

AQUABUOY - HOSE-PUMP OPTIMISATION

LEAD ORGANISATION

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PARTNERS

Dunlop Oil and Marine Ltd

COST AND DURATION

The Carbon Trust
contribution towards this
project is £168,000. The
project started in April 2005
and is due for completion in
March 2006.

PROJECT REFERENCE NUMBER

2004-7-1561-7

OBJECTIVES

The objective of the project is to optimise the design of the hose pump used in the AquaBuOY so that the modelled performance, survivability and suitability for long-term use in wave energy conversion applications are confirmed.

SUMMARY

The project is based on, and makes use of, all previous work and accomplishments of hose-pump development. Earlier ocean trials demonstrated that the hose pump provides the predicted pressure and water flows when properly damped. Optimisation work will greatly benefit from a collaborative effort between AquaEnergy and Dunlop, combining field testing and fabrication/manufacturing experiences.

A technology assessment performed by International consultants Black & Veatch (BV) under the Marine Energy Challenge programme, sponsored by the Carbon Trust, defined a set of performance parameters for the hose pump that need to be confirmed by physical tests. Once these parameters have been validated and confirmed, they will demonstrate AquaBuOY's ability to reach competitive energy generation prices. BV highlighted the simplicity and attractiveness of the hose-pump concept in wave-energy conversion and has recommended specific areas of additional research to be carried out to assist AquaEnergy in the commercial development and deployment of AquaBuOYs.

Previous ocean trials and recent assessments by Dunlop of test hose-pumps have established the design starting point. This project combines AquaEnergy's



Cross section
of AquaBuOY

knowledge of hose-pump theory, numerical models and ocean-test experience with the manufacturing know-how and materials research of Dunlop. The project will enable a high efficiency hose-pump with validated long-term operational, performance and fatigue characteristics to be developed.

Once commercialised, the AquaBuOY-based offshore power plants will provide an indirect CO₂ emissions reduction by displacing the use of fossil fuel and/or adding new clean generation without the use of fossil fuel. Both partners believe that there is a greater than 90% chance of a successful outcome to the project.

Dunlop estimates that by 2011, supply of hose-pumps could add about £6,000,000 to its annual turnover, creating a number of new and long-term jobs at its Grimsby factory.



Making business sense
of climate change