

New policy on solar photovoltaic power supply for communication base stations

Are solar powered cellular base stations a viable solution?

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 state-of-the-art in the design and deployment of solar powered cellular 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.

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 photovoltaic panels & how do they work?

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. Photovoltaic panels are given a direct current (DC) rating based on the power that they can generate when the solar power available on panels is 1 kW/m².

How do solar powered BSS share energy?

To share resources so that outages are minimized or the quality of service (QoS) of users is improved, solar powered BSs may share energy either directly through electrical cables, or indirectly through power-control/load-balancing/spectrum-sharing mechanisms.

Why is spectrum sharing a problem in solar powered BS?

Spectrum sharing in solar powered BSs is motivated by the fact that for a given rate requirement and channel noise (e.g. in an AWGN channel), the transmit power may be reduced by increasing the bandwidth, and vice-versa. The problem of energy and spectrum sharing may also be considered jointly.

In remote areas or islands where it is difficult to access the traditional power grid, the solar power supply system can provide stable power support for power and communication base stations, ...

Integrating distributed PV with base stations can not only reduce the energy demand of the base station on the power grid and decrease carbon emissions, but also effectively reduce the ...

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