ContainerPower Energy Solutions

Charging pile plus energy storage profit model

Overview

To understand how energy storage car charging piles generate revenue, it’s essential to consider several facets of their operation and functionality. 1. Energy arbitrage opportunities, 2. Demand response implementation, 3. Ancillary services participation, 4. Leasing and subscription models.How does the energy storage charging pile's scheduling strategy affect cost optimization?

By using the energy storage charging pile's scheduling strategy, most of the user's charging demand during peak periods is shifted to periods with flat and valley electricity prices. At an average demand of 30 % battery capacity, with 50–200 electric vehicles, the cost optimization decreased by 18.7%–26.3 % before and after optimization.

How do energy storage charging piles work?

To optimize grid operations, concerning energy storage charging piles connected to the grid, the charging load of energy storage is shifted to nighttime to fill in the valley of the grid's baseline load. During peak electricity consumption periods, priority is given to using stored energy for electric vehicle charging.

How to calculate energy storage based charging pile?

Based on the real-time collected basic load of the residential area and with a fixed maximum input power from the same substation, calculate the maximum operating power of the energy storage-based charging pile for each time period: (1) $P_m(t_h) = P_{am} - P_b(t_h) = P_{cm}(t_h) - P_{dm}(t_h)$.

How to reduce charging cost for users and charging piles?

Based Eq. , to reduce the charging cost for users and charging piles, an effective charging and discharging load scheduling strategy is implemented by setting the charging and discharging power range for energy storage charging piles during different time periods based on peak and off-peak electricity prices in a certain region.

Do energy storage charging pile optimization strategies reduce peak-to-Valley ratios?

The simulation results demonstrate that our proposed optimization scheduling strategy for energy storage Charging piles significantly reduces the peak-to-valley ratio of typical daily loads, substantially lowers user charging costs, and maximizes Charging pile revenue.

How do you calculate a profit from a charging pile?

If the stored energy is less than the discharge amount at peak prices, then the profit can be expressed as the product of the charging quantity of the charging pile during off-peak prices and the difference in peak-to-valley electricity prices.

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