

## Kongres Container

# Key cost analysis of wind and solar complementary technology 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.

How to optimize wind and solar energy integration?

The optimization uses a particle swarm algorithm to obtain wind and solar energy integration's optimal ratio and capacity configuration. The results indicate that a wind-solar ratio of around 1.25:1, with wind power installed capacity of 2350 MW and photovoltaic installed capacity of 1898 MW, results in maximum wind and solar installed capacity.

What are the complementary characteristics of wind and solar energy?

The complementary characteristics of wind and solar energy can be fully utilized, which better aligns with fluctuations in user loads, promoting the integration of wind and solar resources and ensuring the safe and stable operation of the system. 1. Introduction.

Does wind-solar ratio affect installed capacity under different loss of load rates?

Fig. 12, Fig. 13, Fig. 14 illustrates the impact of different wind-solar ratio settings and wind and solar curtailment rate settings on the total installed capacity under different loss of load rates. It is clear that regardless of the wind and solar curtailment rate, the optimal installed capacity ratio is close to 1:1.

Does a higher wind and solar curtailment rate increase integrated solar capacity?

It is evident that regardless of the wind-solar ratio, a higher loss of load rate and wind and solar curtailment rate lead to a more considerable integrated wind and solar capacity. Through analysis, it can be inferred that increasing the wind and solar curtailment rate reduces the output fluctuation of new energy integrated into the system.

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