SolarInnovate Energy Solutions

Photovoltaic solar water pumping system in Ghana

Overview

In Ghana, a key component of the project is supporting small scale farmers to access and use solar PV pumps for irrigation purposes through market incentives and capacity development for solar companies and farmers.Can small Solar PV pumps irrigate shallow water resources?

Santra evaluated the performance of small solar PV pumps for irrigation purposes. The study found that an AC or DC type 1 hp solar pump can successfully operate mini sprinklers, microsprinklers, and drippers with good uniformity when it comes to irrigating shallow water resources with pressure irrigation systems.

Can a solar-powered photovoltaic pumping system be used for drip irrigation?

Unreliable electricity supply in tropical regions has necessitated the use of alternate power sources for efficient irrigation. Consequently, this study focuses on evaluating the performance, energy efficiency, and economic feasibility of a solar-powered photovoltaic (PV) pumping system for drip irrigation in Kaleo, Upper West Region of Ghana.

Are solar PV systems good for water pumping?

There has been a significant rise in the adoption of solar PV systems for water pumping in rural parts of developing nations, thanks to their reliability and sustainability as energy sources .

How efficient is the solar pumping system?

The solar pumping system comprised a 2.43 kWp solar array, one 1.3 kW brushless DC motor, and a 1.8 kW maximum power point tracker DC converter. The pump operating energy was recorded at 3025 kWh, which fulfilled approximately 92.6% of the water demand for the 1-ha bean farm, making the system 82% efficient.

Can a 1 hp solar pump irrigate shallow water resources?

The study found that an AC or DC type 1 hp solar pump can successfully operate mini sprinklers, microsprinklers, and drippers with good uniformity when it comes to irrigating shallow water resources with pressure irrigation systems. The optimal design of a PV drip irrigation system was analyzed by Miran et al.

Can a solar PV pumping system be used for drip irrigation in Kaleo?

Conclusions This research has explored the design, simulation, and economic analysis of a solar PV pumping system for drip irrigation of 1-ha bean farmland in Kaleo. Through a comprehensive analysis, the study has identified several critical insights that significantly contribute to the understanding of such systems.

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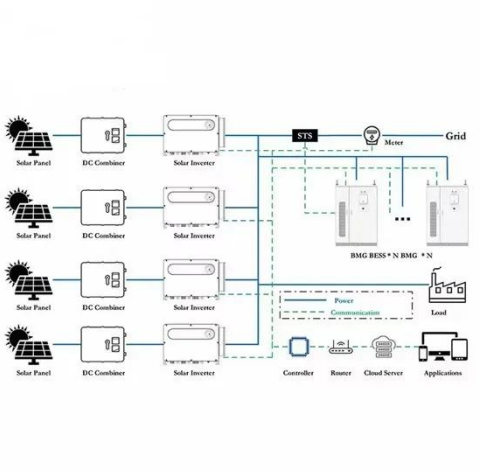

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