

Base station power regulation coordination mechanism





Overview

What is the dormancy control strategy of a base station?

The dormancy control strategy of the base station is mainly a question of considering the efficiency of signal transmission within the slice area, and radiating the most effective signals with the smallest total cost.

Is Dn voltage control a co-regulation method for base station energy storage?

However, these storage resources often remain idle, leading to inefficiency. To enhance the utilization of base station energy storage (BSES), this paper proposes a co-regulation method for distribution network (DN) voltage control, enabling BSES participation in grid interactions.

How does a hybrid control strategy benefit base stations?

Furthermore, the effect of peak shifting is significantly enhanced with an increase in the scale of scheduling participation. The hybrid control strategy for base stations enables the effective utilization of the differing power reserve and temperature regulation resulting from the varying communication loads of base stations.

Why do communication base stations use battery energy storage?

Meanwhile, communication base stations often configure battery energy storage as a backup power source to maintain the normal operation of communication equipment [3, 4]. Given the rapid proliferation of 5G base stations in recent years, the significance of communication energy storage has grown exponentially [5, 6].



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Multi-objective interval planning for 5G base ...

Jul 23, 2024 · Large-scale deployment of 5G base stations has brought severe challenges to the economic operation of the distribution network, ...

Exploring power system flexibility regulation potential based ...

Dec 20, 2023 · 5G base stations (BSs) are potential flexible resources for power systems due to their dynamic adjustable power consumption. However, the ever-increasing energy ...

Coordinated scheduling of 5G base station energy storage ...

Sep 25, 2024 · Auxiliary equipment includes power supply equipment, monitoring and lighting equipment. The power supply equipment manages the distribution and conversion of electrical ...

Exploring power system flexibility regulation potential ...

Dec 23, 2024 · Exploring power system flexibility regulation potential based on multi-base-station cooperation self-optimising sleep strategy for 5G base stations Xiaoyan Ma1

Efficient virtual power plant management strategy and ...

Mar 15, 2024 · Efficient virtual power plant management strategy and Leontief-game pricing mechanism towards real-time economic dispatch support: A case study of large-scale 5G base ...

Day-ahead collaborative regulation method for 5G base stations ...

Feb 21, 2025 · Optimizing energy consumption and aggregating energy storage capacity can alleviate 5G base station (BS) operation cost, ensure power supply reliability, and provide ...

Coordinated scheduling of 5G base station ...

Sep 25, 2024 · Auxiliary equipment includes power supply equipment, monitoring and lighting equipment. The power supply equipment ...

Aggregated regulation and coordinated scheduling of PV ...

Nov 1, 2024 · Photovoltaic (PV)-storage integrated 5G base station (BS) can participate in demand response on a large scale, conduct electricity transaction and provide auxiliary ...

Exploring power system flexibility regulation ...

Dec 20, 2023 · 5G base stations (BSs) are potential flexible resources for ...

Optimal configuration for photovoltaic storage system ...

Oct 1, 2021 · Base station operators deploy a large number of distributed photovoltaics to solve the problems of high energy consumption and high electricity costs of 5G base stations. In this ...



Optimization Control Strategy for Base Stations Based on ...

Mar 31, 2024 · On the basis of ensuring smooth user communication and normal operation of base stations, it realizes orderly regulation of energy storage for large-scale base stations, ...

Exploring the Cellular Base Station Dispatch Potential Towards Power

Jan 1, 2022 · Article on Exploring the Cellular Base Station Dispatch Potential Towards Power System Frequency Regulation, published in IEEE Transactions on Power Systems 37 on 2022 ...

A day-ahead self-dispatch optimization framework for load ...

Mar 1, 2025 · The work in Ref. [11] aggregated some 5G base stations in the distribution network to achieve a win-win situation for power grids and base station operators through participation ...

Review of virtual power plant operations: Resource coordination ...

Mar 1, 2024 · The interaction mechanism of distributed resources under the coupling perspectives of cyber-physical-social, the high-dimensional uncertainty modeling of aggregation operation, ...

Base station power control strategy in ultra-dense networks ...

Aug 1, 2025 · In response to these challenges, base station sleep technology is increasingly seen as a promising solution [3]. Nonetheless, several current base station sleep algorithms depend ...

Energy-saving control strategy for ultra-dense network base stations

Aug 1, 2025 · A base station control algorithm based on Multi-Agent Proximity Policy Optimization (MAPPO) is designed. In the constructed 5G UDN model, each base station is considered as ...

Energy-saving control strategy for ultra-dense network base stations

Aug 1, 2025 · The authors in the paper [23] investigated that under the constraints of mobile network operators' user QoS demands and base station power budgets, an energy-efficient ...

Coordination and Optimal Scheduling of Multi-energy ...

Mar 2, 2021 · Therefore, it is necessary to establish a multi-source complementary coordination mechanism to fully tap the flexible regulation capacity of power system, so as to improve the ...

Coordinated scheduling of 5G base station energy storage ...

With the rapid development of 5G base station construction, significant energy storage is installed to ensure stable communication. However, these storage resources often remain idle, leading ...

Modeling and aggregated control of large-scale 5G base stations ...

Mar 1, 2024 · The limited penetration capability of millimeter waves necessitates the deployment of significantly more 5G base stations (the next generation Node B, gNB) than their 4G ...



Hybrid Control Strategy for 5G Base Station Virtual Battery ...

Sep 2, 2024 · Furthermore, a multi-objective joint peak shaving model for base stations is established, centrally controlling the energy storage system of the base station through a ...

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