Researchers to put cutting edge wave power technology to the test in real ocean conditions

May 27 2015

Oceans – which after all cover some 71 % of the earth's surface – represent an untapped source of clean, renewable energy. Early demonstrations have already shown that the energy stored in waves can be captured by floating energy converters. Now scientists want to rigorously test this technology on a much larger scale, to see whether the concept is truly viable and whether hardware is capable of surviving rough sea conditions over a period of several years.

These are the key objectives of the five-year EU-funded CEFOW (Clean Energy from Ocean Waves) project, due for launch in June 2015. With an overall budget of some EUR 24.7 million – the EU is providing nearly EUR 17 million in funding – CEFOW hopes to conclusively show that wave energy can be a cost-effective and efficient addition to Europe's energy mix.

The project is not starting from scratch. Team members will have access to an existing wave power testing centre off the north coast of Cornwall in the UK called Wave Hub, which contains the necessary infrastructure. In addition, the wave energy converter technology to be deployed in the project has already been tested and proven in real conditions in Scotland. This technology includes a new type of convertor called the Penguin, which is based on industry standard components and includes a generator typically used in wind turbines. The concept of this convertor is to enable scalable manufacturing using existing processes.

The CEFOW project therefore aims to build on progress that has been

made so far, and push forward the development and deployment of wave power. Through testing the technology in real ocean conditions, the team hopes to tweak and improve the hardware as the project progresses. The consortium has set targets to improve the performance of wave energy converters by 50 % and to develop new types of dynamic mooring.

In addition, the consortium aims to bring together different aspects of the wave power supply chain in order to set in place the necessary support network for larger wave power projects in the future. The project will also study the feasibility of on-board and onshore energy storage solutions, and conduct thorough multi-year environmental, health and safety studies. Additionally, researchers will also work with local fishermen during the course of the project to assess how devices interact with the marine ecosystem.

In addressing every possible aspect of wave power generation, CEFOW hopes to ultimately play a key role in helping the EU meet its ambitious renewable energy targets for 2020. These targets, known as the '20-20-20' targets, set three key objectives for 2020: a 20 % reduction in EU greenhouse gas emissions from 1990 levels; raising the share of EU energy consumption produced from renewable resources to 20 %; and a 20 % improvement in the EU's energy efficiency.

The development of cost-efficient wave power technology could prove crucial in helping Europe combat climate change, increase energy security and strengthen its competitiveness.

Provided by CORDIS