



LEADING EDGE ADVANCED PROTECTION USING NOVEL MATERIALS AND PROCESSES FOR WIND ENERGY (LEAPWIND)

**CIRCULAR DESIGN FOR THE SUSTAINABILITY OF THE
OFFSHORE RENEWABLE ENERGY SECTOR**

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EIRECOMPOSITES: COMPANY BACKGROUND

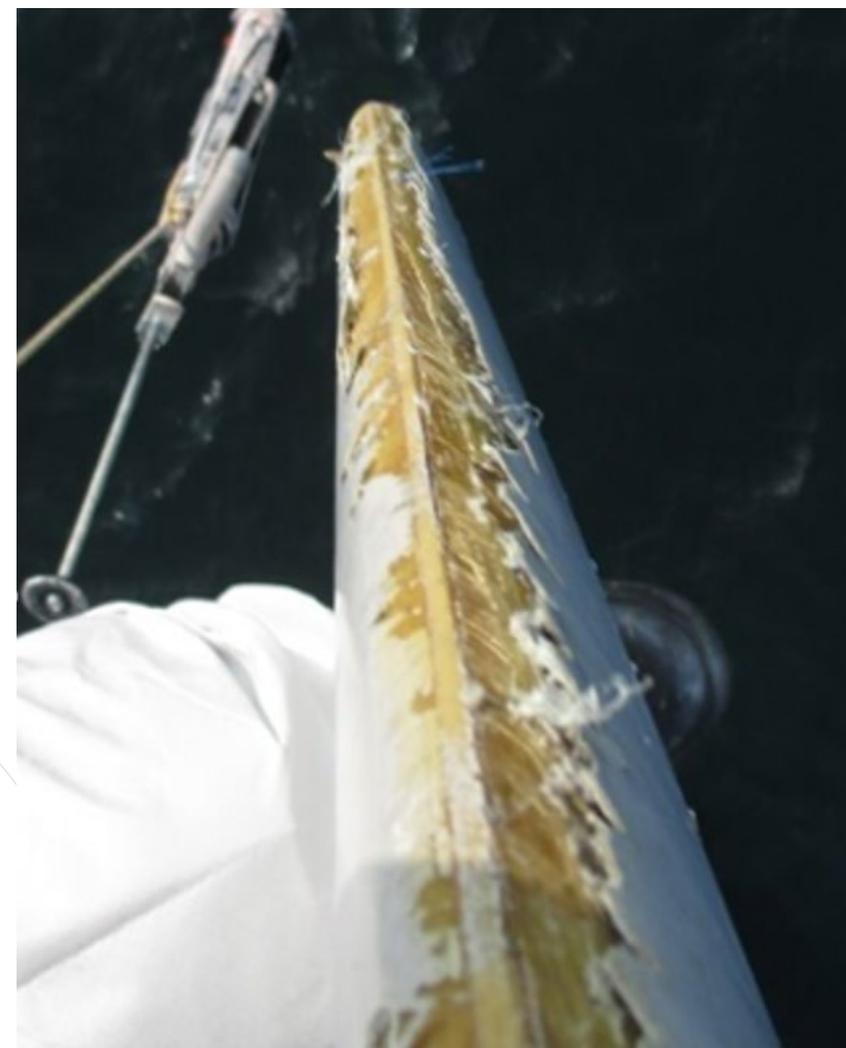
- Composites Design, Manufacturing & Testing for Aviation, Space and Renewable Energy
- Manufacturer of wind blades
 - 14m epoxy blades for a derivative of the 225kW Vestas V29
 - Glass-fibre reinforced polypropylene thermoplastic wind turbine blades for 5kW to 15kW turbines
- AS/EN 9100 and NADCAP approved
- Proven track record of research with the European Space Agency and Horizon 2020 program
- Manufacturer of aviation structures, tidal blades, and satellite components





MOTIVATION FOR LEADING EDGE PROTECTION

- Erosion can reduce annual energy production of a wind turbine by between 4% and 20%
- Offshore blade repairs are expensive and dangerous
- Production losses and maintenance costs as a result of erosion are a major challenge in the wind sector
- Problem will be worsened due to larger blades with higher tip-speeds
- Blade erosion causes a loss in productivity worth between \$168m and \$842m a year across European offshore wind sector





SOLUTION & RESULTS

- Protective coating for blade leading-edge
- Thermoplastic material
 - Recyclable material for circular design
 - UV resistant
 - Good energy absorption
 - Thermoformable to blade geometry
- Solution demonstrated through full-scale laboratory testing
- Operational trials ongoing in Shetland
- Harsh marine environment representative of real life conditions to be experienced offshore
- Excellent performance from initial operational trials





MARKET ADOPTION

- Leading Edge Protection to be applied during the manufacturing stage to eliminate erosion of wind blade.
- Commercial trials planned with an existing customer – SD Wind Energy.
- SD has experience with our blades on harsh environments including Antarctica and offshore oil platforms.
- Following successful rollout with SD Wind energy, we plan to target other customers.





CONCLUSIONS

- There is a massive, growing market for Leading Edge Protection.
- The LEAPWind project has developed a novel solution to address this market.
- The solution has been tested in a laboratory and in operational trials and shows excellent results.
- The technology is disruptive and can place Europe in a globally leading position in terms of offshore wind.
- It will decrease electricity cost while providing a more sustainable solution by using recyclable materials.
- Solving the problem is worth over €500m to European energy producers.





THANK YOU



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The logo for EIRECOMPOSITES, featuring a stylized 'E' icon on the left and the company name 'EIRECOMPOSITES' in a bold, sans-serif font on the right. The 'E' icon is composed of blue and grey geometric shapes. The text 'EIRECOMPOSITES' is in blue and grey. There are also faint, overlapping circles in the background of the logo area.

EIRECOMPOSITES



RELATED RESEARCH

- Tidal Energy
 - EireComposites has manufactured and tested the world's largest tidal turbine blade (8m, 4 tons)
 - EireComposites has manufactured the tidal turbine blades with the longest operational history in the US (over 7 million cycles)
- Other projects
 - FloTEC - Floating Tidal Energy Conversion, H2020 LCE, €9.8m, www.scotrenewables.com/projects/flotec
 - SEABOAT - Sustainable Environmentally-friendly Advanced-Composite Zero-Emission Boats, H2020, €1.65m, www.seaboat.eu
 - PowderBLADE - Commercialisation of Advanced Composite Material Technology: Carbon-Glass Hybrid in Powder Epoxy for Large Wind Turbine Blades, H2020, €2.7m, www.powderblade.com
 - AirPoxy - Thermoformable, repairable and bondable smart epoxy-based composites for aerostructures, H2020, €6.5m, www.airpoxy.com

