Solar power generation in saline-alkali land in Northwest China

Is northwest China a good place for solar energy development?
Northwest China has abundant solar energy resources and extensive land, making it a pivotal site for solar energy development. However, restrictions on site selection and severe weather conditions have hindered the establishment and operation of photovoltaic (PV) power stations.

Why is solar energy scarce in Xinjiang?
Solar energy resources are scarce due to sandstorms and air pollution. In addition,the southern part of Xinjiang is mostly covered by mobile deserts,making construction,operation,and maintenance costs extremely high. The most suitable areas are located in the Gobi Desert and are close to crucial administrative centers.

What are the regional differences in solar energy resources in China?
There are great regional differences in solar energy resources in China (Jing et al., 2023). Solar energy resources in plateau areas and dry areas with little rain are larger, while those in plain areas and rainy areas with high humidity are smaller (Yao et al., 2022).

What are the different types of photovoltaic agriculture in China?
At present, there are four major modes of photovoltaic agriculture in China: photovoltaic planting, photovoltaic breeding, photovoltaic water conservancy and photovoltaic cottages (Xue, 2017). The "Photovoltaic + industry" refers to the integration of industrial and commercial plant roofs with PV applications.

What is the growth rate of wind and photovoltaic power in China?
During the 12th Five Year Plan for Economic and Social Development of the People's Republic of China (12th Five-Year Plan) period,the combined annual power generation of wind and photovoltaic (PV) power in China accounted for less than 4%,annual growth of about 0.6%(Fig. 1). Fig. 1.

Which country has abundant solar energy resources?
Overall,Chinabelongs to the country with abundant solar energy resources,with two-thirds of the country's regions having an annual radiation level of over 5,000 MJ/m 2. China is also a country with abundant wind energy resources. There are great regional differences in solar energy resources in China (Jing et al.,2023).

Thanks to its abundant resources, northwest China will not only achieve self-sufficiency in terms of wind and solar generation, but also facilitate the transmission of green ...

Winter irrigation is widely carried out to alleviate soil salinization in Northwest China. In recent years, the effects of irrigation amount and irrigation schedule on soil water ...

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The saline-alkali soil area accounts for over 1/4-1/5 of the land area in Gansu Province of China, which are mainly distributed in the north of Hexi corridor and Jingtai basin. ...

Studying land use change and its associated climate effects is important to understand the role of human activities in the regulation of climate systems. By coupling remote sensing measurements with a high-resolution ...

Developing effective irrigation and drainage strategies to improve the quality of saline-alkali soil is vital for enhancing agricultural production and increasing economic returns. ...

The Hetao irrigation region is located in Inner Mongolia, China, within a dry and semi-dry region. This region suffers from poor agricultural productivity and environmental damage due to the presence of saline soil. To ...

Saline and alkaline soil is notoriously difficult to farm, producing low crop yields. China has about 1.5 billion mu of saline-alkali land, of which around 500 million mu is available ...

The terrain in China rises from the southeast to the northwest, so the solar radiation is higher ... including sandy land, Gobi, bare rock land, saline-alkali land, marshland, ...

Currently, there are about 9.9×10 7 hm 2 of salt-affected soils in China, in which the modern saline soil is about 3.7×10 7 hm 2 . As an important reserved cropland resources, the ...

In October, Fuxian village in Shuangliao city, Northeast China"s Jilin province, unveiled a unique eco-friendly "solar-grazing" farm operated by China Three Gorges ...

To reach the goal of carbon emissions peaking by 2030 requires an increase of 6.17 × 106 kW in the installed capacity for wind and solar power generation in Golmud, would ...

Drip irrigation in agricultural saline-alkali land controls soil salinity and improves crop yield: Evidence from a global meta-analysis. Author links open overlay ... distribution and ...

Saline-alkali land is widely distributed on the earth, and the area of saline-alkali land in the world is about 1.0 × 10 9 hm 2, accounting for about 25% of the earth"s land area ...

The world"s salinized soil area accounts for 25% of the total land area and widely occurs in >100 countries and regions. In addition, the saline-alkali land area has consistently ...

Saline soil is a typical degraded soil, and more than 1125 million hectares of saline soil are distributed all over the world, and about 800 million hectares of available arable ...

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There are about 128,000 remote villages in China, where there are more than 7 billion people living in poverty without average power level for lighting [7].Even in some ...

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