

PRESS RELEASE | 6 February 2023

Biofouling is a phenomenon to be taken into account for the design, durability, and sustainability of offshore wind farms



Quantifying and qualifying biofouling is a major challenge

The biocolonisation of submerged structures, also known as biofouling, leads to a modification of the marine environment in which they are deployed, through a reef effect. This is being extensively studied to understand the extent to which this phenomenon can create a reserve. Biocolonisation can also have a significant impact on mooring lines and dynamic cables which link the bottom to the surface. However, this effect is not fully understood, especially when considering sites that are highly dynamic, shallow (< 200 m) and far from the coasts that are characteristic of offshore wind project locations. **Biofouling is therefore a crucial parameter to be quantified and qualified to be correctly considered.**

Innovative experiments and results with high added value for the sector

Given the stakes involved in a detailed understanding of the biocolonisation phenomenon, both from a technical and ecological point of view, a collaborative R&D project called [ABIOP+](#) was conducted from 2019 to 2022 by a consortium of academics and industry. Led by France Energies Marines and Nantes University, this large-scale project included many innovative experiments that yielded several results with high added value for the sector:

- Highlighting the **strong spatial and temporal variability** of the communities of organisms constituting biofouling thanks to multi-site monitoring at sea;
- Identification of the **main parameters influencing biocolonisation**, i.e., geometry, material, exposure and stress of the component concerned, and this in a way that has not been done before for **synthetic moorings**;
- Determination of a **reliable range of volumetric weights** associated with the different types of biofouling in order to support engineering sensitivity studies;
- Construction of an **image database** and definition of a **list of metadata** allowing efficient learning by artificial intelligence on a limited number of classes of organisms, then preparation of a roadmap for a method of automatic quantification of the percentage cover;

- Determination for the first time of the **multi-species heat exchange coefficient on living biofouling** and development of a **numerical model** to predict the thermal behaviour of a colonised electrical cable,
- Identification of **innovative biofouling management solutions** and identification of a new biocide-free coating effective under static and dynamic conditions.

Next steps

These results will be presented in the next few months during a public webinar that will allow the audience to discuss live with the scientists of the ABIOP+ project. **The BIODHYL project has just been launched** to further characterise the phenomenon of biocolonisation and its structural and environmental impacts on floating systems. The objective is to make biofouling characterisation techniques more reliable to anticipate its development and to refine the quantification of the effects of biocolonisation at the environmental and structural levels. On this last point, the aim is to optimise the design of the farms, reduce their maintenance costs and increase their lifespan.

*Press contacts: Mélusine Gaillard - melusine.gaillard@ite-fem.org - T. +33 (0)2 98 49 98 27
Faustine Heugues - faustine.heugues@univ-nantes.fr - T. +33 (0)6 74 16 03 44*

ABIOP+ project in short



↪ See the [project webpage](#)

Duration: 45 months (2019-2022) | **Budget :** €2,014K