

POWER PLANT SOLAR ENERGY STORAGE

DEEP PEAK REGULATION



Do coal-fired power plants need deep peak regulation? Considering that the minimum generation limit of coal-fired plants is much higher than that of most generation technologies, and coal-fired power plants cannot be frequently started up and shut down, thus deep peak regulation (DPR) is an essential service provided by coal-fired power plants to support renewable energy integration.



What is the optimal energy storage allocation model in a thermal power plant? On this basis, an optimal energy storage allocation model in a thermal power plant is proposed, which aims to maximize the total economic profits obtained from peak regulation and renewable energy utilization in the system simultaneously, while considering the operational constraints of energy storage and generation units.



Can a pricing mechanism reflect the value of deep peak regulation? This research proposes a pricing mechanism for deep peak regulation (DPR) service that can reflect the value of such service to the power system. The main conclusions are as follows. 1) The DPR service of coal-fired power plants is an important source of flexibility for large-scale renewable energy integration.



Can a concentrated solar power plant with an electric heater join peak regulation? Therefore, a concentrated solar power (CSP) plant equipped with an electric heater (EH) is implemented to join the peak regulation, and the joint peak regulation strategy between thermal power units (TPUs) and a CSP plant is proposed. Firstly, the peak regulation principle of a CSP plant with EH is analyzed in detail.



Who should pay for deep peak regulation (DPR) service? The renewables should be the major payers for DPR service. At present, the decarbonization of China's power system depends on the large-scale integration of renewable energy. Motivating coal-fired power plants to provide deep peak regulation (DPR) service is the most important means

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of avoiding renewable energy curtailment.

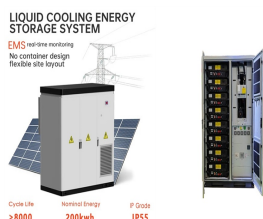
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What is deep peak regulation (DPR)? The peak regulation ability of TPUs directly affects the amount of wind power accommodated in the power system (Wang et al., 2021). Therefore, some high-capacity TPUs should be transformed with flexibility into deep peak regulation (DPR) units. In this paper, TPUs are divided into DPR units and conventional TPUs.



Deetjen and other scholars studied how wind and solar power affect the flexibility of the Texas power grid based on the slope and volatility of the net load (Deetjen et al., 2017). ???



Energy storage is one of the most effective solutions to address this issue. Under this background, this paper proposes a novel multi-objective optimization model to determine ???



Low-carbon economic dispatch of Photovoltaic-Carbon capture power plant considering deep peak regulation. Author links open overlay panel Xing Guo a solar energy. ???



At present, the decarbonization of China's power system depends on the large-scale integration of renewable energy. Motivating coal-fired power plants to provide deep peak ???

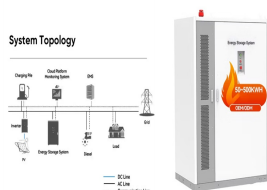
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Specifically, we propose a cluster control strategy for distributed energy storage in peak shaving and valley filling. These strategies are designed to optimize the performance and economic ???



The feasibility of applying the new heat storage material to deep peak regulation in thermal power plants is proved. 3) An economic analysis model is established considering the scenario of the peak-regulating subsidy, ???



Therefore, deep peak regulation (DPR) of thermal power plants remains one of the main peak regulation methods for the source side in China. The lower reserve capacity of thermal power plants is used to provide peak ???



Therefore, a concentrated solar power (CSP) plant equipped with an electric heater (EH) is implemented to join the peak regulation, and the joint peak regulation strategy ???



The low-carbon energy system has introduced the urgent demand for the ability of peak-shaving for coal fired power plants (CFPPs). A novel and efficient integration concept of ???