Field results in Namibia and Brazil of the new solar desalination system for decentralised drinking water production

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\textbf{ABSTRACT}

Areas in many rural and coastal zones, particularly in developing countries, have a demand for a lower-price, low maintenance, environmentally friendly, and decentralized small-scale desalination systems. For these regions, a new thermal desalination system with heat recovery has been developed and tested in different countries. The system has two components: a desalination tower with multiple stages and a set of solar thermal collectors. Sea and ground water can be fed on the top stage of the tower, and it flows down filling the lower stages. The tower produces desalinated and decontaminated water in its 5–7 horizontal stages. The present work presents the field results of two systems tested in Brazil, and the numerical results of a design installation for Namibia. For Namibia, six systems are planned with capacity of 400–500 L/d. Seven systems use flat plate collectors and tree systems use evacuated tube collectors. In Brazil, two systems with a 35–40 L/d capacity, one with evacuated tube and the other flat plate collectors were tested. They incorporate the most recent improvements made in the components so far. The performance was evaluated by the coefficient of performance and the gain output ratio values. They were 4.78 and 2.52 for the field tests in Brazil. The simulated values for Namibia were 72 L/d for a 4.4 m\textsuperscript{2} solar collector area and 1.5 m\textsuperscript{2} condensation area per stage.

\textbf{Keywords}: Solar desalination; Decentralised drinking water production

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