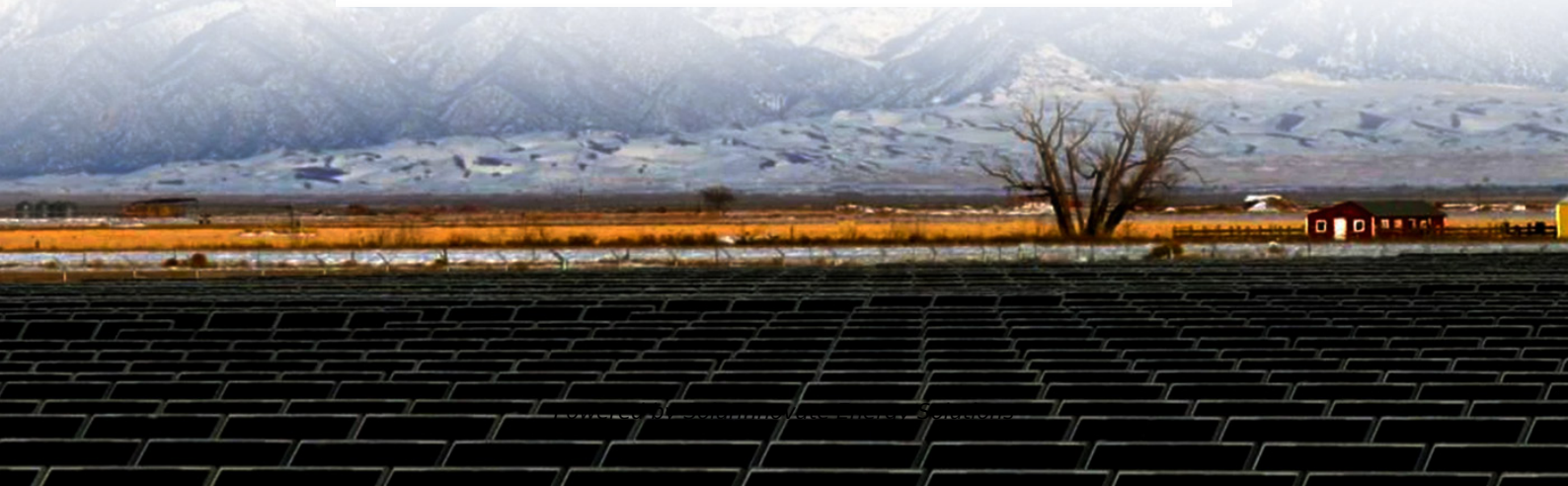
SolarInnovate Energy Solutions

Regulations on the distance between wind and solar complementary power stations



Overview

The complementarity between wind and solar resources is considered one of the factors that restrict the utilization of intermittent renewable power sources such as these, but the traditional complementarity ass.

Are wind-solar complementarities necessary for a hybrid energy system?

The inherent complementarity of wind and solar energy resources is beneficial to smooth aggregate power and reduce ramp reserve capacity. This article proposes a progressive approach to assess the wind-solar complementarities in Shandong province, China for the preliminary planning of hybrid energy systems.

Are wind and solar energy resources complementary in China?

The results reveal that wind energy and solar energy resources in China undergo large interannual fluctuations and show significant spatial heterogeneity. At the same time, according to the complementarity of wind and solar resources, over half of China’s regions are suitable for the complementary development of resources.

Are wind and solar energy resources complementary?

Finally, we also strive to harmonize regions where wind and solar resources are less complementary by introducing hydro-energy resources. The results reveal that wind energy and solar energy resources in China undergo large interannual fluctuations and show significant spatial heterogeneity.

Does complementarity support integration of wind and solar resources?

Monforti et al. assessed the complementarity between wind and solar resources in Italy through Pearson correlation analysis and found that their complementarity can favourably support their integration into the energy system. Jurasz et al. simulated the operation of wind-solar HES for 86 locations in Poland.

Do wind and solar resources have a complementarity metric system?

To this end, we propose a novel variation-based complementarity metrics system based on the description of series' fluctuation characteristics from quantitative and contoured dimensions. From this, the complementarity between wind and solar resources in China is assessed, and the trend and persistence are tested.

Which regions have a weak complementarity between wind and solar energy?

However, for the regions with relatively poor wind and solar resources, such as central Tibet, eastern Sichuan, western Yunnan, Chongqing, Guizhou, Zhejiang, Guangdong, and Guangxi, the complementarity is relatively weak.

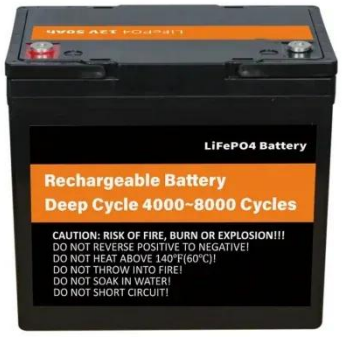
Regulations on the distance between wind and solar complementary

Optimizing the sizes of wind and photovoltaic power plants integrated

Feb 15, 2020 · Optimizing the site, size, and operation of complementary hydro-wind-PV power systems can fully utilize the natural space-time complementarity of the resources and the ...

Variation-based complementarity assessment between wind and solar

Feb 15, 2023 · The complementarity between wind and solar resources is considered one of the factors that restrict the utilization of intermittent renewable power sources such as these, but ...

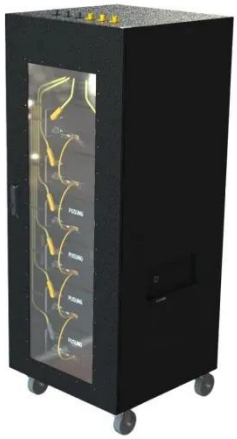


Generation expansion planning for Guizhou province based ...

Nov 1, 2022 · This paper introduces the basic information of the Guizhou provincial power system and geometrical renewable resource distribution characteristics, especially the power source ...

Variation-based complementarity assessment between wind and solar

Feb 15, 2023 · From this, the complementarity between wind and solar resources in China is assessed, and the trend and persistence are tested. Furthermore, the spatial compatibility ...



Capacity configuration optimization of wind-solar combined power

Dec 1, 2023 · Based on the existing installed capacity of local wind power, a concentrating solar power (CSP) station and its energy storage system are configured, and a two-layer capacity ...

Optimal site selection for wind-solar-hydrogen storage power ...

Mar 15, 2025 · (4) Hydrogen energy storage is incorporated into the site selection consideration of wind-solar complementary power stations, and multiple factors such as resources, climate, ...

Capacity planning for large-

scale wind-photovoltaic-pumped ...

Apr 1, 2025 · Lv et al. [15] proposed a dual-layer planning model for a hydropower-wind-solar complementary system, with an outer layer maximizing wind-solar capacity and an inner-layer ...

Assessing the potential and complementary characteristics ...

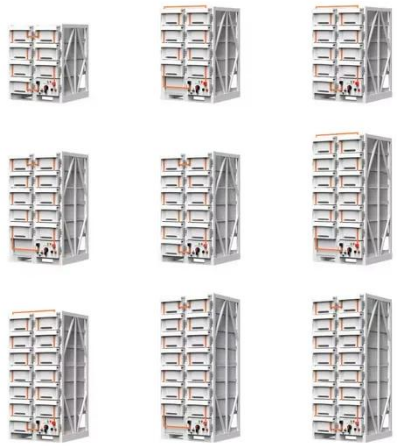
Aug 15, 2025 · Key findings include: 1) Under low-emission scenarios, PV potential steadily increases, while wind power density (WPD) slightly declines. In high-emission scenarios, both ...

Application of photovoltaics on different types of land in ...

Mar 1, 2024 · Land is a fundamental resource for the deployment of PV systems, and PV power projects are established on various types of land. As of the end of 2022, China has amassed ...

Exploring complementary effects of solar and wind power ...

Mar 1, 2025 · Given the above, this work aims to contribute to the theme in question - namely, simulation of renewable energies - by proposing a methodology to simulate joint scenarios for ...



Research on short-term joint optimization scheduling ...

Nov 1, 2023 · Due to its randomness, intermittence, and volatility, the high-proportional integration of wind and solar power poses challenges to the safe and stable operation of power systems. ...

Research status and future of hydro-related sustainable complementary

Jan 1, 2021 · Due to the increased awareness of environmental protection and the possible pollution caused by thermal power generation, research on hydro-related multi-energy ...

Multi-timescale scheduling optimization of cascade hydro-solar

Jan 27, 2025 · Multi-timescale scheduling optimization of cascade hydro-solar complementary power stations considering spatio-temporal correlation Li Shen1, Qing Wang1, Yizhi Wan2*, ...

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