

Distribution of China Communications Green Base Stations





Overview

How many 5G base stations are built in China?

As 5G serves as the foundation for the construction of new infrastructure, China, as the world leader in 5G base station construction, has already built over 1.4 million 5G base stations in 2021 alone. In the same year, 5G base stations in China produced approximately 49.2 million tons of CO₂ eq.

How many base stations are there in China?

The network traffic data cover 12,264 4G base stations and 2,159 5G base stations. Monthly data on the numbers of base stations and mobile users in each province are released by the Ministry of Industry and Information Technology of the People's Republic of China²⁷.

What will China's base stations be like in 2021?

The construction of base stations in China has continued to grow rapidly since 2019. From 2021 to 2030, cumulative carbon emissions during the operational phase will be 710 ± 50 MtCO₂ e, and cumulative carbon emissions during the manufacturing phase will be 102 ± 5 MtCO₂ e, accounting for 87% and 13%, respectively.

Which regions have fewer 5G base stations?

In contrast, the western provincial regions (such as Qinghai and Tibet) have fewer 5G base stations and produce fewer additional carbon emissions. The wealthier eastern provincial regions also have higher additional carbon emissions per unit area than the less developed western areas (Fig. 1f).

How are base stations and network traffic data collected in Nanchang?

In this paper, the energy consumption data of base stations and network traffic data in Nanchang are collected by the China Mobile Research Institute. The number of base stations and mobile users in each province are collected from the Ministry of Industry and Information Technology of the People's



Republic of China.

How much power does a micro base station use?

The power consumption of a single macro base station is approximately 5 kW, whereas a Pico Cell requires only about 10 W (Bolla et al., 2012; Deruyck et al., 2014; Hu & Yi, 2014). Deploying multiple micro base stations to cover the blind spots of a macro base station will reduce power consumption during operation, thereby reducing carbon emissions.



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An Insight into Deployments of Green Base Stations (GBSs) for ...

Energy efficient base station deployment in green cellular networks with traffic variations, in 1st IEEE International Conference on Communications in China (ICCC), Beijing, pp. 399-404.

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China Mobile - Renewable energy and green base station upgrades

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 the ability to ...

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Low-carbon upgrading to China's communications base stations ...

These outcomes demonstrate that upgrading to low-carbon base stations not only ensures economic feasibility but also delivers significant environmental and public health ...

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Resource management in cellular base stations powered by ...

This paper aims to consolidate the work carried out in making base station (BS) green and energy efficient by integrating renewable energy



sources (RES). Clean and green ...

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[Carbon emissions of 5G mobile networks in China](#)

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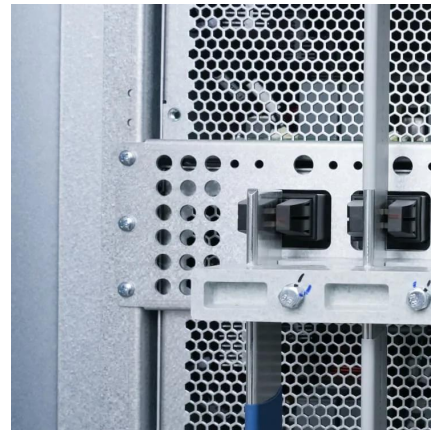
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Telecom + Solar energy: Opening a new era of green communication

Most base stations in the western region of China are located in remote areas such as mountains and deserts; the power grid extension cost is very high and the power ...

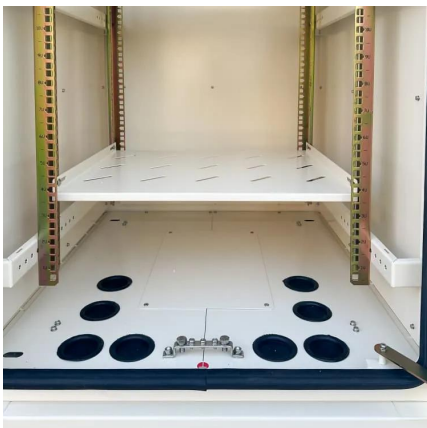
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Carbon emissions and mitigation potentials of 5G base station in China

Operators can reduce the carbon emissions generated by the construction of macro stations through reasonable layout of base stations in the early stage, combined distribution of ...

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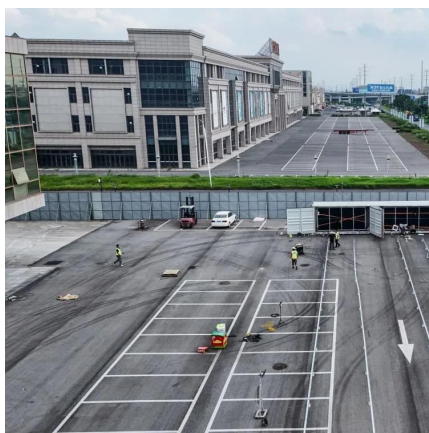




Temporal-spatial distribution nature of traffic and base stations in

Recent years have witnessed the unprecedented surge of mobile traffic and base stations (BSs) deployment, which poses severe requirement for future communications ...

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Optimal configuration for photovoltaic storage system capacity in ...

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 ...

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

Figure 8.6 depicts the distribution of 5G base stations in China, which shows that the construction of 5G base stations from 2020 to 2021 was mainly concentrated in coastal cities.

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[Low-carbon upgrading to China's communications base ...](#)

It is important for China's communications industry to reduce its reliance on grid-powered systems to lower base station energy costs and meet national carbon targets. This study examines ...

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[Carbon emissions of 5G mobile networks in China](#)

Here we develop a large-scale data-driven framework to quantitatively assess the carbon emissions of 5G mobile networks in China, where over 60% of the global 5G base stations are

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(PDF) Dispatching strategy of base station backup power supply

Overall, this study provides a clear approach to assess the environmental impact of the 5G base station and will promote the green development of mobile communication facilities.

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On the Spatial Distribution of Base Stations and Its Relation to the

The spatial distribution of base stations (BSs) and traffic demands is essential for efficient network planning and BS sleeping, which are key elements of green cellular ...

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