

## Kongres Container

# How much electricity does a mobile base station device consume in a day



## Overview

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In this post, we explore the energy saving features of 5G New Radio and how this enables operators to build denser networks, meet performance demands and maintain low 5G energy consumption. Ph.D., Expert Radio Network Energy Performance, Ericsson Research Senior Researcher radio networks Ph.D.

The more we use wireless electronic devices, the more energy we will consume. 5G will exponentially increase energy usage. The Small Cell Forum predicts the installed base of small cells to reach 70.2 million in 2025 and the total installed base of 5G or multimode small cells in 2025 to be 13.1.

Have you ever wondered how much energy our hyper-connected world is consuming?

5G base stations, the backbone of next-gen connectivity, now draw 3-4 times more power than their 4G counterparts. With global 5G subscriptions projected to hit 5.9 billion by 2027 (Ericsson Mobility Report 2023).

Compared to its predecessor, 4G, the energy demand from 5G base stations has massively grown owing to new technical requirements needed to support higher data rates and ultra-low latency. Now, let's get to the nuts and bolts of precisely why 5G is more power-consuming, address how this is dealt.

This is mainly achieved through air conditioning, and data shows that on average, the electricity cost of each base station's air conditioning accounts for about 54% of the entire base station's electricity cost. And it is expected

that China will build 8 million 5G base stations by 2025. How much.

Network provider Ericsson expects global monthly mobile data usage to increase fivefold by 2026 compared to 2020. And ING foresees a 20-fold increase in global data traffic by 2030 compared to 2018 (3). Streaming over wireless networks leads to a higher environmental impact compared to over wired. A. How do base stations affect mobile cellular network power consumption?

Base stations represent the main contributor to the energy consumption of a mobile cellular network. Since traffic load in mobile networks significantly varies during a working or weekend day, it is important to quantify the influence of these variations on the base station power consumption.

How much power does a 5G base station use?

“A 5G base station is generally expected to consume roughly three times as much power as a 4G base station. And more 5G base stations are needed to cover the same area,” -IEEE Spectrum, 5G’s Waveform Is a Battery Vampire.

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.

Is there a direct relationship between base station traffic load and power consumption?

The real data in terms of the power consumption and traffic load have been obtained from continuous measurements performed on a fully operated base station site. Measurements show the existence of a direct relationship between base station traffic load and power consumption.

How much energy does a mobile network use?

In 2022, the Finnish Transport and Communications Agency Traficom published a pilot study on the energy consumption of communications networks in the country finding most energy is consumed by mobile networks (60%) compared to fixed networks (20%) and other network parts (20%).

What is the largest energy consumer in a base station?

The largest energy consumer in the BS is the power amplifier, which has a share of around 65% of the total energy consumption . Of the other base station elements, significant energy consumers are: air conditioning (17.5%), digital signal processing (10%) and AC/DC conversion elements (7.5%) .

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