ENVIRONMENTAL EFFECTS METADATA SURVEY FORM

Name	Date submitted
Tom Clements/Ian Hutchison	March 24, 2014

Project name: Fair Head Tidal Array

Project description:

Project Developer: Fair Head Tidal

Technology type: Technology neutral

Resource (wave, tidal): Tidal

Project scale (test site, prototype, array, commercial): Commercial scale

Installed capacity (MW): 100 MW

Project Website: http://www.fairheadtidal.com/

Launch Date: To be confirmed

Additional Description: Fair Head Tidal (FHT), a development company set up by DP Marine Energy (DPME) and DEME Blue Energy (DBE), proposes to build a tidal energy development of up to 100MW installed capacity off Fair Head in North Antrim in Northern Ireland.

The project received an "Agreement for Lease" (AfL) from The Crown Estate (TCE) on the 10th October 2012. The AfL allows the developer exclusive rights to develop a tidal energy site off Fair Head[1]. If, following consultation and environmental impact assessments, the proposal is consented the build programme will commence around 2016/2017 although this will depend heavily on resolving onshore grid connection issues. The ultimate target is to have a fully operational commercial array by the end of 2019[2].

The area of development lies within the Rathlin Island and Torr Head Strategic Area 2km east of Fair Head. The site occupies a total area of approximately 3km^2 and is around 1km from the nearest point on land.

Grab samples collected by the British Geological survey indicate that the seabed in this area is an extensive rocky outcrop supporting some gravelly sediments, with the majority of the area from Fair Head to Torr Head being shallow course sediment plains. Water depths vary from 25 to 130m with a steep slope being present 50m from the headland. This extends out to 1km and the gradient levels off at a depth of around 120m 4km from the coast line.[2]

[1] Fair Head Tidal Available [Online] http://www.fairheadtidal.com Accessed 04/03/2014.

[2] Fair Head Tidal, Project description Available [Online] http://ballycastlesdlp.files.wordpress.com/2013/03/fair-head_description_-final-2012121.pdf Accessed 12/03/2014.

Technology: The proposal is based on a technology neutral approach. Given the physical constraints and resources of the development site, an envelope has been developed based on a generic design philosophy using horizontal axis tidal turbines with open rotors. The envelope allows for both floating moored and seabed bed mounted systems which may be surface piercing or non-surface piercing.

Example devices include the Siemens MCT SeaGen S, the Alstom TGL, Voith Hydro and Hammerfest Strom. Currently there is no practical experience for turbine spacing, however analytical models are being produced and preliminary layouts or the array are based on spacing's of 500m down-stream and 150m across. Rotor diameter will be limited by water depth.[2]

Inter array cables: Individual turbines will be connected to one or more subsea or surface mounted marshalling units containing both power conditioning equipment and transformers in order to increase the generated voltage to 33kV for transmission without significant losses. It is unlikely that a further step up in voltage to 110kV or 132kV will be necessary. Subsea substations at this scale are still unproven, and consequently the project approach is to utilise surface piercing solutions such as the SeaGen S Mark 2 or floating devices to provide the marshalling points for the farm. The advantage of this approach is that principle connections can be undertaken dry with no requirement for underwater connections or the placement of key electrical equipment on the seabed.[2]

Export Cables: The detailed electrical design is yet to be completed but it is likely that multiple 33kV cables will be used to deliver the 100MW capacity to shore. The Fair Head project is relatively close to the mainland, hence lower voltage cables can be utilised with minimal transmission losses. Additionally there is no requirement for a dedicated high voltage and expensive offshore transformer station. As far as possible, cable routes will avoid traversing areas of very high tidal flow and will be either trenched, pinned or protected by rock dumping or mattresses depending on the seabed characteristics. Installation methods and routing will be defined in more detail as part of the EIA to identify the most appropriate subsea route and landfall location.

Onshore Infrastructure: The onshore substation location has yet to be defined and will be subject to a detailed assessment of potential landfalls and optimum locations from both an EIA and final grid connection perspective. There is potential for both the Fair Head and Torr Head tidal projects to share a common substation and grid connection point. This has yet to be confirmed and the ultimate size and voltage of the station will depend on this decision. If both projects are brought into a common point ashore it is likely that the substation will need to transform the voltage of the incoming subsea cables to 110kV.

Vessel spread: Vessels to be used in construction have not yet been confirmed, however the project description suggests that jack up barges and DP vessels will be required to install the devices.

Location: Fair Head, Northern Ireland.

Coordinates: 55.231N 6.107W

Process status: Agreement for lease granted in 2012. Scoping Document issued. Feasibility study for onshore grid connection is underway and the Navigational Risk Assessment has commenced. Baseline work is being carried out to inform the consulting process.[3]

Licensing Information: No licence of consent applications have been submitted to date for this project.

Key Environmental issues: An Environmental Impact Assessment has not yet been completed for this project.

Environmental webpage:

[3]Fair Head Tidal, Consultation, Presentation to Moyle district Council. Available [Online] http://www.fairheadtidal.com/documents/FairHead_Moyle%20DC_28-1-13.pdf Accessed 18/08/2014

Baseline studies and project effects studies: Fair Head Tidal project				
General description	The following field surveys were undertaken (or commissioned by) the developer to inform baseline characterisation.			
Receptor	**Study description**	**Design and methods** (brief description)	**Results** (brief description)	**Status** (planned, underway, completed, with dates)
	TBC			

Monitoring and adaptive management: Fair Head Tidal project				
General description				
Receptor	**Monitoring program description**	**Design and methods** (brief description)	**Results** (brief description)	**Status** (planned, underway, completed, with dates)
	TBC			