



A new release for DTOcean suite of tools

The second version of the wave and tidal energy arrays design tool DTOcean has been delivered by Irish consultancy Data Only Greater.

DTOcean 2.0 is the product of 18 months of development by Data Only Greater while partnering with Sandia National Laboratories, a Department of Energy, National Nuclear Security Administration laboratory based in the United States. Following the release in January 2017 of the first version of the tool which was the ultimate deliverable of the DTOcean FP7 EU 3-year project gathering 19 international partners, Sandia has been helping to identify bugs in the software and evaluate its effectiveness by comparing the output to wave and tidal energy reference models. In doing so, Sandia leveraged its deep experience in current and wave energy technologies, resource characterization, and environmental effects analysis; along with its multidisciplinary expertise in high performance computing, advanced materials and coatings, complex systems simulation, and multi-scale testing.

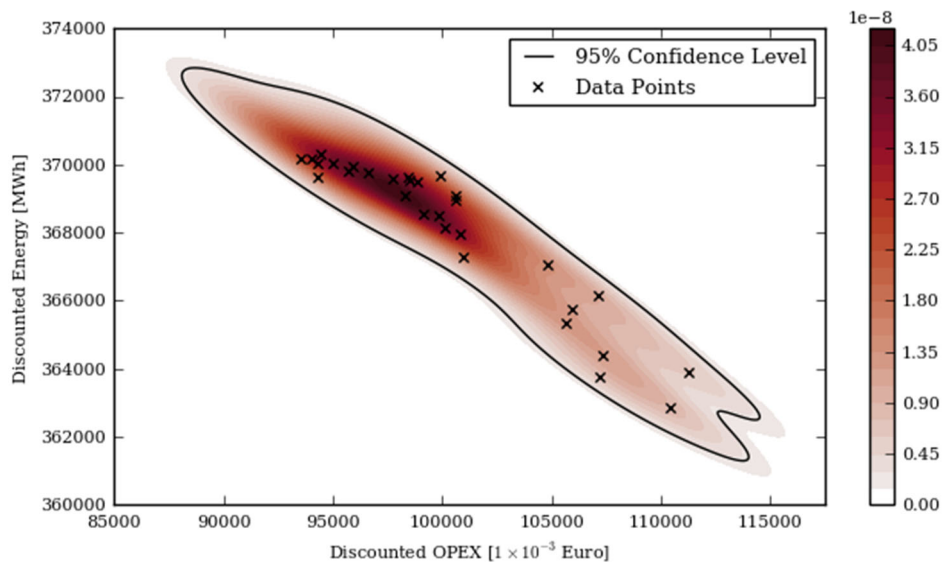
The new version fixes several problems identified with the original release, offering full levelized cost of energy (LCoE) calculation for the first time. DTOcean 2.0 also adds functionality to help developers quantify risk to profitability resulting from the unique environmental conditions faced by ocean energy technologies.

Dr. Mathew Topper, founder of Data Only Greater, said: "Working with Sandia, we found a number of bugs that prevented the tool from functioning correctly. I managed to fix these and, at the same time, solve some of the scientific challenges that remained from the original DTOcean project. That work has now formed the basis of a journal article, currently under review, and this new release of DTOcean."

Given a set of user inputs regarding the chosen wave or tidal energy converter and array location, DTOcean can automate device layout, balance of plant, logistics procedures and lifetime array maintenance requirements. By designing balance of plant at component level, the impact of individual components on LCoE can be understood. Random component failures and stochastic weather conditions are combined to form a unique statistical representation of LCoE, which can be used to determine the likelihood of different components or array layouts achieving a particular value.

The DTOcean software package is available as a free download from github.com/DTOcean/dtocean. New video tutorials, demonstrating installation of DTOcean, are available at Data Only Greater's website www.dataonlygreater.com, which also includes details of their training and development services.

The H2020 EU DTOceanPlus project partners are developing the next generation of advanced design tools. New features will include technology concept selection, facilitated by a structured innovation design tools, and technology development, enabled by a stage-gate design tool. This 3-year project commenced 1 May 2018 and will conclude 30 April 2021. See www.dtoceanplus.eu for further details.



DTOcean’s economic analysis provides a range of possible LCoE values for an array, extracted from the bivariate probability distribution of discounted OPEX and discounted energy production



About DTOcean and DTOceanPlus projects

DTOcean was a European collaborative project funded by the European Commission under the 7th Framework Programme for Research and Development. DTOcean aimed 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.

DTOceanPlus, a 3-year EU H2020 project (May 2018 – April 2021) with a total budget of 8 million euros, aims to develop and test a suite of advanced design tools for the selection, development and deployment of ocean energy systems. This 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. The functional requirements of the 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 was also very useful. Keep in touch at dtoceanplus.eu.



About Data Only Greater

Data Only Greater is an Irish consultancy which combines scientific software development, numerical modelling expertise, and specialisation in offshore engineering. Company founder, Dr. Mathew Topper, has led the development of some of the highest profile software tools in the sector, including JBA's Forecast Marine risk management software and the DTOcean ocean renewable energy array design tools.

Data Only Greater supports the open-source software movement and wants to help companies develop their toolchains to include collaborative, community driven software. To learn how your company can benefit from Data Only Greater’s services, visit www.dataonlygreater.com.