



COMMISSION OF THE  
EUROPEAN COMMUNITIES



## **Equitable Testing and Evaluation of Marine Energy Extraction Devices in terms of Performance, Cost and Environmental Impact**

Grant agreement number: 213380



### **Deliverable D7.3.1**

## **Support Structures for Arrays of Wave Energy Devices**

**Grant Agreement number:** 213380

**Project acronym:** EQUIMAR

**Project title:** Equitable Testing and Evaluation of Marine Energy Extraction Devices in terms of Performance, Cost and Environmental Impact



## Deliverable D7.3.1

### Support Structures for Arrays of Wave Energy Devices

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#### Summary

A study has been conducted into the design options and expected costs of an offshore structure that is suitable for installation of an array of closely spaced heaving wave energy devices. Relevant background and motives for this study are given in the following section. Following a tendering process via the Official Journal of the European Union, Offshore Design Engineering Ltd were commissioned by University of Manchester to conduct the study. The work is reported in a report titled

“PRELIMINARY DESIGN AND COSTING OF SUPPORT STRUCTURE FOR AN ARRAY OF WAVE ENERGY DEVICES”, ODE report number 9181-G-M-0001 Rev1.

Report filename is: “EquiMar-Del7-3-1 REPORT 9181-G-M-0001 Rev 1.pdf”

This report represents a contribution to EQUIMAR under deliverables 7.3.1 and 7.3.3.

#### Background to support-structure study:

Many wave energy devices are presently in development and some devices have been tested offshore. However, devices have only been tested at relatively small deployment scales, rated capacities of the order of 1-2MW, and it is not straightforward to determine how the costs of these different technologies will change as deployment increases to rated capacities of the order of 100MW and above. To understand how the economic viability of different types of wave-device varies with rated capacity deployed it is important to understand how the cost of infrastructure varies with the installed capacity. Examples of infrastructure include the moorings required for station-keeping, the electrical interconnectors, umbilicals, transformers and transmission lines and supporting structures. Although many types of wave device are moored, floating devices, several design proposals now exist which are supported from a superstructure. Examples of this type of device include the Manchester Bobber, Fred Olsen Buldra (FO<sup>3</sup>), Wavestar and the Trident Energy system. For these devices, the structures proposed would be similar to existing oil and gas structures but would support an array of closely spaced floats each driving an electrical generator of some form. However, information concerning how the cost of these structures will vary with key design parameters is not widely available and so comparison to other types of wave energy device is not straightforward. A technical appraisal of the available design concepts is therefore required in the form of a design study of support structures for wave device arrays.

The scope of work encompasses:

- 1) The design study report on: the preliminary design, cost and installation of an offshore platform to support an array of wave energy devices.

