

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 [1] proposed a widely used power consumption model, which explicitly shows the linear relationship between the power transmitted by the BS and its consumed power.

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.

How do base stations affect mobile cellular network power consumption?

Base stations represent the main contributor to the energy consumption of a mobile cellular network. Since traffic load in mobile networks significantly varies during a working or weekend day, it is important to quantify the influence of these variations on the base station power consumption.

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.

Which base station elements consume the most energy?

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%). New research aimed at reducing energy consumption in the cellular access networks can be viewed in terms of three levels: component, link and network.

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Energy consumption is a big issue in the operation of communication base stations, especially in remote areas that are difficult to connect with the traditional power grid, ...

Since the sites we visited were all outdoors, there wasn't much more equipment consuming the energy besides the radio units and the base band units, therefore we constructed regression ...

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 ...

The energy consumption of 5G networks is one of the pressing concerns in green communications. Recent research is focused towards energy saving techniques of base ...

The architectural differences of these networks are highlighted and power consumption analytical models that characterize the energy consumption of radio resource ...

However, there is still a need to understand the power consumption behavior of state-of-the-art base station architectures, such as multi-carrier active antenna units (AAUs), as well as the ...

Power consumption models for base stations are briefly discussed as part of the development of a model for life cycle assessment. An overview of relevant base station power ...

By conducting detailed measurements across various base station configurations, the study will aim to uncover the operations that consume the most energy, whether related to high data ...

Frequent electricity shortages undermine economic activities and social well-being, thus the development of sustainable energy storage systems (ESSs) becomes a center ...

The potential increase in energy consumption is not only due to the increase in the number of base stations, but also due to the increased energy consumption of operating a ...

In this paper we have developed a power consumption model for macro base stations which comprises of a static power consumption part only. In contrast to that, a power consumption ...

