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FACT SHEET

ENERGY STORAGE DEVELOPMENT AND POLICY IN CHINA

China has rapidly become a global leader in "new-type energy storage" deployment (i.e., energy storage other than conventional pumped hydro), particularly battery energy storage systems (BESS), supported by national plans and policies, provincial mandates, power market reform, and declining battery costs. While China initially focused on setting energy storage capacity mandates for new wind and solar projects in an effort to reduce curtailment, it has shifted toward market mechanisms that reward utilization and services provided by energy storage to the power system. Energy storage is now being deployed across a wide range of applications and scenarios, providing flexibility and stability to a power system with increasing shares of wind and solar generation.

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Aerial view of energy storage containers at a solar farm in China.

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ENERGY STORAGE IN THE CONTEXT OF CHINA'S ENERGY LANDSCAPE

China has the world's largest power system, totaling 4,132 gigawatts (GW) of installed capacity as of the end of September 2026. In particular, solar and wind power, the fastest-growing sources of new generation, reached 1,313 GW and 700 GW, respectively, for a combined 2,013 GW as of September 2026, representing 48.7 percent of total installed capacity (31.8 percent and 16.9 percent respectively) and 23.8 percent of generation for the first nine months of 2026.[1] (See figure 1, below.)

Given the differences in timing between solar and wind generation and electricity demand, energy storage systems—particularly battery energy storage systems—can play an important role in better utilizing zero carbon electricity from solar and wind. For example, solar generation now helps meet daytime electricity demand in much of China, shifting the net demand peak—the peak in electricity demand that wind and solar generation do not cover—to the early evening. BESS can store surplus solar electricity during the day and discharge it as solar output falls, helping manage the evening ramp-up and meet this net demand peak. BESS also helps meet summer and winter demand peaks driven by cooling, heating, and industrial activity, strengthening the reliability of electricity supply.

BESS and other types of energy storage provide flexibility and dispatchable power needed in a power system with growing shares of solar and wind generation and a falling share of coal power generation. While coal power plants continue to provide stability and flexibility to the power system, BESS can increasingly provide firm capacity—power available when needed—as well as ancillary services that help keep the grid balanced and stable. These include peak regulation, which helps balance supply and demand across high- and low-demand periods, and frequency regulation, which corrects short-term imbalances between electricity supply and demand—services historically provided by coal power.

In China, the term "new-type energy storage" refers primarily to lithium-ion batteries but also includes other technologies such as flow batteries, compressed air storage, flywheels, and thermal storage. By the end of June 2026, China's cumulative installed new-type energy storage capacity had reached 168.3 GW/448.7 gigawatt-hours (GWh), with an average storage duration of approximately 2.67 hours.[2] China added 21.8 GW/58.6 GWh of new-type energy storage capacity in the first half of 2026, following additions of 66.4 GW/189.5 GWh in 2025.[3]

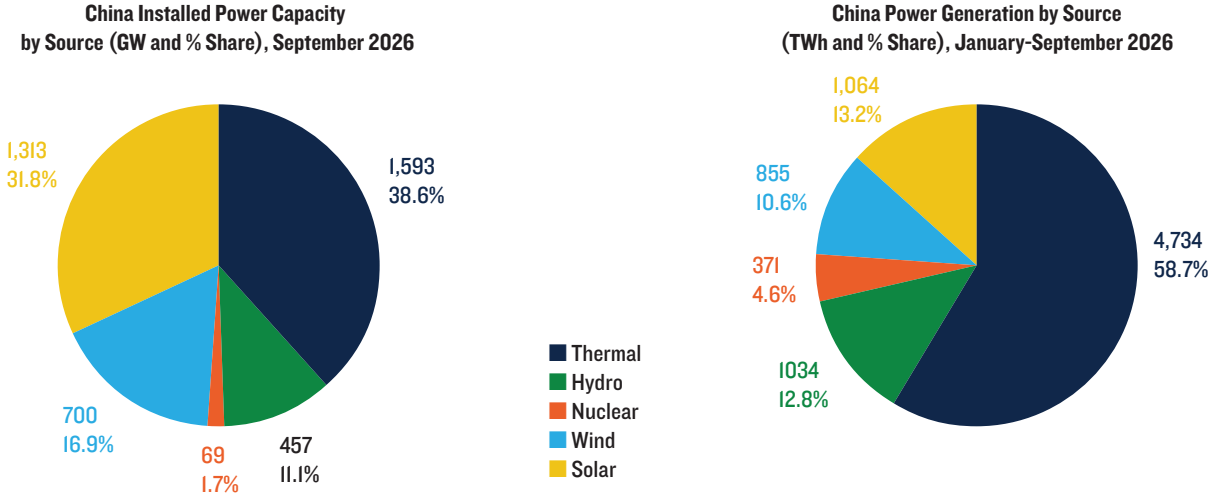
Lithium-ion batteries continue to dominate China's new-type energy storage market, with more than 95 percent of cumulative capacity through June 2026. Their rapid growth has benefited from declining battery prices, technological improvements, short construction times, and flexibility in application and location, allowing them to overtake pumped hydro in installed power capacity in 2024 to become China's dominant energy storage technology.[4]

PLANS AND POLICIES SUPPORTING ENERGY STORAGE DEVELOPMENT IN CHINA

China's development of new-type energy storage has benefited from strong government support, including plans and targets to develop the industry, provincial mandates requiring energy storage to be built alongside new wind and solar projects, and more recent power market reforms aimed at improving storage utilization and enabling energy storage to earn revenues from electricity market arbitrage, ancillary services, and capacity compensation mechanisms.

In 2017, the central government released guiding opinions for energy storage technology and industry development, setting a target for moving from R&D and demonstration of technologies to early commercialization within five years and large-scale development within a decade, and emphasizing the role of energy storage in integrating renewable energy and providing flexibility and stability to the grid.[5] The 14th Five-Year Plan (2021–25) saw the release of the first

Figure 1: China's Power Installed Capacity (September 2026) and Generation (January–September 2026) by Source



dedicated new energy storage industry development plan in 2022, targeting at least 30 GW of new-type energy storage capacity by the end of 2025, a target reached by the end of 2023.[6] Most recently the government released a 2025–27 energy storage industry development plan targeting more than 180 GW capacity by 2027 and the 15th Five-Year Plan for Building a New Energy System (2026–30) targeting 300 GW by 2030. The 15th Five-Year Plan also calls for expanding other sources of power-system flexibility, including virtual power plants, with at least 50 GW of regulation capability by 2030, and vehicle–grid interaction, with approximately 50 GW of aggregated adjustable charging capacity.[7]

In China, energy storage facilities are commonly categorized as generation-side (associated with power generation facilities), grid-side (typically independent facilities providing services to the power grid), or user-side (serving electricity consumers, especially larger commercial and industrial customers). Early on, energy storage development was supported by province-level policies requiring a minimum mandatory capacity (e.g., 10–20 percent) of generation-side energy storage to be matched with new wind and solar projects as a condition for their construction. The earliest such policy was set in Qinghai Province in 2017, requiring storage equivalent to 10 percent of wind capacity for new wind farms.[8] These provincial mandates helped create a market for independent, grid-side energy storage projects to lease storage capacity to renewable energy developers so they could fulfill their storage obligations by contracting for capacity without having to construct their own storage systems.

Such leasing of capacity became a major source of revenue for independent, grid-side BESS plants, providing around half or more of revenue for projects in some provinces. However, the regulatory basis for the capacity leasing model began to change in February 2025, when the government released Document No. 136, which promotes the full marketization of wind and solar power. Document No. 136 requires all wind and solar power generation to be exposed to market-based pricing, while introducing a two-way, contracts-for-difference-type mechanism that effectively provides a floor and ceiling for revenues from a portion of generation from new projects that successfully bid for price protection in provincial auctions.[9]

Importantly, Document No. 136 also effectively prohibits provinces from continuing to impose mandatory energy storage capacity requirements for new wind and solar projects, increasing the importance of alternative revenue streams for new storage projects, including spot market arbitrage, ancillary services (which differ by province and may include frequency regulation, peak shaving, operating reserves, and ramping), and capacity compensation mechanisms. This builds on earlier efforts by the central government to open electricity markets to energy storage, with policies issued in 2021 encouraging storage participation in ancillary services and regulations in 2022 explicitly allowing independent storage facilities to participate in electricity markets.[10]

Further, in January 2026, the central government released a new policy establishing a national framework for a generation-side capacity pricing mechanism under which eligible independent grid-side new-type energy storage can receive capacity payments, similar to those introduced for coal-fired power plants in 2024. Capacity payments for energy storage are based on provincial coal power capacity prices, adjusted by a factor reflecting the storage facility's ability to meet peak electricity demand, including its discharge duration.[11]

China's shift away from provincial mandates requiring new wind and solar projects to install or lease energy storage capacity, toward more market-driven mechanisms that compensate new-type energy storage for providing services to the power system, is intended to improve storage utilization and operational efficiency. The relatively low utilization of generation-side storage compared with independent, grid-side storage illustrates one of the shortcomings of the earlier mandate-driven approach and highlights the importance of designing market mechanisms that incentivize effective utilization of energy storage assets. According to an analysis by Ember, average battery utilization increased substantially between 2022 and 2025, from 146 to 299 cycles per year (equivalent full charge-discharge cycles) for grid-side stand-alone systems, and from 80 to 199 cycles per year for generation-side renewable co-located systems; however, generation-side storage still averaged approximately 100 fewer cycles annually than grid-side storage.[12]

As China transitions toward a more market-driven approach, BESS investors, developers, and operators must increasingly seek to stack revenues from electricity market arbitrage, ancillary services, and capacity compensation mechanisms, depending on the opportunities available in each provincial market.

MODELS AND APPLICATIONS FOR ENERGY STORAGE IN CHINA'S POWER SYSTEM

Energy storage technologies, particularly batteries, are being deployed across a wide range of applications and business models in China, demonstrating their versatility in providing services to the power system and supporting renewable energy integration. Energy storage provides support across the power system, with grid-side, independent storage accounting for the largest share of installed capacity, at approximately 58 percent, followed by generation-side storage paired with renewable energy (around 32 percent), user-side, behind-the-meter storage (8 percent), and storage paired with thermal power plants (1.4 percent).[13]

Energy storage business models and applications include:

- Generation-side storage paired with wind and solar power plants, historically supported by provincial storage installation mandates;
- Grid-side independent storage providing services to the power system, including energy arbitrage, capacity support, and ancillary services;

- User-side behind-the-meter storage, particularly for commercial and industrial customers, which pay higher prices than residential customers, enabling them to store electricity during lower-price periods and consume it during higher-price periods under time-of-use electricity tariffs;
- Virtual power plants and demand-side aggregation, which coordinate distributed energy resources, including BESS, flexible loads, and distributed generation, to participate in electricity markets and provide grid services;
- Emerging applications of BESS paired with wind and solar generation to support green hydrogen production through electrolysis using renewable electricity, or to provide renewable electricity to industrial facilities, including zero-carbon industrial park pilot projects;
- Integrated solar-plus-storage projects participating jointly in electricity market transactions;
- Solar-plus-storage applications in agriculture and rural development, including irrigation and other agricultural electricity needs;
- Energy storage integrated with electric vehicle charging and battery-swapping stations, sometimes alongside solar photovoltaic generation;
- BESS paired with coal-fired power plants to improve operational flexibility and reduce the need for rapid changes in coal generation output;
- Transmission- and distribution-level storage, including grid-forming BESS, supporting renewable energy integration, grid stability, and helping address bottlenecks in power transmission and distribution; and
- Coordinated dispatch of multiple BESS facilities to help meet peak electricity demand, including during periods of high summer cooling or winter heating loads, as illustrated in the following case study.

OPTIMIZING THE ROLE OF ENERGY STORAGE IN CHINA'S ENERGY SYSTEM

Energy storage is playing a crucial role in the construction of China's new-type power system centered on growing shares of solar and wind power, providing flexibility to balance supply and demand and strengthen the resilience of the grid. As energy storage systems continue to expand their role in the power system, it is important for policymakers, investors, industry and users to continue to promote the optimization of pricing mechanisms and market rules in a way that rewards them for the services they provide to the power system across a wide range of applications while helping to decarbonize the grid.

CASE STUDY: SHANDONG PROVINCE UTILIZING ENERGY STORAGE TO MEET PEAK SUMMER LOADS

Shandong Province in eastern China is one of China's most developed and industrial provinces, with a population of 100 million people and the third-largest provincial economy. With one of China's largest provincial power systems, including approximately 110 GW of coal power, Shandong has also promoted rapid development of renewables and has been a leading province in electricity market reform. By the end of July 2026, Shandong's installed wind and solar capacity had reached 136.6 GW, accounting for more than 50 percent of the province's total installed generating capacity. Meanwhile, Shandong's new-type energy storage capacity had reached 14.41 GW, including electrochemical storage (such as lithium-ion batteries), compressed-air storage, and flywheel storage.[14]

Due to its leading solar capacity, particularly distributed solar, Shandong in recent years has seen negative power prices during midday, when an excess of solar power generation provides an oversupply of power. The province has therefore turned to energy storage, virtual power plants, and other flexible resources to better utilize its surplus solar PV generation when needed, such as in the evening hours when solar generation rapidly falls and net loads increase from residential usage. Notably, Shandong has been a leader in using energy storage to meet peak summer loads, including from air conditioning demand.

On August 3, 2026, State Grid Shandong jointly dispatched 172 new-type energy storage stations—73 independent stations and 99 stations paired with renewable generation—with 13.13 GW of total installed capacity. The stations reached a maximum combined discharge power of 11.98 GW, helping meet record summer peak loads of 131 GW during the day and 119 GW in the evening. The coordinated dispatch set a record for centralized dispatch of new-type energy storage by a provincial power grid, demonstrating how large-scale energy storage can provide greater flexibility to support renewable energy integration and grid balancing.[15] State Grid Shandong enabled the large-scale coordinated dispatch through load forecasting and real-time generation data, assessing each storage station's optimal charging and discharging periods and output range and developing station-specific charging and discharging plans.[16]

Shandong's experience illustrates how coordinated dispatch of energy storage facilities can provide substantial flexibility to a power system with high shares of solar and wind power during periods of peak electricity demand, demonstrating the growing operational value of China's rapidly expanding energy storage fleet.

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