SolarInnovate Energy Solutions

Energy consumption formula of communication base station

Overview

A linear equation is developed is Y = 1.713×X + 1.274, where Y is power consumption and X is traffic generated, which shows that the power consumption of base stations linearly depends on the traffic generated.What is a base station power consumption model?

In recent years, many models for base station power con-sumption have been proposed in the literature. The work in proposed a widely used power consumption model, which explicitly shows the linear relationship between the power transmitted by the BS and its consumed power.

How do you calculate energy consumption of wireless communication systems?

The first step when modeling the energy consumption of wireless communication systems is to derive models of the power consumption for the main system components, which are then combined with time-dependent traffic load models to estimate the consumed energy.

How can a power consumption model be used to estimate power consumption?

Quantification models are most suitable for quantifying overall power consumption of base station or even networks as part of large-scale evaluations. The number and complexity of parameters is limited, and simple usage with load profiles or traffic models is possible to estimate total energy 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.

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.

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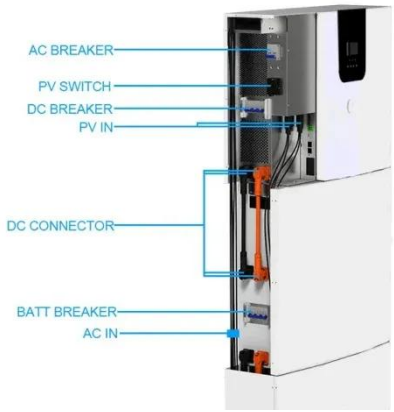

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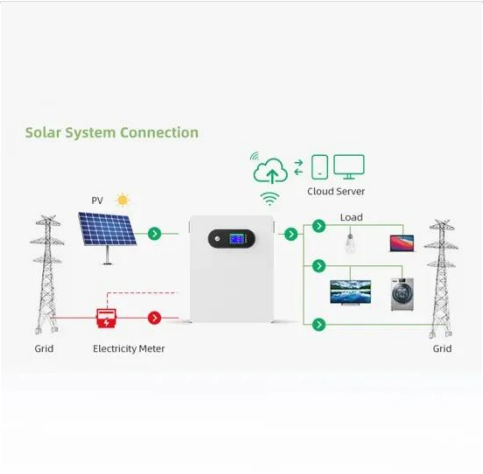

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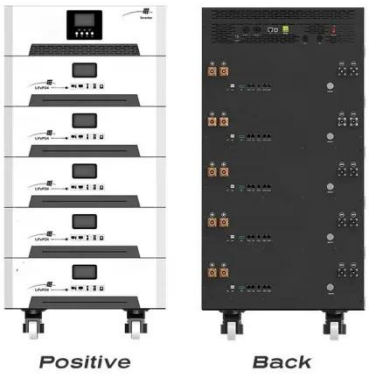

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