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Site Studies – Various Sites

Expert support Wind & Water

Annex 5b

Scope of Work

Colophon

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Project manager
Contact

Annex(es)	
Author	M. Vrolijk, S. Wezenberg
Reviewed	Matte Brijder
Approved	XXX

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Introduction

Scope document

This document details the Scope of Work (SoW) to provide RVO with Wind & Water (W&W) expert support services for a number of sites.

Background

The Ministry of Economic Affairs and Climate Policy is responsible for the legislative framework for the development of offshore wind farms in the Netherlands. Within this framework (a) (concession) tender(s) 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 for potential future wind farm sites / zones, and who is able to support RVO with managing the interfaces between different site investigations.

RVO is specifically looking for expertise in the field of soil investigations (Lot 1) and wind & water investigations (Lot 2).

This SoW is in relation to Lot 2: providing expert support services for W&W investigations.

Site Description

There are multiple W&W site studies ongoing and a large number of studies, such as Metocean Campaign (MC) and Metocean Assessment (MA), will be initiated in the upcoming future. The order in which the different W&W studies will be initiated is still being discussed with The Ministry of Economic Affairs and Climate policy, although a general outline is anticipated.

As such, the potential sites, contractor(s) will provide expert support for are the following Various Sites (but not limited to):

- VS1;
- VS2
 - (potential shift possible from VS2 to another VS).
- VS5;
- VSDS

The expert services will not consider the full characterisation of all the listed areas but will contain a selection of works. This selection can be adjusted during the course of the execution of the WORK to the needs and priorities as set by the Contracting Authority.

In the section you will find some information about the four (4) sites.

Various site 1 (VS1)

VS1 is located in the west of the Dutch Shelf in the North Sea. A shipping corridor is planned to divide the wind farm zone in 2 areas. In total it is expected that this site can accommodate a maximum of 6 GW of offshore wind divided over multiple sites. Figure 1 below presents the location VS1.



Figure 1: Location VS1.

Various site 2 (VS2)

VS2 is located in the North-West of the Netherlands. The site is located north of the IJmuiden Ver Wind Farm Zone. In total it is expected that this site can accommodate a maximum of 4 GW of offshore wind divided over multiple sites. Figure 2 below presents the location VS2.



Figure 2: Location VS2.

Various Site 5 (VS5)

VS5 is located to the North-East border of the Dutch shelf of the North Sea. The site are located North-West of the Ten noorden van de Waddeneilanden Wind Farm Zone. In total it is expected that this site can accommodate a maximum of 6 GW of offshore wind divided over multiple sites. Figure 3 below presents the location VS5.



Figure 3: Location VS5

Various Site - Demonstration site (VS5)

As part of the Energy transition to renewable energy there is an intention to set-up a demonstration site (VS5) for the purpose of innovation and demonstration in offshore wind development. Expectations are that the VS5 will be suitable for a maximum of 500 MW of offshore wind. Site characterisation shall be performed to reduce the risks for developers participating in the tender. The tender details (planning) and location of the site are not yet defined. Site characterisation will be adjusted to suit the tender planning when this becomes available.

The Expert support WORKS can be conducted (but not limited) to the sites described above. The content of the WORKS and the required expertise is detailed in the Scope of Work section below.

Scope of Work

The Contracting Authority intends to conclude the contract with one contractor for Lot 2.

For the wind & water investigations of the future sites, the following expertise is requested from the expert support:

1. Expertise in Metocean measuring campaigns (MC).
2. Expertise performing duties as Offshore Client representatives during MCs.
3. Expertise in Metocean assessment (Metocean Assessment - MA is a combination of the Metocean desk study, database and Wind Resource Assessment - WRA).

The SoW is to provide RVO with 10.000 hours of expert support.

Main scope: 10.000 hours are specified for predetermined areas and investigations.

Optional scope: 1.000 hours of expert support. The 1.000-hour scope is non-specified for predetermined areas or - investigations. RVO would like to use the 1.000 hours of expert support for a wide array of investigations/enquiries, which have yet to be determined. During the contract RVO might need support with a new study or help with a new tender for a new selected (demonstration) site. As such, RVO wishes to reserve the right to use the optional hours with some degree of flexibility. Using them for sites and studies not listed/specified in this SoW though related to wind and water investigations. The optional scope might be used (in part) by RVO, but might also not be used. The use of the optional scope is to the discretion of RVO.

Various sites in SOW

In this document reference is made to Various sites (VS) for the Metocean campaign (MC) and the Metocean Assessment (MA). Site investigations and studies focus on the VS.

The various sites (VS) included into this SoW for W&W expert support are:

- VS1
- VS2 (Potential shift from VS2 to other VS);
- VS5;
- VSDS

The SoW has been subdivided into the following works:

1). Providing expert support for 4 MCs:

- VS1
- VS2 (potential shift from VS2 to other VS possible);
- VS5;
- VSDS.

Task of expert support for the Metocean campaign for VS1, VS2, VS5 en VSDS: review data (monthly review and yearly review) and review of project documentation for buoy deployment/recovery.

2). Providing offshore client representatives (OCR) during 4 MCs:

- VS1
- VS2
- VS5
- VSDS

Task of OCRS include (but are not limited to): buoy deployment, overseeing buoy modification (at location), buoy exchange and buoy recovery.

3). Providing expert support for 4 MAs:

- VS1
- VS2 (potential shift of VS2 to other VS).
- VS5
- VSDS.

*Task of expert support for the Metocean assessment of VS1, VS2, VS5 and VSDS:
Creating tender documents, assisting with the MoI, Evaluation of proposals, Examination
and verification contractor work.*

4). Optional scope:

- 1000 Hours that are reserved for support for new unforeseen developments, like helping with a tender or support for a wind and water study for a new wind farm

The schedules for the upcoming W&W studies are presented in Table 3, chapter 3.

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 W&W package in Lot 2 will contain the site characterisation studies as indicated by the red outline in Figure 4.

General expert support will consist of supporting RVO with selecting a contractors, assessing study/campaign plans and quality assurance in relation to reporting and provided deliverables (data/reports) for the separate parts of the W&W site studies.

Included in the Wind and Water studies are the MC and the MA. The latter being a combination of the Metocean desk study, the wind resource assessment and creation/verification of the metocean data-base.

The contractor providing expert support will also deliver a lead expert (see roles and responsibilities) managing the interfaces between the different studies and the different site study Contractors.

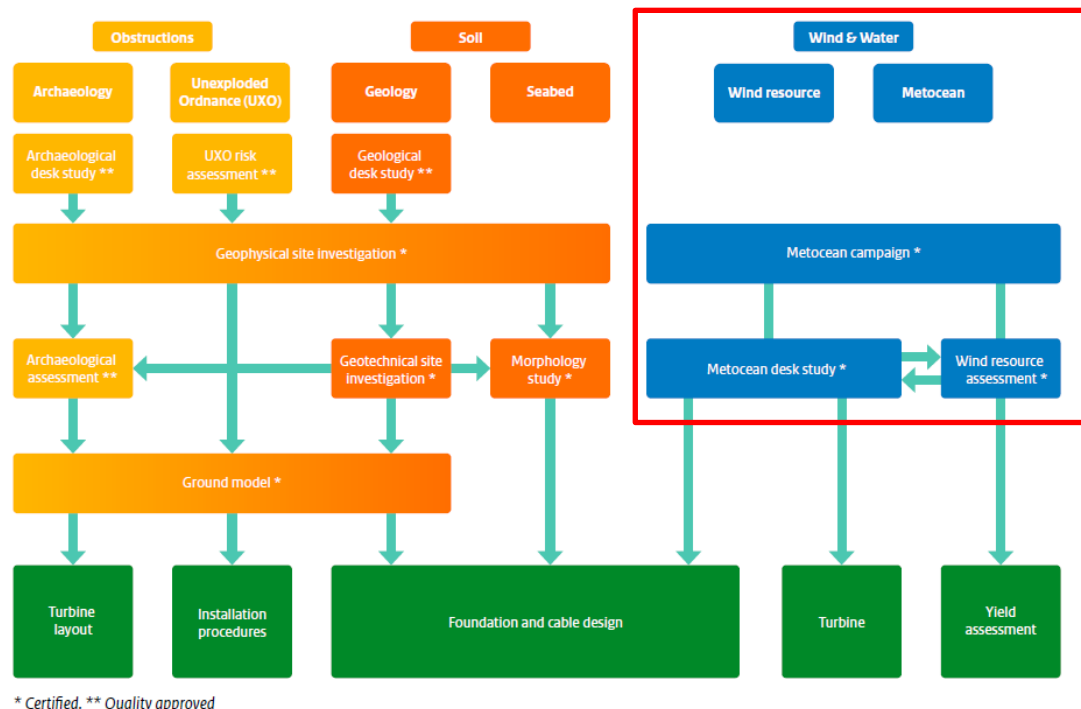


Figure 4 Wind and Water site characterisation package

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

To visualise the PROJECT team set up an organization chart is presented in Figure 5.

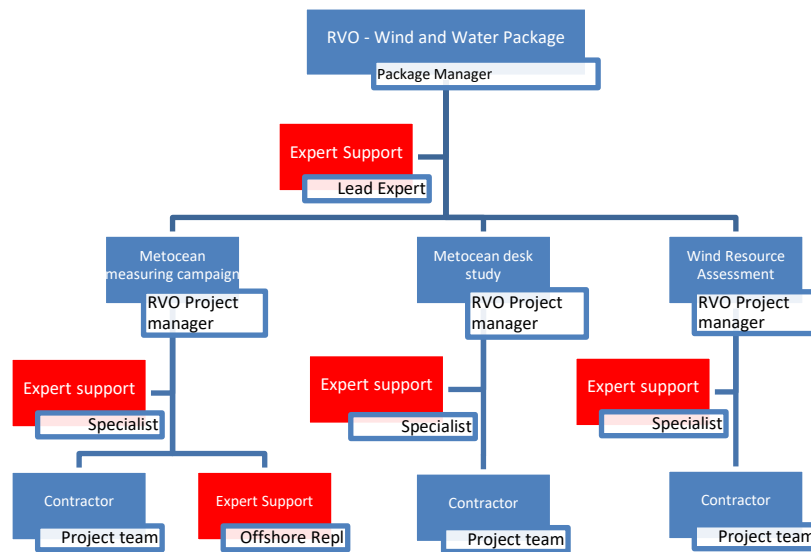


Figure 5: Organisation chart W&W studies

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 organisation 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 5. 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 optimise 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 visualised Figure 6.

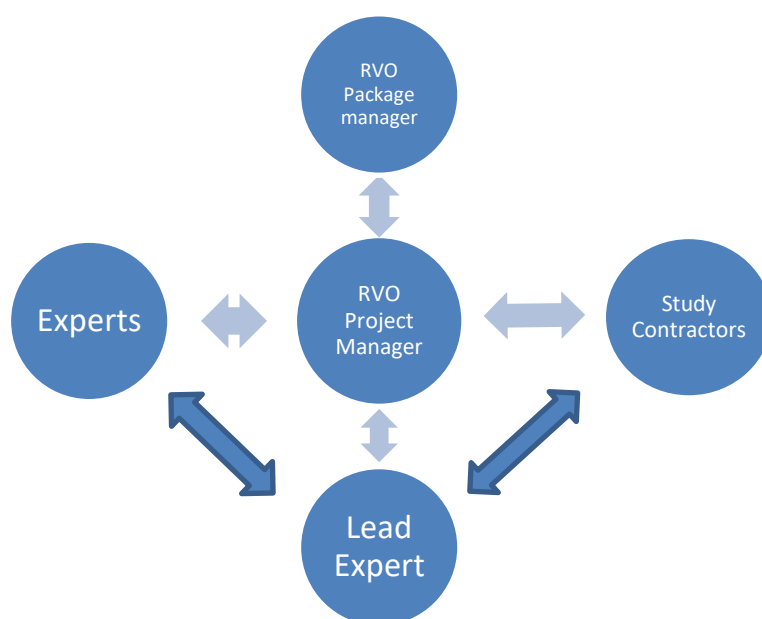


Figure 6: Communication lines

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.

Table 1: Hours for the main and optional Scope of Work, divided per required expertise..

Role	Hours main scope (10.000 hours)	Hours optional scope (1000 hours)
Lead expert	1500	1000
Specialist Expert Metocean measuring campaign	4500	
Client representatives	1000	
Specialist Expert Metocean desk study and database	3000	
Total amount	11.000	

Lead expert (1500 hours in main scope)

This expert must have knowledge in Metocean desk studies, MCs and WRAs. 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 MCs and WRAs 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;

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

Activities and responsibilities (but not limited to)

- Participate in meetings related to Wind resource assessment, MCs, Metocean desk study and offshore operations;
- Help define strategy for future MCs and MAs and preparation of associated procurement documents;
- 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 (4,500 hours in main scope)

RVO is considering to contract site study Contractor(s) to execute MCs for the VS with multiple floating LiDAR systems. The datasets will (generally) cover monthly periods and a 24-months period. Reports with the floating LiDAR data are delivered regularly (monthly) and at the end of the reporting period.

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):

- Help define strategy for future MCs and MAs and preparation of associated procurement documents;
- Support in managing the MC: 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 MC 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 **four** available experts. Three of them should be senior experts and one should be a mediator or junior expert. Additional experts offered will be assessed as back-up experts.

Offshore Client representatives (1000 hours in main scope)

The offshore 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 MC 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 assessment (3000 hours in main scope)

The purpose of the metocean assessment (MA) is to provide the meteorological and oceanographic (metocean) conditions for business case calculations and 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.

The Wind Resource Assessment component of the MA shall provide data that can be used as an input by potential wind farm developers for future wind farm modelling, energy yield assessments and business case calculations for the offshore wind farm to be developed.

Required know-how:

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

Activities (but not limited to):

- Updating and preparing the procurement documents for the metocean assessment tender;
- Help define strategy for future MCs and MAs and preparation of associated procurement documents;
- Review and evaluate proposals of the metocean assessment tender;
- Technical support in the execution of the metocean assessment and database by the Contractor;
- Review of the (draft) reports of the metocean assessment;
- 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 **four** available experts. Three of them should be a senior experts and one should be a medior or junior expert. Additional experts offered will be assessed as back-up experts.

Table 2: required experts for Scope of Work

Role	Senior expert	Medior/junior expert
Lead expert	1	-
MC expert	3	1
Offshore Client representatives	3	-
Metocean experts	3	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 Key Dates upcoming W&W studies

Table 3: Schedule and interfaces related to the delivery of the Metocean campaign, offshore client representatives and Metocean Assessments.

<i>Metocean Campaign (MC)/Metocean Assessment (MA)</i>	<i>Estimated Schedule for delivery (estimated)</i>	<i>Various Site</i>	<i>Task included in SoW</i>
Providing expert support for Metocean Campaign			
MC	June 2022	VS1	Review data (monthly review)
MC	Q3 2023	VS1	Review data (yearly review)
MC	Q3 2023	VS1	Review project documentation for buoy deployment/recovery
MC	Q1 2023	VS2	Review data (monthly review)
MC	Q1 2024	VS2	Review data (yearly review)
MC	Q3 2022	VS5	Review project documentation for buoy deployment/recovery
MC	Q1 2023	VS5	Review data (monthly review)
MC	Q1 2024	VS5	Review data (yearly review)
MC	Q1 2024	VS5	Review project documentation for buoy deployment/recovery
MC	Q4 2022	VSDS	Review data (monthly review)
MC	Q4 2023	VSDS	Review data (yearly review)
MC	Q4 2023	VSDS	Review project documentation for buoy deployment/recovery
Providing Client Representatives			
MC	Q2-Q3 2022	VS1	Buoy deployment, modification, exchange and recovery
MC	Q1 2023	VS2	Buoy deployment, modification, exchange and recovery
MC	Q1 2023	VS5	Buoy deployment, modification, exchange and recovery
MC	Q4 2022	VSDS	Buoy deployment, modification, exchange and recovery
Providing expert support for Metocean Assessment			
MA	Q2 2022	VS1	Creating tender documents
MA	Q3 2022	VS1	Assisting with Mol
MA	Q3 2022	VS1	Evaluation of proposals
MA	Q1 2023 – Q1 2025	VS1	Examination and verification contractor work

MA	Q2 2022	VS2	Creating tender documents
MA	Q3 2022	VS2	Assisting with MoI
MA	Q3 2022	VS2	Evaluation of proposals
MA	Q1 2023 – Q1 2025	VS2	Examination and verification contractor work
MA	Q2 2022	VS5	Creating tender documents
MA	Q3 2022	VS5	Assisting with MoI
MA	Q3 2022	VS5	Evaluation of proposals
MA	Q1 2023-Q12025	VS5	Examination and verification contractor work
MA	Q2 2022	VSDS	Creating tender documents
MA	Q3 2022	VSDS	Assisting with MoI
MA	Q3 2022	VSDS	Evaluation of proposals
MA	Q4 2022 – Q4 2024	VSDS	Examination and verification contractor work

This table provides an estimation of the dates. Tenders cannot derive any rights from the provided information.

