

Design, sizing and simulation of solar powered desalination unit for brackish water in Jordan

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ABSTRACT

In the framework of a regional scientific cooperation project between USA, Israel, Jordan, and the Palestinian Authority, Jordan (represented by the National Energy Research Center (NERC) has received two desalination units. The first unit is a US-military RO-desalination unit (ROWPU), producing 21.3 m³/d of fresh water and operated with diesel generator. The second unit designed for brackish water also produces 21.3 m³/d fresh water, and is accompanied by a complete 16 KWp-PV system. This paper describes the water situation in Jordan, the potential of solar radiation in the area, site selection criteria, and the designing, sizing and simulation of a photovoltaic power supply system for the second RO-desalination unit. Also the paper contains measurement and evaluation data concerning the water quality, energy consumption and efficiency of the (ROWPU), which has been installed and operated by NERC in the village of Qatar in Jordan.

Keywords: RO technology; Brackish water; Photovoltaic; Solar radiation; Remote areas
