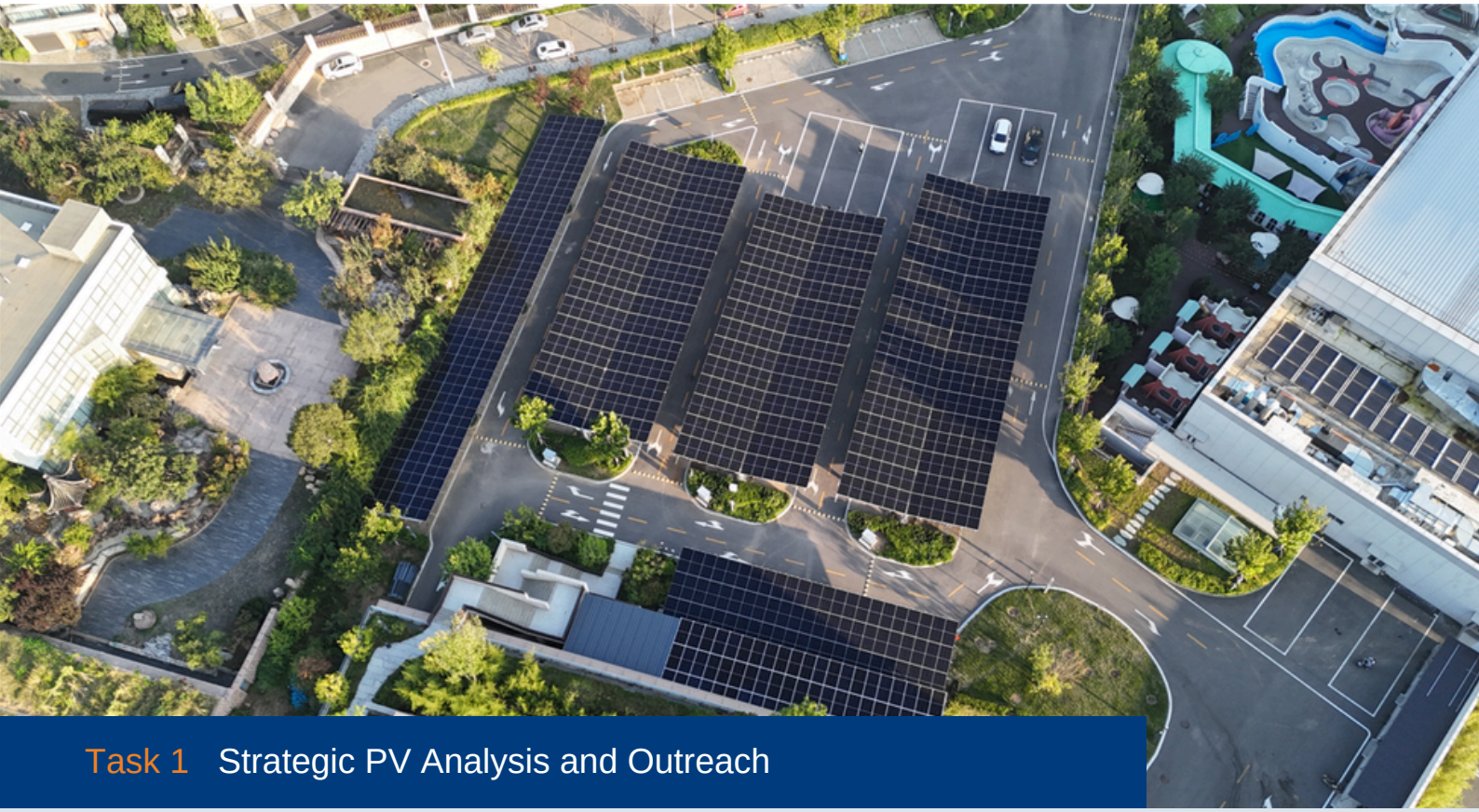
Technology Collaboration Programme
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International Energy Agency
Photovoltaic Power Systems Programme



Task 1 Strategic PV Analysis and Outreach

PVPS

National Survey Report of PV Power Applications in China

2025

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What is IEA PVPS TCP?

The International Energy Agency (IEA), founded in 1974, is an autonomous body within the framework of the Organisation for Economic Co-operation and Development (OECD). The Technology Collaboration Programme (TCP) was created with a belief that the future of energy security and sustainability starts with global collaboration. The programme is made up of 6 000 experts across government, academia, and industry dedicated to advancing common research and the application of specific energy technologies.

The IEA Photovoltaic Power Systems Programme (IEA PVPS) is one of the TCPs within the IEA and was established in 1993. The mission of the programme is to "enhance the international collaborative efforts which facilitate the role of photovoltaic solar energy as a cornerstone in the transition to sustainable energy systems." In order to achieve this, the Programme's participants have undertaken a variety of joint research projects in PV power systems applications. The overall programme is headed by an Executive Committee, comprised of one delegate from each country or organisation member, which designates distinct 'Tasks,' that may be research projects or activity areas.

The IEA PVPS participating countries are Australia, Austria, Belgium, Canada, China, Denmark, Finland, France, Germany, India, Israel, Italy, Japan, Korea, Malaysia, Morocco, the Netherlands, Norway, Portugal, Slovakia, South Africa, Spain, Sweden, Switzerland, Thailand, Turkey, the United Kingdom and the United States of America. The European Commission, Solar Power Europe and the Solar Energy Research Institute of Singapore are also members.

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What is IEA PVPS Task 1?

The objective of Task 1 of the IEA Photovoltaic Power Systems Programme is to promote and facilitate the exchange and dissemination of information on the technical, economic, environmental and social aspects of PV power systems. Task 1 activities support the broader PVPS objectives: to contribute to cost reduction of PV power applications, to increase awareness of the potential and value of PV power systems, to foster the removal of both technical and non-technical barriers and to enhance technology co-operation. An important deliverable of Task 1 is the annual "Trends in photovoltaic applications" report. In parallel, National Survey Reports are produced annually by each Task 1 participant. This document is the country National Survey Report for the year 2025. Information from this document will be used as input to the annual Trends in photovoltaic applications report.

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TABLE OF CONTENTS

Acknowledgements 6
1 Hightlights 7
2 Installation Data 8
2.1 Applications for Photovoltaics 8
2.2 Total Photovoltaic Power Installed 9
2.3 Key Enablers of PV Development 11
3 Competitiveness of PV electricity 12
3.1 Module Prices 12
3.2 System Prices 12
3.3 Financial Parameters and Specific Financing Programs 13
3.4 Specific Investments Programs 13
3.5 Additional Country Information 14
4 Policy Framework 15
4.1 National Targets for PV 15
4.2 Direct Support Policies for PV Installations 16
4.3 Self-consumption Measures 20
4.4 Collective Self-Consumption, Community Solar and Similar Measures 22
4.5 Tenders, Auctions & Similar Schemes 23
4.6 Other Utility-scale Measures including, Floating and Agricultural PV 24
4.7 Indirect Policy Issues 25
4.8 Financing and Cost of Support Measures 27
4.9 Grid Integration Policies 28
5 Industry 30
5.1 Production of Feedstocks, Ingots and Wafers (Crystalline Silicon Industry) 30
5.2 Production of Photovoltaic Cells and Modules (Including TF and CPV) 30
5.3 Manufacturers and Suppliers of Other Components 32
5.4 Recycling 33
6 PV In The Economy 35
6.1 Business Value 35
7 Interest From Electricity Stakeholders 36

7.1 Structure of the Electricity System 36
7.2 Interest from Electricity Utility Businesses 36
7.3 Interest from Municipalities and Local Governments 37
8 Prospects 38

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1 HIGHLIGHTS

In 2025, China added 316.57 GW of new PV capacity, representing a 14% year-on-year increase despite the high installation base in the previous year. Utility-scale PV additions reached 163.57 GW, up 3% year on year, accounting for 52% of total new PV capacity in 2025. Distributed PV additions reached 153 GW, up 29% year on year, accounting for 48% of total new PV capacity. Within distributed PV, commercial and industrial (C&I) PV additions reached 107.06 GW, up 21% year on year, accounting for 34% of total new PV capacity, while residential PV additions reached 45.95 GW, up 55% year on year, accounting for 15% of total new PV capacity.

In 2025, China's PV power generation reached 1 170 TWh, representing a 40% year-on-year increase, while the national PV utilisation rate was 95%.

In 2025, amid the combined impact of supply chain price volatility and a complex and severe external environment, China's PV manufacturing output underwent a phased correction. Output across polysilicon, wafer, cell, and module segments declined to varying degrees, with polysilicon and modules experiencing relatively pronounced drops.

With the continued development of key technologies such as Tunnel Oxide Passivated Contact (TOPCon), Heterojunction (HJT), and back-contact (xBC) technologies, monocrystalline silicon cell efficiency records were broken repeatedly in 2025. Chinese PV companies continued to lead global technological breakthroughs, achieving a series of industry-leading milestones:

In April 2025, LONGi set new efficiency records in both monocrystalline silicon and tandem solar cell fields. Its independently developed Hybrid Interdigitated Back Contact (HIBC) crystalline silicon solar cell achieved a photoelectric conversion efficiency of 27.81%, further narrowing the gap with the 29.4% theoretical efficiency limit. During the same period, its independently developed two-terminal perovskite/crystalline silicon tandem solar cell was certified by the U.S. National Renewable Energy Laboratory (NREL) at a conversion efficiency of 34.85%.

In October 2025, Jiangsu Runergy achieved a power conversion efficiency of 26.55% using its n-type TOPCon 3.0 technology on an M10-sized full-area cell, as certified by Institute for Solar Energy Research Hamelin (ISFH) in Germany.

In November 2025, JinkoSolar announced that its tunnel back contact (TBC) cell had achieved a conversion efficiency of 27.79%, as certified by ISFH in Germany.

Looking ahead, as Chinese PV companies continue to deepen their research and development efforts in key materials, device architectures, and manufacturing processes, they are expected to set further efficiency records and drive the global PV industry toward higher efficiency, lower costs, and broader applications.

2 INSTALLATION DATA

The PV power systems market is defined as the market of all nationally installed (terrestrial) PV applications with a PV capacity of 40 W or more. A PV system consists of modules, inverters, batteries and all installation and control components for modules, inverters and batteries. Other applications such as small mobile devices are not considered in this report.

For the purposes of this report, PV installations are included in the 2025 statistics if the PV modules were installed and connected to the grid between 1 January and 31 December 2025, although commissioning may have taken place at a later date.

2.1 Applications for Photovoltaics

As of the end of 2025, China's cumulative installed solar PV capacity reached 1.2 TW, equivalent to 1.35 times the 2024 level. Of this total, 670 GW came from utility-scale PV installations and 530 GW from distributed PV installations.

In 2025, China added 316.57 GW of new PV capacity, representing a 14% year-on-year increase despite the high installation base in the previous year. Utility-scale PV additions reached 163.57 GW, up 3% year on year, accounting for 52% of total new PV capacity in 2025. Distributed PV additions reached 153 GW, up 29% year on year, accounting for 48% of total new PV capacity. Within distributed PV, commercial and industrial (C&I) PV additions reached 107.06 GW, up 21% year on year, accounting for 34% of total new PV capacity, while residential PV additions reached 45.95 GW, up 55% year on year, accounting for 15%.

Over the past three years, the structure of China's new PV installations has undergone significant changes. In terms of utility-scale PV, growth has accelerated in recent years, driven by the construction and grid connection of the first batch of large-scale renewable energy bases under the 14th Five-Year Plan. As a result, utility-scale PV has continued to increase its share of new installations and has overtaken distributed PV.

2.2 Total Photovoltaic Power Installed

Table 1: Annual PV power installed during calendar year 2025

		Installed PV capacity in 2025 [MW]	AC or DC
	Distributed	153 000	AC
	Centralised	163 574	AC
	Off-grid	-	-
	Total	316 574	AC

Table 2: Data collection process

If data are reported in AC, please mention a conversion coefficient to estimate DC installations.	Distributed: DC ≈ AC Centralised: DC=AC × 1.2
Is the collection process done by an official body or a private company/Association?	Data on annual and accumulated PV grid-connected installation capacity in 2025 were published by National Energy Administration. Off-grid installation accounts for a small scale in China so the data was estimated by PV experts.
Link to official statistics (if this exists)	http://www.nea.gov.cn/

Table 3: The cumulative installed PV power in 4 sub-markets (In AC)

Year	Off-grid [MW]	Grid-connected distributed [MW]	Grid-connected centralised [MW]	Total [MW]
2010	0	190	283	800
2011	0	680	2 000	3 500
2012	0	890	2 630	7 060
2013	0	3 100	16 320	19 420
2014	0	4 670	23 380	28 050
2015	0	6 060	37 120	43 180
2016	0	10 320	67 100	77 420
2017	0	29 660	100 540	130 200
2018	0	50 620	123 840	174 460
2019	0	62 630	141 670	204 300
2020	0	78 310	174 790	253 100
2021	0	107 510	198 480	305 990
2022	0	157 620	234 420	392 040
2023	0	254 440	354 480	608 920
2024	0	374 780	510 890	885 680
2025	0	533 000	666 914	1 199 914

Table 4: Other PV market information (In AC)

	2025
Number of PV systems in operation in your country	Approximately 7.339 million households
Decommissioned PV systems during the year [MW]	Approximately 2 700-3 000 MW
Repowered PV systems during the year [MW]	N/A

Table 5: PV power and the broader national energy market

	Data (2025)
Total power generation capacities [GW]	3 890 GW
Total renewable power generation capacities (including hydropower) [GW]	2 337 GW
Total electricity demand [TWh]	10 368 TWh
New power generation capacities installed [GW]	542 GW
New renewable power generation capacities (including hydropower) [GW]	452 GW (hyd. 12.15 GW, wind 120 GW, PV 317 GW, Bio. 1.51 GW)

Estimated total PV electricity production (including self-consumed PV electricity) in [GWh] (or [TWh])	1 170 TWh
Total PV electricity production as a % of total electricity consumption	11.3%
Average yield of PV installations (in kWh/kWp)	975 kWh/kWp

2.3 Key Enablers of PV Development

Table 6: Information on key enablers

	Description	Annual Volume	Total Volume	Source
Distributed storage systems	Newly Commissioned new energy storage	62.24 GW/183 GWh	136 GW/351 GWh	National Energy Administration (NEA), China new energy storage Development Report (2026); NEA press conference, January 30, 2026.
Residential Heat Pumps (number)	Heat Pump Production (Including Residential, Commercial and Industrial Buildings)	Approximately 3 million units (2024 data; 2025 data pending official release).	-	Interpretation of the Action Plan for Promoting High-Quality Development of the Heat Pump Industry (NDRC Environmental Resources [2025] No. 313), issued by the National Development and Reform Commission and five other departments.
100% Electric cars (number)	Battery Electric Vehicle (BEV) Stock	New registrations of new energy vehicles reached 12.93 million in 2025.	BEV stock reached 30.22 million units, accounting for 68.74% of the total NEV stock.	Ministry of Public Security, released on January 26, 2026.
Hybrid rechargeables (number)	Plug-in Hybrid Electric Vehicle (PHEV) Stock	-	PHEV Stock: Approximately 13.75 million units (estimated by subtracting 30.22 million BEVs from the total NEV stock of 43.97 million).	Estimated based on data released by the Ministry of Public Security on January 26, 2026.

3 COMPETITIVENESS OF PV ELECTRICITY

3.1 Module Prices

Table 7: Typical module prices

Year	Lowest price of a standard module crystalline silicon	Highest price of a standard module crystalline silicon	Typical price of a standard module crystalline silicon
2025	0.60 Yuan/W	0.90 Yuan/W	0.69 Yuan/W

3.2 System Prices

Table 8: Turnkey PV system prices of different typical PV systems

Category/Size	Typical applications and brief details	Current prices [Yuan/W]
Residential BAPV 5-10 kW	Grid-connected, roof-mounted, distributed PV systems installed to produce electricity to grid-connected households. Typically roof-mounted systems on villas and single-family homes.	3.5-4.5
Small commercial BAPV 10-100 kW	Grid-connected, roof-mounted, distributed PV systems installed to produce electricity to grid-connected commercial buildings, such as public buildings, multi-family houses, agriculture barns, grocery stores, etc.	2.6-3.5
Large commercial BAPV 100-250 kW	Grid-connected, roof-mounted, distributed PV systems installed to produce electricity to grid-connected large commercial buildings, such as public buildings, multi-family houses, agriculture barns, grocery stores, etc.	2.5-3.0
Industrial BAPV >250 kW	Grid-connected,roof-mounted,distributed PV systems installed to produce electricity to grid-connected industrial buildings, warehouses, etc.	2.2-2.8
Small centralised PV 1-20 MW	Grid-connected, ground-mounted, centralised PV systems that work as central power station. The electricity generated in this type of facility is not tied to a specific customer and the purpose is to produce electricity for sale.	2.0-2.5
Large centralised PV >20 MW	Grid-connected, ground-mounted, centralised PV systems that work as central power station. The electricity generated in this type of facility is not tied to a specific customer and the purpose is to produce electricity for sale.	1.4-2.3

Table 9: National trends in system prices for different applications

Year	Residential BAPV Grid-connected, roof-mounted, distributed PV system 5-10 kW **[Yuan/W]**	Small commercial BAPV Grid-connected, roof-mounted, distributed PV systems 10-100 kW **[Yuan/W]**	Large commercial BAPV Grid-connected, roof-mounted, distributed PV systems 100-250 kW **[Yuan/W]**	Centralised PV Grid-connected, ground-mounted, centralised PV systems 10-50 MW **[Yuan/W]**
2025	3.5-4.0	2.6-4.5	2.6-4.0	2.3-3.4

3.3 Financial Parameters and Specific Financing Programs

Table 10: PV financing information in 2025

Different market segments	Loan rate [%]
Average rate of loans – residential installations	3.2%-3.5%
Average rate of loans – commercial installations	3.3%-3.5%
Average cost of capital – industrial and ground-mounted installations	2.6%-3.8% (debt financing); equity IRR benchmark at approximately 6.5%.

3.4 Specific Investments Programs

Delivering the "Five Major Articles" of Finance

In March 2025, the General Office of the State Council issued "Guiding Opinions on Delivering the 'Five Major Priorities' of finance ". The document clarifies that the key areas and main focuses of advancing green finance should center on "providing high-quality financial supply for the comprehensive green transition of economic and social development and the development of a Beautiful China", and clearly emphasizes that advancing green finance should align with China's green development strategy in the new stage.

Ministry of Finance Releases "People's Republic of China Sovereign Green Bond Framework"

On February 20, 2025, the Ministry of Finance publicly released "People's Republic of China Sovereign Green Bond Framework". Serving as the foundation for the Ministry of Finance to issue Chinese green sovereign bonds overseas, the document aims to demonstrate China's commitment to supporting sustainable green development, enrich high-quality green bond varieties in the international financial market, encourage more Chinese issuers to issue green bonds, and further attract various investors to participate in the green financial market.

Two Authorities Jointly Issue "Circular on Leveraging Green Finance Policies to Support the Development of Green Factories"

On November 20, 2025, the Ministry of Industry and Information Technology and the People's Bank of China jointly issued "Circular on Leveraging Green Finance Policies to Support the

Development of Green Factories", with the goal of establishing a mechanism for targeted financial support for the green transition of the manufacturing sector. The document defines the key directions for green finance to support green factories, prioritizing investment projects implemented by national-level green factories that adopt green and low-carbon technologies specified in "Catalogue of Projects Supported by Green Finance (2025 Version)", as well as those outlined in policy plans and technical catalogues issued by relevant national authorities.

3.5 Additional Country Information

Table 11: Country information

Retail electricity prices for a household [Yuan/kWh]	0.5–0.6 Yuan/kWh, with a tiered electricity tariff
Retail electricity prices for a commercial company [Yuan/kWh]	0.5–1.25 Yuan/kWh. No unified national data is available for commercial electricity price, which varies significantly depending on the province, voltage level, peak/off-peak periods, and electricity market trading arrangements.

4 POLICY FRAMEWORK

This chapter describes the support policies aiming directly or indirectly to drive the development of PV. Direct support policies have a direct influence on PV development by incentivizing or simplifying or defining adequate policies. Indirect support policies change the regulatory environment in a way that can push PV development.

Table 12: Summary of PV support measures

Category	Residential			Commercial + Industrial			Centralised		
Measures in 2025	**Legacy**	**Ongoing**	**New**	**Legacy**	**Ongoing**	**New**	**Legacy**	**Ongoing**	**New**
Feed-in tariffs		Yes	-		Yes	-		Yes	-
Feed-in premium (above market price)		-	-		-	-		-	-
Capital subsidies		-	-		-	-		-	-
Green certificates		Yes	Yes		Yes	Yes		Yes	Yes
Renewable portfolio standards with/without PV requirements		Yes	Yes		Yes	Yes		Yes	Yes
Income tax credits		-	-		-	-		-	-
Self-consumption		Yes	-		Yes	-		-	-
Net-metering		-	-		-	-		-	-
Net-billing		-	-		-	-		-	-
Collective self-consumption and delocalized net-metering		-	-		-	-		-	-
Sustainable building requirements		Yes	-		Yes	-		-	-
BIPV incentives		-	-		Yes	-		-	-
Merchant PV facilitating measures		-	-		-	-		Yes	Yes
Other (specify)		-	-		-	-		-	-

4.1 National Targets for PV

2026 Annual Target: Over 200 GW of New Wind and Solar Capacity

The 2026 National Energy Work Conference, held in December 2025, specified that China will add more than 200 GW of wind and solar power generation capacity in 2026, continuously increasing the share of new energy in total supply.

2030 National Target: Total Wind and Solar Capacity to Exceed 2 800 GW

In 2026, the State Council issued the "Carbon Peaking Action Plan for the 15th Five-Year Plan", specifying that "by 2030, the total installed capacity of wind and solar power will reach over 2 800 GW."

The "15th Five-Year Plan for Renewable Energy Development" (NDRC Energy [2026] No. 1067), jointly issued by the National Development and Reform Commission and the National Energy Administration in July 2026, further detailed the 2030 generation targets: total installed renewable energy capacity to reach approximately 3 500 GW; total installed wind and solar capacity to exceed 2 800 GW, accounting for over 50% of total installed capacity; annual wind and solar generation to exceed 4 000 TWh, accounting for 30% of total electricity generation.

2035 Long-Term Target: Striving for 3 600 GW of Total Wind and Solar Capacity

On September 24, 2025, China's new round of Nationally Determined Contributions (NDC) target was announced at the UN Climate Change Summit, specifying that by 2035, the total installed capacity of wind and solar power nationwide should reach more than six times the 2020 level, striving to exceed 3 600 GW, and that the share of non-fossil energy in total energy consumption should exceed 30%.

At a press conference on October 31, 2025, the National Energy Administration noted that as of the end of September 2025, total installed wind and solar capacity had exceeded 1 700 GW. To achieve the 2035 NDC target, approximately 200 GW of wind and solar capacity needs to be added annually over the next decade.

4.2 Direct Support Policies for PV Installations

Development Measures of Accommodation

Policies Related to the Development of a Unified National Electricity Market:

(1) Top-level Design for Virtual Power Plants

On March 25, 2025, the National Development and Reform Commission (NDRC) and the National Energy Administration (NEA) jointly issued "Guiding Opinions on Accelerating the Development of Virtual Power Plants". The document puts forward the general guidelines for virtual power plant development for the "15th Five-Year Plan" period, standardizes the definition and positioning of virtual power plants from an industrial perspective, and better coordinates the innovative development and safe operation, market trading and demand response, technological upgrading and management improvement of virtual power plants. It sets out 18 tasks and measures, providing policy guidance for fully implementing the requirements of the Demand-side Coordination Capacity Improvement Initiative for the new-type power system and accelerating the quality improvement and scale expansion of virtual power plants.

(2) Promoting the Full Implementation of the Electricity Spot Market

On April 29, 2025, the National Development and Reform Commission (NDRC) and NEA issued the "Notice on Comprehensively Accelerating the Construction of Electricity Spot

Markets". The document specifies that by the end of 2025, full coverage of electricity spot markets will be basically achieved, and continuous settlement operations will be fully launched.

(3) Improving Market Mechanisms for Regions with Continuous Spot Market Operation

On September 2, 2025, NDRC and NEA issued the "Guidelines for Market Construction in Regions with Continuous Electricity Spot Market Operation". The document explicitly calls for optimizing spot market trading mechanisms, accelerating the improvement of medium-and long-term market trading mechanisms, establishing a sound ancillary services market system tailored to local conditions, researching and establishing a reliable capacity compensation mechanism, building a standardized and transparent retail market, improving market intervention and response mechanisms, and continuously enhancing market operational capabilities.

(4) Revision of Basic Rules for the Medium-and Long-term Market

On December 17, 2025, NDRC and NEA issued the Basic Rules for the Electricity Medium-and Long-term Market. These rules are designed to meet both the "current" and "long-term" needs of electricity market development, promoting the extension of medium-and long-term transactions toward both "longer" and "shorter" time cycles.

Promoting Direct Green Power Connection and Local Consumption

On May 21, 2025, NDRC and NEA jointly issued the "Notice on Matters Relating to the Orderly Promotion of Direct Green Power Connection" (No. 650). As the first national-level dedicated policy on direct green power connection, the document clarifies key issues such as the applicable scope, management methods, trading and pricing mechanisms of the direct green power connection model, standardizes project planning, construction, investment, and operation models, and delineates the boundaries of safety and economic responsibilities.

On September 9, 2025, the NDRC and the NEA issued "the Notice on Improving the Pricing Mechanism to Promote Local Consumption of New Energy Generation". Building upon the regulatory framework for direct green power connection established in Document No. 650, the notice further refines the pricing mechanism for new energy local consumption projects, providing a policy basis for calculating the corresponding electricity prices.

PV and Its Green-Molecule Application

National Strategy Upgrade for Integrated PV-driven Hydrogen-Ammonia-Methanol Production

Since 2025, China has achieved major policy breakthroughs for the development of the PV-driven hydrogen-ammonia-methanol industry. Multiple national authorities have issued a series of policies covering laws and regulations, assessment of renewable energy consumption obligations, and financial support. Meanwhile, supporting implementation measures such as green power guarantee and international certification have been put in place to form a full-dimensional policy support system. Especially since the launch of the 15th Five-Year Plan in 2026, national policymakers have deepened strategic planning centering on hydrogen energy and green low-carbon transition, and defined integrated PV-driven hydrogen-ammonia-methanol production as a vital component of the new-type energy system.

The 2026 Government Work Report explicitly states "establish a national low-carbon transition fund to foster new growth drivers including hydrogen energy and green fuels". This marks that the hydrogen-energy and green-fuel industry represented by integrated PV-driven hydrogen-ammonia-methanol production has been formally incorporated into the top-level arrangements of national economic work, upgraded from a "complementary energy source" to a key new

growth pole to be cultivated during the 15th Five-Year Plan period. In addition, the newly released Outline of the “15th Five-Year Plan” identifies hydrogen energy as one of the forward-looking future industries. Under the clause of "accelerating the development of new-type energy infrastructure", it proposes to “strengthen local (on-site) development and utilisation of distributed energy and deploy green hydrogen-ammonia-methanol.” It not only delivers clear policy expectations for the implementation of PV-driven hydrogen-ammonia-methanol projects, but also injects strong impetus into the long-term growth of the industry.

National Policies Encourage Special Pilots and Practical Deployment of Integrated PV-driven Hydrogen-Ammonia-Methanol Production

In December 2025, NEA released the List of Hydrogen Energy Pilots in the Energy Sector (First Batch), covering 41 projects-based pilots and 9 regional pilots. Among them, 11 project pilots fall under the category of "large-scale hydrogen production and integration", making integrated PV-driven hydrogen-ammonia-methanol production a dedicated pilot area. Leveraging project pilots, China promotes the deployment and application of advanced hydrogen technologies and core equipment, supports feasibility and effectiveness verification of various standards, and explores replicable and scalable project development solutions with advanced technologies and well-defined models. Drawing on regional pilots, efforts are made to improve cross-ministerial coordination mechanisms and management models for hydrogen energy, explore innovative and sustainable mechanisms to realize green value, and coordinate and align diverse policy resources.

Development Measures for the Construction and Management of PV Installation

Policies Related to Distributed PV

On January 17, 2025, NEA issued " Measures for the Administration of the Development and Construction of Distributed Photovoltaic Power Generation". Based on the 2013 version, this document has made multiple major adjustments in light of the current industry landscape. The Distributed PV Management Measures set May 1 as the cut-off date. Projects connected to the grid before this date shall continue to follow the previous policies, granting a policy grace period of more than three months.

The Management Measures specify refined classifications and category-specific policies, adjust the criteria for scale determination, modify grid connection methods, and promote the "Four Capabilities" (observable, measurable, adjustable, and controllable).

On December 31, 2025, NEA issued Announcement No. 7 of 2025, officially releasing the new edition of the Guides for Hosting Capacity Assessment of Distributed Resources Connected to Power Systems (DL/T 2041-2025) to replace the original DL/T 2041-2019. The new standard will take effect on June 18, 2026. Under the revised guide, the classification criteria for red, yellow, and green zones have been adjusted, and some areas previously rated as red for hosting capacity will be reclassified as green.

Policies on PV-Based Sand Control

In June 2025, the National Forestry and Grassland Administration (NFGA), NDRC and NEA jointly issued “the Plan for PV-Based Sand Control in Desert, Gobi, and Arid Wasteland Areas of the Three-North Region (2025-2030)”, China's first national-level dedicated plan for PV-based sand control. The plan specifies that by 2030, the Three-North region will add 253 GW of PV-based sand control installed capacity and reclaim 10.1 million mu of desertified land. It divides the region into three categories under the principle of "categorized implementation and zonal advancement," and formulates differentiated technical routes and supporting policies.

In August 2025, the State Council Executive Meeting released the Master Plan for the Three-North Shelterbelt Program, listing PV-based sand control as an ecological restoration measure for the northern wind-sand zone and the northwestern desert zone, and positioning it as a key practice for the coordinated development of ecological restoration and new energy development.

Development Measures of Feed-in Tariffs

Market-Based Reform of PV Feed-in Tariffs

On February 9, 2025, the National Development and Reform Commission (NDRC) and the National Energy Administration (NEA) issued “Notice on Deepening the Market-oriented Reform of New Energy Grid-connected Electricity Prices (NDRC Price [2025] No. 136)”, promoting full market participation of wind and PV grid-connected electricity, with feed-in tariffs determined through market transactions. The reform comprises three main aspects:

First, fully market-based feed-in tariffs for renewable energy. In principle, all grid-connected electricity from renewable energy projects shall enter the electricity market, with feed-in tariffs formed through market transactions.

Second, establishing a price settlement mechanism to support sustainable development of renewable energy. After renewable energy participates in market trading, a sustainable development price settlement mechanism shall be established at the settlement stage, with electricity volumes included in the mechanism settled at the mechanism tariff.

Third, using May 31, 2025 as the cut-off date, differentiated measures are applied to existing and new projects. The mechanism tariff for existing projects is properly aligned with current policies, while the mechanism tariff for new projects is determined through market-based competitive bidding.

Local Policies on New-Energy Grid-connected Tariffs and Clearing Outcomes of Mechanism-based Tariffs

By the end of December 2025, all 32 provincial-level regions across China had rolled out provincial implementation plans for the market-oriented reform of new-energy grid-connected tariffs, and bidding for mechanism-based tariffs of incremental new-energy projects had been largely implemented. The implementation of this round of local policies has been generally stable and orderly. It has delivered a clear institutional framework and stable return expectations for the large-scale, high-quality development of new energy such as PV power, and has fundamentally reshaped the investment decision-making system and market-driven development ecosystem of the new-energy industry at the fundamental logic level. From a national perspective, the clearing outcomes of mechanism-based tariffs for new PV projects in each province are highly correlated with regional new-energy accommodation conditions, power supply-demand landscape and benchmark tariffs for coal-fired power, showing marked regional differentiation.

Development Measures of Green Certification

Improving China's Green Electricity Certificate System: On March 18, 2025, the National Development and Reform Commission and other departments issued the Opinions on Promoting the High-Quality Development of the Renewable Energy Green Electricity Certificate Market (NDRC Energy [2025] No. 262), setting development targets for the green certificate market for 2027 and 2030, and providing guidance on stabilizing green certificate supply, stimulating green certificate demand, improving the green certificate trading

mechanism, expanding green certificate application scenarios, and enhancing the internationalization of green certificates.

Merchant PV Development Measures

On December 1, 2025, NDRC issued the Industry Scope List for Real Estate Investment Trusts (REITs) Projects in the Infrastructure Sector (2025 Edition). The document further expands the scope for issuing infrastructure REITs. Within the industries of transportation infrastructure, energy infrastructure, municipal infrastructure, ecological and environmental protection infrastructure, and industrial park infrastructure, eligible projects from all regions nationwide may apply for inclusion.

Specifically, under the energy infrastructure sector, the application scope covers clean energy projects including wind power, solar power, hydropower, natural gas power generation, biomass power generation, and nuclear power; energy storage facility projects; clean, low-carbon, flexible and efficient coal-fired power generation (including combined heat and power, CHP) projects; ultra-high voltage (UHV) power transmission projects; incremental distribution network, microgrid, and charging infrastructure projects. Under the urban renewal facilities sector, the application scope covers renovation and upgrading projects for old street blocks and old factory areas, as well as integrated urban renewal facility projects encompassing the aforementioned multiple asset types.

4.3 Self-consumption Measures

Table 13: Summary of self-consumption regulations for small private PV systems in 2025

PV self-consumption	1	Right to self-consume	Residential PV may choose full feed-in, full self-consumption, or self-consumption with surplus power fed into the grid. Commercial and industrial (C&I) distributed PV must prioritize self-consumption, with grid feed-in only as a supplement; full feed-in is not permitted. Large-scale C&I distributed PV must adopt full self-consumption.
	2	Revenues from self-consumed PV	Self-consumed electricity displaces retail electricity tariffs.
	3	Charges to finance Transmission, Distribution grids & Renewable Levies	Direct green power connection projects shall pay transmission and distribution tariffs based on capacity (demand); self-consumed electricity is temporarily exempt from system operation fees.
Excess PV electricity	4	Revenues from excess PV electricity injected into the grid	In principle, all electricity shall enter the power market, with tariffs determined through market transactions; electricity volumes covered by the mechanism shall be settled through differential settlement against the mechanism tariff.
	5	Maximum timeframe for compensation of fluxes	A settlement cycle based primarily on calendar months shall be established. In regions where

			the spot market operates continuously, a "daily clearing and monthly settlement" model shall be implemented. For electricity volumes included in the mechanism, local authorities shall break down the annual volume into monthly allocations. If actual monthly grid-connected electricity falls below the monthly allocated volume, settlement shall be based on actual grid-connected electricity, with rolling monthly clearing within the year.
	6	Geographical compensation (virtual self-consumption or metering)	No virtual self-consumption or geographical compensation mechanism has been established. In principle, distributed PV should be consumed locally, and industrial parks and commercial and industrial enterprises are encouraged to self-consume their PV generation. Direct green power connection can achieve physical traceability of green electricity, but it does not constitute virtual self-consumption.
Other characteristics	7	Regulatory scheme duration	May 31, 2025 serves as the cut-off date between existing and new projects; the implementation period of the mechanism tariff shall be specified by provincial authorities.
	8	Third party ownership accepted	Enterprises are permitted to invest in non-individual residential and commercial & industrial (C&I) distributed PV.
	9	Grid codes and/or additional taxes/fees impacting the revenues of the prosumer	New projects must be “observable, measurable, adjustable, and controllable”; virtual power plants (VPPs) may aggregate distributed resources.
	10	Regulations on enablers of self-consumption (storage, DSM…)	Remove mandatory energy storage requirements for new energy projects; advance virtual power plants, direct green power connections, and zero-carbon parks.
	11	PV system size limitations	Residential: ≤6 MW (10 kV); General C&I: ≤6 MW (10 kV), ≤20 MW (35 kV), ≤50 MW (110 kV); Large-scale C&I: full self-consumption.
	12	Electricity system limitations	Hosting capacity assessment adopts a red/yellow/green zoning system; new grid connections are suspended in red zones.
	13	Additional features	Large-scale C&I distributed PV must be equipped with reverse power flow prevention devices; for direct green power connection, the self-consumption ratio shall be no less than

			60% of total available generation and 30% of total electricity consumption (35% by 2030).

Development Measures of Green Electricity Demand

Policies for Improving the Green Power and Green Certificate Value System

Promoting direct green power connection and Local Consumption: According to the relevant policy on direct green power connection (see Section 4.2.1), this is the first national-level dedicated policy on direct green power connection. It clarifies key issues such as the applicable scope, management methods, and trading and pricing mechanisms of the direct green power connection model; standardizes project planning, construction, investment, and operation models; and delineates the boundaries of safety and economic responsibilities.

Improving the Pricing Mechanism for Local Consumption of New Energy Generation: Building upon the regulatory framework for direct green power connection established in Document No. 650, this notice further refines the pricing mechanism for new energy local consumption projects, providing a policy basis for calculating the corresponding electricity prices.

Carry out cross-operating-area green power transactions.

Under the guidance of the National Development and Reform Commission and the National Energy Administration, the Beijing Power Exchange Center and the Guangzhou Power Exchange Center jointly conducted intra-month cross-operating-area green power transactions for power delivery from Guangxi and Yunnan to Shanghai, with a traded volume of 52.70 million kWh. This has effectively promoted the optimal allocation of green energy on a larger scale and marked a new milestone in building a unified national power market.

In 2025, China's national green power transaction volume reached 328.5 TWh, representing a year-on-year increase of 38.3%.

4.4 Collective Self-Consumption, Community Solar and Similar Measures

Generation-Grid-Load-Storage Integration Measures

In 2025, China maintained a relatively high level of PV power accommodation, with the annual PV utilisation rate reaching 95%. In 2025, national solar PV generation exceeded 1 000 TWh, reaching 1 170 TWh, a year-on-year increase of 40%, accounting for 11.3% of total electricity generation.

China continued to advance the construction of UHV AC and DC projects, strengthen key transmission corridors, accelerate the development of transmission facilities for large-scale wind and solar bases, and continuously enhance distribution network hosting capacity, further improving the optimized allocation of renewable energy resources. Efforts were made to enhance the active support capability of renewable energy, strengthen the regulation capability of distributed renewable energy, optimize power balancing strategies, accelerate the development of spot markets, and promote the development of the green power market.

(1) Grid Construction

In 2025, China continued to accelerate power grid construction and strengthen support and safeguards. UHV DC transmission projects were completed and put into operation with high quality, further enhancing inter-regional and inter-provincial power transmission capacity. The

construction of transmission facilities for large-scale wind and solar bases and supporting renewable energy projects was advanced in an orderly manner, and power grid construction at all levels was promoted with high quality.

(2) Grid Operation and Dispatch

In 2025, unified dispatch across the entire grid was continuously strengthened, system regulation potential was tapped, renewable power forecasting accuracy was improved, grid interaction performance of renewable energy was enhanced, and the active support capability of renewable energy was reinforced, providing solid guarantees for high-proportion renewable energy integration and secure grid operation.

(3) Market-Based Trading of Renewable Energy

In 2025, a national unified electricity market was initially established, full market participation of renewable energy was promoted, the scale of green power consumption continued to expand, the decisive role of the market in resource allocation was fully leveraged, and support was provided for the green energy transition and power supply assurance. In 2025, national green power trading volume reached 328.5 TWh, a year-on-year increase of 38.3%. From January to December 2025, the National Energy Administration issued a total of 2.947 billion green certificates; nationwide, a total of 930 million green certificates were traded.

PV power utilisation in 2025 and Outlook for 2026

In 2025, China's national PV utilisation rate reached 95%. The National Development and Reform Commission and the National Energy Administration issued the “Guiding Opinions on Promoting renewable energy integration and Regulation” (see Section 4.2.1), which specifies that by 2030, incremental electricity demand will be primarily met by newly added renewable energy generation, and China will ensure effective integration of more than 200 GW of new renewable energy capacity annually. Against the backdrop of full market participation of renewable energy, curtailment will become a normal phenomenon in power systems with a high share of renewables. PV enterprises need to focus on three areas—market-based bidding strategies, enhanced grid integration capability, and diversified market participation—to balance revenue certainty with market competitiveness and align with the development requirements of the new power system.

China's Electricity Market Operation in 2025

In 2025, the scale of electricity traded in China's national electricity market reached a new high, with cumulative traded electricity volume totaling 6 640 TWh, up 7.4% year on year. Market-based traded electricity accounted for 64.0% of total electricity consumption. In 2025, a total of 930 million green certificates were traded nationwide, up 120% year on year. As of December 31, 2025, including the Southern Regional market, there were 25 electricity spot market operating areas across China, covering 30 provinces and regions. Except for Beijing-Tianjin-Tangshan and Tibet, spot market coverage was achieved nationwide.

4.5 Tenders, Auctions & Similar Schemes

In 2025, China's PV project development continued the overall approach of "placing equal emphasis on large-scale bases and distributed PV," with market-based competitive allocation becoming the primary method.

Large-Scale Base Projects: Large-scale bases remained the mainstay of renewable energy development, including PV. The “15th Five-Year Plan Outline" proposed that new energy bases in desert, Gobi, and barren areas focus on the “Kubuqi, Ulan Buh, Tengger, and Badain

Jaran deserts", developing large-scale wind and solar bases primarily for power transmission. Based on current project layouts and progress, over 50 GW of new energy projects from the second and third batches of desert-Gobi-barren area bases arranged during the 14th Five-Year Plan period will be grid-connected during the "15th Five-Year Plan" period.

Distributed PV: Distributed PV development emphasized local consumption and cultivation of new models. The national policy direction under the "15th Five-Year Plan" is to actively advance project construction, promote local development, utilization, and consumption, particularly by integrating PV applications in buildings and factories through zero-carbon parks and zero-carbon factories. The "Measures for the Administration of the Development and Construction of Distributed Photovoltaic Power Generation" was promulgated in 2025. For general commercial and industrial distributed PV, the self-consumption ratio requirement was delegated to local energy authorities, and more than ten provinces have successively issued provincial-level implementation rules.

Mechanism Tariff Bidding: According to Document No. 136 (see Section 4.2.3), as of the end of 2025, 30 provinces (municipalities and autonomous regions) had issued formal local implementation documents for Document No. 136; 27 provinces had launched mechanism tariff bidding for new renewable energy projects; and 25 provinces had announced results for a total of 31 bidding rounds. Among the 30 bidding rounds that announced mechanism electricity volume results, the mechanism electricity volume for PV exceeded 70 TWh, equivalent to approximately 100 GW of installed capacity. Shandong became the first province in China to complete the entire mechanism tariff bidding process for new renewable energy projects.

Direct Green Power Connection and Zero-Carbon Parks: Since the direct green power connection policy was promulgated (see Section 4.2.1), more than ten provinces have issued local implementation rules, with approved and registered direct green power connection projects totaling over 30 GW of renewable energy installed capacity. Since 2025, China has also successively issued implementation opinions or guiding opinions on high-quality development of zero-carbon parks and zero-carbon factories, and announced the first batch of national-level zero-carbon park construction lists.

PV-based sand control: The "Plan for PV-Based Sand Control in Desert, Gobi, and Arid Wasteland Areas of the Three-North Region (2025-2030)" (see Section 4.2.2) for the first time specified a target of 253 GW of installed capacity and 10.1 million mu (approximately 673 000 hectares) of desertified land to be treated. Key provinces including Inner Mongolia, Xinjiang, Gansu, and Qinghai will successively issue or revise their provincial-level special plans for PV-based sand control to fully align with national targets.

4.6 Other Utility-scale Measures including, Floating and Agricultural PV

Development Measures of Floating PV

China's offshore PV projects (planned, under construction and completed) total nearly 20 GW. An offshore floating PV platform generally consists of a buoyancy structure, PV support structure, mooring and anchoring system, PV modules, cables, and inverters.

Domestic offshore floating PV projects are primarily experimental, harbour-based testing, and demonstration projects, such as the 100 kW offshore floating PV project of CHN Energy Dongtai Offshore Wind Power Co., Ltd., the 500 kW floating PV demonstration project at SPIC Peninsula South No. 3, the CIMC Yantai High-tech Zone Offshore PV Demonstration Base,

and the "Huanghai No. 1" project. Current investment in floating offshore PV projects varies considerably depending on ocean conditions, ranging from RMB 8 000 to 12 000 per kW.

Offshore floating PV remains in its early development stage, constrained by multiple factors including complex marine environments, material aging, core equipment, ecological impacts, and engineering economics. A mature and reliable technology and industrial system has yet to be established. Existing systems demonstrate insufficient reliability under extreme conditions such as typhoons and wave currents; corrosion and biofouling issues are prominent; key equipment and system integration technologies remain immature; ecological impact mechanisms are unclear; and construction and operation and maintenance (O&M) costs are relatively high.

Offshore floating PV will move toward high performance, reliability, intelligence, standardisation and ecological integration.

Regarding standards, China has issued or is developing relevant standards, such as the Technical Specification for Floating Photovoltaic Supporting System (NB/T 11814-2025) and High Density Polyethylene (HDPE) Floating Body Used in Floating Photovoltaic System (IEC TS 63618).

Development Measures of Agricultural PV

The "Distributed PV Management Measures" explicitly stipulate that agriculture-PV and fishery-PV complementary projects are all subject to the management rules for ground-mounted power stations.

PV application standards mainly govern the technical requirements for integrated applications of PV with other sectors, including PV hydrogen production, building-integrated PV, PV transportation, PV agriculture, and PV communications.

Perovskite modules can adjust light transmittance by tailoring material composition—a feature well suited to integration with agriculture. In 2023, the world's first megawatt-scale perovskite fishery-PV complementary water-surface power station was completed and grid-connected in China.

4.7 Indirect Policy Issues

Rural Electrification Measures

Distributed PV development emphasizes local consumption and the cultivation of new models. In the agriculture and rural sectors, distributed PV projects that benefit the people will be implemented in conjunction with the rural energy revolution, advancing the "Sunshine for Millions of Households" Initiative.

In 2025, China added 45.95 GW of residential PV capacity, with approximately 1.163 million new installations, bringing cumulative installations to 7.339 million households.

The average size per household for new residential PV installations continued to increase significantly. In 2025, the average size of newly added residential PV installations nationwide was 39.5 kW per household, up 22.3% year on year.

Support for Electricity Storage and Demand Response Measures

In 2025, China's energy storage sector continued its rapid growth. By the end of 2025, the cumulative installed capacity of new energy storage projects in operation nationwide reached 136 GW/351 GWh, representing a more than 40-fold increase compared with the end of the “13th Five-Year Plan” period. In 2025, China's newly commissioned new energy storage projects recorded a net increase of approximately 62.24 GW/183 GWh. The average storage duration was 2.58 hours.

According to Document No. 136 (see Section 4.2.3), configuring energy storage shall not be a precondition for the approval, grid connection, or feed-in of new renewable energy projects, formally ending the mandatory PV storage allocation model implemented since 2017. Mandatory storage allocation for renewable energy projects has been effectively abolished nationwide.

In August 2025, the National Development and Reform Commission and the National Energy Administration issued the “Special Action Plan for Large-Scale Development of new energy storage (2025-2027)”, setting ambitious targets: by the end of 2027, national new energy storage installed capacity to reach over 180 GW, with more than 100 GW added over three years, driving approximately RMB 250 billion in direct investment.

In 2025, the total installed capacity of energy storage in renewable energy pairing storage projects in China reached 14.2 GW/37.1 GWh. Among these, "PV + storage" emerged as the largest application scenario, with 8.2 GW/20.3 GWh, accounting for 54.8% of capacity on an energy (MWh) basis.

On March 25, 2025, the National Development and Reform Commission and the National Energy Administration jointly issued the “Guiding Opinions on Accelerating the Development of Virtual Power Plants" (NDRC Energy [2025] No. 357), which proposed the overall policy direction for virtual power plant development during the “15th Five-Year Plan” period, systematically deploying 18 tasks and measures. This provides policy guidance for fully implementing the action requirements for enhancing demand-side coordination capabilities of the new power system and accelerating the quality improvement and expansion of virtual power plants.

China is building a demand response system, advancing flexible load regulation capacity, deepening aggregated applications of virtual power plants, and continuously enhancing demand response capabilities to support the construction of the new power system and green power accommodation.

Support for Encouraging Social Acceptance of PV Systems

In 2025, the promotion of social acceptance for China's PV industry presented a multi-level landscape characterized by "national-level project leadership, benchmark venue support, systematic corporate advancement, and broad community and campus participation."

LONGi Green Energy: National-Level Science Popularization Livestream Enters Corporate Headquarters. On December 30, 2025, a science popularization livestream under the "Youth Science and Technology Literacy Enhancement Program"—co-hosted by the China Next Generation Education Foundation and Ping An, and supported by Science and Technology Daily-was held at LONGi Green Energy's headquarters. Teachers and students from over a thousand rural primary schools across 27 provinces and municipalities nationwide watched the broadcast, which garnered over 7.568 million views across all platforms. Through segments including the coloured photovoltaic curtain wall at the BIPV Experience Center, a smart carport

with QR code charging demonstration, and a "time-spanning" juxtaposition of first-generation PV modules and HPBC cells, the livestream visually presented the iterative evolution of PV technology and its everyday application scenarios.

"LightMe" PV Lifestyle Pavilion: Located within the Jiaxing Xiuzhou PV Science and Technology Museum and created by LightMe Technology, this pavilion is dedicated to "PV lifestyle integration," focusing on the R&D and industrialization of PV consumer products across all life scenarios. It serves as a permanent science popularization venue for the global public. Across six scenarios-lighting, green building materials, outdoor portability, charger-free devices, mobile energy, and fashion and cultural-creative products-it displays nearly 50 original designs and innovative products. For the first time, it collectively showcases the expansion of PV power generation from traditional power station and industrial scenarios to universal everyday life scenarios. By making PV products lightweight, stylish, and lifestyle-oriented, it integrates clean energy into all aspects of daily life, opening up new applications of "dual-carbon + new consumption."

Astronergy: Dual-Track Advancement in Domestic Public Welfare and International Exchange. On May 27, 2025, Astronergy's Haining headquarters hosted 80 international students from multiple countries and representatives from more than 10 Zhejiang-based companies for the "Zhejiang Entrepreneurs Going Global Matchmaking Series-Entering Astronergy" event, during which they visited the PV cell and module production workshops. On September 24 of the same year, Astronergy and Nordic PV distributor Aprilice jointly held a Global Factory Tour, inviting Nordic channel partners, project developers, and industry expert representatives to visit the intelligent manufacturing base at its Haining headquarters.

Sungrow New Energy: Immersive Science Popularization Tour of New Energy Power Stations. In August 2025, Sungrow New Energy, in collaboration with the New Technology Development Center of the China Association for Science and Technology (CAST), created China's first immersive science popularization tour of new energy power stations-the "Light Chaser Festival · Tech Light-Chasing Journey." It "moved" real scenarios such as PV stations, wind farms, and energy storage stations into the Hefei Science and Technology Museum, constructing an immersive experience space through four dimensions: exhibitions, hands-on experiments, science lectures, and expert sharing. The first batch of the tour covered nine cities including Beijing, Hangzhou, and Hefei.

China Jiliang University: Flexible PV Technology Enters Communities and Campuses. From June to July 2025, the "Flexible Electronics New Voices-PV Future" science popularization team from China Jiliang University brought laboratory-made flexible perovskite solar cells to multiple communities, primary schools, and kindergartens in Hangzhou. Through four segments-engaging explanations, physical displays, interactive experiments, and hands-on experiences-they popularized cutting-edge PV technology to the public across different age groups.

4.8 Financing and Cost of Support Measures

(1) Changes in China's Green Finance Policies

In 2025, China's green finance policy framework continued to improve. In March 2025, the General Office of the State Council issued the Guiding Opinions on Effectively Implementing the "Five Major Articles" of Finance. On February 20, 2025, the Ministry of Finance released the “People's Republic of China Sovereign Green Bond Framework”. On March 3, 2025, the Ministry of Finance issued the Administrative Measures for Special Funds for Clean Energy Development, with the special funds to be implemented from 2025 to 2029. On September 19,

2025, the National Development and Reform Commission issued the Administrative Measures for Budgetary Investment Earmarking of the Central Government for Energy Conservation and Carbon Reduction, with support set at 20% of the approved total investment. On December 1, 2025, the General Office of the National Development and Reform Commission issued the Industry Scope List for Infrastructure Real Estate Investment Trust (REITs) Projects (2025 Edition) , which includes wind power, solar power, and other clean energy projects within the scope of eligible energy infrastructure applications.

(2) Financing Situation of China's PV Industry

As of the end of 2025, China's outstanding green loans in both domestic and foreign currencies reached RMB 44.77 trillion, a year-on-year increase of 20%. In 2025, the scale of equity financing in China's PV industry contracted significantly. A total of 22 PV enterprises conducted equity financing through the A-share capital market, involving 22 projects, with a total planned fundraising amount of RMB 39.508 billion, down 37.6% year on year. According to Mercom Capital Group, total corporate funding for the overseas PV companies reached USD 22.2 billion in 2025, down 16% year on year—the second consecutive annual decline.

(3) Innovation and Application of Green Finance Products in China's PV Industry

Innovation in green finance products revolves around green credit, green bonds, asset-backed securitization, and other areas. Typical products include fixed asset loans, green supply chain financing, sci-tech innovation credit loans, green bonds, and PV project loans, among others.

(4) Industry Transformation: From "Scale Competition" to "Value Competition"

Starting April 1, 2026, the VAT export tax rebate for PV products will be fully cancelled, compelling enterprises to shift toward market-based competition and driving China's PV industry to build more sustainable competitiveness in the global market.

4.9 Grid Integration Policies

Grid Connection Policies

In 2025, China's PV grid-integration policies were oriented toward standardisation, marketisation, and security enhancement.

(1) Categorized Management of Distributed PV and Adjustment of Grid Connection Modes

Under the Measures for the Administration of the Development and Construction of Distributed Photovoltaic Power Generation (see Section 4.2.2), distributed PV is classified into four categories: natural-person residential (residential PV systems owned by individuals), non-individual residential (residential PV systems owned by legal entities), general commercial and industrial (C&I), and large-scale C&I. Grid connection modes include full feed-in, full self-consumption, and self-consumption with surplus power fed into the grid. Large-scale C&I distributed PV shall, in principle, adopt the full self-consumption mode; in regions where the electricity spot market operates continuously, it may adopt the self-consumption with surplus feed-in mode to participate in the spot market. Investors shall ensure that projects meet the "observable, measurable, adjustable, and controllable" requirements.

(2) Full Market Participation of Renewable Energy and the Price Settlement Mechanism

Under Document No. 136 (see Section 4.2.3), grid-connected electricity from renewable energy projects shall, in principle, fully enter the electricity market, with feed-in tariffs

determined through market transactions. Using May 31, 2025 as the cut-off date, differentiated measures are applied to existing and new projects: the mechanism tariff for existing projects is properly aligned with current policies, while the mechanism tariff for new projects is determined through market-based competitive bidding.

(3) New Model of Direct Green Power Connection

Under the policies on direct green power connection (see Section 4.2.1), renewable energy sources such as wind, solar, and biomass power are permitted not to connect directly to the public grid but instead to supply green electricity to a single electricity user through dedicated lines, achieving clear physical traceability of the electricity supplied. The annual self-consumed renewable electricity of a project shall account for no less than 60% of its total available generation, and its share of total electricity consumption shall increase from no less than 30% in 2025 to no less than 35% by 2030.

(4) Hosting Capacity Assessment and Grid-related Safety Management

On December 31, 2025, the National Energy Administration issued the Guidelines for Hosting Capacity Assessment of Distributed Resources Connected to Power Systems (DL/T 2041-2025), replacing the previous DL/T 2041-2019. The new guidelines adjust the criteria for classifying red, yellow, and green zones, with some red zones for hosting capacity to be reclassified as green, and will officially take effect on June 18, 2026. The new guidelines specify that available hosting capacity assessment includes both assessment at the county-level administrative region and assessment of available hosting capacity for transformers at all voltage levels of 220 (330) kV and below.

5 INDUSTRY

5.1 Production of Feedstocks, Ingots and Wafers (Crystalline Silicon Industry)

Table 14: Silicon feedstock, ingot and wafer producer's production information for 2025

Manufacturers (or total national production)	Process & technology	Total Production	Product destination	Price
Total	Silicon feedstock [Tonnes]	$136.7*10^4$	-	-
Total	sc-Si wafers [MW]	$719.3*10^3$	-	-

Source: CPIA, May 2026.

In 2025, China's polysilicon and wafer sectors continued to be highly concentrated.

Polysilicon: Total capacity was approximately 3.48 million tonnes per year, with about 16 operating producers. The top ten producers accounted for 83.4% of capacity and 93.7% of output; the top six had a combined capacity of approximately 2.55 million tonnes. The largest producer had capacity of about 900 000 tonnes and output of about 465 000 tonnes.

Wafers: Capacity was approximately 1 271 GW, down 5.8% year on year; output was approximately 719 GW, down 7.3% year on year. The largest producer had capacity of about 190 GW and output of about 117 GW.

Wafer thinning: Thinning can reduce silicon consumption and costs but affects breakage rates. Current slicing processes can meet requirements, but are constrained by downstream cell and module manufacturing. In 2025, the pace of thinning slowed. The average thickness of p-type monocrystalline wafers was approximately 150 μm, while n-type thinning was also relatively stable.

Formats: Large formats dominated, with 182 mm and 210 mm and above together accounting for over 99%. Rectangular and micro-rectangular wafers increased, while small formats essentially exited the market. In 2025, micro-rectangular, rectangular, 182 mm square, and 210 mm square wafers accounted for approximately 21.4%, 48.2%, 11.2%, and 18.9%, respectively.

Overall, the sector remained highly concentrated, thinning slowed, and large formats and adoption of rectangular formats became the mainstream direction.

5.2 Production of Photovoltaic Cells and Modules (Including TF and CPV)

Module manufacturing is defined as the industry where the process of the production of PV modules (the encapsulation) is done. A company may also be involved in the production of ingots, wafers or the processing of cells, in addition to fabricating the modules with frames,

junction boxes etc. The manufacturing of modules may only be counted to a country if the encapsulation takes place in that country.

Total PV cell and module manufacture together with production capacity information is summarised in the table below.

Table 15: PV cell and module production and production capacity information for 2025

Cell/Module manufacturer (or total national production)	Technology (sc-Si, mc-Si, a-Si, CdTe, CIGS)	Total Production [MW]		Maximum production capacity [MW/yr]	
		Cell	Module	Cell	Module
Wafer-based PV manufactures					
Tongwei	**sc-Si**	$102.4*10^3$	44.910^3	$150*10^3$	$90*10^3$
JinkoSolar	**sc-Si**	$72.1*10^3$	$78.5*10^3$	$81*10^3$	$117.5*10^3$
LONGi Green Energy	**sc-Si**	$59.8*10^3$	$71.3*10^3$	$103.7*10^3$	$112.4*10^3$
JA Solar	**sc-Si**	$53.8*10^3$	$62.9*10^3$	$78.1*10^3$	$90.1*10^3$
Trina Solar	**sc-Si**	$68.8*10^3$	$66.9*10^3$	$81.4*10^3$	$96.9*10^3$
Thin film manufacturers					
Hangzhou Longyan	CdTe	-	-	390	-
Triumph Glass Holding	CdTe	-	-	600	-
Mingyang Ruike	CdTe	-	-	100	-

Source: CPIA, Jun 2026.

In 2025, total cell production capacity in mainland China contracted to 1 214 GW, down 6.7% year on year. Cell output was approximately 689 GW, down 0.9% year on year—the first annual decline since 2010—mainly due to deep supply-demand adjustments across the industrial chain and persistent price pressure.

In terms of corporate landscape, the top ten enterprises had a combined capacity of 708 GW, accounting for 58.3% of the national total. The largest producer was Tongwei Solar, with 150 GW of capacity and 102.4 GW of output in 2025.

In 2025, China's cell industry entered a critical phase of rational capacity adjustment, with some changes in the technology landscape. TOPCon, leveraging a mature supply chain and continuous cost optimisation, has replaced PERC as the mainstream technology. For the large existing TOPCon production lines, enterprises continued to increase investment in efficiency-enhancement upgrades such as multi-cutting and Poly Finger technologies. XBC cell market share rose steadily from less than 1% in 2023 to 6.7% in 2025. HJT share fluctuated narrowly between 2.6% and 3.3%, falling back to 2.6% in 2025, with scaled deployment slowing relatively.

In terms of technology routes, the rapid release of n-type cell capacity in earlier years has established the mainstream position of n-type TOPCon cells for the next 5-10 years. XBC, HJT,

and other cells currently hold relatively low market shares, but with technological progress and promotion by leading enterprises, their market share still has room to grow.

In 2025, China's PV module production capacity and output reached 1 089.4 GW and 574.5 GW, respectively, down 5.8% and 8.4% year on year, as the industry's supply-demand structure undergoes deep adjustment.

Module encapsulation technology has entered a period of rapid development. Half-cell and multi-cut technologies, SMBB, 0BB, and high-density encapsulation are partially compatible with one another, delivering significant synergistic effects. These remain the primary means of increasing module power beyond cell efficiency improvements. Over the past two years, large-wafer technology has also entered a phase of technical stability. The combination of n-type cells with large-size wafers has pushed module power above 700 W. Leading module manufacturers now all offer 700 W+ product solutions. These high-power, high-efficiency module solutions are based on high-efficiency cells, integrate various high-efficiency encapsulation technologies, and feature optimized and upgraded wafer and module dimensions.

PV module application scenarios are becoming increasingly segmented, further amplifying differentiated value. This is driving the industry to launch tailored product solutions for various typical application scenarios-enhancing end-user experience and addressing practical pain points-such as lightweight modules, anti-dust modules, anti-glare modules, gas station modules, offshore PV modules, and desert-Gobi modules.

5.3 Manufacturers and Suppliers of Other Components

(1) Power conversion system (PCS)

At present, the market concentration of China’s PV inverter industry continues to rise. There are more than 20 active enterprises in the sector with sustainable innovation capacity, large-scale manufacturing capability and strong market influence, and obvious regional agglomeration characteristics have taken shape. Relying on the sound industrial chain of power electronics, semiconductors and supporting manufacturing, coupled with robust R&D investment, high supply chain synergy and advantages in cost control, the Yangtze River Delta and Pearl River Delta have become the core agglomeration areas for the inverter industry. They have built notable strengths in core component supply, system integration capability, product iteration efficiency and market response speed, continuously lifting the overall technical level of China’s inverter industry.

On product and technical routes, inverters are accelerating their evolution toward higher power, intelligence and systematization. New industry products launched in 2025 show a clear technological development path: high-power string inverters above 400 kW are seeing accelerated deployment, and product forms are expanding from single-function inverters to integrated PV-storage-charging solutions. Digital technologies, intelligent operation & maintenance (O&M) and data management platforms are also being further adopted. AI algorithms and digital twin technologies are gradually embedded into the inverter control and O&M system, evolving products from simple electric power conversion devices into intelligent nodes with perception, decision-making and coordinated control capabilities. As the share of new energy installed capacity keeps growing, power grids impose increasingly stringent requirements on system stability and regulation capability. Grid-forming technology, virtual power plant (VPP) interfaces, fast frequency response, inertia support, and "AI + PV-storage coordination" are gradually becoming key focuses of the industry.

(2) Storage batteries

By the end of 2025, the installed capacity of commissioned new energy storage across China reached 136 GW/351 GWh, representing an over 40-fold increase compared with the end of the 13th Five-Year Plan period and achieving leapfrog development. The average storage duration stood at 2.58 hours, an increase of 0.30 hours from the end of 2024.

In terms of individual project scale, the trend toward large-scale development for projects exceeding 100 MW is pronounced. By the end of 2025, projects with a capacity of 100 MW and above accounted for 72% of the total installed capacity, up by approximately 10 percentage points from the end of 2024. The number of new energy storage station projects with a duration of 4 hours or longer has gradually risen, making up 27.6% of installed capacity, an increase of roughly 12 percentage points versus the end of 2024.

In terms of application scenarios, the share of standalone energy storage continued to increase. In 2025, newly added standalone energy storage capacity reached 35.43 GW, while its cumulative installed capacity accounted for 51.2% of the total, approximately 5 percentage points higher than at the end of 2024.

As for technical routes, lithium-ion battery energy storage remains dominant, accounting for 96.1% of the installed capacity. Compressed air energy storage, flow battery energy storage, flywheel energy storage and other technologies together account for the remaining 3.9%.

(3) Solar trackers

With the accelerated construction of UHV transmission lines in the coming years and the development of multiple "PV+" scenarios such as "PV + energy storage" and "PV + green hydrogen production", Chinese solar tracker enterprises will embrace unprecedented development opportunities. In addition, Chinese companies are actively pursuing overseas deployment, which will surely help Chinese solar tracker players narrow the gap with leading overseas peers.

According to relevant statistics, global shipments of solar trackers reached approximately 133 GW in 2025. Among the world’s top 10 solar tracker suppliers by shipment volume, three Chinese enterprises made the list: Arctech Solar, Trina Tracker and Antaisolar.

(4) Building-integrated PV (BIPV) products

At present, the development focus of building-integrated PV (BIPV) in China is gradually expanding from sole reliance on new construction projects to broader scenarios including retrofitting of existing buildings, industrial park renewal and integrated energy systems. Its development priorities lie not only in expanding installed capacity, but also in continuously improving the adaptability to building functions, reliability of engineering quality, standardization of safe operation and maintenance, and coordination capability of energy systems.

In the future, BIPV will play an even more critical role in the green and low-carbon transition of the building sector, the development of the new power system, and the high-quality development of urban and rural construction.

5.4 Recycling

In 2025, the industrialization of China's PV recycling sector became increasingly pronounced. National authorities continued to strengthen regulatory guidance and standards development, a growing number of local governments began viewing PV recycling as an important growth point for the green circular economy, the number of specialized recycling enterprises gradually

increased, and demand for upstream end-of-life PV modules became increasingly rigid/less elastic.

In 2025, policy formulation in China's PV recycling field focused primarily on three areas: implementing the "two new" policy (large-scale equipment renewal and consumer goods trade-in), developing the standards system, and accelerating the R&D and deployment of environmental protection equipment, signaling a trend of rapid industrialization in China's PV recycling sector. The National Development and Reform Commission and the Ministry of Finance expanded the scope of the large-scale equipment renewal policy to include the renewable energy sector. The National Energy Administration explicitly designated the upgrading and retrofitting of aging PV power stations and the recycling of end-of-life modules as priorities for industry standard development. The Ministry of Industry and Information Technology, through its green and low-carbon standardization program and the open-call mechanism, focused on overcoming core technical bottlenecks such as the green separation of PV module laminates, resource utilization of materials, and pollution control.

Public attention to the PV recycling industry in China has continued to grow, with more enterprises entering the sector and recycling plant layouts gradually shifting from the central and eastern regions to the western regions. In 2025, upstream module recycling volumes entered a phase of scaled release, with recycling sources mainly including technological upgrades of utility-scale power stations, replacement of distributed power stations, modules damaged by natural disasters, and production scrap. The total volume is estimated at approximately 150 000–200 000 tonnes. Midstream dismantling technologies continued to improve, with mass-production technology routes primarily divided into physical methods, pyrolysis methods, and pyrolysis-chemical methods. Downstream material recovery prices fluctuated significantly, with price volatility in precious metals such as silver and copper transmitting upstream in reverse to recycling pricing, giving PV recycling materials a distinctly futures-like character.

As of the end of 2025, China had issued a total of 35 standards related to PV module recycling and utilization, spanning national standards, industry standards, local standards, and group standards. The standards cover the entire process from collection, transportation, storage, dismantling, and treatment to resource recovery, forming a preliminary multi-tiered, full-chain standards system.

By the end of 2025, the cumulative number of domestic patent applications in China for PV module recycling and treatment technologies had exceeded 500, with more than 120 patent applications filed in 2025 alone, fully demonstrating the increasing attention that PV module recycling and treatment has received in China in recent years.

6 PV IN THE ECONOMY

This chapter aims to provide information on the benefits of PV for the economy.

6.1 Business Value

Table 16: Rough estimation of the value of the PV business in 2025 (VAT is excluded)

Sub-market	Capacity installed [MW]	Average price [Yuan/W]	Value	Sub-market
Off-grid	-	-	-	36.36 billion Yuan
Grid-connected distributed	153 000	2.82	431.46 billion Yuan	431.46 billion Yuan
Grid-connected centralised	164 000	2.36	387.04 billion Yuan	387.04 billion Yuan
Value of PV business in 2025				854.86 billion Yuan

7 INTEREST FROM ELECTRICITY STAKEHOLDERS

7.1 Structure of the Electricity System

China's electricity system is organised under three major grid companies by region: State Grid Corporation of China, China Southern Power Grid, and Inner Mongolia Power (Group) Co., Ltd. State Grid's operating area covers 26 provinces (autonomous regions and municipalities) across the country. China Southern Power Grid covers five provincial-level regions and is interconnected with the power grids of Hong Kong, Macao, and Southeast Asian countries, with a supply area of 1 million square kilometres and a population served of 272 million. Inner Mongolia Power (Group) Co., Ltd. is a wholly state-owned extra-large grid enterprise directly under the Inner Mongolia Autonomous Region. It supplies electricity to eight cities (leagues) across the region and also transmits electricity across provincial, regional, and national borders to North China, Yulin in Shaanxi, and Mongolia.

By the end of 2025, China's total installed power generation capacity reached 3 890 GW, up 16.1% year on year. By source: hydropower stood at 450 GW, accounting for 11.5%; thermal power at 1 540 GW, accounting for 39.6%; nuclear power at 62.48 GW, accounting for 1.6%; grid-connected wind power at 640 GW, accounting for 16.4%; and grid-connected solar power at 1 200 GW, accounting for 30.9%. Renewable energy accounted for more than 60% of installed capacity. Combined wind and solar capacity reached 1 840 GW, accounting for 47%, historically surpassing thermal power.

In 2025, national renewable energy generation reached 3.99 trillion kWh, up 15% year on year, accounting for approximately 38% of total generation. Of this, PV generation reached 1 170 TWh, up 40% year on year; the national PV utilisation rate was 95%. Nearly 4 out of every 10 kWh of electricity consumed nationwide was green electricity, and the entire increase in electricity consumption was met by newly added renewable energy generation.

7.2 Interest from Electricity Utility Businesses

2025 was a year of comprehensive acceleration for China's electricity spot market. Nationwide electricity market trading volume reached 6 640 TWh, up 7.4% year on year, accounting for 64.0% of total electricity consumption. Inter-provincial and inter-regional traded electricity reached 1.59 trillion kWh, up 11.6% year on year, a record high. By the end of 2025, including the Southern Regional market, there were 25 electricity spot market operating areas across China, covering 30 provinces and regions. With the exception of Beijing-Tianjin-Tangshan and Tibet, full spot market coverage was achieved nationwide.

In February 2025, Document No. 136 was issued (see Section 4.2.3), marking the end of the "fixed tariff" era for renewable energy and the beginning of a fully market-based tariff development cycle. The document specifies that, in principle, all grid-connected electricity from renewable energy projects shall enter the electricity market, with feed-in tariffs determined through market transactions. Differentiated measures are applied to existing and new projects, and a sustainable price settlement mechanism for renewable energy is established.

In green power trading, national green power trading volume reached 328.5 TWh in 2025, up 38.3% year on year, 18 times the 2022 level. Multi-year green power purchase agreements (PPAs) reached 60 TWh. In terms of green certificates, 930 million green certificates were traded nationwide in 2025, up 120% year on year; 2.947 billion green certificates were issued nationwide, of which 1.893 billion were tradable.

PV power stations have moved beyond the guaranteed feed-in purchase model and entered a new stage of full-volume participation in market-based operations. Green certificates are gradually being aligned with the dual control policy on energy consumption and energy intensity; green power consumption certification and energy conservation and carbon reduction management mechanisms are being gradually improved; and green certificates are gradually being linked with carbon accounting and carbon market management mechanisms-providing PV power stations with channels to obtain green revenues.

7.3 Interest from Municipalities and Local Governments

With the advancement of the carbon peaking and carbon neutrality goals, the PV industry has attracted growing attention. Local governments have continued to introduce policies on PV installation targets, distributed PV management, and PV-based sand control, promoting deep integration of the PV industry with local energy transitions.

Installation Targets: By the end of 2025, Jiangsu's cumulative PV installed capacity reached 89.68 GW, accounting for 37% of its total installed power capacity, with 28.04 GW newly added that year and 94.2 TWh of generation, ranking among the top nationwide in multiple core indicators. Zhejiang proposed adding 6 GW of wind and PV capacity and 1 GW of nuclear capacity by the end of 2025, with the non-fossil energy consumption share at around 24%. Shandong's operational PV installed capacity in 2025 reached over 82.5 GW, maintaining a leading position nationwide. Guangdong set a 2025 provincial PV installed capacity target of 29 GW, focusing on deploying a coastal utility-scale PV belt in eastern and western Guangdong and a distributed PV demonstration zone in the Pearl River Delta.

Distributed PV Management: After the National Energy Administration issued the Measures for the Administration of the Development and Construction of Distributed Photovoltaic Power Generation in 2025, provinces successively issued provincial-level implementation rules. Jiangsu, Zhejiang, Anhui, Guangdong, and other provinces currently do not impose mandatory self-consumption ratio requirements on general commercial and industrial (C&I) distributed PV. Shandong requires that C&I distributed PV adopting the self-consumption with surplus feed-in mode have an annual self-consumed electricity ratio of no less than 50% of generation. For projects with annual self-consumed electricity below 50%, peak-shaving efforts shall be increased in the following year when participating in grid peak shaving.

PV-based Sand Control: According to the Plan for PV-Based Sand Control in Desert, Gobi, and Arid Wasteland Areas of the Three-North Region (2025-2030) (see Section 4.2.2), the plan specifies 253 GW of new PV capacity and treatment of 10.1 million mu (approximately 673 000 hectares) of desertified land by 2030. Inner Mongolia, Xinjiang, Gansu, Qinghai, and other key provinces will successively issue or revise their provincial special plans for PV-based sand control to fully align with national targets.

Regional Distribution: Different types of PV projects show notable differences in regional distribution. Utility-scale PV projects are primarily based on large-scale base projects in Northwest and Southwest China. In 2025, Xinjiang's newly added capacity exceeded 30 GW; Jiangsu and Guangdong each exceeded 20 GW; and Shandong, Yunnan, Zhejiang, and Ningxia each exceeded 15 GW. In distributed PV, Jiangsu, Guangdong, and Zhejiang added 18.32 GW, 16.24 GW, and 13.91 GW respectively in 2025, together accounting for 31.7% of the national total. Load centres, with favorable accommodation conditions and tariff advantages, have become core markets.

8 PROSPECTS

In 2025, China's PV industry underwent a deep correction, yet its core strengths in crystalline silicon technology and cost control remained solid. Looking ahead, the industry will shift from "scale competition" to "value competition," with green, low-carbon development and integrated applications becoming the main themes, and international trade and overseas deployment forming a new landscape.

Domestic Installation Outlook: According to the 2025–2026 China PV Industry Development Roadmap published by the China Photovoltaic Industry Association, China's average annual new PV installations during the “15th Five-Year Plan” period are projected at approximately 238-287 GW. In the near term, new PV installations in 2026 face downward pressure due to: the base effect; a wait-and-see period caused by policy adjustments; and tightening distributed PV grid connection capacity. In the medium to long term, new PV installations will remain at a high level, supported by: robust demand driven by the carbon peaking and carbon neutrality goals; gradually improved revenue mechanisms through power market reform; steady growth in nationwide electricity demand; and gradually enhanced land and grid infrastructure support, with large-scale base projects advancing in an orderly manner and distributed PV retaining substantial development potential backed by distribution network upgrades.

Technology Trends: During the “15th Five-Year Plan” period, the industry will accelerate the building of technological moats. First, promote mass production of silver-free/low-silver technologies to reduce dependence on precious metals such as silver. Second, accelerate industrialization of perovskite and tandem cell technologies. Third, continuously improve efficiency through advanced technologies such as edge passivation and multi-slicing. Fourth, optimize production processes and enhance efficiency and quality through digital and intelligent means such as industrial internet, AI-based quality inspection, and digital twins. Five mandatory national standards are currently under public consultation and are expected to be implemented successively during the “15th Five-Year Plan” period.

Green, Low-Carbon and Integrated Development: During the “15th Five-Year Plan” period, the PV manufacturing sector will adhere to intelligent, green, and integrated development. In terms of intelligence, the deep application of industrial internet, AI, and digital twin technologies in PV manufacturing will be accelerated. In terms of green development, key energy-consuming segments will achieve "green production with green electricity," and the application of green certificates and carbon footprints will be comprehensively promoted. In terms of integration, first, expand "PV-plus" application scenarios, including integration with commercial aerospace, data centres, and hydrogen/ammonia/methanol production. Second, deeply participate in the electricity market, improve market trading mechanisms, and explore integrated "PV + storage" development models. Third, enterprises will actively pursue second growth curves.

Accommodation and Power Marketisation: In October 2025, the National Development and Reform Commission and the National Energy Administration issued the Guiding Opinions on Promoting Renewable Energy Integration and Regulation, specifying that by 2030, incremental electricity demand will be primarily met by newly added renewable energy generation, and China will ensure effective integration of more than 200 GW of new renewable energy capacity annually. By 2035, a new power system adapted to a high proportion of renewable energy will be basically established, the renewable energy integration and regulation system will be further improved, and the national unified electricity market will play a fundamental role in renewable energy resource allocation.

As renewable energy fully enters the market, PV enterprises need to focus on three areas-market-based bidding strategies, enhanced grid integration capability, and diversified market participation—to balance revenue certainty with market competitiveness and align with the development requirements of the new power system.

