

What are the expanded attributes of 5G base stations in the power system





Overview

Today we see that a major part of energy consumption in mobile networks comes from the radio base station sites and that the consumption is stable. We can also see that even in densely deployed networks.

Why do we need a 5G base station?

The limited penetration capability of millimeter waves necessitates the deployment of significantly more 5G base stations (the next generation Node B, gNB) than their 4G counterparts to ensure network coverage. Notably, the power consumption of a gNB is very high, up to 3–4 times of the power consumption of a 4G base stations (BSs).

Why does 5G use more power than 4G?

A typical 5G base station consumes three times more power than a 4G station. This is due to the need for higher frequencies, greater bandwidth, and more antennas to ensure connectivity. For telecom providers, this means higher operational costs and increased demand for sustainable energy solutions.

Will 4G base stations be upgraded to non-standalone 5G?

Upgrading 4G base stations by software to non-standalone (NSA) 5G will still require hardware changes. It will act as an interim, but it will still not satisfy the need for true 5G network architecture. The number of base stations needed increases with each generation of mobile technology to support higher levels of data traffic.

How a 5G network can support a power system?

The 5G network and power system are coupled energetically by power feeders. Based on gNB-sleep actions and mode switching of their BESSs, 5G network can provide power support to the power system when the grid frequency deviation reaches the threshold.

How many 5G base stations are there in the United States?

While China leads in sheer numbers, the U.S. is making steady progress. By



late 2023, the country had between 150,000 and 200,000 active 5G base stations. The deployment strategy in the U.S. is different from China's, as it relies on private investment rather than government-led initiatives. Is this article too long?

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Are 5G network operators motivated to cooperate with the power system?

On the one hand, 5G network operators are highly motivated to cooperate with the power system in energy matters, given that the numerous gNBs with their high energy consumption result in significant electricity bills that can be troublesome for the operators , .



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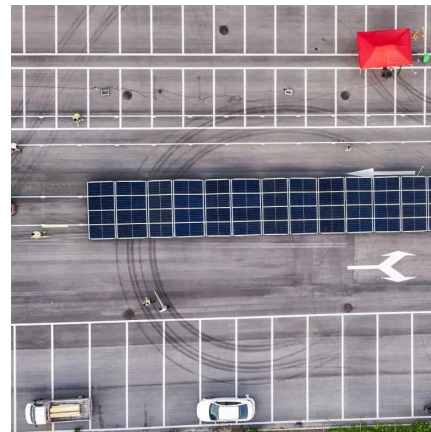


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