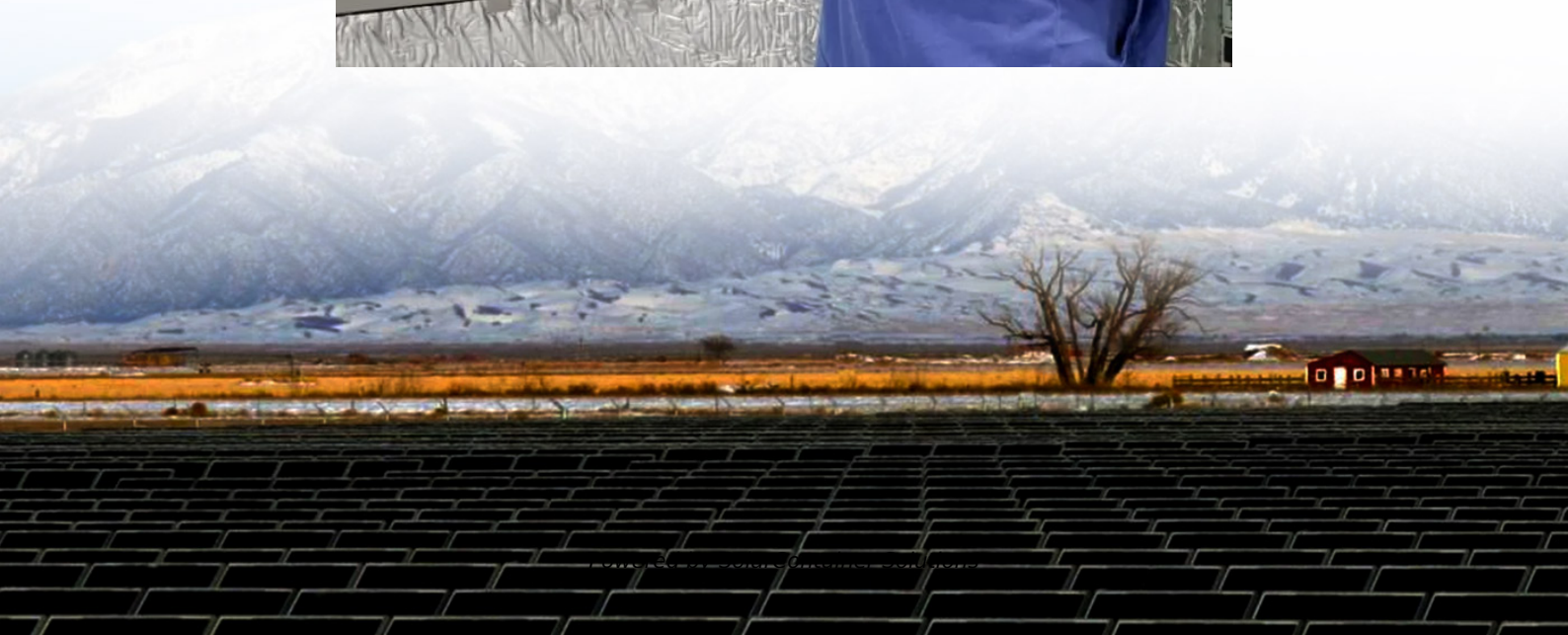


# **China s 5G base station power consumption**





## Overview

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The main factor behind the misalignment between traffic and energy is that the energy consumption of the cooling devices and fixed radio transmission overhead at the base stations is unaffected by tr.

How much energy does a 5G base station use?

China Mobile's measurement report<sup>9</sup> indicates that the energy consumption of a 5G base station is 4.3 kWh, which is four times that of a 4G base station at 1.1 kWh. One 5G base station is estimated to produce 30 t of carbon emissions in one year of operation<sup>10</sup>.

How much carbon is produced by 5G in China?

which is four times that of a 4G base station at 1.1 kWh. One 5G base station is estimated to produce 30 t of carbon emissions in one year of operation<sup>10</sup>. Thus, 5G networks in China are roughly estimated to produce over 60 Mt of carbon emissions annually at the national level<sup>11</sup>.

How can we improve the energy efficiency of 5G networks?

To improve the energy efficiency of 5G networks, it is imperative to develop sophisticated models that accurately reflect the influence of base station (BS) attributes and operational conditions on energy usage.

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 CO<sub>2</sub> eq.

Why does 5G use more power than 4G?

The data here all comes from operators on the front lines, and we can draw the following valuable conclusions: The power consumption of a single 5G station is 2.5 to 3.5 times higher than that of a single 4G station. The main factor behind this increase in 5G power consumption is the high power usage



of the active antenna unit (AAU).

How many 4G & 5G base stations are there in Nanchang?

The network traffic data were collected from China Mobile. We carried out a city-level measurement in Nanchang and collected fine-grained records on the network traffic of all 4G and 5G base stations for one week in May 2022. The network traffic data cover 12,264 4G base stations and 2,159 5G base stations.



## China s 5G base station power consumption

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### [Why does 5g base station consume so much power ...](#)

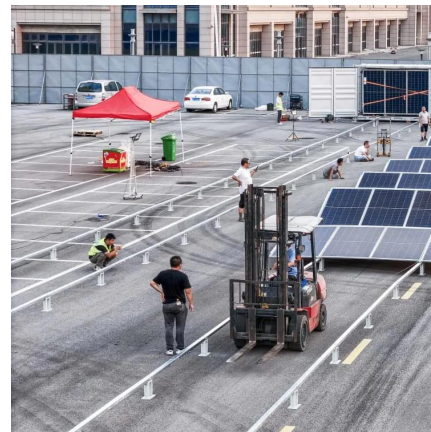
In addition to other small modules that use electricity, the power consumption of a single 5G base station is generally around 3700 watts, ...

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### **Huawei builds a new generation 5G base station antenna with lower power**

Huawei builds a new generation 5G base station antenna with lower power consumption & higher speed. Achieves an edge rate increase of 30%.

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### [Front Line Data Study about 5G Power Consumption](#)

The two figures above show the actual power consumption test results of 5G base stations from different manufacturers, ZTE and HUAWEI, in Guangzhou and Shenzhen, by an anonymous ...

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### [Modelling the 5G Energy Consumption using Real-world ...](#)

To improve the energy efficiency of 5G networks, it is imperative to develop sophisticated models



that accurately reflect the influence of base station (BS) attributes and operational conditions ...

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### [Powering green digitalization: Evidence from 5G network ...](#)

The paper is organized as follows: Section 2 reviews the development of 5G MN in China; Section 3 introduces the methods and data in detail; Section 4 examines the driving ...

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### [ZTE launches power-saving 5G base station chip](#)

But with the release of ZTE's 7nm base-station chip, and even next year's 5nm chip, the problem of high power consumption in 5G base stations ...

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### [Energy-saving Scheme of 5G Base Station Based on LSTM ...](#)

Abstract. As China's new infrastructure, 5G has received national and social attention. 5G promotes economic to grow rapidly. But, the high energy consumption caused by ...

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## A picture tells you why 5G base stations consume so much power

However, the energy consumption pressure of 5G base station construction and network access to operators has not been known to the outside world. Recently, China ...

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## Why does 5g base station consume so much power and how to ...

In addition to other small modules that use electricity, the power consumption of a single 5G base station is generally around 3700 watts, which is about three times that of 4G ...

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## Final draft of deliverable D.WG3-02-Smart Energy Saving of ...

Change Log This document contains Version 1.0 of the ITU-T Technical Report on "Smart Energy Saving of 5G Base Station: Based on AI and other emerging technologies to forecast and ...

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## 5G Base Station

The main energy consumption of 5G base stations is concentrated in the four parts of base station, transmission, power supply and computer ...

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

However, a significant reduction of ca. 42.8% can be achieved by optimizing the power structure and base station layout strategy and reducing equipment power consumption.

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## 5G Base Stations: The Energy Consumption Challenge

Although the energy consumption of 5G base stations is higher than any previous generations, technology and strategy innovations mentioned above would help MNOs stabilize or even ...

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## The carbon footprint response to projected base stations of China's 5G

Under the scenario of business-estimated six million base stations in 2030, the share of electricity consumed by China's 5G networks in 2030 could reach 8.4 % of the ...

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## Remake Green 5G

China Telecom has been enhancing the urgency and practicality of promoting the Net Zero, building green new cloud networks, and building green 5G base stations. The new green ...

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

However, the impact of 5G mobile networks on energy consumption and carbon emissions is a matter of concern. Compared with previous generations of mobile networks, 5G networks have ...

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## The carbon footprint response to projected base stations of ...

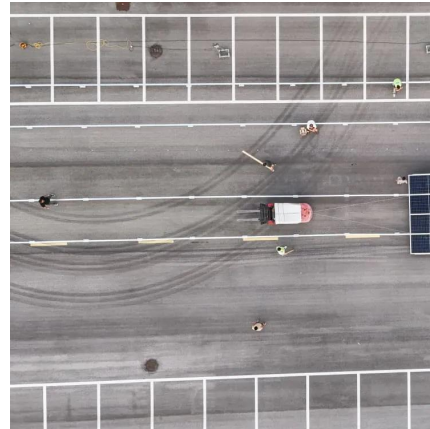
Under the scenario of business-estimated six million base stations in 2030, the share of electricity consumed by China's 5G networks in 2030 could reach 8.4 % of the ...

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## [Innovation and Pricing Pressures Drive 5G Base ...](#)

Globally, 5G is being deployed at two different paces, with China supporting half of the base transceiver station (BTS) market while the rest of ...

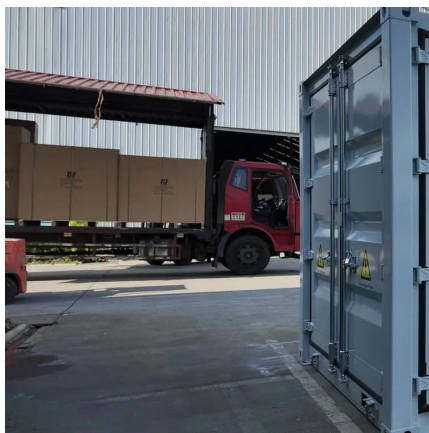
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## China Mobile Reduces the Power Consumption of 5G Base Station

The large operator has built more than 50% of the 5G base stations in the world. In July 2021, China Mobile announced that the power consumption of the 5G base station had ...

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## [5G Power: Creating a green grid that slashes costs, ...](#)

Once 5G networks are deployed, the power consumption of telecoms networks in China will exceed an estimated 100 billion kWh, generating annual carbon ...

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## China Mobile Reduces the Power Consumption of 5G Base Station

In July 2021, China Mobile announced that the power consumption of the 5G base station had been reduced to a figure amounting to about three times that of the 4G base stations, about ...

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## Impact of 5G Industry Development on China s Electricity ...

The impact of 5G industry development on China's electricity demand during the "14th Five-Year Plan" period is quantitatively analyzed, which can provide a reference for the scientific ...

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## Carbon emissions of 5G mobile networks in China

China Mobile's measurement report<sup>9</sup> indicates that the energy consumption of a 5G base station is 4.3 kWh, which is four times that of a 4G base station at 1.1 kWh. One 5G base station is

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## 5G Base Station Deployments; Open-RAN ...

Currently, China has been most aggressive in developing 5G networks, with more than 400 5G-related innovative applications in ...

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

At present, a single 5G base station's full load power is almost 3600 W, while that of a single 4G base station is nearly 1000 W, considering only the power consumption of the ...

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## 5G Power: Creating a green grid that slashes costs, emissions

Once 5G networks are deployed, the power consumption of telecoms networks in China will exceed an estimated 100 billion kWh, generating annual carbon emissions of 27.2 billion kg.

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