

Making fresh water from waves

A Royal Academy of Engineering Global Research Award, co-financed by Aquamarine Power Ltd, has enabled Dr. Matt Folley, from the Wave Energy Research Group at Queen's University Belfast, to spend 12 months with the Renewable Energy and Water Division of the Instituto Tecnológico de las Canarias, investigating the potential for wave-powered desalination technology. These two research groups complement each other perfectly; the group from QUB provides 30 years of experience in wave power research and development, whilst ITC have over 10 years experience in integrating desalination technology with renewable energy sources.

It is estimated that there are currently one billion people living in the world without an adequate source of clean drinking water. Current desalination technology, where fresh water is produced from salt water, is energy-intensive, making its exploitation problematic for locations where traditional sources of energy are either scarce or expensive; wave energy is ideally suited to provide sustainable and environmental energy for desalination.

The key challenge in wave-powered desalination is powering the desalination technology, which operates most efficiently with a constant energy supply, with the naturally variable wave energy. However, initial studies have indicated that using OYSTER, a seabed mounted oscillating flap powering hydraulic rams that pressurise sea water, to directly feed a reverse osmosis (RO) desalination plant potentially offers dramatic benefits; improving the overall

system efficiency by up to 40%, whilst simultaneously eliminating the need for expensive



Model of OYSTER in the wave-tank at QUB

electrically-driven high-pressure pumps.

A conceptual design of an autonomous wave-powered desalination system has been developed which successfully links OYSTER and the reverse osmosis plant. The project is now focussed on modelling the wave-to-water performance of the proposed system so that the optimum specifications of the plant can be identified. It is hoped that this will lead to the installation of a full-scale prototype plant in the Canary Islands in 2008–9.

For further information on the Global Research Award scheme, please contact Dr Chris Coulter at The Royal Academy of Engineering (0207 227 0500; E-mail chris.coulter@raeng.org.uk).

For further information on the project please contact Dr Matt Folley at Queen's University Belfast, (02890 974751; Email m.folley@qub.ac.uk).