IST, DEM meeting room; 04.02.2009

Workshop on Environmental Impacts of Wave Energy Deployment

HOST: **Wave Energy Centre (WavEC);** António Sarmento (AS), Frank Neumann (FN), Teresa Simas (TS), Sofia Patrício (SP), André Moura (AM).

Invited guest: Prof. George Boehlert (Director of Hatfield Marine Science Centre, Oregon/USA)

Participants in the round table debate

Name	Afilliation
José Lino Costa	Instituto de Oceanografia (Ecossistema Lda. – Environmental consultacy for Pelamis)
Cancela de Abreu	Galp Energia (Portuguese Energy Company)
Rui Barros	CEO – Compania de Energia dos Oceanos (Pelamis Project Owner)
Maria Barradas	CCDR Alentejo (Regional Development Agency of Alentejo)
José Oliveira	DNV Portugal
José Leitão	Hidromod (Portuguese Company; focus on Modelling)
Gonçalo Viegas	Consultor (Consultant)
Manuela Nunes	ICNB – Instituto de Conservação de Natureza e da Biodiversidade (Nature nd Biodiversity Conservation Institute)
Joana Andrade	SPEA - Sociedade Portuguesa para o Estudo das Aves (Bird Protection Society)
Sérgio Leandro	Câmara de Peniche / Escola Superior de Tecnologia do Mar (Peniche Municipality & Polytechnical Institute)
João Freire Cardoso	Martifer Renewables (Portuguese Energy Company and technology developer)

Introduction & Presentations

- AS welcomes the participants and thanks Prof. George Boehlert for taking the initiative of travelling to Portugal and contacting WavEC for discussions regarding this topic.

- FN gives a brief outline of WavEC activities in general, and on most relevant international collaboration activities, focusing on topics relevant to this workshop. In particular he mentions the Intelligent Energy Europe project Waveplam for the removal of non-technical barriers, including conflicts of use, public acceptance and environmental consenting. He calls attention to the potential best practice example that Elsam (Denmark) implemented for the Horns Rev and Nysted offshore wind farms: a rigorous and comprehensive environmental baseline and monitoring programme apparently helped to increase significantly the public and other stakeholders' acceptance of the projects.
- TS presents the Equimar project and in particular the role of WavEC as WorkPackage (WP) leader of environmental impact Assessment issues
- SP outlines the National funded project Wave Energy Acoustic Monitoring
- AM presents the situation of the Portuguese pilot zone development, focusing on WavEC's initiative from April 2008, when stakeholders met to prepare a baseline & monitoring proposal.
- Prof. George Boehlert presents the situation and activities in Oregon, including the Hatfield Marine Science Centre and its roles. He mentions that the Centre was appointed as general contact point for international collaboration issues within wave energy (not limited to Oregon, neither on environmental issues).

All presentations are available for download at WavEC's web-page:

http://www.wavec.org/index.php/62/environmental-impacts-of-wave-energy-feb-2009/

Minutes of the Round Table Debate

The discussion on the environmental impacts of wave energy deployment was carried out using the Portuguese Pilot Zone as the case study. The following aspects were discussed:

- Considering there is few specific information on the environmental drivers in this marine zone, the need for a detailed study was stressed. This work, especially the physical characterization, is very expensive since it involves costly ocean sampling campaigns. However, it was agreed that the part of this information concerning the physical characterization is crucial at this stage for following a 'best-practice' approach to the deployment of devices in the Pilot Zone;

- The most appropriate arguments to convince the management entity (or other potential funding bodies) for such a study were discussed, and the following were referred:
    - A baseline study will reduce the cost of implementation and so increase the attractiveness of the pilot zone for project and technology developers;

- A baseline study of the physical parameters will provide the developers crucial information on the best place to locate and explore the devices avoiding the possible additional costs of e.g. repositioning; other negative impacts of not having this information with sufficient detail and quality includes loss in moorings and damage of electrical cables;
- A more comprehensive (fauna, flora) baseline study can furthermore help to avoid unexpected problems related to the interaction with the biosphere;
- Without a baseline study it will be very difficult to analyse the environmental impacts of the devices after deployment since no reference is available for comparison; this will reduce the chances of attracting European funded projects to Portugal and thus of using the pilot zone as an element of the strategy to promote innovation and a cluster of services related to wave energy;
- The general lack of data available and the absence of a sound and comprehensive ocean space monitoring history in Portugal may be an additional motivation for this initiative, bringing along significant added value to the knowledge of the Portuguese nearshore waters.

- However, it was recognised as unlikely to be able to mobilize means to properly monitor the entire pilot zone of 340 km^2, in particular with respect to baseline studies. At present stage of development, everything indicates that there will be no significant funds made available for such undertaking, neither by the management body (the Portuguese transmission grid operator REN) nor the government. It was briefly discussed the possibility of focusing on example areas and/or only start the monitoring activities after the first devices are installed (meaning that the topic is more relevant), however no consent could be yielded on these issues.
- The application of models to analyse the physical baseline conditions of the pilot zone were suggested to reduce the costs and optimize the sampling effort;
- It was stressed that the environmental impacts of wave energy are strongly dependent on the number of devices operating in the area; the analysis of the cumulative impacts of arrays of devices should determine their “density” in the pilot zone;
- The main environmental impacts of wave energy deployment on bird fauna were pointed out by the delegates of SPEA and ICNB:
  - Lighting and above water structure may result in collisions and attraction to buoys;
  - Collisions with the underwater part of the equipment may also occur when the birds dive to feed; the role that the devices may have as Fish Aggregation Devices could highlight this risk

- Since it is part of a bird migration route, the pilot zone (or part of it) is recognized as an Important Bird Area (IBA); however, this designation carries no legislative obligations. Nonetheless in many cases IBAs act as a roadmap for future Special Protected Area (SPA), which does have European legislative backing;
- It is important to note that, in general, IBAs and SPAs are not prohibitive of new projects; instead, they should endorse mitigation measures and monitoring of the project impacts;
- In the pilot zone the main data gap concerning bird fauna is its activity at night; the only way to acquire this information is by resorting to radar; data on the spatial and temporal abundance of birds as well as the important migration patterns are available for the area and can be supplied by SPEA;
- Dr. Pedro Lino from the Oceanography Institute talked about his experience on the baseline and monitoring studies for the AWS and Pelamis on the Póvoa de Varzim coast; for these studies control areas (reference zones) were selected and the criteria of the quality standards in the European Water Framework Directive were applied.

The one day workshop was closed under common agreement that this should be a starting point for further discussions rather than considered conclusive. Possibly such discussions should be scheduled regularly and with confirmed presence of specific stakeholders, as well as be integrated in international platforms.