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Site Studies Wind Farm Zone IJmuiden Ver

Expert support wind & water

Annex 5b

Scope of Work

Colophon

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Introduction

Scope document

This document details the Scope of Work for wind & water expert support services for Ijmuiden Ver Wind Farm Zone (IJVWFZ).

Background

The Ministry of Economic Affairs is responsible for the legislative framework for the development of offshore wind farms in the Netherlands. Within this framework (a) (concession) tender(s) for subsidy for construction and operation of (a) wind farm(s) will be organized. As part of the tender documentation, the participants will receive an information package in which detailed information on the offshore site is included. Detailed information about soil and wind & water conditions at the site will be part of this information package. The Contracting Authority for this assignment is the Netherlands Enterprise Agency (Rijksdienst voor Ondernemend Nederland (RVO)).

Objective

RVO has been requested to prepare and collect all site data required for commercial developers to prepare a competitive bid. In order to achieve the highest results from the site investigations, RVO intends to contract high quality experts who can support RVO in managing the site investigations. The objective of this tender is conclude an agreement with Tenderers who can support RVO on the different site investigations regarding contracting, quality control and operational support.

RVO is looking for an expert support Contractor who can support RVO with managing the site investigations (some for IJWFS I-IV, mainly for IJWFS V-VI) and the interfaces between the site investigations. RVO is specifically looking for expertise in the field of soil investigations (Lot 1) and wind & water investigations (Lot 2).

This scope of work is part of Lot 2: expert support services for wind & water investigations.

Site Description

The IJWFS located 80 kilometres off the west coast of the Netherlands. The IJWFS consists of six Wind Farm Sites (see Figure 1). IJWFS I-IV are currently being developed by RVO by means of site investigations. IJWFS V and VI will now being developed as well. The wind&water investigations will comprise the complete IJWFS I-VI.

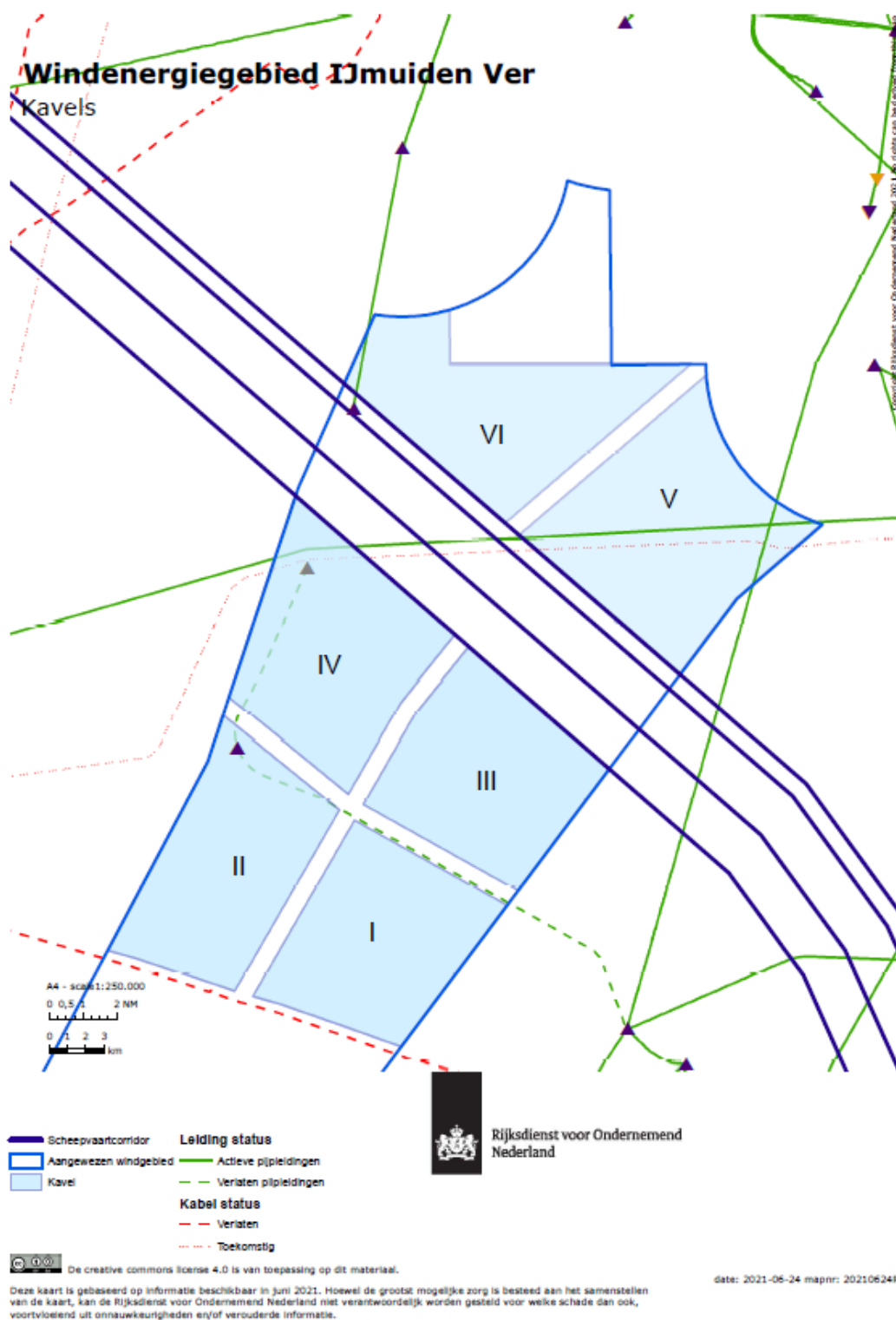


Figure 1: Wind Farm Sites within the IJmuiden Ver Wind Farm Zone

Scope of Work

The Contracting Authority intends to conclude the contract with one contractor, in order to manage the interfaces regarding the studies below adequately.

For expert support during the wind & water investigations for the IJWVFZ, the following expertise is requested for the following tasks:

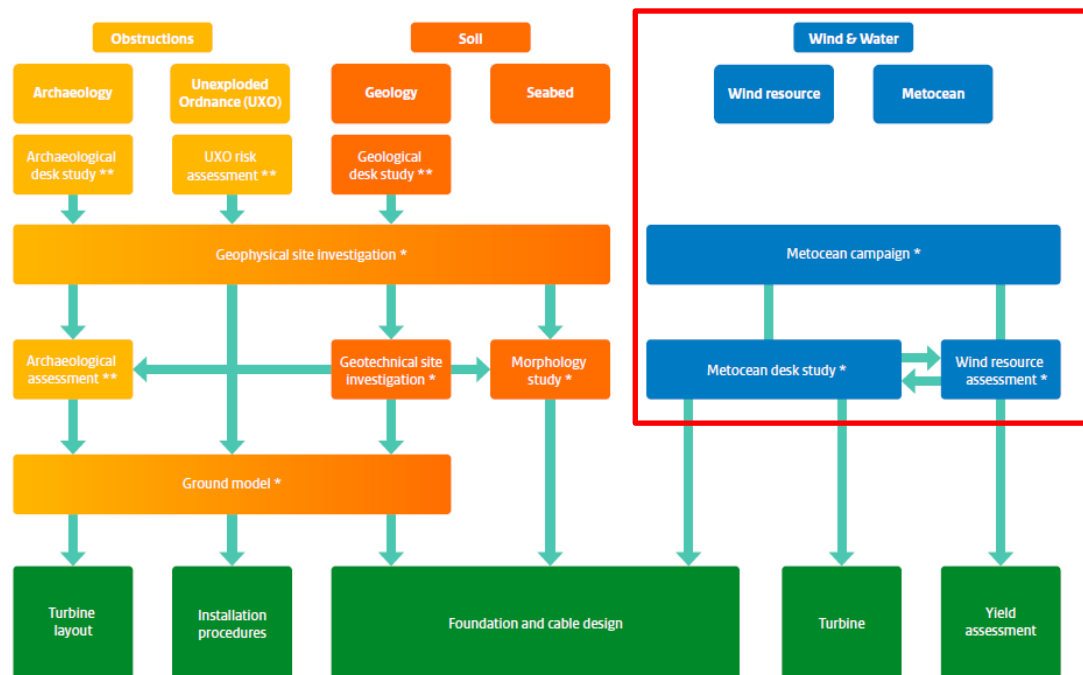
1. Metocean measuring campaign
2. Client representatives metocean campaign
3. Metocean desk study and database
4. Wind Resource Assessment (WRA)

This scope of work is divided in 3 sections;

1. Project set-up
2. Roles and responsibilities
3. Schedule and key dates

1. Project set-up

The IJmuiden Ver Wind and Water package for the IJV WFZ will contain the site characterisation studies as indicated in Figure 2.



* Certified, ** Quality approved

Figure 2: Wind and Water site characterization package

RVO will manage the wind and water site characterization for the IJV WFZ, hereafter called PROJECT. Expert support will be required to assist the RVO team with in-depth knowledge.

To visualize the PROJECT team set up an organization chart is presented in Figure 3.

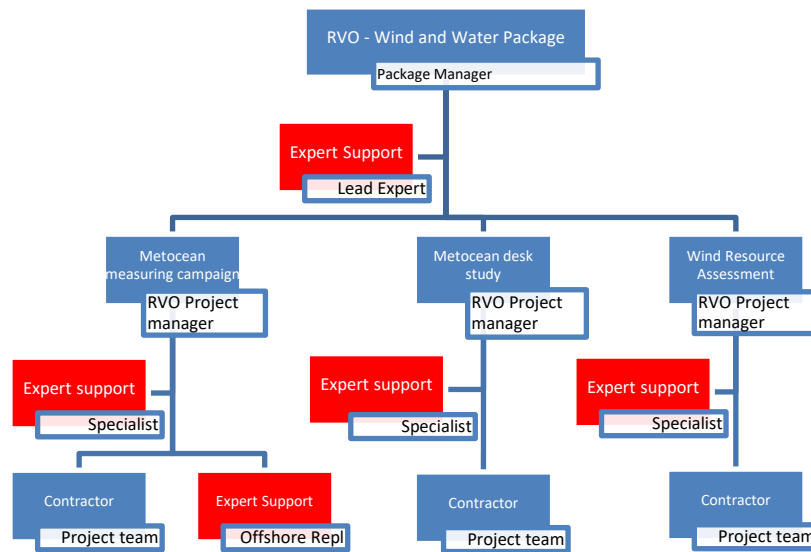


Figure 3: Organization chart IJmuiden Ver Wind and Water

Items marked in red are presenting the areas where in-depth knowledge support by external experts is requested by means of this SOW.

The PROJECT organization will be built under supervision of a package manager from RVO. The package manager will be responsible for interfaces between studies, overall planning and overall budget.

In addition to the package manager from RVO there will be multiple RVO project managers assigned to the PROJECT to manage the individual studies. A single RVO project manager can be assigned to multiple studies and can be adjusted during the PROJECT.

The expert support Contractor is expected to supply lead expert(s) and specialists in the sectors as presented in Figure 3. The lead expert will need overall knowledge to participate into the different studies and to advise the RVO package manager where necessary. The main task of the lead expert will consist of interfacing between the studies. For in-depth discussions, reviews and support through the PROJECT the lead expert (and the RVO project managers) can call in the specialist experts. For detailed roles and responsibilities of the requested expert support reference is made to section 2 of this SOW.

Aim of the project set up as described is to optimize the interfaces and optimize the use of the specialist knowledge.

During the execution of the PROJECT all the communication between the different parties as described above and site study Contractors will be managed by the RVO project manager. The communication lines are visualized in Figure 4.

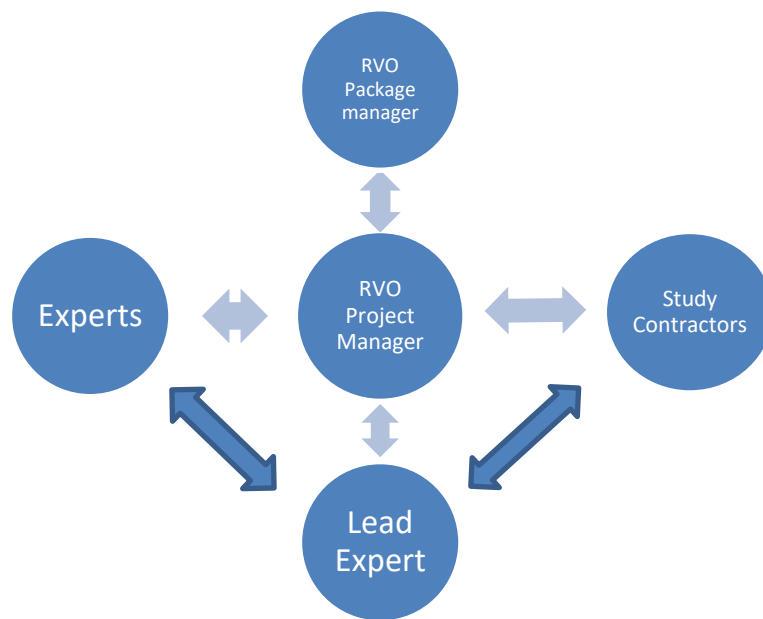


Figure 4: Communication lines

Note: If required during the PROJECT direct communication lines can be established between the Experts and site study Contractors upon discretion of the RVO project manager(s).

2. Roles and Responsibilities

This section describes the roles and responsibilities for the expert support during the PROJECT.

Lead expert (approximately 500 h)

This expert must have knowledge in Metocean desk studies, Metocean measuring campaigns and wind resource assessments. The lead expert will be the interface during progress meeting with RVO and the site study Contractors. The lead expert shall be capable to participate during the calls as representative of all specialist experts. The lead expert should be able to answer questions related to the studies or be able to capture the essence and transfer them to the experts to arrange follow up.

To improve interfaces and consistency it is important that a single lead expert will supervise and participate in all studies together with the RVO project managers.

If required a deputy (temporary) lead expert can be assigned to support the lead expert during absence or when workload requires.

Required know-how; the lead expert will need to have general knowledge regarding metocean campaigns and wind resource assessments within of the North Sea. For detailed in-depth knowledge the lead expert can consult the specialist experts in the team, but the lead expert will need the following required know-how;

- Project management and interface skills;
- The general meteorological and oceanographic conditions preferably in the North Sea;
- State of the art methods and equipment for metocean data acquisition by using LiDAR based measuring systems;
- Insight in the metocean data required for wind farm engineering design and planning of vessel operations;

- e. Assessing data of metocean measuring campaigns (meteorology, physics).

Activities and responsibilities (but not limited to)

- Participate in meetings related to Wind resource assessment, Metocean campaigns, Metocean desk study and offshore operations;
- During the meetings it is expected that the lead expert can represent the expert group and participate in discussions;
- Manage interfaces between studies, experts and RVO;
- The lead expert will have to share information between the teams so that all experts have all the required information. When questions arise the lead expert will arrange follow up with the correct party;
- Quality assurance and quality control;
- Participate in webinars;
- Drafting the scope of work for contractors to execute the studies;
- Assessing the contractor's bids.

Expert support contractors are requested to offer **one** senior expert for the lead expert position. Additional experts offered will be assessed as back-up experts.

Specialist Expert Metocean measuring campaign (approximately 1,500 h)

RVO is considering to contract a site study Contractor to execute a Metocean measuring campaign for IJVFZ with multiple floating LiDAR systems. The dataset will cover a 24-month period (**QX 2022-QX 2024**). Reports with the floating LiDAR data are delivered regularly and at the end of the reporting period. Support during tender process for the metocean campaign is included in this SOW.

The expert(s) must have experience in acquiring metocean data for offshore wind farms, preferably in the North Sea.

Required know-how:

- a. The meteorological and oceanographic conditions in the North Sea;
- b. State of the art methods and equipment for metocean data acquisition by using LiDAR based measuring systems;
- c. Insight in the metocean data required for wind farm engineering design and planning of vessel operations;
- d. Assessing and interpretation of data of metocean measuring campaigns (meteorology, physics).

Activities (but not limited to):

- Preparation of the procurement documents for Metocean campaign tender;
- Review and evaluate proposals of the metocean campaign tender;
- Support in managing the Metocean campaign: check the planning, assist in document control (including check on required actions from progress meetings);
- Review of data and (validation) reports (certification) of the deployed metocean systems;
- Quality assurance and quality control including providing a Statement of Compliance as a quality certificate that the metocean data is in conformance with industry standards and for purpose, after review of the data and data (validation) reports;
- Attend progress meetings with the Metocean campaign contractor;

- Disclosure of information to the market (publication at offshorewind.rvo.nl, contribution to the project and site description, market questions, webinars, etc.).

Expert contractors are requested to offer **two** available experts. One of them should be a senior expert and one should be a medior or junior expert. Additional experts offered will be assessed as back-up experts.

Client representatives (approximately 400 h)

The experts must have a training as Client REP, understanding of contract law, project documentation and HSE with a valid BOSIET and medical (or equal) as minimum.

Required know-how:

- a. Method Statements for deploying / recovering / lifting / towing buoys/platforms;
- b. State of the art methods and equipment for metocean data acquisition by using LiDAR based measuring systems.

Activities (but not limited to):

- Review of Method Statements, Operational reports and other documentation from the Metocean campaign Contractor;
- Attending kick-off meetings at locations before operations for deployment or recovery of buoys;
- Presence as Client Representative during offshore operations for maintenance, deployment, recovery or inspections or other of the metocean buoy(s);
- Reporting on the operations.

The offshore operations are usually planned at short notice and are single day work executed with small vessels. Expert contractors are requested to offer **three** available senior experts. Additional experts offered will be assessed as back-up experts .

Specialist Expert Metocean desk study and database (approximately 800 h)

The purpose of the metocean desk study (MDS) is to provide the meteorological and oceanographic (metocean) conditions to serve as input for the design, installation and maintenance of wind turbines, inter array cables, substations and their support structures at planned Wind Farm Zones.

The analysis is based on the best available data sources, to be carried out with state-of-the-art methods. The results (i.e. tables, graphs) will be made available through reports and a digital metocean database that will enable obtaining output at any requested (x, y) location within the site boundaries of IJmuiden Ver.

Required know-how:

- a. Assessing data of metocean measuring campaigns (meteorology, physics);
- b. Wave and current modelling and maximum wind and wave conditions and extreme value analysis;
- c. Insight in the metocean data required for wind farm engineering design;
- d. Preferably know how of (floating) LiDAR based measurements.

Activities (but not limited to):

- Drafting the procurement documents for the metocean desk study tender;
- Review and evaluate proposals of the metocean desk study tender;
- Technical support in the execution of the metocean desk study and database by the Contractor;
- Review of the (draft) reports of the metocean desk study;
- Disclosure of information to the market (publication at offshorewind.rvo.nl, contribution to the project and site description, market questions, webinars, etc.).

Expert contractors are requested to offer **two** available experts. One of them should be a senior expert and one should be a medior or junior expert. Additional experts offered will be assessed as back-up experts.

Specialist Expert Wind Resource Assessment (approximately 200 h)

A Wind Resource Assessment (WRA) will be based on LiDAR data, corrected to a long-term reference. This assessment will make use of existing data sets like the OWEZ and IJmuiden metmast data and the EMD-ConWx mesoscale model dataset as a long-term reference.

Required know-how:

- a. Assessing and interpreting wind resources for offshore wind energy purposes (meteorology, physics);
- b. Assessing the wind climate of the North Sea;
- c. Preferably with know-how of (floating) LiDAR based Wind Resource Assessments.

Activities:

- Drafting the procurement documents for the Wind Resource Assessment tender;
- Review and evaluate proposals of the Wind Resource Assessment tender;
- Technical support in the execution of the Wind Resource Assessment by the site study Contractor;
- Review of the Wind Resource Assessment deliverables;
- Disclosure of information to the market (publication at offshorewind.rvo.nl, contribution to the project and site description, market questions, webinars, etc.).

Expert contractors are requested to offer **two** available experts. One of them should be a senior expert and one should be a medior or junior expert. Additional experts offered will be assessed as back-up experts.

Role	Senior expert	Medior/junior expert
Lead expert	1	-
Metocean campaign	1	1
Client representatives	3	-
Metocean desk study	1	1
Wind resource assessment	1	1

It should be clear in the project plan who the above mentioned main experts per position are and which experts are offered as back-up per position.

3. Schedule of Key Dates

Planning metocean Campaign:

Select contractor for metocean campaign	Q1 2022
Start metocean campaign	Q2 2022
Reporting	Q2 2023 and Q2 2024

Planning Metocean desk study and database:

Select contractor for metocean report and database	Q1 2023
Start metocean report and database	Q2 2023
Reporting	Q1 2024

Planning Wind Resource Assessment:

Select contractor for wind resource assessment	Q1 2023
Start wind resource assessment	Q2 2023
Reporting	Q1 2024