

# A review on development of photovoltaic water pumping system

When compared to diesel powered pumping systems, the cost of solar PV water pumping system without any subsidy works out to be 64.2% of the cost of the diesel pump, over a life cycle of ten years. Solar pumps are available to pump from anywhere in the range of up to 200 m head and with outputs of up to 250 m<sup>3</sup>/day.

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 ...

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 ...

Once compared to diesel supercharged pumping systems, the value of star PV water pumping system with none grant works bent be sixty four.2% of the price of the diesel pump, over a life cycle of 10 years. Star pumps area unit accessible to pump from anyplace within the vary of up to two hundred m head and with outputs of up to 250 m<sup>3</sup>/day.

Currently direct coupled DC and AC solar run water pumps are extensively used worldwide. The main objective of this study is to review the performance studies of direct coupled photovoltaic water pump systems (PVWPS) along with a case study of an old functional solar water pump after prolonged outdoor exposure in a western Indian Himalayan ...

Systems of the first type were equipped with PV modules manufactured by Solar Power (USA), electric motor by AEG (Germany), floating CP by KSB (Germany) while the other system had PV modules and water pump of original manufacture and electric motor by Boston Gear (Canada) These two systems had daily performance 90 m<sup>3</sup> and 16 m<sup>3</sup> for PV arrays ...

8 Vishwa Nath Maurya et al.: Scope and Review of Photovoltaic Solar Water Pumping System as a Sustainable Solution Enhancing Water Use Efficiency in Irrigation [43] Okanta A.D. et al., Techno- economic feasibility and cost analysis of solar water pumping in Nigeria, 22nd National Solar Energy Society of Nigeria Annual Conference, Nsukka, 3-6 ...

In [1], [2] an exhaustive review of the recent technology applied to solar photovoltaic water pumping is presented, evaluating its economic feasibility, advantages and drawbacks, as well as some ...

One of the sustainable development approach is solar photovoltaic water pumping system (SPVWPS). ... Tamer & Nagi, Farrukh, 2017. "A review of photovoltaic water pumping system designing methods,

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control strategies and field performance," Renewable and Sustainable Energy Reviews, Elsevier, vol. 68(P1), pages 70-86.

"A review on modeling, design methodology and size optimization of photovoltaic based water pumping, standalone and grid connected system," Renewable and Sustainable Energy ...

Since last two decades, PV-based water pumping system is being explored by various researchers with the objective of increasing the availability of drinkable water, turbulence-free water pumping, increase in yield outcome, addressing the issue of variations in rain cycle, etc. Various types of system configurations were proposed in the literature, including both ...

Solar Photovoltaic Water pumping system (SPVWPS) is an ideal alternative to the electricity and diesel based water pumping systems. It has been a promising field of research for last fifty years. In the 1970 decade, efforts were made to explore and study the economic feasibility, and practicality of SPVWPS.

Bidirectional power flow control of a grid interactive solar photovoltaic (PV)-fed water pumping system that enables a consumer to operate the water pump at its full capacity for 24 ...

Solar energy for water pumping is a possible alternative to conventional electricity and diesel based pumping systems, particularly given the current electricity shortage and the high cost of diesel.

According to the survey conducted by the Bureau of Electrical Energy in India in 2011, there are around 18 million pump sets and around 0.5 million new connections per year is installed with average of 5HP capacity for agricultural purpose [19].Solar PV technology applied to water pumping systems is based on the conversion of solar energy into electrical energy by ...

Solar photovoltaic water pumping system (SPVWPS) has been a promising area of research for more than 50 years. In the early 70s, efforts and studies were undertaken to explore the possibility of ...

The water pumping arrangement and its constituents such as the photovoltaic array, the MPPT control system, the motor drive and the pumping system are explained in the first section. The next step is to conduct a literature review that focuses on study results from both the multi-stage and single-stage pumping arrangements.

**Key words:** Solar photovoltaics, water pumping system, irrigation, photovoltaic (PV) pumping system  
**INTRODUCTION** Solar energy is the most abundant source of energy in the world. Solar power is not only an answer to today's energy crisis but also an environmental friendly form of energy. Photovoltaic (PV) generation is an efficient

Some reviews about solar photovoltaic water pumping systems and modeling of solar energy systems can be

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found in the literature (Aliyu et al., 2018; Li et al., 2017; Gopal et al., 2013; Elsheikh et ...

Photovoltaic panels use solar energy to directly generate electricity which could be used to power the electricity-operated water pumps. For the past several years, researchers have been focusing on the development of efficient solar-powered water pumping systems [4]. These systems have been proven reliable even in severe weather conditions such as snowfall [2], ...

Thus, to mitigate the energy crisis, the Indian government has already launched one program in 2014-2015 for installation of 0.1 million solar photovoltaic water pumps for irrigation and drinking ...

An advanced literature review on the design and performance of solar technology for water pumping is presented, exploring also the best perspective of transition for the developing countries energy needs and the Mozambique's perspective on renewable energy technologies.

(Al-smairan, 2012) Domestic water pumping The presence of storage tank will improve the performance of the photovoltaic water pumping systems (Nisha & K, 2020) Domestic water pumping It was concluded that overall efficiency of the photovoltaic water pumping system was improved by better system design and load matching using BLDC Motor

Downloadable (with restrictions)! Solar photovoltaic water pumping system (SPVWPS) has been a promising area of research for more than 50 years. In the early 70s, efforts and studies were undertaken to explore the possibility of SPVWPS as feasible, viable and economical mean of water pumping. SPVWPS consists of different components and parts associated with different ...

Authors reported that a PV system with (900 Wp PV array, 800 W DC motor-pump mono-blocks) can provide 70-100 kPa pressure at the delivery side with a discharge of 3.4-3.8 l/h from each dripper during different hours of the day. The emission uniformity was found to be 92-96% in a field of 1ha. It is suggested that PV water pumping systems need to ...

The current state of system technologies, research, and the application of conventional and novel methods are presented in a review of solar water pumping systems. This publication aimed to compile studies on water ...

This project aims to design a PV water pumping system (PVWPS) for a paddy field in West Godavari, Andhra Pradesh, India. As a standalone system, it will operate independently. ... Chandel R (2015) Review of solar photovoltaic water pumping system technology for irrigation and community drinking water supplies. Renew Sustain Energy Rev 49:1084 ...

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