

# CHINA S MOST ADVANCED DRILLING ENERGY STORAGE

APPLICATION SCENARIOS



How big is China's energy storage capacity? China's installed new-type energy storage capacity had reached 44.44 gigawatts by the end of June, expanding 40 percent compared with the end of last year, the National Energy Administration (NEA) said on Wednesday. Lithium-ion batteries accounted for 97 percent of China's new-type energy storage capacity at the end of June, the NEA added.

APPLICATION SCENARIOS



Why did China double its energy storage capacity in 2022? Power lines in Yichun, China. China almost quadrupled its energy storage capacity from new technologies last year, as the nation works to buttress its rapidly expanding but unreliable renewables sector and wean itself off dirty coal. Capacity rose to 31.4 gigawatts, from just 8.7 gigawatts in 2022, the National Energy Administration said Thursday.

APPLICATION SCENARIOS



Why is China's energy storage capacity expanding? BEIJING, July 31 -- China's energy storage capacity is expanding to facilitate the utilization of growing renewable power amid the country's efforts to advance its green energy transition.

APPLICATION SCENARIOS



What is China's largest flywheel energy storage plant? China's massive 30-megawatt (MW) flywheel energy storage plant, the Dinglun power station, is now connected to the grid, making it the largest operational flywheel energy storage facility ever built.

APPLICATION SCENARIOS



Is China's power storage capacity on the cusp of growth? [WANG ZHENG/FOR CHINA DAILY] China's power storage capacity is on the cusp of growth, fueled by rapid advances in the renewable energy industry, innovative technologies and ambitious government policies aimed at driving sustainable development, experts said.

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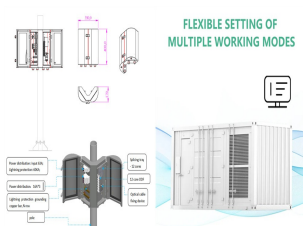


Why is energy storage important in China? Developing energy storage is an important step in China's transition from fossil fuels to renewable energy, while mitigating the effect of new energy's randomness, volatility and intermittence on the grid and managing power supply and demand, he said.

APPLICATION SCENARIOS



China's Energy Storage Market: Still Full of Opportunity. Several policy signals in the past months suggest that the nation's taking a step back from its formerly aggressive decarbonization approach. These signals include the underwhelmed clean-tech targets, with the shelving of the 30GW new energy storage capacity target another example.



Recently, a major breakthrough has been made in the field of research and development of the Compressed Air Energy Storage (CAES) system in China, which is the completion of integration test on the world-first 300MW expander of advanced CAES system marking the smooth transition from development to production.



Clean, firm energy resources are critical for cost-effective decarbonization of electricity systems, and total system costs are minimized when multiple clean, firm technologies are available 1,2,3



Dynamic Modelling and Control Design of Advanced Energy Storage for Power System Applications. Luis E Juanico. Dynamic Modelling, 2010. The work to develop electric energy storage systems for drilling rigs has been underway worldwide for the last 5 years, however, mainly targeting isolated offshore rigs. 13 Vol.:(0123456789) Journal of

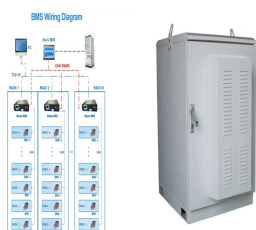
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The first advanced ultradeep ocean drilling vessel independently developed by China was officially named Mengxiang, meaning "dream" in Chinese, on Dec 18. It also started its maiden voyage that same day. It marked a key step advance in China's capacity in deepsea detection and development and research of marine technology equipment.



Underground salt cavern gas storage has many advantages and is very suitable for gas storage and peak shaving???However, most of the underground salt rocks in China are layered salt beds, and some



Onboard energy storage system (ESS) is an important energy-saving technology in urban rail transit. The key issue of the ESS is the array configuration. In this paper, a new array configuration



Compressed air energy storage (CAES) is one of the many energy storage options that can store electric energy in the form of potential energy (compressed air) and can be deployed near central power plants or distributioncenters. In response to demand, the stored energy can be discharged by expanding the stored air with a turboexpander generator.



The CAES project is designed to charge 498GWh of energy a year and output 319GWh of energy a year, a round-trip efficiency of 64%, but could achieve up to 70%, China Energy said. 70% would put it on par with flow batteries, while pumped hydro energy storage (PHES) can achieve closer to 80%.

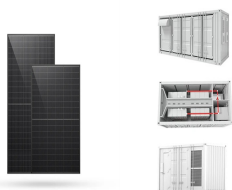
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Siemens Energy signed an agreement with Maersk Drilling to upgrade two ultra-harsh environment CJ70 jack-up drilling rigs in the North Sea with hybrid power plants using lithium-ion energy storage. The rigs ??? the Maersk Intrepid and Maersk Integrator ??? were retrofitted with BlueVault??? batteries from Siemens Energy.



MW Zhangjiakou Advanced Compressed Air Energy Storage Demonstration Project scheme is a national pilot project for the technology, and is also the largest and most efficient CAES plant so far, according to the Chinese Academy of Sciences. It is located in Miaotan Cloud Computing Industrial Park and covers an area of 5.7ha.



In 2019, China's physical energy storage technology made important breakthroughs. The world's first 10 MW advanced compressed air energy storage project passed acceptance by the Ministry of Science and Technology, and the world's first 100 MW advanced compressed air energy storage project officially began construction in Zhangjiakou.



The oil & gas transport and storage (OGTS) engineering, from the upstream of gathering and processing in the oil & gas fields, to the midstream long-distance pipelines, and the downstream tanks and LNG terminals, while using supply chains to connect each part, is exploring its way to reduce energy consumption and carbon footprints. This work provides an ???

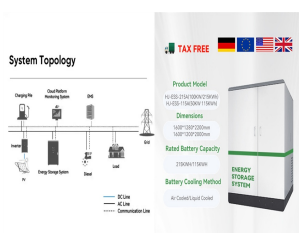


In the long run, energy storage will play an increasingly important role in China's renewable sector. The 14 th FYP for Energy Storage advocates for new technology breakthroughs and commercialization of the storage industry. Following the plan, more than 20 provinces have already announced plans to install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

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China has begun sea trials for its first domestically-built ultra-deep ocean drilling ship. Officials are boasting that it is one of the most sophisticated vessels in the world while reporting it



The drilling goal of Fushen-1 Well is granite dated 250 million years ago. Since the exploration was launched in August 2023, Sinopec has adopted multiple independently developed innovative technologies, including the combination of dual-drive drilling and high-pressure injection, to reach the temperature limit of hot dry rock stipulated by the national ???



With increasing global energy demand and increasing energy production from renewable resources, energy storage has been considered crucial in conducting energy management and ensuring the stability and reliability of the power network. By comparing different possible technologies for energy storage, Compressed Air Energy Storage (CAES) is ???



The load frequently oscillates in large amplitude like pulses when the draw-works lift or lower in the oil well drilling rig, and that makes the diesel engine run uneconomically. A new solution for the pulse load problem is to add a motor/generator set and a flywheel energy storage (FES) unit to the diesel engine mechanical drive system to form a hybrid power ???



By comparing different possible technologies for energy storage, Compressed Air Energy Storage (CAES) is recognized as one of the most effective and economical technologies to conduct long-term

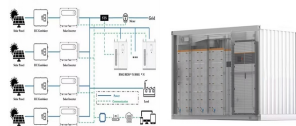
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The literature written in Chinese mainly and in English with a small amount is reviewed to obtain the overall status of flywheel energy storage technologies in China. The theoretical exploration of flywheel energy storage (FES) started in the 1980s in China. The experimental FES system and its components, such as the flywheel, motor/generator, bearing, ???



This technology is involved in energy storage in super capacitors, and increases electrode materials for systems under investigation as development hits [[130], [131], [132]]. Electrostatic energy storage (EES) systems can be divided into two main types: electrostatic energy storage systems and magnetic energy storage systems.



Mengxiang has two drilling modes: one for oil and gas exploration and development, and one for ocean scientific research. It is equipped with the world's most advanced drilling system, which



Supporting drilling contractors and operators" ESG goals and objectives for a carbon-neutral future, Caterpillar has created targeted solutions. Among these is the Cat Energy Storage Solution, a



Asia Pacific (including China), four new capture facility started operations in China in 2023, and planned capture and storage capacity could reach 50 Mt CO<sub>2</sub> and 85 Mt CO<sub>2</sub> per year by 2030, respectively. The Middle East, where around 15 projects are in development across the region in addition to the three already in operation.



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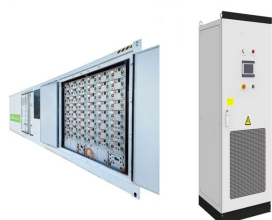
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COSLProspector, the fourth deep-water semi-submersible drilling rig built by CIMC Raffles for China Oilfield Services Limited (COSL), has been delivered in Yantai, Shandong Province. It represents another milestone for China's deep-water drilling rig going into the global mainstream market.



public sectors and favorable regulatory regimes. This study has reviewed China's domestic strategy to support wind, solar, and energy storage technology development and China's position globally in each of these sectors" innovation. The recommendations provided in this study aim to provide China with more comprehensive



Energy storage technology is the most promising solution to these problems. The development of energy storage technology is strategically crucial for building China's clean energy system, improving energy structure and promoting low-carbon energy transition [3]. Over the last few years, China has made significant strides in energy storage



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