

Cost-effectiveness analysis of a 15MWh solar container





Overview

Can concentrating solar power be integrated with thermal energy storage?

Concentrating solar power (CSP), when integrated with thermal energy storage (TES), can address both intermittency and storage needs by providing dispatchable renewable electricity.

How much does a solar field cost?

In 2010, the solar field for a PTC plant cost an estimated \$4503 per kW, accounting for 44 % of total installed costs . By 2020, advances in trough technology had slashed solar field costs by 68 % to just \$1440 per kW, reducing its share of total installed costs to 30 % .

How flexible is a solar energy storage system?

The thermal energy storage system is the main driver for the high flexibility of CSP systems. Primarily due to the stochasticity of the solar resource, CSP plants without storage operate with capacity factors in the range of 22–28 %, depending on technology and location .

Is CSP a competitive advantage against solar PV?

Overall, the techno-economic analysis reveals that while CSP has achieved substantial progress, its competitiveness against solar PV must continue improving significantly for widespread adoption. The inherent thermal energy storage capability of CSP remains its differentiating advantage versus intermittent PV and wind.



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