SOLAR PRO.

SolarInnovate Energy Solutions

Algeria photovoltaic off-grid energy storage configuration

Overview

This paper presents an alternative methodology for the optimal design of hybrid PV / WT / energy storage and diesel generator backup, for the supply of electricity to oil and gas drilling camps in Adrar, southwest of Algeria.What is an autonomous microgrid?

The proposed autonomous microgrid is composed of a load, two renewable energy sources namely a photovoltaic system and a wind turbine, a set of batteries as energy storage unit, a diesel generator as backup energy source, and an inverter. Figure 1 illustrates the overall configuration of the autonomous microgrid under study.

Can hybrid fuel cells reduce energy costs in Iran?

Moghadam et al. 16 presented a design for energy management of hybrid systems that combine PV, WT, and hydrogen storage (HS) based fuel cell to make the total net cost lower in the northwest region of Iran based on the flower pollination algorithm (FPA).

What is a hybrid photovoltaic/wind turbine system?

In Ref 25 a hybrid photovoltaic/wind turbine system has been submitted for the Lafarge cement plant in Al-Tafilah, Jordan. The system is designed to maximize the demand proportion served by the hybrid system at a lower cost of electricity (COE) than the grid tariff.

Can a mini-grid provide electricity to remote villages?

Given the high cost of extending power lines to these remote locations, the installation of a mini-grid equipped with renewable energy sources seems to be the most realistic option for providing electricity to these villages.

Can a hybrid microgrid system be a single objective function problem?

In the literature, some studies 1, 9, treat the Hybrid Microgrid System (HMS) problem as a single objective function problem using the weighted sum

approach, by multiplying each of the objective functions by a user-assigned weight. However, this method has the disadvantage of finding only one solution, depending on the weights already provided.

What is the Pareto front of a stand-alone microgrid system?

Figure 12a–d presents the Pareto front of the stand-alone microgrid system obtained for each algorithm based on LPSP and COE functions. On the Pareto front, the results show not only an optimal solution, but a group of optimal solutions (non-dominated solutions), a variety of design decision possibilities.

Algeria photovoltaic off-grid energy storage configuration

Decision-making and optimal design of off-grid hybrid renewable energy

This paper presents an alternative methodology for the optimal design of hybrid PV / WT / energy storage and diesel generator backup, for the supply of electricity to oil and gas drilling camps ...

Optimal configuration of an off-grid hybrid renewable energy ...

Aug 18, 2022 · Hydrogen storage and ice storage are promising environment-friendly energy storage technologies, but there are few investigations on the optimal configuration of hybrid ...

A Critical Evaluation Design and Sizing Approaches for Off-Grid ...

Mar 2, 2025 · The findings aim to guide researchers and practitioners in selecting appropriate methodologies for optimizing the design and performance of off-grid hybrid energy systems. ...

Optimal multiobjective design of an autonomous hybrid renewable energy

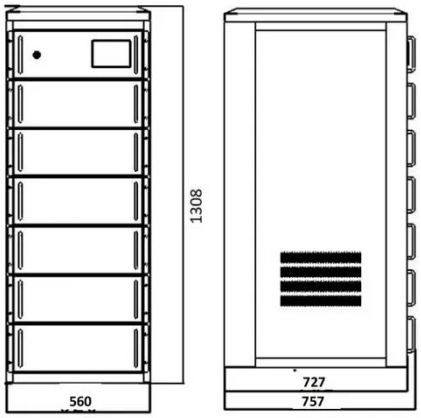
Feb 4, 2025 · This paper describes the proposed microgrid configuration for a stand-alone hybrid renewable energy system based on photovoltaic panels/wind turbines as the main sources, a ...

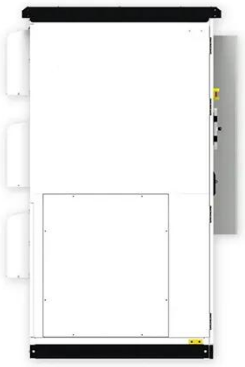
A hybrid renewable energy system for Hassi Messaoud region of Algeria

Mar 1, 2025 · This study focuses on optimizing a hybrid renewable energy system (HRES) for off-grid applications in the Hassi Messaoud region of Algeria to balance technical performance, ...

Optimal hybrid pumped hydro-battery storage scheme for off-grid

Nov 1, 2019 · The current state of art on energy storage systems shows a renewed interest in pumped-storage hydro (PSH), particularly in remote areas. This storage technology is mature ...





Optimal sizing and location based on economic parameters for an off

Jun 15, 2020 · Although several studies have focused on applications of hybrid technologies for renewable energy sources and their optimization, appropriate optimization approaches are ...

Optimization and decision-making approach for energy storage ...

Mar 15, 2025 · This study offers a thorough examination and enhancement of solar renewable energy systems (RES) for natural gas production facilities (NGPF) in Southern Algeria. The ...

Contact Us

For catalog requests, pricing, or partnerships, please visit: https://institut3i.fr