Stratospheric wind and solar power

How do solar activity agents affect the stratospheric polar vortex?
Two solar activity agents are supposed to affect the stratospheric polar vortex: spectral solar irradiance through the "top-down" mechanism,and energetic particles. Increased UV irradiance was found to lead to a negative phase of the North Atlantic Oscillation,while increased energetic particles result in a positive phase.

Does solar power have a lower power spectrum than hydropower and wind power?
The power spectrum of the solar power potential is loweroverall than that of the hydropower and wind power potentials except at the annual peaks that appear for all energy sources (Fig. 2a); this finding suggests the overall lowest variance in solar power (except at the annual peak).

What is the vesg of wind and solar power?
By testing various shares of wind and solar power as complements to the existing hydropower system,we find that the share of 2:4:1 is close to a maximized VESG of 467 TWh,and these shares satisfy the energy production-consumption of 4494 TWh y -1.

How effective is solar and wind generation?
The efficacyof meeting electricity demands with generation from solar and wind resources depends on factors such as location and weather; the area over which generating assets are distributed; the mix and magnitude of solar and wind generation capacities; the availability of energy storage; and firm generation capacity 11,12,13,14,15,16.

Do geophysically-focused results explain regional solar- and wind-dominated electricity systems?
Our geophysically-focused results help to explainsuch results irrespective of cost assumptions. Indeed,we compare the estimates of reliability and capacities in this study with several techno-economic studies that have used independent approaches to model regional solar- and wind-dominated electricity systems in detail 29,44,45.

How are solar and wind data normalized?
The solar,wind,and demand data are each normalized by dividing by their respective 39-year mean value. Daily cycles of solar and wind resources in each country are also somewhat complementary. Wind power usually peaks at night and rarely falls to zero when resources are aggregated over an entire country.

Simulation results show that, 1) endurance of the stratospheric airship can be improved by adjusting power sequential during day and night with maneuverable wind ...

The influence of solar activity on the stratospheric atmosphere, including changes in Earth"s surface temperature, stratospheric temperature, wind fields, and cloud cover ...

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The Wind & Solar Tower (TM) The World"s Only Hybrid Generating System Powered by Both Wind and Sun. Each Wind & Solar Tower (TM) generates enough renewable energy to produce 234,154 kWh per year which provides over ...

The stratospheric airship is a type of aerostat that uses solar energy as its power source and can fly continuously for months or even years in near space. The rapid and accurate prediction of the output power of its solar ...

The zone presented the UAS with extremely demanding conditions with temperatures plummeting to lows of -73C and wind speeds of up to 58 knots or around 30 meters per second. Using all ...

The solar array layout is one of the critical factors affecting the output performance of a solar array on a stratospheric airship. Optimizing the layout to improve ...

The rotatable solar array system can comprehensively improve the solar array output power and the output power increment after optimization at high latitude is more than ...

Wind and solar are the cheapest solutions. Solar and wind power costs have been declining rapidly. During the decade to 2020, the cost of wind and solar power fell by ...

The manifestations of the solar poloidal field are the slow solar wind, and HSS"s from solar coronal holes. Numerous studies have found statistically significant correlations between solar activity and atmospheric ...

Thermal characteristics and output power performances are important factors to be considered in the design and operation of long endurance stratospheric airships.

This article aims to provide a comprehensive analysis of solar power vs wind power, compare and contrast solar energy and wind energy, and provide pros and cons of ...

An optimization model of the optimum area of solar array for a stratospheric solar-powered airship is developed. The objective of the optimization is to reduce the mass of ...

wind velocity, airship"s latitude and working date on the optimum area. The obtained result is a valuable ... Solar radiation that affects the output power of solar array on ...

In many cases, the best solution is to use a hybrid system that combines wind power and solar energy. Hybrid systems can provide a more reliable and consistent electricity supply than wind power or solar energy ...

Some researchers projected the solar array onto the direction of solar incident light, 6 or the coordinate planes of the earth coordinate system. 7 The output power can be ...

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The Rmean reproduces reasonably well the observed spatial patterns of solar irradiance, air temperature, total cloud cover, wind speed at 100 m above the ground level, ...

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