Wave power push for new WA desalination plant

Western Australian company, Carnegie Corporation, is proposing to set up the world's first base-load wave-power electricity station and desalination plant by 2012 based on locally developed CETO technology.

Carnegie Managing Director Dr Michael Ottaviano says the company is finalising details for a $400 million 50 megawatt (MW) demonstration wave farm that could supply power for around 40 000 households.

He says that once it was up and running, the wave farm's operating cost 'should be competitive with fossil fuel alternatives as it has zero fuel costs'.

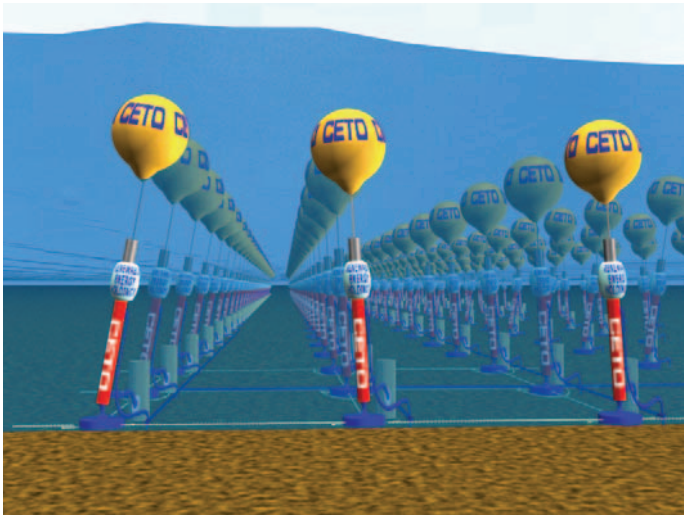
CETO – named after the sea goddess of Greek mythology – comprises an array of subsurface buoys connected to pumps on the seafloor; the movement of buoys in response to wave pressure variations drives the pumps. Pressure-driven water is then piped to a land-based hydroelectric turbine or reverse-osmosis desalination plant, or both.

According to the Carnegie Corporation, any combination of power and water is feasible, from 100% power to 100% water.

In May, Western Australia's Water Corporation called for expressions of interest for a second desalination plant to deliver 45 gigalitres (GL) to Perth's water supply by 2011, with the capacity to deliver 100 GL later on.

The Water Corporation says it will be 'actively investigating economic sources of renewable energy' for the new plant.

This announcement was welcomed by Carnegie Corporation, which has been lobbying state and federal governments to use wave-powered desalination to deal with water shortages.



Unlike many other wave-power technologies, the CETO system sits beneath the sea surface. Carnegie

However, Phil Jennings, Professor of Energy Studies at Murdoch University, says that while the technology is exciting, it is also experimental and untested on a large scale.

'Currently, the government is looking for an assured water supply,' says Professor Jennings. 'If the new desalination plant is not reliably producing clean drinking water by the target date, there will be a shortfall in Perth's water supply.

'First, CETO would need to prove itself at a smaller scale for a use that is not as critical as Perth's drinking water supply. The company needs to demonstrate that the technology would be cost-competitive at a larger scale with other energy sources, such as wind power.'

Using sewage and mining wastes to make arable land

According to the CRC for Contaminated Assessment and Remediation of the Environment (CRC CARE), Australia's 13 million tonnes of fly ash from power generation, an even larger amount of 'red mud' from bauxite processing and millions of tonnes of bio-solids from urban sewage systems are all potential ingredients for artificial soils.

'We think we can formulate them into something useful that is currently in short supply and becoming quite expensive – new topsoil,' says CRC CARE's Professor Dick Haynes.

Haynes says good soils contain stable minerals and organic compounds that provide structure, porosity and fertility. Topsoils currently sold at nurseries and garden centres mostly contain composted green waste, which eventually breaks down and disappears.

The millions of tonnes of red mud left over from alumina production could be used to neutralise acid soils and mop up other contaminants. CSIRO

Australia has millions of hectares of acid and sodic soils, both of which limit food production. Haynes says improving such soils could greatly increase the country's capacity to grow food.

'Wastes such as fly ash can be highly alkaline and could be used to correct acid soils.

'Further, red mud, fly ash and slag have a very high adsorptive capacity. We can literally use them to mop up heavy metals or organic contaminants from other wastes, rendering these safe to use as soils, building materials or other products.'

The CRC is assisting with research to standardise the way these waste products are treated, ensure they are completely safe and explore ways that their long-term effect and reuse in the environment is beneficial.