Workshop Wind farm zone Borssele
17th November 2014

Site Studies

Ruud de Bruijne – RVO.nl

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Introduction

- Objectives site data:
  - Provide information about the physical environment of the Borssele wind farm zone to developers and other (commercial) parties.
  - Provide site data required for the EIA and Wind farm site decision.

- Process
  - RVO.nl consulted NWEA about the scopes of the studies
  - Updates discussed with the sector in monthly workshops
  - All final results will be made public (reports, maps, data)

Update status and content studies

1. Desk studies (pre survey). Status: almost completed

• Geology and Geomorphology	CRUX
• UXO	REASeuro
• Archaeology	Vestigia
• Morphodynamics	Deltares
• Metocean	Deltares
• Wind resource assessment	N/A

2. Surveys, campaigns

   - Geophysical & Geotechnical
     Framework agreements surveys to be signed 28th November (Alcatel period)

   - Wind and wave measurements => published shortly

3. Desk Study (post survey)

   - Update geology, geomorphology and morphodynamics
   - Update wind resouce assessment

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Update status and content studies

4. Supporting activities
   - Experts
     - Overall consultancy and project management: BLIX
     - Review bids surveys: Reynolds Int. & Wind Support Ltd
   - Wind measurement campaign assessment: DNV GL (GH)
   - Certification: DNV GL
5. Communications
   - Technical Project Description
     - First revision based on desk studies: 15th December 2014
     - Second revision: update based on surveys & updates deskstudies Q3 2015
   - Website (downloads reports & GIS viewer)
   - FTP server for raw data

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Deskstudy Geology and Geomorphology by CRUX

Purpose:
Get a first understanding of the geology and geomorphology of the Borssele wind farm zone.

Timeline and Status:
Completed. Report available.

Results:
- Recommendations Soil Investigations;
- Cross sections showing the geological stratification of the Borssele wind farm zone;
- Geological, geomorphological and bathymetry maps.

Deskstudy UXO by REASeuro

Purpose:

Get insight in possible areas in the Borssele wind farm zone with an increased risk in finding unexploded ordnances (UXO's).

Timeline and Status:

Almost completed. Report available shortly

Results :

- Borssele wind farm zone is an UXO risk area
- Possible presence of UXO's is no constraint for offshore wind farm activities

Recommendations:

- Conduct dedicated UXO survey prior to operations
- Recommendations for soil investigations
- Validity of the collected data limited in time, minimize the time lapse between the survey(s) and operations

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Deskstudy Archaeology by Vestigia

Purpose:

Get insight in archaeological aspects that could play a role in the development process of the wind farm zone Borssele.

Timeline and Status:

Draft report under review. Available shortly

Results :

- chance to encounter prehistoric archaeology: small (low sensitivity)

- chance to encounter historic archaeology (shipwrecks, airplanes, etc.): average (medium sensitivity)

Recommendation:

- Investigate historic or scientific value of identified wrecks or archaeological sites which cannot be avoided for soil disturbing activities. Report the value to the authorities.

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Desk study Morphodynamics by Deltares

Purpose:
Improve the geomorphological understanding of the Borssele wind farm zone.

Timeline and Status:
Draft report under review. Available shortly

Results :
- Windfarm zone highly dynamic with complex bathymetry
- Static shore-parallel sand banks
- Dynamic shore-perpendicular sand waves with typical length of 230m, height of 4m and migration speed of -1,7m/a

Deskstudy Metocean data

Purpose:
Define the meteorological and oceanographic (metocean) data that are input for design calculations in accordance with applicable norms and standards, or equal and provide wave and wind persistence information for the installation works to be carried out for the Borssele wind farm zone.

Timeline and Status:
On-going, final results early December 2014, subject to certification.

Results expected:

- Data for design basis and persistence tables.
- Data sets for each wind farm site in the Borssele area (4 reference points and local variation over de wind farm sites):
  - Wind conditions
  - Waves conditions
  - Current conditions
  - Water levels
  - Sea water conditions
  - Joint probability conditions
  - Other criteria (in accordance with DNV –OS-J101)

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Wind resource assessment

Purpose

Provide wind data that can be used as input for wind farm modelling and business case calculations for the Borssele wind farm.

Timeline and status

Not yet started

Expected results

- Assessment of the wind conditions and long-term extrapolation of the wind conditions and wind profiles.
- Assessment of general wind conditions at the site
- Prediction of the energy yield based on the defined layout, and the various selected wind turbine models.
- Assessment of the suitability available data for carrying out the assessment.

Certification by DNV GL

Purpose:
Confirmation of compliance according to standard DNV OS-J101 of studies relevant for the design basis.

Timeline and Status:
On-going.

Results expected:

- Statement of Compliance of :
  - Geotechnical and geophysical site investigations - Scope Definition
  - Geotechnical site investigations Borssele - Results;
  - Geophysical site investigations Borssele - Results;
  - Metocean desk study – Results;
  - Geomorphological study – Results.

Geotechnical and geophysical site investigations

Purpose:

Obtain geophysical and geotechnical information of the wind farm zone which is suitable to progress design and installation requirements of foundations and cables.

Timeline and Status:

Public Tender published September 5th . Framework agreements signed on 28th November 2014 (planned). Commencement geophysical survey early January 2015

Results expected:

- Seabed geology and morphological aspects;
- The presence of all seabed features including natural objects (boulders) and non-natural objects (wrecks, debris, UXO's)
- The water depth (variation) over the site;
- Sub bottom geology over the site, confirmation geological / geophysical model;
- The exact position of existing cables and pipelines;
- Vertical and lateral variation in seabed conditions;
- Geotechnical data for the design of foundations and cables.

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Post survey desk studies

Purpose

Update geology, geomorphology and morphodynamics

Update

Timeline and status

Q2 2015

Results expected

Overall report about the geology, geomorphology and morphodynamics of the Borssele windfarm zone (replaces pre survey reports)

Wind Measurement Program Assessment - DNV-GL

Purpose:

Identify the possible wind data sources and/or means of collecting wind data for the Borssele area (and the other appointed areas) and provide insight in the cost and benefits of each option.

Timeline and Status:

Draft report under review. Available shortly

Results :

- Recommendation to start floating Lidar measurements at the Borssele wind farm zone ASAP

Wind measurement campaign

Purpose:

Provide a set of wind data; measured ≥1 year at the wind farm zone (undisturbed wind) which can be used for yield assessments. The floating lidar to be used should be at least pre-commercial.

Timeline and status

- Procurement started (public tender to be published shortly)
- Industry consultation meeting on 12th November 2014
- Measurements start March 2015?

Expected results

- Wind data. Raw data will be published monthly
- Report with analysis of measured data

To be discussed

- A second measurement close to the Belgium wind farms during 3 months is suggested by developers

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Technical Project Description - RVO

Purpose:

The 'Technical Project Description' facilitates any party interest ed in the (planned) SDE+ tender for the appointed offshore wind farm sites Borssele. This documents summarizes:

- All site data collected by RVO.nl
- A selection of constraints and (technical) requirements that are deemed to be most relevant for development of the Borssele area (incl e.g. substation locations and applicable constraints).

Timeline and Status:

1st Revision end 2014 (e.g. results desk studies)
2nd Revision Q3 2015 (e.g. including results geophysical and -technical investigations)

Results expected:

Comprehensive report serving as a reading guide/ bridging document
to all studies and other relevant information publicized.

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Contact

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