

# Sectors in Infancy

Although many say the renewable energy sector is still in its infancy, the industry is quickly evolving. This *Hydro international* therefore carries a full Hydro energy special. While the best known source of renewable energy is wind (see feature pages 21 and 32), there are many more, varying from the obvious wave and tidal energy to lesser known forms like biomass and osmotic energy (see page 25).

Many more categories, however, can be pointed to in one particular field. Many designs are for example being tried out by developers to capture the power of waves. The aquatic renewable-energy learning tool Aqua-RET shows that wave devices may be categorised using several differing methods, such as the location and depth in which they are designed to operate: shoreline, near- or offshore, or by the methods used to capture wave power. Examples here are 'point absorbers', like buoys, and partially submerged, 'oscillating water columns': hollow structures open to the sea so that they can trap air channelled through an air turbine to produce power.

When extracting energy from waves, or even tides and tidal streams, it is crucial to look at the reliability, maintainability and survivability requirements in order to get trustworthy marine energy converters and thus a successful and economic energy farm. But how reliable does a device have to be? The common belief is that a ten-year Mean Time Between Failure (MTBF) means that the equipment will last about ten years: a fallacy. The mistake lies in the fact that a ten-year MTBF is not a ten-year lifespan. After ten years' running, about 63% of 'ten-year MTBF equipment' will have failed. A typical solution to poor reliability is redundancy, which might work rather well with aeroplanes, but not under water; actually, it only makes thing worse, because of the extra possibility of failure. The MTBF of an offshore wind turbine is, by the way, only a month.

When looking at survivability, the first thing to consider is harsh environment, as storms cause serious damage to large renewable structures. As waves vary from hour to hour and day to day, the long-term wave climate for near-shore sites would seem unknowable with any degree of certainty. And, as remarked by Michael Starling of British Maritime Technology Ltd at the recent Second International Wave Energy Summit in London, surviving the hundredth annual wave/storm may not be good enough, because the 101st might happen tomorrow.

So the industry is moving quickly, and construction and tendering activity is at an all-time high. This months' interviewee, Adam Westwood of energy business analysts Douglas-Westwood, sees the growing number of deals in the industry as a function of companies seeking to integrate component suppliers, control installation assets and finance their expansion. Learn more of the view of this young and successful specialist in our interview on page 10.

Enjoy reading!

## Further Reading

EMEC (The European Energy Center, Ltd), 2009. Guidelines for Reliability, Maintainability and Survivability of Marine Energy Conversion Systems. 39 pp.