POWSEIDOM
Deployment of wind and turbulence observations in the Mediterranean

DURATION: 30 months | LAUNCH: 2021 | Total budget: €834K

CONTEXT

The Gulf of Lion, an area with a high potential for the development of floating wind turbines, is the focus of the challenges of fine characterisation of the wind resource and precise knowledge of the environmental conditions. In this region, direct measurements are currently collected through a network of coastal anemometers. However, offshore data are needed to validate the numerical models used to characterise the resource and to design the systems. While the installation of anemometers on masts in deep waters is technically excluded, the use of remote sensing devices, such as lidar, is promising.

TECHNOLOGIES

STAGES OF THE VALUE CHAIN

Design

O&M

OBJECTIVES

- To overcome the lack of wind and turbulence data from in-situ measurements in the Gulf of Lion
- To propose specific recommendations for the design of offshore wind turbines in this region

SCIENTIFIC CONTENT

- **Deployment** of a WindCube v2 lidar operating at 4 Hz (acquisition frequency 4 x higher than a commercial lidar of the same type)
- **Preliminary study** of the lidar's capacity to measure turbulence by comparison with a measuring mast equipped with anemometers
- **Characterisation of turbulence** in the Gulf of Lion by measuring the lidar deployed on Planier Island
- **Test of the lidar on board a mobile platform** reproducing the representative movements of a buoy deployed in the Gulf of Lion
- **Development** of a motion compensation **algorithm**

EXPECTED RESULTS

- **Representative dataset** of the Gulf of Lion, from in-situ wind and turbulence measurements collected over a period of 6 to 9 months
- **Motion compensation algorithm** for turbulence measurement using lidar on a mobile platform
- **Recommendations for the calculation of wind induced loads** acting on structures deployed in the Gulf of Lion, which may lead to the development of certification documents such as IEC 61400-3, to take into account turbulence intensity, turbulence spectra and gust statistics

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