

5G base station power consumption is several times that of 4G





Overview

Investing in the communication infrastructure transition requires significant scientific consideration of challenges, prioritisation, risks and uncertainties. To address these challenges, a bottom-up approach was used to demonstra. Investing in the communication infrastructure transition requires significant scientific consideration of challenges, prioritisation, risks and uncertainties. To address these challenges, a bottom-up approach was used to demonstrate the future of wireless network transmission and deployment. This study developed an agent-based model to explore the future deployment of non-standalone 5G networks, synthesizing multi-dimensional data visualization. In particular, this research took the UK as an example to investigate the spatiotemporal dynamic characteristics of 5G evolution, and further analysed the energy consumption and carbon footprint of 5G networks, as well as the consequent change in the operating expenses pattern. The simulation results show that 700 MHz and 26 GHz will play.

- Analysed the exogenous factors and policies affecting the 5 G development of the UK.
- Developed an agent-based model with the aid of spatiotemporal visualization techniques.
- Visualized basestation distribution at postcode level.
- Compared the capital expenses and oper.

5G networkSocio-technical systemsEnergy consumptionSpatio-temporal evolution.

Abbreviations4G□

4th generation communication technology

5G□

5th generation communication technology

ABM□

Agent-based model

AR□

Augmented reality



BB□

Baseband

CapEx□

Capital expenses

CIFUS□

Committee on Foreign Investment in the US

eMBB□

Enhanced broadband

GHG□

Greenhouse gas

GHz□

Gigahertz

ICT□

Information and communication technology

IoT□

Internet of Thing

LTE□

Long term evolution

Mbps□

Million bits per second

MHZ□

Megahertz



MIMO□

Multiple input multiple output

mmWave□

Millimetre wave

MNO□

Mobile network operator

MS□

Mains supply

Ofcom□

The Office of Communications

O&M□

Operation and maintenance

OpEx□

Operating expenses

P.

Being connected has become a defining feature of the modern economy and a significant trend of the 21st century. Cisco forecasts that by 2023, nearly two-thirds of the global population will have Internet access, and the number of devices connected to networks will be more than three times the global population (Cisco, 2020). However, current internet speeds can only take us so far and severely restrict economic development. To unlock a digital data-driven economy, the UK Government has set an ambitious agenda for building world-digital infrastructure (UK Government, 2017). The fifth generation technology standard for wireless cellular networks, or 5G for short, is the next generation of wireless cellular network or mobile network, which is capable of ultra-fast data speeds, and low latency, and ha.



Are 5G base stations causing more energy consumption?

However, Li says 5G base stations are carrying five times the traffic as when equipped with only 4G, pushing up power consumption. The carrier is seeking subsidies from the Chinese government to help with the increased energy usage.

Does China Mobile have a 5G base station?

China Mobile has tried using lower cost deployments of MIMO antennas, specifically 32T32R and sometimes 8T8R rather than 64T64R, according to MTN. However, Li says 5G base stations are carrying five times the traffic as when equipped with only 4G, pushing up power consumption.

How will 5G affect the energy consumption of mobile operators?

Edge compute facilities needed to support local processing and new internet of things (IoT) services will also add to overall network power usage. Exact estimates differ by source, but MTN says the industry consensus is that 5G will double to triple energy consumption for mobile operators, once networks scale.

Does 5G use more energy than 4G?

Carriers have been looking at energy efficiency for a few years now, but 5G will bring this to top of mind because it's going to use more energy than 4G. Telcos spend on average 5% to 6% of their operating expenses, excluding depreciation and amortization, on energy costs, according to MTN Consulting.



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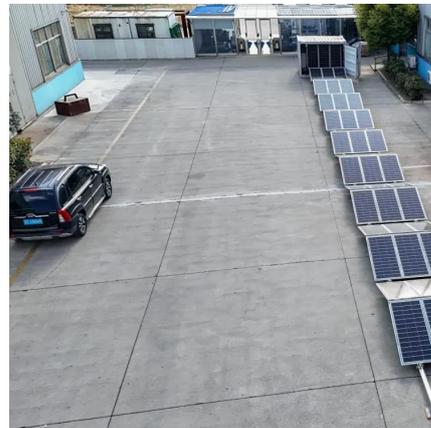


[Power consumption based on 5G communication](#)

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Comparison of Power Consumption Models for 5G Cellular Network Base

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5G base stations use a lot more energy than 4G base stations...

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