



BY GILES PARKINSON

Swell ideas

Australia will be the world powerhouse of wave-generated electricity if two inventors get their innovations up and floating.

SOME TIME IN the next few weeks, power from a pilot wave-energy plant in Port Kembla will be connected to the NSW electricity grid. It will be a first for Australia and possibly the world. Within a few years, there might be hundreds of them installed across the globe.

Wave energy is such a limitless resource that numbers don't really make much practical sense. OceanLinx's pilot plant will generate around 500kW – perhaps enough for 500 houses. In theory, however, there is enough power in the oceans to satisfy the world's energy needs more than 5000 times over.

“My vision is that within five or 10 years, we will have [plants generating] thousands of megawatts installed and be making a serious contribution to reducing carbon emissions,” says Dr Tom Denniss, inventor, company founder, shareholder and executive director of OceanLinx.

The idea of generating energy out of waves and tides has been around for more than 1000 years: medieval tidal mills were built in Spain, Portugal and France. In 1799, the French Girard family filed a patent for a wave-power plant that included a barge, a big lever and a water pump, but it was never built.

Denniss' invention looks like a giant hair dryer, but the technology is simple. Waves push water into a chamber, inside which the air is compressed and pushed past a turbine, generating power. As the water recedes, air rushes back into the vacuum, turning the turbine in the opposite direction, generating more electricity.

The 30m by 10m plant, which can float pretty much anywhere on

the continental shelf, is about as noisy as a domestic vacuum cleaner and because there is only one moving part – and that well above water – there is no threat to marine life. Last year, the International Academy of Science named it one of the 10 most outstanding technological developments in the world.

The Port Kembla installation is the first of many planned over the next few years. By

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early 2008, a 1.5MW plant will be installed at Portland in Victoria, near the giant aluminium smelter. An agreement to feed 15MW of power into the local grid is expected to be signed soon.

Other plants are to be built near Cornwall, where the UK government has pledged £28m (\$66.8m) to support a project that will create an ocean floor “energy socket” into which wave-energy providers can plug their technology. Other plants will be built off the US, Mexico, and South Africa.

Denniss predicts it will not be long before large wave farms are created off the coast (but over the horizon to assuage aesthetic concerns). “I can envisage hundreds of thousands of them in 30 or 50 years' time,” he says. The cost is estimated at around 5¢ per kilowatt-

hour, which compares with 3.5¢ for coal (not including the cost of carbon emissions). Wave-energy power costs are expected to fall as production reaches a larger scale.

OceanLinx's technology may also offer a solution to the water crisis. Denniss says the units can double as producers of desalinated water. Denniss estimates each 1.5MW plant could produce about 1 billion litres of drinking water a year – at considerably less cost than conventional desalination plants.

That idea is being taken up by Perth-based Carnegie Corporation, which has developed an underwater system made up of a series of buoys that sit below the surface and drive pumps on the ocean floor. High-pressured water is then piped to a land-based plant for conversion into freshwater or to drive hydro-electric turbines, or both. Carnegie is lobbying state and federal governments to use its technology to address the water crisis.

“I expect there will be underwater forests of these things,” says founder, inventor and major shareholder Alan Burns. “A relatively small area can provide enough water for a major city.” Burns is an oil and gas man who founded Hardman Resources and much of his technology and know-how of working underwater – like that of almost all the scientists and engineers on his project – come from that industry. The units measure just 5m by 0.5m, but dozens can be grouped together to create a critical mass.

The inspiration for Burns' invention came when he went diving off Rottneest Island, near Perth, some 30 years ago and almost found himself trapped in a cave by the force of the currents. “We are the Saudi Arabia of waves. We should use it.” ●



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BRAIN WAVE
The prototype for
OceanLinx's power plant off
the coast of Port Kembla



BUOY WONDERS
One of the Carnegie Corp devices,
which drive pumps on the ocean floor