

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.

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.

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%).

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.

How much energy does a BS site use?

Assuming for simplicity equal energy consumption for each month during a year, total yearly energy consumption of this BS site is 64,171.2 kW. The operator has approximately 2,000 installed BS sites and average energy consumption per site is approximately 60% of monthly/yearly consumption of the analyzed BS site.

What percentage of AC power consumption is caused by telecommunication equipment?

Figure 17 shows the percentage of the active power consumption in the site's total AC power consumption, for each of the analyzed equipments. According to Figure 17, a major fraction (52% cumulatively) of the total site consumption is caused by the analyzed telecommunication equipment, namely the GSM 900 sector 1 and 2, GSM 1800 and UMTS BSs.

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 ...

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 ...

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