Advantages of the water-wind complementary power generation system

Can wind power complement hydropower?

For the sake of demonstrating the complementary capacity of hydropower,part of wind power is first used to complement hydro and PV,and the remaining wind power is then used to complement PV (Scheme 2). According to Schemes 1 and 2,the output fluctuation of the complementary system will significantly decrease with the help of HPU.

Does wind and hydro participate in a complementary system?

Therefore,Scheme 3 is proposed that all the hydro and wind participates in the complementary system. In Scheme 1,wind-PV complementation is dominant,that is,all wind power is involved in regulating the PV power,and the remaining PV power is complemented by hydropower.

How important is hydropower energy in the hydro-wind complementary system?

The importance of hydropower energy in the hydro-wind complementary system is revealed in by constructing a maximized wind-hydro power expectation benefit. A novel off-grid hybrid power generation system is proposed, including PV, wind and hydropower .

How does integrating wind and PV power affect hydropower efficiency?

The decrease in hydropower efficiencycaused by integrating wind and PV power means lower water resources utilization efficiency under the complementary operation,which implies the 'sacrifice' of hydropower for operating more frequently in the low-efficiency conditions.

The way of bundling unstable wind- PV energy with water energy into the grid makes full use of the abundant local clean renewable energy and enhances the ability to consume unstable ...

(2) Wind turbine generator: The wind turbine generator is a crucial component of the wind-solar-hydro complementary power generation system, converting wind energy into electrical ...

In this article, the impact of the electrical energy quality and stability of the complementary wind-water power generation system on the grid was explored through establishing a mathematical ...

Complementary operation with hydropower can facilitate the integration of intermittent wind and photovoltaic (PV) power by the regulation ability of reservoirs and the flexibility of hydro units. ...

In this study, a mathematical model and an optimization model of hydro-wind-PV multi-energy complementary systems are established with output smoothness as the objective function ...

To address climate change, China is positively adjusting the configuration of energy generation and consumption as well as developing renewable energy sources ina has made ...

In order to reduce carbon emissions, promote the realization of the "double carbon" goal, and improve the

level of clean energy utilization and the operating efficiency of the power system, a ...

Hydropower as a flexible regulation resource is a rare choice to suppress the ever-increasing penetration of wind power in electrical power systems. The complementary characteristics ...

Method this paper actively improved the current wind power and photoelectric complementary units, innovated and developed the hydropower storage and power generation unit, introduced the ...

This article is based on the cooperative game theory to construct a water-wind-light multi-energy complementary power generation system structure, analyze the game process of water ...

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