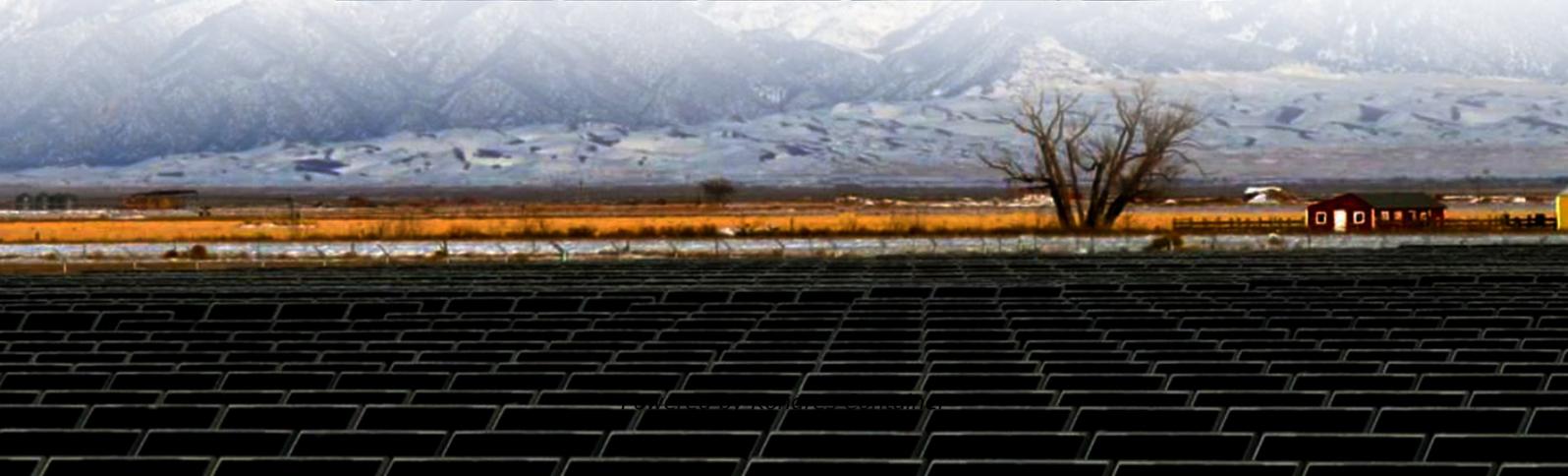


## Kongres Container

# How is the profit of wind and solar complementary for communication base stations



## Overview

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Can solar power improve China's base station infrastructure?

Traditionally powered by coal-dominated grid electricity, these stations contribute significantly to operational costs and air pollution. This study offers a comprehensive roadmap for low-carbon upgrades to China's base station infrastructure by integrating solar power, energy storage, and intelligent operation strategies.

How much energy does a communication base station use a day?

A small-scale communication base station communication antenna with an average power of 2 kW can consume up to 48 kWh per day. 4,5,6 Therefore, the low-carbon upgrade of communication base stations and systems is at the core of the telecommunications industry's energy use issues.

Can a solar-wind system meet future energy demands?

Accelerating energy transition towards renewables is central to net-zero emissions. However, building a global power system dominated by solar and wind energy presents immense challenges. Here, we demonstrate the potential of a globally interconnected solar-wind system to meet future electricity demands.

What is the complementary coefficient between wind power stations and photovoltaic stations?

Utilizing the clustering outcomes, we computed the complementary coefficient  $R$  between the wind speed of wind power stations and the radiation of photovoltaic stations, resulting in the following complementary coefficient matrix (Fig. 17.).

Is there a complementarity between wind and solar energy?

Studying the complementarity between wind and solar energy is crucial for optimizing the use of these renewable resources. Multi-energy compensation

systems need to consider multiple metrics, and current research relies on the correlation of single metrics to study this complementarity.

How does a base station work?

In this scheme, the base station is powered by solar panels, the electrical grid, and energy storage units to ensure the stability of energy supply. When there is a surplus of energy supply, the excess electricity generated by the solar panels is stored in the energy storage units.

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