Research on compressed air energy storage system

PDF | On Nov 15, 2025, Ephraim Bonah Agyekum and others published Compressed air energy storage (CAES) systems: technological progress, challenges, and future prospects in renewable...

This paper provides a comprehensive review of CAES concepts and compressed air storage (CAS) options, indicating their individual strengths and weaknesses. In addition, the paper ...

A comprehensive data-driven study of electrical power grid and its implications for the design, performance, and operational requirements of adiabatic compressed air energy storage ...

This technology strategy assessment on compressed air energy storage (CAES), released as part of the Long-Duration Storage Shot, contains the findings from the Storage Innovations (SI) 2030 strategic ...

In this investigation, present contribution highlights current developments on compressed air storage systems (CAES). The investigation explores both the operational mode of the system, ...

An isobaric adiabatic compressed air energy storage system using a cascade of phase-change materials (CPCM-IA-CAES) is proposed to cope with the problem of large fluctuations in ...

Potential application trends were compiled. This paper presents a comprehensive reference for developing novel CAES systems and makes recommendations for future research and ...

The compressor is one of the most critical core components of a compressed air energy storage system. During the energy storage process, it will compress the atmospheric pressure air to ...

Recent advancements have focussed on optimising thermodynamic performance and reducing energy losses during charge-discharge cycles, while innovative configurations have been proposed to...

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Summary Long-duration energy storage (LDES) is vital for decarbonizing the energy system but faces economic challenges, including high upfront costs, low trading frequency, and limited revenue in ...

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