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11:00 am – 12:00 pm | Riyadh

Unlocking affordable, reliable power for Saudi data centers with PV & Storage

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DATAVOLT

January 21st , 2026

Powering Saudi Arabia's digital future: Solar & Storage For The New energy Era

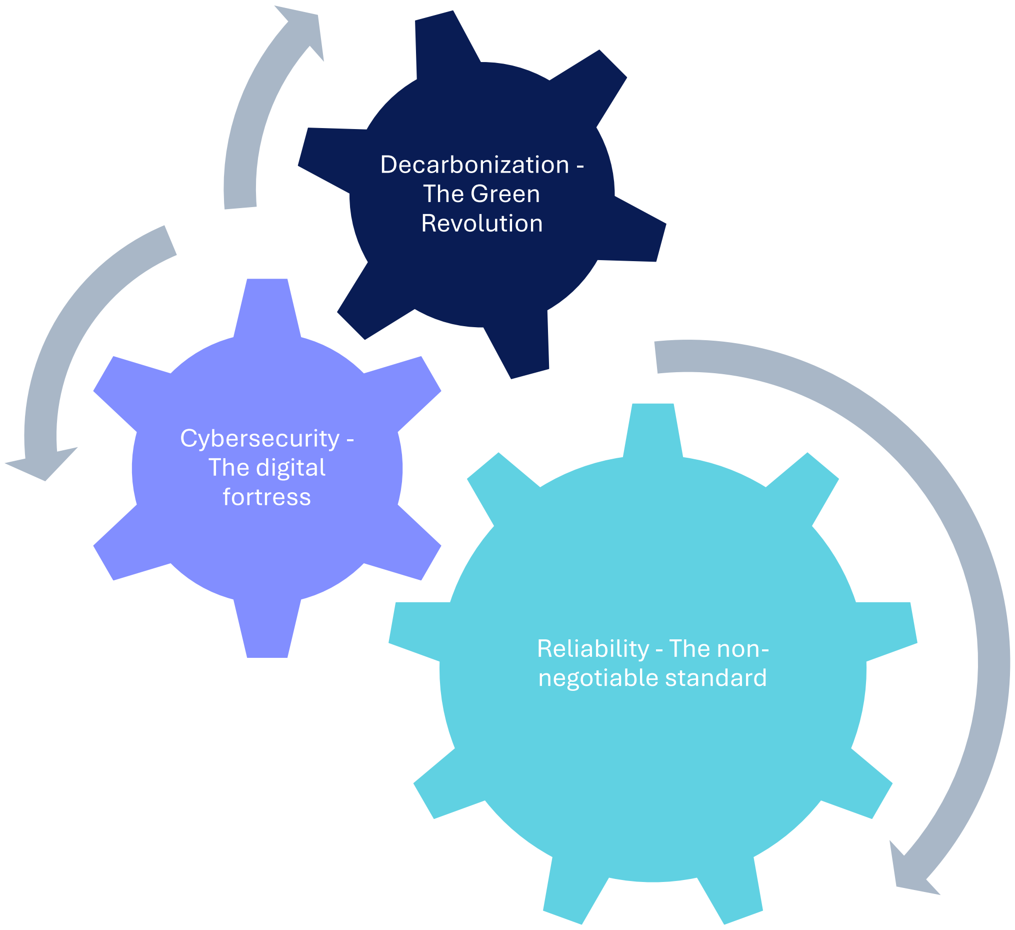
Integrating Renewable Energy with Mission-critical Digital Infrastructure

By: Samira Nikzad – Director of Development

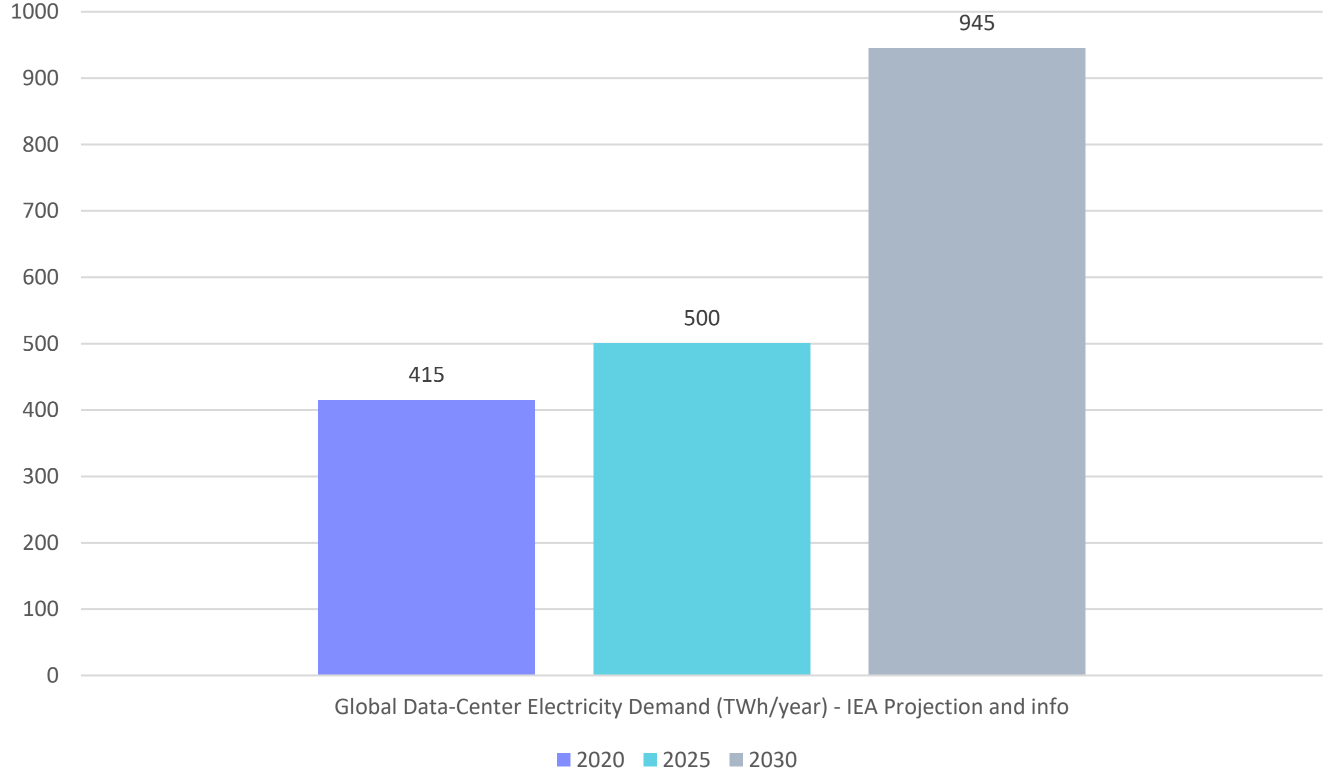
Classification: Confidential

Transformation at Scale

Introduction: The Non-negotiable of a Data Centre — Power



Redundancy is built into every layer, from power to network paths, to ensure that a backup is always available.



Source: International Energy Agency

Global data-centre electricity demand is projected to more than double by 2030, reaching close to 1,000 TWh annually, with AI workloads the dominant growth driver.

Saudi Arabia’s AI Infrastructure Vision — Global Ambition in Action

DATAVOLT

Building world-class infrastructure for AI (data centres, cloud, compute fabric)

Attracting global investment, talent, and partnerships

Creating value chains anchored in digital leadership rather than resource extraction.

Power-system Transformation Mandate

Solar is no longer just a decarbonisation tool — it becomes industrial infrastructure.

AI data centres are ideal anchor loads for large-scale solar

AI demand raises the utilisation factor and economic value of solar assets.

Renewable power in KSA moves from energy quantity to time-quality power.

Sunlight is converted into digital economic output.

Source: https://www.pif.gov.sa

Solar Power On-site Integration in Data Centres— Opportunities

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Opportunity	Impact
Direct reduction of grid electricity consumption.	Improved energy cost predictability and reduces grid imported energy.
Immediate carbon reduction with high credibility.	Clear Scope 2 emissions reduction.
Alignment with cooling-driven daytime demand.	Onsite PV can directly offset the most energy-intensive operating hours.
Enhanced resilience when combined with storage or microgrids.	Onsite generation strengthens energy autonomy.
Strategic and reputational value.	Onsite PV signals responsible growth and grid awareness

Source: https://www.datacenterknowledge.com

Iron Mountain Data Center	7.2 MW Solar Array (USA)
Emerson Data Center	~100 kW Missouri (USA)
Kinetic Solution Data Center	Arizona/California (USA)
Microsoft Data Center	(planned rooftop PV)
Khazna Data Center Photovoltaic Plant	7 MW Abu Dhabi (UAE)

Solar Power On-site Integration in Data Centres— Challenges

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Challenge	Impact	Solution / Recovery
SEC Eligibility and Sizing for generation and wheeling is capped.	SEC Eligibility and sizing to contracted load: 30 MW cap "or contracted load, whichever is lower.	Utilisation of Solar power in smaller deployments.
Space VS power - Rooftop and campus PV typically supply ~5–15% of total annual energy.	Onsite PV reduces demand—it does not redefine supply.	On-site Solar power can be utilised for non-critical applications.
Intermittency and mismatch with 24/7 loads.	Without storage, excess daytime PV cannot serve night demand.	Utilisation of BESS to implement time shifting.
Land, roof loading, and structural constraints.	Roof and ground spaces house critical Equipment or expansion.	In data centre's, space is strategic, not spare. Colo BESS can be the solution to this.
Operational complexity and O&M integration	Additional protection requirements and assets to maintain.	Any onsite PV system must be invisible to IT operations when things go wrong.

Onsite PV will not power the data centre alone—but it will make the data centre cleaner, more resilient, and more grid-responsible.

Storage

Offsite Renewables

Intelligent Grid Integration.

Solar Power Integration in Data Centres— Putting it All Together

For large AI ecosystems, the future is not one battery, but a layered system

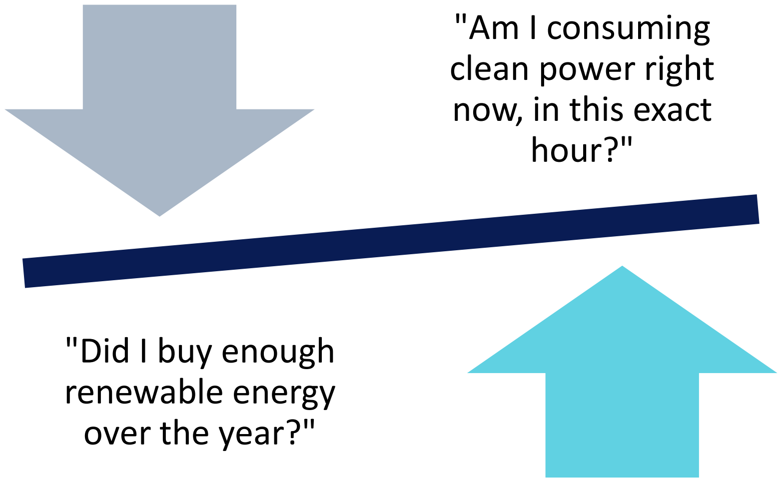
Layer	Role
Grid-scale BESS	System stability, renewable absorption
Renewable-coupled BESS	Firm clean energy supply
Front-of-meter BESS	Grid acceptance & power quality
Onsite BESS	Optimisation & resilience
Microgrid BESS	Continuity & autonomy
Virtual / market BESS	Portfolio efficiency
AI-aware BESS	Next-gen optimisation

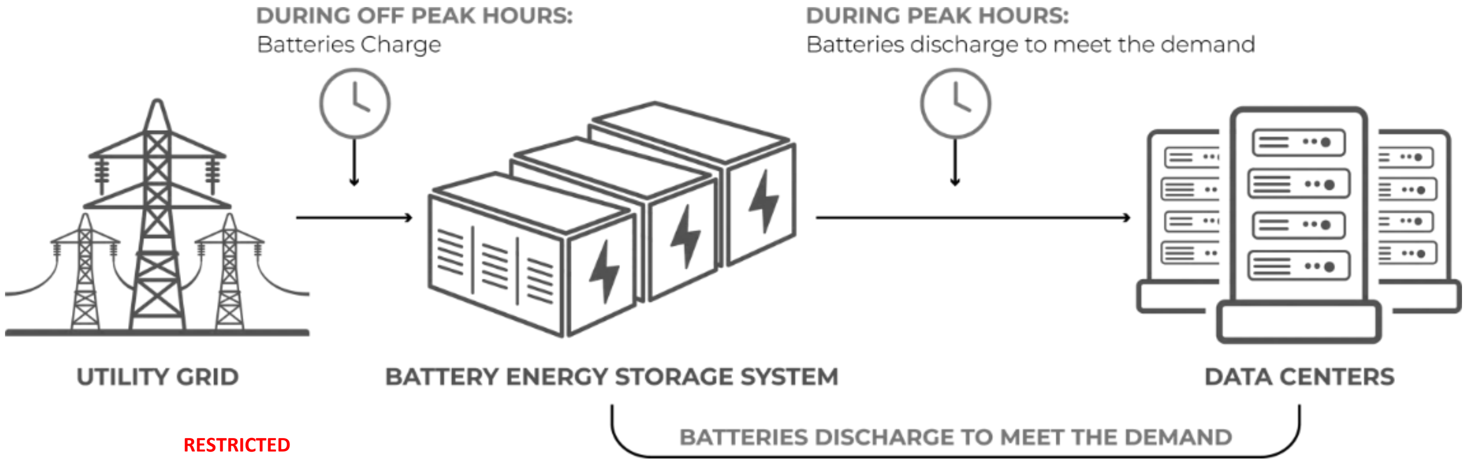
Through BESS, instantaneous response (faster than diesel) can be provided that covers short- and medium-duration outages and enables islanded operation when combined with solar.

Load smoothing will happen when BESS charge during low-demand or high-solar periods, discharge during peak demand hours, and flatten the net load seen by the grid.

During daylight hours solar PV meets live demand while excess solar charges the batteries and it is discharged during non-sun hours.

Firming is what allows renewables to move from “supplemental” to “primary” power sources.





Source: https://eticaag.com

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Ameera AL Amayrah

Research Team
Lead

Solarabic

Speaker

Saudi Arabia's Digital Horizon

Powering the Data Center Boom with Solar & Storage

24/7 Reliability in Desert Conditions

Research Team Lead, Solarabic DMCC

Ameera Al-Amayrah

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1) Saudi Arabia Solar Climate & Environmental Conditions

Daily Totals (GHI)

4.6 - 5.8 kWh/kWp

Yearly Totals

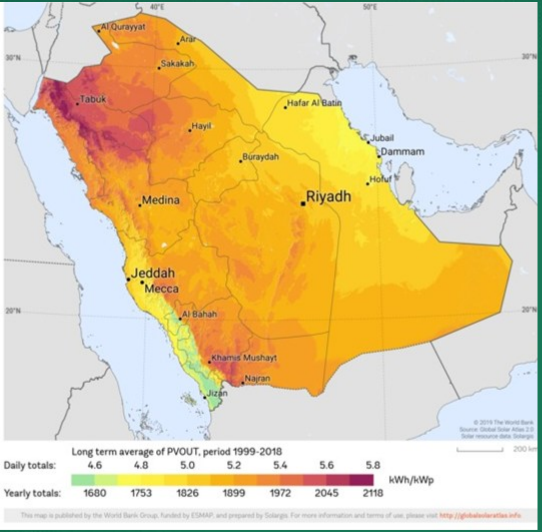
1680 - 2118 kWh/kWp

Weather Conditions

- High Irradiation
- Extreme Heat (>50°C)
- Sand & Dust Storms

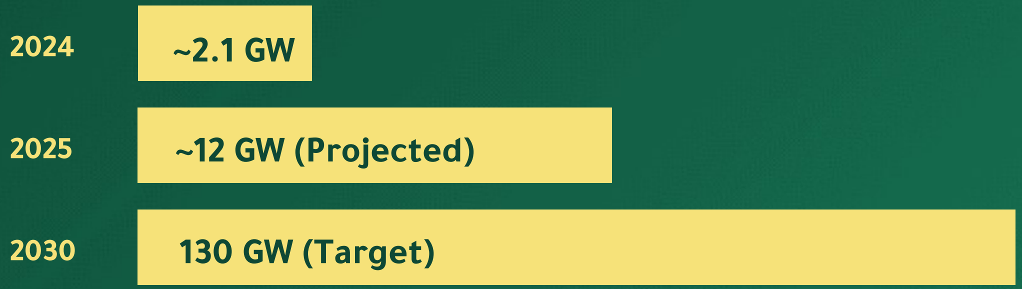
Saudi Arabia PV Power Potential

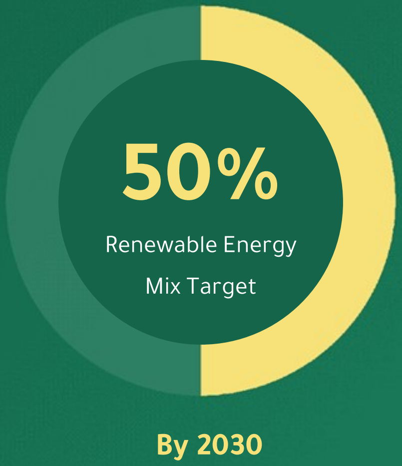
KWh/KWp



Source: SolarGIS / World Bank Group / ESMAP

2) Rapid Capacity Growth in Utility-Scale Sector Aligned with Vision 2030





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3) Policy & Economic Pivot in Saudi Arabia

Regulatory Framework

Self-Consumption

Allowed for systems without grid export.

Net Billing

Credit mechanism for surplus energy export.

Storage Limit

< 30 MW allowed for self-consumption with storage.

LCOE Hall of Fame

Project	Year	LCOE (¢/kWh)
Sakaka (300MW)	2019	2.34
Sudair (1.5GW)	2021	1.24
Al Shuaibah (2.0GW)	2023	1.04

World's Largest BESS

Red Sea Project (1.3 GWh) - Off-grid 100%

Diesel Price Hike

November 2024

1.15 SAR ($0.3067) per liter

↑53% Increase

May 2025

1.66 SAR ($0.4427) per liter

↑44% Increase

Jan 2026

1.79 SAR ($ 0.48) per liter

↑7.8% Increase

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4) Solar & Storage Adoption in DG

Successive diesel price hikes (reaching **SAR 1.79($ 0.48)/L** in 2026) have accelerated the shift toward distributed solar PV across key economic sectors.

Agricultural

Rapid replacement of diesel generators for irrigation and farm operations to secure long-term water and food security.

Industrial

Manufacturing facilities leveraging self-consumption to hedge against energy price volatility and meet sustainability mandates.

Commercial

Malls, offices, and logistics hubs integrating solar to reduce high peak-load costs and operational expenses.

Data Centers

Mission-critical facilities adopting Solar + Storage for **24/7 reliability** and cost-effective power in remote locations.

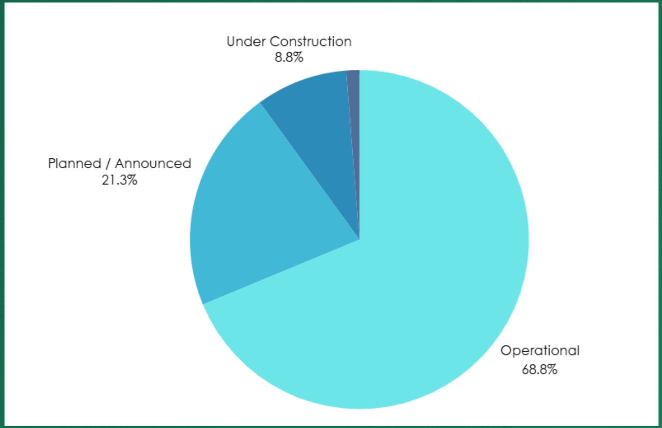
5) Data Centers in Saudi Arabia

Total Identified Facilities

80

Operational	68.8%
Planned / Announced	21.3%
Under Construction	8.8%

KSA Data Center Status Breakdown



Source: Solarabic Research (2026)

6) Data Centers Geographic Distribution & Strategic Hubs

Riyadh & Central Region

Primary administrative & financial hub. Largest concentration of hyperscale facilities.

Jeddah & Western Region

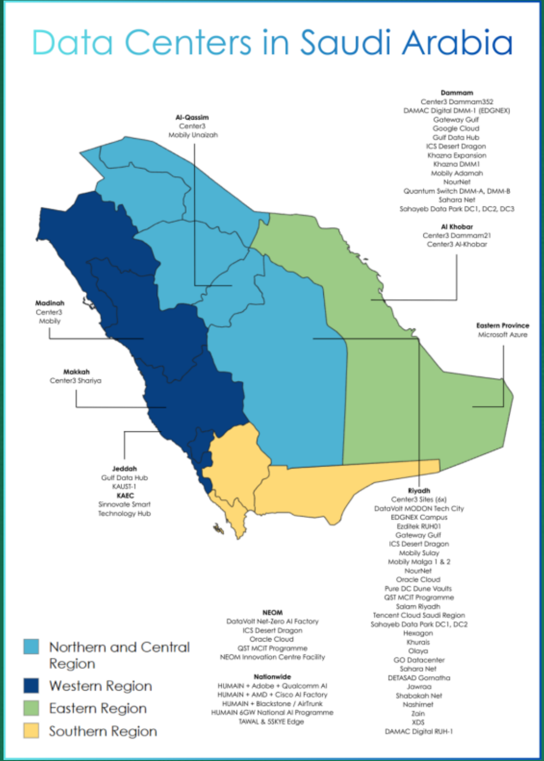
Strategic gateway for subsea cables. Critical low-latency connectivity to Europe/Asia.

Dammam & Eastern Province

Industrial heartland. Energy sector demand and regional cloud nodes.

NEOM & The North

Emerging hub for 100% renewable-powered AI data centers.



Source: Solarabic Research (2026)

7) Technical Solutions for 24/7 Reliability

High-Performance Hybrid Systems for Mission-Critical Infrastructure

High-Performance PV

Utilizing **High-Tech** modules with superior temperature coefficients to mitigate efficiency losses from extreme desert heat (>50°C).

Battery Storage (BESS)

Essential for shifting solar generation to meet **night-time loads**, ensuring 24/7 power availability and grid stability.

Autonomous Cleaning

Robotic cleaning systems are crucial for maintaining optimal performance and maximizing yield in high-soiling desert environments.

Aligning technical excellence with Saudi Vision 2030 renewable energy commitments.

White Paper

Saudi Arabia's Digital Horizon: Powering the Data Center Boom with Solar & Storage

SUNRISE ARABIA
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Joint Research White Paper

Developed by **Solarabic DMCC** and **pv magazine Global**, exploring the Saudi Data Center Energy Market.

Full Findings Release

Comprehensive data will be released post-conference.

Scan for Immediate Access

pv magazine

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Edgard Aboukheir

Technical Service Manager

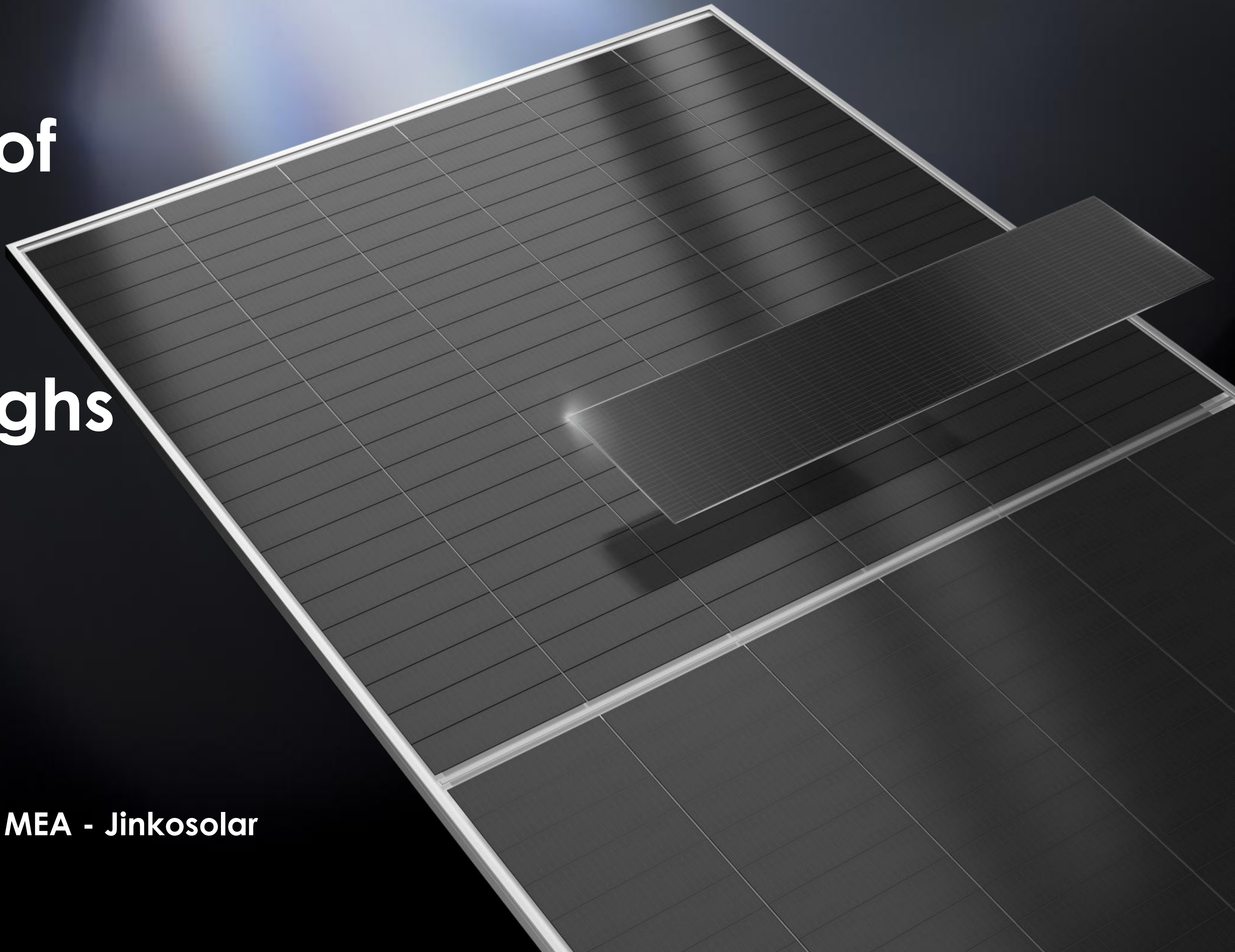
Jinko Solar

Speaker

TIGER Neo III

2006 All In Solar 2026 Solar For All

Unlocking the Future of Green Data Centers: Technical Breakthroughs in Tiger Neo 3.0



Edgard Abou Kheir, Technical Services Manager MEA - Jinkosolar

PV Magazine webinar

Jinko Solar Milestones

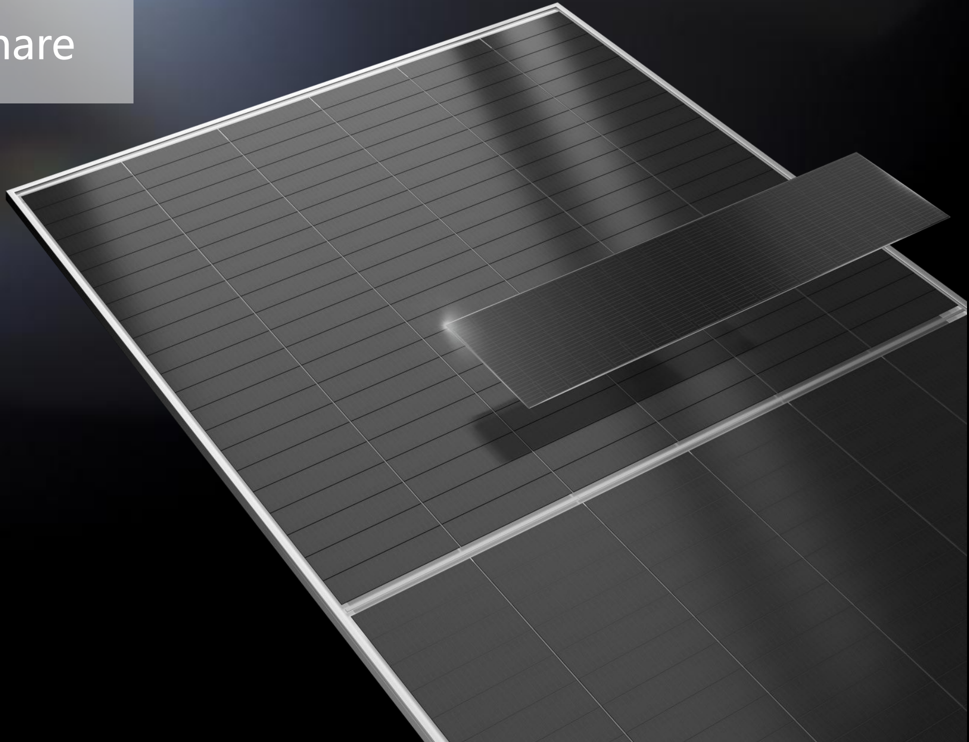
400+GW
Global First to Break Through Shipment

6 times
No. 1 in Yearly Shipment

15.5%
2024
Global Market Share

32 times
Word Record

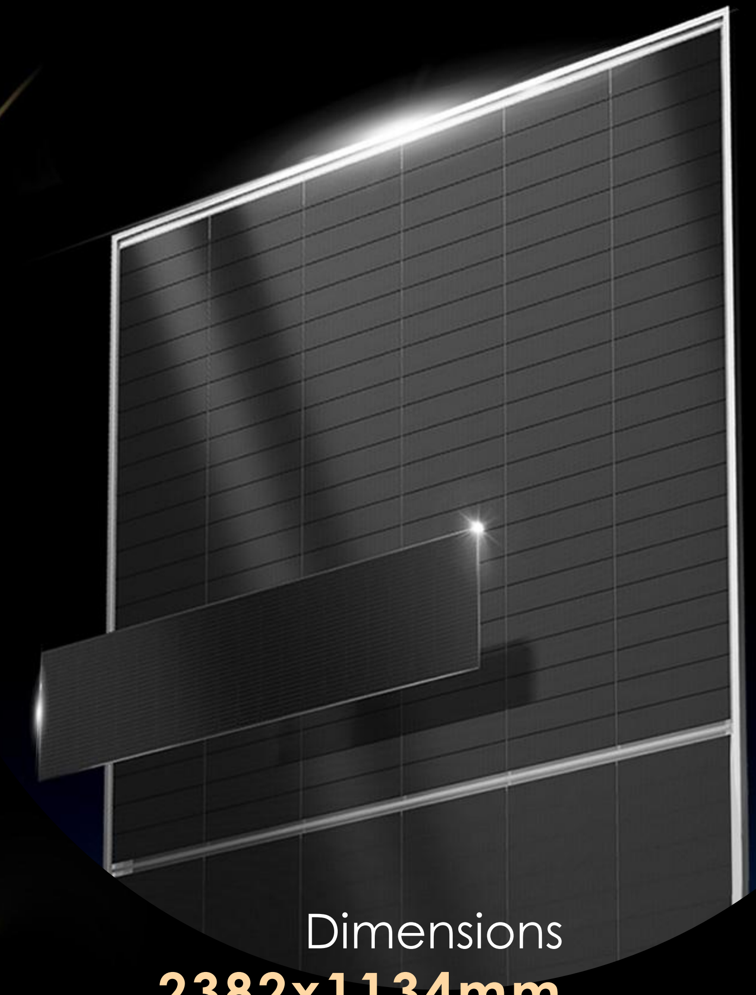
100+GW
N-Type Capability



TIGER Neo III

JinKO Solar

Six Advantages of the Product



Power
650-670W

Better Bifacial Factor
85±5%

Optimized Power Temp Coeff.
-0.26%/℃

Better Annual Degradation:
-0.35%

Better Lower Irradiation Performance
95~98%
*200W/m^2

Gain Per Watt Compared to BC
+3-3.5%

Dimensions
2382x1134mm

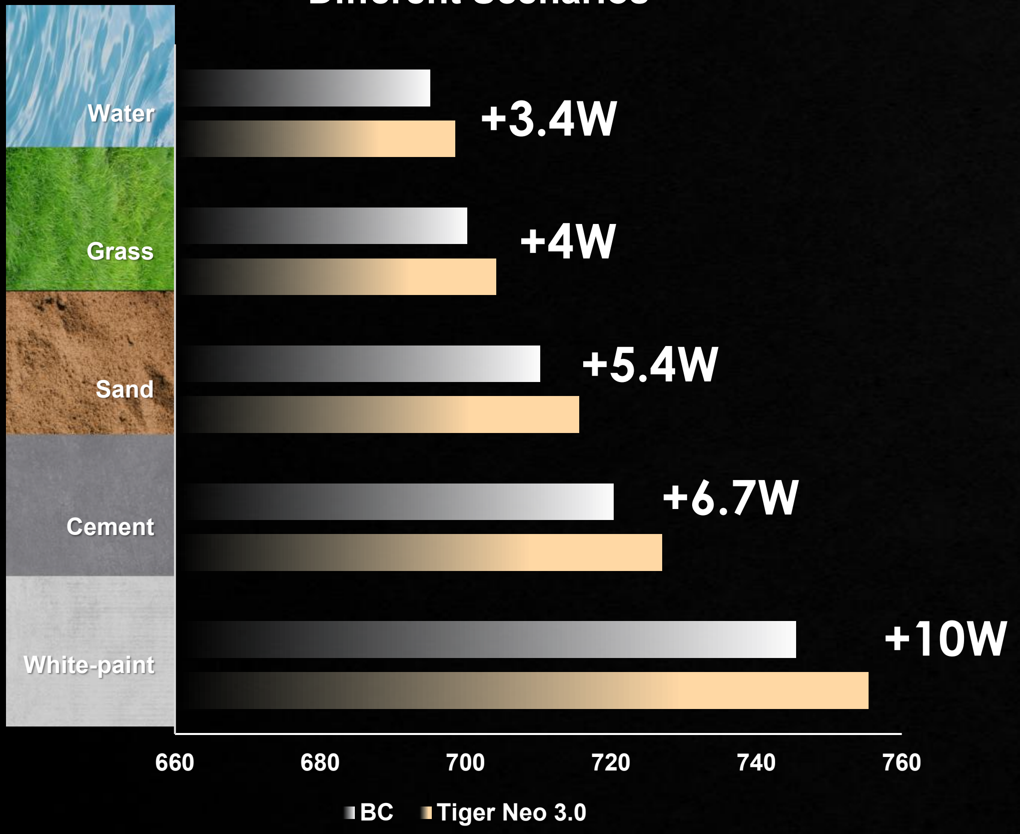
TIGER Neo III

JinKO Solar

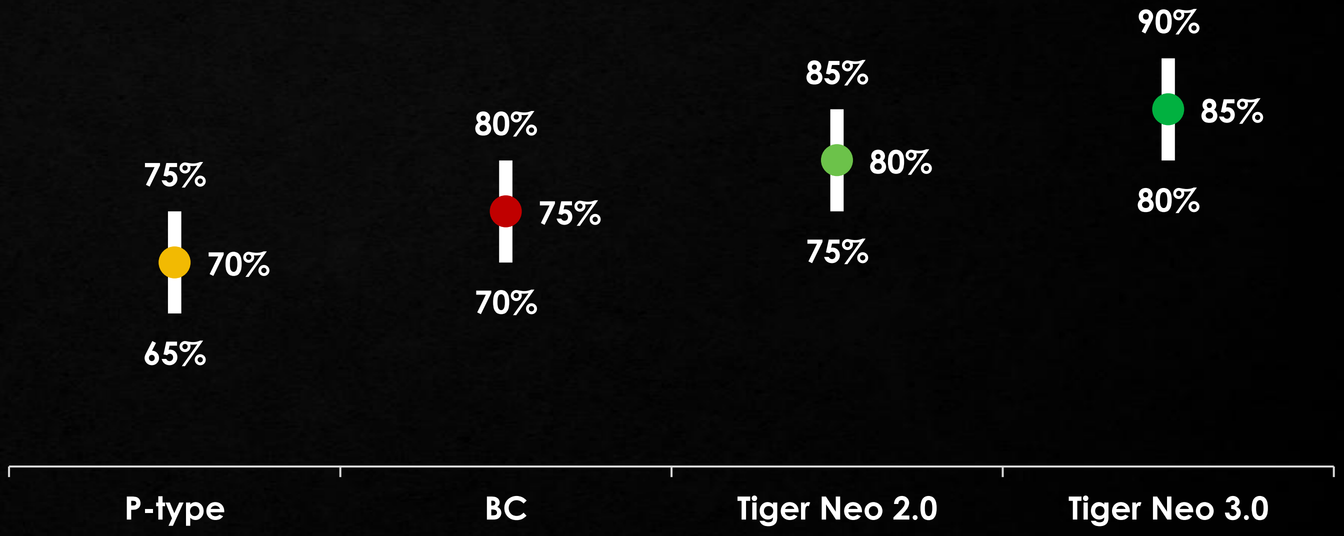
Better Bifacial Factor 85±5%

Each 5% bifaciality increase can achieve more than **0.6%** generation gain for the ground mounted project

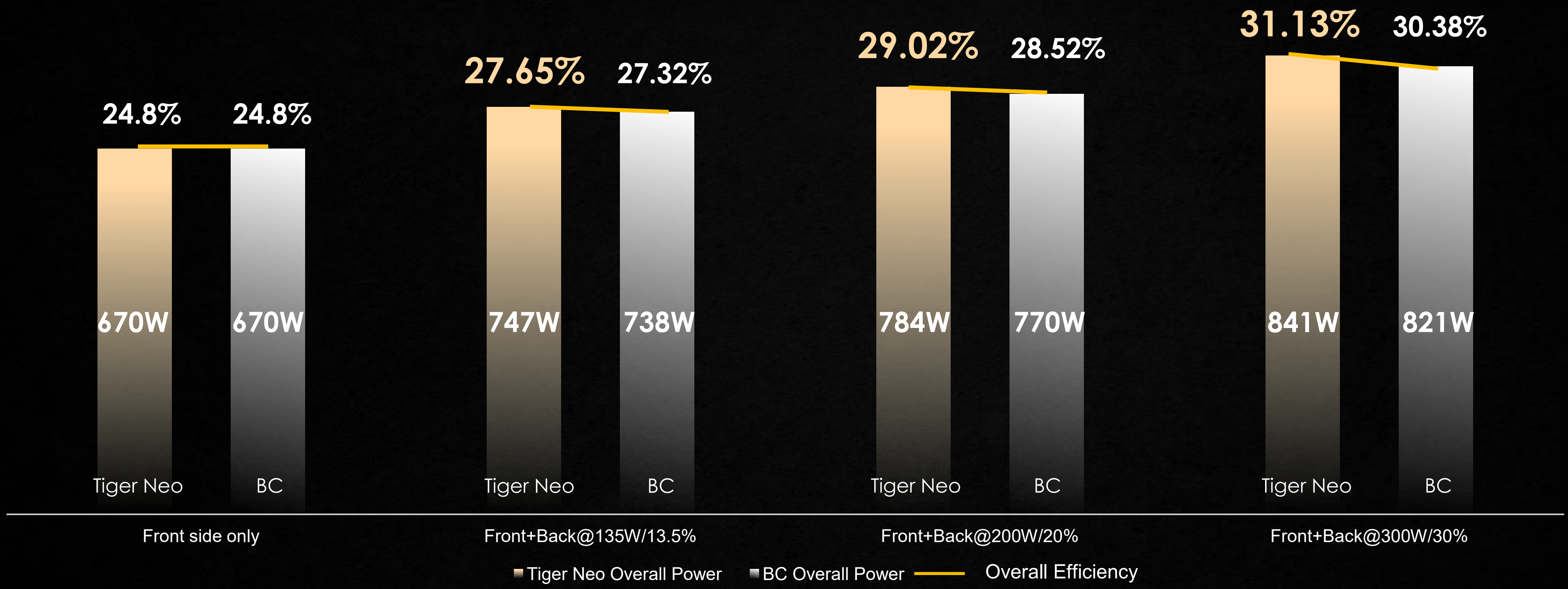
Comparison of Overall Power Under Different Scenarios



Bifaciality Comparison Across Technologies



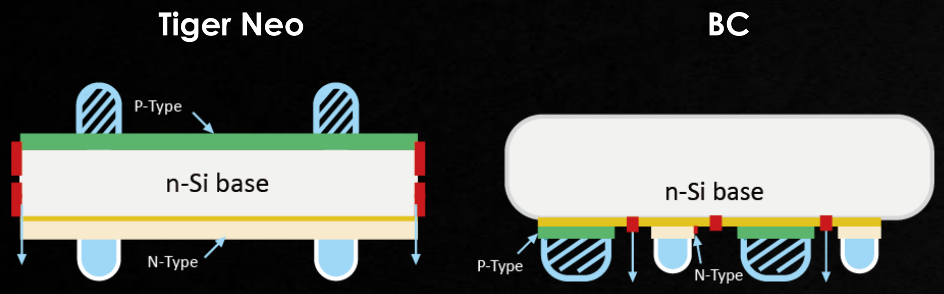
Higher Overall Efficiency

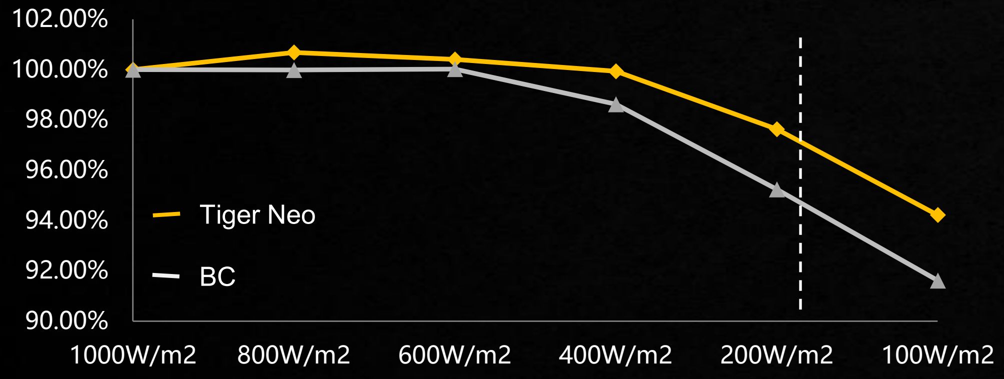


* BNPI: IEC 61215-2021 specifies that the nameplate verification of bifacial modules must be performed using a front-side irradiance of 1000 W/m² and a rear-side irradiance of 135 W/m².

- Overall Power = Front Power + Front Power × Bifaciality Factor × Rear Irradiance

Better Low Irradiance Performance





Feature	TOPCon	BC (Back-Contact)
Electrode Structure	Electrodes are located on opposite sides of the cell (front and back).	Electrodes are interdigitated and integrated on the rear side of the cell.
Physical Isolation	**Benefit:** Provides **natural physical isolation**, ensuring good insulation between positive and negative poles.	**Challenge:** Adjacent positive and negative poles with minimal spacing make **effective isolation difficult to achieve**.
Performance Under Shading	**Low Risk:** An internal insulation layer effectively blocks reverse current, keeping leakage current at a **very low level**.	**High Risk:** Reverse current can travel laterally to create short circuits, leading to **uncontrollable leakage current** and cell overheating.

Performance under 200W/m² :

- Tiger Neo : **95%~98%**
- BC: **93%~95%**

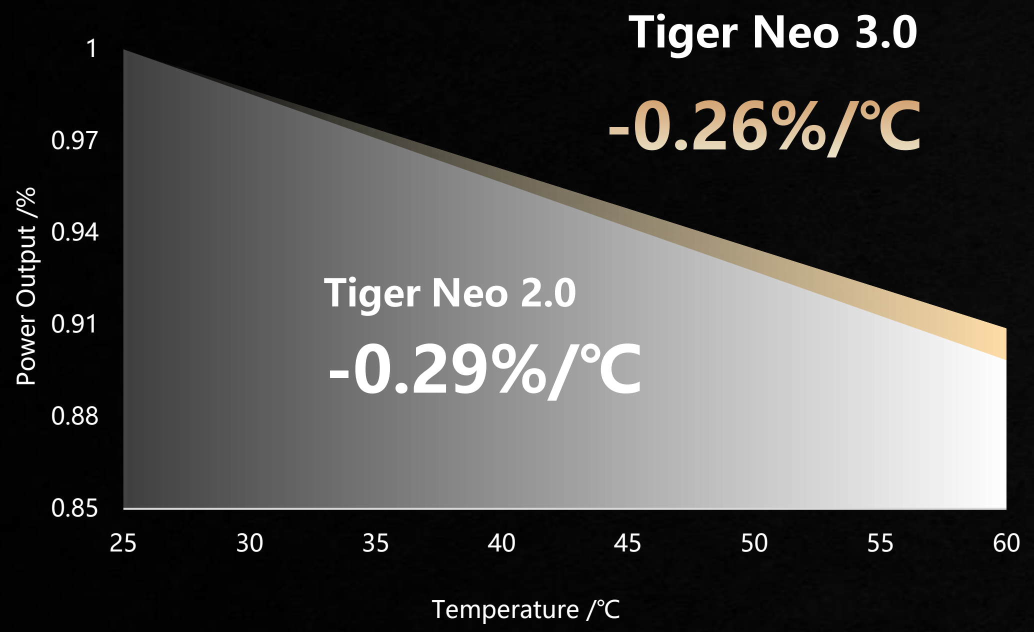
↑ 2%-3%

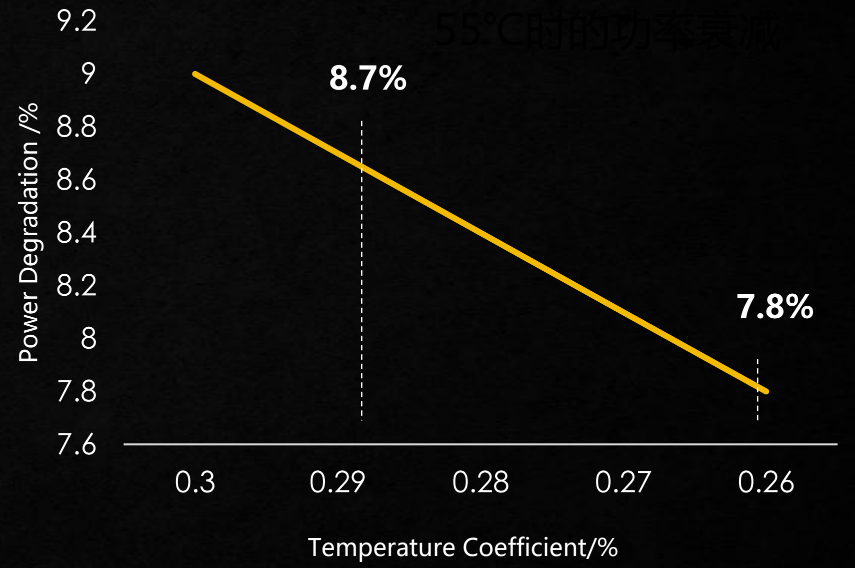
Optimized Temperature Coefficient

STC Cell Temperature is 25 ℃

△T : Cell temperature variation (actual – STC)

*TC: Temperature Coefficient





Power decreases with increasing temperature

Actual Power = Nominal Power x (1– △T x TC)

Power Degradation(55℃):

Tiger Neo 2.0 : (55-25) x 0.29%=**8.7%**

Tiger Neo 3.0 : (55-25) x 0.26%=**7.8%**

↑ 0.9%

Advanced Warranty

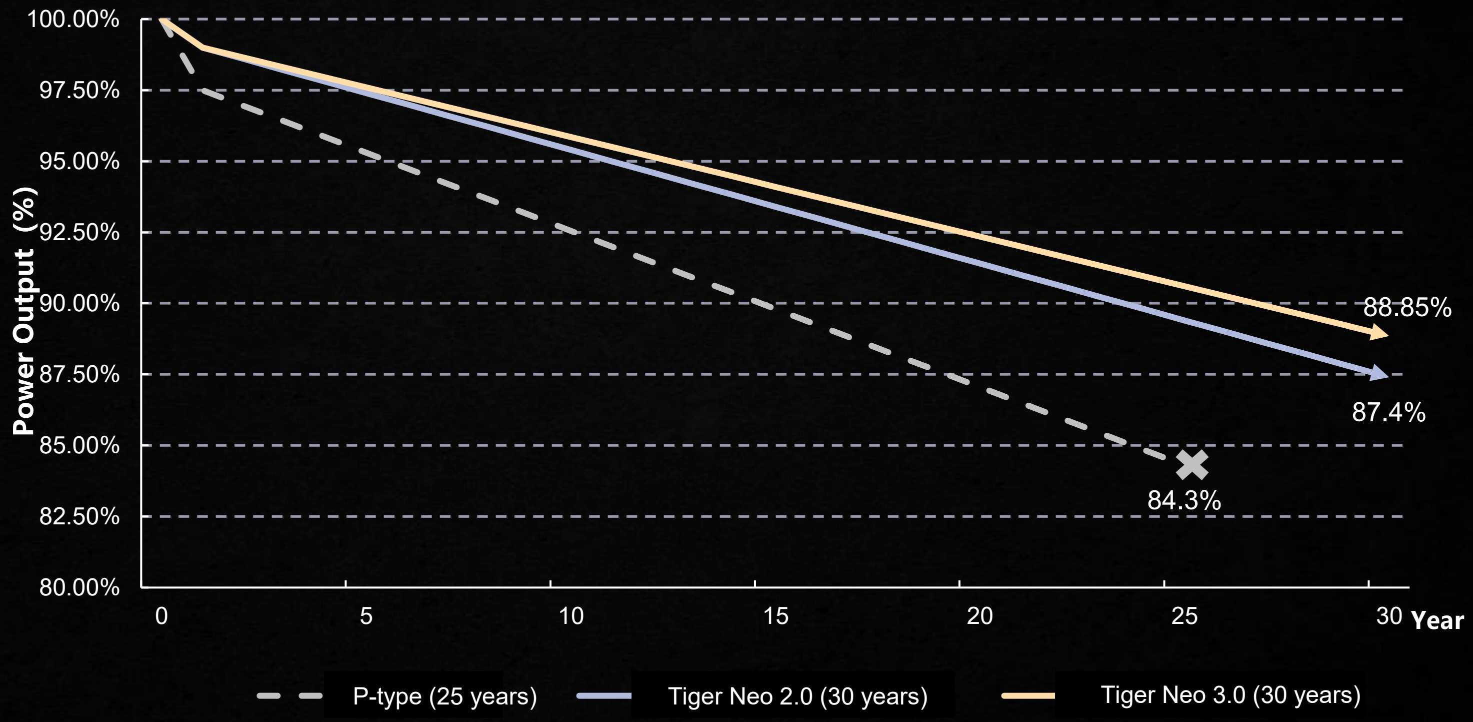
30 Year Power Warranty

≤ 1%

First year degradation

≤-0.35%

Annual degradation



Tiger Neo III

JinKO Solar

Tiger Neo 3.0 Simulated Power Generation Gain Assessment

	Temperature Coefficient	Bifacial Factor	Low Irradiance Performance	Annual Degradation	Higher Generation Gain
Tiger Neo 3.0 VS. Normal TOPCon	+0.9% * Power increase at 55°C cell temperature	≈0.68% * Increase in overall power output under BNPI conditions	Same	+0.6%	2-2.5% * Based on Jinko's proprietary model calculations
Tiger Neo 3.0 VS. BC	Same	≈1.35% * Increase in overall power output under BNPI conditions	≈2-3% * Superior low-light performance at 200W/m²	Same	3-3.5% *Based on Jinko's proprietary model calculations; empirical comparisons between Tiger Neo 2.0 and BC technologies; and PVsyst simulation data.

20th 2026 2006 | JinKO

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THANKS

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Mallak Alrai

Sales Manager - MENA

LEAPTING

Speaker

Maximizing Solar Output for High-Demand Digital Infrastructure through Advanced PV Cleaning

Speaker： Huzhou Leapting Technology Co., Ltd.

Date: 21st Jan 2026

01 Why it matters now?

- Digital Infrastructure Needs Reliable Power
- AI & data centers → rapidly rising electricity demand
- Solar increasingly used, especially in desert regions
- Reliability & availability are critical

02

Dust & Soiling in Desert Solar

Desert = High Irradiance + High Soiling

- Dust, sand, pollution
- Continuous accumulation

Power Loss

- 0.5 – 1% power loss per day
- 15 – 30% annual loss without effective cleaning

03 Why Soiling Is a Serious Risk

Direct Impact

- Energy yield reduction
- Lower PR

Hidden Impact

- Hot spots
- Faster module degradation
- Higher long-term LCOE

04 Limits of Traditional Cleaning

Manual & Water-Based Cleaning

- High water consumption
- Labor and safety risks
- Limited frequency
- Often requires downtime

Challenge in reality

- Raising O&M cost
- Water scarcity in desert regions
- Unsecured cleaning performance

05 Solution: Autonomous PV Cleaning Robots

Designed for Utility-Scale Solar

- Fully autonomous
- Water-free or ultra-low-water
- Night-time operation
- No power interruption

Core Value

Frequent, consistent cleaning without production loss

06

Real-World Results

Utility-Scale Desert PV Projects

Measured Improvements

- Energy yield increase: 5–15%
- O&M cost reduction: 20–40%
- Water savings: ~100%
- Typical payback: 2–4 years

07 Why This Matters for AI & Data Centers + Conclusion

Strategic Value

- Higher solar availability
- More predictable output
- Lower energy risk
- Strong ESG & water-saving impact

Final Takeaways

- Soiling losses are predictable and preventable
- Automation scales in desert solar
- Clean PV enables reliable digital infrastructure

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