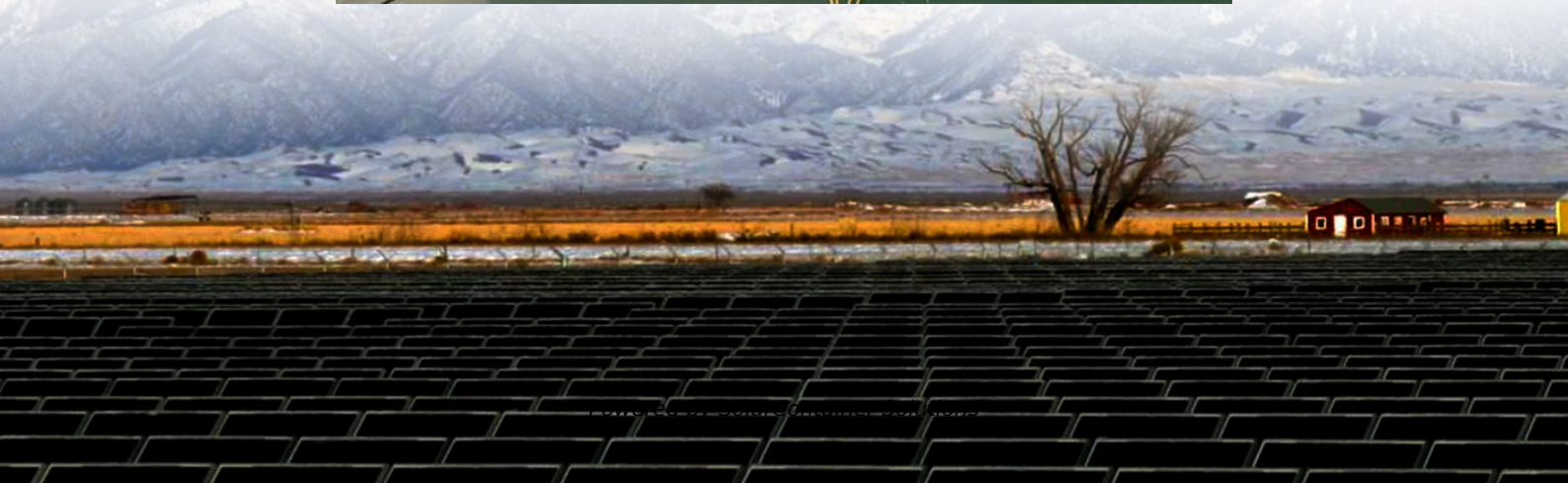


How to reduce power consumption in 5G base stations





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 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 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 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].

Is a 5G energy saving solution enough?



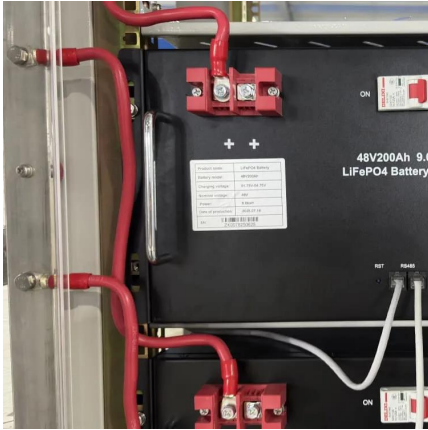
It also analyses how enhanced technologies like deep sleep, symbol aggregation shutdown etc., have been developing in the 5G era. This report aims to detail these fundamentals. However, it is far away from being enough, a revolutionized energy saving solution should be taken into consideration.

How to choose a 5G energy-optimised network?

Certain factors need to be taken into consideration while dealing with the efficiency of energy. Some of the prominent factors are such as traffic model, SE, topological distribution, SINR, QoS and latency. To properly examine an energy-optimised network, it is very crucial to select the most suitable EE metric for 5G networks.



How to reduce power consumption in 5G base stations



[Improving energy performance in 5G networks and beyond](#)

The lean design of 5G NR standards represents a major improvement compared to LTE, enabling unprecedentedly low energy consumption in 5G networks, and beyond.

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[How to Reduce Your 5G Energy Footprint](#)

For example, a 5G base station needs 3X more power than a 4G base station. ABI Research's 5G Energy Consumption and Operator Sustainability Initiatives report looks at the best ...

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A Holistic Study of Power Consumption and Energy Savings ...

The power consumption of a 5G base station using massive MIMO is dominated by the power consumption of the radio units whose power amplifier(s) consume most of the energy, thus ...

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5G Energy Efficiency Overview

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



consumption. In the Fifth Generation (5G), ...

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China Mobile Reduces the Power Consumption of 5G Base Station

The company's goal is to reduce the peak power consumption of 5G base stations to twice that of 4G by 2025. By the end of March 2021, the number of 5G base stations in China ...

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

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[Dynamic Power Management for 5G Small Cell Base Station](#)

5G networks with small cell base stations are attracting significant attention, and their power consumption is a matter of significant concern. As the increase of the expectation, concern for ...

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[How to Reduce Your 5G Energy Footprint](#)

To reduce energy consumption from the use of 5G, telco companies must pay close attention to three key levels: the network level, the equipment level, and the site level. From promising ...

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[Power Consumption of 4G and 5G Networks](#)

?Another trend worth noting is the rise in data center power consumption in 5G. With many of the core network services moving to the ...

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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

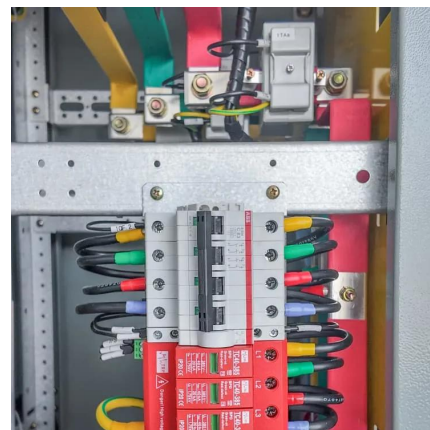
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Analysis of power consumption in standalone 5G network and ...

This paper proposes two modified power consumption models that would accurately depict the power consumption for a 5G base station in a standalone network and a novel ...

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[Reducing energy use with 5G-Advanced](#)

As the radio technology strongly influences the ability to minimize energy use, Nokia is also actively engaged in the 3GPP standardization of new enablers in 5G-Advanced. These ...

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[Reducing energy use with 5G-Advanced](#)

In this white paper, we examine the 5G RAN energy-saving techniques introduced in 3GPP Release 18, describe how these can strengthen the broad energy-saving toolbox offered by ...

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[5G Base Station Saves Energy And Reduces Consumption](#)

The power consumption of 5G equipment is a serious challenge facing operators. At the same time, in the context of green and low-carbon development around the world, saving energy, ...

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Analysis of energy efficiency of small cell base station in 4G/5G

To get the energy efficiency, in this research work, we have addressed the total power consumption and delay of User Requests (URs) in the small cell as well as 5G small ...

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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 ...

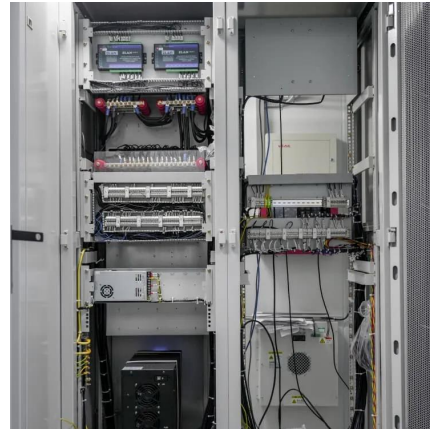
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[5G base stations use a lot more energy than 4G base ...](#)

However, Li says 5G base stations are carrying five times the traffic as when equipped with only 4G, pushing up power consumption. The carrier is ...

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

One advantage of using SUV deployment base stations in the early stages of China's 5G network construction is that. 5G base stations can be ...

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[Carbon emissions of 5G mobile networks in China](#)

Here we develop a large-scale data-driven framework to quantitatively assess the carbon emissions of 5G mobile networks in China, where over 60% of the global 5G base ...

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

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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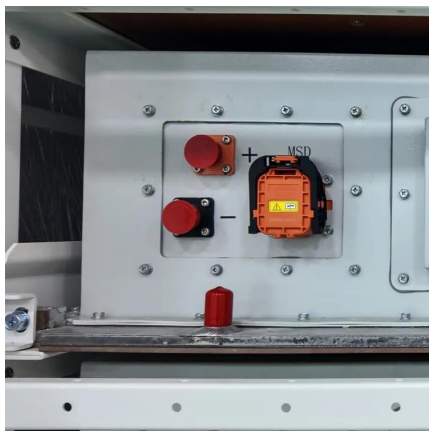




What is 5G Energy Consumption?

Liquid-cooled base stations to replace wasteful air conditioning units, redesigned chipsets to improve computing efficiency, and gallium nitride amplifiers to increase power density are ...

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

One advantage of using SUV deployment base stations in the early stages of China's 5G network construction is that. 5G base stations can be directly installed on the ...

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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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[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 ...

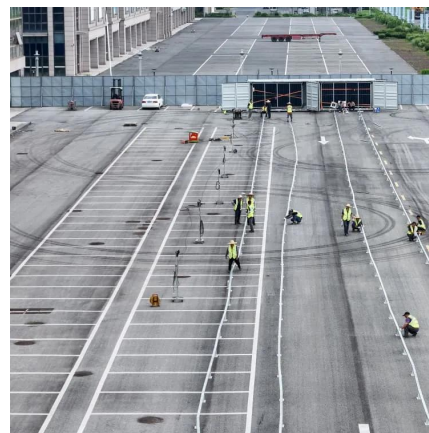
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A Power Consumption Model and Energy Saving Techniques for ...

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