

# **Power consumption of 5G base stations of three operators**





## Overview

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Do 5G base stations consume a lot of energy?

The energy consumption of the fifth generation (5G) of mobile networks is one of the major concerns of the telecom industry. However, there is not currently an accurate and tractable approach to evaluate 5G base stations' (BSs') power consumption.

How much power does a 5G station use?

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). Under a full workload, a single station uses nearly 3700W.

Is 5G more energy efficient than 4G?

Although the absolute value of the power consumption of 5G base stations is increasing, their energy efficiency ratio is much lower than that of 4G stations. In other words, with the same power consumption, the network capacity of 5G will be as dozens of times larger than 4G, so the power consumption per bit is sharply reduced.

Should power consumption models be used in 5G networks?

This restricts the potential use of the power models, as their validity and accuracy remain unclear. Future work includes the further development of the power consumption models to form a unified evaluation framework that enables the quantification and optimization of energy consumption and energy efficiency of 5G networks.

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.



## Why does 5G use so much power?

The main factor behind this increase in 5G power consumption is the high power usage of the active antenna unit (AAU). Under a full workload, a single station uses nearly 3700W. This necessitates a number of updates to existing networks, such as more powerful supplies and increased performance output from supporting facilities.



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[A technical look at 5G energy consumption and performance](#)

Power consumption models for base stations are briefly discussed as part of the development of a model for life cycle assessment. An overview of relevant base station power ...

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### Machine Learning and Analytical Power Consumption Models for 5G Base

In this article, we propose a novel model for a realistic characterization of the power consumption of 5G multi-carrier BSs, which builds on a large data collection campaign.

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

This paper proposes a novel 5G base stations energy consumption modelling method by learning from a real-world dataset used in the ITU 5G Base Station Energy Consumption Modelling ...

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[A technical look at 5G energy consumption and performance](#)

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 ...



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### **The 5G Dilemma: More Base Stations, More Antennas--Less Energy?**

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According to ABI Research analysis and certain infrastructure vendor statistics, the typical three 5G massive MIMO 64T64R AAUs at a site need to consume more than 2600 watts, which are ...

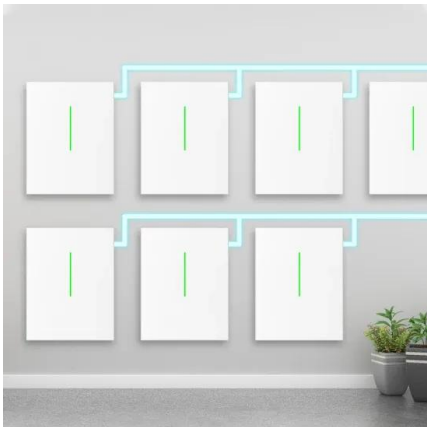
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### [Comparison of Power Consumption Models for 5G Cellular ...](#)

This paper conducts a literature survey of relevant power consumption models for 5G cellular network base stations and provides a comparison of the models. It highlights commonly made ...

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### **Optimal configuration for photovoltaic storage system capacity in 5G**

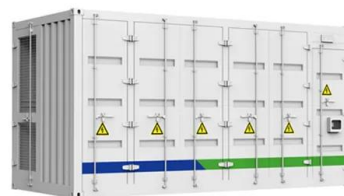
Base station operators deploy a large number of distributed photovoltaics to solve the problems of high energy consumption and high electricity costs of 5G base stations. In this ...

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### [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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5G - by design the most energy efficient cellular generation to date - evolves further with new features and solutions to further improve energy performance.

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### [Renewable energy powered sustainable 5G network ...](#)

Renewable energy is considered a viable and practical approach to power the small cell base station in an ultra-dense 5G network infrastructure to reduce the energy provisions ...

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### **Optimal energy-saving operation strategy of 5G base station with**

To further explore the energy-saving potential of 5 G base stations, this paper proposes an energy-saving operation model for 5 G base stations that incorporates communication caching ...

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### [Power consumption evaluation of mobile radio access ...](#)

Therefore, this work aims to estimate the total energy consumption of broadband RANs in Belgium in 2020, and to forecast it by 2025 using six scenarios of 5G deployment. Models of ...

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## Power Consumption: 5G Basestations Are Hungry, Hungry Hippos

The increased power consumption of next-generation basestations may be one of the dirty little secrets of 5G, which might not be a secret much longer as operators roll out initial

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## What is the Power Consumption of a 5G Base Station?

These 5G base stations consume about three times the power of the 4G stations. The main reason for this spike in power consumption is the addition of massive MIMO and ...

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## **Comparison of Power Consumption Models for 5G Cellular Network Base**

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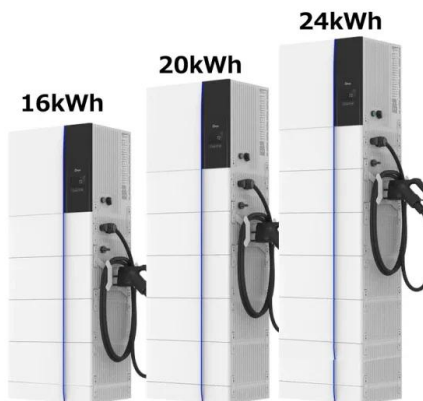




### [Power Consumption Modeling of 5G Multi-Carrier Base ...](#)

Importantly, this study item indicates that new 5G power consumption models are needed to accurately develop and optimize new energy saving solutions, while also considering the ...

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A literature review is presented on energy consumption and heat transfer in recent fifth-generation (5G) antennas in network base stations. The review emphasizes on the role of ...

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These alarming figures advocate for proactive digital sobriety policies. Index Terms--Mobile Network, 5G, Base Station, Power Con- sumption, Digital Sobriety, France. I. ...

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