

# **How to reduce the high power consumption of 5g base stations**





## Overview

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Can 3GPP reduce base station energy consumption in 5G NR BS?

Aiming at minimizing the base station (BS) energy consumption under low and medium load scenarios, the 3GPP recently completed a Release 18 study on energy saving techniques for 5G NR BSs . A broad range of techniques was evaluated in terms of the obtained network energy saving (NES) gain and their impact to the user-perceived throughput (UPT).

Can 5G reduce energy consumption?

However, the energy consumption of 5G networks is today a concern. In recent years, the design of new methods for decreasing the RAN power consumption has attracted interest from both the research community and standardization bodies, and many energy savings solutions have been proposed.

Can network energy saving technologies mitigate 5G energy consumption?

This technical report explores how network energy saving technologies that have emerged since the 4G era, such as carrier shutdown, channel shutdown, symbol shutdown etc., can be leveraged to mitigate 5G energy consumption.

Does Mappo reduce power consumption in 5G ultra-dense networks?

In this paper, we thoroughly study the base station control problem in 5G ultra-dense networks and propose an innovative MAPPO algorithm. The algorithm significantly reduces the overall power consumption of the system by optimizing inter-base station collaboration and interference management while guaranteeing user QoS.



## How to reduce the high power consumption of 5g base stations



### A Power Consumption Model and Energy Saving Techniques for 5G ...

Download Citation , On May 28, 2023, Maria Oikonomakou and others published A Power Consumption Model and Energy Saving Techniques for 5G-Advanced Base Stations , Find, ...

### [Optimal energy-saving operation strategy of 5G base station ...](#)

Dec 1, 2025 · Currently, the energy-saving strategies for individual 5 G base stations can be categorized into two main areas: hardware equipment and software management. In terms of ...



### [Energy-efficiency schemes for base stations in 5G ...](#)

In today's 5G era, the energy efficiency (EE) of cellular base stations is crucial for sustainable communication. Recognizing this, Mobile Network Operators are actively prioritizing EE for ...

### [5G base station saves energy and reduces consumption](#)

Dec 18, 2023 · The purpose of consumption is to reduce equipment power consumption, reduce enterprise operating costs, and break the shackles of high electricity bills for the



development ...



### Power consumption based on 5G communication

Oct 17, 2021 · At present, 5G mobile traffic base stations in energy consumption accounted for 60% ~ 80%, compared with 4G energy consumption increased three times. In the future, high ...



### **A Power Consumption Model and Energy Saving Techniques for 5G ...**

May 28, 2023 · Aiming at minimizing the base station (BS) energy consumption under low and medium load scenarios, the 3GPP recently completed a Release 18 study on energy saving ...



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

Apr 3, 2025 · The power consumption of the 5G base station mainly comes from the AU module processing and conversion and high power-consuming high radio frequency signals, the ...





## [Final draft of deliverable D.WG3-02-Smart Energy Saving ...](#)

May 7, 2021 · 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 ...



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

Apr 3, 2025 · The power consumption of the 5G base station mainly comes from the AU module processing and conversion and high power ...

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

Jan 23, 2023 · However, there is still a need to understand the power consumption behavior of state-of-the-art base station architectures, such as multi-carrier active antenna units (AAUs), ...



## **Energy-saving control strategy for ultra-dense network base stations**

Aug 1, 2025 · To reduce the extra power consumption due to frequent sleep mode switching of base stations, a sleep mode switching decision algorithm is proposed. The algorithm reduces ...



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