

Optimization of pilot scale photovoltaic reverse osmosis desalination system for ground water

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Abstract

Water and energy cannot be considered separately, they are interrelated issues. The most significant problem associated with desalination systems, specifically Reverse Osmosis systems, is energy consumption. In reverse osmosis system, high pressure pump is the most energy intensive part. Providing the required energy for the high pressure pump helps to reduce the operating cost and as a consequence cost of producing water. The main objective of our research is optimizing the energy consumption and producing water. The more water production simultaneously the less energy consumption the higher performance will be achieved. Also, in arid areas that there is no access to grid electricity with enough amount of sun, the most proper solution for providing water is solar desalination system. In this paper, optimization of the photovoltaic-powered RO in respect to performance, energy efficiency and economic assessment is investigated. Performance evaluation in terms of flux and recovery is investigated. Energy consumption of the photovoltaic-powered RO is calculated and compared to grid- powered RO.

Biography

Kwonit Mallick is a graduate student in the department of chemical engineering. They are currently working as research assistants with the Institute for Energy & the Environment on water desalination system with renewable energy.