

# EFFICIENT HYDRAULIC MOTOR FOR MARINE RENEWABLE-ENERGY DEVICE

## LEAD ORGANISATION

Artemis Intelligent Power Limited  
Mayfield Road  
Sanderson Building  
Edinburgh  
EH9 3JL  
Contact: Dr Uwe Stein  
Tel: 0131 650 5700  
E-mail:  
u.stein@artemisip.com  
www.artemisip.com

## PARTNERS

Ocean Power Delivery Ltd.

## COST AND DURATION

The Carbon Trust contribution towards this project is £160,387. The project started in March 2005 and is due for completion in August 2006.

## PROJECT REFERENCE NUMBER

2004-6-1408

## OBJECTIVES

The objective of this project is to deliver an optimised, reliable, highly efficient hydraulic motor through the use of Digital Displacement™ technology, to drive electrical generators at the downstream end of the power take-off system in a marine renewable-energy device.

## SUMMARY

Artemis Intelligent Power was spun out from the University of Edinburgh after the first Digital Displacement™ pumps/motors had been built. These were designed to be highly controllable hydraulic machines, which maintain a high efficiency over the whole displacement range.

The Digital Displacement™ technology is able to improve significantly the overall performance of a marine renewable-energy device.

This project will look at integrating the Digital Displacement™ technology into project partner Ocean Power Delivery's wave energy device, Pelamis, to confirm its efficiency, controllability and reliability.

The project will be divided into the following phases:

- Specification and outline design study of the Digital Displacement™ motor to understand fully the demand for hydraulic transmissions in the marine renewable-energy market.
- Detailed 3D design of all motor components with all hardware, electronic control system and electronic components specified.
- Manufacturing planning and component ordering.
- Assembly and commissioning of the different components of the Digital Displacement™ motor.



Conceptual view of a Digital Displacement™ machine

- Testing the Digital Displacement™ motor on the existing full-scale power module test rig of Ocean Power Delivery Ltd to analyse fully Digital Displacement™ performance against current hydraulic motors.

Results from the test work will be recorded and analysed to confirm efficiency, controllability and reliability. These will then be used in discussions with potential manufacturers and clients.