

# Risk and rewards

Making marine renewables work - managing opportunities and risks in remote and harsh environments. **Gareth Davies**, managing director of **Aquatera**, reports



Top left: Marker buoy rendered ineffectual by being dragged underwater by force of tide.

Top right: Group of Orkney companies exhibiting at All Energy 2007. There are already 150 people engaged in renewables work in Orkney.

bles could ever have. Hundreds are killed each year in coal mining accidents, oil is a major source of pollution, and gas and oil contribute massively to greenhouse gas emissions. In comparison with nuclear power, there is no long-term waste legacy associated with renewables and there is little prospect of a wave or tidal device ever becoming a weapon of mass destruction!

In the marine renewables sector, the need for good decisions and the margins for error they can tolerate can be very narrow. Time needs to be measured in minutes rather than hours. Distance needs to be considered in metres rather than

kilometres. The dynamics of energy fields need to be considered in many dimensions. Decision making needs to be on site and real-time. Responses to events need to be instantaneous and effective. But the successful companies will be those that embrace and empower local knowledge and capacity to ensure that all risks are avoided and all opportunities are grasped.

## Benefits

Having demonstrated to a number of clients the benefits of developing local capacity in Orkney, the Aquatera approach is being rolled out internationally. The company

is already conducting work in Taiwan and South Korea, and has established links in Norway, Portugal, British Columbia, Bay of Fundy, South Africa and Chile. In these disparate places the company seeks to work in partnership with local organisations who understand local conditions and sensitivities. To this local knowledge Aquatera can bring early practical experience of investigating, selecting, and operating at various wave and tidal sites. The combined team can then help to manage environmental opportunities and risks in any location. □

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environmental services and products



## Aquatera delivers complementary environmental services and products that:

- Address strategic and project planning issues at the international, national and local level
- Combine deep scientific and technical understanding of the environment with state-of-the-art communications expertise
- Enable full investigation, assessment and management of the potential impacts of a project on the environment, and of the environment on the project
- Provide full lifecycle support for renewables, wider energy and other industrial projects, from initial concepts through to decommissioning

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Recovery of failed structures from the seabed - contingency measures need to be available to respond effectively to unplanned events.

The areas where wave and tidal energy can be harvested are areas of sea that have largely been avoided for any kind of marine construction work. Even the simple transit of vessels can, on occasions, be difficult in these areas. What makes marine renewables even more challenging is that the technology is in the early stages of development and, for many of the structures, underwater access and inspection is going to be difficult and expensive.

## Negotiate

Traditional maritime practice uses the skills and local knowledge of local pilots to help vessels negotiate difficult waters. In this way, risks are reduced and the opportunity for safe passage maximised. The same principles apply to the successful deployment of marine renewables. This ethos of combining state-of-the-art understanding of science and technology with a deep experi-

ence of local operating conditions underpins the work of environmental consultancy Aquatera, which has to date completed over 30 projects for the marine renewables sector.

If there is a desire to lead the world in this field, and benefit from the jobs and the intellectual property it will generate, there is the need to be there from the start. Marine renewables technology is still some way off from providing energy to the masses, but already it is having a significant positive impact upon communities choosing to harness marine energy and upon creating a more balanced and dispersed energy sector. There will also be a multitude of spin-off technology advances and infrastructure, with benefits that are as yet undefined.

Aquatera believes that the greatest challenges for marine energy will be found in operating the technology rather than in designing the technology itself. The deployment of marine technologies to date has

shown that the design principles of early technologies are generally sound. The main problems encountered are site access and operability, establishing suitable moorings and foundations, availability of nearby service infrastructure and wider environmental issues.

## Experimentation

If technology deployments are to be successful, all of these issues need to be considered in an integrated way. As the marine sector evolves from experimentation towards commercialisation, it will be essential that local capacity close to the key resource centres is established. This will help to keep costs manageable and will develop a core base of expertise that will serve the industry well into the future.

In terms of risks, existing sources of energy production such as coal, oil, gas and nuclear have just as many, and often far greater, risks and impacts than marine renewa-