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DEVELOPMENT OF NUMERICAL AND EXPERIMENTAL TECHNIQUES FOR THE ENGINEERING, PRODUCTION AND LIFE-CYCLE MANAGEMENT OF IMPROVED FIBRE-BASED MATERIAL SOLUTIONS OF LARGE OFFSHORE ENERGY PLATFORMS

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ABSTRACT

There is no doubt that the offshore renewable energy exploitation has a great potential to grow, and it will greatly help reach climate goals and CO2 reduction levels and are likely to secure Europe's technical and economic competitiveness. However, the open sea is a very aggressive environment with may largely affect the maintenance costs of the installations and therefore the overall cost of offshore energy generation. The owners of offshore assets are well aware of that and are paying a steep price. A massive amount of steel goes into those assets, and all this metal is subject to degradation, which explains why corrosion accounts for approximately 60% of offshore maintenance cost. Preventive maintenance is not just expensive but also reduces the operating life of the assets. Despite the convenient immunity to corrosion of Fibre Reinforced Polymers
(FRP), the use of those materials for large marine structures is limited to secondary components.

The aim of this session is to show the use of FRP materials in the structure of the next generation of large Renewable Energy Offshore Platforms (REOPs) by overcoming the above mentioned challenges. Numerical and experimental works regarding the use of FRP materials for offshore applications are welcome. In particular the following topics are of special interest:

- Simulation techniques of FRP materials
- Fatigue in FRP materials: numerical modeling and experimental tests.
- Development of joining techniques using FRP materials.
- Structural health monitoring of offshore structures.
- Development of digital twins for offshore structures.