



Winter test for Carnegie's wave power project

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On a dark and stormy night in Perth in early May, Mike Ottaviano couldn't have been more content and relaxed as 5.8 metre waves lashed Garden Island and the HMAS Stirling naval base.

Ottaviano heads Fremantle-based Carnegie Wave Energy, which claims to be one of the few surviving commercial-stage proponents of wave power globally.

During the bleak weather, Carnegie's inaugural project — which powers HMAS Stirling, Australia's biggest naval facility — faced a foaming reliability test.

"We generated power all the way through it," Ottaviano says. "It was beautiful to see."

After pouring \$100 million into development over the last 16 years, Carnegie is on the cusp of declaring that not only its technology works but it can be commercialised and sold to markets such as island nations dependent on diesel power.

"It does what it says on the tin, generating electricity from the waves," Ottaviano says. "Now we need to prove its survivability over winter to complete the phase."

Carnegie's intellectual property is based on so-called CETO method, which involves installing huge bulbous "buoys" a metre or so underwater.

Not only is this more sightly, but the equipment avoids the full battering impact of the waves. "We look despairingly at wave technology with big floating structures because we know how it will end," Ottaviano says.

The pilot Garden Island project, commissioned last November, involves producing three megawatts of power from and

fifth-generation (CETO5) buoys, each capable of generating 240 kilowatts of power.

The CETO6, which can each generate one megawatt and are twice the size of the CETO5 units, are due to be commissioned at the site in 2017.

Carnegie's focus now turns to demonstrating the 50-tonne units can be removed and reinstalled for maintenance cheaply and easily.

The units also have to survive their first winter. "In the past, projects elsewhere have come unstuck when hit by 4m-5m waves," Ottaviano says. "We expect seven to nine metre waves over winter."

Carnegie intends to licence the technology, rather than provide the equipment, to end users. Given that wave power (and generation) is not new, Carnegie's IP lies with the algorithms that align the equipment with the ocean's rhythm.

Carnegie has inked a deal with French utility EDF which will make it EDF's preferred energy supplier.

Ottaviano says Carnegie hopes to announce its first island project in the next six months, or a "well supported" European locale such as Ireland.

Despite being supported by state and federal co-funding grants, Carnegie's first full-scale project won't be in Australia because it would not stack up under the current regulatory regime and wholesale electricity prices.

The Department of Defence championed the Garden Island not on the economics but on securing an alternative power source should a mischief-maker sever the cable to the mainland.

In Britain, wave projects enjoy feed-in tariffs five times greater than those applicable to wind and

also five times the wholesale electricity rate in Australia.

"In other words, if I build a \$100m wave farm in Australia and a \$100m wave farm in the UK I will get a five times better return on the latter."

The buoys themselves are made in Vietnam. "The harsh reality is the cost base in Australia is (such) you can get three built in Asia for the cost of one here."

He says Carnegie needs to spend another \$50m to reach commercialisation. About \$35m is available through undrawn grants, including \$25m from the Australian Renewable Energy Agency.

"We will need to fill the gap at some point but at this stage there is no need to raise capital," he says.

Ottaviano describes Carnegie as the "only grid-connected wave farm in the world". "Nine years

ago there were hundreds of people with ideas," he says. "Now there are maybe a dozen and of them two or three are active demonstrating larger-scale systems."

A quirk of the company is that it receives royalties from the Higgsville gold project, a legacy of its resource company ancestry.

Carnegie is chaired by former Pacific Hydro chief Jeff Harding, who presided over the \$1bn sale of the then listed company to industry funds group IFM.

Infrastructure heavyweight

Mike Fitzpatrick is a Carnegie director and 8 per cent shareholder through his personal fund, 88 Green Ventures.

Despite the progress Carnegie shares languish at 5c, ascribing a market capitalisation of \$87m.

But Ottaviano is convinced the ocean's forces will account for 10 per cent of the world's power



needs by 2050. "It's a beautifully predictable resource," he says, adding that renewable energy generally is "seriously disrupting" the fossil fuel incumbents.



MARIE NIRME

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