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Title: Outdoor base station energy-saving design standards

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What is the energy-saving technology of base stations?

This technical report focuses on energy-saving technology of base stations. Some energy saving technologies since 4G era will be explained in details, while artificial intelligence and big data technology will be introduced in response to the requirement of an intelligent and self-adaptive energy saving solution.

How can a base station save energy?

There are two main methods of base station energy saving, including hardware and software.

What are the standardized energy-saving metrics for a base station?

(1) Energy-saving reward: after choosing a shallower sleep strategy for a base station, the system may save more energy if a deeper sleep mode can be chosen, and in this paper, the standardized energy-saving metrics are defined as (18) $R_{ie} = E_{SM} - 0 E_{SM} = i E_{SM} - 0 E_{SM} = 3$

Why do base stations waste so much energy?

When there is little or no communication activity, base stations typically consume more than 80% of their peak power consumption, leading to significant energy waste. This energy waste not only increases operational costs, but also burdens the environment, which is contrary to global sustainability goals.

Aiming at the problem of mobile data traffic surge in 5G networks, this paper proposes an effective solution combining massive multiple-input multiple-output techniques ...

The present document defines the dynamic measurement method for evaluating energy efficiency of 5G radio Base Stations with respect to the eMBB use case only.

A literature review is presented on energy consumption and heat transfer in recent fifth-generation (5G) antennas in network base ...

A literature review is presented on energy consumption and heat transfer in recent fifth-generation (5G) antennas in network base stations.

Modern base station equipment is designed with energy-saving technologies such as high-efficiency power amplifiers, low-loss cables, and intelligent control systems.

Discover the Large-scale Outdoor Communication Base Station, designed for smart cities, communication networks, and power systems. Integrated with solar, wind, and energy storage ...

Various approaches have been proposed to reduce the energy consumption of an RBS, for instance, passive cooling techniques, energy-efficient backhaul solutions, and distributed base ...

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 ...

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 forecast and optimize the ...

The rapid development of Fifth Generation (5G) mobile communication system has resulted in a significant increase in energy consumption. Even with all the effort.

Figure 8. Comparison of electricity consumption equipment cabinet between 12 °C and 39 °C, in winter which meets the national standard for outdoor communication base stations, thus, there ...

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