

Reasons for reducing power consumption of 5g base stations





Overview

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.

Is energy consumption a concern for 5G networks?

Abstract—The fifth generation of the Radio Access Network (RAN) has brought new services, technologies, and paradigms with the corresponding societal benefits. However, the energy consumption of 5G networks is today a concern.



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

Dec 1, 2025 · In this context, fully exploring the flexible regulation potential of 5 G base stations in terms of load power consumption, communication equipment is of great significance for ...

[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 ...



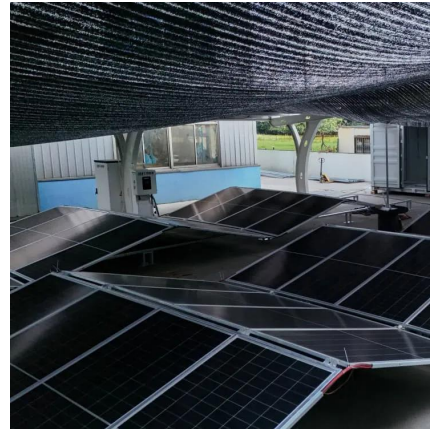
[Energy-efficiency schemes for base stations in 5G ...](#)

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 ...



[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 ...



[Energy Efficiency for 5G and Beyond 5G: Potential, ...](#)

Oct 14, 2024 · Energy efficiency constitutes a pivotal performance indicator for 5G New Radio (NR) networks and beyond, and achieving optimal efficiency necessitates the meticulous ...



[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 ...



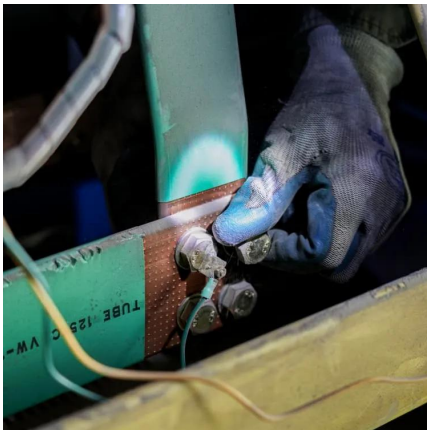
[Power consumption based on 5G communication](#)

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 ...



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

Jul 27, 2023 · This review paper identifies the possible potential solutions for reducing the energy consumption of the networks and discusses the challenges so that more accurate and valid ...



[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), ...

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