



REPORTS

PV MODULE MANUFACTURER RANKING

EDITION 1/2026



Welcome to this Edition 1 - 2026 version of the **SINOVOLTAICS PV Module Manufacturer Ranking Report.**

The Altman-Z Scores in this report has been calculated from March 2023 until December 2025, and provide detailed insight how the financial strength of PV manufacturers has evolved over the past 3 years.

What's the value of Altman-Z Scores?

Altman-Z Scores are calculated to understand which **PV module manufacturers are financially stable**, and which players are **at risk of going bankrupt**.

For any stakeholder involved in solar projects, the financial stability of the manufacturer is of crucial importance.

Employing solar PV modules from financially stable manufacturers provides for a better hedge against the potential risks of collapsing return of investment (ROI) of any PV project.

Why is financial stability important?

Ultimately, the **financial stability of a PV module manufacturer is geared to the validity and enforceability of the warranty policies** on its modules. Most people realize that today's PV module manufacturers will probably not be around in 25 years. However for the short to medium term, you want to be sure that warranties are in place.

In many years to come, lots of PV projects will likely face this tough question: whom to contact with performance complaints and replacement requests regarding a malfunctioning module after 2, 5 or even 15 years?

**2023 - 2025:
rating of
PV module
manufacturers
worldwide**

In this report we present you the **Altman Z-Scores of 60+ solar PV module manufacturers**. This report can be used to see how one manufacturer matches up to the other, and can be an important indicator when selecting your PV module manufacturer.

The Altman Z-Scores show you which PV module manufacturers are **financially strong**, and which manufacturers are in the **risk zone of going bankrupt within the coming 2 years**.

On the following pages you find the full table showing the Altman Z-Scores of the major, publicly listed Asian, European and American manufacturers.

The scores have been calculated by team Sinovoltaics with the use of publicly available financial data.

MANUFACTURERS	RANKING	TREND	MAR23	JUN23	SEP23	DEC23	MAR24	JUN24	SEP24	DEC24	MAR25	JUN25	SEP25	DEC25	LISTING
INSOLATION ENERGY	1	↓	4.22				17.38	31.29	32.02	36.35	26.03	17.08	13.92	10.77	BOM:543620
WAAREE RENEWABLE TECHNOLOGIES	2	↓	7.04	9.42	6.86	10.66	20.6	29.19	27.37	14.76	10.65	11.88	13.6	10.33	BOM:534618
PREMIER ENERGIES	3	↓							11.65	14.46	8.57	9.49	8.41	7.37	NSE:PREMIERENE
HT SAAE	4	↑	2.18	2.13	2.09	1.9	1.56	1.37	2.1	2.58	2.57	2.64	3.23	6.1	SHSE:600151
FIRST SOLAR	5	↑	6.41	5.61	4.76	4.75	4.44	5.21	5.82	4.49	3.64	4.06	4.9	5.48	NAS:FSLR
SOLEX ENERGY LTD	6	↓	3.78				4.62	6.66	7.55	7.49	5.19	4.62	5.72	4.82	NSE:SMSOLEX
ETERBRIGHT (HIWIN)	7	↓	4.27	4.15	3.77	4.35	5.03	3.96	3.98	5.67	4.38	3.91	4.02	3.86	TPE:2049
DMEGC SOLAR (DMEGC MAGNETICS GROUP)	8	↓	3.88	3.67	3.4	2.84	3.07	2.75	2.85	2.73	2.7	2.87	3.26	3.23	SZSE:002056
KYOCERA	9	↑	2.98	2.88	2.81	2.96	2.84	2.65	2.66	2.45	2.52	2.51	2.75	2.92	OTCPK:KYOCY
BOVIET SOLAR (NINGBO BOWAY ALLOY MATERIAL CO)	10	↓	2.59	2.59	2.51	2.59	2.73	3.16	2.91	3.15	3.11	2.91	3.11	2.79	SHSE:601137
ERA SOLAR (YONGGAO GROUP)	11	↑	2.25	2.4	2.99		3.38	2.3	2.61	2.64	2.66	2.18	2.54	2.71	SZSE:002641
PHONO SOLAR (SUMEC)	12	↓	3.18	3.22	2.87	2.74	2.76	2.71	2.63	2.69	2.71	2.69	2.77	2.68	SHSE:600710
TSEC	13	↑	3.33	3.14	3.04	3.2	3.11	3.17	2.63	2.25	2.02	1.74	1.63	2.36	TPE:6443
TAINERGY	14	↓	6.32	6.42	6.5	6.72	5.2	4.51	3.52	1.75	1.16	1.3	2.43	2.26	TPE:4934
LG SOLAR	15	↓	2.47	2.45	2.35	2.24	2.3	2.34	2.35	2.26	2.09	2.16	2.27	2.15	XKRX:066570
HANSOL	16	↓	2.04	2.1	2.22	2.32	2.04	1.9	1.77	1.8	2.01	2.18	2.21	2.05	XKRX:004710
PENNAR INDUSTRIES	17	↓	1.96	2.04	2.09	2.2	2.26	2.3	2.58	2.16	2.16	2.47	2.83	2.03	BOM:513228
TCL SUNPOWER GLOBAL (TCL ELECTRONICS HOLDINGS)	18	↑				1.75				1.92		2.03	2.02	2.03	HKSE:01070
REC SOLAR (RELIANCE INDUSTRIES LIMITED)	19	↓	2.18	2.28	1.98	2.11	2.53	2.62	2.15	1.92	1.84	2.02	2.24	2.02	NSE:RELI
TOPRAYSOLAR	20	↑	2.44	2.28	2.22	2.31	2.1	1.61	1.89	1.96	1.77	1.71	1.8	2.02	SZSE:002218

*The trend column in the table reflects a comparison of the current quarter score to the previous one.

MANUFACTURERS	RANKING	TREND	MAR23	JUN23	SEP23	DEC23	MAR24	JUN24	SEP24	DEC24	MAR25	JUN25	SEP25	DEC25	LISTING
BYD	21	↓	1.95	1.86	1.79	1.74	1.61	1.76	2	1.76	2.31	2.33	2.16	2	OTCPK:BYDDF
MISSION SOLAR (OCI)	22	↑	2.43	3.39	3.41	3.44	2.74	2.8	2.58	2.07	1.62	1.73	1.87	1.97	XKRX:010060
BHARAT HEAVY ELECTRICALS	23	↑	1.01	1.13	1.31	1.68	2.03	2.45	2.19	1.97	1.9	2	1.72	1.94	NSE:BHEL
LINYANG ENERGY	24	↓	3.02	3.08	2.66	2.21	2.22	2.4	2.34	2.23	2.17	1.93	1.92	1.79	SHSE:601222
ULICA SOLAR (SHANSHAN GROUP)	25	↓	2.31	2.19	2	1.87	1.78	1.25	1.27	1.24	1.22	1.44	1.85	1.76	SHSE:600884
LONGI SOLAR (LONGI GREEN ENERGY)	26	↓	4.4	3.73	3.37	2.91	2.78	2.04	1.97	1.78	1.78	1.68	1.82	1.74	SHSE:601012
TOPSOLA (HONGRUN GROUP)	27	↑	1.47	1.47	1.35	1.37	1.35	1.26	1.28	1.37	1.4	1.32	1.71	1.72	SZSE:002062
ADANI SOLAR (ADANI ENTERPRISES)	28	↓	2.23	2.71	2.74	2.63	2.94	2.75	2.75	1.93	1.85	2.11	2.09	1.71	NSE:ADANIENT
CHENGDU HUASUN TECHNOLOGY GROUP	29	↑	2.86	3.03	2.61	2.48	2.14	1.94	2.04	2.06	2.05	1.77	1.57	1.71	SZSE:000790
MOTECH	30	↓	2.86	2.73	2.45	2.69	2.5	2.61	2.11	1.77	1.69	1.54	1.51	1.5	ROCO:6244
ASTRONERGY (CHINT GROUP)	31	↑	1.96	1.96	1.65	1.59	1.58	1.53	1.48	1.52	1.52	1.43	1.46	1.48	SHSE:601877
ALMADEN	32	↓	3.11	2.95	2.72	2.7	2.54	2.21	2.12	1.86	1.83	1.55	1.56	1.43	SZSE:002623
SHINSUNG E&G	33	↓	2.42	2.6	2.37	2.25	2.15	1.93	1.83	1.6	1.36	1.38	1.5	1.42	XKRX:011930
HYUNDAI HEAVY INDUSTRIES	34	↑	1.28	1.3	1.27	1.13	1.17	1.18	1.23	1.28	1.24	1.26	1.34	1.42	XKRX:267250
RITEK	35	↑	1.02	1.06	0.97	0.97	0.96	1.18	1.23	1.5	1.29	1.15	1.13	1.24	TPE:2349
AU OPTRONICS	36	↓	0.94	0.94	0.82	1.08	1.13	1.19	1.17	1.13	1.25	1.35	1.28	1.21	OTCPK:AUOTY
TATA SOLAR (TATA POWER)	37	↓	0.93	0.99	1.32	1.22	1.38	1.63	1.73	1.27	1.23	1.43	1.42	1.14	NSE:TATAPOWER
HY SOLAR (HOYUAN GREEN ENERGY CO)	38	↑	4.46	3.31	2.15	1.19	1	0.5	0.5	0.3	0.27	0.28	0.59	1.1	SHSE:603185
JINKOSOLAR	39	↓	2.21	2.22	2.02	2.07	2.03	1.85	1.91	1.73	1.68	1.31	1.2	1.09	SHSE:688223
CECEP	40	↑	1.53	1.53	1.43	1.38	1.36	1.28	1.25	1.21	1.18	1.07	0.98	1.01	SZSE:000591

*The trend column in the table reflects a comparison of the current quarter score to the previous one.

MANUFACTURERS	RANKING	TREND	MAR23	JUN23	SEP23	DEC23	MAR24	JUN24	SEP24	DEC24	MAR25	JUN25	SEP25	DEC25	LISTING
TANGSHAN HAITAI NEW ENERGY TECHNOLOGY CO LTD	41	↓	2.92	2.73	2.25		2.36	1.88	1.76	1.85	1.97	1.49	1.26	0.94	BJSE:835985
ALEO SOLAR (SINO-AMERICAN SILICON PRODUCTS)	42	↓	1.83	1.84	1.71	1.67	1.7	1.46	1.17	1.09	0.98	0.83	0.97	0.88	ROCO:5483
TONGWEI SOLAR (TONGWEI GROUP)	43	↑	3.95	3.79	3.62	2.84	2.83	1.8	1.26	1.02	0.95	0.78	0.87	0.88	SHSE:600438
SHANGHAI ELECTRIC GROUP	44	↓	0.8	0.8	0.81	0.8	0.82	0.77	0.77	0.89	0.81	0.83	0.87	0.83	SHSE:601727
TRINA SOLAR	45	↓	2.2	2.04	1.83	1.76	1.69	1.51	1.4	1.24	1.2	0.92	0.81	0.79	SHSE:688599
JA SOLAR	46	↓	3.78	3.82	2.62	2.07	1.98	1.4	1.26	1.21	1.15	0.86	0.91	0.76	SZSE:002459
HANWHA Q-CELLS (HANWHA SOLUTIONS)	47	↓	1.65	1.55	1.37	1.32	1.13	0.85	0.67	0.54	0.57	0.66	0.73	0.7	XKRX:009830
CANADIAN SOLAR	48	↓	1.42	1.55	1.37	1.29	1.26	0.96	0.89	0.73	0.68	0.64	0.63	0.65	NAS:CSIQ
ANJI TECHNOLOGY	49	↓	1.42	1.45	1.39	1.32	1.11	0.93	0.76	0.56	0.6	0.57	0.78	0.6	TPE:6477
GCL SYSTEM INTEGRATION TECHNOLOGY	50	↓	0.97	0.95	1.11	0.97	0.95	0.68	0.8	0.9	0.85	0.71	0.63	0.54	SZSE:002506
JIawei RENEWABLE	51	↓	4.14	3.03	2.48	1.74	1.48	1.27	1.08	0.65	0.71	0.57	0.61	0.4	SZSE:300317
JOLYWOOD	52	↓	1.61	1.56	1.41	1.52	1.44	1.19	1.01	0.66	0.63	0.38	0.46	0.37	SZSE:300393
RENEW ENERGY GLOBAL	53	↓	0.36	0.28	0.31	0.32	0.3	0.3	0.27	0.28	0.23	0.3	0.41	0.36	NAS:RNW
AIKO SOLAR	54	↑	3.67	4.17	2.99	2.2	2.02	1.06	0.5	0.13	0.16	-0.24	0.24	0.35	SHSE:600732
URE	55	↑	2.2	2.1	1.66	1.39	0.64	0.54	0.35	0.19	0.46	0.29	0.29	0.32	TPE:3576
RISEN ENERGY	56	↓	1.61	1.56	1.34	1.21	1.17	0.99	0.77	0.56	0.53	0.19	0.24	0.32	SZSE:300118
HUANSHENG PV (ZHONG-HUAN SEMICONDUCTOR)	57	↑	2.26	2.33	2.07	1.75	1.62	1.08	0.85	0.51	0.52	0.2	0.19	0.21	SZSE:002129
S-ENERGY	58	↓	0.87	0.67	0.85	0.73	0.6	0.52	0.47	0.39	0.14	0.04	0.12	-0.15	XKRX:095910
TALESUN (ZHONGLI SCIENCE AND TECHNOLOGY)	59	↓	-0.85	-0.26	-0.52	-0.72	-0.77	-1.88	-1.92	-1.77	-1.72	-0.32	-0.58	-0.33	SZSE:002309
EGING PV	60	↓	1.85	1.91	1.67	1.41	1.35	0.83	0.63	0.38	0.4	-0.83	-0.8	-0.86	SHSE:600537

*The trend column in the table reflects a comparison of the current quarter score to the previous one.

MANUFACTURERS	RANKING	TREND	MAR23	JUN23	SEP23	DEC23	MAR24	JUN24	SEP24	DEC24	MAR25	JUN25	SEP25	DEC25	LISTING
JG SOLAR (GANSU JINGANG SOLAR CO.)	61	↓	1.15	0.6	-0.13	0.28	0.12	-0.93	-1.13	-1.44	-1.61	-2.65	-2.74	-1.83	SZSE:300093
SOLARTRON	62	↓	-0.18	-0.84	-0.56	-0.56	-0.48	-1.02	-1.15	-1.19	-1.33	-1.54	-1.44	-1.92	BKK:SOLAR
MEYER BURGER	63	↓				-2.65	-3.33	-3.19	-3.45	-3.42	-3.44	-3.48	-3.48	-3.51	XSWX:MBTN
SPI ENERGY	64	↓	-4.26	-4.21	-4.05	-4.18	-4.07	-4.08	-4.09	-4.09	-4.12	-4.12	-4.12	-4.12	NAS:SPI

*The trend column in the table reflects a comparison of the current quarter score to the previous one.

Graph overview

Graph #1 - The latest PV module manufacturers ranking, recorded December 2025

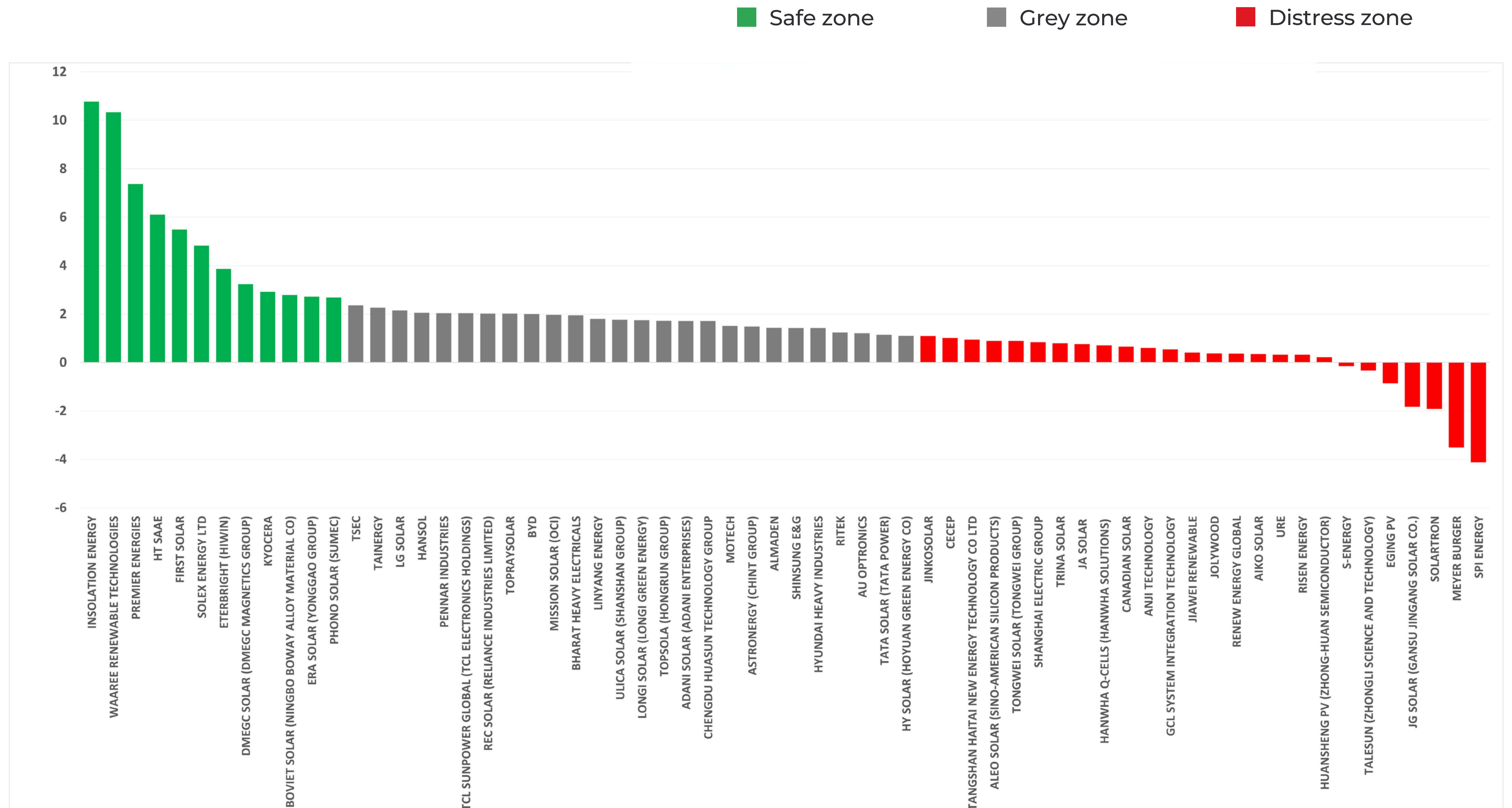
Graph #2 - PV module manufacturers that are currently in the Safe Zone

Graph #3 - PV module manufacturers that are currently in the Grey Zone

Graph #4 - PV module manufacturers that are currently in the Distress Zone

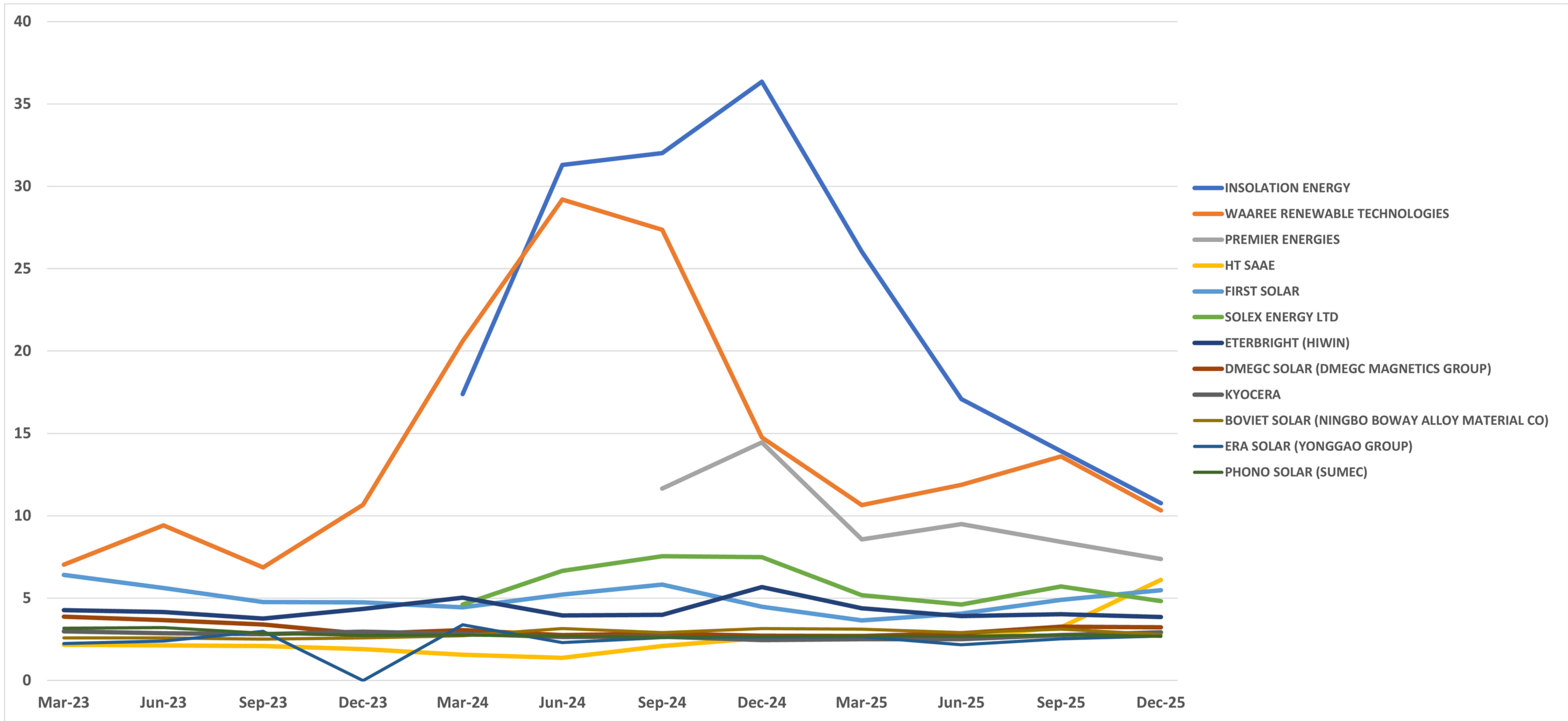
Graph #1 - Full ranking overview of PV module manufacturers

Sinovoltaics PV manufacturer ranking - Edition #1 - 2026



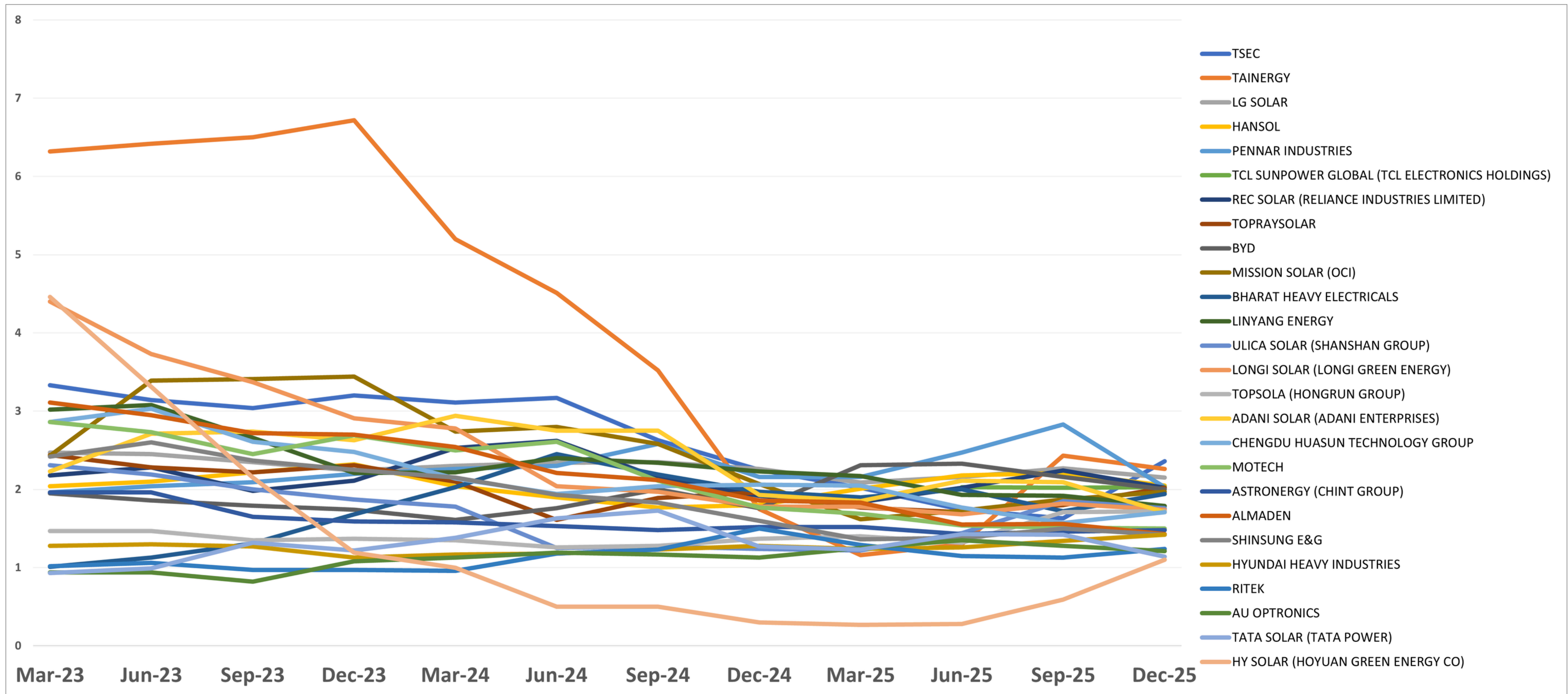
Graph #2 - PV module manufacturers - Safe Zone

Sinovoltaics PV manufacturer ranking - Edition #1 - 2026 - Safe Zone



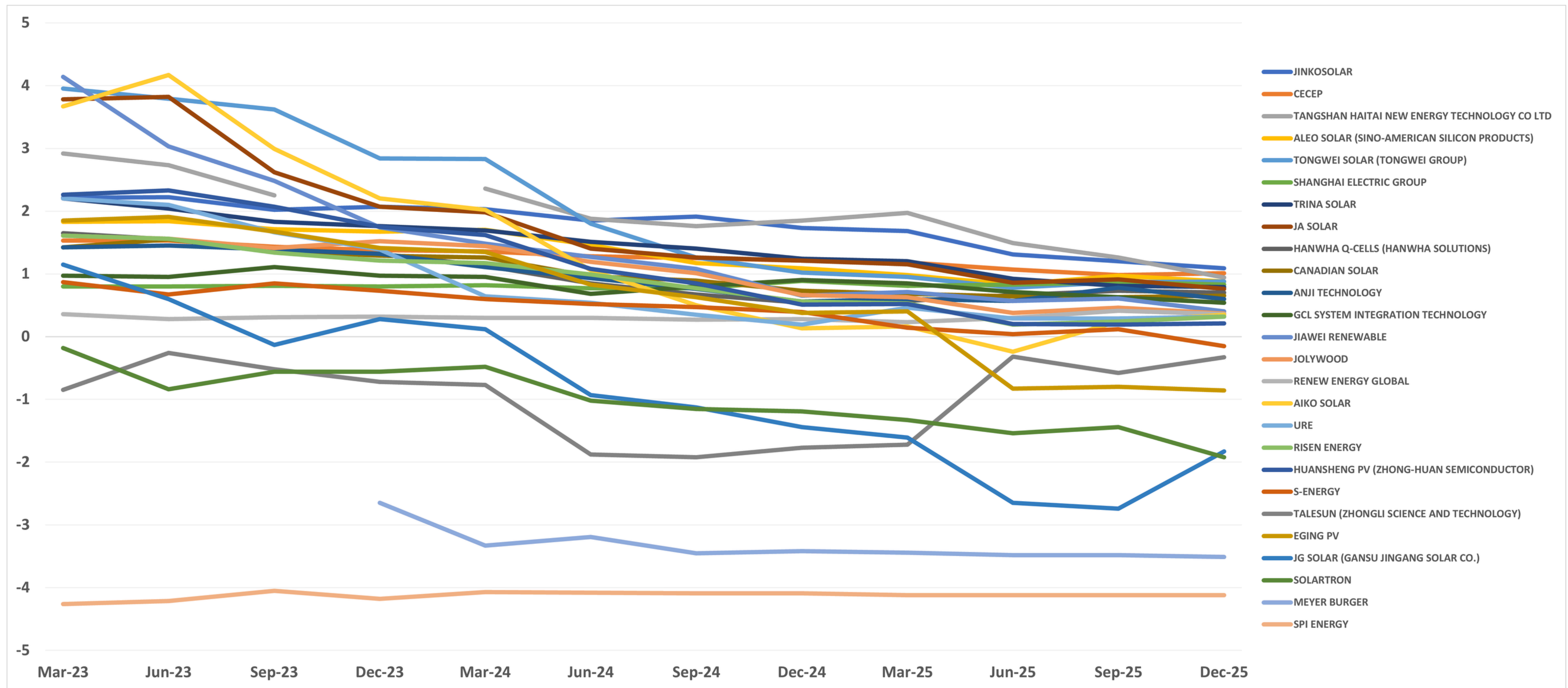
Graph #3 - PV module manufacturers - Grey Zone

Sinovoltaics PV manufacturer ranking - Edition #1 - 2026 - Grey Zone



Graph #4 - PV module manufacturers - Distress Zone

Sinovoltaics PV manufacturer ranking - Edition #1 - 2026 - Distress Zone



How is the Sinovoltaics Ranking Score calculated?

The Sinovoltaics PV Manufacturer Ranking Score is based on the Altman Z-Score

$$\text{Altman Z-Score} = 1.2A + 1.4B + 3.3C + 0.6D + 1.0E$$

The original formula is broken down as following:

A	Working Capital/Total Assets: measures liquid assets in relation to the size of the company.
B	Retained Earnings/Total Assets: measures profitability that reflects the company's age and earning power.
C	Earnings Before Interest & Tax/Total Assets: measures operating efficiency apart from tax and leveraging factors. It recognizes operative earnings as being important to long-term viability.
D	Market Value of Equity/Total Liabilities: adds market dimension that can show up security price fluctuation as a possible red flag.
E	Sales/Total Assets: a standard measure for total asset turnover.

How are the Altman Z-Scores interpreted?

The scores are categorized into 3 zones called the Safe Zone, Grey Zone and Distress Zone:

$Z > 2.6$	Safe Zone
$1.1 < Z < 2.6$	Grey Zone
$Z < 1.1$	Distress Zone

How to interpret companies in the 'GREY ZONE'?

With a large number of companies in the 'Grey Zone', how to interpret these scores when selecting a manufacturer?

While ideally, a manufacturer is in the 'Safe Zone', some companies have been consistently in the 'Grey Zone' for years.

Take for instance **FIRST SOLAR**. Here's a number of Altman Z-Scores over the years:

6.41 on Q1 2023

5.21 on Q2 2024

5.82 on Q3 2024

5.48 on Q4 2025

Currently stands at 5.48 (Dec'25)

The PV module sector continues to show improving financial stability, with **12 manufacturers** now classified in the safe zone, defined by **Altman Z-scores of 2.6 or higher**, compared to **11 companies in the previous reporting period**. This increase reflects a **broader improvement in financial resilience across the industry**.

Among these companies, **FIRST SOLAR**, headquartered in **Arizona, United States**, stands out with an **Altman Z-score of 5.48 as of December 2025**. While the company's score has experienced moderate fluctuations—from **6.41 in Q1 2023, 5.21 in Q2 2024, and 5.82 in Q3 2024**—it has consistently remained well within the **safe zone (AZ ≥ 2.6)**. This sustained performance reflects **strong operational management, disciplined financial practices, and a resilient balance sheet**, positioning First Solar as **one of the most financially stable players in the PV manufacturing sector**.

Compared with peers such as **KYOCERA** and **TSEC**, **FIRST SOLAR** demonstrates a relatively balanced financial trajectory, combining strong solvency with consistent performance over time. While **KYOCERA has remained largely stable within the safe zone**, its scores show modest fluctuations, whereas **TSEC exhibits a more pronounced downward trend**, falling below the safe-zone threshold by **Q4 2025 (AZ 2.36)**. In contrast, First Solar maintains a significantly stronger solvency profile, suggesting **robust financial management and operational discipline relative to parts of the PV module market**.

KYOCERA	TSEC
2.98 Q1 2023	3.33 Q1 2023
2.65 Q2 2024	3.17 Q2 2024
2.66 Q3 2024	2.63 Q3 2024
2.92 Q4 2025	2.36 Q4 2025



SINOVOLTAICS PV MODULE MANUFACTURER RANKING

CONTACT US: contact@sinovoltaics.com

Discover our **ZERO RISK SOLAR & BESS SERVICES**

QUALITY ASSURANCE



PV QUALITY INSPECTIONS

Hire our **PV specialized quality engineers** to inspect your PV components on-site at the factories in Asia.

TEST ALL PV COMPONENTS, INCLUDING:

- Solar modules
- Inverters
- BOS components
- Solar cells
- Energy Storage



FACTORY AUDITS

Make a **fully informed decision** on the factories you're procuring from. Our accredited auditors provide you with **full insights** in the manufacturing capabilities of any PV factory worldwide. Use our **audit scoring card** system to manage and compare your factory selection.

FACTORY AUDITS INCLUDE:

- Pre-manufacturing audit
- General qualification audit
- Factory benchmark
- Factory background check
- Financial audit



LABORATORY TESTING

Thoroughly test your solar PV components at our **accredited PV lab**. Inform about country and climate specific test procedures for your region

A SELECTION OF LAB TESTS:

- Potential Induced Degradation (PID) test
- Light Induced Degradation (LID) test
- EVA gel content test
- Damp heat testing
- Thermal cycling testing



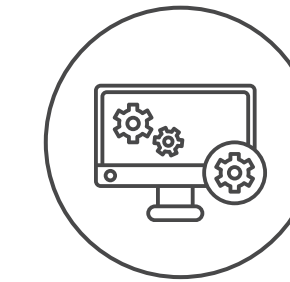
SOLAR FARM INSPECTIONS

On-site solar farm **inspections** and **troubleshooting** worldwide. Assess your existing solar farms and optimize performance.

SOLAR FARM INSPECTIONS INCLUDE:

- Drone infrared thermography
- I-V measurement
- Electroluminescence imaging
- Electrical safety tests
- Commissioning checks

SINOVOLTAICS EL MASS ANALYSIS (SELMA)



Eliminate **micro-cracks** and other cell-inherent defects and boost your solar power plant performance with **Sinovoltaics EL Mass Analysis (SELMA)**, our AI-driven electroluminescence Testing Software.

WHY CHOOSE SELMA FOR EL TESTING?

- Up to 99.9% accuracy
- Inspection of ALL modules (no sampling!)
- High-speed and on-the-fly analysis: avoid delays and easily keep up with the factory's production speed
- Identification and classification of up to 15 cell-inherent defect types
- Replace defective PV modules before shipment

QUALITY GUARANTEE

QUALITY ASSURANCE MEETS INSURANCE:

- With our Quality Guarantee, Sinovoltaics becomes a shared risk partner in our clients' PV projects.
- The Quality Guarantee enables the client to claim Liquidated Damages in case of a valid Warranty Claim with the factory.
- Eligibility: after performing our regular, 100% pre-shipment inspection on the client's PV modules at the factory, the client will be eligible for our Quality Guarantee for 3 years.
- Industry-wide unique protection and based on Sinovoltaics' Zero Risk Solar® framework the Quality Guarantee is backstopped by Munich Re.



www.sinovoltaics.com

contact@sinovoltaics.com

15+ years
at the PV and BESS
factories in Asia

25+ GWp
Zero Risk
Solar and BESS
projects

14,800+
Community

350+
PV & BESS
Factories
Audited