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Energy method for 5g base station construction in China





Overview

The emergence of fifth-generation (5G) telecommunication would change modern lives, however, 5G network requires a large number of base stations, which may lead to greater carbon emissions. Sin.

How many 5G base stations are built in China?

Emission reduction potential and model sharing In 2019, China began to build 5G base stations and has built over 113,000. Construction of 5G base stations accelerated in 2020 and a total of 718,800 base stations were built, resulting in a sharp increase in carbon emissions.

Are 5G base stations sustainable?

However, due to their high radio frequency and limited coverage, the construction and operation of 5G base stations can lead to significant energy consumption and greenhouse gas emissions. To address this challenge, scholars have focused on developing sustainable 5G base stations.

How does a 5G base station consume energy?

In terms of energy consumption, 5G base stations require continuous operation and stability, which leads to significant electricity consumption (Guo et al., 2022a). This power is mainly supplied by transmission equipment and auxilliary equipment, such as transformers, UPS power supplies, and cooling equipment.

How much carbon does a 5G base station produce?

Previous research has estimated that a single 5G base station will produce approximately 30.2 ~ 33.5 tCO₂ eq throughout its life cycle (Ding et al., 2022; Guo et al., 2022a). Consequently, the carbon emissions from 5G base stations in China in 2021 amounted to approximately 49.2 MtCO₂ eq.



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[Energy-efficiency schemes for base stations in 5G ...](#)

In today's 5G era, the energy efficiency (EE) of cellular base stations is crucial for sustainable communication. Recognizing this, Mobile Network Operators are actively prioritizing EE for

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[Application of AI technology 5G base station](#)

Dec 9, 2020 · Introduction of energy saving of 5g
There are mainly two method of base station energy saving, which are hardware power saving and software energy saving.



[Optimal configuration for photovoltaic storage system capacity in 5G](#)

Oct 1, 2021 · In this study, the idle space of the base station's energy storage is used to stabilize the photovoltaic output, and a photovoltaic storage system microgrid of a 5G base station is

...

[China plans to upgrade its 5G network, accelerate 6G ...](#)

Jan 6, 2025 · China will continue to accelerate the research, development, and innovation of 6G cellular technology and upgrade its 5G mobile network to reach 5G-A level in its new data ...



Energy-Efficient Base Station Deployment in Heterogeneous Communication

Aug 23, 2019 · With the advent of the 5G era, mobile users have higher requirements for network performance, and the expansion of network coverage has become an inevitable trend. ...

[Towards Integrated Energy-Communication-Transportation Hub: A Base](#)

Aug 18, 2025 · An effective method is needed to maximize base station battery utilization and reduce operating costs. In this trend towards next-generation smart and integrated energy ...



[Optimal energy-saving operation strategy of 5G base station ...](#)

Dec 1, 2025 · To further explore the energy-saving potential of 5G base stations, this paper proposes an energy-saving operation model for 5G base stations that incorporates ...



Coordinated scheduling of 5G base station energy ...

Sep 25, 2024 · College of Electrical and Information Engineering, Hunan University, Changsha, China With the rapid development of 5G base station construction, significant energy storage ...



Low-Carbon Sustainable Development of 5G Base Stations in China

T1 - Low-Carbon Sustainable Development of 5G Base Stations in China N2 - With the construction of new infrastructure is on the rise in many countries, the impact of the 5G ...



Optimization Control Strategy for Base Stations Based on ...

Mar 31, 2024 · Therefore, in response to the impact of communication load rate on the load of 5G base stations, this paper proposes a base station energy storage auxiliary power grid peak ...



China Electric Power Green Energy Patent: Deep Learning

Oct 11, 2025 · Guangdong China Electric Power Green Energy Technology Co., Ltd. has recently applied for a patent titled "A Method and System for Intelligent Pipeline Deployment and Base ...



Carbon emissions and mitigation potentials of 5G base station in China

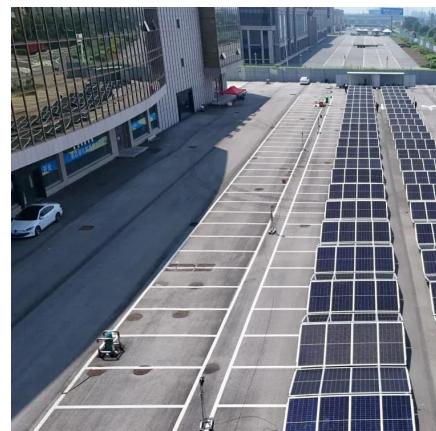
Jul 1, 2022 · This study aims to understand the carbon emissions of 5G network by using LCA method to divide the boundary of a single 5G base station and discusses the carbon emission

...



Low-Carbon Sustainable Development of 5G Base Stations in China

May 4, 2024 · With the construction of new infrastructure is on the rise in many countries, the impact of the 5G developments on circular economy in the era of COVID-19 cannot be ...



China Mobile - Renewable energy and green base station ...

Aug 7, 2025 · Through these interventions, China Mobile added 467,000 5G base stations while achieving a 2% reduction in overall base station energy consumption in 2024, demonstrating ...



Carbon Reduction Path Analysis of 5G Base Stations in the

Jun 30, 2022 · Therefore, for the 5G base station carbon reduction path, participating in the common construction and sharing of communication infrastructure to reduce the base station ...



Optimal configuration of 5G base station energy storage

Jun 21, 2025 · The high-energy consumption and high construction density of 5G base stations have greatly increased the demand for backup energy storage batteries. To maximize overall ...



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