

# Green energy from the sea

## Innovation ideas

SPOTLIGHT ON A CURRENT PROJECT #005



Energy generated from natural sources, such as ocean waves, doesn't produce any carbon emissions. If this energy can be captured and used to replace that generated from fossil fuels, it will help the UK meet its target of reducing carbon emissions by 80% by 2050 and will minimise our dependence on imported energy. A new wave of reliable and robust technologies will need to be developed to achieve this.



# Technology Strategy Board

Driving Innovation

Aquamarine Power's Oyster® is designed to capture the energy contained in waves close to the shore. As the waves pass over the Oyster, which is fixed to the seabed at a depth of about 10 metres, they cause it to move back and forth. This movement drives hydraulic pistons that push high-pressure water through a pipeline to an onshore turbine, which drives a generator. Multiple Oysters will feed into a single onshore generator. The expected peak power output is 0.5-1 MW per device.

#### Competitive advantage

- Robust and reliable design
- Low-cost operation and maintenance
- Use of proven hydro-electric power generation technology
- Low weight-to-power ratio (minimises capital cost)
- Accessibility (nearshore and onshore equipment)
- Economies of scale
- High capture factor
- High power output.

#### Development status

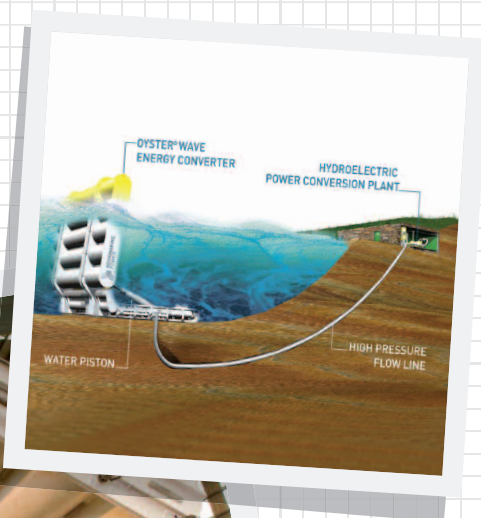
A full-scale Oyster demonstrator is being installed at the European Marine Energy Centre on Orkney. Grid connection and sea trials are planned for 2009.

#### Development contracts

Aquamarine Power has signed an agreement with renewable energy company Airtricity to develop Oyster wave farms with a capacity of up to 1,000 MW by 2020. Discussions are in progress with other potential development partners.

#### Market size

Aquamarine Power plans to have a 2,500 MW of Oyster farms under development by 2012, with a further 7,000 MW in development worldwide by 2020. The wave resource available to Oyster suggests a total global installed capacity could reach 20 GW.



'It's innovative products like Oyster that will lead to reduced dependence on fossil fuels and a slowdown in climate change.'

Martin McAdam, CEO, Aquamarine Power

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#### Project number

22295  
Duration 41 months – ends  
October 2009

#### Technology Strategy Board investment

£870,000  
Total project cost £1.75 million

#### Current project partners

Queen's University Belfast

Collaborative research and development projects are one of the tools that the Technology Strategy Board uses to drive innovation in the UK. The Technology Strategy Board is a business-led executive non-departmental public body, established by the Government. Its role is to promote and support research into, and development and exploitation of, technology and innovation for the benefit of UK business, in order to increase economic growth and improve the quality of life. It is sponsored by the Department for Business, Innovation and Skills (BIS).

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