

# **Workshop Wind farm zone Borssele**

## **Site Studies**

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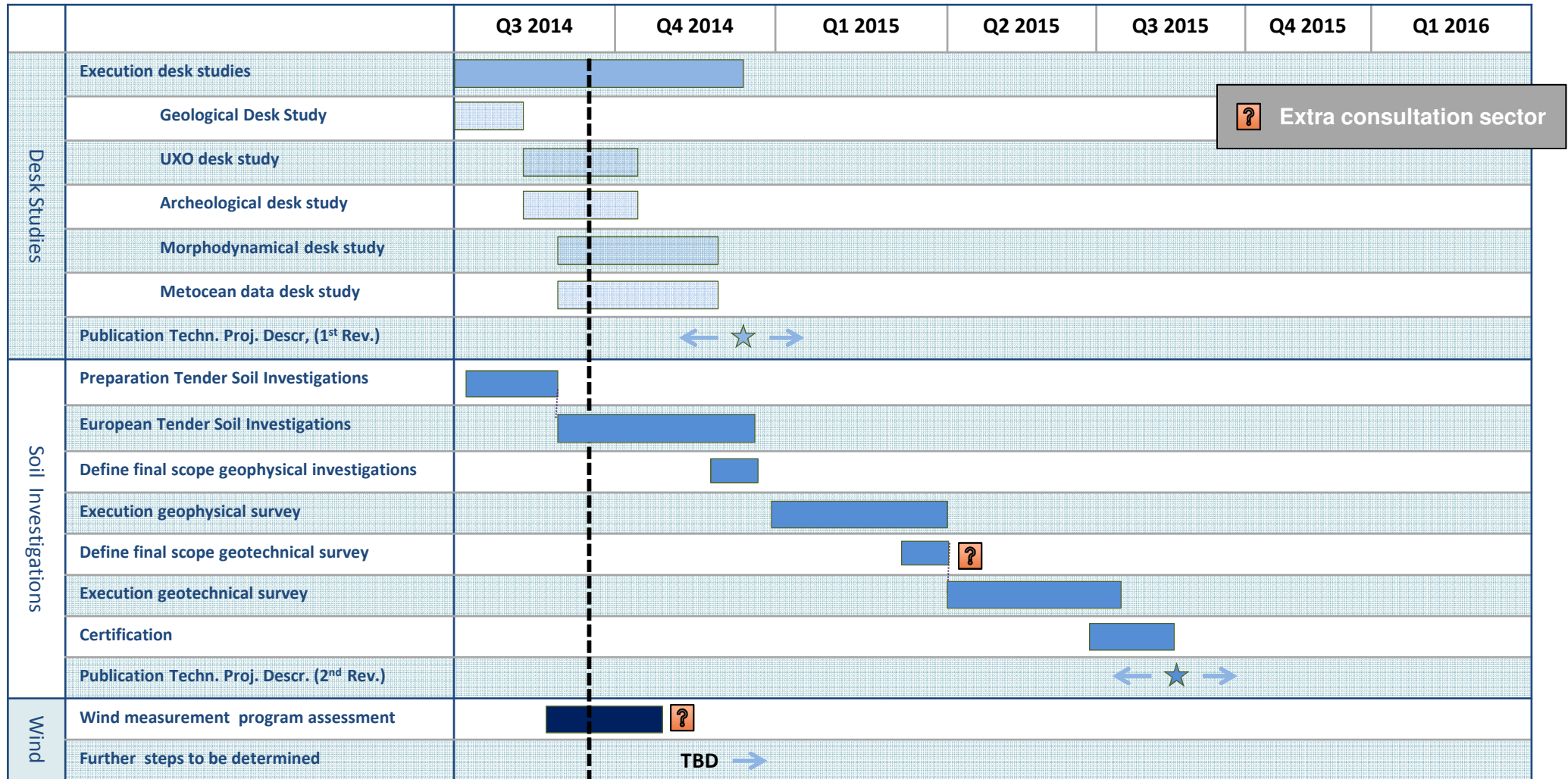
# Agenda

1. Introduction
2. Planning
3. Status and content studies
4. Next steps
5. Any other business

# Introduction

- Objectives site data:
  - Provide developers and other (commercial) parties with information regarding the physical conditions of the Borssele wind farm zone.
  - Provide site data required for EIA and Wind farm site decision.
- Objective this workshop:
  - Inform interested (commercial) parties what site data will be made available and when.
- Process
  - RVO.nl has consulted a NWEA working group on July 4<sup>th</sup> and September 4<sup>th</sup> about the scopes of the studies
  - Updates will be discussed with the sector in several workshops (if relevant)
  - All final results will be made public (reports, maps, data)

# Planning



[?] Extra consultation sector

Today

# Update status and content studies

## 1. Desk studies

- Geology and Geomorphology
- UXO
- Archeology
- Morphodynamics (pre survey)
- Metocean
- Update Morphodynamics (post survey)
- Update geology and geomorphology (post survey)

## 2. Surveys, campaigns

- Geophysical
- Geotechnical
- Wind and wave measurements (?)

## 3. Supporting studies

- Wind Measurement Program Assessment
- Certification

## 4. Technical Project Description



# Deskstudy Geology and Geomorphology by CRUX

## Purpose:

Get a first understanding of the geology and geomorphology at 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:

On going, final results expected end of September 2014.

## Results expected:

- Study showing the locations with an increased risk regarding the presence of specific UXO's and the characteristics of the UXO's that could be found in these areas.
- Risk assessment and identification and recommendations for offshore wind farm related activities in the Borssele wind farm zone as a result of the presence of specific UXO's.



# Deskstudy Archeology 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:

On going, final results expected end of September 2014.

## Results expected:

1. Description of the current situation.
2. Description of the historical context and possible disturbances due to the intended use of the wind farm zone.
3. Description of known archaeological aspects and geological information.
4. A map showing the areas with expected archaeological interest and the characteristics of these areas.
5. Recommendations on further geotechnical and geophysical site investigations.





# Desk study Morphodynamics

## Purpose:

Improve the geomorphological understanding of the Borssele wind farm zone.

## Timeline and Status:

Procurement on-going, final results expected October 2014.

## Results expected:

1. Description of the morphological features (e.g. different sand banks and gullies) and their characteristics.
2. Map of the Borssele wind farm zone showing the specific morphological features and information on the mobility of the seabed including representative cross sections for further analysis.
3. Overview and identification of the specific areas of the Borssele wind farm zone with similar morphodynamic characteristics and information on these characteristics
4. Overview of Actual Seabed Level, Reference Seabed Level and Maximum Seabed Level
5. Specifications for further geophysical site investigations.



# 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:

Procurement on-going, final results expected October 2014, subject to certification.

## Results expected:

- Data for design basis and persistence tables. Results will be certified. Possibly separate data sets for several zones in Borssele area to consider local variation:
  - Wind conditions
  - Waves conditions
  - Current conditions
  - Water levels
  - Sea water conditions
  - Joint probability conditions
  - Other criteria (in accordance with DNV –OS-J101)



# Certification

## Purpose:

Confirmation of compliance by an accredited certification body with applicable norms and standards (DNV OS-J101 or similar) of studies relevant for the design basis.

## Timeline and Status:

Procurement on-going. Works continue through 2014-2015.

## 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:

EU Tender published September 5<sup>th</sup> . Commencement geophysical survey  
December 2014 / 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.



# Post survey desk studies

## Purpose

Update Morphodynamical desk study based on results geophysical survey.

Update geological and geomorphological desk study based on geophysical and geotechnical surveys.

## Timeline and status

Q2-Q3 2015

## Results expected

Overall report about the morfodynamical characterstics of the Borssele windfarm zone.

Overall report about the geology and geomorphology of the Borssele windfarm zone (replacing the 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:

Ongoing, results expected October 2014.

## Results expected:

- Recommendation on the most cost effective means of collecting wind data for the Borssele area and other appointed offshore wind areas.
- Input for follow up workshop with sector on this topic.



# Technical Project Description - RVO

## Purpose:

The 'Technical Project Description' facilitates any party interested 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:

1<sup>st</sup> Revision end 2014 (e.g. results desk studies)

2<sup>nd</sup> Revision Q3 2015 (e.g. results geophysical and -technical investigations)

## Results expected:

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