

PDEOZE PowerContainer

Coordinated establishment of a mechanism for energy storage pricing



Overview

What is a demand-side shared energy storage multi-entity operational model?

The framework for a demand-side shared energy storage multi-entity operational model, based on mixed games, is illustrated in Fig. 1. This framework encompasses three primary entities: power supply companies, shared energy storage operators, and prosumers. Power supply companies are those entities responsible for the supply of electricity.

How do energy storage operators make decisions?

Energy storage operators act as followers, making decisions regarding storage capacity and operational strategies based on the tariffs set by the grid. Their decision-making process incorporates historical capacity tariffs, operating costs, expected returns, and market dynamics.

Do distributed energy storage systems play a dual role of generation and consumption?

As an emerging flexible resource in the power market, distributed energy storage systems (DESSs) play the dual roles of generation and consumption (Kalantar-Neyestanaki and Cherkaoui, 2021; Li et al., 2021), thereby complicating the market dynamics for energy storage users.

Is storage opportunity price linearly constrained by energy price and reserve price?

Storage opportunity price is linearly constrained by energy price and reserve price, and this relationship varies with different charging and discharging states. Furthermore, the charging price and discharging price are bounded within $[0, 30.05] \$/MWh$ and $[0, 47.63] \$/MWh$ for the whole-year simulation, which verifies Corollary.

Can a capacity tariff optimization model save the energy storage system cost?

If we do not consider the Stackelberg game mechanism, the capacity tariff of

the energy storage plant is calculated as 584.76 CNY/MW according to the traditional method, which shows that the capacity tariff optimization model of the grid energy storage plant proposed in this paper can save the system cost.

Are shared energy storage operators able to optimize decision-making?

Existing research has made significant progress in the field of shared energy storage: Ma et al. (2022) constructs a bilateral optimization model between users and operators based on the cloud energy storage business model, providing an important reference for the decision-making optimization of shared energy storage operators (SESO).

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