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Cost Analysis of High-Temperature Resistant Photovoltaic Storage Containers

Overview

The present study conducts a comprehensive comparative techno-economic analysis of some near-term sensible thermal energy storage (TES) alternatives to the ‘standard’ two-tank molten salt system for co.

How much does a high temperature sensible thermal energy storage system cost?

Table 1. High temperature sensible thermal energy storage system studies for CSP plants. For DMT systems, Pacheco et al. (2002) reported a specific cost of 21 US$/kWh th (i.e. the total cost of TES divided by the storage capacity) for a DMT tank filled with Quartzite compared to a 30 US$/kWh th specific cost in two-tank molten salt systems.

Can thermal energy storage systems be used for solar power plants?

Comparative life cycle assessment of thermal energy storage systems for solar power plants Renew. Energy, 44 (2012), pp. 166 - 173 Development of a molten-salt thermocline thermal storage system for parabolic trough plants Design and optimization of lab-scale sensible heat storage prototype for solar thermal power plant application.

How much does a thermal energy storage system cost?

At present, considering an average storage cost of 22 US$/kWh th for the commercial thermal energy storage system in CSP plants, the cost of TES systems for utility scale applications is still ~30–150 times lower than that of electricity storage systems (Lai and McCulloch, 2017, Luo et al., 2015).

Do alternative thermal energy storage systems have a techno-economic advantage?

We propose herein that the true techno-economic advantage (or lack thereof) of choosing alternative TES systems should be judged by a ‘normalized cost of thermal energy storage (NCOTES)’ which normalizes the cost of storage systems with regards to their annual electricity generation capacity.

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Annual comparative performance and cost analysis of high temperature, sensible thermal energy storage systems integrated with a concentrated solar power plant (English)

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