



The modular design of photovoltaic reverse osmosis systems: making technology accessible to nonexperts

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ABSTRACT

Photovoltaic reverse osmosis systems can provide water to many underserved communities. These systems need to be custom-tailored for the water demand, solar insolation, and water characteristics of a specific location. Systems can be constructed from modular components to be cost effective. Designing a custom system composed of modular components is not a simple task. For a given modular inventory, a large number of possible system configurations exist. Determining the best system configuration is a daunting task for a small community without expertise. This paper presents a computer-based modular design method that can enable nonexperts to configure such a system for their community from an inventory of modular components. The method employs fundamental engineering principles to reduce the number of possible configurations and optimization methods to configure a system. Examples cases for a range of communities demonstrate the power of this approach.

Keywords: Photovoltaic reverse osmosis; System design; Optimization

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