



SolarTech Power Solutions

China's communication base station hybrid energy planning



Overview

This model encompasses numerous energy-consuming 5G base stations (gNBs) and their backup energy storage systems (BESSs) in a virtual power plant to provide power support and obtain economic incentives, and develop virtual power plant management functions within the 5G core network to minimize control costs. Can solar power improve China's base station infrastructure?

Traditionally powered by coal-dominated grid electricity, these stations contribute significantly to operational costs and air pollution. This study offers a comprehensive roadmap for low-carbon upgrades to China's base station infrastructure by integrating solar power, energy storage, and intelligent operation strategies.

What is a hybrid control strategy for communication base stations?

The objective of this paper is to present a hybrid control strategy for communication base stations that considers both the communication load and time-sharing tariffs.

Do communication base station operations increase electricity consumption in China?

Comparing data from 2021, 2025, and 2030, 41 we found that the electricity consumption due to communication base station operations in China increased annually.

Will China Telecom upgrade base stations in 2024?

In Anhui Province, for example, the China Telecom branch plans to upgrade 700 base stations with low-carbon retrofits in 2024 and selectively implement an active deep sleep system for base stations across the province at night to reduce the cost of purchased power.

What is a 5G communication base station?

The 5G communication base station can be regarded as a power consumption system that integrates communication, power, and temperature coupling, which is composed of three major pieces of equipment: the communication system, energy storage system, and temperature control system.

Why do Chinese communication companies rely on a power grid?

This is primarily due to the reliance of these base stations on the power grid, which derives over 70% of its energy from coal.^{19,20} Compounded by the Chinese government's stringent low-carbon policies, which mandate environmental responsibility across all industries, 21 communication companies face considerable policy pressure.

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