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Price of chemical energy storage in solar power plants

Overview

Which thermal energy storage systems are used in solar power plants?

Thermal energy storage systems are key components of concentrating solar power plants in order to offer energy dispatchability to adapt the electricity power production to the curve demand. This paper presents a review of the current commercial thermal energy storage systems used in solar thermal power plants: steam accumulators and molten salts.

What is thermal energy storage?

Thermal energy storage can solve the mismatch between solar energy supply and electricity demand, providing a distinctive advantage to STE plants compared to other renewable energies, like wind or photovoltaic .

What percentage of Ste installed capacity is energy storage?

More precisely, a 36% of the total STE installed capacity. With the maturity of molten salt and steam accumulator storage technologies, over 53% of the capacity under construction has energy storage. This percentage increases up to 83% not considering the 1 GW solar plant under construction in Oman.

What is a solar tower plant?

3.1.2. Direct thermal energy storage system with molten salts A solar tower plant consists of a large field of heliostats, a heat transfer fluid/steam generation system, and a Rankine steam turbine/generator cycle.

How does a solar power plant work?

During summer months, these plants can typically operate around 10–12 h a day at full-rated solar energy electric output. To achieve electric production during overcast or night time periods, thermal storage is integrated into the plant to allow solar energy to be stored and dispatched when power is required by the grid.

Why do energy storage systems need a specific solution?

Due to diversified demand profiles regarding to type, amount and power of needed energy, each energy storage system (electrical, thermal, mechanical or chemical) requires a specific, optimal solution regarding efficiency and economics.

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