Special Issue

Research and Development of Compressed Air Energy Storage System and Distributed Energy System

Message from the Guest Editors

As energy systems worldwide continue to be decarbonized, large-scale energy storage technologies are becoming increasingly critical for supporting the widespread deployment of renewable power generation. Among these, compressed air energy storage (CAES) is a promising large-scale energy storage solution, offering high technical maturity, low capital costs, and a long operational lifespan. Despite the rapid development of CAES technology in recent years, there are still some gaps to fill, such as managing frequent off-design operations, addressing mismatched response rates, improving multi-process coupling for renewable integration, characterizing dynamic performance, enhancing energy density and practical round-trip efficiency, and optimizing deployment in distributed energy systems through improved design, control strategies, market frameworks, and policy planning. To tackle these challenges, this Special Issue will present the latest advancements in CAES technology and its applications in distributed energy systems.

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Energies is an international, open access journal in energy engineering and research. The journal publishes original papers, review articles, technical notes, and letters. Authors are encouraged to submit manuscripts which bridge the gaps between research, development and implementation. The journal provides a forum for information on research, innovation, and demonstration in the areas of energy conversion and conservation, the optimal use of energy resources, optimization of energy processes, mitigation of environmental pollutants, and sustainable energy systems.

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