

Using Renewable Energy in Desalination & Reverse Osmosis Powered with Photo-Voltaics*

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Abstract

The rising in the world's population leads automatically to the rising in water demand. As a consequence the lack of drinking water increases. Currently, approximately 1.2 billion people globally (one-sixth of the world's population) do not have access to adequate clean water. Since a large part of the world's population is concentrated in coastal areas, the desalination of seawater seems to be a promising solution, especially in our Arab world. An innovative stand-alone solar desalination system could be used to produce drinking water from seawater or any brackish water sources. The great advantage of such a system is that it combines efficient desalination technology, reverse osmosis, with a renewable energy source. The main goal is to improve the technical feasibility of such systems. There are many advantages of this coupling with RE resources; first of all we separate the drinking water from the electricity grid and its faults, save burning the fossil fuel and its emissions, and provide fresh water to remote communities that do not have sufficient traditional energy sources. But as we see in this study we don't have economic benefit; because these projects depend on the electricity cost in each country and the location and its solar specifications.

We designed and implemented a small laboratorial model for PV-RO (Photo-Voltaic Powered Reverse Osmosis) to recognize the performance for seawater and brackish water, we faced some problems such as embargo on Syria; so have done project using affordable local potentialities, but we craved to keep the principle of operation, so we make it for the tap water which close to brackish.

Keywords: Photo-Voltaic, Desalination, Renewable energies, Solar energy, Reverse osmosis.

- For The paper in Arabic see pages (289-306)

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