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The world's first 300-megawatt compressed air energy storage (CAES) station in Yingcheng, Central China's Hubei province, is successfully connected to grid on April 9. [Photo/sasac.gov.cn]

It has achieved three world records in terms of single-unit power, energy storage scale, and conversion efficiency. Additionally, it has established six industry benchmarks, dozens of international firsts, and marked a global breakthrough.

The world's first 300-megawatt compressed air energy storage (CAES) station utilizes the self-developed CAES system by China Energy Engineering Corporation Limited. [Photo/sasac.gov.cn]

With a total investment of approximately 1.95 billion yuan, the station boasts a single-unit power capacity of 300 megawatts and an energy storage capacity of 1,500 megawatt-hours, achieving a system conversion efficiency of about 70 percent.

"Compressed air energy storage", alongside pumped-storage hydroelectricity, is one of the most mature physical energy storage technologies currently available. It will serve for constructing a new energy system and developing a new power system in China, as well as a key direction for cultivating strategic emerging industries.

During the construction, the CEEC, together with various construction partners, achieved 100 percent localization of core technical equipment, overcoming many challenges, including process system integration, underground gas storage construction, and key equipment research and development.

Dubbed as a "super power bank", the station is expected to reach a gas storage capacity of 1.9 billion cubic meters, and generate approximately 500 million kilowatt-hours of electricity annually.

The project was invested by China Energy Engineering Group Science and Technology Development Co Ltd (ENERGY CHINA STDC) and State Grid Hubei Comprehensive Energy Service Co Ltd, and co-constructed by CEEC Hunan Power Construction Co Ltd and Southern Construction & Investment Co Ltd.

China has made breakthroughs on compressed air energy storage, as the world's largest of such power station has achieved its first grid connection and power generation in China's Shandong province.

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With a total investment of 1.496 billion yuan (\$206 million), its rated design efficiency is 72.1 percent, meaning that it can achieve continuous discharge for six hours, generating approximately 600 million kWh per year.

This new type of power station was independently developed by the Institute of Engineering Thermophysics under the Chinese Academy of Sciences and Zhongchu Guoneng (Beijing) Technology Co Ltd.

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