

DTOcean



Optimal Design Tools for Ocean Energy Arrays



DTOcean project

DTOcean is a collaborative project funded by the European Commission under the 7th Framework Programme for Research and Development, aiming at accelerating the industrial development of ocean energy power generation knowledge, and providing design tools for deploying the first generation of wave and tidal energy converter arrays. It gathers 18 partners from 11 countries under the coordination of the University of Edinburgh.

OBJECTIVES

1. The development of a full suite of whole-system software design tools to enable the design, development and installation of wave and tidal energy converter arrays in a cost-effective, timely and environmentally appropriate manner.
2. The strategic identification of enabling technologies to reduce deployment costs and increase the performance of ocean energy arrays.
3. Provide the wave and tidal energy sector, and its stakeholders, with well validated guidelines for accelerating decisions by means of reducing risks and uncertainties.



TOOL FUNCTIONALITY WILL INCLUDE :



Array Layout

Focused on the hydrodynamic interaction between the individual devices in the array, how this affects the resource, power performance, cost uncertainties and environmental impact.

Main objectives are to:

- determine the relevant ranges of the geometrical parameters describing the layout of an array
- evaluate the device interactions within an array and their effects on the power production
- quantify cost for devices within an array
- evaluate environmental impact of an array layout on the hydrodynamic environment

Electrical System Architecture

Determination of technically and economically optimal configurations for the offshore electrical network



Main objectives are to:

- enable comparison of the benefits of combining various electrical subsystems
- develop models for the computation of the electrical efficiency of different configuration
- create a software tool to predict the reliability of the selected configuration
- develop a cost comparison and optimisation software tool



Moorings & Foundations

Development of models to inform about mooring networks and foundation requirements

Main objectives are to:

- develop suitable methodologies for design and assessment of mooring networks
- assess suitable design tools specifically for array mooring and foundation requirements in arrays
- develop assessment criteria for moorings and foundations
- generate database for array mooring and foundation components

Lifecycle Logistics

Design optimal logistic solutions during procurement, manufacturing, installation, O&M and decommissioning of ocean energy arrays



Main objectives are to:

- characterise logistic requirements for ocean energy arrays during a lifetime project
- generate a database of suitable maritime infrastructure for ocean energy arrays
- assemble a model to find logistic solutions



System Control & Operation

Identify, adapt and develop methods to optimise operational aspects of arrays of wave and tidal devices

Main objectives are to:

- characterise control and maintenance requirements for ocean energy arrays
- provide a comprehensive evaluation of maintenance strategies based on cost and downtime
- develop optimised control methods and requirements for arrays of ocean energy devices
- assemble algorithms for cost and environmental optimisation of array operation

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MORE INFORMATION

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