

China's 5G base station power consumption decreases



Overview

How much energy does a 5G base station use?

China Mobile's measurement report 9 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 10.

How does 5G affect network capacity?

As illustrated in Fig. 1a, the launch of 5G resulted in an increase in daily network capacities from 12 PB (12,264 4G base stations) to 22 PB (12,264 4G base stations and 2,159 5G base stations).

How much electricity will China's 5G network consume in 2030?

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 national total power generation, causing 0.44 GtCO₂ /yr CO₂ emissions.

Does China have a 5G network?

Given that China currently has the largest 5G network in the world (~1.53 million base stations by the end of 2021, Table S1) and that base station number was projected by up to 6–8 million by 2030 (CCID Consulting, 2020), concerns are being expressed regarding 5G mobile networks' environmental effects and sustainability.

How much carbon does 5G emit in China in 2021?

The results indicate that, due to the high carbon emissions resulting from the new infrastructure, the carbon emissions of 5G base stations in China in 2021 amounted to 49.2 MtCO₂ eq.

How bad is 5G in China?

Thus, 5G networks in China are roughly estimated to produce over 60 Mt of carbon emissions annually at the national level 11. Such high energy consumption and carbon emissions may cause severe environmental problems and conflict with global sustainable development goals (SDGs) 12.

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