Photovoltaic battery array in Ethiopia

From simulation result, the combination of PV array, diesel generator, battery storage and converter brings to the optimal configuration of hybrid renewable energy system applicable to be used as an off-grid system for selected village of 200 house hold in southern region of Ethiopia with cost of energy $0.401/kWh.

encourages the use of clean energy resource of PV systems in Ethiopia. Key-Words: - Photovoltaic system, Off-grid, Resource ... stand-alone hybrid photovoltaic-diesel-battery systems for rural electrification in the eastern part of ... system over the life cycles of mono-crystalline PV arrays in terms of LCC, electric unit cost, and ...

The results indicate that PV/DG/battery hybrid energy system (HES) with a 7.5 kW PV, 7.3 kW DG, 6.60 kW converter, and 11 units of batteries (case I) is the most feasible, optimized, cost ...

From simulation result, the combination of PV array, diesel generator, battery storage and converter brings to the optimal configuration of hybrid renewable energy system applicable to be used as an off-grid system for selected village ...

Design, Modeling, and Simulation of a PV/diesel/battery hybrid energy system for an off-grid hospital in Ethiopia June 2024 e-Prime - Advances in Electrical Engineering Electronics and Energy 8(15 ...

Introduction. Most of the Ethiopian rural country has abundant hydro and solar energy resources. From the total exploitable capacity of 45 000 MW, installed capacity accounts for 4330 MW [1, 2] and the estimated potential of small and micro hydro is 10% [].However, the main drawbacks of using such systems are seasonal shifts and poor topographic positioning of ...

IN ETHIOPIA Solomon Gebremariam Fissaha Date: 05/09/2017 Master in Energy, Engineering track ... A hybrid power system that consists of PV-array, diesel generator, battery bank (storage device) and convertors has been proposed and discussed to obtain an efficient topology, economic power management strategy (system), and efficient power system ...

Falling costs for renewable energy sources, especially solar PV, are anticipated to enable solar PV to compete with coal in terms of price by the mid-2020s to 2030 s [6]. Solar PV systems, which are central to this energy transition, are expected to become 40%-50% less expensive by ...

In Ethiopia, several studies have been conducted to electrify off-grid communities using stand-alone hybrid systems, such as solar PV-WTs-DGEs-battery (Gebrehiwot et al., Citation 2019; Mekonnen et al., Citation 2021; Benti et al., Citation 2022, Citation 2023). These studies have primarily focused on MiG design, combining various energy sources and ...

Based on eq. (3), the minimum daily averaged energy delivered (E d) and available from the PV array (E l) was received in July (Fig. 4 g), August (Fig. 4h), September (Fig. 4i), and June (Fig. 4f), respectively.July 27, July 22, July 25, and July 28 (as shown in (Fig. 4 g)) were the months in which the minimum energy was delivered to and available from the PV ...

Assessment of Stand-Alone Solar PV Power Systems Performance and Reliability for Rural Electrification of Ethiopia Acknowledgement I am greatly indebted to express my sincere gratitude and heartfelt appreciation to my advisor Dr.

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