MAY 2025

CHINA ENERGY POLICY

NEWSLETTER

China Energy Transformation Programme

1. China energy transition updates

China will release its 2035 NDC targets before COP30

Nationally Determined Contributions (NDC) are national climate action plans and targets introduced under the *Paris Agreement* and should be updated every five years. By the end of 2024, there were 195 NDC parties, of which China has submitted its NDC targets twice, in 2015 and 2020, and pledged to achieve a carbon peak before 2035 and carbon neutrality before 2060. According to the requirements of the *Paris Agreement*, the deadline for a new round of NDC submission was February 10, 2025. However, due to the recent global climate, trade, geopolitical, and other unstable factors, only 17 countries, including the United Kingdom, Japan, and Brazil, submitted it on time. When China will submit its third NDC targets has attracted much attention. On April 23, 2025, Chinese President Xi Jinping attended the online *Leaders Meeting on Climate and the Just Transition*. In his speech, President Xi once again mentioned the carbon peak and carbon neutrality targets previously released in the NDC, and announced that China will publish its 2035 NDC targets covering the economy-wide, including all greenhouse gases, before the United Nations Climate Change Conference in Belém (COP30).[1]

Wind and solar power capacity exceeds thermal power

According to statistics from the NEA, in the first quarter of 2025, China's newly installed wind power and solar PV capacity totalled 74.3 GW. As of March, the total installed capacity of wind power and solar PV reached 1,482 GW, including 536 GW of wind power and 946 GW of solar PV, historically exceeding the 1,451 GW of thermal power. In the first quarter, the incremental wind and solar power generation was over 90% higher than the incremental electricity consumption nationwide. The total wind and solar power generation accounted for 22.5% of the national electricity consumption, an increase of 4.3 percentage points year-on-year.[2]

[1] "习近平在气候和公正转型领导人峰会上的致辞（全文）," Xinhua News Agency, 23 April 2025, accessed at https://www.gov.cn/yaowen/liebiao/202504/content_7020623.htm.
[2] "我国风光装机历史性超过火电 风电光伏装机超过火电将成为常态," National Energy administration, 25 April 2025, accessed at https://www.nea.gov.cn/20250425/148efd0ca61148148d285edd438912df/c.html.

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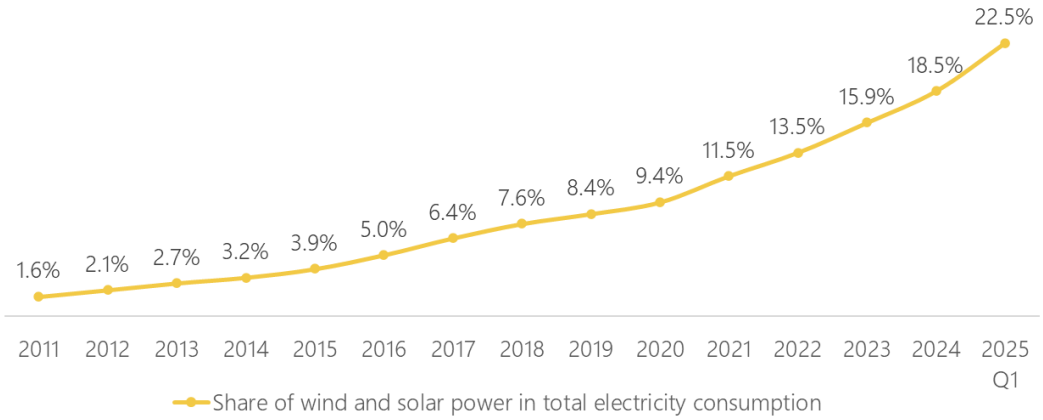
2011-2025 Q1 The proportion of wind and solar power generation in total electricity consumption



Source: National Energy Administration (NEA) and China Electricity Council (CEC), accessed in April 2025

NEA defines key tasks of the energy sector for 2025

The NEA issued the *Guiding Opinions on Energy Work in 2025* (CHN: 2025年能源工作指导意见), which clarifies key tasks for the energy sector development in 2025.[3] First, continue to enhance the energy supply capabilities, maintain stable and increased production of coal, crude oil, and natural gas, as well as increase installed capacity, power generation, and inter-regional power transmission capabilities. Second, continue to optimise the energy structure, increase the proportion of non-fossil energy and electricity in total primary energy consumption, and progress in renewable energy substitution projects in key energy-consuming sectors. Third, to steadily improve energy efficiency and quality, including keeping the coal consumption of power supply and the wind and solar curtailment rates at reasonable levels, building an intelligent large-scale coal mine system, and initially establishing a national unified power market system. See the table below for specific targets.

In addition, the government will continue to improve the energy legal system, accelerate the revision of the *Renewable Energy Law* (CHN: 可再生能源法), the *Electric Power Law* (CHN: 电力法), and the *Coal Law* (CHN: 煤炭法), and promote the formulation of the *Petroleum Reserve* Regulations (CHN: 石油储备条例). The National People's Congress will compile an *Energy Law* (CHN: 能源法) interpretation and conduct relevant training to improve the implementation efficiency.

Comparison of key targets in the energy sector in 2025 and the actual situation in 2024

	2025 Target	Actual Situation 2024
The proportion of non-fossil energy in total primary energy consumption	~20% (+0.2 pct)	19.8%
Total installed power generation capacity	3,600 GW above (+251 GW, +7.5% y-o-y)	3,349 GW
Newly installed new energy capacity	200 GW above	371 GW
The proportion of non-fossil energy in total installed power generation capacity	~60% (+1.8 pct)	58.2%
Total power generation	10,600 TWh (+7.3% y-o-y)	9,880 TWh

Source: NEA, April 2025

[3] "国家能源局关于印发《2025年能源工作指导意见》的通知, 国能发规划〔2025〕16号," National Energy Administration, 27 February 2025, accessed at https://www.nea.gov.cn/20250227/b60fb4f51097434e8c5d7ee19b423651/c.html; "《2025年能源工作指导意见》政策解读," National Energy Administration, 27 February 2025, accessed at https://www.gov.cn/zhengce/202502/content_7007284.htm.

National ETS involves steel, cement, and aluminium smelting industries

In July 2021, China launched the national carbon market (ETS). The first industry the national ETS has included is power generation, covering only carbon dioxide (CO_2) emissions. By the end of 2024, the national ETS has completed three compliance periods (i.e., 2019-2020, 2021-2022, 2023). In March 2025, the Ministry of Ecology and Environment (MEE) officially announced the expansion of the national ETS to involve steel, cement, and aluminium smelting industries. The steel and cement industries cover direct CO_2 emissions, and the aluminium smelting industry covers direct emissions of CO_2, carbon tetrafluoride (CF_4), and carbon hexafluoride (C_2F_6). Units with annual GHG emissions of 26,000 tons of CO_2e will become participating entities, and they will no longer participate in similar transactions in local ETS. After the expansion, the national ETS will cover 60% of the country's total CO_2 (~8 billion tons) instead of 40% (~5 billion tons); in addition to CO_2 emissions from energy activities, CO_2 emissions from industrial processes, and other GHGs will also be covered. The government will implement the market expansion in two phases.[4]

Implementation plan for the expansion of the national ETS in China

Phase	Development target	Total carbon allowance and distribution plan
Phase I 2024-2026 Starting phase	▪ 2024 is the first year of emission control ▪ The first compliance period will be completed before the end of 2025	▪ In 2024: The total carbon allowance allocation=the actual verified carbon emissions ▪ In 2025 and 2026: The total carbon allowance allocation is based on the carbon emission intensity control approach
Phase II 2027- Improving phase	▪ Improve the laws, regulations and supervision system, and comprehensively strengthen the authenticity, accuracy, and integrity of carbon emission data ▪ Establish a mechanism for gradually tightening allowance with clear expectations, openness, and transparency	▪ Optimise carbon allowance allocation method based on the industry's advanced emission level

Source: Ministry of Ecology and Environment (MEE), March 2025

The national GHG emission factor database is officially online

In order to improve the carbon emission statistical accounting system, the MEE and the National Bureau of Statistics (NBS) jointly led the construction of the *National Greenhouse Gas Emission Factor Database* (CHN: 国家温室气体排放因子数据库). The first version of the database is now online (see website).[5] The website provides various GHG emission factors by industry, fuel type, and region. Also, it offers online carbon emission calculation tools for power generation, cement, and electrolytic aluminium enterprises to calculate carbon emissions generated from fossil fuel consumption, net electricity consumption, and industrial and agricultural production activities.

[4] "关于印发《全国碳排放权交易市场覆盖钢铁、水泥、铝冶炼行业工作方案》的通知," Ministry of Ecology and Environment, 20 March 2025, accessed at https://www.mee.gov.cn/xxgk2018/xxgk/xxgk03/202503/t20250326_1104736.html; "一图读懂 | 全国碳排放权交易市场覆盖钢铁、水泥、铝冶炼行业工作方案," Ministry of Ecology and Environment, 26 March 2025, accessed at https://www.mee.gov.cn/zcwj/zcjd/202503/t20250326_1104769.shtml.

[5] "国家温室气体排放因子数据库," Ministry of Ecology and Environment, accessed at https://data.ncsc.org.cn/factoryes/index.

NDRC releases three-year action plan for coal power unit upgrade

As the low-carbon transition of the energy sector continues to deepen and the proportion of renewable energy continues to increase, coal power is shifting from a base load power source to a flexible power source. In April 2025, the National Development and Reform Commission (NDRC) and the NEA jointly issued the *Implementation Plan for the Dedicated Action Plan for New-Generation Coal Power Unit Upgrade (2025-2027)* (CHN: 新一代煤电升级专项行动实施方案（2025—2027年）)", which proposed a quantitative technical indicator system for the construction, retrofit and upgrading of coal power units from 2025 to 2027, focusing on improving flexibility and reducing carbon emissions, and helping to build a new-generation coal power system. The *Action Plan* also encourages using zero-carbon and low-carbon fuel blending, carbon capture and storage (CCS), and coal-renewable energy coupling technologies to improve the carbon reduction level of units and supports the joint operation of new-generation coal power projects and renewable power projects.[6]

New-generation coal power unit technical index system (excerpt)

Index			Retrofit units		New units	New-generation pilot and demonstrative units
			Subcritical and below	Ultra (super) critical		
CO_2 Emission reduction			Encourage low-carbon retrofit		Adopt low-carbon units if conditions permit	CO_2/kWh is 10-20% compared with similar units in 2024
Output compliance rate during the guaranteed power supply period*			98%			99%
Number of unplanned outages during the guaranteed power supply period			0.3 times/year			0.3 times/year
Power supply coal consumption			Meet the technical standard GB21258			<270 g/kWh (Ultra-supercritical, wet cooling conditions)
Power supply coal consumption (30% rated capacity, condensing condition)**			+≤25%	+≤25%	+≤20 %	+15%
Minimum output (Pe)	Bituminous coal (*yan mei*)		35%	35%	25% (condensing)	
	Anthracite (*wuyan mei*)		35%	35%		
	Low-calorific value coal (CFB)		25%	25%		
Ramp rate (Pe/min)	Pulverised coal furnace	load ≥50%	2.5%	2.2%	2.2% (bituminous coal)	4% (load ≥50%) / 2% (load 30-50%)
		load 30-50%	1.2%	1%	1% (bituminous coal)	
	W-type flame furnace	load ≥50%	2%	1.5%	-	
		load 30-50%	1%	0.8%		
	CFB furnace	load ≥50%	1.2%	1.2%	-	
		load 30-50%	0.8%	0.8%		
Primary frequency regulation			Encourage improvement through self-regulation or ancillary support			
Start-stop peak-load regulation			✓ (Units with design and retrofit conditions)			✓

* Actual output / reported maximum output of the unit during the annual peak-load periods, i.e. hot summer, cold winter, and extreme weather. ** Maximum allowed increase in coal consumption when the power plant is running at 30% of the rated capacity in condensing mode.

[6] "国家发展改革委 国家能源局关于印发《新一代煤电升级专项行动实施方案（2025—2027年）》的通知, 发改能源〔2025〕363号," National Development and Reform Commission, National Energy Administration, 26 March 2025, accessed at https://www.nea.gov.cn/20250418/5c9e2108eefc4e7d8c9931de4456dda9/c.html.

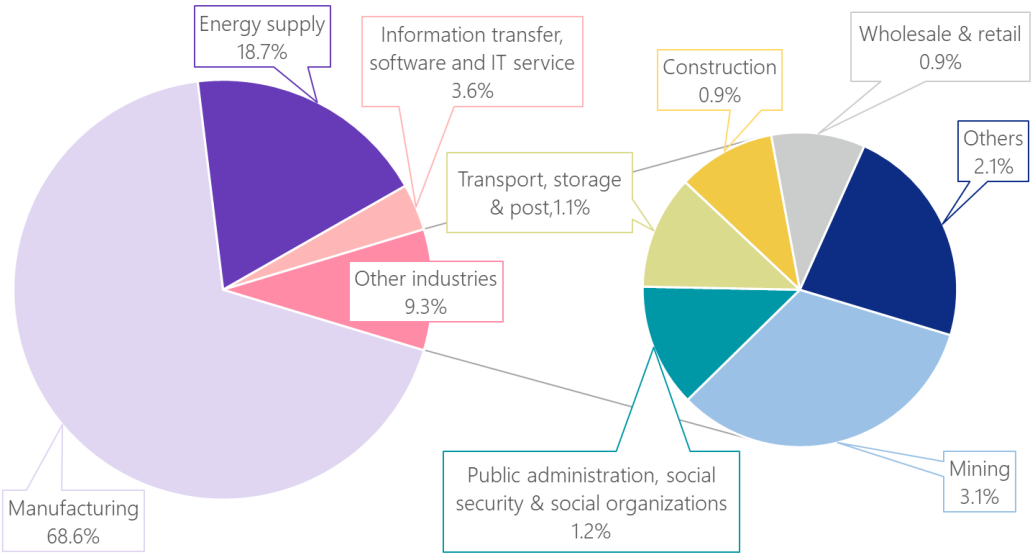
China Green Certificate Development Report 2024 released

The NEA released the *China Green Certificate Development Annual Report* for the first time, reviewing the overall development of China's Green Electricity Certificates (GEC) from 2017 to 2024.[7] Since the establishment of the GEC system in 2017, more than 4.9 billion GECs have been issued, of which more than 95% were issued in 2024, mainly due to the government's expansion of GEC coverage from onshore wind and utility-scale solar PV to all renewable power projects. From a regional perspective, the eight provinces rich in renewable energy, including Inner Mongolia, Sichuan, Xinjiang, Qinghai, Hubei, Gansu, and Hebei, have issued more than 200 million CGEs respectively, accounting for 55% of the total GEC issuance. From the perspective of project types, in utility-scale projects, wind, conventional hydro, solar and biomass power generation accounted for 41%, 34%, 17% and 8%, respectively, and there were a few wind-solar integrated power, geothermal power and ocean power projects; in distributed projects, the ratio of wind power to solar PV was 59:41.

From 2017 to 2024, the total number of GCE traded was 553 million, of which 80% were made in 2024. The ratio of GEC sold separately with electricity to GEC sold together with electricity was 57:43. GEC sold separately with electricity were mainly inter-provincial transactions, accounting for 92%; GEC sold together with electricity were mainly intra-provincial transactions, accounting for about 90%. The loose supply of GECs has led to a downward trend in prices. In 2024, the monthly average price of GEC sold separately with electricity was 0.3-2.4 ct RMB/kWh, and the annual average price was 0.56 ct RMB/kWh. GEC consumers are mainly in the manufacturing industry (70%), while the energy supply industry (incl. power, heat, gas, water) and other industries account for 20% and 10%, respectively. Affected by the low-carbon development policy of data centres, the purchase of information transmission, software, and IT services has grown rapidly and has gradually become an important buyer.

Last but most importantly, in April 2025, the Climate Group RE100 announced the recognition of China's GECs without handling extra verification materials. This is a big step forward for GEC development in China, implying a better authority and a bigger impact on the international platform. It will strongly build up GEC procurement and consumption willingness within RE100 members and supply chain enterprises, thus expanding GEC's total demand and improving the competitiveness of exports.[8]

Distribution of GEC consumers by industry by 2024



Source: NEA, April 2025

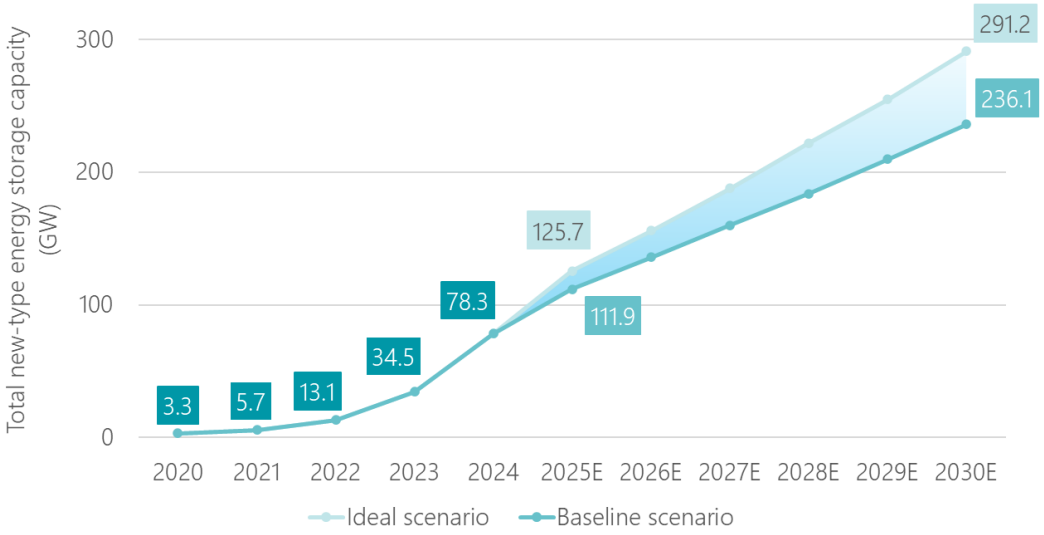
[7] "国家能源局发布《中国绿色电力证书发展报告（2024）》," National Energy Administration, 21 April 2025. Accessed at http://www.lvsefazhan.cn/index.php/msg/4059.html.
[8] "国家能源局回应！RE100无条件认可中国绿证意味着什么？," National Energy Administration, 28 April 2025, accessed at https://mp.weixin.qq.com/s/sDemLQUhrFoQDTa24y66lg.

China's new-type energy storage capacity is expected to reach over 200 GW in 2030

The China Energy Storage Alliance (CNESA) recently released the *Energy Storage Industry White Paper 2025* (CHN: 储能产业研究白皮书2025).[9] The *White Paper* reviews the development of the energy storage industry in 2024 and predicts the installed capacity of new-type energy storage in 2030. New-type energy storage in China mainly includes electrochemical energy storage (incl. lithium-ion batteries, lead-acid batteries, flow batteries, etc.), compressed air energy storage, flywheel energy storage, gravity energy storage, and supercapacitors. By 2024, the total installed new-type energy storage capacity reached 78 GW, surpassing pumped hydro for the first time to become China's most important energy storage resource (56.8%). In terms of technology, electrochemical energy storage based on lithium-ion batteries is absolutely dominant, accounting for 98.5% of the total installed capacity.

Due to the cancellation of the energy storage installation mandate policy[10], it is expected that the newly installed new-type energy storage capacity in 2025 will be lower than that in 2024 (44 GW) but will still exceed 30 GW, and the total installed capacity is expected to reach 112-126 GW. Entering the *15th Five-Year Plan* (2026-2030) period, the development trend will gradually transform from policy-driven to market-driven. Throes of industry transition are inevitable, making the yearly added capacity expected to decline first and then rise again. From 2025 to 2030, the average annual installed capacity is expected to reach 26-36 GW, building up the total installed capacity to 236-391 GW in 2030.

2025-2030 Forecast of China's total installed capacity of new-type energy storage



Source: China Energy Storage Association (CNESA), April 2025

[9] "《储能产业研究白皮书》," China Energy Storage Alliance, accessed at https://www.esresearch.com.cn/report/?category_id=26.

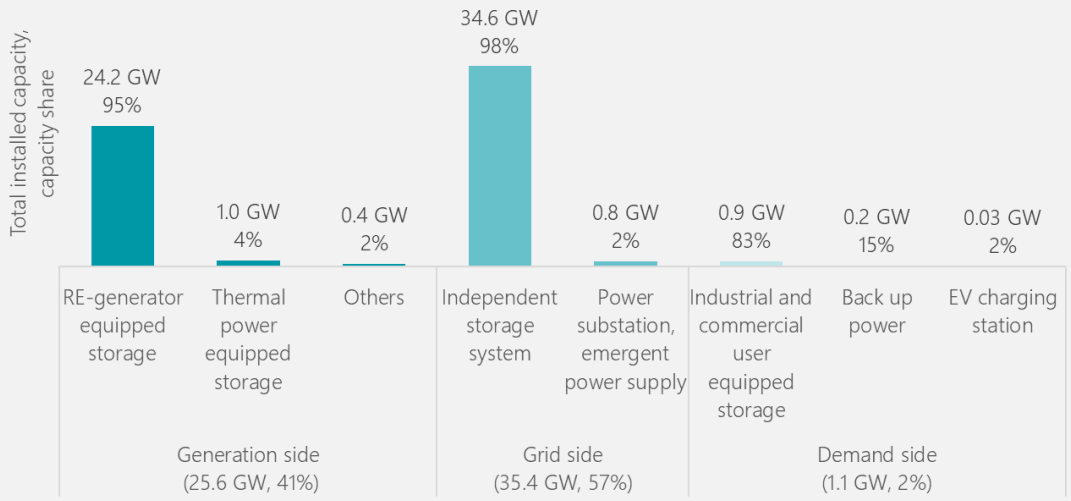
[10] Wind power and solar PV projects approved since 2021 must be equipped with a minimum capacity/hour of energy storage or peak shaving facilities.

CEC releases 2024 electrochemical energy storage industry statistics

China Electricity Council (CEC) and the National Safety Monitoring Information Platform for Electrochemical Energy Storage Power Station jointly released the *Electrochemical Energy Storage Station Industry Statistics 2024* (CHN: 2024年度电化学储能电站行业统计数据), which systematically sorted out the capacity, generation, efficiency, and safety data of national electrochemical energy storage projects in 2024. Electrochemical energy storage shows a centralised and large-scale development trend overall, and its operating efficiency has been greatly improved. By 2024:

- Application scenarios: 62 GW of electrochemical energy storage stations have been put into operation, with the ratio of generation, grid, and user sides at 41%, 57%, and 2%, respectively. The main application scenarios are grid-side independent energy storage stations and RE-generator-equipped energy storage stations, with a total installed capacity of 35 GW and 24 GW, respectively, accounting for a total of 95%;
- Project scale: The total installed capacity of large, medium, and small-scale[11] energy storage stations are 40 GW, 21 GW, and 0.6 GW, respectively, of which large-scale stations (≥100 MW) account for 65%, an increase of 14 percentage points year-on-year;
- Energy storage duration: A 2-hour energy storage station is the most widely used, accounting for 67%. From the application scenarios, 50%, 82%, and 35% of RE-generator-equipped storage, grid-side independent storage, and industrial and commercial user-equipped storage stations have a storage duration of 2 hours, respectively; 43%, 17%, and 19% are 4 hours, respectively; and thermal power-equipped storage stations are mainly 1 hour or less.
- Grid-connection voltage level: 51% of projects are connected to grids of 220 kV and above grids, and 44% are connected to 35 kV~110 kV grids.
- Battery type: Lithium-ion batteries still dominate the application with a total battery energy of 136 GWh, accounting for 96% of the total energy, of which 99.9% are lithium iron phosphate; followed by lead-acid/lead-carbon batteries (2.93%), flow batteries (0.52%) and sodium-ion batteries (0.22%).
- Utilisation hours: The average annual utilisation hours of electrochemical energy storage reaches 991 hours, an increase of 300 hours year-on-year; 8 provinces[12] reach over 1,000 hours, of which Zhejiang and Jiangsu are the highest, reaching about 2,000 hours; benefiting from the introduction of dedicated dispatch policies for new-type energy storage, the average annual utilisation hours of RE-generator equipped storage and grid-side independent storage stations both increase by over 300 hours, reaching 766 hours and 995 hours respectively.

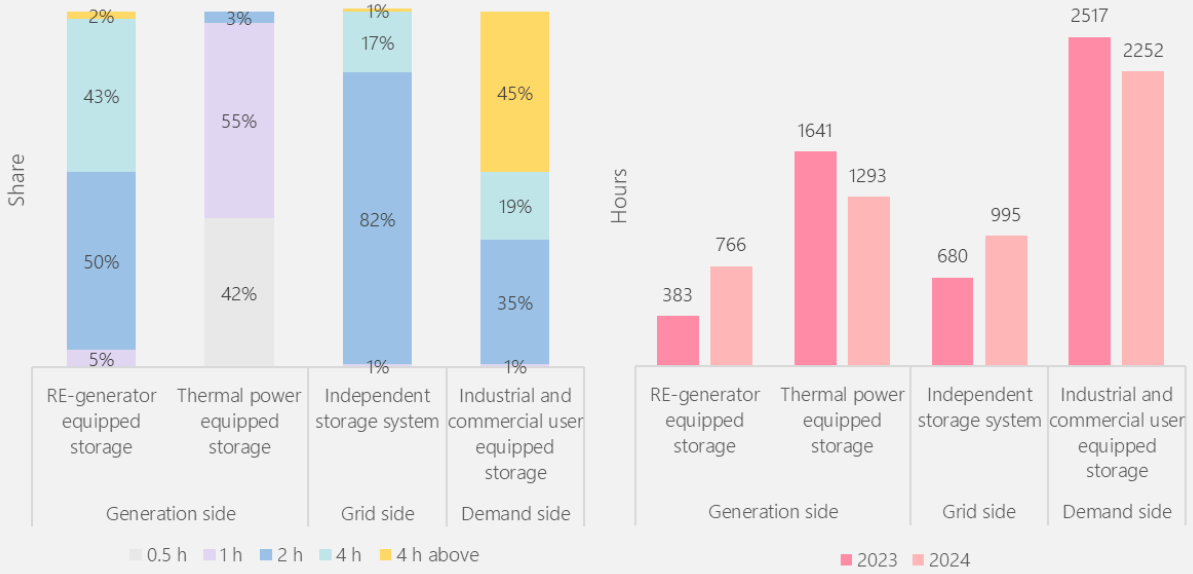
Distribution of electrochemical energy storage capacity by applications in 2024



Source: Calculated based on data from the CEC, accessed in April 2025

[11] Scales of energy storage stations: small: power <5MW; medium: 5MW≤power <100MW; large: power ≥100MW.
[12] Zhejiang, Jiangsu, Chongqing, Xinjiang, Guangdong, Tibet, Hubei and Ningxia.

2024 Distribution of storage duration by electrochemical energy storage applications (left);
2023-2024 Average annual utilisation hours by electrochemical energy storage applications (right)



Source: CEC, April 2025

2024 Distribution of electrochemical energy storage project scale, storage time, and grid-connected voltage level

Project size		Storage time		Grid-connected voltage level	
Large-scale(≥100M)	65%	0.5 hr	0.2%	220 kV and above	51%
Mid-scale (5MW≤ Power <100MW)	34%	1 hr	3%	35~110 kV	44%
Small-scale (< 5MW)	1%	2 hr	67%	6-20 kV	3%
		4 hr	27%	220 V/380 V	1%
		4 hr above	3%	Off-grid	0.3%

Source: CEC, April 2025

3. Policy monitoring

2025-04-25

https://xxgk.mot.gov.cn/2020/jigou/zhghs/202504/t20250425_4167770.html

MoT defines the energy development goals of the transport industry in 2035

The Guiding Opinions to Facilitate the Integrated Development of the Transport Industry and the Energy Sector, Transport Planning and Development [2025] No.42

Transport is one of China's important energy-consuming industries. The Ministry of Transport (MoT) pointed out that by 2027, the share of electricity in the total energy consumption of the transport industry should reach 10%, the non-fossil power capacity along the transport infrastructure should not be less than 5 GW, and the proportion of local consumption will steadily increase; by 2035, to establish an low-carbon energy based transport energy system, the share of electricity remains high, EVs becomes the mainstream of new sales vehicles, to achieve large-scale application of new energy heavy trucks, and to establish a green fuel supply system.

2025-04-15

https://www.mee.gov.cn/xxgk2018/xxgk/xxgk06/202504/t20250415_1114934.html

MEE deploys work on the national carbon market in 2025

Notice on Relevant Work in the National Carbon Emission Trading Market in 2025, MEE General Office Climate Letter [2025] No. 140

The document clearly states that units in the power generation, steel, cement, and aluminium smelting industries with annual direct GHG emissions of 26,000 tons of CO_2e will be included in the national ETS in 2025. Before August 20, 2025, MEE will verify and issue the 2024 carbon emission allowances for the covered units in the power generation industry. The 2024 carbon allowances for the steel, cement, and electrolytic aluminium industries will be verified and issued before October 20, 2025. 2025 will be the first compliance period for these three industries.

2025-03-25

https://www.nea.gov.cn/20250411/94a805e55f064493901cab6196e0448d/c.html

NDRC sets 2030 VPP regulation capacity target

Guiding Opinions on Accelerating the Development of Virtual Power Plants, NDRC Energy [2025] no. 357

A virtual power plant (VPP) is a new model aggregating distributed power sources, dispatchable loads, energy storage, and other distributed resources to coordinate power system optimisation and power markets. The development of VPPs in China is still in its infancy. VPP has a small investment and high marketisation. The government will strongly support private enterprises' investment in developing and operating VPP projects. Under certain pre-conditions, VPPs are allowed to participate in medium- and long-term contracts, spot power markets, and ancillary service markets independently. By 2027 and 2030, the national VPP regulation capacity is expected to reach 20 GW and 50 GW, respectively.

2025-03-17

https://www.ndrc.gov.cn/xxgk/zcfb/tz/202504/t20250402_1396954.html

Six ministries jointly issue the 2030 heat pump development action plan

Notice on Issuing the Action Plan for Promoting High-Quality Development of the Heat Pump Industry, NDRC Environment Resource [2025] No. 313

The government strives to increase the energy efficiency of key heat pump products by more than 20% by 2030, achieve breakthroughs in core technologies such as high-power, high-temperature heat pumps, high-efficiency compressors and new-type refrigerants, and continue to increase the heat pump building areas and installed heat pump capacity. In the building sector, promote clean energy-based heat pump heating and water heaters; in the industry sector, use heat pumps to recover waste heat to make high-temperature steam; in the agriculture sector, use heat pumps to replace loose coal for drying agricultural materials; in the transport sector, to promote heat pump air conditioning and heating equipment, and to participate in EV thermal management.

2025-03-14

https://www.gov.cn/zhengce/zhengceku/202503/content_7015273.htm

NEA puts forward new requirements for distributed solar PV projects

Notice on further organising and implementing the "Action of Solar Utilization for Thousands of Rural Households", NEA General Notice New Energy [2025] No.44

In 2021, the NEA carried out county-level rooftop pilot projects of distributed solar PV (DGPV). As DGPV installation witnessed explosive growth, grid connection and consumption have become the main bottleneck. For this reason, NEA issued a new regulation to manage DGPV project constructions in rural areas. According to the regulation, it is not allowed to designate project operating entities, force investing in supportive industries, engage in monopoly development through franchise operations, and infringe on the benefits of farmers. Instead, to fully play the role of the market to promote the healthy and orderly development of DGPVs.

2025-03-13

https://www.ndrc.gov.cn/xxgk/zcfb/tz/202504/t20250402_1396958.html

The first batch of large-scale V2G application pilots determined

Notice on the announcement of the first batch of pilot projects for large-scale application of vehicle-network interaction, NDRC General Office [2025] No.241

Vehicle-to-grid (V2G) refers to the bidirectional charging and discharging between new energy vehicles (NEVs) and the power grid. By the end of 2024, China's NEV ownership reached 31.4 million. The disorderly charging of a large number of NEVs will put massive pressure on the power system balance, highlighting the necessity of a large-scale V2G application. The government recently announced the first batch of 39 large-scale V2G application pilots, including nine pilot cities (Shanghai, Changzhou, Hefei, Huaibei, Guangzhou, Shenzhen, Haikou, Chongqing, and Kunming), and 30 pilot projects such as the new-type storage-based V2G regulation pilot project in Beijing.