

Energy storage investment republic of china

Energy storage is crucial for China's green transition, as the country needs an advanced, efficient, and affordable energy storage system to respond to the challenge in power generation. According to Trend Force, China's energy storage market is expected to break through 100 gigawatt hours (GWh) by 2025. It is set to become the world's fastest-growing energy storage market, overtaking Europe and the United States.

Energy storage refers to the process or device that captures energy produced for use at a later time to reduce imbalances between energy demand and production. It can provide a rich spectrum of benefits to the electric grid, to electricity end-users, and to society as a whole. As for China, energy storage offers sustainable solutions for more efficient use of energy.

While China's renewable energy sector presents vast potential, the blistering pace of plant installation is not matched with their usage capacity, leading more and more clean energy to be wasted. Some provinces in the northwest region with rich wind and solar resources generally have an oversupply of electricity. Analysis shows that nearly 12 percent of power generated by wind turbines in Inner Mongolia and 10 percent of solar power in Qinghai this year has been wasted. In Gansu, due to low consumption capacity, the overall utilization rate of energy may drop below 90 percent, compared with 96.83 percent in 2021.

By saving surplus energy and releasing when the demand is higher, the energy storage sector will balance out the variability in power generation from renewables. In doing so, it will integrate more renewable sources into China's energy systems and further facilitate the transition towards a carbon-neutral economy.

China's renewable sector is currently experiencing rapid growth. According to data from the National Energy Administration (NEA), as of April, the country's installed power generation capacity was about 2.41 billion kilowatts (KW), a year-on-year increase of 7.9 percent. China is aiming for 50 percent of its electricity generation from renewable power by 2025, a 42-percent increase from now. China also has one of the largest battery energy storage markets, with a total capacity around 70GW with a market value of US\$1.2 billion in 2021, which is projected to increase to 170 GW with \$6 billion by 2025.

On March 21, 2022, the National Development and Reform Commission (NDRC) and the National Energy Administration (NEA) jointly released the Implementation Plan for the Development of New Energy Storage Technologies during the 14th Five-Year Plan Period (the 14th FYP for Energy Storage), which calls for a wider ecosystem of government and private entities to build the energy storage sector and emphasizes the role of market forces, including generation utilities and independent service providers, in investing in storage projects. By 2030, China plans to build up domestic capabilities in all core energy storage technologies to meet the needs of the future power system.

In the long run, energy storage will play an increasingly important role in China's renewable sector. The 14th FYP for Energy Storage advocates for new technology breakthroughs and commercialization of the storage industry. Following the plan, more than 20 provinces have already announced plans to install energy storage systems over the past year, with the combined capacity of over 40 gigawatts.

The Plan has also made a clear goal to decrease the per unit cost of energy storage by 30 percent by 2025. Once these targets are met, the price can reach at RMB 0.8 to 1.0 (US\$0.12 to 0.15) per watt-hour, making the energy storage system commercially viable without subsidies.

The Plan thus gives energy storage a path to market-driven growth and paves the way for large-scale deployment of energy storage in the power sector. From there, pricing mechanisms capable of making energy storage profitable will provide strong force to achieve carbon neutrality before 2060.

As diverse mechanisms can better meet different storage needs and duration requirements, the 14th FYP for Energy Storage outlines the collective development of various new energy storage technologies, such as compressed air, hydrogen, battery, and thermal energy, and aims for self-reliance in key fields. It also sets out ambitious targets for the development of 30GW from non-pumped hydro energy storage technologies as well as their commercialization and large-scale implementation.

A primary source of clean energy, hydro technology possesses a huge generation potential of 680 GW in China, based on estimation from the NEA, which set a goal of attaining 180 GW with new constructions by 2025. PowerChina, the country's largest builder of hydro power projects, plans to construct 200 pumped hydro stations with a combined capacity of 270 GW by 2025.

As for storage, the country aims to massively scale up to the capacity of 120 GW by 2030 from about 32 GW now by 2030. At the end of 2019, the entire world had 158 GW of hydro storage.

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