

# Trends in China's pumped storage

How big is China's pumped-storage capacity?

China's pumped-storage capacity is set to increase even more, with 89 GW of capacity currently under construction. Developers are seeking governmental approvals, land rights, or financing for an additional 276 GW of pumped-storage projects, according to the data from Global Energy Monitor. Pumped storage is a type of energy storage.

Does China have pumped storage projects?

Global map showing a concentration of planned pumped storage projects in China. In 2021, China released an ambitious plan to roll out pumped storage nationwide in an effort to reduce reliance on fossil fuels. China's momentum has allowed it to surpass Europe's capacity for pumped storage.

Will China expand its pumped storage capacity by 2027?

China intends to expand its pumped storage capacity to 80 GW by 2027 and total hydropower capacity to 120 GW by 2030. The 3.6 GW Fengning Pumped Storage Power Station in China started commercial operations Sunday on its twelfth and final reversible turbine unit.

Why is China building pumped-storage hydropower facilities?

China is building pumped-storage hydropower facilities to increase the flexibility of the power grid and accommodate growing wind and solar power. As of May 2023, China had 50 gigawatts (GW) of operational pumped-storage capacity, 30% of global capacity and more than any other country.

Can pumped storage hydropower boost China's green energy transition?

Increasing pumped storage hydropower capacity is vital for promoting the green energy transition in China, responding to extreme situations and ensuring energy security, said Peng Caide, chief engineer with the China Renewable Energy Engineering Institute, a think tank under China's National Energy Administration.

Can China tap pumped storage hydropower capacity?

Peng said China has substantial potential to tap pumped storage hydropower capacity, as it only accounts for 1.4 percent of the country's power system, far behind the average of 10 percent in developed countries.

In this paper, the cost allocation and diversion strategies of PSP in different market stages are studied, and the specific impact of cost allocation of pumped storage power plants through T&D tariffs in the current and future development trends of China's electricity market is analysed and demonstrated.

China is by far the largest contributor to global growth in pumped storage with 36 150 MW under construction and has been responsible for most of the global growth in pumped storage over recent years. As of March 2022, China has 38 large and medium-sized pumped-storage plants in operation, with a total capacity of 35.6 GW.

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Pumped storage hydro is a mature energy storage method. It uses the characteristics of the gravitational potential energy of water for easy energy storage, with a large energy storage scale, fast adjustment speed, flexible operation and high efficiency [1]. The pumped storage power station, as the equipment for the peak shaving, frequency modulation and ...

In this study, the energy scenario in China was analyzed by retracing the trend of exponential population growth, gross domestic product (GDP), and electricity production and consumption. A forecast up to 2050 was made based on the history and forecasts of other field studies. It was possible to deduce data on pollutants in terms of CO<sub>2</sub> equivalent (CO<sub>2</sub>-eq) ...

The cumulative installation of cold and heat storage was about 930.7MW, a year-on-year increase of 69.6%, accounting for 1.1% of the total installed energy storage capacity. China's new energy storage capacity will be installed in 2023. In 2023, China's new installed capacity of energy storage was about 26.6GW.

Pumped storage installed capacity reached in 2021 Pumped storage capacity added in 2021 decrease from 2020 on 2020 on 2020 up on added in 2020 Capacity added in 2021, including pumped storage up on-1.6% +1.9% 21 GW +3.3% 1.5 GW added in 2020 4,298 TWh 1,360 GW 26 GW 165 GW 4.7 GW To achieve a 2°C target, we need to see around 850 GW

For example, in 2023, pumped hydro emerged as the leading segment in China's energy storage industry, receiving the highest investment with a total allocation of USD 47 billion [59]. China is constructing pumped-storage hydropower facilities to enhance grid flexibility and integrate increasing amounts of wind and solar power.

After entering the "14th Five-Year Plan" [2], China's pumped storage power has entered a stage of rapid development under the guidance of many national policies. ... helping to understand the dynamics and trends in this field across the country. The data period is from January 1, 2021 to February 8, 2024. Summarize the current development ...

In China, pumped storage is also the dominant player of the field. Moreover, China will strive to peak its carbon dioxide emissions by 2030 and achieve carbon neutrality by 2060 based on the commitment made at the 75th Session of the United Nations General Assembly. ... Trends and challenges in the operation of pumped-storage hydropower plants ...

In late January, it was announced by GE Hydro Solutions that all four units at the 1.2GW Jinzhai pumped storage power plant in China were successfully connected to the grid and have completed 15 days of trial operation. GE was selected in 2017 by Anhui Jinzhai Pumped Storage Power Co., LTD, one of the divisions of State Grid Xin Yuan, to supply ...

Figure 5: Trend of average bid price in energy storage system and EPC (2023.H1, unit: CNY/kWh) About

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Global Energy Storage Market Tracking Report. Global Energy Storage Market Tracking Report is a quarterly publication of market data and dynamic information written by the research department of China Energy Storage Alliance (CNESA).

Figure 3 illustrates the global trends in annual installations of pumped hydro storage (PHS) systems from 1962 to 2030. It provides insights into the operational status of PHS systems (in operation or under construction) and the cumulative power capacity in MW up to a given year. ... Changlongshan Pumped Storage Power Station, China.

With Fengning now online, China aims to expand its pumped storage capacity to 80 GW by 2027 and reach a total hydropower capacity of 120 GW by 2030. Globally, pumped storage hydropower is the largest form of renewable energy storage, with nearly 200 GW of installed capacity. The International Hydropower Association (IHA) is highlighting a year ...

On May 14, 1968, the first PSPS in China was put into operation in Gangnan, Pingshan County, Hebei Province. It is a mixed PSPS. There is a pumped storage unit with the installed capacity of 11 MW. This PSPS uses Gangnan reservoir as the upper reservoir with the total storage capacity of 1.571×10<sup>9</sup> m<sup>3</sup>, and uses the daily regulation pond in eastern Gangnan as the lower ...

China's National Energy Administration (NEA) in September issued a middle and long-term development plan for the country's pumped storage hydropower sector covering the period from 2021 to 2035, eyeing an expansion in China's pumped storage hydropower volume to 62 million kilowatt-hours (kWh) at the end of 2025, as part of efforts to boost ...

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Pumped Hydro Storage Market - Growth, Trends, and Forecasts (2023 - 2028) - The pumped hydro storage market installations totaled 159.49 GW in 2020, and it is anticipated to reach 235.07 GW by 2027, recording a CAGR of 5.87% during 2022-2027. The COVID-19 pandemic negatively impacted the global pumped hydro storage market due to disruptions in ...

The Ministry of Industry and Information Technology announced that it grew to 32GWh in 2021 (a 146% y-o-y increase). While this bodes well for the battery storage sector, it still falls below the potential of pumped storage, informing us that pumped storage will dominate Mainland China's electricity storage solutions over the coming years.

The No. 1 unit of the Fukang pumped-storage power station in northwest China's Xinjiang Uygur Autonomous Region went into full operation on November 25. It is the first pumped-storage unit that has been put into operation for power generation in

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pumped storage power stations that frequently switch between energy storage and power generation modes, Li et al. (2019) used the Zhanghewan pumped storage power station as an example to discuss the causes and impacts of local structural vibrations. Force balance type sensor, piezoelectric sensor and pressure fluctuation

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