

**Project Title:** 'A wave/current flume for research on offshore renewable energy devices: with the first application on multiple heavy point wave absorbers.'

**Principle Investigator:** Professor Stansby (University of Manchester)

**Project duration:** 01/07/06 – 30/06/07

**Grant Value:** £47,494.00

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 waves and tidal streams which may in principle supply more energy than the UK needs. The main consideration when developing devices which utilise wave and tidal power in order to



generate electricity is economic viability. In order to assess whether potential devices will be economically viable to produce and run, as well as to maximise their performance, it is crucial to rigorously test physical prototypes. To do this the conditions created in the various near shore locations the devices would operate have to be replicated in a laboratory environment. The aim of this project is provide a wave/current facility (flume) in which marine power devices can be properly tested because the influence of currents on wave devices and

waves is often overlooked. It is believed that Marine power devices are most effective when deployed in arrays and this facility is wide enough to test the interaction of these devices when deployed in this way without any interference from the flume side walls.

For this project a wave maker was added to an existing 5m wide and 20m long environmental flume. The wave maker can generate regular, random and directional seas which is vital because the power generated is much reduced by random directional waves which occur in reality.

The first project to use the flume was the nationally renowned Manchester Bobber which is a floatation device which generates electricity through arrays of vertically oscillating floats. So far the first two phases of this project have been carried out which have involved building 1/100 then 1/10 scale models of the device have been built and yielded positive test results. The third phase of the project, which involves building a full size model of the bobber, is well underway and is due to be completed late this year. There are also plans for several other projects to use the flume in the near future.