

Water is a precious resource for agriculture and most of the land is irrigated by tube wells. Diesel engines and electricity-operated pumps are widely used to fulfill irrigation water requirements; such conventional systems are inefficient and costly. With rising concerns about global warming, it is important to choose renewable energy source. In this study, SPVWPS has been optimally ...

electrical energy for lifting water at least 7 m head. A PV solar power pumping system consists of a PV array, a DC/AC motor, pump, water storage tank, Electrical wire, and water outlet. The ...

This study presents a technique based on a multi-criteria evaluation, for a sustainable technical solution based on renewable sources integration. It explores the combined production of hydro, solar and wind, for ...

Over the past decade, global installed capacity of solar photovoltaic (PV) has dramatically increased as part of a shift from fossil fuels towards reliable, clean, efficient and sustainable fuels (Kousksou et al., 2014, Santoyo-Castelazo and Azapagic, 2014). PV technology integrated with energy storage is necessary to store excess PV power generated for later use ...

This paper presents a solar water pumping system with captive energy storage using a synchronous reluctance motor (SYRM). An intermediate boost converter, commonly used to track the peak power of solar photovoltaic array, is eliminated in this system. A voltage source converter is used to drive a SYRM pump drive. A sensorless vector control algorithm is ...

Key components comprise a water source heat pump (2), a hybrid photovoltaic system (1), and two distinct thermal energy storage units (on source side (3) and load side (4) of the heat pump). In the system, a water-to-water heat pump is employed for generating thermal energy to meet both winter requests for heat and summer requests for cool.

Photovoltaic heat pump (PV-HP) system integrates a variety of energy technologies [7], which can meet demands of space heating (SH), space cooling (SC), and electricity, and has the advantages of high energy utilization efficiency [8, 9], good economic benefits [10] and environment-friendly [11]. However, due to the volatility and randomness of ...

Fig. 2 shows the schematic diagram of the proposed system, where PV and grid are sources of energy and PHS is the energy storage of the microgrid. The PHS consists of a pump and a turbine, where the pump stores water and the turbine generates electricity from the stored water. Demand is power consumption in the farmhouse and the irrigation pump.

Pumps powered by photovoltaic panels are more environmentally friendly, require less maintenance, and use

no fuel. One of the most significant and promising uses of photovoltaic systems in urban and rural ...

STWHs face increasing competition from high performance heat pumps utilising refrigerants such as R744 (CO₂) and more recently PV systems are being considered for water heating (Suehrcke, 2018, Clift, 2019) interest in Photovoltaic Thermal (PVT) collectors that combine electrical and thermal supply is also noted (Othman et al., 2016). PVT collectors, ...

Application of photovoltaic array for pumping water as an alternative to diesel engines in Jordan Badia, Tall Hassan station: Case study. Mohammad Al-Smairan, in Renewable and Sustainable Energy Reviews, 2012. 3 Photovoltaic water pumping system. At present, photovoltaic water pumps systems are widely used in Jordan Badia as well as many other countries or regions ...

The chosen hybrid hydro-wind and PV solar power solution, with installed capacities of 4, 5 and 0.54 MW, respectively, of integrated pumped storage and a reservoir volume of 378,000 m³, ensures 72 ...

For China, the development of low-energy buildings is one of the necessary routes for achieving carbon neutrality. Combining photovoltaic (PV) with air source heat pump (ASHP) yields a great potential in providing heating and domestic hot water (DHW) supply in non-central heating areas. However, the diurnal and seasonal inconsistencies between solar availability and building heat ...

In (Charfi et al., 2016) An optimal sizing of a hybrid PV-diesel energy system in different locations Tunisia, Jordan and KSA is presented. In (Shabani & Mahmoudimehr, 2018) A techno-economic strategy for a hybrid photovoltaic-pump storage hydroelectric standalone energy system is evaluated. The (PV-PSH) and (PV-battery) systems are elaborated ...

Figure- 1. Battery storage system for the PV water pumping system. The PV data, Boost DC-DC converter calculation and values, MPPT topology, VSI control technique and the motor-pump set (three phase induction motor driving a centrifugal pump) parameters are all fully demonstrated in [3]. Additionally, a thorough explanation of the inclusion

The proposed system comprises of a solar photovoltaic (SPV) system, solar water pump, pico-hydro turbine-generator and pumped-hydro energy storage system. Its operation is quite different from all other existing SPV power generating systems. ... In addition to batteries, another very popular EES, which is used all over the world for a long time ...

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