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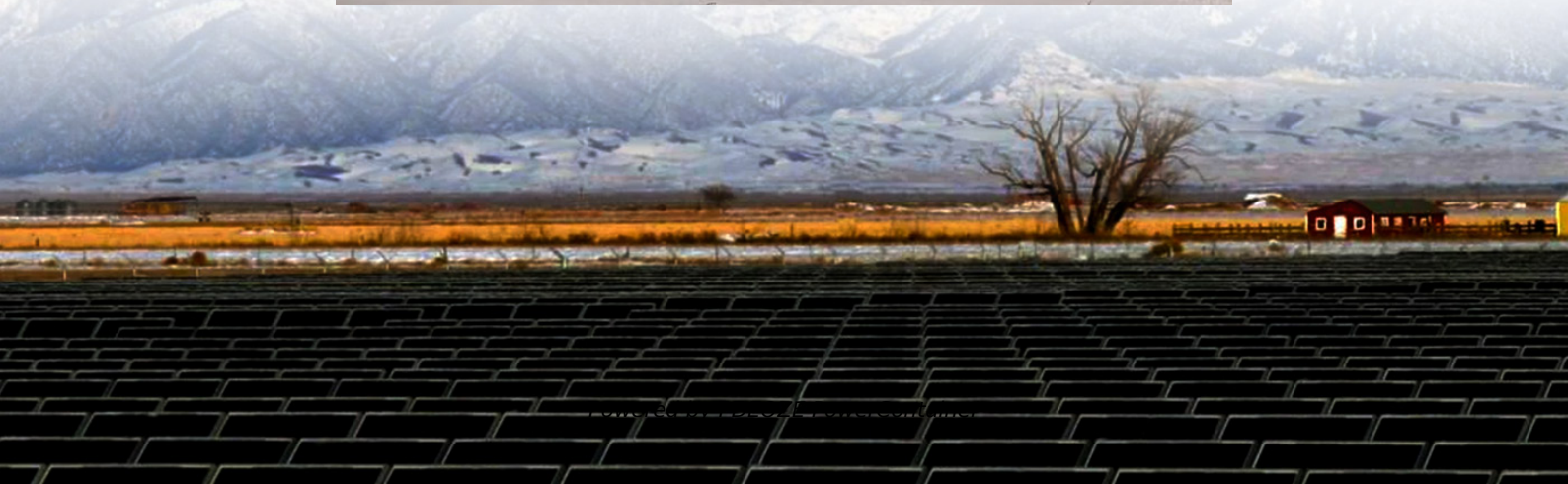
Internal test of wind and solar hybrid in communication base stations



Overview

The paper proposes a novel planning approach for optimal sizing of standalone photovoltaic-wind-diesel-battery power supply for mobile telephony base stations. The approach is based on integration of a compr.

Can a PV/wind/A-CAES based hybrid energy system be used in rural MBS?

A standalone PV/wind/A-CAES based hybrid energy system for rural MBS is proposed. The fan and A-CAES turbine exhaust provide cooling energy besides air conditioner. The performance assessment of the proposed system is carried out. The parametric sensibility and LPSP analysis are implemented.

What are the design criteria for a hybrid energy supply system?

Design condition The most important performance of the standalone renewables based hybrid energy supply system for rural MBS is the reliability. The system load must be met by the renewable power at every instant. Thus, the LPSP is the system design criteria.

How adiabatic compressed air energy storage based hybrid energy supply system works?

In this paper, a standalone photovoltaic/wind/adiabatic compressed air energy storage based hybrid energy supply system for rural mobile base station is proposed. The renewable solar and wind act as the primary power sources. The adiabatic compressed air energy storage system is employed as an energy buffer to smooth the fluctuant renewables.

How photovoltaic-wind turbine configuration affect system performance?

The photovoltaic-wind turbine configuration influences the system performance. The photovoltaic panels number and wind turbines number both have negative effect on the system loss of power supply probability and energy saving ratio, and positive effect on the system dump load ratio and relative fluctuation rate.

What would happen if a hybrid energy supply system was proposed?

The hourly power balance of the proposed hybrid energy supply system for rural MBS for a typical week from Mar 11 to Mar 17. If the total renewable outputs (PV + WT) are larger than the loads, the surplus power would be fed to A-CAES system, and thus the air tank pressure would increase.

What are the conditions for a-CAES based hybrid energy supply system?

The simulation results under the extreme meteorological condition and maximum air tank pressure condition for the proposed standalone PV/wind/A-CAES based hybrid energy supply system for rural MBS. There are three parts in this table: the low wind speed condition, the zero solar radiation condition and the maximum tank pressure condition of A-CAES.

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