

Reasons for reduced power consumption of 5G base stations





Overview

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.

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.

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).

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.

Does 5G New Radio save energy?

Emerging use cases and devices demand higher capacity from today's mobile networks, leading to increasingly dense network deployments. 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.

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].



Reasons for reduced power consumption of 5G base stations



5G base stations use a lot more energy than 4G base ...

Carriers have been looking at energy efficiency for a few years now, but 5G will bring this to top of mind because it's going to use more energy than ...

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Research on Performance of Power Saving Technology for 5G Base Station

In the tidal scene, some 5G base station in an idle state still power fully, which causes great power waste. The historical volume of base station business data is used to train LSTM model, ...

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

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 savi

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Final draft of deliverable D.WG3-02-Smart Energy Saving of ...

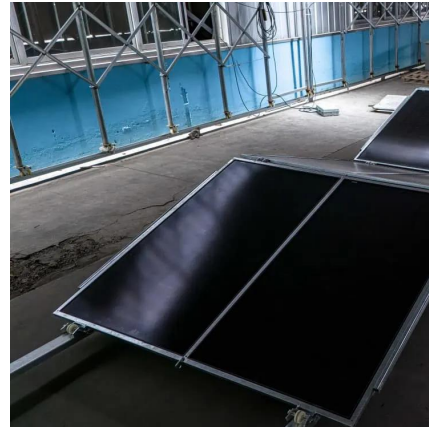
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Focus Group Technical Report Summary This



technical report explores how network energy saving technologies that have emerged since the 4G era, such as carrier shutdown, channel ...

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

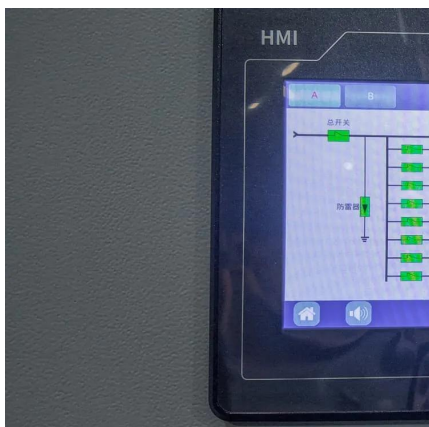
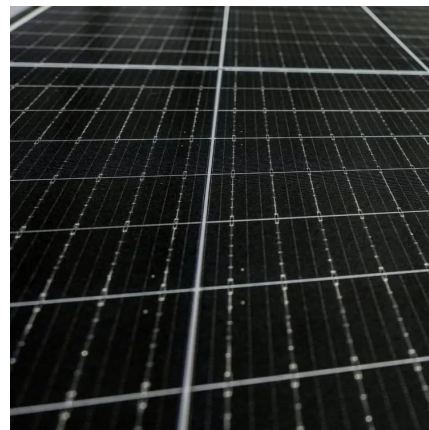
5G base stations use high power consumption and high RF signals, which require more signal processing for digital and electromechanical units, ...

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[Energy-efficient 5G for a greener future](#)

For example, the power consumption of the air conditioning system at the base station can be significantly reduced if a cloud-RAN (C-RAN) architecture, which is based on ...

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[Front Line Data Study about 5G Power Consumption](#)

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 ...

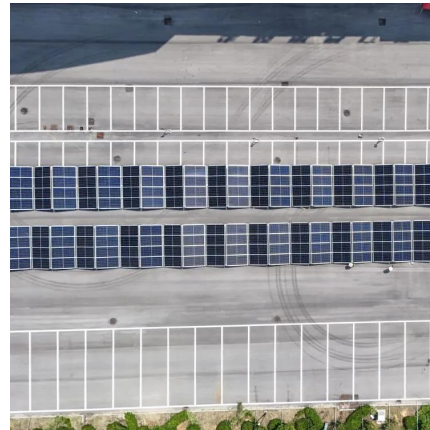
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What are the power delivery challenges with 5G to ...

The two primary power delivery challenges with 5G new radio (NR) are improving operational efficiency and maximizing sleep time.

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

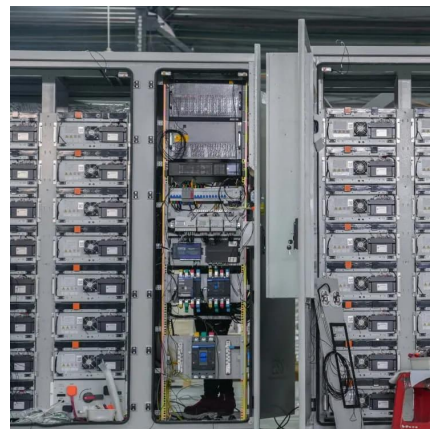
Aiming at minimizing the base station (BS) energy consumption under low and medium load scenarios, the 3GPP recently completed a Release 18 study on energy saving ...

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5G base stations and the challenge of thermal ...

Phase change 5G materials enhance the transfer of heat to heat sinks, which allows the component to run at a lower temperature, minimizing ...

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5G Power: Creating a green grid that slashes costs, ...

Energy consumption per unit of data (watt/bit) is much less for 5G than 4G, but power consumption is much higher. In the 5G era, the maximum energy ...

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

5G base stations use high power consumption and high RF signals, which require more signal processing for digital and electromechanical units, and also put greater pressure ...

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

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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Dynamical modelling and cost optimization of a 5G base station ...

For energy efficiency in 5G cellular networks, researchers have been studying at the sleeping strategy of base stations. In this regard, this study models a 5G BS as an $(M^{\wedge} \{ \dots$

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[Front Line Data Study about 5G Power Consumption](#)

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 ...

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5G Energy Efficiency Overview

In this paper, we do an overview of power consumption and improvements made so far on the networks and user equipment side and provide our proposals on how to overcome these ...

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What is the reason for the high energy consumption of 5G base station

According to the "5G Power White Paper" released by Huawei last year, from 4G to 5G, although the power consumption per unit flow has been greatly reduced, the total power ...

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Energy-efficiency schemes for base stations in 5G heterogeneous

In the coming future due to the 5G network, the environmental sustainability and energy consumed by the femtocell BSs will turn into a big problem. Hence, effective strategies for ...

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Measurements and Modelling of Base Station Power Consumption under Real

Power consumption caused by air conditioning can be reduced by minimizing the operational temperature of base station models, or by using additional elements like heat exchangers, ...

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Modelling the 5G Energy Consumption using Real-world Data: ...

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

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 savi

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How Much Power Does a 5G Base Station Consume? - Smart Solar

The rise of 5G technology brings faster speeds and lower latency, but it also raises questions about its energy consumption. As 5G networks are rolled out across the globe, it is important ...

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(PDF) 5G Energy Efficiency Overview

It is a critical requirement for the future of 5G communication networks to provide high speed and significantly reduce network energy ...

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Energy consumption optimization of 5G base stations considering

The ECOS-BS strategy proposed in this paper can reduce the connection between UEs and MBSSs, and maximize the number of sleeping SBSs through the VTSP process, ...

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What are the power delivery challenges with 5G to maximize

The two primary power delivery challenges with 5G new radio (NR) are improving operational efficiency and maximizing sleep time.

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Energy-saving Scheme of 5G Base Station Based on LSTM ...

Abstract. As China's new infrastructure, 5G has received national and social attention. 5G promotes economic to grow rapidly. But, the high energy consumption caused by ...

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

Abstract 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 ...

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