

# DESIGN OF A PROTOTYPE AWS WAVE-ENERGY GENERATOR

## LEAD ORGANISATION

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## COST AND DURATION

The Carbon Trust contribution towards this project is £125,000. The project started in February 2006 and is due for completion in January 2007.

## PROJECT REFERENCE NUMBER

2005-3-2919

## OBJECTIVES

The Archimedes Wave Swing (AWS) is a powerful and efficient wave-energy system that harnesses renewable energy from ocean waves. The project will complete optimisation, design and performance assessments of a prototype AWS to feed into/confirm the design for the first commercial units. The output will be a complete design with associated costings ready for construction to commence.

## SUMMARY

With numerous wave energy concepts under development globally, the AWS concept is considered a real commercial opportunity by several independent reviews.

This submerged telescopic buoy will be attached to the seabed while the upper part or 'floater' rises and falls under the pressure of the water levels above it, thus driving a generator to produce electricity. Annually, each AWS unit will generate around 4,000MWh and avoid 1,548 tonnes of CO<sub>2</sub> being emitted to the atmosphere.

The project aims to produce a detailed design for the device, and will set out parameters for subsequent work and prepare the numerical models that will later be used in calculating operating loads and performance.

The project will outline the design of the whole system to a level where the detailed design of various elements can be carried out with confidence. An initial design of the bearing arrangements and generator will be made, and the power capture and ancillary system performances will be confirmed.

During the middle stage of the project, scale-model testing of the device will be carried out to confirm deployment stability, survival wave loadings and hydrodynamic drag coefficients.



AWS full-scale pilot plant during submergence offshore Portugal, May 2004

The project will then carry out the structural design and detailing, electrical system design, ancillaries design, and then construction and deployment sequencing. Information will be summarised in detailed engineering drawings, specifications and method statements for the procurement of items for the device.

Finally, the viability assumptions for the technology will be confirmed. Priced bills of quantities for construction, and budgets for management, health and safety plans, etc, will be obtained, and operating and maintenance costs assessment and future cost-reduction possibilities will be made. The project will then assess future energy costs for forecasting.

The project will then be complete and a report will form the basis on which the decision to build the AWS on a commercial basis will be made.