

What is 5G base station?

1. Introduction 5G base station (BS), as an important electrical load, has been growing rapidly in the number and density to cope with the exponential growth of mobile data traffic. It is predicted that by 2025, there will be about 13.1 million BSs in the world, and the BS energy consumption will reach 200 billion kWh.

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.

How to evaluate a 5G energy-optimised network?

To properly examine an energy-optimised network, it is very crucial to select the most suitable EE metric for 5G networks. EE is the ratio of transmitted bits for every joule of energy expended. Therefore, while measuring it, different perspectives need to be considered such as from the network or user's point of view.

What is 5G BS power consumption?

The 5G BS power consumption mainly comes from the active antenna unit (AAU) and the base band unit (BBU), which respectively constitute BS dynamic and static power consumption. The AAU power consumption changes positively with the fluctuation of communication traffic, while the BBU power consumption remains basically unchanged.

What is 5G New Radio?

5G New Radio (NR) is designed to enable denser network deployments and simultaneously deliver increased energy efficiency, thus reducing both operational costs and environmental impacts. Before we explore the new technical features, let's look more closely at how the existing 4G LTE radio networks function.

How does mobile data traffic affect the energy consumption of 5G base stations?

The explosive growth of mobile data traffic has resulted in a significant increase in the energy consumption of 5G base stations (BSs).

The energy management model of communications equipment in the 5G macro BS network was described in the previous section. BS sleeping and user allocation strategies were adopted to ...

We propose transforming base stations into energy-communication-transportation integrated hubs by adding electric vehicle supply equipment (EVSE), which can utilize excess ...

Abstract--The energy consumption of the fifth generation (5G) of mobile networks is one of the major

concerns of the telecom industry. However, there is not currently an accurate and ...

The popularity of 5G enabled services are gaining momentum across the globe. It is not only about the high data rate offered by the 5G but also its capability to accommodate myriad of ...

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 ...

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 ...

In this study, the idle space of the base station's energy storage is used to stabilize the photovoltaic output, and a photovoltaic storage system microgrid of a 5G base station is ...

With the advent of the 5G era, mobile users have higher requirements for network performance, and the expansion of network coverage has become an inevitable trend. Deploying micro 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 ...

Importantly, this study item indicates that new 5G power consumption models are needed to accurately develop and optimize new energy saving solutions, while also considering the ...

creased the demand for backup energy storage batteries. To maximize overall benefits for the investors and operators of base station energy storage, we proposed a bi-level optimization ...

An energy consumption optimization strategy of 5G base stations (BSs) considering variable threshold sleep mechanism (ECOS-BS) is proposed, which includes the initial ...

This paper proposes a double-layer clustering method for 5G base stations and an integrated centralized-decentralized control strategy for their participation in frequency ...

