

In this Review, we survey advances across ETES systems, examining how different conversion methods paired with various thermal storage media affect efficiency, scalability, cost and...

However, effective thermal energy storage systems are needed to improve the performance of engineering systems. Studies show that the use of thermal energy storage systems ...

The recent trends of TES materials in various applications, including building, industrial, power, food storage, smart textiles, thermal management, and desalination are also briefly discussed.

For example, thermal energy storage technologies are very broadly defined and cover a wide range of potential markets, technology readiness levels, and primary energy sources. In other areas, data ...

Recent innovations in nano-enhanced phase change materials (PCMs), hybrid TES configurations, and intelligent system integration are highlighted. The role of advanced computational ...

This editorial outlines the evolving role of thermo-fluid sciences in advancing sustainable energy systems amid the global energy transition. It highlights key research frontiers, including ...

The thermal behavior of various solar energy storage systems is widely discussed in the literature, such as bulk solar energy storage, packed bed, or energy storage in modules.

One key challenge is the cost-effectiveness and scalability of energy storage systems, particularly for grid-scale applications. Additionally, issues related to the efficiency, lifespan, and ...

This review highlights the latest advancements in thermal energy storage systems for renewable energy, examining key technological breakthroughs in phase change materials (PCMs), ...

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