

Niger Photovoltaic Water Pump Inverter Project

What is the Niger solar energy access project?

The World Bank-funded Niger Solar Electricity Access Project enables farmers to buy pumps. Based on its success, a broader \$800-million solar energy project - Niger Accelerating Electricity Access (HASKÉ) - will integrate grid power, mini-grids, and off-grid solutions for electricity and clean cooking.

Can solar-powered irrigation pumps transform Niger?

Solar-powered irrigation pumps and other appliances have demonstrated their power to transform Niger by increasing crop yields and production. "Previously, I irrigated only a tiny plot using diesel water pumps," says Alzouma. "With solar irrigation, we now grow fruit trees, onions, tomatoes, and moringa.

How many solar pumps are there in Niger?

Four solar pump companies accounting for half of all pump sales in Niger have tapped into the credit line, bringing 800 solar pumps to Niger's farms since 2017. NESAP has loaned more than \$1.5 million to solar system importers, wholesalers, retailers, installers, and solar electricity service providers.

What is a solar-powered water pumping system?

The solar-powered water pumping system enables Alzouma to rotate crops on his farm in Finaré, Niger. Photo credit: ICM Niger. Based on its success, a broader \$800-million solar energy project - Niger Accelerating Electricity Access (HASKÉ) - will integrate grid power, mini-grids, and off-grid solutions for electricity and clean cooking.

Is solar energy a key to economic transformation in Niger?

"Increasing access to electricity through solar energy in Niger, especially in rural areas, is key to economic transformation and empowerment," says Kwawu Mensan Gaba, Practice Manager at the World Bank.

Why is solar energy important in Niger?

Increasing access to electricity through solar energy in Niger, especially in rural areas, is key to economic transformation and empowerment. Making use of the support and credit provided by our project, farmers really increase yields, rotate, and even diversify their crops, which is so important for food security.

Water and energy are becoming more and more important in agriculture, urban areas and for the growing population worldwide, particularly in developing countries. To provide access to water it is necessary to use appropriate pumping systems and supply them with enough energy for operation. Pumps powered by solar photovoltaic energy are complex ...

Mounting: Securely mount the PV combiner box close to the solar panels.. Connections: Connect the positive and negative terminals of the solar panels to the corresponding inputs in the combiner box.. Safety Devices:

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Ensure fuses and surge protection devices are installed within the combiner box.. 4. Connecting the Inverter.
DC Input: Connect the output ...

Off-grid solar pump inverters utilize solar energy captured by photovoltaic (PV) panels to power water pumps without relying on a grid connection. These inverters convert the direct current (DC) generated by solar panels into alternating current (AC), enabling efficient water pumping in remote locations.

A grid connected solar water pumping system is reported in [14] wherein a power allocation system decides whether to draw power from PV array or from the utility (when PV array is insufficient to power the pump). A water pump along with a pump controller is connected at the common DC bus of PV array and grid connected inverter.

The solar water pump system, or PV pumping system, is mainly comprised of solar panels, a solar pump inverter, a water pump, a pipeline, and a water tank. In this system, the storage battery is omitted, and the water pump is directly driven, which has high reliability and reduces the investment cost. 1. Solar cell module

2. Photovoltaic pump inverter. 3. Three-phase water pump. The solar pumping system consists of three parts: solar panels, solar pump inverters and water pumps. Solar pump inverter directly obtains DC power from solar panels and convert it into AC power to supply water to the pump. According to the intensity of sunlight, adjust the real-time ...

Photovoltaic water pumps can be used to extract water either for irrigation or for drinking and other domestic purposes. The most widespread architecture for domestic water access in rural areas is shown in Fig. 2.1, the system is set on a borehole, extracts water from aquifers and is of moderate size with PV modules capacity usually less than 2000 W p [4, 10, 14].

Product types: photovoltaic systems residential, solar traffic lighting systems, water pumps, solar water pumping system components, batteries deep cycle, photovoltaic modules. Service types: consulting, installation, engineering, project development services

The design of such a system is very simple as we have to match the power and voltage rating of the PV module to that of the DC pump motor so when the module receives the solar radiation the pump will draw the water and store ...

In this study, a review of current state of research and utilization of solar water pumping technology is presented. The study focuses on recent advancement of the PV pump technology, performance evaluation, optimal sizing, modeling and simulation, degradation of PV generator supplying power to pump, economic and environmental aspects, and viability of PV ...

Nowadays, two types of photovoltaic water pumping systems are used: the photovoltaic water pumping with

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batteries and without batteries. In Niger, it is often used photovoltaic water pumping without batteries, commonly known as "pumping over the sun". Pumping over the sun is simpler and less expensive than with battery system.

Solar PV water pumping system is found to be more economical, eco-friendly, reliable, with less maintenance and a long life span in comparison to diesel-powered water pumps. 4-6 years of payback ...

Standard pump, powered by solar pumping inverter. The pumps are powered with three-phase alternating current (AC) and variable frequency in the very large majority of cases. Type of Equipment (examples) Small pump controller. Solar pump inverter. Example of brands and ranges of main suppliers VOLENTA: - One pump in the range but price

Solartech local installer successfully installed a diesel-powered water pumping system for a local farmer. The new alternative used photovoltaic (PV) as the power source and chose Solartech 11KW G3 High Intelligence Series PV head Inverter, which is perfectly compatible with pumps ranging from 10HP to 13HP, With a head of 35 meters, the pump can ...

Some farmers use engine pumps to pump water to make up for the shortage. Therefore, their earnings are in jeopardy due to the fuel cost of the pumps. In response to this situation, we implemented a demonstration project ...

Nowadays, the utilization of PV conversion of solar energy to power the water pumps is an emerging technology with great challenges. The PV technology can be applied on a larger scale and it also presents an environmentally favorable alternative to fossil fuel (diesel and electricity) powered conventional water pumps [1], [2].Moreover, the importance of solar PV ...

The Dolycon CT112 photovoltaic water pump inverter is a prime example of advanced technology in this field. It is specifically engineered to convert the direct current (DC) electricity generated by solar panels into alternating current (AC) electricity suitable for driving water pumps. This conversion process is essential as it optimizes the ...

Project Overview. Site: A farm Date: July 2019 Location: Philippines Industry: Agricultural Irrigation, Fruit Tree Irrigation Project scope: To develop a new series of solar pumps with the help of VEICHI solar pump ...

The basic components used in SPVWPS belong to different fields of engineering. The water pump and the tracking system used belong to mechanical, PV panel, DC-AC inverter, pump controller, charge controller and batteries belong to Electrical and Electronics; different algorithms used in maximum power point tracking (MPPT) come under computer science ...



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