

Estimation of power supply costs for 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.

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.

Can a base station Power model be combined?

As the main components are common to most of the models, they can be easily combined to form a new model. Most of the base station power models are based on measurements of LTE (4G) hardware or theoretical assumptions. For the more recent models, based on measurements of 5G hardware, the parameter values are not publicly available.

What are base station models?

The base station models vary in their approaches and potential use cases. Hereafter, the models are grouped according to these aspects. Main component models only model the power consumption of the main base station components (power amplifier, analog frontend, baseband unit, active cooling, power supply) separately.

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.

Do telecommunication towers contain Base Transceiver Stations (BTS)?

Abstract: Telecommunication towers for cell phone services contain Base Transceiver Stations (BTS). As the BTS systems require an uninterrupted supply of power, owing to their operational criticality, the demand for alternate power sources has increased in regions with unreliable and intermittent utility power.



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Comprehensively evaluate various factors and select the most suitable power system design scheme to ensure the stable and reliable operation of the base station.

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Optimized Power System Planning for Base Transceiver Station ...

In this paper, we present three such alternate frameworks for power supply to the BTS in case of a power failure; to supply uninterrupted and continuous power to the sites.

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