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Doordewind Wind Farm Zone

Annex 9-II Starting Points and Assumptions

Colophon

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1 Introduction

This document provides the starting points and assumptions for the Doordewind Wind Farm Zone.

The starting points and assumptions are to be used by contractors when executing investigations, studies or likewise, for the development of the Doordewind Wind Farm Zone 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 if you have the latest version available (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 4,700 MW, of which at least 2,400 MW is fully operational, and another 2,300 MW will be operational at the end of 2023 (see Table 1).

Table 1 Wind Farms in the Dutch North Sea (operational or under construction)

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
Hollandse Kust (noord)	V	18,5 km	Under construction	69 11 MW	Crosswind
Hollandse Kust (west)	VI	53 km	In preparation		Ecowende
	VII		In preparation		Oranje Wind Power II

2.2 The roadmap 2030+ towards 21 GW offshore wind power

The Dutch government has created the offshore wind roadmaps 2030+ to set out a schedule of tenders for wind farm permits (see Figure 1 and Table 2). In the beginning of 2022 the Dutch Government announced three new Wind Farm Zones called Lageland, Nederwiek (Nederwiek zuid site I and Nederwiek noord sites II and III) and Doordewind. The development of the southern part (HKWWFS VIII) of the Hollandse Kust (west) Wind Farm Zone and the IJmuiden Ver Wind Farm Site Gamma in the IJmuiden Ver Wind Farm Zone were also confirmed. The total capacity of offshore wind energy will then be 21 GW and around 90 TWh of power production. This equals around 75% of the current Dutch electricity consumption.

The wind farms will be built in designated Wind Farm Zones. Wind farms outside these Wind Farm Zones are prohibited. Within the designated Wind Farm Zones, the government defines the specific

sites where wind farms can be constructed using a so-called Wind Farm Site Decision ('Kavelbesluit'). This Wind Farm Site Decision contains all conditions for building and operating a wind farm on that specific site.

Developers can apply in tenders for the permits to build and operate a wind farm according to a Wind Farm Site Decision. Winners of these permit tenders will be granted a permit and a grid connection to the mainland.

The Dutch Government provides comprehensive site data and Dutch transmission system operator TenneT is responsible for grid connection. RVO is responsible for the site characterisation data, which can be used for the preparation of bids for these tenders.

Table 2 Wind Farm Zones in the Dutch North Sea

Wind Farm Zones in the Dutch North Sea				
Wind Farm Zone	Wind Farm Site	Tender	Capacity	Owner
Borssele	I and II	2015	752 MW	Ørsted Borssele 1 B.V.
	III and IV	2016	731 MW	Blauwwind II C.V. (Shell, Van Oord, Eneco, Diamond Generating Europe)
	V	2016	19 MW	Two Towers
Hollandse Kust (zuid)	I and II	2017	740 MW	Chinook (Vattenfall)
	III and IV	2018	760 MW	Vattenfall
Hollandse Kust (noord)	V	2019	759 MW	Crosswind
Hollandse Kust (west)	VI	2022	≥700 MW	Ecowende
	VII	2022	≥700 MW	Oranje Wind Power II
IJmuiden Ver	Alpha	Q1 2024	≥2 GW	t.b.d.
	Beta	Q1 2024	≥2 GW	t.b.d.
	Gamma	Q2 2025	≥2 GW	t.b.d.
Nederwiek	I	Q2 2025	≥2 GW	t.b.d.
	II	2026	≥2 GW	t.b.d.
	III	2026	≥2 GW	t.b.d.
Hollandse Kust (west)	VIII	2026/2027	≥700 MW	t.b.d.
Ten noorden van de Waddeneilanden	I	2026/2027	≥700 MW	t.b.d.
Doordewind	I	2027	≥2 GW	t.b.d.
	II	2027	≥2 GW	t.b.d.

An overview for the Roadmap 2030+ is provided in Figure 1.

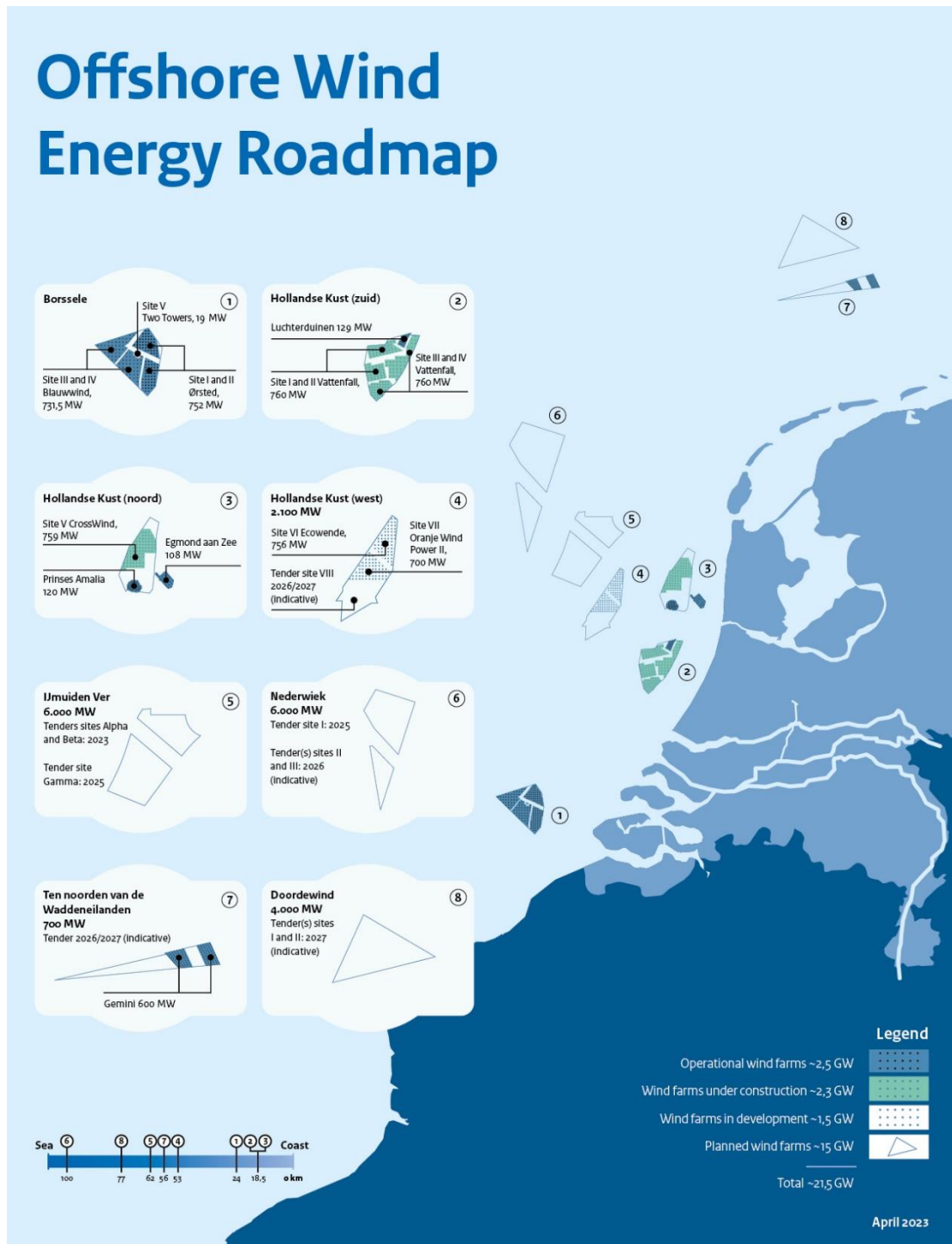


Figure 1 Dutch Offshore Wind Farm Zones overview for road map 2030+

3 General introduction Doordewind WFZ

3.1 Layout & coordinates

The Doordewind Wind Farm Zone (DDW WFZ) is located approximately 77 kilometres north off the Dutch Wadden Isles. General characteristics of the DDW WFZ are shown in Table 3. **Fout!** **Verwijzingsbron niet gevonden.** shows the coordinates of the Doordewind Wind Farm Zone.

The DDW WFZ is planned to contain a total capacity of 4 GW divided over 2 sites of 2 GW each. The wind farm permit tender is scheduled in 2027.

Table 3 Characteristics of the Doordewind Wind Farm Zone

Characteristics	
Water depth	Approximately -35.4m – 43.6m LAT
Distance from shore	Approximately 77 km
Total Wind Farm Zone area	Approximately 580 km ²

Table 4 Coordinates of the Doordewind Wind Farm Zone

Doordewind Wind Farm Zone coordinates		
Point No.	Easting	Northing
DDW_WFZ_01	655159	6036270
DDW_WFZ_02	663962	6030204
DDW_WFZ_03	648113	6006322
DDW_WFZ_04	651378	6006915
DDW_WFZ_05	688081	6013583
DDW_WFZ_06	692054	6010845
DDW_WFZ_07	649883	6002686
Coordinate system: ETRS_1989_UTM_Zone_31N		
WKID: 25831 Authority: EPSG		

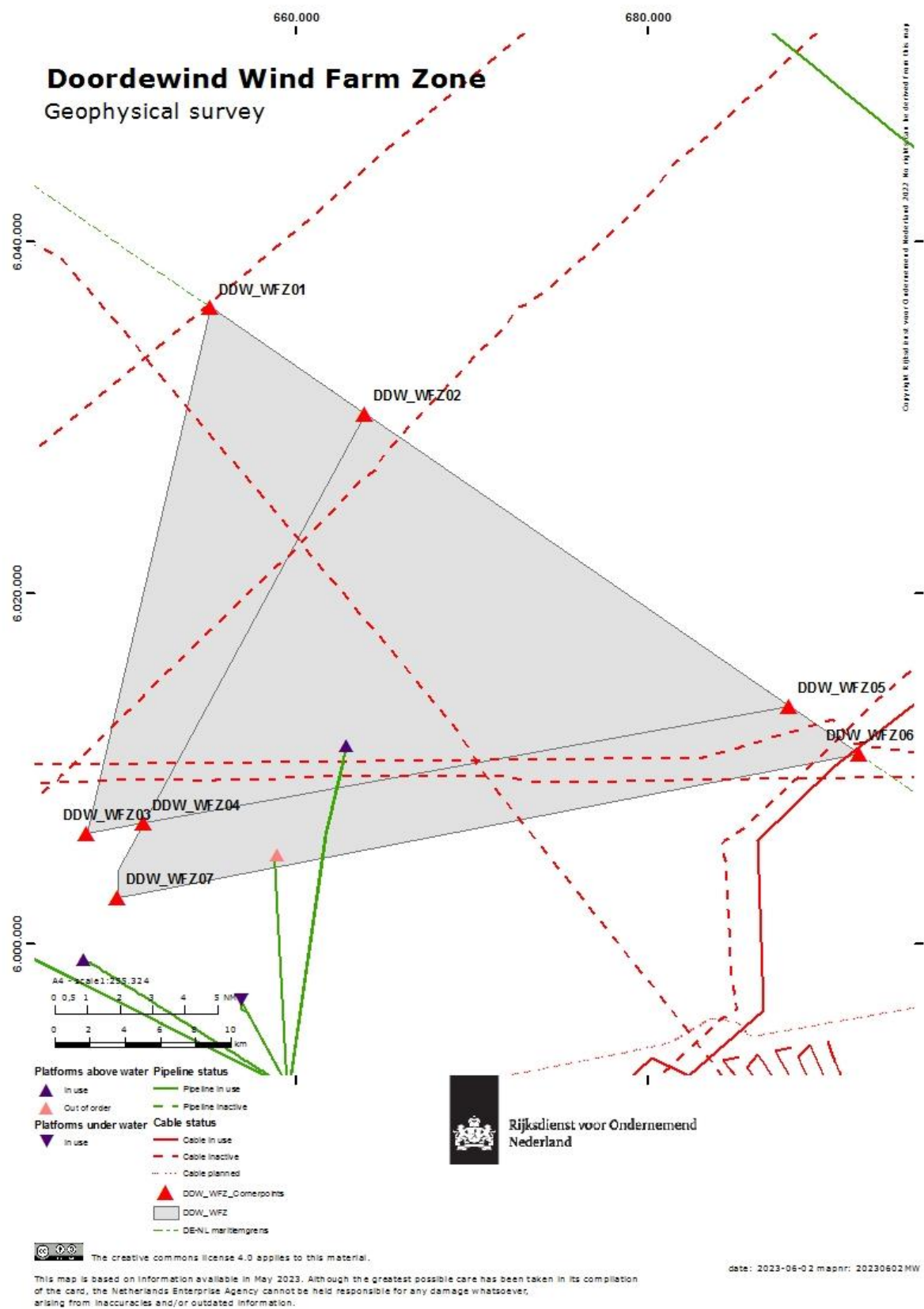


Figure 2 Map of the Doordewind Wind Farm Zone

3.2 Cables and pipelines within the Wind Farm Zone

Several operational and abandoned cables and pipelines cross the Wind Farm Zone, as shown in **Fout! Verwijzingsbron niet gevonden.** and Figure .

Table 4 Characteristics of cables and pipelines in the Doordewind Wind Farm Zone

Cables and pipelines					
Name	Operator	Trace	Diameter [in]	Type	Status
PL0195_PR	Neptune Energy B.V.	G14-B to G17d-AP	14	Pipe	Active
PL0214_PR	Neptune Energy B.V.	G14-B to G17d-AP	12	Pipe	Abandoned
PL0171_HS	Neptune Energy B.V.	G14-A to G17d-AP	2	Pipe	Active
PL0171_PR	Neptune Energy B.V.	G14-A to G17d-AP	12	Pipe	Active
UK – Germany 4	-	Winterton (GB) to Spiekeroog (D)	n/a	Cable	Abandoned
UK – Germany 6	British Telecom	Scarborough (GB) to Norddeich (D)	n/a	Cable	Abandoned
UK – DK 3	-	Winterton (GB) to Romo (DK)	n/a	Cable	Abandoned
Tycom-cable	Eu Networks B.V.	Eemshaven (NL) to England	n/a	Cable	Abandoned
ODIN 1	TDC A/S	Egmond (NL) to Fano/Maade (DK)	n/a	Cable	Abandoned
Atlantic Crossing 1 Segment B2	Global Crossing	Castricum (NL) to Sylt (DK)	n/a	Cable	Active

3.3 Units

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

3.4 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 you can always contact RVO for further information or explanations.

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.ioqp.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://iho.int/uploads/user/pubs/standards/s-44/S-44_Edition_6.1.0.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 Appendix 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/cms/view/5c06ac88-c12f-4903-89f3-27d66937b7e9/general-information-ijmuiden-ver>.

4.3 GIS Metadata requirements

The requirements for GIS metadata which all Contractors shall comply with is shown in Appendix 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. The specifics on the mandatory delivery to the "Basisregistratie Ondergrond (BRO)" is provided in the Scope of Work document whenever applicable.

4.5 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:

DDW_Date_Study_Organization_Name document_Author_Version_Status

- DDW: Doordewind.
- Date: yyyymmdd, e.g. 20230624.
- Study: Cert
- 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 20230624_F.
- Status: (D) for draft documents, (F) for signed and approved documents.

4.6 Standards, formats, templates

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

Contractors provide for each completed study a publishable summary for the Project and Site description, which consists of a maximum of two (2) A4 pages, including some high-resolution pictures or graphs. Besides, Contractors are requested to present the results of the study during a webinar in due time for the permit tender.

All reports must use the terminology as specified in the online taxonomy list (https://offshorewind.rvo.nl/files/view/dff880d4-9494-4e6d-b398-8fd1f097957e/162642502520210714_taxonomy%20list%20offshore%20wind%20energy_dutch-english.xlsx)

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

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

- Front:
Offshore wind energy Netherlands
Site characterisation data Doordewind 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)
Graadt van Roggenweg 200 | 3531 AH | 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

4.7 Other data

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

4.8 Deliverables (results / maps)

All maps (in GIS and PDF) will unless agreed otherwise 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 Doordewind (DDW) Wind Farm Zone.

4.9 Storage of data (electronic)

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

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
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

Laura Jansen

E l.e.jansen@minezk.nl

T +31 (0)6-29645189

Rijkswaterstaat

Raoul Syrier

E raoul.syrier@rws.nl

T +31 (0)6 11072554

Site characterization 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

5.5 Email

All emails related to the site investigations must be sent in CC to the project mailbox:
DDW@RVO.nl

The subject of an email related to Doordewind Wind Farm Sites needs to start with the date and the abbreviation DDW. Then also it needs to be followed by an abbreviation of the type of site survey.
E.g. : DDW_20230713_GP for the geophysical survey for DDWWFZ.

5.6 Emergency Response

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

Appendix 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 to be agreed upon between CONTRACTOR and CLIENT. 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 2.0.2⁰ (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:

<https://validatie.geostandaarden.nl/etf-webapp/testruns/create-direct?testProjectId=3dd218a5-2ba3-3f1c-98fb-10e923839a3c>

Manufacture options

Creating metadata should preferably 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 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 geodatabaseheer (geodatabaseheer.GISCC@RVO)

Other options are possible as long as the data will be validated by the metadata validator for ISO 19115 version 2.0.2 (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 to 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:

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 ... (e.g. Borssele, Hollandse Kust, Doordewind)
- ...
- ...

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 [*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 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 a 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: ...

Appendix B - MPK file of DDW WFZ

[provided separately]