

Compressed air energy storage design





Overview

This paper provides a comprehensive overview of CAES technologies, examining their fundamental principles, technological variants, application scenarios, and gas storage facilities. What is compressed air energy storage (CAES)?

Compressed air energy storage (CAES) systems offer significant potential as large-scale physical energy storage technologies. Given the increasing global emphasis on carbon reduction strategies and the rapid growth of renewable energy sources, CAES has garnered considerable attention.

What is a compressed air energy storage system?

Today's systems, which are based on the conservation and utilization of pressurized air, are usually recognized as compressed air energy storage (CAES) systems. The practical use of compressed air dates back to around 2000 B.C. when bellows were used to deliver a blast of air for the metal smelting process .

Where can compressed air energy be stored?

The number of sites available for compressed air energy storage is higher compared to those of pumped hydro [,]. Porous rocks and cavern reservoirs are also ideal storage sites for CAES. Gas storage locations are capable of being used as sites for storage of compressed air .

What are the advantages of compressed air energy storage systems?

One of the main advantages of Compressed Air Energy Storage systems is that they can be integrated with renewable sources of energy, such as wind or solar power.



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