Project Title: 'A Joint Numerical and Experimental Study of A Surging Point Absorbing Wave Energy Converter (WRASPA).'
Principle Investigator: Dr C Mingham (MMU) & Dr G Aggidis (Univ. of Lancaster)
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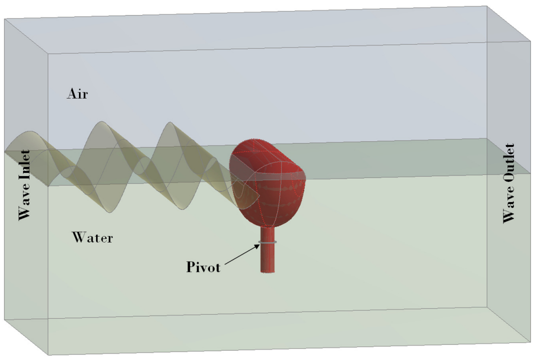
In order for the UK to meet its ambitious targets for energy production from renewable sources (10% of electricity by 2010, 15% by 2020) it needs to expand its capacity to generate all forms of renewable energy and marine energy is a big part of this. The development and production of new solutions for generating renewable energy, as well as contributing to meeting the UK's energy targets, provides business opportunities internationally. This project is concerned with marine energy in the form of wave energy which may in principle supply a significant amount of the UK's energy consumption.

For this project a new wave energy converter called WRASPA was developed and evaluated by means of computer modelling and small scale wave tank tests in a joint program between Manchester Metropolitan University (MMU) and Lancaster University (LU). MMU will carry out the computer simulations of the device and LU will carry out the tank tests. In the WRASPA concept, wave forces act on the face of a collector body, carried on an arm that rotates about a fixed horizontal axis some 20m below sea level so that the body moves to and fro at about the frequency of the ocean swell generating high power from a small device. In storms the arm naturally moves to a position that minimises forces and so helps ensure its survival. The varying input power is extracted at the pivot and smoothed using a novel on-board control system incorporating a short-term energy store so that it can then be used to generate steady electrical power that will be transmitted by cable along the sea bed.



WRASPA and incident waves in numerical wave tank

Once the WRASPA design is perfected it is hoped that full-sized devices weighing about 400 tonnes each could be manufactured on land and deployed in water depths of about 25m. An array of WRASPA devices would move to and fro in the direction of wave travel and might be said to resemble an underwater forest swaying in a strong wind. Achieving this in what will be a small and relatively cheap device could lead to economic benefits for the UK and for the Northwest in particular where renewable energy is emerging as a strong area for future growth.