

# Analysis of the current cost of power supply for communication base stations

How much power does a base station use?

BSs are categorized according to their power consumption in descending order as: macro, micro, mini and femto. Among these, macro base stations are the primary ones in terms of deployment and have power consumption ranging from 0.5 to 2 kW. BSs consume around 60% of the overall power consumption in cellular networks.

How does the range of base stations affect energy consumption?

This in turn changes the traffic load at the BSs and thus their rate of energy consumption. The problem of optimally controlling the range of the base stations in order to minimize the overall energy consumption, under constraints on the minimum received power at the MTs is NP-hard.

How much power does a macro base station use?

Among these, macro base stations are the primary ones in terms of deployment and have power consumption ranging from 0.5 to 2 kW. BSs consume around 60% of the overall power consumption in cellular networks. Thus one of the most promising solutions for green cellular networks is BSs that are powered by solar energy.

Are solar powered base stations a good idea?

Base stations that are powered by energy harvested from solar radiation not only reduce the carbon footprint of cellular networks, they can also be implemented with lower capital cost as compared to those using grid or conventional sources of energy. There is a second factor driving the interest in solar powered base stations.

What are the components of a solar powered base station?

solar powered BS typically consists of PV panels, batteries, an integrated power unit, and the load. This section describes these components. Photovoltaic panels are arrays of solar PV cells to convert the solar energy to electricity, thus providing the power to run the base station and to charge the batteries.

How much power does a BS use?

In particular, the deployed BSs use compression techniques so that voice calls require rates of 4 kbps (compared to 14 kbps in conventional systems) and each cell site has an average power consumption of 90 W (compared to 130 W or more).

Optimization and economic analysis of solar PV based hybrid system for powering Base Transceiver Stations in India Niranjana Rao Devela a, Bhim Singh b, Tara C. Kandpal a ...

Furthermore, the power supply showed peak power shaving of 5kW; thus, reducing the reliance on the grid as well as increased the energy-efficiency of this hybrid power supply ...

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Cellular base stations powered by renewable energy sources such as solar power have emerged as one of the promising solutions to these issues. This article presents an overview of the ...

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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 ...

