

# DEEPEN ENERGY STORAGE AND PEAK LOAD REGULATION



Do thermal power units provide deep peak regulation? Specifically, first, the flexibility requirement of renewable integration is quantified, and the operating characteristics of thermal power units providing deep peak regulation are modeled. On this basis, a capacity optimization for BES is proposed considering peak regulation characteristics of thermal power units.



Do I need to charge the energy storage system for peak shaving? The dispatching department calls it for free. When the output of thermal power unit is between  $(1 - \frac{P_{the}}{P_{the}}) P_{the}$  and  $0.5 P_{the}$ , the thermal power unit has the ability for peak shaving. At this time, there is no need to charge the energy storage system for peak shaving. To avoid deep discharge in energy storage system, SOC<sub>min</sub> is set to 20%.



Is there a trade-off between energy storage and peak regulation? In the meantime, the trade-off between deploying energy storage and leveraging the deep peak regulation capacity of existing thermal generators remains to be explored.



How effective is peak-load regulation capacity planning? Based on probabilistic production simulation, a novel calculation approach for peak-load regulation capacity was established in Jiang et al. (2017), which is still effective for peak-regulation capacity planning when some information of renewable energy and loads is absent.



What is the peak load and Valley load of energy storage system? The load data was extracted from the historical data of typical daily load, as shown in Table 3. The peak load and valley load are 3475.94 MW and 2595.70 MW, respectively. The parameters of the energy storage system are shown in Table 2.

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What is peak regulation? Peak-regulation refers to the planned regulation of generation to follow the load variation pattern either in peak load or valley load periods. Sufficient peak-regulation capability is necessary for the reliable and secure operation of power grid, especially in urban regions with extremely large peak???valley load difference (Jin et al.,2020).



It will also actively develop the storage system for new energy, including new types of power storage and pumped-storage, source-network-load-storage integration and multi-energy complementarity



Peak-regulation refers to the planned regulation of generation to follow the load variation pattern either in peak load or valley load periods. Sufficient peak-regulation capability ???



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 plan said China will vigorously improve the comprehensive regulation capability of the power system, accelerate construction of flexible regulation power, guide self-supplied power plants, traditional high-energy ???

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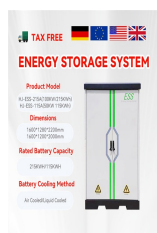
As far as existing theoretical studies are concerned, studies on the single application of BESS in grid peak regulation [8] or frequency regulation [9] are relatively mature. ???



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Optimal scheduling for power system peak load regulation considering short-time startup and shutdown operations of thermal power unit. Author links open overlay panel Yiwei ???



With the rapid growth of electricity demands, many traditional distributed networks cannot cover their peak demands, especially in the evening. Additionally, with the interconnection of distributed electrical and thermal grids, system operational ???



The optimal configuration of the rated capacity, rated power and daily output power is an important prerequisite for energy storage systems to participate in peak regulation on the grid side. Economic benefits are the main ???

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In this paper, a peak shaving and frequency regulation coordinated output strategy based on the existing energy storage is proposed to improve the economic problem of energy storage development and increase ???



""",??????, ???



0 , [1-2],??? ???



As renewable energy penetration increases, maintaining grid frequency stability becomes more challenging due to reduced system inertia. This paper proposes an analytical ???



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 ???