

Ocean waves can power Australia's future

(Reuters) - Waves crashing on to Australia's southern shores each year contain enough energy to power the country three times over, scientists said on Tuesday in a study that underscores the scale of Australia's green energy.

The research, in the latest issue of the journal of Renewable and Sustainable Energy, comes as the nation is struggling to wean itself of years of using cheap, polluting coal to power the economy and to put a price on carbon emissions.

Oceanographers Mark Hemer and David Griffin from the state-funded research body the CSIRO looked at how wave energy propagates across the continental shelf and how much is lost. The aim was to build a picture of the amount of energy on an annual basis and how reliable that source is.

The government has passed laws that mandate 20 percent renewable electricity generation by 2020 to curb carbon emissions and wind power is likely to make up the bulk of the green energy investment. Wave power is still in early development.

"So what we're saying is that we can achieve that target if we harness 10 percent of the available wave energy resource," Hemer told Reuters from Hobart.

Hemer and Griffin used complex computer models to map how the energy in the waves attenuates near the shore. They looked at the annual cycle both in terms of mean wave conditions and the 10th and 90th percentiles.

This means that 10 percent of the time waves are smaller than the mean and for the 90th percentile the waves are larger than that value for 10 percent of that time.

"Basically what this means is that there is still a fairly large resource for 90 percent of the time," said Hemer. And this is crucial because some types of renewable energy, such as wind and solar panels, are limited because they can't generate steady power 24 hours a day, unlike coal or gas.

Wave power has much greater potential to deliver steady power supplies, but connecting it to the grid in remote areas could be a problem.

"Averaged over the whole year, Australia's southern coastline has a sustained wave energy resource of 146 gigawatts (1,329 terawatt-hours/year)," the researchers say in their study, or three times Australia's total installed generation capacity.

The government, facing an election on Saturday, is under pressure to put a price on planet-warming carbon emissions and further boost investment in cleaner energy.

The country is one of the developed world's top carbon emitters and relies on coal to generate about 80 percent of its electricity.

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Hemer and Griffin's work has created a series of maps of the coastline that helps wave power investors find the right sites and design projects that can cope with calm and stormy conditions and how frequent these might be.

Their work is different from some past studies, which used wave data from deep-ocean waters.

The researchers don't advocate any particular wave power technology.

But there are three firms in Australia developing technologies, including Fremantle-based Carnegie Wave Energy, which has a system based on large buoys suspended just below the surface near the shore.

Hemer and Griffin's estimates are based on the amount of energy along the coast at 20 meters deep, since many emerging wave power systems are likely to be at that depth or less.

Ideal sites included Portland in Victoria and Albany in southern Western Australia because of easy grid connections.

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