

What are thermal storage technologies?

Thermal storage technologies have the potential to provide large capacity, long-duration storage to enable high penetrations of intermittent renewable energy, flexible energy generation for conventional baseload sources, and seasonal energy needs. Thermal storage options include sensible, latent, and thermochemical technologies.

What is thermal energy storage for cooling application?

In particular, thermal energy storages for cooling application are promising, since they have the potential to alter consumption dynamics, reduce energy demand and cut the costs of air conditioning systems. In fact, cold TES (CTES) provides cooling capacity by extracting heat from a storage medium.

What is thermal energy storage?

Thermal energy storage (TES) is one of several approaches to support the electrification and decarbonization of buildings. To electrify buildings efficiently, electrically powered heating, ventilation, and air conditioning (HVAC) equipment such as a heat pump can be integrated with TES systems.

How much does a thermal storage system cost?

The target capital cost for the U.S. Department of Energy (DOE) CSP program is \$15/kWh for the entire thermal storage system. Molten salts freeze at  $>200^{\circ}\text{C}$ , which requires expensive trace heating to maintain all components at temperatures well above the freezing point.

Is space heating and cooling a viable energy storage solution?

Space heating and cooling account for up to 40% of the energy used in commercial buildings. Aligning this energy consumption with renewable energy generation through practical and viable energy storage solutions will be critical to achieving 100% clean energy by 2050.

Can thermal energy storage improve the performance of hybrid energy systems?

Thermal batteries can be used for heating, cooling, and energy generation (Ding et al., 2020, Ding and Wu, 2022, Lari and Sahin, 2018). Song and Zhou (2023a) suggested that thermal energy storage can improve the performance of hybrid energy systems and decelerate battery degradation.



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