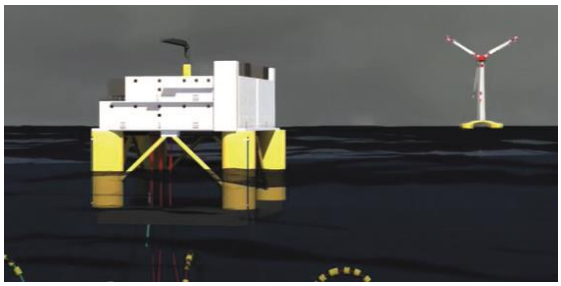
FRANCE ENERGIES MARINES

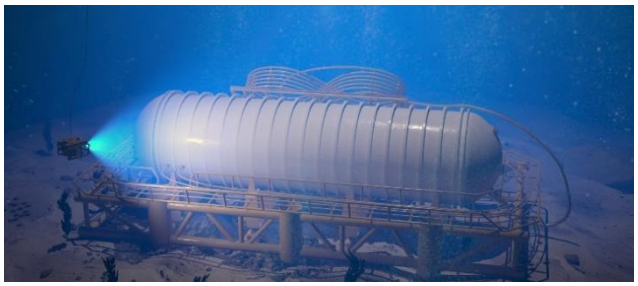
UNIVERSITÉ DE NANTES

Rte Le réseau de transport d'électricité

PRESS RELEASE | 21 October 2021

How to reduce the total cost of offshore electrical substations for future floating wind farms?





Left: Floating substation (© Yohann Boutin) - Right: Subsea substation (© Naval Energies)

Finding alternatives to bottom-fixed substations

Usually, offshore wind farms are connected to the land grid via offshore substations using bottom-fixed structures. This technology would connect 62% of France's wind energy potential. The remaining 38% represent a technical challenge. Floating offshore wind farms are installed in deeper waters where bottom-fixed design substations would be too expensive to set up. A floating solution could be more relevant, in parallel with the development of high voltage equipment adapted to floating conditions. The latter are necessary for connection to wind turbines and to the grid. The subsea substation also represents a plausible industrial alternative that has not yet been considered for high voltage connection.

▶ Watch the context in video

Identifying technological bottlenecks and potential solutions

The LISORE R&D collaborative project led by RTE and France Energies Marines was set up to identify technological locks and potential solutions which will enable the reduction of the total cost of offshore substations by 2025 for commercial floating wind farms. Technical feasibility and predesign studies for floating or subsea substations were carried out, an associated maintenance plan was defined. In addition, the overall cost of implementation and operation was calculated for different substation configurations and several ORE sites. Technological barriers related to the innovative substations with a TRL below 5 were also identified. At the end of this work, the floating configuration was chosen for a more in-depth study, as the subsea alternative still has too many technological locks to be competitive.

▶ Learn more about the LISORE project

A focus on monitoring strategies

In line with the LISORE project, another R&D project called MOSISS was launched a few months ago. The objective is to develop and demonstrate a comprehensive and innovative methodology for in-service monitoring of the electrical and structural condition of floating substations in order to optimise the monitoring strategies with currently available solutions, in particular concerning sensors. Complementarily, it is planned to identify challenges for future technologies and to specify targets for the operation of new and existing components in the new floating environment to meet the substation's availability rate. This project is led by Université de Nantes and France Energies Marines, and brings together 5 other partners with complementary skills.

▶ Learn more about the MOSISS project

Press contacts:
France Energies Marines: melusine.gaillard@ite-fem.org - T. +33 (0)2 98 49 98 27
RTE: perrine.mas@rte-france.com – T. +33 (0)1 41 02 12 79
Université de Nantes: faustine.heugues@univ-nantes.fr – T. +33 (0)6 74 16 03 44

Partners of LISORE project

➪ Project web page

Duration: 17 months (2019-2020) | **Budget:** €476K

This project was supported by the French government, managed by the National Research Agency as part of the Investments for the Future Programme (ANR-10-IEED-0006-31), and by public funding from the Réunion region.

Partners of MOSISS project

➪ Project web page

Duration: 24 months (2020-2022) | **Budget:** €892K

This project is supported by the French government, managed by the National Research Agency as part of the Investments for the Future Programme (ANR-10-IEED-0006-34).