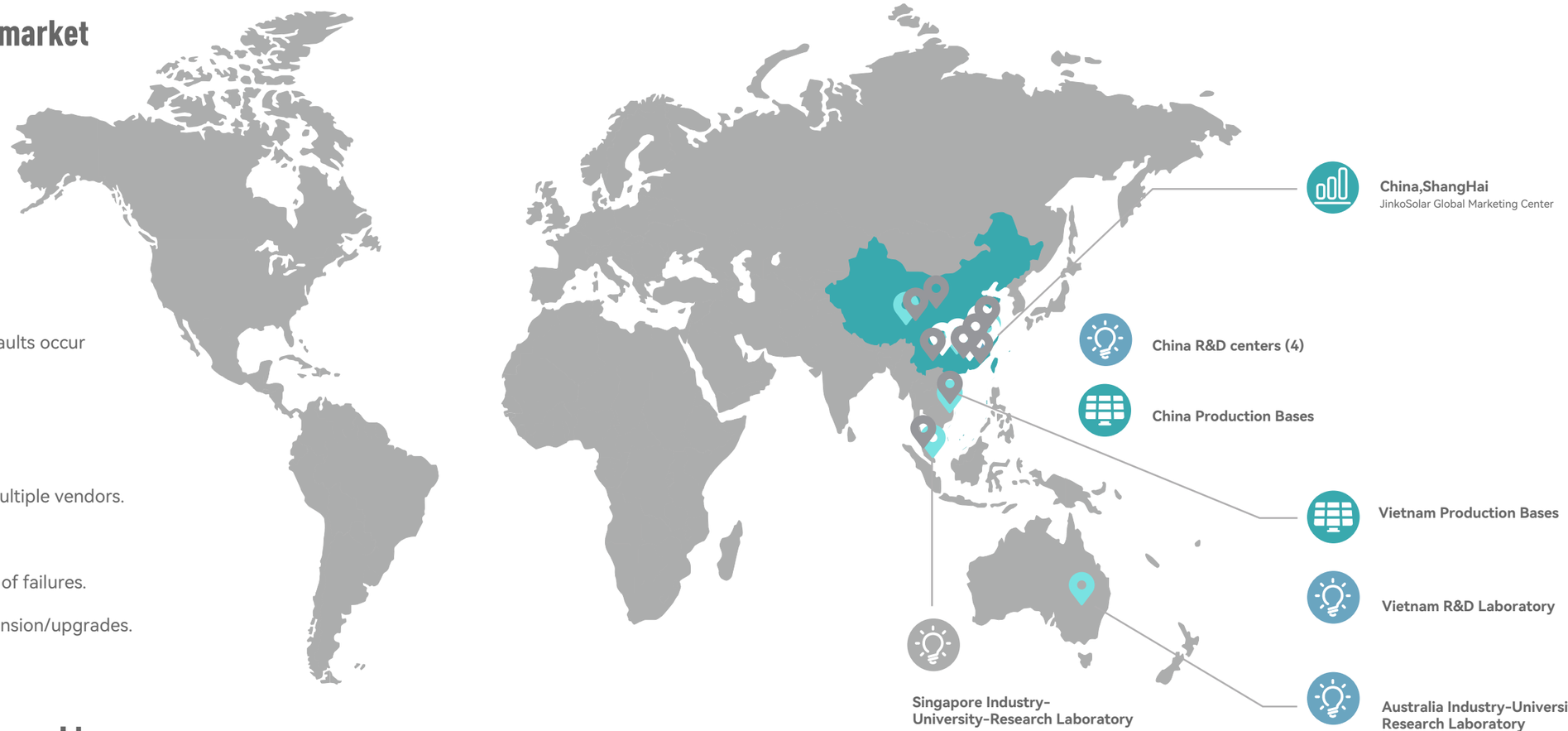
From Plant Owners:

From Plant Owners:
Complex after-sales, O&M, warranty – multiple vendors.

Low system integration, poor synergy.

Finger-pointing among suppliers in case of failures.

Lack of unified standards for future expansion/upgrades.



Jinko: A one-stop solution provider

- We provide a comprehensive warranty and after-sales service for the entire solar-storage system, and will always take responsibility for any issues that may arise.
- We offer an integrated approach covering solution design, product delivery, installation, commissioning and operation and maintenance, to ensure optimal performance.
- Comprehensive technical support for PV-Storage systems and partner training.
- We guarantee a stable supply of the latest PV-Storage products.
- A standardised quality assurance system for after-sales operation and maintenance.

35	4000+	200+	120+
Global Service Centers	Strategic Customers	Distribution Countries	Global Marketing Branches

AIDC PV-Storage System Solution

1.Scenario Description and Typical Load Characteristics

AIDCs primarily support AI training, AI inference, and high-performance computing (HPC), serving as critical computing infrastructure in the AI era. With the rapid expansion of GPU server deployments, data centers are evolving toward ultra-high power consumption, high density, and round-the-clock continuous operation, placing higher demands on power supply reliability and energy efficiency. AIDC loads are characterized by high stability, high continuity, and round-the-clock operation, providing a solid foundation for synergistic integration with PV and energy storage systems.

Operating Mode

7×24-hour continuous operation

Power Consumption Characteristics

High load factor, high stability,
round-the-clock operation

Power Supply Requirements

Highly reliable power supply,
zero downtime for mission-critical operations

power Needs

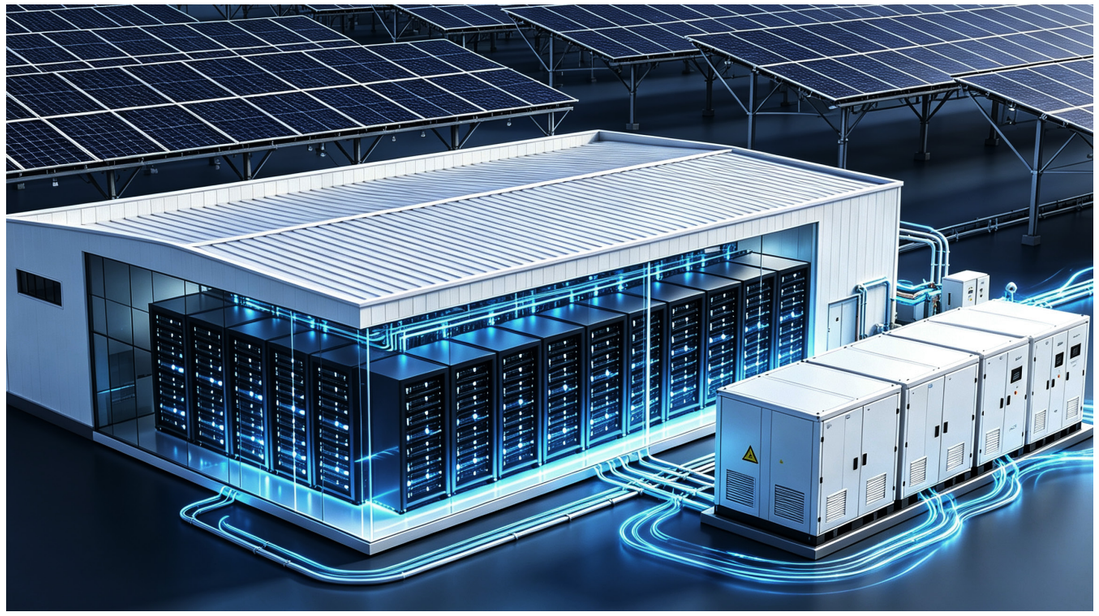
Increased share of green electricity,
reduced operating costs

2. Trends in the Evolution of AIDC Power Supply Architectures

800V HVDC Drives Upgrades to AI Data Center Power Supply Architectures

As the power density of AI computing clusters continues to increase, traditional power supply architectures face challenges such as high power, high density, and rapid power fluctuations. NVIDIA is driving the evolution of next-generation AI data centers (AI Factories) toward an 800V HVDC (High-Voltage Direct Current) power supply architecture and is promoting the establishment of a corresponding integration and certification system for energy storage systems. Its core objective is to address the power supply bottlenecks—including high power, rapid fluctuations, and high density—caused by AI computing clusters through a “high-voltage direct current + energy storage” solution.

By increasing the supply voltage, 800V HVDC reduces the transmission current for the same power output, thereby minimizing line losses and alleviating pressure on the power distribution system, and supporting the construction of AI computing infrastructure with higher power density. At the same time, energy storage systems enhance the AI data center power supply system’s resilience to load fluctuations and grid anomalies through capabilities such as rapid power response, grid-forming operation, and coordinated on-grid and off-grid operation.



AIDC PV-Storage System Solution

Energy Storage Becomes a Key Component of the 800V HVDC Architecture

In an 800V HVDC architecture, energy storage systems not only serve as backup power sources in the traditional sense but must also provide stronger dynamic power support and grid adaptability, including:

Rapid dynamic response:
Tracking rapid power changes in AI loads, smoothing out power steps and transient fluctuations, and enhancing the dynamic stability of the power supply system.

Grid formation and islanded operation:
Autonomously establish voltage and frequency during grid anomalies or when disconnected from the grid, supporting islanded operation and black start.

Grid support capability:
Possess high- and low-voltage ride-through and reactive power support capabilities, enhancing the system's adaptability to grid fluctuations.

Coordinated grid-connected and off-grid operation:
Support smooth switching between grid-connected and off-grid operating modes, improving the overall resilience of the AIDC power supply system.

For high-power-density AI data centers, future energy storage systems will work in close coordination with 800V HVDC architectures to form a layered energy architecture combining "short-term dynamic support" and "long-term energy storage": front-end rapid-response devices such as supercapacitors can suppress millisecond-level power fluctuations, while battery energy storage systems handle power balancing and backup power supply over longer time scales.

3.Scenario Pain Points

Extremely high requirements for power supply continuity and dynamic stability:

AI workloads run continuously and experience rapid power fluctuations; power outages or insufficient dynamic response can lead to interruptions in computing tasks and business losses.

Continually increasing electricity consumption and cost pressures:

Continually increasing electricity consumption and cost pressures: The high-load operation of GPU clusters makes AI data centers (AIDCs) a typical high-power consumption scenario, with power supply capacity and energy costs becoming major constraints on infrastructure development.

Challenges in Grid Connection and Expansion Capacity:

Challenges in Grid Connection and Expansion Capacity: With computing loads growing rapidly, some regions face issues such as insufficient grid capacity, lengthy expansion cycles, or inadequate grid stability.

Increasing Demand for Green Energy:

Increasing Demand for Green Energy: The continuous expansion of AI infrastructure drives demand for renewable energy, prompting AIDCs to increase their use of green electricity to optimize their energy mix and achieve low-carbon operations.

4. Overseas RTC 24/7 Green Power Supply Solution (Weak Grid/Off-Grid Areas)

Configuration Plan
Taking a 1 GW AIDC continuous load as an example:

AIDC load	1GW
PV capacity	4.5GWp
BESS capacity	19GWh
Module	Tiger Neo 3.0
Storage	SunTera

Products

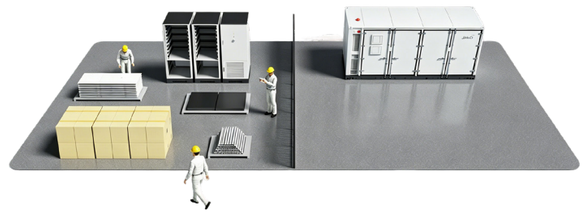
Tiger Neo 3.0 PV Module

- **High-Efficiency Power Generation:** Designed for high efficiency and high power output, this system enhances power generation capacity per unit area and is suitable for large-scale photovoltaic over-configuration scenarios.
- **Efficient Utilization of Low-Light Resources:** Excellent low-light power generation performance extends effective generation time and improves energy acquisition capabilities under complex climatic conditions.
- **Highly Reliable Operation:** Adaptable to complex environments such as high temperatures and desert conditions, ensuring long-term, stable power generation.

SunTera Energy Storage System

- **Grid-forming and Black Start:** Supports grid-forming operation, black start, and microgrid operation, suitable for weak grid and off-grid power supply scenarios.
- **High Safety and Reliability:** A five-layer safety protection system and long-life design ensure the long-term stable operation of long-duration energy storage systems.
- **High Integration and Rapid Deployment:** The system is highly integrated and factory-prefabricated, reducing on-site installation and commissioning work and shortening the project construction cycle.

- **Smart O&M:** Supports remote monitoring, condition diagnostics, and predictive maintenance to improve the operational and maintenance efficiency of large-scale energy storage systems.



Configuration Description:
This solution draws on the global RTC (Round-the-Clock) model for round-the-clock green power supply. Through large-scale over-provisioning of PV capacity and long-duration energy storage, it ensures round-the-clock green power supply for the AIDC.

System Operation Logic

Daytime Operation: The 4.5 GWp PV system prioritizes supplying power to the AIDC's 1 GW continuous load. The remaining approximately 3.5 GW of available photovoltaic power is used to charge the energy storage system via the PCS. Based on an energy storage capacity of 19 GWh, the theoretical charging time is approximately 5.4 hours;

Nighttime Operation: When PV output is insufficient or generation ceases, the energy storage system supplies power to the AIDC's continuous load at a rate of approximately 1 GW. The 19 GWh of energy storage capacity can theoretically sustain this for about 19 hours.

System Features:

- Solar power is prioritized to meet load demand
- Excess green electricity is stored in the energy storage system
- The energy storage system provides power during nighttime and periods of low irradiance
- Reduces reliance on the external grid and enables RTC operation

Revenue Projections

Category	Item	Data	Notes
Electricity Demand	AIDC Continuous Load	1GW	Assumes continuous operation throughout the year
Annual Electricity Consumption	Annual Electricity Consumption	8.76 billion kWh	1GW×8760h
Electricity Rate Reference	C&I Electricity Rate 0.70 RMB/kWh	0.70 RMB/kWh	Calculated based on typical overseas electricity rates
Electricity Expenses	Annual Electricity Costs	Approx. 6.1 billion RMB/year	8.76 billion kWh × 0.70 yuan/kWh
Project Value	Substituted Electricity Costs	Approx. 6.1 billion RMB/year	Theoretical substituted electricity osts under the RTC model

Note: This section only presents the annual electricity purchase costs that can be substituted under the RTC model; it does not include calculations related to project investment, IRR, or payback period.

5.Domestic AIDC Backup Power Solution (Strong Grid Area)

10MW Continuous Load Case

AIDC load	10MW
PV capacity	10MWp
BESS capacity	40MWh（4小时应急备电）
Module	Tiger Neo 3.0
Storage	SunTera

Tiger Neo 3.0 PV Module

- **High-Efficiency Power Generation:** Designed for high efficiency and high power output, this system enhances the park's capacity to supply green electricity per unit area.
- **High-Efficiency Utilization of Low-Light Conditions:** Improves power generation capacity during early mornings, evenings, and under low irradiance conditions, extending the effective power generation period.
- **Highly Reliable Operation:** Adapted to long-term outdoor operating environments to ensure stable operation of the PV system.

AIDC PV-Storage System Solution

SunTera Energy Storage System

- **Rapid Response and Grid-Supporting Capabilities:** Supports grid-supporting operation, providing power support to critical loads during grid anomalies.
- **Highly Reliable Backup Power:** Supports black start and microgrid operation capabilities, enhancing the resilience of emergency power supply for data centers.
- **High-Safety Design:** A five-layer safety protection system enhances the safety of the energy storage system throughout its entire lifecycle.
- **High Integration and Rapid Deployment:** The system is highly integrated and factory-pre-fabricated, reducing on-site installation and commissioning work and shortening the project construction cycle.

- **Smart O&M:** Supports remote monitoring, condition diag-nostics, and predictive maintenance, reducing on-site O&M workload.

Configuration Notes: This solution is suitable for regions with well-developed grid infrastructure, such as China. The PV system prioritizes supplying green electricity to the AIDC, while the energy storage system primarily serves as an emergency backup power source and does not participate in the RTC's round-the-clock power supply.

System Operation Logic

Normal Operation: The PV system prioritizes supplying power to the AIDC, while the energy storage system is charged by the utility grid and remains in standby mode, not participating in daily energy dispatch;

Grid Failure: In the event of a utility power failure, the data center's UPS performs a millisecond-level power supply switchover; the energy storage PCS rapidly switches to grid-forming mode and gradually assumes power supply for critical loads; the diesel generator (if configured) starts up and takes over emergency power supply duties. Once the utility grid is restored, the utility grid resumes its role in providing long-term power supply.

System Features:

- PV continuously reduces electricity costs
- Energy storage provides emergency backup capacity
- Improves power supply reliability and grid resilience
- Meets the data center's high-reliability operational requirements

Revenue Projections

Category	Item	Data	Notes
Electricity Demand	AIDC Continuous Load	10 MWp	Typical Configuration
Annual Electricity Consumption	Annual Electricity Consumption	11–13 million kWh	Based on 1,100–1,300 hours
Electricity Rate Reference	C&I Electricity Rate 0.70 RMB/kWh	0.70–0.80 yuan/kWh	Typical domestic commercial and industrial electricity tariffs
Save on electricity bills	Holiday electricity revenue	7.7–10.4 million yuan per year	Photovoltaic power generation replacing purchased electricity
The value of energy storage	Emergency backup power	/	Economic benefits are not calculated separately

Note: In the domestic scenario, the energy storage system primarily serves as an emergency backup power source; therefore, only the electricity savings generated by photovoltaic power generation are calculated, and the benefits of energy storage are not calculated separately.

TIGER Neo III

66QL6-BDV

650-670 Watt

85±5% Bifaciality

BIFACIAL MODULE

Higher Power on Front Side

Leading power class based on the enhanced N-type TOPCon platform, through cutting-edge technology and an optimized layout that captures more sunlight.

Better Generation on Rear Side

Enabling industry-leading bifaciality in TOPCon cells through an improved structure that enhances light absorption and trapping.

Optimized Heat Resistance

Optimized temperature coefficient via advanced graphical patterning, busbar and multi-cells technology.

Proven Low Light Performance

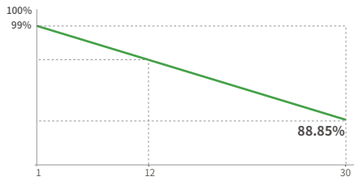
Enhanced cell structure ensures superior module performance under low-light conditions.

Industry Leading Warranty

Advanced metallization and iterated module encapsulation deliver superior resistance to PID, LID / LeTID, and UV degradation.

Mechanical Load Enhanced

Certified to withstand:
5400 Pa front side max static test load
2400 Pa rear side max static test load



12 Year Product Warranty | **30** Year Linear Power Warranty | **1**% First-year Degradation | **0.35**% Annual Degradation Over 30 Years

- IEC61215:2021 / IEC61730:2023
- IEC61701 / IEC62716 / IEC60068 / IEC62804
- ISO9001:2015: Quality Management System
- ISO14001:2015: Environment Management System
- ISO45001:2018: Occupational health and safety management systems

JKM650-670N-66QL6-BDV-F2-EN

66QL6-BDV 650-670 Watt

Mechanical Characteristics

Cell Type	N- type Mono-crystalline
No. of Cells	264 (66×4)
Dimensions	2382×1134×30 mm
Weight	32.5 kg
Front Glass	2.0 mm, Anti-reflection Coating
Back Glass	2.0 mm, Heat Strengthened Glass
Frame	Anodized Aluminium Alloy
Junction Box	IP68 Rated
Protection Class	Class II
IEC Fire Type	Class C
Connector Type	JK03M / JK03M2 / Others*
Output Cables (Including Connector)	4.0 mm^2 (+): 600 mm , (-): 400 mm or Customized Length

*MC4-EVO2 available upon request and subject to availability

Packaging Configuration

Pallet Dimensions	2396×1110×1251 mm
Packing Detail (Two pallets = One stack)	36 pcs/pallet, 72 pcs/stack, 720 pcs/ 40'HQ Container

Specifications (STC)

Maximum Power - Pmax [Wp]	650	655	660	665	670
Maximum Power Voltage - Vmp [V]	42.57	42.70	42.83	42.96	43.09
Maximum Power Current - Imp [A]	15.27	15.34	15.41	15.48	15.55
Open-circuit Voltage - Voc [V]	50.26	50.44	50.62	50.80	50.98
Short-circuit Current - Isc [A]	15.98	16.04	16.10	16.16	16.22
Module Efficiency STC [%]	24.06	24.25	24.43	24.62	24.80
Bifacial Factor	85 ± 5%				
Power Tolerence	0 ~ +3 %				
Temperature Coefficient of Pmax	-0.26 %/°C				
Temperature Coefficient of Voc	-0.24 %/°C				
Temperature Coefficient of Isc	0.046 %/°C				

STC: Irradiance 1000W/m^2, Cell Temperature 25°C, AM=1.5

Specifications (BNPI)

Maximum Power - Pmax [Wp]	724	729	735	741	746
Maximum Power Voltage - Vmp [V]	42.52	42.69	42.86	43.03	43.20
Maximum Power Current - Imp [A]	17.04	17.10	17.17	17.23	17.30
Open-circuit Voltage - Voc [V]	50.38	50.56	50.74	50.92	51.10
Short-circuit Current - Isc [A]	17.80	17.87	17.94	18.00	18.07

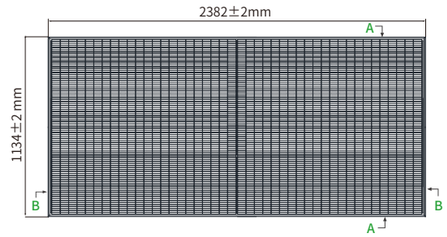
BNPI: Irradiance: Front 1000W/m^2, Rear 135W/m^2, Cell Temperature 25°C, AM=1.5

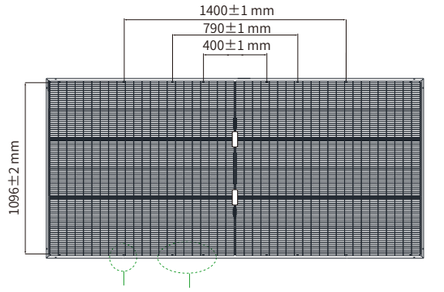
Application Conditions

Level T_{98} ⩽ 70 °C	-40 °C ~ +70 °C*
Maximum System Voltage	1500 VDC (IEC)
Maximum Series Fuse Rating	35 A
Bifaciality Coefficents	φVoc: 98±5 %, φIsc: 85±5 %, φPmax: 85±5 %

*Short-term up to 85°C; higher operation requires IEC TS 63126 testing

Engineering Drawings

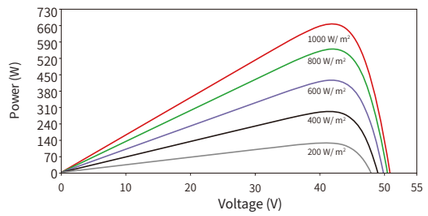




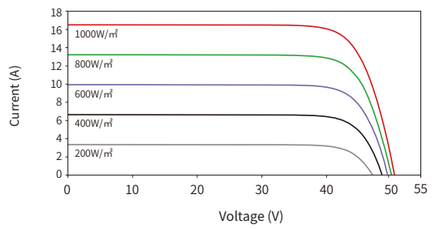
Note: For specific dimensions and tolerance ranges, please refer to the corresponding detailed module drawings.

Electrical Performance

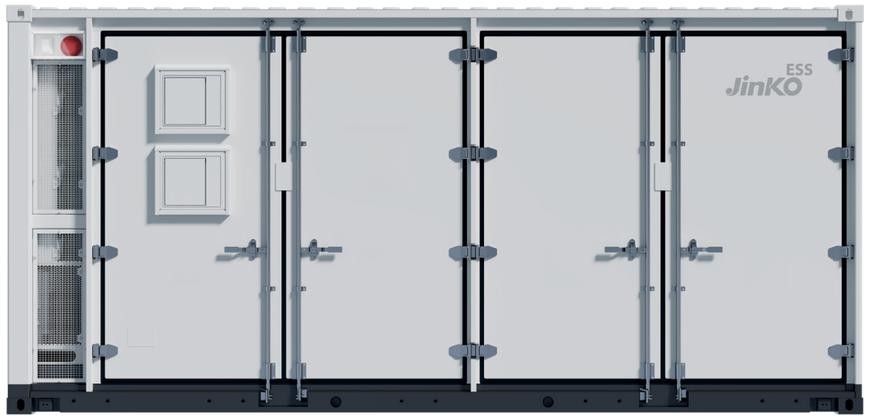
Power-Voltage Curves (66QL6-BDV 660W)



Current-Voltage Curves (66QL6-BDV 660W)



Note: Please read the safety and installation manual before using the product. We reserve the right of final interpretation. The specifications in this datasheet are subject to change without notice.



SunTera G3 6.25MWh

Energy Storage System

The Jinko ESS 6.25 MWh energy storage system leverages our latest liquid-cooled technology and high-capacity 588 Ah $LiFePO_4$ cells to achieve industry-leading energy density, safety, and efficiency. Engineered for grid-scale applications, it maximizes storage capacity and long-term reliability in a standardized 20-foot container layout.

Intelligent Liquid Cooling for Thermal Stability

Features a serpentine multi-parallel flow channel design that maintains a cell temperature difference of less than 2.5℃. Multiple cooling control modes optimize thermal management and reduce auxiliary system power consumption.

Enhanced System Efficiency

Implements a rack-level energy management scheme, increasing RTE (Round-Trip Efficiency) by over 1%. Integrated with active balancing technology to boost available charge/discharge capacity by 5%.

Comprehensive Safety Architecture

Equipped with five-tier protection from cell to system level to prevent thermal runaway. Combines gas detection and water-based fire suppression in a hybrid explosion-proof system for enhanced hazard containment.

Smart O&M & Flexible Deployment

Intelligent control system streamlines commissioning and lowers operational costs. Supports flexible placement configurations (back-to-back or side-by-side) to maximize energy density and adapt to site layout.

Solar-Storage Integration

Seamlessly combine solar PV generation with energy storage to optimize self-consumption, maximize renewable utilization, and ensure a continuous, stable power supply.

Grid Support Services

Deliver critical grid services including frequency regulation, voltage support, and peak shaving to enhance network stability, reliability, and power quality.

Energy Market Participation

Enable revenue generation through energy arbitrage, capacity markets, and ancillary service provision, creating economic value while supporting overall grid efficiency.

Battery parameters

Type of cell	Lithium Iron Phosphate(LFP)
Cell specification	587/588Ah
Charge/discharge power	0.5P/0.25P
Configuration of system	1P416S×8
Rated capacity	6.25 MWh
Rated voltage	1331.2V

System parameters

Dimension(L×W×H)	6058×2438×2896mm
Weight	48,000 kg
Cooling method	Liquid Cooling
Operating temperature	-40~55℃
Operating humidity	⩽100%RH
Altitude	⩽4500m
Noise level	⩽80dB(A), @1m/ 75dB(optional)
IP grade	IP55
Corrosion class	C4/(C5 optional)
Fire suppression system	Temperature sensor + Smoke detector + Combustible gas detector + Deflagration venting• ❍Optional• •+ Aerosol + Water sprinkler
Communication	Ethernet / CAN
Certification Standards	IEC62619, IEC61000, IEC62477, UL9540A, UL1973, UL9540, NFPA68, NFPA69, NFPA855

Version:EN_2026_A2