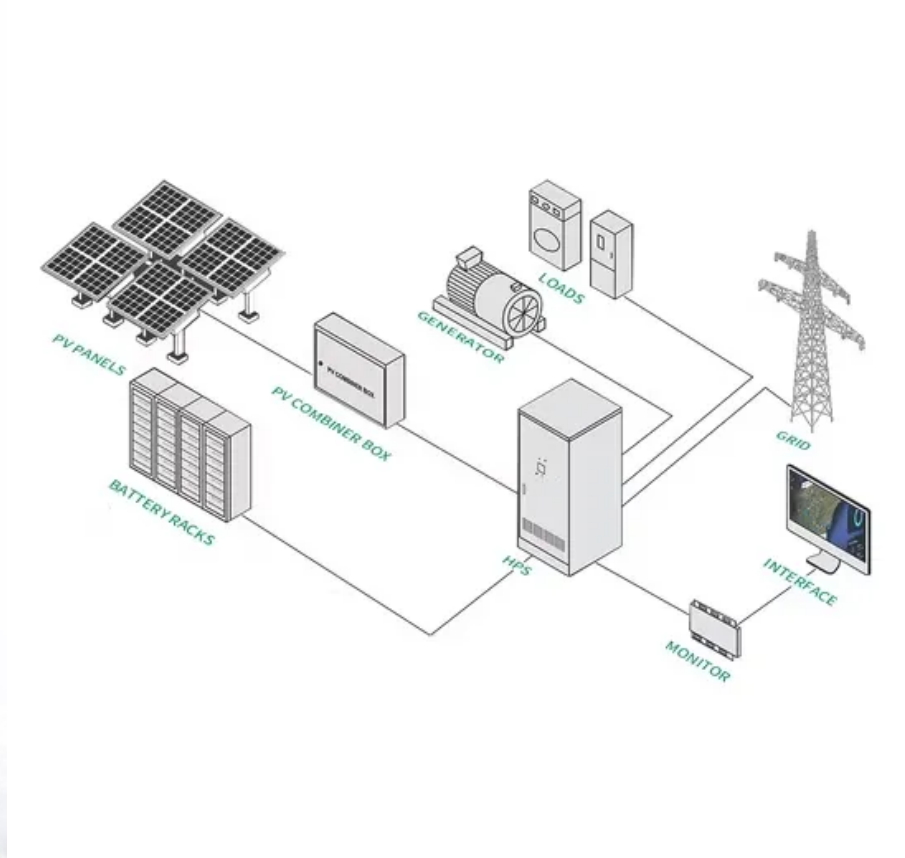


SolarInvert Energy Solutions

Communication base station energy management system and universal medical care



Overview

How to make base station (BS) green and energy efficient?

This paper aims to consolidate the work carried out in making base station (BS) green and energy efficient by integrating renewable energy sources (RES). Clean and green technologies are mandatory for reduction of carbon footprint in future cellular networks.

What are the components of a base station?

A typical base station consists of different sub-systems which can consume energy as shown in Fig. 4. These sub-systems include baseband (BB) processors, transceiver (TRX) (comprising power amplifier (PA), RF transmitter and receiver), feeder cable and antennas, and air conditioner (Ambrosy et al., 2011).

How many Bs are in a $4 \times 4 \text{ K m}^2$ LTE coverage area?

Simulations are done for a $4 \times 4 \text{ K m}^2$ LTE coverage area for a total 16 BS placed uniformly. The results were compiled for 48 h, which showed 15–16 active BSs in peak hours and 1–2 BSs in night/off-peak hours, serving all users.

How can radio resources be manipulated to conserve energy?

The radio resources can be manipulated to conserve energy by adapting the capacity and/or converge of the green BS. This is demonstrated in (Valerdi et al., 2010), where both aspects are optimized according to the available renewable energy and battery back-up available.

How can multi-cell cooperation optimize BS' energy consumption?

Scheduling of cell sizes, like dividing a macro cell into micro cells, or shutting down micro cells by extending coverage (cell zooming) with macro cell when traffic is low, is another way of multi-cell cooperation to optimize BS' energy usage (Le et al., 2011).

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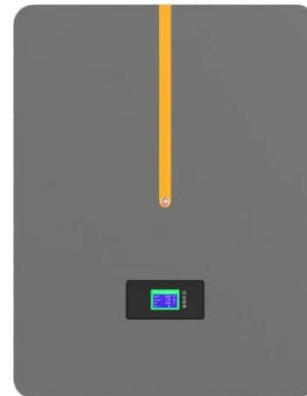
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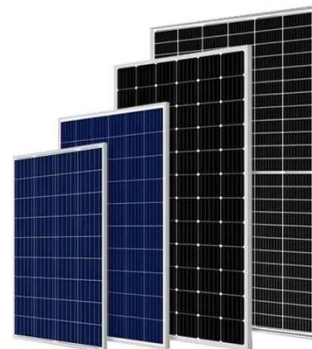
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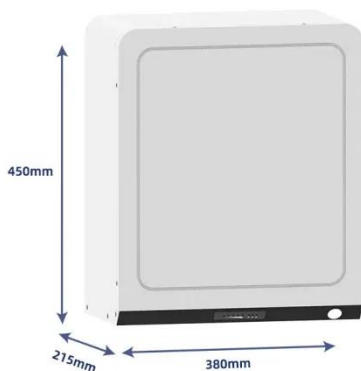
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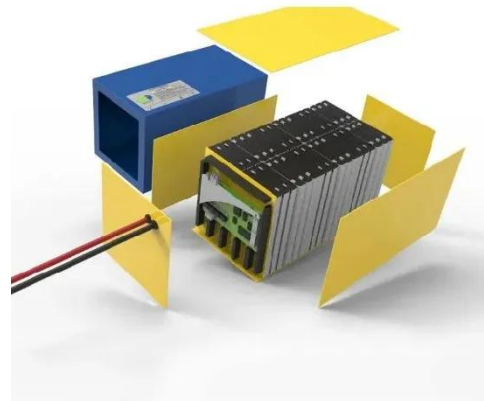
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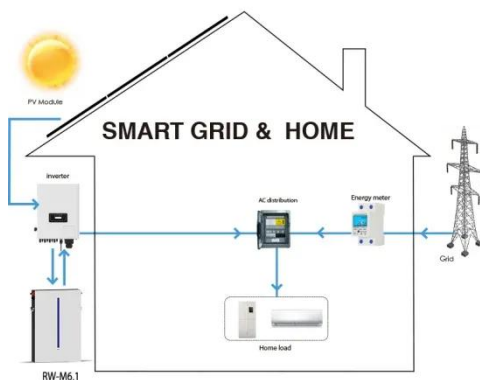
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