

LIDAR Wind Measurement Campaign without LIDAR Equipment Investments

EMD International A/S (EMD) and Alpha Wind Energy (AWE) are pleased to offer a **full LIDAR measurement campaign – both short-term and long-term** – for your site(s), consisting of rental and operation of the LIDAR as well as subsequent analysis of the measured data compared with traditional met mast data. The wind data is analyzed in the WindPRO software, and both micro-siting as well as a fully bankable AEP (Annual Energy Production) assessment report prepared by EMD can be supplied as part of the package.

Wind farm energy production is today typically estimated by performing wind measurements with one or more met masts located within or very close to the potential wind farm. In order to reduce uncertainty of the subsequent AEP (Annual Energy Production) calculations, it is advantageous to measure as close to turbine hub height as possible.

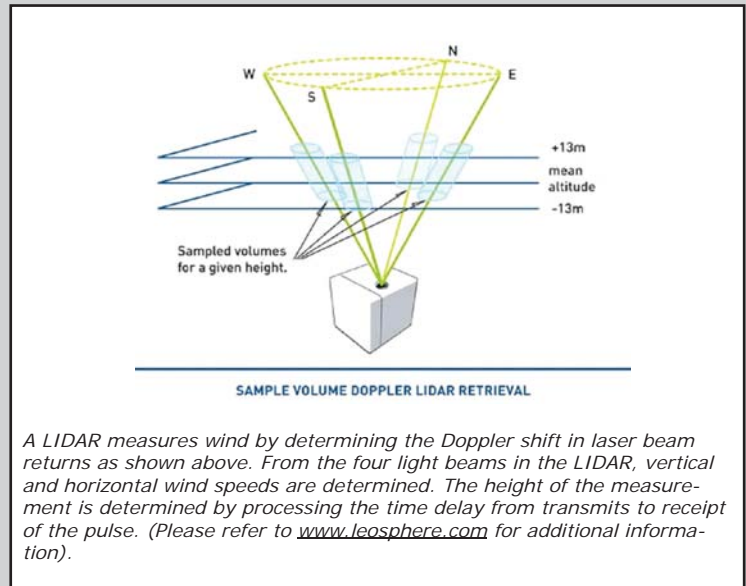
With the Light Detection and Ranging (LIDAR) technology we can now provide a well-proven wind measurement solution as an alternative / supplement to conventional met mast measurements.

By using LIDAR solely at a site, it is possible to avoid applying for a permit to install a measurement mast.

When using LIDAR as supplement to the traditional met mast measurements, it is possible to have a much better set of wind data for the site and thus reduce the uncertainty of the AEP calculation.

Investing in a LIDAR System is very costly and requires know-how. When using EMD / AWE for your LIDAR measurement campaign, you can avoid these investment costs as we supply the system on a rental basis.

The LIDAR equipment used by EMD / AWE is the Leosphere Windcube system.



LIDAR Potential

EMD and AWE see a significant potential for using our LIDAR measurement campaign in a variety of scenarios:

- **Validations of data from a remotely positioned met mast.** If access to data can be obtained from a mast outside the site under development, the use of the Windcube for one or several shorter periods can validate the use of data from the remotely positioned mast, which will otherwise be considered too remote to apply. A potential scenario for such an application is shown in the below figure.
- **Supplementing sub hub-height met mast measurements with Windcube.** Using a sub hub-height met mast combined with one or several shorter periods with Windcube can be a cost-effective solution compared to a met mast measuring in full hub-height
- **Supplementing a met mast at larger sites that would otherwise require two or more met masts.** Instead of installing a second met mast on a site, the deployment of a Windcube for one or several shorter periods can be used to obtain sufficient data to correlate to the met mast.
- **Standalone LIDAR measurements in flat terrain and in coastal applications.** In some cases stand alone measurements with Windcube can provide sufficient accurate data to fully avoid a met mast. This solution will normally only be cost-effective when special circumstances prevent the use of a traditional met mast.



Services Offered

A LIDAR measurement program would typically involve:

- **Site analysis** of the site in question and the conditions under which the data is to be applied.
- **Site survey** for general impression of the area from a wind resource perspective and for determining the best position for the Windcube LIDAR system.
- **Rental and operation of the LIDAR system** during for one or more measurement periods.
- **EMD analysis of wind data** from the Windcube LIDAR system and possible met mast data. This can also include micro-siting and a final bankable AEP report, if so desired, or inputs for the developer to perform this on their own.

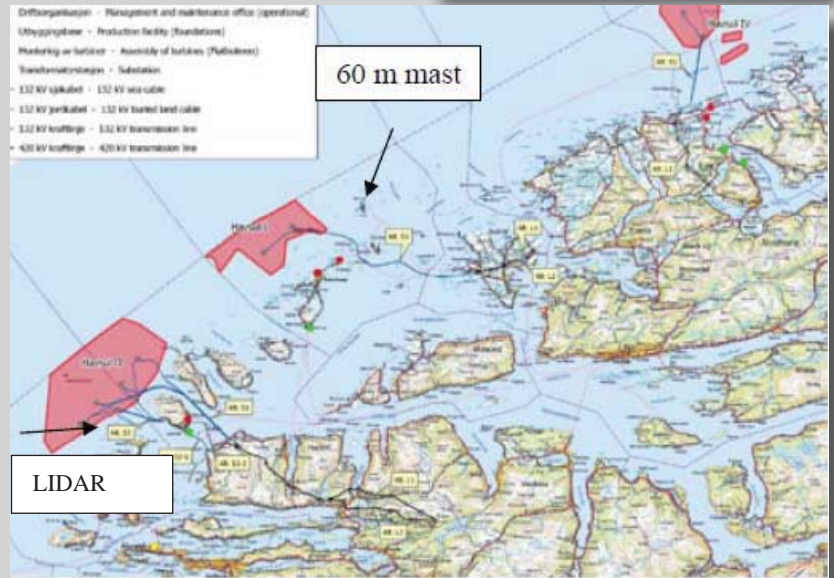
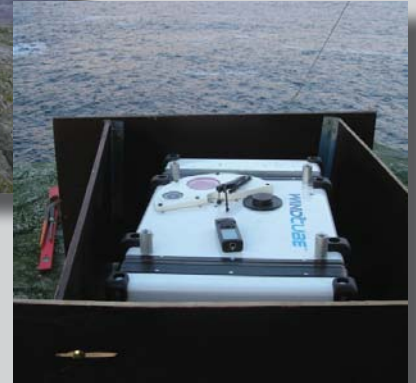
Reference

EMD and AWE were among the first commercial consultancy companies worldwide to use LIDAR for measurement campaigns, and both companies have each more than 20 years of experience within wind energy.

Since January 2008 EMD and AWE have conducted a LIDAR measurement campaign using a Windcube LIDAR system from Leosphere on an offshore site in Norway. The Windcube is deployed on a small island (rock with lighthouse) and a 60 m mast has been installed at the island of Ona located approximately 20 km from the position of the LIDAR. The positions are indicated on the map to the right.

The Windcube LIDAR collects data up to 160 m and is the primary source while the 60 m mast provides validation of the Windcube data. Prior to installation of the LIDAR at site, it was calibrated against the 160 meter met mast at the Høvsøre test station in Denmark.

AWE installed and operates both the Windcube and the 60 m met mast and is responsible for data availability. Data analysis and AEP calculations for the planned 1,500 MW offshore project is conducted by EMD.



Interested in additional Information?

For further information and to receive a quotation for a LIDAR measurement campaign at your site, please contact:

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