Special Issue

Technologies of Energy Storage, Carbon Capture, Utilization and Storage

Message from the Guest Editors

To combat climate change, the commitment to reducing carbon emissions and achieving sustainable development is strengthening worldwide. Energy storage and carbon capture, utilization, and storage technologies play a crucial role in mitigating carbon emissions. Large-scale energy storage also enhance the utilization of renewable energy, balance grid load, reduce energy costs, and improve the flexibility and security of energy systems.

But they also encounter challenges, including the need to enhance energy storage efficiency, lower costs, improve economic viability of carbon capture, guarantee long-term stability and safety of large-scale energy storage and carbon sequestration, and discover more effective methods for integrating renewable energy systems. Mechanical energy storage faces geographical and efficiency limitations, while electrochemical energy storage is challenged by costs, material sustainability, efficiency, and insufficient infrastructure. Underground energy storage and carbon sequestration technologies, also face substantial technical and economic challenges in their development.

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