

## OP 325

### The next generation of large offshore wind energy generators

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The next generation of offshore-wind and tidal power generators requires advancements in materials, coatings, and architectures to enhance operational performance and reduce costs. Corrosion and fatigue are major challenges in offshore structures due to harsh environmental conditions, leading to high maintenance expenses. MAREWIND project, funded by the EC Horizon 2020 programme, is addressing these issues by improving material durability and maintenance techniques. Progress includes the following results with successful pilot prototypes: (1) antifouling coatings with significant delay in fouling cumulation after several months immersed in the sea; (2) anticorrosion coatings with resistance achieved in the laboratory testing corresponding to CX corrosivity category, implying extreme resistance of more than 25 years. Easy and direct application of the coating by spray gun has been demonstrated and the production of 100 L is envisaged to validate its upscaling. (3) Ultra High Performance Concrete (UHPC) developed presents a more sustainable solution than standard UHPC and shows 90% durability improvement compared to a standard C60 at same age (4) Successful testing of sensors on concrete and composites for blades for Structural Health Monitoring (SHM).

The project outcomes are being developed towards a reduction of Operation and Maintenance costs contributing to a sustainable offshore wind sector.