

How does 5G base station consume power





Overview

The 5G NR standard has been designed based on the knowledge of the typical traffic activity in radio networks as well as the need to support sleep states in radio network equipment. By putting the base sta.

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).

Does 5G increase energy consumption?

However, this technological leap comes with a substantial increase in energy consumption. Compared to its predecessor, the fourth-generation (4G) network, the energy consumption of the 5G network is approximately three times higher .

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.

Why is low 5G energy consumption important?

With new devices and use cases increasing the capacity of the networks, the demand to ensure low 5G energy consumption is critical to minimizing operator expenses and ensuring they can still meet energy reduction goals. How can NR bring an answer?

Figure 1: Global mobile data traffic outlook [Ericsson Mobility Report, June 2019].



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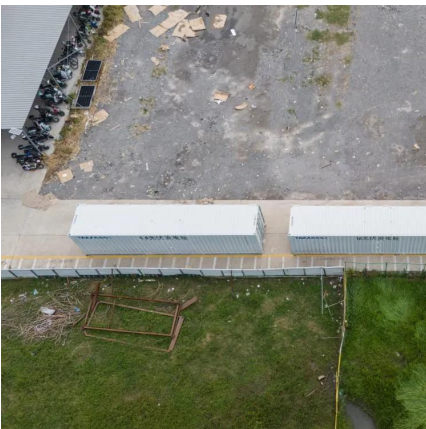


[How Much Power Does 5G Base Station Consume? , Huijue ...](#)

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

Sep 15, 2025 · Accurate energy consumption modeling is essential for developing energy-efficient strategies, enabling operators to optimize resource utilization while maintaining network ...



[What is 5G Energy Consumption?](#)

2 days ago · The 5G network is a dynamic system that consumes energy continually and responds to spikes in network activity. Over 70% of this energy is consumed by RAN ...

Comparison of Power Consumption Models for 5G Cellular Network Base

Jul 1, 2024 · This paper conducts a literature survey of relevant power consumption models for 5G cellular network base stations and



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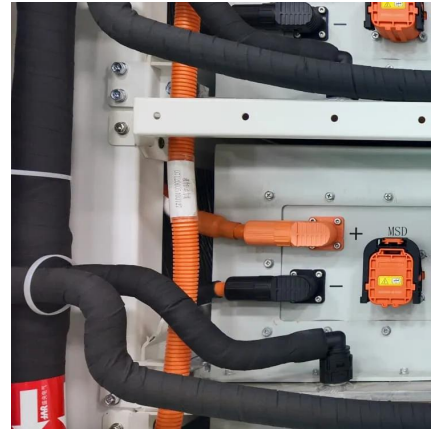
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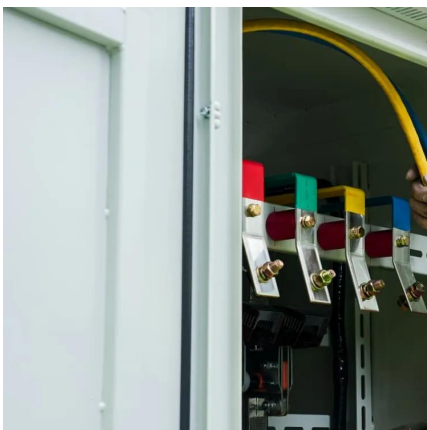


[Power consumption based on 5G communication](#)

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 ...

Optimal energy-saving operation strategy of 5G base station ...

Dec 1, 2025 · 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 ...



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

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