Technical University of Denmark

DTU

EU FP7 NORSEWInD. A project based Wind Atlas

Oldroyd, A.; Hasager, Charlotte Bay; Stickland, M.T.; Mikkelsen, Torben Krogh; Estanqueiro, A.

Publication date:
2013

Link back to DTU Orbit

DTU Library
Technical Information Center of Denmark

EU FP7 NORSEWInD
A project based Wind Atlas

A Oldroyd[1]; C B Hasager[2]; M T Stickland[3]; T Mikkelsen[2]; A Estanqueiro[4]
1. Oldbaum Services UK; 2 DTU Wind Energy DK; 3 University of Strathclyde UK; 4 LNEG PT
www.norsewind.eu

NORSEWInD
NORTHERN SEAS WIND INDEX DATABASE

Abstracts

In 2008, the EC programme NORSEWInD kicked-off to answer three key barriers to industry as presented by EWEA in a report issued in 2006. these were:
1. Maximise availability of information in the public domain
2. Resource mapping covering the Irish, Baltic and North Seas;
3. Better understanding of key technologies such as LiDAR, SoDAR and Satellite

Based on state of the art techniques in remote sensing and mesoscale modelling, the NORSEWInD team have worked to create an open source free to use wind atlas covering the North, Irish and Baltic seas, based on a substantial database of offshore wind data .

This paper presents the output of 4 years of work at a budget of 7 million euros, and the joint effort of 17 partners.
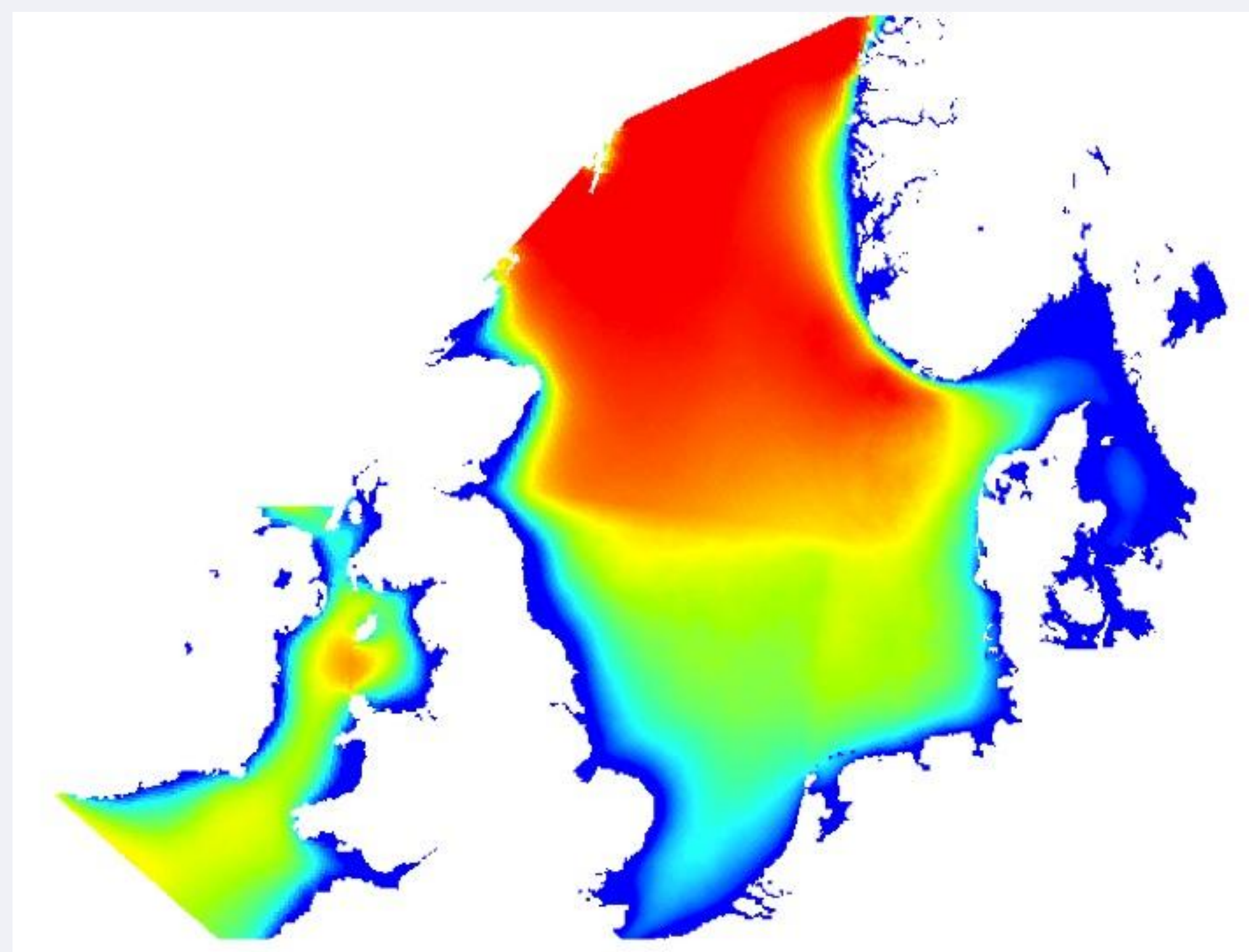
R&D Priorities regarding Wind Resource Estimation and Mapping

Maximum availability of wind resource data, if possible in the public domain, to ensure that financiers, insurers and project developers can develop high quality projects as efficiently as possible, and avoid project failure through inaccurate data

Mixing height

Resource mapping of areas with a high probability of high wind resource potential, but as yet unexplored, including the Baltic, North and Black Seas.

Development of cost effective measuring units, including communications and processing, and which are easily transportable, for the assessment of wind resource characteristics, such as LIDAR, SODAR and satellite observation.
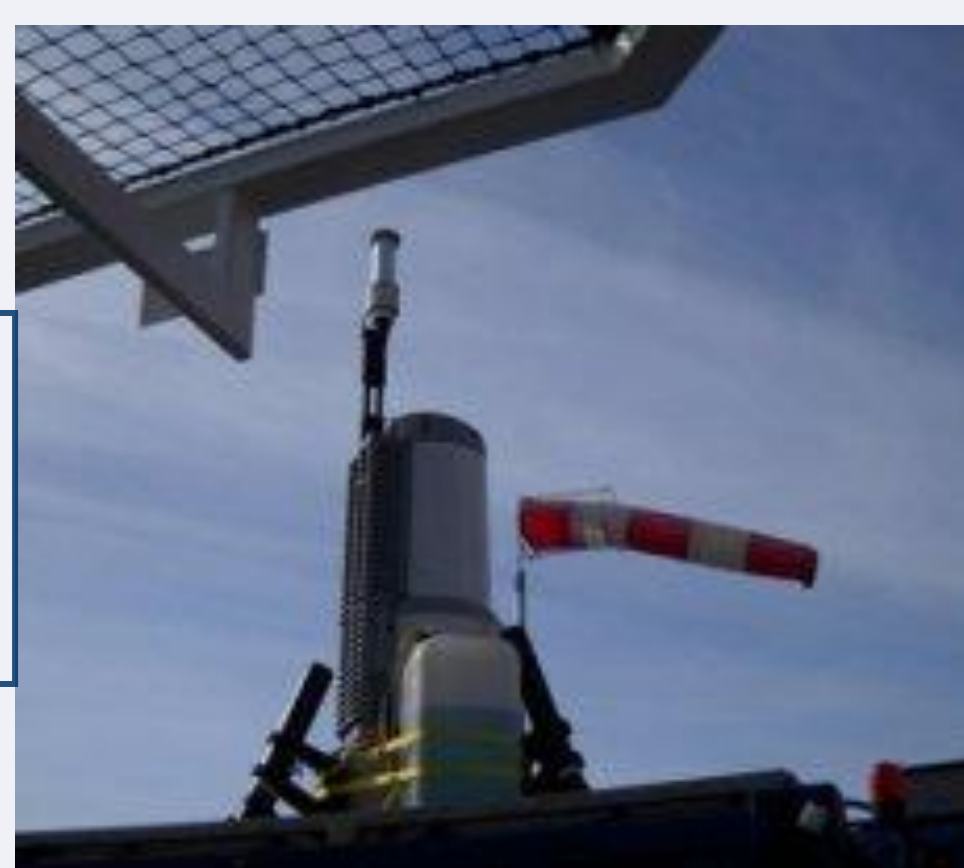
Physical data

NORSEWInD Data Acquisition

NORSEWInD is based on the acquisition of offshore data using a combination of data sources. For the production and validation of the wind atlas, LiDAR data (the largest network of its kind world wide), Met mast data and satellite data were used to evaluate, and correct, mesoscale data.

Leosphere WindCUBE North Sea

Natural Power ZephIR Fino - 3

Relevance of NORSEWInD

Data within the offshore wind sector is a very expensive commodity. With data looking to trade for 7 figures, the price that data owners can command reflects the commitment and cost of offshore wind measurements.

This is further underlined by the install price of UK Round 3 met masts, which are commanding prices often in excess of 12 million Euros. This price is severely limiting to offshore developers, and at 1GW levels, results in single met masts being deployed. This in turn leads to sites being inadequately described in terms of local wind data, and hence an increase in uncertainty. Ultimately wind farm projects may be taken forward, or rejected based on insufficient data as opposed to decisions being made when in full possession of the necessary information.

NORSEWInD, helps to address this data shortage issue through the wind atlas, but also through the methodology.

Whereas the wind atlas is the headline product output, NORSEWInD looked at many topics such as data coverage for wind farm forecasting, cost of energy modelling, shear profiles offshore (a major body of work), the installation, maintenance, testing and post deployment testing of LiDAR systems, flow correction modelling for LiDAR installations, IEC validation of the FINO-3 met mast, and the creation of large collated satellite image databases which increase confidence and the available information.

All of the NORSEWInD output is available via the NORSEWInD website.

NORSEWInD as a project has been a successful significant industry programme with a clear aim to provide better data free of charge to the wind industry.

In addition it is the commitment of the project to maintain and continue to make available the large volume of scientific information acquired within the project for research activities, and to provide a baseline of data for future projects looking at offshore wind.

NORSEWInD is the result of a significant effort by the 17 partner organisation, who have worked in collaboration to ensure the result is relevant to the wind industry today.

SEVENTH FRAMEWORK PROGRAMME

Key Outcomes

NORSEWInD has made a number of contributions to the understanding of offshore wind climates and the techniques used to capture this data. These include:

- Systematic testing of LiDAR systems for commercial use;
- Deployment, system management and proof of concept in offshore environments;
- Aggregation of satellite data collection techniques and available archive;
- Systematic examination of offshore met mast datasets to determine data quality;
- Systematic approach to flow distortion effects on wind measurements (Mast and platform)
- Systematic approach to assess appropriate data source for long term correction
- A wind atlas with less than 2.5% uncertainty across the domain in long term speed prediction;
- Over 73 publications and counting.

List of Available Parameters

- Annual average wind speed maps (long-term corrected)
- Monthly average wind speed maps (long-term corrected)
- Standard deviation of annual averages
- Weibull-distributions
- Wind direction distributions
- Turbulence intensity
- Wind shear (maps of the wind shear coefficient α)
- Temperature and static stability

Methods of Access

To access the dataset go to:

www.norsewind.eu and fill out the contact form

Go to LNEG Geoportal:

http://geoportal.lneg.pt/geoportal/mapas/index.html

Partners