

## Riding the wave...

A wave energy company has chosen Cornwall as the ideal location in which to develop its highly promising new technology.

### Overview

In February 2008 the marine power firm Orecon announced that it had raised \$24 million in venture capital to push ahead with development of its pioneering new wave energy devices.

Many saw this as further confirmation of the vast economic potential of energy generated from the world's oceans. With oil prices hitting new highs and climate change looming ever larger on the political agenda, the urgency of developing new ways of exploiting natural power sources has never been greater.

Orecon started life as a spin-out from a project run by two postgraduate students at the University of Plymouth: marine engineering specialist Fraser Johnson and ocean science graduate Nicola Harper. In 2003, a DTI SMART Award helped pay for feasibility work, and the following year Orecon raised private investment to match-fund a Carbon Trust grant for the development of its unique MRC (multiple resonance chamber) technology.

Despite successful scaled trials in wave tanks and off the south Devon coast, it proved hard to raise capital to take the company to the next stage. And there the story might have ended were it not for the intervention of entrepreneur David Crisp.

"I'd worked in the oil and gas industry for about a decade before moving into the high-tech sphere," Crisp explains. "After selling a start-up to investors in California, I moved over to Silicon Valley

myself and spent five years working there before moving back to Fowey in Cornwall, where I'd had a house for many years. And that's when I heard about Orecon. Having worked offshore and being a keen sailor, the proposition immediately made a lot of sense. The more I drilled into the sector and looked at other propositions out there, the more Orecon stood out as a winner."

Crisp joined the company as chief executive and started talking to venture capital firms in London, Europe and the US. "These guys make hard-headed investment decisions based not just on the technology but also on the people involved in the company," he says. In Orecon's case, both were excellent, and we're also working with industrial partners with impressive credentials, so it all hung together."

As the company moved into a new phase, it began to look for new premises. Orecon has been closely involved with the Wave Hub, a £28m government project to put a state of the art electrical power infrastructure facility on the seabed off Cornwall to connect wave-energy projects to the national grid. Together with the county's long coastline and strong commitment to sustainable development, this made it the obvious choice as a location.

### Workforce

Orecon currently has a nine-strong team working at its headquarters in a newly converted barn on the Lanhydrock Estate near Bodmin, though this is expected to expand to more than twenty over the next two to three years. Crisp says that being located in one of the most beautiful parts of England, with excellent rail and air connections, has been a significant factor in persuading talented people to relocate - as evidenced by the threefold increase in headcount in as many months. He also sees Cornwall's institutions of higher education as a major asset in terms of both possible R&D link-ups and recruitment, and the company has already taken on a graduate of the Renewable Energy degree course at Camborne School of Mines.

### Partners

Orecon is supported by a powerful syndicate of venture capital firms including Advent Ventures (UK), Venrock (US), Wellington Partners (UK and Germany) and Northzone Ventures (Norway). On the technical side the company works closely with Converteam, a major power-conversion engineering company and the UK's largest supplier of electrical systems to the renewable market worldwide, and with leading UK-based turbine manufacturer Peter Brotherhood.

### Technology

The MRC device developed by Orecon is a wave energy converter based on the oscillating water column principle. Waves cause water within fixed chambers to move up and down, forcing air out through

a turbine as the water rises and sucking it back in as it falls. Resembling a large buoy tension moored to the sea-bed, the simple, robust device has no moving parts below water, greatly facilitating maintenance and giving it an estimated working life of at least 25 years. By automatically tuning itself to different wave frequencies, the device maximises energy conversion, making it suitable for use in a wide range of offshore locations. Each MRC will have a generation capacity of 1.5MW - enough to power over 1000 homes and with its tension mooring system, it has an outstanding power density of more than 100MW/km<sup>2</sup> compared to wind at 11MW/km<sup>2</sup>

### Support

"As a test centre for wave energy projects, the Wave Hub at Hayle is a fantastic facility for companies like us," says Crisp. "The availability of regional and European funding is also a plus factor in Cornwall, as is the generally very positive attitude to renewable energy - there's a real awareness of the sort of economic impact it could bring to the area, as well as the environmental benefits. And we're very impressed with what's going on in the academic sphere in Cornwall, which is helping to form the kind of critical mass needed to get a new industry off the ground."



**Orecon**

Making wave energy work