

PRESS RELEASE | 24 September 2025

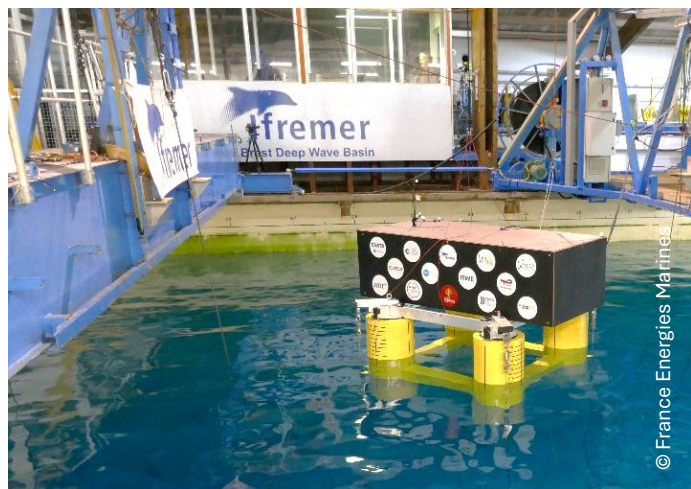
OFFSHORE WIND - Designing the electrical substations of the future

Towards a floating high-voltage direct current connection

The increasing distance from the coast of future offshore wind farms and the inherent energy losses make high-voltage direct current (HVDC) a competitive alternative solution. The design of floating electrical substations operating with this technology raises a number of questions requiring R&D. AFOSS-DC JIP (2022-2025) aims to define the appropriate electrical architecture and components to be included in the topside, design the platform concepts, the dynamic cable and its connection system. Based on this design, a risk and reliability of the system will be performed and the CAPEX and OPEX will be estimated. Recommendations for further R&D activities will also be drawn.

Successful wave tank tests

Within the framework of AFOSS-DC, two types of floaters are being studied: a semi-submersible version and a tension-leg platform (TLP). The latter was digitally pre-designed in order to develop a 1/50 reduced scale model that was used in a series of hydrodynamic tests. Indeed, between end of June and beginning of July, 3-week trials were carried in Ifremer deep water wave tank to monitor the structure motion, waves-induced



loads, relative wave elevation and tension in mooring tethers. During this campaign, we ran over 100 different tests including: regular and irregular wave conditions, focused waves, platform at two different orientations and 3 tethers' stiffness. The gathered data are now being compared with numerical results previously obtained to identify wave conditions that may trigger high-frequency resonance phenomena on the TLP concept.

AFOSS-DC in a nutshell



ATLANTIQUE
OFFSHORE ENERGY

Centrale
Méditerranée

ENST2
IP PARIS

Ifremer

Rte
Le réseau
de transport
d'électricité

RWE

SuperGrid
Institute

TotalEnergies

This project receives French State funding managed by the National Research Agency under the France 2030 investment plan. It also benefits from financial support of Pays de la Loire, Occitanie and SUD Provence-Alpes-Côte d'Azur regions.

⇒ [See project webpage](#)

Duration: 37 months (2022-2025) | **Budget:** €1,560K

Press contact: Mélusine Gaillard - melusine.gaillard@ite-fem.org - T. +33 (0)2 98 49 98 27

france-energies-marines.org

