Galician waves are best for producing energy

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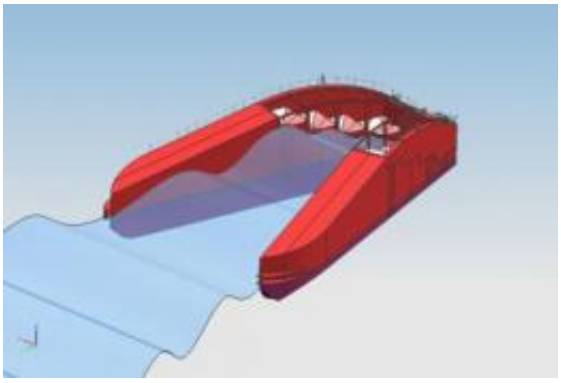

This image shows a WaveCat Credit: Iglesias et al./USC.

The best coastal areas in the Iberian Peninsula in terms of harnessing wave energy are the Costa da Morte and Estaca de Bares, in La Coruña, Galicia, according to two pioneering studies by researchers from the University of Santiago de Compostela (USC), published this month in the journals *Energy* and *Renewable Energy*.

"The Costa da Morte, between Finisterre and the Sisargas islands, and the Estaca de Bares areas - both of which are on the coast around La Coruña - have the greatest potential of any coastal areas in the Iberian Peninsula in terms of installing systems to exploit wave energy", Gregorio Iglesias, co-author of both studies and an engineer at the Higher Polytechnic School of the USC, tells SINC.

In the research studies, which have just been published in the journals

Energy and *Renewable Energy,* the engineers say that wave energy along the Costa da Morte can reach 50 kilowatts per metre of water (more than 400 MW/hm per year) and a little more than 40 kW/m at Estaca de Bares.

"The energy potential in this region in the north west of the peninsula decreases as one moves eastwards through the Cantabrian Sea (25 Kw/m in the Basque Country) and through the Atlantic towards the south", explains Iglesias, "While wave power in the Mediterranean is not strong enough for efficient energy production".

The study analyses the energy potential of Galician waters, and is the first such study to have focused on this region in detail. The researchers' data came from maritime climate studies (wave patterns over time) in deep water at 20 sites along the Galician coast. This information comes from four buoys (Langosteira, Vilán-Sigargas, Cabo Silleiro and Estaca de Bares) and 16 nodes of the SIMAR-44 dataset (series of atmospheric and oceanographic parameters generated using data gathered between 1958 and 2001).

Gregorio Iglesias highlights the importance of waves as a source of renewable energy, which may play a "crucial" role in reducing greenhouse gases and helping to comply with the Kyoto Protocol.

These are waves in the Atlantic Ocean. Credit: SINC

Wave energy

Energy produced by waves (as distinct from tidal energy, which is costly and only effective in coastal areas where it is possible to confine large water masses), can be generated by a range of devices, from buoys that move a generator as they rise and fall, to hermetically-sealed columns or tubes linked to the sea, through which the waves push air into a turbine, while energy can also be obtained from the movement of linked floating articulating sections, such as in the system used by the Pelamis or "sea snake" device, developed in Portugal.

In Spain there are not yet any wave power facilities operating on a commercial basis, although there are two pilot power plants, the first of which is in Santoña (Cantabria) and uses vertical oscillation of electric buoys, while the other, in Mutriku (Guipuzcoa), uses oscillating water column technology. There is a project planned to set up a wave power plant in the port of Granadilla (Tenerife).

The USC researchers have also designed a wave energy generation system called "WaveCat", which is a floating steel structure, which contains turbines to produce electricity. Currently, the team is working to improve the numerical models of the system and is building a scale prototype to trial in a wave tank.

More information:

• G. Iglesias, M. López, R. Carballo, A. Castro, J.A. Fraguela, P. Frigaard. "Wave energy potential in Galicia (NW Spain)". Renewable

Energy 34 (11): 2323, Nov 2009.

• G. Iglesias y R. Carballo. "Wave energy potential along the Death Coast (Spain)". *Energy* 34 (11): 1963-1975, Nov 2009.

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