ŁOTWA SYSTEM

Hybrid energy for Kabul base station room

Overview

This paper presents the design and analysis of a hybrid off-grid energy system for military stations, integrating photovoltaic (PV) solar panels, wind turbines, battery energy storage systems (BESS), and a diesel generator as backup.Can a hybrid energy system be used to electrify rural areas in Afghanistan?

In this study, the HOMER optimization tool was applied to investigate the performance and economic analysis of three hybrid renewable energy systems to select the best option for the electrification of rural areas in Afghanistan. The technical, economic, sensitivity and multi-year analy-sis criteria of the hybrid generation system were considered.

Can solar power supply affordable electricity to Afghanistan's remote communities?

This study’s purpose is to evaluate the techno-economic viability of hybrid systems based on solar, wind, and biomass to supply dependable and affordable electric-ity to Afghanistan’s remote communities. The study’s goal is to use low-carbon technology to achieve a low COE and enhance power access in rural areas.

Is a hybrid energy system better than a national grid?

However, the COE in optimal HRES is higher than the COE supplied by Afghanistan’s national grid to the household resident in large cities, but COE in the hybrid system is about 37% lower than the cost of energy in the study area and some provinces of Afghanistan.

How much energy does a hybrid system use?

The authors explained that the global applicability of the siz-ing methodology is unquestionable. Their findings show that with an annual electricity production of 843,150 kWh and a production cost of 0.064 $/kWh, the hybrid system configu-ration uses 44.4% wind energy and 55.6% solar energy.

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