

SolarTech Power Solutions

Electricity consumption of communication network base stations



Overview

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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.

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. In recent years, the design of new methods for decreasing the RAN power.

This paper conducts a literature survey of relevant power consumption models for 5G cellular network base stations and provides a comparison of the models. It highlights commonly made assumptions and relations between available models and provides guidance for selection and categorization of a.

For telecom operators, the quality of the network is the focus of operation cost control, and the quality of the network depends on the number of base stations and coverage in the network. However, when telecom operators carry out network optimization, they will encounter such a problem: how to. Do base stations dominate the energy consumption of the radio access network?

Furthermore, the base stations dominate the energy consumption of the radio access network. Therefore, it is reasonable to focus on the power consumption

of the base stations first, while other aspects such as virtualization of compute in the 5G core or the energy consumption of user equipment should be considered at a later stage.

What is a base station power consumption model?

In recent years, many models for base station power consumption have been proposed in the literature. The work in proposed a widely used power consumption model, which explicitly shows the linear relationship between the power transmitted by the BS and its consumed power.

How do base stations affect mobile cellular network power consumption?

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How to reduce the energy consumption of a base station?

So when the inter-cell distance is too large, it is necessary to increase the distance between cells, thus reducing the power consumption of the base station. In the actual network, in order to reduce the energy loss caused by frequent switching, the following two methods can usually be used: increase the distance between cells.

What is the largest energy consumer in a base station?

The largest energy consumer in the BS is the power amplifier, which has a share of around 65% of the total energy consumption . Of the other base station elements, significant energy consumers are: air conditioning (17.5%), digital signal processing (10%) and AC/DC conversion elements (7.5%) .

Is there a direct relationship between base station traffic load and power consumption?

The real data in terms of the power consumption and traffic load have been obtained from continuous measurements performed on a fully operated base station site. Measurements show the existence of a direct relationship between base station traffic load and power consumption.

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