

## ContainerPower Energy Solutions

# Energy Storage Power Station Pricing Mechanism



## Overview

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Based on equal responsibility, power, and interest of all stakeholders, a pricing mechanism and a cost diversion optimization method for designing energy storage power stations, based on the transfer factor, are proposed and explained by case study.

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Energy storage systems (ESSs) can smooth loads, effectively enable demand-side management, and promote renewable energy consumption. This study developed a two-stage bidding strategy and economic evaluation model for ESS.

Electricity pricing for energy storage power stations is influenced by several critical factors, including regulatory frameworks, market structures, operational costs, and technological advancements.

According to different energy storage application scenarios and roles, the paper proposes an electrochemical energy storage price mechanism that adapts to the development of China's power system.

Therefore, based on the Vickrey-Clarke-Groves (VCG) mechanism design theory, an energy pricing mechanism is proposed for grid-side energy storage power stations to participate in the market to reduce the impact of market power and discover the greatest value of energy storage power plants. What are the economic benefits of energy storage system (ESS)?

The economic benefits of ESS are measured based on the ESG concept. The performance of several battery types was assessed, as well as the effect of ESS rated power and capacity on economy. Energy storage systems (ESSs) can smooth loads, effectively enable demand-side management, and promote renewable energy consumption.

What are electricity pricing mechanisms & pricing methods?

Electricity pricing mechanisms and pricing methods are the primary programs in the new electricity power reform. Various pricing mechanisms and methods result in different electricity prices .

How does price affect the stability of a power supply?

A price lower than the cost of power generation and supply will cause losses to the power supplier. By contrast, a price exceeding the affordability of power consumers will affect the stability of the power supply. Therefore, it is necessary to limit the peak and valley prices to a reasonable range, as shown in Eq. (15).

How does storage system power affect net profit?

This indicates that the larger the storage system power, the higher the net profit, even at a lower difference in the electricity price between the peak and valley. The value of the economic evaluation indicator for the ESS increased as the ESS power increased, as shown in Fig. 10 (e).

Does battery capacity increase the cost of ESS?

The cost of the ESS increased as the storage system capacity increased; however, this increase was smaller than the increase in the rated capacity. Fig. 11 (c) and (d) show that an increase in the battery capacity increased the fixed cost while slightly increasing the revenue. Moreover, the ESS net profit decreased with increased battery capacity.

What is the cost of power transmission and energy conversion equipment?

The unit power cost and capacity cost of the power transmission and energy conversion equipment were 50 (10 4 Yuan/MW), 54 (10 4 Yuan/MWh), respectively. The financing rate  $r$  was 6 %, and  $x\%$  and  $y\%$  were set to 2 %. The battery constant  $k_p$  was 1.5.

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