

# Unstoppable rising tide of British sea power?

**MARINE ENERGY** Wave and tidal power is gathering full speed ahead to make up for lost time, as industry leaders set a course for future commercial viability, writes **Geoff Nairn**

Can Britannia once more rule the waves? Marine energy has an obvious appeal for an island nation and stronger government support, coupled with improving technologies, means this long-neglected industry could soon come of age.

Marine energy is currently more expensive than better-established renewable energies, like solar and wind, but it does have two advantages. It is less susceptible to the vagaries of the weather and, importantly for policy makers, it is an area where the UK currently enjoys a strong lead.

The Carbon Trust believes wave power could grow to become a £2-billion opportunity for UK companies. Tidal power also offers considerable potential given the strong currents around the British Isles.

"There is now a unique opportunity to develop a national industry around marine energy," says Guy Lavender, general manager of the Wave Hub marine energy project.

By 2020, the Carbon Trust predicts, 1,000 marine energy schemes could be generating 2 gigawatts (GW) of electricity, which would potentially allow a large coal-fired power station to be mothballed. Fast forward to 2050 and marine energy could provide 20 per cent of UK energy demand, which is a greater share than nuclear power provides today.

## PROSPECTS

Those are ambitious targets for the UK's fledgling marine energy industry but, compared to a few years ago, prospects already look brighter. Government funding and policy initiatives have, to some extent, helped offset the chronic lack of investment in this sector.

This summer, the Carbon Trust awarded £22 million to six wind and tidal energy companies to help develop their technologies further.

Over the next five years, around 300 megawatts (MW) of marine projects will be installed in the UK, according to Emerging Energy Research. That is a big advance from 2009, when the installed capacity of marine power was just 3MW, equal to the output of a single offshore wind turbine.

Comparisons with the fast-growing offshore wind sector are inevitable. According to the Carbon Trust, the marine energy sector is ten years behind offshore wind in its development. Indeed, the rapid rise of offshore wind is viewed with envy by marine energy companies.

"The offshore wind industry had the luxury of being able to develop on

land before going offshore," says Angus Norman, chief executive of Ocean Power Technologies (OPT), the only marine energy company quoted on the London Stock Exchange and which is also listed on Nasdaq.

## ROC AND ROLL

He complains that offshore wind projects benefit unfairly from the UK's renewable obligation certificates (Rocs) mechanism. Rocs are credits that utilities buy to meet their obligation to use renewable energy.

Outside of Scotland, offshore wind and marine energy schemes are weighted equally: they receive two Rocs for each megawatt-hour (MWh) of energy generated. However, marine energy technologies are much less mature than offshore wind turbines, making them a less attractive investment proposition.

Last year, the Scottish government recognised this and moved the goal posts to favour marine energy. Scottish wave energy schemes now enjoy five Rocs, tidal energy gets three Rocs while offshore wind producers are given just two Rocs. The revised Scottish policy caused a storm south of the border. "There is now the risk that England and Wales are going to see no new wave or tidal schemes," warns Martin Wright, managing director of Marine Current Turbines (MCT), a Bristol-based tidal power company.

The Scottish policy also puts wave energy above tidal energy in the peck-

ing order, a decision that Mr Wright argues is politically inspired, as many wave energy companies are Scottish. "Three Rocs puts tidal energy producers at a big disadvantage in Scotland. We want five Rocs as well," he says.

MCT is ahead of many marine energy companies and is already selling electricity to the national grid. Its SeaGen marine current turbine has been operating in Northern Ireland's Strangford Lough since 2008.

SeaGen only generates 1.2MW – the same as a typical wind turbine – and MCT wants funds to scale up

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its technology. Hedging its bets, the company has plans for larger tidal farms both north and south of the Scottish border, off the Orkney Islands and Anglesey respectively.

Experts say tidal energy could become commercially viable sooner than wave power. However, the UK government thinks otherwise as it has just shelved plans for a large-scale tidal barrage across the Severn Estuary on cost grounds.

Minesto's Deep Green technology is similar to that of a wind kite



## Wave Hub in uncertain waters

**Guy Lavender**, general manager of the Wave Hub marine energy project, should be a happy man. After seven years, Wave Hub was finally installed on the seabed off north Cornwall in September.

But he cannot help feeling queasy as the project is now sailing in unchartered funding waters.

The £42-million Wave Hub was the brainchild of the South West Regional Development Agency (SWRDA) which wants to attract wave companies to the region. But the quango is to be abolished in 2012 and the future of Wave Hub is in doubt.

Mr Lavender says: "There's no more money coming from SWRDA and the big question now is who will own the asset?"

Wave Hub provides the marine infrastructure to let wave energy projects hook up the national grid. It is like a giant underwater socket that companies rent to avoid having to lay cables themselves.

Its business plan requires four tenants generating 17MW of wave power for the project to become cash-flow positive.

But to date the only tenant is Ocean Power Technologies, which has rented a 5MW "birth" and has yet to generate power. OPT plans to use Wave Hub to test its next-generation 500kW PowerBuoy technology, the development of which is part-funded by SWRDA.

Despite Wave Hub's uncertain future, OPT praises the initiative. "It is a wonderful service and provides a ready-made channel to market for us," says Angus Norman, OPT chief executive.

Ministers argued that the barrage was unlikely to attract private investment and that public money would be better spent on wind or nuclear power.

Marine energy veterans say such arguments are short-sighted. As technologies mature and more projects go operational, economies of scale will reduce costs, just as they have done for wind and other renewable energy technologies.

## WAVE DRAGON

"After we have 100 units installed, we will be able to deliver electricity at the same price as offshore wind," says Hans Sørensen, chairman of Wave Dragon, which hopes to deploy its first full-size 7MW pontoon device off Pembrokeshire next year.

But the project is currently on hold as Wave Dragon has run out of funds. It needs around £15 million and, while the Welsh government has offered £5 million, private investors have been unwilling to provide the rest.

Mr Sørensen is particular disappointed by the response from the utilities. "Their focus is short-term shareholder value. They like the technology but do not want to be the first to use it," he says.

There are at least a dozen wave energy projects around the British Isles. But most are small-scale demonstrators generating trivial quan-

ties of electricity, rarely enough to justify the cost of a grid connection.

Wave Dragon is taking a different tack by thinking big from the outset. Its floating pontoon can generate 50 times the energy of a typical buoy system. By starting big, the company hopes economies of scale will kick in much quicker.

If it gets funding, Wave Dragon will produce enough green electricity to meet the annual demand of more than 2,500 homes.

A scaled-down version of the Wave Dragon, anchored off the Danish coast, has been running for more than 20,000 hours, so Mr Sørensen argues the technology risk is minimal.

But for institutional investors, the potential returns from marine energy do not yet justify the risks.

"Marine energy is a little too exciting for us as it has not been commercially-proven over time," says Mark Florian, managing director at First Reserve Energy Infrastructure, a big US private equity firm.

While institutional investors sit on the sidelines, big energy companies are starting to pay attention to this long-ignored sector. Siemens took a small stake in MCT earlier this year and several utilities now have stakes in marine energy projects. The next few years will show if the marine energy industry can finally shake off its Cinderella image.

