



A freshwater solution

A new technology that converts ocean waves into energy has successfully produced power and desalinated water and is on the path to commercialisation.

Anyone who has been dumped in the Australian surf knows all about the energy in ocean waves, and what it's like to swallow sea water. If we could just tap it, and maybe get rid of the salt ...

It's been done. A technology developed by Renewable Energy Holdings of the UK and Perth-based clean energy technology developer Carnegie Corporation has produced electrical power and fresh water. CETO converts wave energy into base-load energy and achieves emissions-free desalination. The technology has been in development since 1999.

The CETO units sit offshore, out of sight, moored to the sea floor. Seawater-filled buoys just below the surface move

elliptically with the waves and drive a pump underneath. The pumps draw in seawater and push it through a pipeline to shore under very high pressure.

Carnegie Corporation managing director Michael Ottaviano says a few other wave energy technologies are being developed globally, but they typically generate electricity offshore and bring it back via a high-voltage line.

"There is an increasing global demand for zero-emissions power, and CETO has the advantage over the most commonly used renewable at the moment – wind – because it has a base load.

"Other wave technologies need a large swell to generate power, but we can work in



CETO is a new technology that converts ocean waves into energy and fresh water.



Electrical Connection

Monday 1/10/2007

Page: 32

Section: General News

Region: National Circulation: 29,066

Type: Magazines Science / Technology

Size: 362.27 sq.cms.

Published: Quarterly

Index: 1.1

Brief: SEAPOW(P

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the range of 1-2m, which exists throughout the world for more than 90% of the time."

Once ashore, the water from CETO can be used in a turbine to generate hydro-electricity, or the pressure is high enough to use standard reverse osmosis desalination membranes to create fresh water. The proportion of power to water generated can be varied from zero to 100%.

"We are developing a sustainable technology, and it needs to have minimal environmental impact," Michael says. "By the year 2030, the UN estimates that nearly two-thirds of the world will be water-scarce."

Considering that 60% of the global population is within 60km of a coastline, CETO can avoid the transmission issues of geothermal applications.

Each installed unit can generate up to 180kW. A 'wave farm' of 300 units would have a maximum capacity of about 50MW and would occupy a sea floor area equivalent to two football ovals. Michael says expected annual average output is 25MW and about 50GL of fresh water – concurrently.

Commercial site selection is already under way, and Michael hopes to be producing at commercial levels within three years.

"Our pre-commercial prototypes are undergoing initial in-sea testing that should be completed this year. We will then begin full-scale final tests."

The Federal Government has invested \$775,000 in the technology, and Michael says the Western Australian Government is likely to support local commercialisation efforts.

- Paul Skelton