

Barriers to the Deployment of a 100 MW Tidal Energy Array in the UK

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Abstract:

The UK is an internationally important area for tidal energy, with half of the extractable European tidal resource estimated to be in UK territorial waters [1]. Marine (wave and tidal) energy resources are said to have the potential to supply up to 20% of national electricity demand [2], and now is a critical time in the development of tidal energy, with a wide range of devices at the design and testing stage, some in the water, and a few generating meaningful amounts of electricity. The recent announcement of an increase in financial support for tidal devices is also a very positive development [3]. Many people believe that the UK tidal energy industry is currently in a similar position to the wind energy industry in the mid-1980s, and lies at the bottom of a very steep and exciting development curve. Numerous companies have developed tidal energy machines, and the vast majority are designed to be operated in arrays, or “farms” of multiple devices, similar to those used in the on- and off-shore wind industry. No such tidal farms currently exist, although some are being developed [4]. This paper discusses the challenges the UK tidal industry is expected to face during the design, building, installation and operation of an array of tidal devices rated at 100 MW. A meeting was held during the RenewableUK conference in October 2011 to discuss the future of the industry, and notes from this meeting were drawn on during the writing of this paper. The author would like to thank everyone who contributed to this event. The conclusion of this paper is that there are many challenges standing between the current position of the industry and deployment of a 100 MW array. It is very easy to focus, as is the case in mainstream media, on the development of the turbine devices themselves, however many of the challenges lie in other areas, such as installation, cabling and connection. Nonetheless, these challenges are not insurmountable, and by taking a holistic approach to the design of a tidal array and working together these challenges will be solved.

Keywords:Renewable Energy; Marine Energy; Tidal Energy; Tidal Energy Converters; Tidal Array; Tidal Farm

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