



Operating control strategies and dimensioning of photovoltaic-powered reverse osmosis desalination plants without batteries

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ABSTRACT

Small photovoltaic reverse osmosis systems (PV-RO) without batteries are not driven constantly at their operating point, but are tracked to the solar power offered. Because of this intermittent and dynamic operation, high requirements for the operating control strategies must be satisfied. A PV-RO system has been modelled in the Dymola simulation environment. This system minimizes the specific energy consumption (SEC) and accordingly distributes the incoming PV power to the different pumps in the PV-RO system. The operating control strategy also accounts for the requirements stipulated by the membrane producer. To obtain the required amount of permeate every day of the year, a tool has been developed especially for dimensioning the PV generator for the PV-RO system under the local boundary conditions.

Keywords: Photovoltaic; Reverse osmosis; Energy

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