

## A-Core Container

# The latest requirements for wind and solar complementary ratios for communication base stations



## Overview

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Is a multi-energy complementary wind-solar-hydropower system optimal?

This study constructed a multi-energy complementary wind-solar-hydropower system model to optimize the capacity configuration of wind, solar, and hydropower, and analyzed the system's performance under different wind-solar ratios. The results show that when the wind-solar ratio is 1.25:1, the overall system performance is optimal.

Can a multi-energy complementary power generation system integrate wind and solar energy?

Simulation results validated using real-world data from the southwest region of China. Future research will focus on stochastic modeling and incorporating energy storage systems. This paper proposes constructing a multi-energy complementary power generation system integrating hydropower, wind, and solar energy.

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.).

What is a good wind-solar ratio?

The results show that when the wind-solar ratio is 1.25:1, the overall system performance is optimal. At this ratio, the maximum wind-solar integration capacity reaches 3938.63 MW, with a curtailment rate of wind and solar power kept below 3 % and a loss of load probability maintained at 0 %.

How to determine the optimal rate of wind and PV capacity?

Then, the system's optimal rate of wind and PV capacity is determined by

choosing the largest complementarity evaluation index. This can reduce the fluctuation of the power generation system and improve the reliability of the system's capacity. 2.2. The timing production simulation model for optimizing hydropower output.

How to measure complementarity between wind speed and radiation?

The Kendall CC, Spearman CC, and fluctuation coefficient are combined to construct a comprehensive measure of the complementarity between wind speed and radiation, which provides a reliable tool for quantitatively evaluating the complementary characteristics of wind and solar energy. 2. A copula-based wind-solar complementarity coefficient R

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