Project Title: 'Flume modernisation and refurbishment'
Principle Investigator: Mr Stephen Quayle
Project duration: 01/03/07 – 01/04/07
Grant Value: £7,864.00

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 tidal streams and it is reasonably straightforward to generate power from moving water, the difficult bit is doing it efficiently and at lowest cost. 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. Model testing in the field can be difficult, expensive and time consuming with variables such as weather affecting results considerably on a daily basis. For this reason it is much easier to recreate controlled conditions within a laboratory where repeatable experiments can be set up. Similar to a wind tunnel for air flow and study of aeroplanes, a water flume can be used to study tidal flows and how devices will interact to generate electricity. 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 in which tidal power devices can be properly tested.

The Northwest and Morecambe Bay area have the second highest tidal range in the UK and have several areas where tidal currents offer potential for renewable energy generation. There is also a long history of working with the sea in the region, with ship building and offshore industry located in Barrow and further south in Birkenhead. A growing tidal energy market offers considerable potential for the region with evidence of existing suppliers such as Bendalls Engineering in Carlisle becoming an important player in the construction of Marine Current Turbines. The continued provision of scale test facilities in the area will enable the industry to flourish with potential for new devices to come to market and for research work to be completed to improve efficiency of existing devices.

The flume was opened on the 10th August 2009 and can produce currents simultaneously with any type of wave condition. The first project to make use of the facility was the nationally renowned Manchester Bobber which is a floatation device which generates electricity through a grid of floats which 'bob' up and down with the motion of the sea. There are also several other projects using the facility such as one being carried out by a group of MEng students which is sponsored by Yorkshire water.