

Can energy storage flexibly participate in power system frequency regulation? This paper proposes a control strategy for flexibly participating in power system frequency regulation using the energy storage of 5G base station. Firstly, the potential ability of energy storage in base station is analyzed from the structure and energy flow. What is the primary responsibility of the base station energy storage? The primary responsibility of the base station energy storage is to protect the power supply of the base station, so the dynamic backup capacity of the base station in real time will be considered in the future. Chen, X.; Lu, C.; Han, Y.: Power system frequency problem analysis and frequency characteristics research review. What is the energy saving strategy of base station? In [20], the energy saving strategy of base station is proposed considering the variability and complementarity of base station communication loads. This strategy helps the power system to cut peaks and fill valleys while reducing base station operating costs. What is the nominal capacity of a base station energy storage? The nominal capacity of the base station energy storage is 20 kWh, and the number of the base station in each operating state is 500. The SOC values of the base station obey normal distribution between 0 and 1 in each operating states. This paper takes $(\text{SOC})_{\min} = 0.3$ and $(\text{SOC})_{\max} = 0.9$. Can a bi-level optimization model maximize the benefits of base station energy storage? To maximize overall benefits for the investors and operators of base station energy storage, we proposed a bi-level optimization model for the operation of the energy storage, and the planning of 5G base stations considering the sleep mechanism. How to optimize energy storage planning and operation in 5G base stations? In the optimal configuration of energy storage in 5G base stations, long-term planning and short-term operation of the energy storage are interconnected. Therefore, a two-layer optimization model was established to optimize the comprehensive benefits of energy storage planning and operation.

Optimization Control Strategy for Base Stations Based on Communication
 Mar 31, 2023
 Abstract: With the maturity and large-scale deployment of 5G technology, the proportion of energy consumption of base stations in the smart grid is increasing, and there is an urgent need for energy storage. Optimal configuration of 5G base station energy storage
 Feb 1, 2023
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Strategy of 5G Base Station Energy Storage Participating in Energy Flow Analysis and Feasibility of A Single 5G Base Station
 Feasibility Analysis
 There are two types of 5G base stations: macro-base station and micro-base station. A micro-base station covers small space and consumes little energy. On the contrary, a macro-base station consumes more energy and covers wider space than micro-base station. Therefore, macro-base station has a greater FR potential, and this paper focuses primarily on the FR potential of aggregated 5G base stations.

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