

Canary Islands Institute of Technology (ITC) experiences in desalination with renewable energies (1996–2008)

Vicente J. Subiela*, Juan A. de la Fuente, Gonzalo Piernavieja, Baltasar Peñate

Water Department, Research and Technological Development Division, Canary Islands Institute of Technology,

Playa de Pozo Izquierdo, s/n. 35119 Santa Lucía, Gran Canaria, Spain

Tel. +34 (928) 72 75 20; Fax +34 (928) 72 75 90; email: vsubiela@itccanarias.org

Received 14 October 2008; Accepted in revised form 9 June 2009

ABSTRACT

Fresh water shortage is a raising problem, especially in some parts of the world as North Africa and Middle East areas. Global climate change and progressive increment of population are reducing day by day the availability of per capita drinking water supply; this is becoming a critical question for certain developing countries. Desalination has narrowed the gap of water demand for more than 20 years thanks to a cheap energy supply; but the age of “easy oil” is coming over and the link water–energy is more and more critical. A hopeful option is desalination powered by renewable energies (RE). RE are not only safe but also endless resources, and there are already successful experiences in RE desalination. The Canary Islands Institute of Technology (ITC) has been testing and monitoring RE desalination systems for more than 10 years. Vapour compression, reverse osmosis, electrodialysis, membrane distillation and humidification–dehumidification plants have been connected to wind or solar energy systems in more than ten field projects. This paper summarizes the main outcomes of this long experience, focusing on the more practical questions to be considered in order to implement new RE desalination projects.

Keywords: Reverse osmosis; Photovoltaic energy; RE-powered desalination; Canary Islands; Africa

* Corresponding author.