

The price of charging and discharging energy storage power stations





Overview

Do energy storage charging piles have a charging control problem?

Based on the theoretical framework of mean field game (MFG), this paper considers the battery degradation and charging efficiency taking into account the charging demand of EVs, the charging control problem of energy storage charging piles is proposed to achieve the goal of minimizing the cost of the charging station.

Where do public charging stations get their energy?

Public charging stations typically source energy from the grid. The majority of America's power supply comes from natural gas and coal (around 59%), and 20% is nuclear. The remainder is from wind, hydro and solar, and solar energy ranks lowest at 2%.

How EV chargers can meet ultrafast charging demands?

For instance, at the airport EV charging station, with a total power capacity of 120 kW times the charger number, it can satisfy ultrafast charging demands from S1 to S7 using only this strategy, with a reasonable increase in waiting times. Regarding energy storage, it can buffer peak loads, but the cost is a major consideration.

Can a dynamic waiting strategy reduce power capacity at charging stations?

The researchers also investigated two generalized solutions to address the issue of insufficient power capacity at charging stations: a dynamic waiting strategy and the deployment of energy storage. The dynamic waiting strategy can effectively decrease peak loads by delaying some charging sessions.



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Proceedings of

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