Peak-shaving solar energy storage and utilization in thermal power plants

Abstract The rapid growth of renewable energy applications demands enhanced flexibility in conventional coal-fired power plants. To address this challenge, A novel hybrid ...

Download Citation | On Aug 1, 2025, Yao Ma and others published Multi-objective optimization design of hybrid molten salt-phase change salt thermal energy storage system: An enhanced ...

Firstly, this paper analyses the data using the time-series production simulation to obtain the required renewable energy curtailment space and energy storage discharge space.

The ambitious green revolution to renewable energy sources in global power grids necessitates massive integration of solar and wind energy, which involves intermittent ...

[65] Wang D, Liu D, Wang C, et al. Flexibility improvement method of coal-fired thermal power plant based on the multi-scale utilization of steam turbine energy storage.

This study proposes an optimized operation model for the joint operation of thermal power and energy storage while considering the lifespan degradation of energy ...

In this chapter, various types of thermal energy storage technologies are summarized and compared, including the latest studies on the thermal energy storage materials and heat transfer enhancements.

The necessity for peak-shaving energy storage has been compounded by advances in technology and the growing adoption of renewable energy sources. As more individuals and businesses opt for solar panels and ...

The operational flexibility of thermal power plants is important to consume renewable energy generation, especially in the regions where combined heat and power (CHP) ...

In direct steam generation (DSG) concentrated solar power (CSP) plants, a common thermal energy storage (TES) option relies on steam accumulation. This conventional ...

To solve the problem of power imbalance caused by the large-scale integration of photovoltaic new energy into the power grid, an improved optimization configuration method ...

Complementary operation of indeterminate power sources with traditional hydro/thermal power plants or energy storages like pumped hydropower [10] and compressed ...

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This section conducts thermodynamic research on the coupled system of molten salt and thermal power, and analyzes the thermal storage transformation plan of molten salt ...

The increasing integration of renewable energy necessitates coal-fired power plants to operate flexibly at low loads for grid stability. However, conventional coal-fired power ...

Abstract Energy storage technology plays an important role in grid balancing, particularly for peak shaving and load shifting, due to the increasing penetration of renewable ...

Due to its stability and controllability, this technology has been widely applied in energy systems [34], especially in areas such as solar thermal power generation [35], grid ...

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