



OWA

Offshore & Wind Assistance



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## North Sea floating LIDAR wind measurement trials, a huge success

A full-size prototype of the floating LIDAR offshore resource assessment system, known as FLIDAR™, has been successfully tested 15km off the Belgian coast. It has been located next to a stationary LIDAR (WINDCUBE®v2 LIDAR from Leosphere) on a fixed communication mast for the month of October, in order to test survivability and validate the accuracy of the wind speed measurements.

This is the first successful trial of a floating LIDAR device in real offshore conditions in the North Sea. Designed to withstand significant wave heights of over 6 metres the FLIDAR system was tested in wind speeds up to 25 m/s and proved highly accurate, with an  $r^2$  of over 0.99 when compared to reference LIDAR data.

“The recent tests have proven that the FLIDAR system can offer the fastest, most cost-effective, accurate offshore wind resource assessments”, said Bruce Douglas, Sales and Marketing Director at 3E.

The FLIDAR was developed by global renewable energy consultant 3E, and OWA (Offshore & Wind Assistance NV), a 100% subsidiary of the Belgian geotechnical offshore contractor GeoSea. It is made up of an industry standard buoy adapted to marine regulations for faster permitting. The world leading Leosphere WINDCUBE®v2 Offshore LIDAR device is secured on top of a mechanical stabilisation system whilst a set of PV panels, small wind turbines and battery pack provide independent power supply. Data is retrieved and communicated via satellite to a web based monitoring and reporting tool. The results can also be coupled with a wind farm simulation model to allow real time analysis of key performance indicators for wind turbine energy conversion.

The development of the FLIDAR floating LIDAR system is part of the Offshore Wind Infrastructure (OWI) project co-financed by the Flemish Government.

**Press Conference – Save the date:** The FLIDAR system will be launched at a press conference at the upcoming EWEA offshore event at 10:00 on 30 November in Amsterdam.

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### Context – Why measure offshore wind resource with a floating LIDAR

The profitability of offshore wind farms depends heavily on the ability to predict and deliver maximum power output at competitive costs. Reaching this optimum first requires an in-depth knowledge of the wind resource.

As the wind resource is the primary energy source of any offshore wind farm, its precise assessment is of great importance. Furthermore, as the behaviour of the wind has an impact on nearly all the components of a wind farm, a wrong estimation of some parameters (especially turbulence, gusts, extreme wind speed and wind speed distribution) may impact the performance of the turbines, the component lifetime or even the structural integrity of the turbines. Both short term and long term characteristics of the wind and the corresponding predictability are important.

Until now, building fixed measurement masts at sea equipped with standard anemometers or LIDAR systems was necessary to ensure successful measurements offshore. The construction of this type of infrastructure requires extensive permitting and can cost 3 - 8 Million Euro.

The FLIDAR is intended to significantly reduce these prohibitive costs and provide more flexibility for wind power developers and asset managers.

- *What is a LIDAR?*

LIDAR measurement technology has become the industry standard for wind resource assessment at upper heights. LIDAR data are considered bankable in flat terrain by bank engineers and major industry players. A LIDAR (Light Detection And Ranging) device is an optical remote sensing technology that can measure the distance to, or other properties (such as speed) of, a target by illuminating the target with light, often using pulses from a laser. With this technique, it is possible to know with a high degree of accuracy the evolution of the wind speed as a function of time and height.



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## **About the FLIDAR developers:**

### **3E**

3E is a global, full scope renewable energy consultant with over 15 years of experience in wind and solar energy. The company provides services and software to develop and optimise performance of solar and offshore/onshore wind energy projects. Specialised in resource assessments, 3E's expert wind team operates several LIDARs and floating LIDARs (FLIDAR), providing the most accurate wind data and analyses. 3E also guides its customers at all project phases, with engineering and design services, turbine inspections, due diligence, performance monitoring and optimisation.

### **OWA**

OWA (Offshore & Wind Assistance NV) is a fully owned subsidiary of the Belgian company Geosea, offering a wide range of offshore services including maintenance of offshore installations (such as Offshore Wind and Oil & Gas assets). OWA provides marine logistic services (transport of crew, supplies and (spare) parts, heavy lifting), inspection and survey services and maintenance and repair services. Geosea is an experienced offshore contractor offering a wide range of specialized techniques mainly applied from jack-up vessels. They comprise directional drilling, very large diameter drilling and piling, soil investigation, rock drilling and blasting, injection techniques and soft soil improvement and landfall construction through innovative techniques. The company's current focus is on building foundations for jetties and mooring systems; construction of offshore structures such as offshore wind farms and geotechnical investigation at great depth. GeoSea, which is part of the Belgian DEME group (Dredging, Environmental and Marine Engineering), is operating around the globe.

### **Leosphere**

Specialist in laser-based atmospheric observations, Leosphere has globally developed the LIDAR (Laser-Radar) technology into the areas of meteorology, climate and wind energy. Since 2009 Leosphere and NRG Systems, leading manufacturer of wind measurement equipment, formed a global partnership to expand the use of remote sensing in the wind energy industry. WINDCUBE@v2 LIDAR remote sensor is already in use in more than 20 countries worldwide, in various applications, from early stage prospecting and bankable resource assessment to site suitability and power performance measurements. The WINDCUBE@v2 Offshore uses the same technology core and has been reinforced to operate for extended periods in harsh sea conditions. With more than 200 deployments on and off-shore, it is the ultimate wind measurement tool to reduce both investment costs and uncertainties. The products and services are developed, marketed, and serviced globally through LEOSPHERE global support.