

## Project PREMISE



# Future generations of coatings and guidelines for pollution prevention (WP4)

- **Task 4.1.** Future generation of anti-erosion coatings: Current promising directions and strategies of preventing and mitigating the coatings erosion are mapped, including bio-based biodegradable and recyclable coatings, nanoengineered coatings, metal-polymer hybrids, thermoplastic, self-healing coatings. The solutions are classified according to their reported performance/expected success chances, quality of protection, TRL, level of development. Several most highly developed and promising coatings of new generation are shortlisted (preliminary short list: thermoplastic/ acrylonitrile butadiene styrene/ABS, repairable vitrimer and carbon nanotube/CNT reinforced polyurethanes).
- **Task 4.2.** Evaluation of pollution potential of new generation of blade protection coatings. The new coatings, as bio-based, nanoreinforced, self-healing or easy repairable have different damping, erosion suppressing mechanisms. In this task, the volume and frequency of erosion for selected future coatings is investigated.. The new coatings' degradation is tested using RET and then the particle evolution under sea water/ageing conditions (using the methods WP2-WP3), and with view on their effect on the most sensitive species and benthic organisms (WP4). The potential of nanoparticles (CNT, cellulose), ABS components, temperature sensitivity of vitrimers are investigated. New coatings and materials are ranked with view on polluting risks.
- **Table 4.3.** Guidelines on development new generation of coatings, with minimized environmental effects. Recommendations to the mitigation of surface erosion by using advanced coatings are developed, and shared with the target groups.

**Expected results:** Evaluation of potential risks from future/new blade coatings under development, and development of guidelines for erosion pollution prevention

### Milestones:

- M4.1. Mapping and classification of future directions of wind turbine coatings and materials (DTU, M25)

### Deliverables:

- D4.1. New generations of materials for blade protection: Mapping and review (DTU, M23)
- D4.2. Evaluation of risks of new generation of blade protection (AAU, RUC, M28)
- D4.3. Guidelines on development new generation of coatings, with minimized environmental effects (DTU, M34)

