



CASE STUDY

BOMBORA

The UK has some of the best marine energy resources in the world and we are well placed to make the most of them. Whilst our ability to extract energy from tides is currently more advanced than from waves, both industries combined hold the potential to supply about 20% of the UK's electricity, which would offset approximately 30 million tonnes of CO2 emissions each year.

THE CHALLENGE

Wave energy is a largely untapped source of power that could be harnessed to decarbonise the UK energy market and provide a complementary and considerable source of renewable power. With a global market worth £76 billion across 50 countries, it's estimated that wave and tidal energy could contribute about £4 billion to UK GDP by 2050, offering strong export opportunities and the potential to increase the number of skilled jobs from the current 1,700 to around 20,000 in the next decade.

The challenge in relation to the development of wave power is demonstrating methods of harnessing this fantastic natural resource affordably and reliably.

THE SOLUTION

Bombora is a leading, Welsh based, wave energy technology developer. It has designed an innovative 1.5MW wave energy device that they call mWave™, which they will soon deploy off the Pembrokeshire coast. The current

seabed mounted design focuses on nearshore, shallow water locations; however, the lion's share of the global wave energy resource is located in deeper offshore sites.

The Marine Energy Engineering Centre of Excellence (MEECE) team have worked hand in hand with Bombora to identify a techno-economic solution that is viable for such sites. This work has included research in to how best to extend Bombora's mWave™ technology into the right offshore environments and, crucially, to explore the potential of co-location with floating wind structures. This co-location is a potentially game changing development, as it can offer significant advantages in relation to increased infrastructure utilisation and maximising capacity.

ORE CATAPULT'S ROLE

The MEECE team carried out numerical modelling work to assess floating platform designs that could host mWave in deeper waters and enable co-location with floating wind. ORE Catapult's Analysis and Insights team also reviewed

Bombora's in-house techno-economic model used for estimating the levelized cost of energy (LCOE) of their wave energy devices.

The project identified that semi-submersible based platforms akin to those used in the floating offshore wind industry could be used to host mWave™, and the motion of the platform could enhance wave energy generation under certain conditions. A number of recommendations were also made to improve the inputs and assumptions used in Bombora's techno-economic model, which will improve the confidence in the commercial proposition of mWave™.

The project enabled Bombora to begin detailed design work on floating mWave™, and they subsequently formed a strategic partnership with TechnipFMC to develop a floating wave and wind power project.

“The combined knowledge of the MEECE and the ORE Catapult teams greatly assisted Bombora identify the optimum design pathway for the floating mWave solution. The parallel approach to technical modelling and industry costing assessment enabled design options to be analysed and incremented efficiently. Ultimately this groundwork has enabled Bombora to progress to the InSPIRE integrated wind + mWave floating platform solution that is able to deliver significant commercial benefits over single use floating platforms.”

Sam Leighton
Managing Director of Bombora



In collaboration with:



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