



An Overview of Blue Energy and UBC Research Initiatives



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Outline



Introduction – Blue Energy Technology

Current Blue Energy Initiatives

- UK Partnerships
- Research Agreement with U.B.C.

Research at UBC

- Facilities
- Recent Projects
- Objectives

Conclusion





Introduction



Blue Energy Canada Inc.

- Conducted research with the NRC in the 1980's developing the Davis turbine
- Incorporated as Blue Energy Canada in 1997
- Intending to commercialize vertical-axis tidal current turbines as both stand-alone and tidal fence configurations
- Received engineering firm RW Beck's technology review report in September 2005



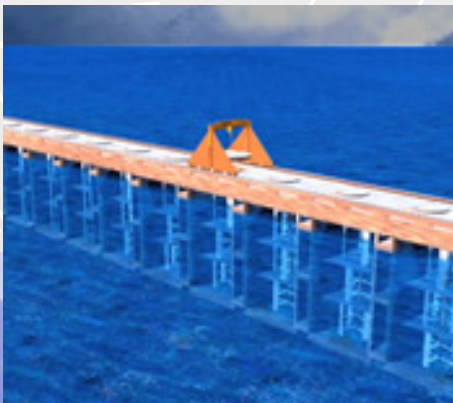


Blue Energy Initiatives



Due to a number of UK clean energy incentives, Blue Energy is intending to install a 10MW tidal fence in the Orkney Islands:

- Currently forming a research agreement with the University of Highlands and Islands
- Halcrow engineering has conducted preliminary civil engineering analysis and will manage civil engineering components of project
- There is a pending power purchase agreement with ALCOA for the energy produced





Blue Energy Initiatives

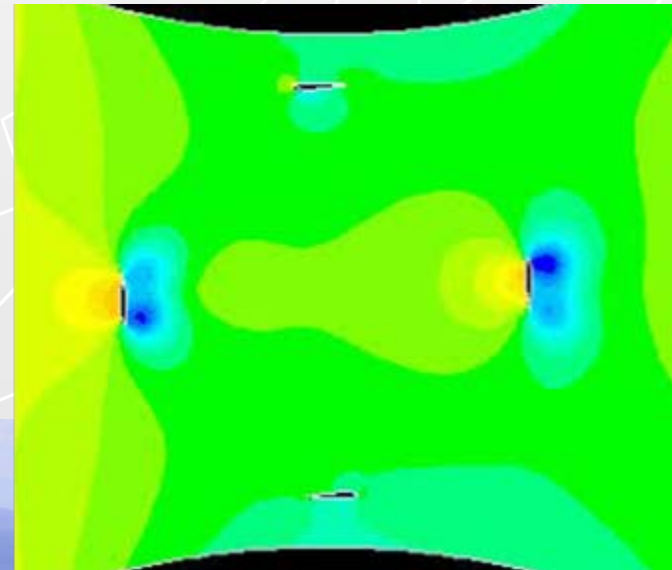


Blue Energy has entered a research agreement with U.B.C. to conduct a parametric study on the turbine before progressing to the UK. This includes:

- Numerical modeling of the turbine
- Experimental tow-tank testing to validate numerical models
- Optimization of a variety of turbine components

This work is expected to progress to the NRC for testing of a larger dual turbine unit.

CFD analysis on a tidal current turbine (top view)





Blue Energy Initiatives



Ongoing work at U.B.C. and in Canada will focus on the design and installation of a stand-alone 250 kW demonstration unit.





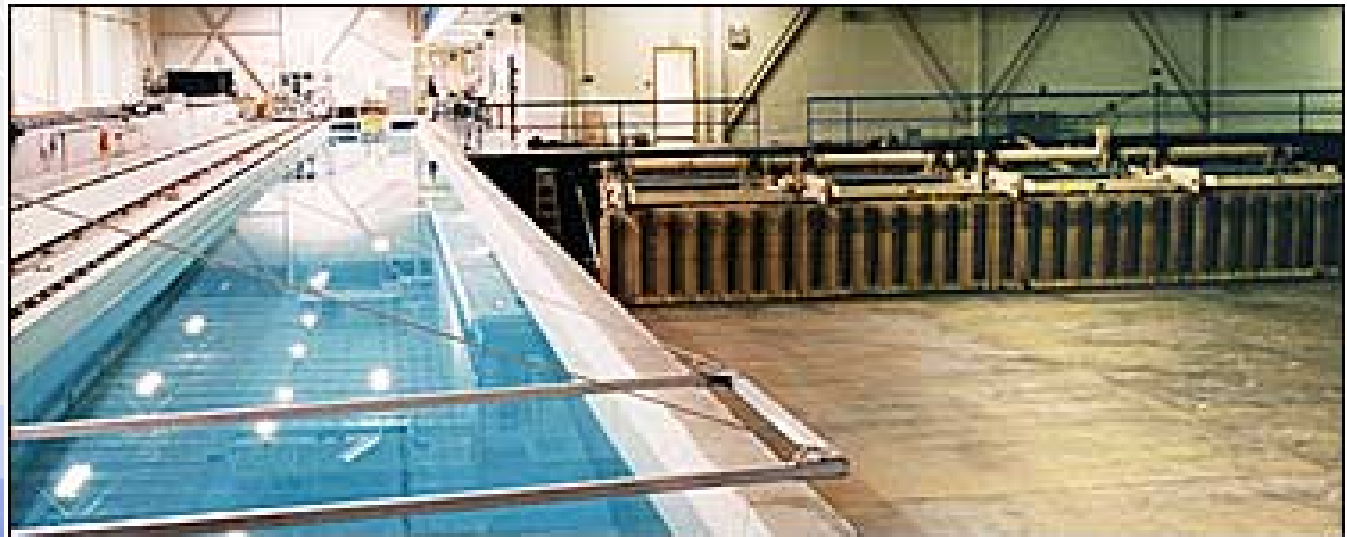
Research at U.B.C. - Facilities



Among the facilities that attracted Blue Energy to U.B.C. are:

- 2 wind tunnels
- A small wave flume (23 m long)
- Computational Fluid Dynamics capabilities
- Access to the Vizon Scitec towing tank
 - 60 m x 3.7 m x 2.4 m deep towing / wave tank
 - 800 m³ wave basin

Vizon Scitec
towing tank





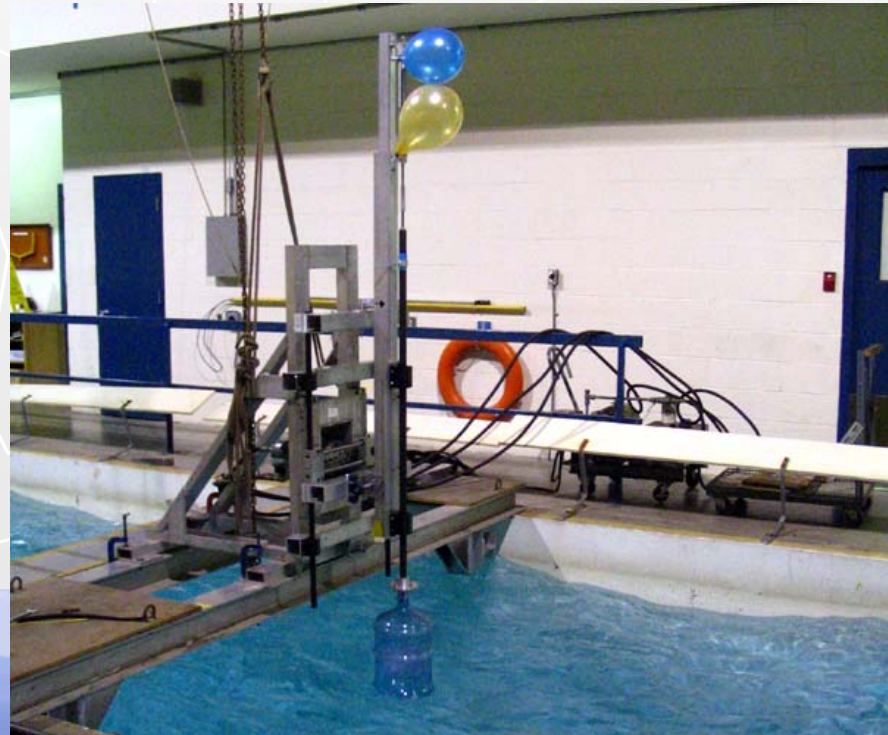
Research at U.B.C. – Recent Projects



In addition to collaboration with Blue Energy, additional research is occurring at U.B.C.:

- Study of wave interactions around cylinder arrays
- Design and manufacture of a wave-buoy test-bench to examine hydrodynamics of buoys in towing tank

Wave buoy test bench measuring forces on buoy while compressing air





Research at U.B.C. - Objectives



These projects at U.B.C. demonstrate a need for an increased research capacity on the west coast.

U.B.C. / Blue Energy submitting a joint project to Western Diversification to improve research capabilities at U.B.C.

- Build a towing carriage for testing ocean energy devices
- Assemble a stockpile of instrumentation for use by various companies
- Subsidize co-op students to install equipment and examine potential facility improvements
- Subsidize a research associate to enhance computer modeling capabilities





Research at U.B.C. - Objectives



It is hoped that such funding will support the Faculty of Applied Science's objective of creating three research chairs in ocean energy/coastal engineering next year.

- Create a critical mass of ocean industry research capabilities on the west coast
- Hopefully lead to a partnership with the NRC and other government/academic institutions nation-wide

U.B.C. is seeking support for this initiative from ocean energy companies as well as other interested groups

- ie. Steelworkers/IWA for the design and construction of fully-contained fish farms powered by renewable ocean energy





Conclusion



Blue Energy is intending to commercialize it's vertical-axis turbine technology in tidal fence and stand-alone configurations

The collaboration between U.B.C. and Blue Energy demonstrates the need for an increased research capacity on the west coast

A project proposal funded by Blue Energy / Western Diversification is being composed to enhance U.B.C.'s research capabilities

This is expected to support U.B.C.'s objective of establishing three research chairs in ocean engineering and hopefully forming partnerships nation-wide

UBC would like to speak with all groups interested in such a facility



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