The debate is over: low carbon technologies are the way of the future. The only questions remaining are which ones, when, and most importantly, how?

Governments and energy companies around the world are under pressure to find alternative ways of satisfying our ever-increasing thirst for power. The transition to a greener future is nearing its tipping point. Marshalling the skills required to make this transition and applying them in a smart, efficient and cost-effective manner is the key challenge.

Developers, engineers and regulators have a complex set of problems to address. Which device types will be feasible? What will the economics be like? What are the risks? What is the optimum development path? How will technology and project management issues be handled?

BPP-TECH has been engaged by several renewable energy ventures to help them develop wind and wave energy projects and meet the challenges of economically viable renewable devices.

Large Offshore Vertical Axis Wind Turbine (NOVA)

NOVA was a project carried out by a consortium funded by the Energy Technologies Institute (ETI). Its prime aim was to develop a range of novel vertical axis wind turbines rated from 5 to 10 MW for offshore installations. The device design was complex, and as the consortium was made up of diverse teams, this inevitably led to project execution and schedule issues. BPP-TECH was brought in to co-ordinate project delivery and to carry out some of the tasks, offering both project management skills and providing technical project leadership. BPP-TECH streamlined the tasks in power train engineering and structural analysis. This resulted in the consortium teams working together to concentrate on resolving the problems associated with their respective fields of expertise. Success depended upon exchange of key information between the teams, so BPP-TECH were required to provide cross team input and feedback. Ultimately, this involved co-ordinating controlled discussions and setting realistic targets to develop an efficient process to design and deliver a novel solution to a worldwide problem. The project was completed successfully in mid-2010.

Energy from Ocean Waves

One approach to wave energy for power generation uses the wave action to drive pressured air through a bi-directional turbine. Orecon was one company that set out to develop such a device, and BPP-TECH provided technical support and project managed the tanktesting program.

A concept review of the Orecon Multi Resonant Chamber (MRC) wave energy device was undertaken initially. This review included calculating design loads for the device, including hydrostatic pressures on the overall structure, survival pressures on the external hull, loads experienced during wave slam events and mooring loads.

BPP-TECH was part of the team that model tested the concept design. The objectives of the model test were to investigate the motions of the full-scale buoy when tension-moored. Responses to waves and tensions in the mooring lines were measured, internal slam pressures and loads were recorded. BPP-TECH provided the scantlings for the exterior plating of the device, so that the structural design would meet Det Norske Veritas (DNV) certification requirements.