

**EU-OEA's response to the European Commission's**



**COMMUNICATION TO THE EUROPEAN PARLIAMENT, THE  
COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE  
AND THE COMMITTEE OF THE REGIONS**

**Second Strategic Energy Review**

**AN EU ENERGY SECURITY AND SOLIDARITY ACTION PLAN**

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## Foreword

The following pages contain the European Ocean Energy Association's position towards the **Second Strategic Energy Review, AN EU ENERGY SECURITY AND SOLIDARITY ACTION PLAN.**

The European Ocean Energy Association, established in 2006, represents the emerging ocean energy sector. The main aim is the promotion of the development of ocean energy and raising awareness in Europe and internationally.

The undeniable resource potential of ocean energy can make a significant contribution to increasing the EU competitiveness, in securing the energy supply and in contributing to the EU energy mix. A swift development of the ocean energy industry will not only help reducing CO<sub>2</sub> emissions but it will also contribute to economic growth, an increase of regional development (especially in remote areas), high quality jobs and European industrial leadership.

As an association devoted to the development of ocean energy we always pointed at regulatory, grid, and network weakness, among the main limitations hindering the development of the sector. We, therefore, welcome the Second Strategic Energy Review, An EU Energy Security and Solidarity Action Plan as key contribution to the effort for the removal of these barriers, and fundamental step to achieve the goals of the EU's new energy policy: sustainability, competitiveness and security of supply.

We also welcome the Commission's new action plan to promote offshore wind energy *Offshore Wind Energy: Action needed to deliver on the Energy Policy Objectives for 2020 and beyond* as an important commitment towards RES in general, and the development of the European energy mix.

## Background

Ocean Energy resources over Europe's seas, especially on the Atlantic and the North Sea borders but also interesting opportunities exist in the Mediterranean, Black and Baltic Sea represent a vast, indigenous source of clean, renewable energy. In the last two years, since the publication of the European green paper Energy strategy for a sustainable, competitive and secure energy supply (March 2006), the Ocean Energy sector underwent serious development, especially in its wave and tidal segments. Overall, the global potential of OE has been estimated around 80TW that is over 90,000 TWh/year, half of which from wave energy alone. Marine and tidal currents can produce over 800 TWh/y; OTEC (thermal gradient) 10,000 TWh/y, tidal over 300 TWh/y, and salinity gradient 2,000 TWh/y.<sup>1</sup>

In Europe, the tidal barrage of La Rance in France produces 600 GWh/y since 1966. The recently grid connected wave farm of Agoucadoura in Portugal is designed to produce almost 5GWh/y. At present, many different concepts and devices are under development (tapping on tides, waves, current, thermal gradient, and saline gradient), many of them are in an advanced demonstration phase of R&D, through the deployment and test of large-scale prototypes in real sea conditions, and some have reached premarket deployment.

Although the sector is still moving its first steps into a full commercial dimension, the industry is already looking at it with interest and positive expectation. Key oil companies such as Shell, Exxon, along with major industries such as Siemens and Bosch Rexroth have opened research branches dedicated to Ocean Energy.

Électricité de France (EDF) recently closed agreements with the ocean energy developing company Open Hydro to create grid connected OE plants.

The UK invested £28m to build by 2010 a 20MW grid connected wave energy farm in Cornwall enabling pre-commercial testing of wave energy devices on a large scale. Portugal created a 250 MW pilot zone with simplified licensing and permits for wave energy and a feed-in tariff scheme to support the development of this new industry. Iberdrola, one of the leading private electric utilities in the world, and the Basque Tecnalia Corporación Tecnológica invested around €4.5m to develop the OCEANTEC project to put into operation a wave energy device by 2009.

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<sup>1</sup> See, for example, IEA-OES, International Energy Agency, *Implementing Agreement On Ocean Energy Systems*, Annual report 2007

A cooperation agreement covering the development of wave power technology has been signed by Swedish utility company Vattenfall AB and Wavebob Ltd of Ireland. Under the terms of the agreement the two companies will collaborate on bringing prototype wave power devices to readiness for full-scale commercial wave power farms, including the study for the development of a large demonstration project of 250 megawatts

After several years of research and development, ocean energy is today more than ready to make a significant contribution to the energy market. At present, the cost of energy produced is almost comparable with other renewable energy sources. Cost of energy from initial tidal and wave energy farms has been estimated to be in the range of 15-55 €cents/kWh; initial stream farms, in the range of 11-22 €cents/kWh. Electricity generation costs of 10-25 €cents/kWh, comparable to photovoltaic, are expected by 2020. In its World Energy assessment the United Nations and the World Energy Council estimate the potential future energy cost in the same range of wind energy. According to the latest research findings, in fact, OE will benefit from a very strong learning factor that is estimated to be 10-15% for offshore wave, and 5-10% for tidal stream. Compared to offshore wind, OE will have a much stronger learning curve due to the fact that OE is entering the market at a much higher level. OE development could even go faster than seen in onshore wind energy as the final size of wave devices is in place from the very beginning: wind energy development went from 25kW turbines to 2-4MW turbines during the first 25 years of development, while a full scale Wavedragon, for example, is rated 7MW.

In the medium term OE has the potential to become one of the most competitive and cost effective forms of generation, and will enjoy in the next few years a dynamic market penetration, following an analogous curve to on-shore wind energy.

In addition to the tremendous potentialities of OE in term of reducing greenhouse gas emissions, ensuring security of supply and improving competitiveness, OE has several very concrete advantages such as a strong and versatile possibility of hybridization and synergy with other sectors such as offshore oil and offshore wind, and job creation and economic development for maritime communities (estimated 5-10 jobs/MW) in the very region where the energy is generated.

Compared to offshore wind, the resource potential for OE has a wide European spreading and therefore it appears to be appealing to a large number of European countries, while the

first would benefit mainly a restricted group of Northern European countries. Also, OE enjoys a tremendous advantage over other RETs such as wind and solar: predictability. In fact, while wind and solar are subject to the intermittence of atmospheric conditions, OE is highly and accurately predictable, making it extremely appealing for grid distribution.

## Challenges

We would like to express our concern about the prioritization of the second strategic Energy Review towards a single RES (offshore wind), both in the general strategy, and in the specific call for a North Sea Offshore Grid.

Notwithstanding the well recognized high potential and the extremely encouraging prospective of OE, the Second Strategic Energy Review only gives reference to OE as a vague and imprecise “marine resources” on pag. 13, and a “wave” towards the end of the document, in the inventory of RES that would benefit from a supergrid ring around Europe (pag. 16). We would like to stress how the omission of RES such as OE, with high potentiality in energy, synergies, and environmental advantages is a rather strident one.

Although, in general, the wave power resource in the North Sea is slightly smaller than the resource in front of the West European coast, the wave climate of the North Sea, according to many studies, is attractive for wave energy conversion. As a matter of fact the North Sea is already a location of choice for many wave energy generation plants. In 2008, Denmark together with the large industrial partner Danfoss, invested 3 millions € to build the 500 kW wave energy plant “Wave Star” in combination with the off shore wind farm Horns rev., representing the largest government funding ever on a single wave energy project. Ocean Energy should be, therefore, considered an important beneficiary of the North Sea Offshore Grid.

The development of a coastal grid on the Atlantic European coast, as well as the Northern Sea one, is vital to OE development in Europe. The statement of the Second Strategic Energy Review on p. 16 however implies a regionalization of RES attributing the North Sea to offshore wind. Instead, unique mention of “waves” on the same page is limited only to a generic “western wave” (p. 16).

This approach is somewhat contradictory to previous EC documents such as “Energy Policy And Maritime Policy: Ensuring A Better Fit”, or “An Energy Policy for Europe” (10.1.2007) {SEC (2007) 12}, where the necessity of the diversification of the RES strategies in order to

strengthen the security of energy supply, and the recognition of the relevance of the OE sector is clearly stated.

This is why, in accordance with the SET plan adopted by the Commission in 2008, the Second Energy Review affirms on p. 13 that the development of all renewable energies has to be seen as EU's greatest potential source of indigenous energy. To be able to tackle energy and climate problems, it is necessary to diversify the portfolio of renewable energies.

## **Conclusion**

It is not our concern to discuss here a hierarchy on the potentialities of the different offshore RES. However, given the tremendous potentialities of OE in term of reducing greenhouse gas emissions, ensuring security of supply and improving EU competitiveness, hybridization and synergies with other sectors, we would like to call for an equal treatment of all RES under the Second Strategic Review, and, consequently, for major relevance of Ocean Energy in the Second Energy Review, and of its weight in the Blueprint for an North Sea Offshore Grid. Furthermore, since the Strategic Energy Reviews, as defined in “An Energy Policy for Europe” (10.1.2007) {SEC (2007) 12} provide the overall framework for the discussion on energy issues in the EU institutions, to focus on a single RES reducing the diversity of the European energy mix, especially in a context such as grid access, strategic to the development of OE, appears very restrictive.

As the RES directive points out, EU member states must ensure that transmission system operators and distribution system operators guarantee the transmission and distribution of renewable electricity and provide for either priority access or guaranteed access to the grid. Grid connection is a key issue for all renewable energy technologies and, because of the weakness (or more often, the lack) of a European coastal grid, this is especially relevant for all marine based. To dedicate portions of the European grid to a specific renewable energy source (offshore wind) would weaken the grid development potential, hindering the general European interest for the development of a strong energy mix and security.