

SolarInnovate Energy Solutions

How to calculate the electricity price of communication base stations



Overview

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.

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.

Can power models be used for macro and micro base stations?

In this paper we developed such power models for macro and micro base stations relying on data sheets of several GSM and UMTS base stations with focus on component level, e.g., power amplifier and cooling equipment. In a first application of the model a traditional macro cell deployment and a heterogeneous deployment are compared.

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 do you calculate the power consumption of a BS?

Therefore, the total power consumption of all BSs at time t , $P_{BS,all}(t)$, is expressed as follows: (3) $P_{BS,all}(t) = \sum_{i=0}^M s_i(t) \times [a_i + b_i \times T_i(t)] + (1 - s_i(t)) \times P_{sleep,i}$ Generally, UEs will be interfered by other BSs and accompanied by noise interference when receiving useful signals.

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