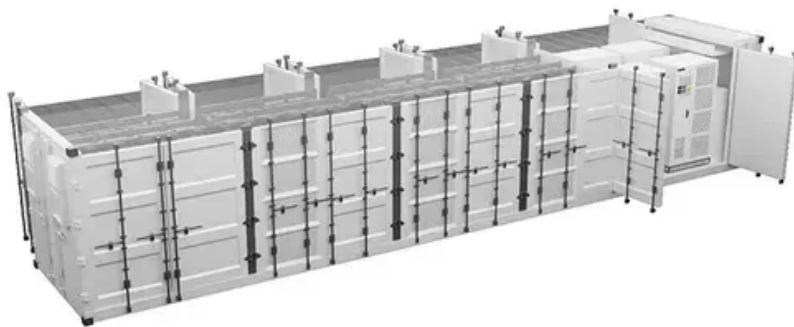


Sudan user-side energy storage lithium battery





Overview

What are the advantages of a lithium-ion battery?

Among the various battery types, the lithium-ion battery is advantageous for its high energy density, high cycle numbers, and high flexibility. At present, growing electricity users employ their own BESSs and perform individual energy management.

Why are battery energy storage systems important?

Battery energy storage systems (BESSs) have been widely employed on the user-side such as buildings, residential communities, and industrial sites due to their scalability, quick response, and design flexibility. However, cell degradation is caused by the charging and discharging of batteries, which reduces the economy of BESSs.

How much will a lithium-ion battery cost in 2023?

According to Bloomberg NEF's Research Report, the average price of a global lithium-ion battery pack will be near to \$100 / kWh by 2023, and as low as \$62 / kWh by 2030. Fig. 5 depicts the global lithium-ion battery price change trend. Fig. 5. Global average price trend of lithium-ion battery (Data source: Bloomberg NEF). 3.2.3.

How much does a lithium ion battery cost?

T_{Bat} is the life of the battery, which is determined by its characteristics and operation strategy. The price of lithium-ion batteries is reducing, which needs to be considered. According to Bloomberg NEF's Research Report, the average price of a global lithium-ion battery pack will be near to \$100 / kWh by 2023, and as low as \$62 / kWh by 2030.

How to optimize the net profit of lithium-ion batteries?

To this end, the semi-empirical degradation model of lithium-ion batteries and economic models of BESSs are embedded into the optimization frame. Particle



swarm optimization (PSO) algorithm and fmincon toolbox of MATLAB are adopted to solve the two-layer frame to maximize the net profit of BESSs.

What determines the optimal configuration and operation of lithium-ion batteries?

It was also observed that the optimal configuration and operation varies from the type of lithium-ion batteries, which are determined by the coefficients of the degradation model and economic models.



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