



Date 16 February, 2022
Status Final

Metocean Assessment

Annex 6 – Section VII

Starting Point and Assumptions

Dutch Wind Farm Zones

Colophon

Project name	Metocean Assessment
Project number	
Version	16 February, 2022
File name	Annex 6 Section VII Starting Points and Assumptions
Annex(es)	1
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1 Introduction

This document provides the starting points and assumptions for the site characterisation of the Dutch Offshore Wind Farm Zones (WFZs). The starting points and assumptions are to be used by contractors when executing investigations, studies or likewise, for the development of the WFZs and commissioned by one of the following organisations:

- The Ministry of Economic Affairs and Climate Policy
- The Ministry of Infrastructure and Water Management
- Netherlands Enterprise Agency (RVO)
- Rijkswaterstaat
- Tennet TSO B.V.

This document is part of the QA/QC process for these studies.

Please note:

- This is a living document; before use check the revision history for the latest updates (to be confirmed by your client)

If you have any queries please contact your client.

2 General introduction to the offshore wind energy in the Netherlands

2.1 Existing offshore wind farms

The Netherlands' existing offshore wind farms have a combined capacity of approximately 3,000 MW, of which 2,000 MW is fully operational

Windfarm	Sites	Distance of the coast	Year of commissioning	Turbines	Owner
Offshore Wind Farm Egmond aan Zee (OWEZ)		10-18 km	2008	36 Vestas 3 MW	Noordzeewind (joint venture NUON and Shell)
Prinses Amalia Wind Farm		23 km (12 NM)	2009	60 Vestas 2 MW	Eneco
Luchterduinen		23 km (12 NM)	2015	43 Vestas 3 MW	joint venture Eneco and Mitsubishi Corporation
Gemini		85 km	2017	150 Siemens 4 MW	Northland Power, Siemens, Van Oord and HVC
Borssele	I – II	22 km	2020	94 Siemens 8 MW	Ørsted
	III - IV		2020	77 Vestas 9,5 MW	Blauwwind
	V		2021	2 Vestas 9,5 MW	Two Towers
Hollandse Kust Zuid	I – IV	18 km	Under Construction	140 Siemens 11 MW	Vattenfall

Table 1 Wind Farms in the Dutch North Sea

2.2 The roadmap 2030 towards 49 TWh/a offshore wind power

In September 2014, the Government published its first roadmap towards 4,5 GW offshore wind in the Netherlands. This set out a schedule of tenders in designated Wind Farm Zones, offering 700 MW of development each year in the period 2015 – 2019, with all wind farms to be fully operational by 2023.

Borssele and Hollandse Kust (zuid) Wind Farm Zones were allocated 1.500 MW each, with 700 MW allocated for Hollandse Kust (noord). The Borssele wind farms have been developed and deliver electricity to the onshore grid. Commissioning of the Hollandse Kust (zuid) Wind Farm Sites (I- IV) is scheduled to start in the first half of 2022.

In light of the success of the initial roadmap, the Dutch Ministry of Economic Affairs and Climate Policy called for the deployment of an additional 7 GW of offshore wind capacity by 2030. This will bring the Netherlands' total offshore wind capacity to 11,5 GW. RVO and transmission system operator (TSO) TenneT are conducting the necessary preparations for the Wind Farm Zones to be developed until 2030.

For offshore wind developments in the period after 2030, the Government and stakeholders are making preparations to designate new areas within the 'Programma Noordzee 2022 – 2027' (North Sea Programme 2022 – 2027).

The 'Ontwerp Programma Noordzee 2022 – 2027' (North Sea Programme Design 2022 – 2027) identifies eight new search areas, with an option for an additional 27 GW offshore wind after 2030. However, it is possible the Government will decide to accelerate the roll-out to meet the increased European CO₂ reduction target for 2030. This would require an amendment to the 2030 roadmap, which the cabinet will decide upon. This will probably add some of these search areas to the 2030 roadmap.

The Wind Farm Sites are allocated by means of a competitive tender, organised by RVO and the Ministry of Economic Affairs and Climate Policy. A schedule for upcoming construction of Hollandse Kust (Noord) and upcoming tenders is provided in Table 2.

Wind Farm Zones in the Dutch North Sea				
Wind Farm Zone	Wind Farm Site	Tender	Capacity	Owner
Hollandse Kust (noord)	V	Q4 2019	≥700 MW	Crosswind
Hollandse Kust (west)	VI and VII	Q1 2022	2 x ≥700 MW	t.b.d.
Ten noorden van de Waddeneilanden	I	t.b.d.	≥700 MW	t.b.d.
IJmuiden Ver	I and II	Q4 2023	≥ 2 x 1,000 MW	t.b.d.
	III and IV	Q4 2025	≥ 2 x 1,000 MW	t.b.d.
	V and VI	2026	≥ 2 x 1,000 MW	t.b.d.

Table 2 Wind Farm Zones in the Dutch North Sea

A tender to develop the IJmuiden Ver Wind Farm Zone is scheduled to open in three stages. Wind farm site I and II will open in 2023. Wind farm site III and IV will open in 2025 and Wind farm sites V and VI will open around 2026. An overview for the roadmap 2030 is provided in Figure 1*.

*Figure 1 does not show IJmuiden Ver sites V and VI as they are not part of the first roadmap 2030. More information can be found on: <https://windopzee.nl/onderwerpen/wind-zee/wanneer-hoeveel/wind-zee-2030-0/>

Dutch Offshore Wind Farm Zones

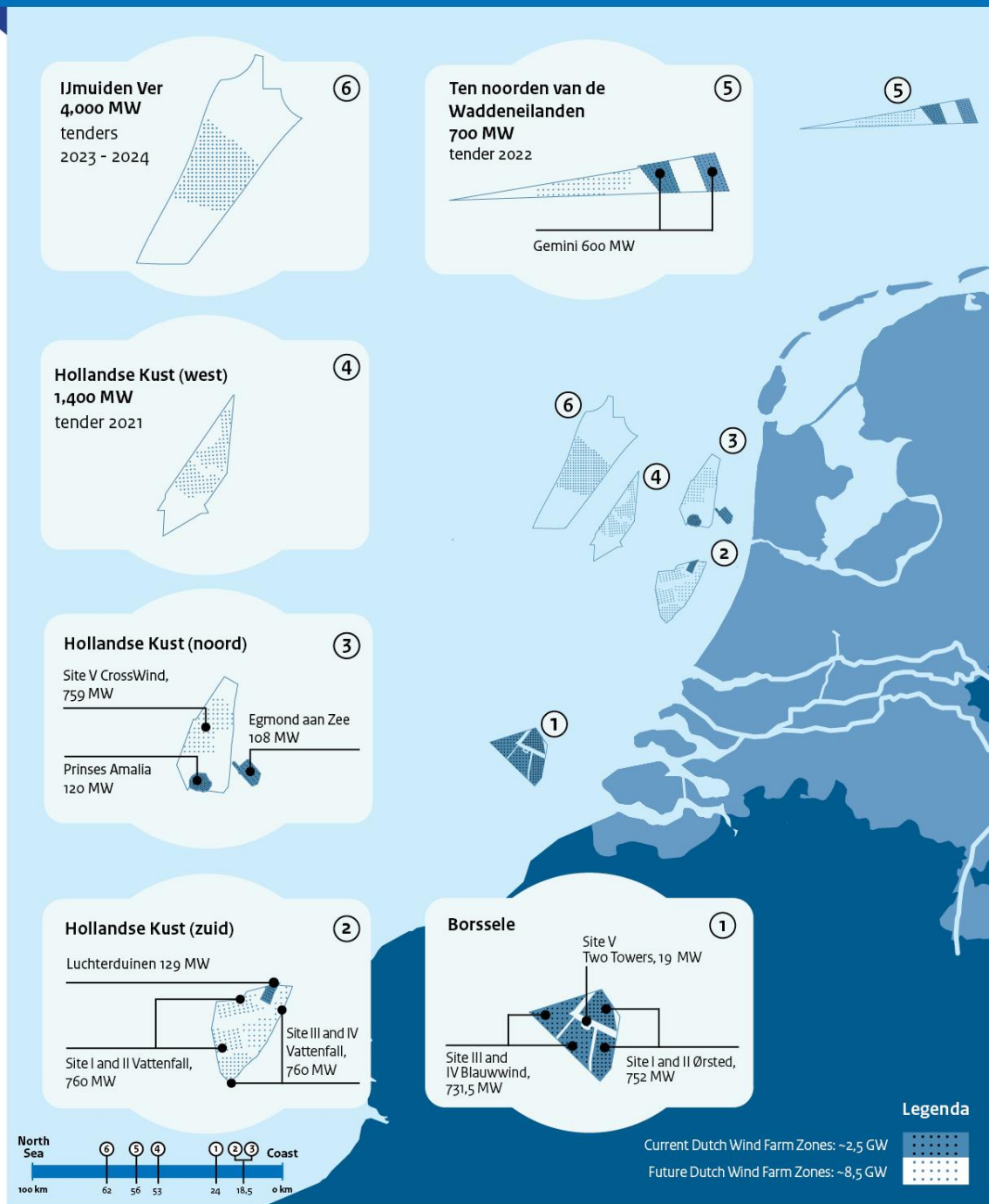


Figure 1: Dutch Offshore Wind Farm Zones overview for road map 2030

3 Units of measurement and vertical and horizontal datum

3.1 Units

SI units (ISO/IEC 8000) are applicable for any activities carried out at the Wind Farm Zone.

3.2 Vertical and horizontal datum

The chart datum is Lowest Astronomical Tide (LAT).

All positioning data shall be collected in the European Terrestrial Reference System 1989 (ETRS89) and projected using ETRS89 Transverse Mercator Coordinate Reference System (UTM Zone 31N). The reference for this system is EPSG Projection code 25831 - ETRS89 / UTM zone 31N.

4 Quality requirements

This chapter describes quality requirements including data model and GIS data deliveries. During the process and delivery of the data further information or explanations can be requested at RVO.

As RVO will make this data publicly available, the metadata needs to be in line with the GDPR (AVG) requirements.

4.1 Spatial data

All created data in the study will be delivered by the supplier in GIS format. The supplier will need to comply with the data requirements set out by RVO and provide an inventory list of the deliverables supplied. The inventory should include project name, name of contractor and responsible person, survey date, product medium (i.e. hard drive, web service, etc.), folder structure and description of data contents.

- The data should be delivered in one of the following formats: ESRI File Geodatabase, TIFF or ESRI Shapefile (.shp). Should another format be used, this can only be delivered after consulting with RVO.
- Both raw data and processed data along with any relevant GIS workspaces (MXDs) are required and should also include the associated reports and charts.
- Data preferably in a data model format like the *SeaBed Survey Data Model* (<http://www.iogp.org/bookstore/product/guidelines-for-the-use-of-the-seabed-survey-data-model/>)
- Data described in the IHO S44 standards should be delivered according to that standard: https://www.iho.int/iho_pubs/standard/S-44_5E.pdf
- The geodetic system used for horizontal projections is European Terrestrial Reference System 1989 (ETRS89). EPSG code: 25831 <http://www.epsg-registry.org/>. If another CRS is used the transformation parameters to ETRS89 needs to be included.
- All GIS data shall be provided with Metadata describing specific details and origin regarding the spatial data. The requirements regarding the metadata are included in Annex A.

4.2 Taxonomy

All contractors must use the taxonomy as presented in the taxonomy list, which is available online at https://offshorewind.rvo.nl/file/view/55039930/Taxonomy+List+Offshore+Wind+Energy+-+Dutch_English

4.3 GIS Metadata requirements

The requirements for GIS metadata which all Contractors shall comply with is shown in Annex A of this document.

4.4 Mandatory data delivery BRO

RVO as a government agency is obligated by law to provide subsurface data to the central 'subsurface register' in the Netherlands. Therefore, below the mandatory delivery to the "Basisregistratie Ondergrond (BRO)" is provided below.

The contractor shall carry out its work in compliance with the obligations resulting from the Law "Basisregistratie Ondergrond (BRO)", including the implementation on behalf of RVO of the user duty, the delivery and the duty of investigation related to the delivery of data to databases in the BRO-Law ('LV BRO'). The contractor shall use and consult the LV BRO on presence of relevant data before the start of the project. If the contractor has reasonable doubt about the accuracy of data in the LV

BRO, the contractor should notify LV BRO following the applicable procedure, in accordance to article 30 of the Act on behalf of the client.

If the contractor generates subsurface data, these should comply with the requirements and the format of the LV BRO. The contractor has obtained background information within 20 working days of the date of acquisition to the Source holder Portal BRO.

The contractor has to supply the relevant the subsurface data, complying with the metadata data requirements in the annex "Fill instruction format LV BRO" available on the website <https://www.basisregistratieondergrond.nl/>.

Please note that for the Metocean Assessment no delivery to BRO is required.

5.5 Document control requirements

The naming of the documents shall be standardized in order to facilitate the document control during the whole project. The following naming code is required for all documents produced within the project:

IJV_Date_Organization_Name document_Author_Version_Status

- IJV: IJmuiden Ver
- Date: yyymmdd, e.g. 20210101
- Organization: Name of the organization e.g.
 - "RVO" for all internal and general documents produced by the Netherlands Enterprise Agency (RVO)
 - Consultant or Contractor name (shortened)
- Name document: Make sure the name clearly explains the content, include here the original name if from external party
- Author: Abbreviation of the author if an internal document. Author shall be removed for final documents
- Version: Revision number or date, respectively V01 till V0x_D or 20200101_F
- Status: (D) for draft documents, F for signed and approved documents

5.6 Standards, formats, templates

All reports will be written in English and include both an English and Dutch management summary.

Contractors provide for each completed study a publishable summary for the Project and Site description. Maximum 1 A4.

All reports must use the terminology as specified in Annex A of the Starting points and assumptions. For your convenience this dictionary is also available as XLSX file.

Reports and deliverables will be delivered by contractors in pdf and original, regular, formats (docx; xlsx; ppt; etc).

Final reports will have a cover according to the corporate identity of the Netherlands Enterprise Agency, with the following text:

- Front:
Offshore wind energy Netherlands
Site data IJmuiden Ver Wind Farm Zone
Name document

- Back:
A colophon with the following content:

The creative commons license 4.0 apply to this material. (including a Creative Commons logo

and hyperlink to the relevant Creative Commons website page:
<https://creativecommons.org/licenses/by/4.0/>)

- The (investigation) (report) was carried out by <<name contractor>>, commissioned by RVO, an agency of the Ministry of Economic Affairs and Climate Policy. Whilst a great deal of care has been taken in compiling the contents of this document and the mentioned investigations, Netherlands Enterprise Agency (RVO) cannot be held liable for any damages resulting from any inaccuracies and/or outdated information.

- Contact
Netherlands Enterprise Agency (RVO)
Croeselaan 15 | 3521 BJ | Utrecht | The Netherlands
P.O. box 8242 | 3503 RE | Utrecht | The Netherlands
www.rvo.nl/ <http://english.rvo.nl>

- Netherlands Enterprise Agency (RVO) | Date of publication

5.8 Other data

In the case of collected data: primary data must be delivered in regular formats.

5.9 Deliverables (results / maps)

All maps (in GIS and PDF) will not show the investigation areas nor the specific Wind Farm Sites. The maps will only show the outer boundary of the Wind Farm Zone boundary of the IJmuiden Ver Wind Farm Zone.

5.10 Storage of data (electronic / hardcopy)

The Netherlands Enterprise Agency will store all reports and other relevant documents for at least five years both electronically and hardcopy.

5 Communication

5.1 Confidentiality

All information provided to contractors/suppliers by the Ministry of Economic Affairs and Climate Policy and/or the Netherlands Enterprise Agency and/or the Ministry of Infrastructure and Water Management and/or Rijkswaterstaat and/or TenneT must be regarded confidential.

All deliverables produced by contractors/suppliers remain confidential until a deliverable has been made public by the Ministry of Economic Affairs and Climate Policy and/or the Netherlands Enterprise Agency and/or the Ministry of Infrastructure and Water Management and/or Rijkswaterstaat and/or TenneT.

5.2 Accessibility public information

- Site investigations: offshorewind.rvo.nl
- SDE: <http://english.rvo.nl/subsidies-programmes/stimulation-sustainable-energy-production-sde>
- Wind farm Site Decisions and EIA: <https://www.rvo.nl/subsidies-regelingen/bureau-energieprojecten/lopende-projecten>

5.3 Authorities

Wind Farm Site Decision ('Kavelbesluit'):

Ministry of Economic Affairs and Climate Policy
Camiel van der Hout
E c.j.r.vanderhout@minezk.nl
T +31 (0)6-11 02 81 31

Rijkswaterstaat
Raoul Syrier
E raoul.syrier@rws.nl
T +31 (0)6 11072554

Site data:

Netherlands Enterprise Agency
Matté Brijder
E matte.brijder@rvo.nl
T + 31 (0)6 27878952

Grid connection ('Transmissiesysteem op zee'):

TenneT TSO BV
Johan Dekkers
E johan.dekkers@tennet.eu
T +31 (0)6 29360328

5.4 Media

All media contacts will be coordinated by the Ministry of Economic Affairs and Climate Policy. If a supplier is approached by press representatives than he/she should refer to the spokesman of the Ministry only.

Ministry of Economic Affairs and Climate Policy

Caspar Itz
c.itz@minez.nl
+ 31 610551061

6.5 Email

All emails related to the site investigations must be send in CC to the project mailbox: IJV@rvo.nl

The subject of an email related to Ijmuiden Ver needs to start with the date and the abbreviation of Ijmuiden Ver so IJV. Then also it needs to be followed by an abbreviation of the type of site survey. E.g. : 20210806 IJV MA for the Metocean Assessment for IJMuiden Ver Investigation Area

6.6 Emergency Response

In case of an emergency suppliers are obliged to inform the Netherlands Enterprise Agency immediately.

Annex A. GIS Metadata requirements

Goal of metadata requirements is to make sure the future users of this data can use this data in the appropriate way and find out what the constraints of the usage of the data is from the metadata.

Format

All data collected, either in the field or in a desktop study, by third parties must be provided with metadata. Data is preferably collected in an ArcGIS file geodatabase (version 10.6 or lower). In this case, metadata is stored within the data in the database. In case of a shapefile, GML or GRID metadata must be provided in pure XML-format as separate files.

Metadata must be compliant with the Dutch standard for metadata ISO 19115 version 2.0.0¹ (or any version available at the time of creating the data), in addition the column names of all data records. More information on the standard can be found here:

<https://www.geonovum.nl/geo-standaarden/metadata/nederlands-metadataprofiel-op-iso-19115-geografie>

To validate your metadata a validator is available from the website of Geonovum:

<http://www.geonovum.nl/validator-nederlands-metadataprofiel-op-iso-19115>

Manufacture options

Creating metadata should preferably be done when the data is acquired or created and checked and finalised before delivering the data.

Preferred option:

Organisations that use Esri software can use the GeoSticker application to create and edit metadata:

<http://www.esri.nl/geosticker>.

Other options:

The Metadatamaker offered by the RWS can also be used to make the metadata and can be found at <http://rws.metainfomaker.nl/>

The Nationaal Georegister (NGR) allows meta data to be made, to do this a guest account is required. This can be requested by mailing to EZ geodatabeheer (geodatabeheer.GISCC@rvo.nl)

Other options are possible as long as the data will be validated by the metadata validator for ISO 19115 version 2.0.0 (or newer version available at the time of creating the data) at the website of Geonovum

Metadata elements with explanation:

Identification

1. File title:

No abbreviations, complete title of the dataset covering the content of the dataset.

2. Status:

According a standard list:

completed; historicalArchive; obsolete; onGoing; planned; required; underDevelopment.

3. Source data date:

- a. creation YYYY-MM-DD
- b. publication YYYY-MM-DD (date of approval by RVO)
- c. revision YYYY-MM-DD

4. abstract:

¹ There is one major difference between the Dutch metadata standard ISO 19115 version 2.0.0 and the RVO metadata requirements: the description of the content of the dataset. A description of all attributes, including - if applicable - all possible values and its measurement is mandatory and not optional.

Short description of the content of the dataset.

5. Subject / topics:

Define the key topic(s) of the dataset

6. Keywords:

Keywords describing the dataset, e.g.

- Wind Farm Site
- Wind Farm Zone ... (Borssele or Hollandse Kust)
- ...
- ...

7. Revision frequency:

N/A

8. Next revision date:

N/A

9. Purpose of production:

Concise description of the original aim of the dataset

10. Denominator :

Scale on which the dataset can be used.

11. useLimitation :

Applications for which the data set is not to be used. I.e. Not to be used for navigation. Not to be used on a scale larger than 1:50.000

12. accessConstraints:

None, data will be published in the public domain

13. useConstraints:

The creative commons license 4.0 apply to this material. See hyperlink

<https://creativecommons.org/licenses/by/4.0/>

This investigation was carried out by ..., commissioned by RVO, an agency of the Ministry of Economic Affairs and Climate Policy. Whilst a great deal of care has been taken in compiling the contents of this investigation, RVO cannot be held liable for any damages resulting from any inaccuracies and/or outdated information.

14. otherConstraints :

Other restriction(s) if any.

15. Description complementary document or website:

On the RVO website general information about offshore wind energy can be found as well as links to more detailed information regarding the information of the investigation where this deliverable resulted from.

Quality

16. General origin:

General description of when, how and where the data was created / collected.

17. Accuracy:

Describe accuracy of the dataset.

18. Completeness:

Is the dataset complete? If not, a description of the incompleteness is necessary.

19. Processing of data (if applicable):

If data is processed, description of each step is required i.e. transformation or generalisation

20. Source datasets (if applicable):

Description of used source datasets (if any).

Coverage

21. Geographical coverage:

Geographical coverage of the file e.g. The Netherlands, North Sea.

22. Validity period:

Define start and end date of validity of the dataset.

Content

23. Attribute information:

Description of all attributes, including - if applicable - all possible values and its measurement.

General

24. Contact information:

As this information will be made publicly available personal information should be avoided and generic contact details should be provided. If personal email addresses are provided that person should have given consent to use their e-mail address.

Contact information of client and/or creator and/or point of contact. At least one contact is mandatory. Name organisation, role organisation (owner, processor, point of contact, administrator, provider, creator), and an generic email address of contact department

If website is available, name of contact and role of contact

Do to the GDPR it is no longer desirable to have personal information in the data, it is preferred to have a general email instead of a personal one and a function title instead of a person's name.

Client:

Business Name: ...

Contact Person: ...

Address: ...

Telephone: ...

Email

Creator:

Business Name: ...

Contact Person: ...

Address: ...

Telephone: ...

Email: ...