

EU H2020 DTOceanPlus project: publication of 3 new deliverables

The first six months of DTOceanPlus were rich in discussions, exchanges and consultations with stakeholders of the marine energy sector. It should be recalled that this EU H2020 project aims to develop and test a suite of advanced design tools for tidal and wave systems, based on the work already carried out within the framework of the EU FP7 DTOcean project. Three new deliverables have just been posted on the project's dedicated website: dtoceanplus.eu.

Functional requirements in line with the needs of the field

The functional requirements of the 2nd generation design tool suite have been built taking into account the expectations of potential users, identified during a consultation phase, and the functionalities not covered by the various tools available on the market. The feedback from the DTOcean project has also proved very valuable in producing a document that combines technicality, precision and pragmatism.

A suite of 4 design tools to support the entire technology innovation process

DTOcean 2nd generation suite will comprise 4 design tools called 'Structured Innovation', 'Stage Gate', 'Deployment' and 'Assessment'. It will be applicable to three different technology levels of the farm system, specifically: sub-system, device and array. This suite will be designed to support users with differing requirements in terms of detail; from investors wishing for a high-level overview of a technology or project, to developers performing detailed technical assessments.

Structured Innovation design tools' requirements

The **Structured Innovation** design tools are part of the significant additions to the original DTOcean software. They will be used to assist the stakeholders in creating and generating new concepts of innovations worth for further development. In combination with other DTOcean tools, they can be used at all the stages of the project lifecycle to assess potential concepts from low to high TRL levels for devices, sub-systems and arrays. The ability to self-learn to use the tool, to spend as little time as possible inputting the data in the Structured Innovation design tools and the flexibility to import or export data to other software are some of the requirements from the stakeholders.

Stage Gate design tools' requirements

The **Stage Gate** design tools are the other part of the significant additions to the original DTOcean software. They will be used to aid decision-making by evaluating what stage in technology development a technology is currently at, and the distance and further actions needed to reach the next stage. They will need to work very closely with the Structured Innovation, Deployment and Assessment tools in the assessment of technologies. The ability to assess technologies at both low and high TRL levels for sub-systems, devices and arrays is key to its functionality and reinforces the links between all the tools. Flexibility of how the tool is used was one of the key outputs of the user requirements study.



Deployment design tools' requirements

The **Deployment** design tools will be used to support optimal device and array deployment. They will improve and expand on the capabilities of the original DTOcean software to consider the main functionalities of ocean energy technologies and systems, split into 6 modules:

- The **Site Characterization** module will have to provide the characterization of the environmental conditions at the farm's deployment site, by processing raw input data (bathymetry, wave regime, sea water level) and outputting processed data (current, wave statistics) to other tools of the suite and for user visualization.
- The **Energy Capture** module should allow the identification of the layout producing the maximum energy yield from an array of either tidal or wave energy converters.
- The **Energy Transformation** module should make it possible to assess and optimize the Power Take-Off (PTO) technologies and associated control strategies at varying levels of complexity throughout the project lifecycle.
- The **Energy Delivery** module will allow to design and assemble optimal solutions for the electrical infrastructure for a given sub-system, device, array and site.
- The **Station Keeping** module should allow to design the station keeping system and support the decision-making process by providing validated design options for the station keeping systems.
- The **Logistics and Marine Operations** module will provide decision support to the user in the design and planning of all lifecycle operations related with offshore ocean energy systems.

Assessment design tools' requirements

The **Assessment** design tools will provide a dual role: firstly, to provide objective information to the developer or investor on the suitability of a technology and project (in link with the Stage Gate tools); and secondly to support the other tools of the suite. They will improve and expand on the capabilities of the original DTOcean software, split into 4 modules:

- The **System Performance and Energy Yield** module will provide information about the system performance and energy yield in order to evaluate and compare different sub-systems, device or array.
- The **Reliability, Availability, Maintainability and Survivability (RAMS)** module will give an estimation of the reliability, availability, survivability and maintainability of sub-systems, devices or arrays of ocean energy technologies.
- The **System Lifetime Costs** module will provide a detailed assessment of the lifetime costs of a system or project, revealing its economic and financial viability.
- The **Environmental and Social Acceptance** module will provide environmental and social impact assessment to the user during all lifecycle operations related with offshore ocean energy systems.

Open science: a strong commitment

DTOceanPlus partners believe strongly in the concepts of open science. The project through the H2020 programme is part of the initiative launched by the European Commission concerning free access to scientific publications and research data. The open source license under which the suite of tools will be distributed will provide free access to all interested parties. As the people potentially interested in DTOceanPlus have very varied profiles, the



communication and dissemination activities will have to reach targets as different as design offices, project leaders, standardization bodies, research institutes or students.

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 **DOWNLOAD ON DTOCEANPLUS.EU**

[Deliverable D2.2 “Functional requirements and metrics of 2nd generation design tools”](#)

[Deliverable D9.2 “Dissemination and Communication Plan”](#)

[Deliverable D9.10 “Data Management Plan - First version”](#)

DTOceanPlus in short

Subject: development and testing of a suite of digital tools for the design of tidal and wave systems

Duration: 3 years (May 2018 to April 2021)

Budget: €8 million

Funding: EU Research and Innovation Programme H2020 (Grant Agreement No 785921)

Consortium members:



International partners:



This project has received funding from the European Union’s Horizon 2020 research and innovation programme under grant agreement No 785921