Summary draft Memorandum Scope and Level of Detail environmental impact report wind farm site decisions (draft NRD) Doordewind Wind Farm Zone

In front of you lies the draft Memorandum Scope and Level of detail for the building, operation and removal of wind farms in Doordewind Wind Farm Zone, which is located in the Dutch part of the North Sea. These are wind farms with a combined installed capacity of between 4 and 4.6 GW in the already designated Doordewind Wind Farm Zone and in the expansion of that wind energy area to be designated. The expansion of the wind energy area is part of the North Sea partial review program 2022-2027, in which the expansion is referred to as Doordewind (west). In this cNRD, the name Doordewind is used for the whole area, including the extension to be designated.

The Concept Note Scope and Level of Detail (cNRD) is an essential document for the launch of the environmental impact assessment procedure (Dutch: mer) for wind farms in Doordewind Wind Farm Zone. The expected impacts of wind farms are described in the Environmental Impact Assessment (EIA). The wind farms are a crucial part of the Dutch energy transition. The document (cNRD) outlines the background, objectives, location choices, environmental impacts, and legal frameworks necessary for the construction, operation and disposal of wind farms.

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1. Reason, purpose and frameworks

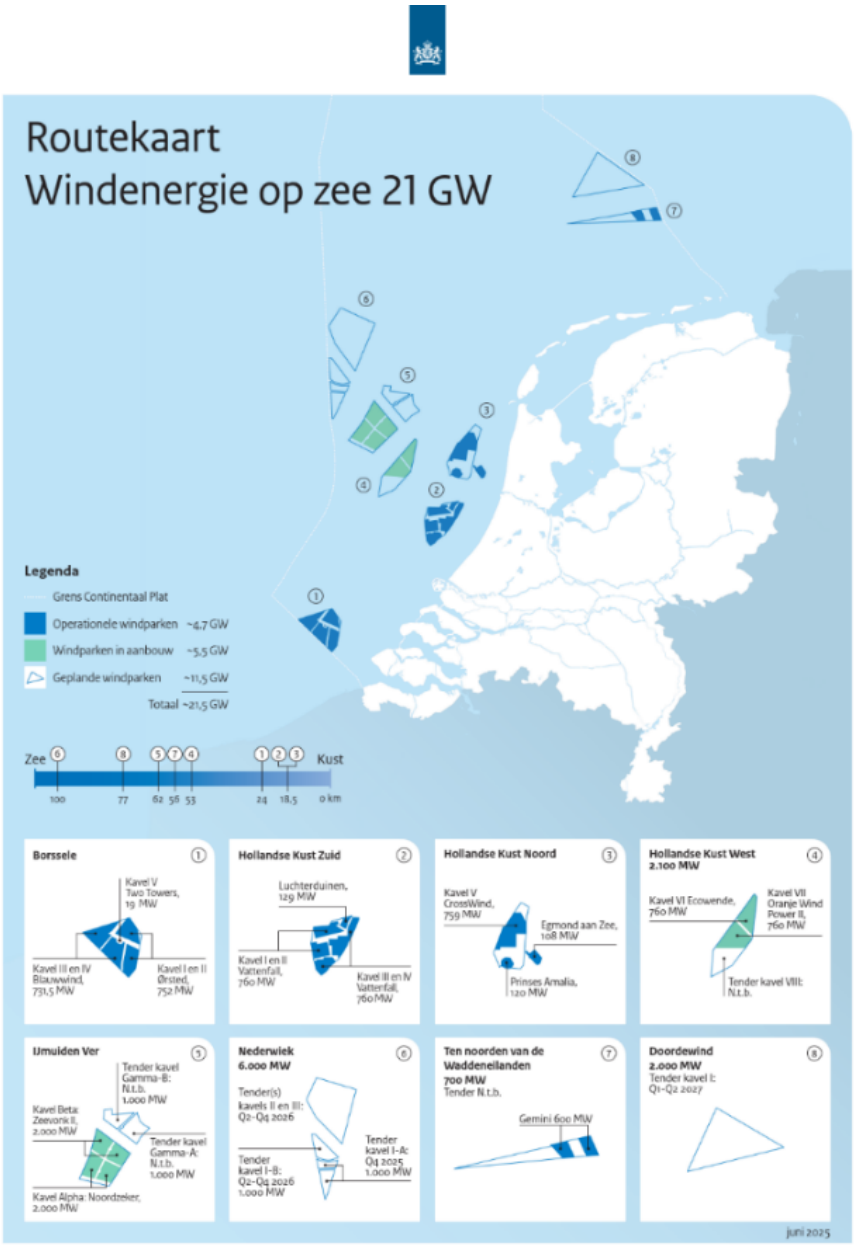
1.1 Reason

The Netherlands has ambitious targets for reducing CO2 emissions. According to the Dutch climate act, the government aims to reduce CO2 emissions by 55 percent by 2030, compared to 1990. For 2050, the cabinet is committed to achieving a full CO_2-neutral electricity production. Offshore wind energy plays an important role in achieving these goals because:

- Wind farms provide large-scale renewable energy.
- This reduces the dependence of the Netherlands on energy imports.

The wind farms are an important contribution to achieving the goals set out in the climate act. The Roadmap 21 GW (Offshore Wind Energy Roadmap) describes the planning of new wind farms, including Doordewind. The objective is to increase the capacity of wind farms in the North Sea to 21 gigawatts (GW) by the year 2032.

Figure 1.0 Roadmap 21 GW



1.2 Purpose Memorandum Scope and Detail Level (NRD)

This draft version of the NRD forms the basis for the EIA and defines:

- Intention: The construction, operation and removal of wind farms.
- Scope: The components being examined, the areas and activities that focus on, and the alternatives or extremes that need to be explored.
- Level of detail: The environmental aspects relevant to the research, the way in which the impacts are presented and the associated depth.

The cNRD focuses on documenting impacts in order to fully incorporate the environmental interest in decision-making.

1.3 Legal frameworks

The project is covered by a wide range of regulations:

- Offshore Wind Energy Act: Manages the allocation of sites and conditions for exploitation.
- North Sea Programme 2022-2027.
- Partial revision North Sea Programme 2022-2027.

- Offshore wind energy roadmap.
- Environmental Act: Bundles rules around the environment, nature and spatial planning.
- Marine Strategy Framework Directive (MSFD): Ensuring ecological and chemical quality of the North Sea.
- Ecology and Cumulation Framework (KEC).
- Nature network Netherlands.
- Espoo convention: Regulates consultations on transboundary environmental impacts with neighboring countries such as Germany.
- North Sea Agreement and North Sea Consultation: Aligns interests between ecology, shipping, defense, mining and fishing.

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2. Competent authority and procedural steps

2.1 Initiator and Competent Authority

The initiator and the competent authority for the wind farm site decision is the Minister for Climate Policy and Green Growth. This will be done in collaboration with the Minister for Infrastructure and Water Management, the Minister for Housing and Spatial Planning and the State Secretary for Agriculture, Fisheries, Food Security and Nature.

2.2 Procedurestappen

The steps for the development of a wind farm are:

1. **Designation of wind farm zones**: By the government in national policy documents such as the National Water Programme.
2. **Preliminary division**: Research into space use within the wind farm zone.
3. **Roadmap development**: Priorities and order of sites are defined.
4. **EIA and wind farm site decision**: Environmental impacts are examined, followed by decision-making.
5. **Permit**: A developer is selected through a call for subsidy tender or auction.
6. **Construction and operation**: Contracts are concluded, turbines are placed, and electricity is supplied.
7. **Monitoring and supervision**: The Directorate-General for Public Works and Water Management (Dutch: Rijkswaterstaat) monitors compliance with conditions.

Formal participation times are included in step 4 and step 5. Public views are incorporated into the EIA and the Wind Farm Site decision.

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3. Intended activity

The intended activity is the building, operation and disposal of four offshore wind farms in Doordewind Wind Farm Zone with a combined installed capacity of up to 4.6 GW. For each wind farm, a site is designated by means of a wind farm site decision.

3.1 Project details

The Wind farm Doordewind is designed to provide up to 4.6 GW of energy, divided into four sites of up to 1.15 GW each. Construction and operation shall include:

- wind turbines consisting of a tower, nacelle, three rotor blades and any measuring equipment (see figure 3.0);
- a foundation of the wind turbine and any transition piece (see figure 3.1);
- scour protection.
- cabling that connects the individual wind turbines and connects to TenneT platform (inter-array cables).

Figure 3.0 Example of a wind turbine (source: Vestas, 2011)

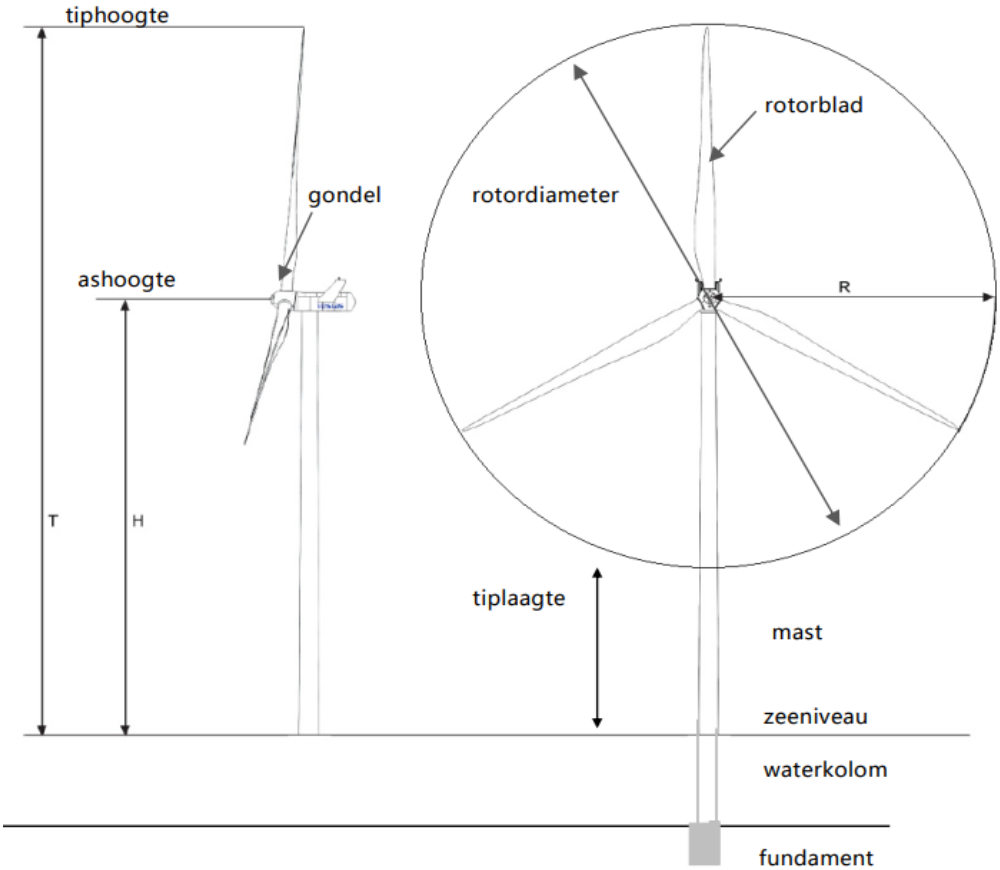
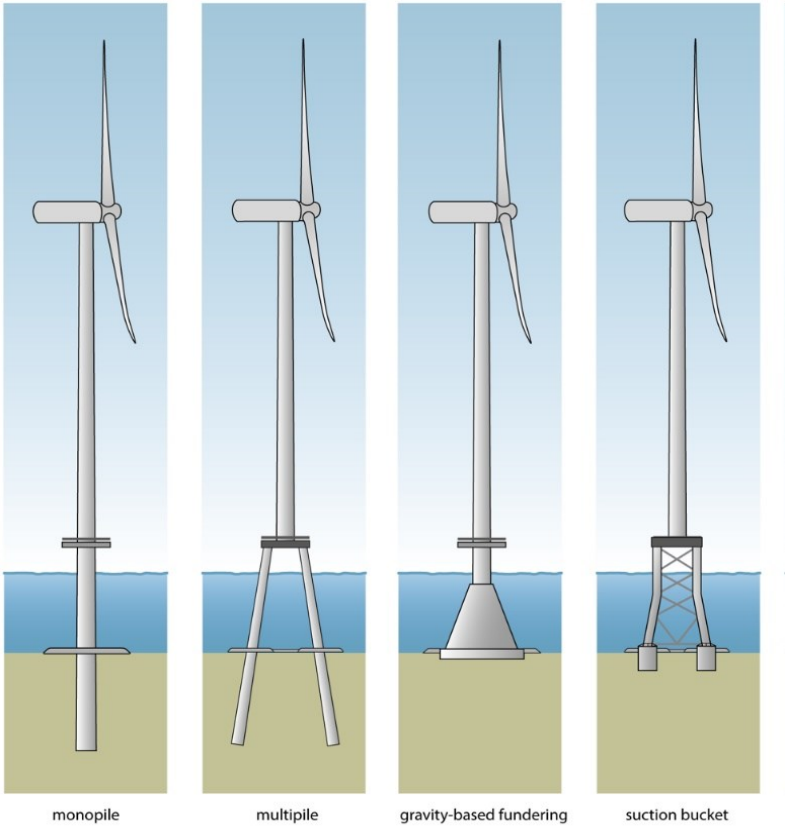


Figure 3.1 Example of different types of foundations (source: Waardenburg Ecology, 2023)



3.2 Bandwidth

In order to enable market developments and innovations, a wide range of technical specifications is used. This ensures flexibility for the final authorization holder.

This bandwidth approach makes specific requirements for EIA. The environmental impacts associated with different arrangements that allow for the lot decision should be examined in the EIA. Therefore, in table 3.0 below, a bandwidth for the MER study is shown. This specifically concerns a range for the purposes of the EIA study, which is not in advance equal to the range eventually allowed in the wind farm site decision.

The range examined in the EIA can be limited in the wind farm site decision, if necessary, on the basis of the results of the EIA. However, the multiplicity of possible combinations does not make it possible to examine all possible arrangements. Therefore, a worst-case approach is taken: if the worst-case situation of the range is admissible in terms of effects, then all configurations within the range are possible. The worst-case situation will vary by environmental aspect or user interest.

The range to be examined is based on the current state of the technology, expectations of developments in the coming years, and the outcome of the EIAs and the appropriate assessments of previous wind farm site decisions. This range is summarized in table 3.0 and explained below by component, assuming four lots of each with a power set-up of up to 1.15 GW.

The impact assessment in the EIA shall in particular:

- the number of wind turbines;
- the rotor diameter of the wind turbines.
- the type of foundation and the pilling-energy required for the pilling of foundations (and thus the noise level), and
- the tip highest level and the tip lowest level of the wind turbines.

Table 3.0 Bandwidth to be used for the EIA

Subject	**Bandwidth**
Total installed capacity in Doordewind Wind Farm Zone	4,0- 4,6 GW
Number of sites	4 of approx. 1 – 1.15 GW
Maximum number of turbines per site	76 for sites of approx. 1 – 1.15 GW
Capacity of individual wind turbines	Minimum 15 MW and maximum 25 MW
Tip highest level of individual wind turbines	15 MW turbines: maximum 261 metres 20 MW turbines: maximum 304.8 metres (= 1,000 feet) 25 MW turbines: maximum 330 metres
Tip lowest level of individual wind turbines	Minimum 25 metres
Rotor diameter of individual wind turbines	15 MW turbines: maximum 236 metres 20 MW turbines: maximum 280 metres 25 MW turbines: maximum 330 metres
Maximum total swept area	3,509,787 m² for sites of approx. 1.15 GW (57 turbines)
Minimum distance between wind turbines	4 times the rotor diameter
Number of rotor blades per wind turbine	3
Type of foundations	Monopile, multipile, gravity-based structure, suction bucket
Acceptable noise pollution in the event of foundation pile driving (impulse noise)	160 to maximum 164 dB re 1 µPa2s SELss (at 750 metres from the noise source)
In the case of pile driving/vibration of monopile foundations; number of piles per turbine and diameter of foundation pile(s):	**Monopile** / **15 MW** / **20 MW** / **25 MW** Top diameter (m) / 7.5 / 8.5 / 10.5 Bottom diameter (m) / 9.9 / 11.3 / 13
Electrical infrastructure (inter-array cabling)	66 kV, buried at a depth of 1 to 3 metres and kept at that depth
Lifespan and complete removal of all components of the wind farm	Approximately 35 years. This is in line with a maximum licence period of 40 years (5 years for the building and removal of the wind farm).

3.3 Nature-inclusive design

In addition to the bandwidth, the plot decision will also focus on nature-inclusive design. With nature-inclusive design, space is consciously created for biodiversity in wind farms, so that greater diversity of algae and animals can live. An example of this is that concrete measures are being taken for the foundation of wind turbine piles or platforms to increase habitat potential for local species. The EIA will address the possibilities for nature-inclusive design.

4. Location sites

4.1 Location

The designated wind farm zone, Doordewind is located in the Dutch exclusive Economic Zone (EEZ) and it borders the EEZ of Germany. The area is about 85 kilometers north of the wadden island of Ameland and about 95 kilometers from mainland (Province of Friesland in the Netherlands).

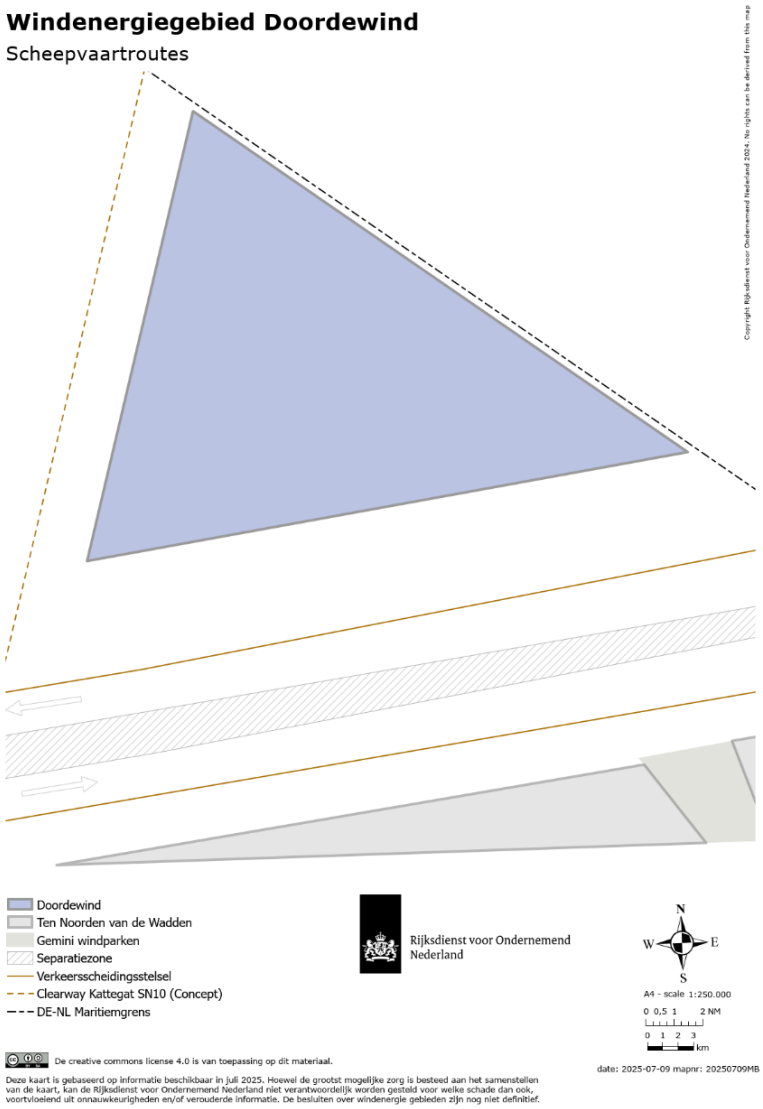
Figure 4.0 Doordewind location (source: RVO)

4.2 Description of wind farm zone

Shipping

Through the wind, the southern boundary is defined by a shipping route which is part of the traffic separation system. To the west of the wind energy region of Doordewind lies an important shipping route towards the Kattegat and the Baltic Sea. The intention is to formalize this route by designating it as 'clearway'.

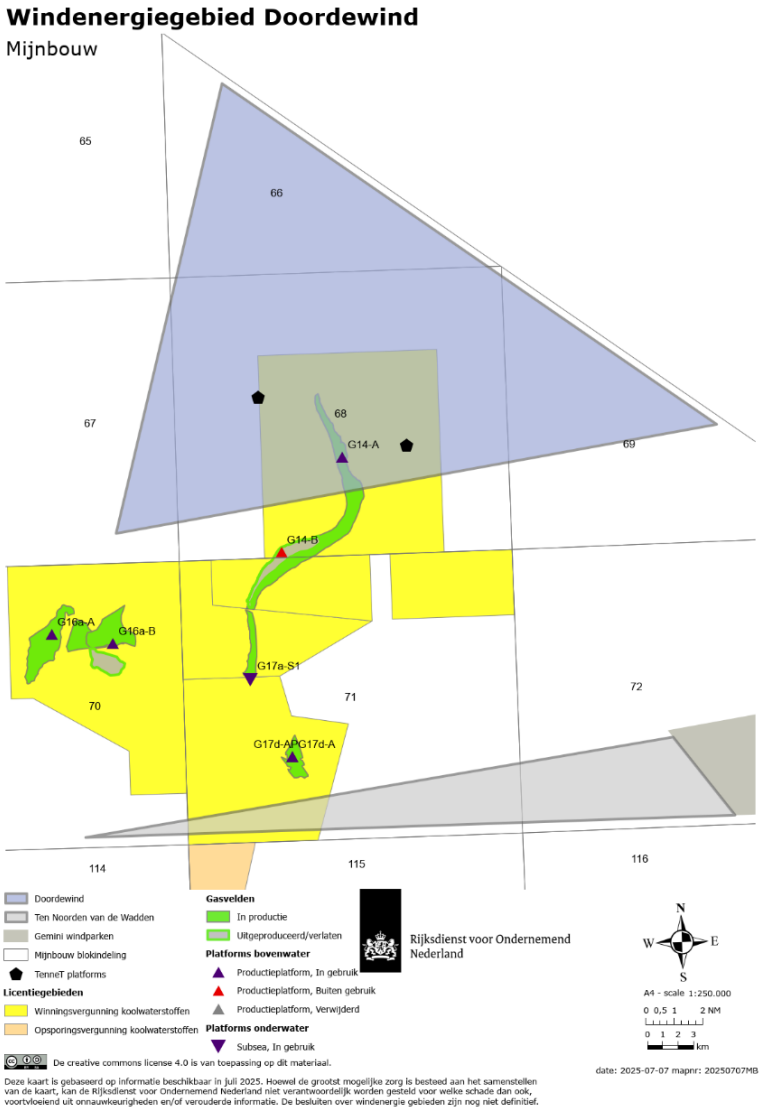
Figure 4.1 Ship lanes in the vicinity of Doordewind Wind Farm Zone (source: RVO)



Mining activities

Mining activities are present in Doordewind Wind Farm Zone. The activities are concentrated in the G14 mining block. It concerns the producing gas field G14-A&B. In the gas field, one well is still productive. The current mining LICENcE G14a & G17b expires in December 2035. In the area there is one active mining platform with helidek (G14-A) from Eni Energy Netherlands BV

Figure 4.2 Oil and gas fields and mining activities in Doordewind Wind Farm Zone (source: RVO)

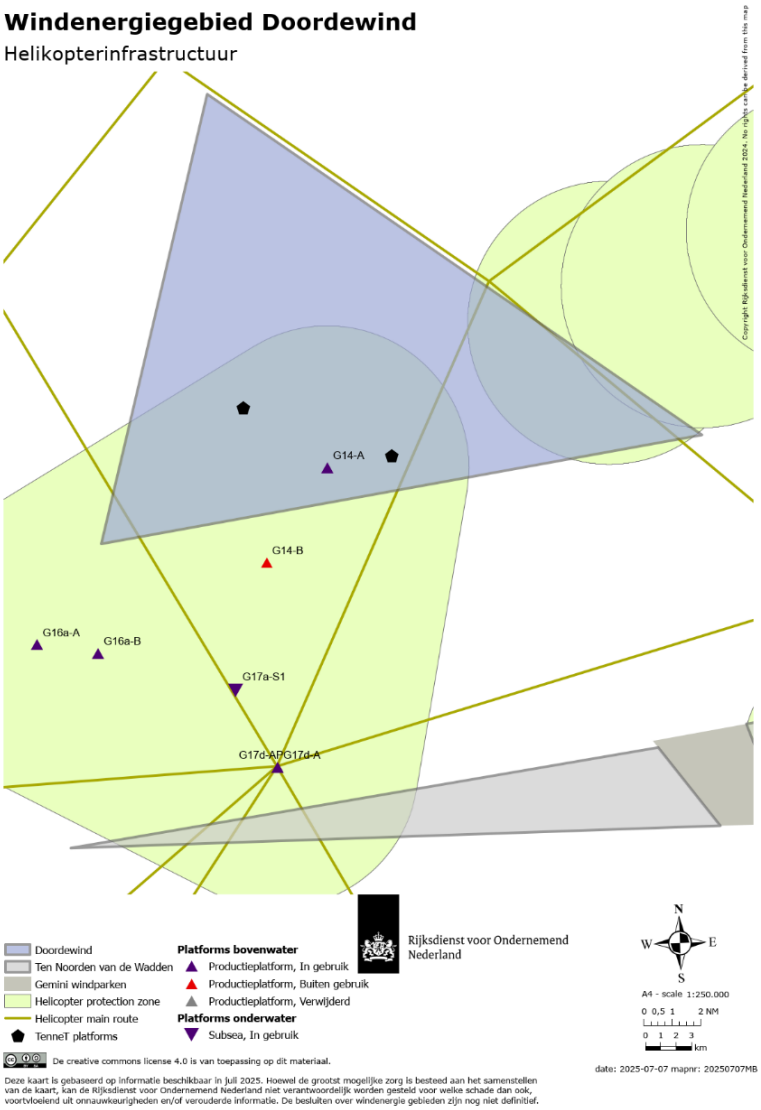


Helicopter infrastructure

The presence of the mentioned mining platform within the wind energy area has resulted in the presence of Helicopter Main Routes and helicopter safety zones.

A Helicopter Main Route (HMR) is an air traffic route where civil helicopters operate on a regular basis, mainly to and from oil and gas platforms. The helicopter main routes KY601, KY602 and KY607 are located in and near Doordewind Wind Farm Zone. In addition, the wind energy area overlaps with an HTZ (Deutsche Bucht) and an HPZ (Goromand). A Helicopter Traffic Zone (HTZ) is a five nautical mile zone around a platform with a helideck at low altitude up to 2,000 feet (approximately 610 meters) and is set to inform/alert airmen of helicopters landing and departing on a helidk. An HPZ has the same function but comprises two or more platforms and may vary in size.

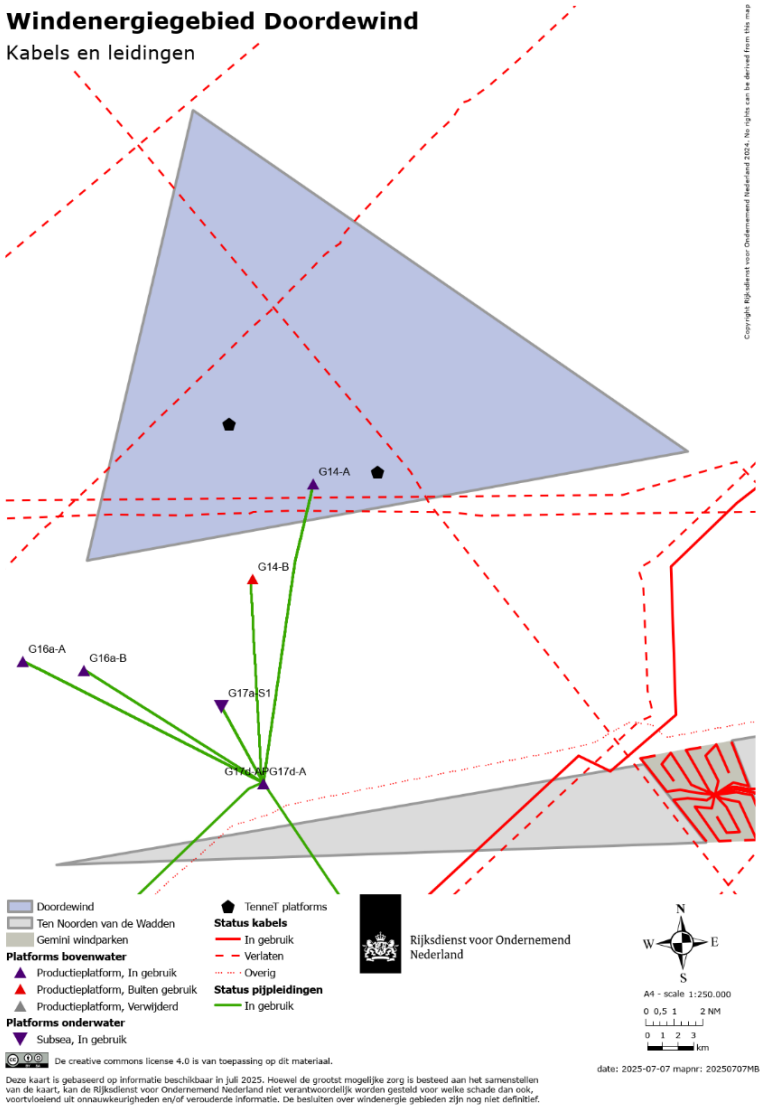
Figure 4.3 Helicopter infrastructure location (source: RVO)



Cables
There are several abandoned telecom cables in Doordewind Wind Farm Zone.
No maintenance zones are provided for inactive telecom cables.

Pipes
In the wind energy area, there is one active gas and methanol pipeline (which runs from the platform in Mining Block Section G14 to the platform in Mining Block Section G17) and one abandoned gas pipeline. For piping, as long as no custom arrangements have been made with the owners/administrators, a 500 meter maintenance zone is applicable on both sides.

Figure 4.4 Cable and pipe routing (source: RVO)



Protected areas

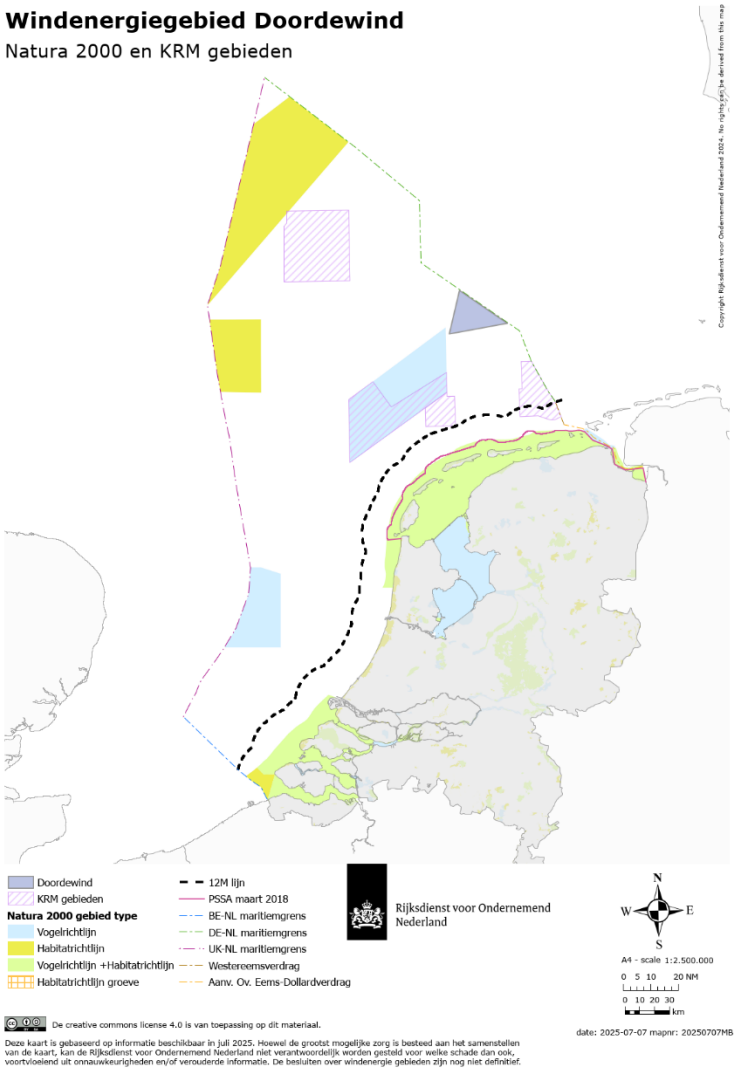
The Doordewind Wind Farm Zone is located outside Natura 2000- and Marine Strategy Framework Directive areas. The closest Dutch Natura 2000- and Marine Strategy Framework Directive area is the Friese Front. Further south is the Marine Strategy Framework Directive area of Borkumse Stenen.

Table 4.0 shows the distance to potentially relevant Dutch Natura 2000- and Marine Strategy Framework Directive (MSFD) areas. In figure 4.5 these Dutch nature reserves have been mapped. Table 4.0 and figure 4.5 do not contain foreign nature reserves. Several Natura 2000 areas have also been designated in the German EEZ and coastal region, including Borkum Riffgrund, Niedersächsisches Wattenmeer und angrenzendes Küstenmeer and Sylter Außenriff. The EIA further analyzes which Natura 2000 areas in the Dutch, German and probably Danish sea or coastal region can have an impact because of the construction, exploitation and disposal of the wind farms.

Table 4.0 Distance from potentially relevant Dutch Natura 2000 or MSFD areas

Natura 2000- or MSFD-area	**Distance to Doordewind**
Friese Front (Natura 2000- en MSFD-area)	approx. 2.5 km
Borkumse Stenen (MSFD-area)	approx. 27 km
Central Oyster Grounds (MSFD-area)	approx. 74 km
North Sea coastal zone (Natura 2000-area)	approx. 75 km
Wadden Sea, incl. Eems Dollard (Natura 2000-area)	approx. 84 km
Klaverbank (Natura 2000-area)	approx. 128 km
Southern Doggersbank (future MSFD-area)	approx. 130 km
Doggersbank (Natura 2000-area)	approx. 133 km
Bruine bank (Natura 2000-area)	approx. 199 km
Voordelta (Natura 2000-area)	approx. 258 km
Vlakte van de Raan (Natura 2000-area)	approx. 320 km

Figure 4.5 Location of Natura 2000 and MSFD areas in relation to Doordewind Wind Farm Zone (source: RVO)



Fishing

In Doordewind Wind Farm Zone are important fishing grounds for, among others, trawling (beam trawl) on flatfish species such as sole.

In Dutch wind farms, active fishing is prohibited under current policy.
Currently, the Ministry of Agriculture, Fisheries, Food Security and Nature and the Ministry of Climate Policy and Green Growth are investigating the possibilities for allowing (and if so, under what conditions) active fishing in Doordewind Wind Farm Zone.

4.3 Subdivision

A site is the area in the wind farm zone in which a wind farm can be realized. Within a wind farm zone there is (usually) space for more than one wind farm. Various frameworks and guidelines are used to shape this area, also known as the subdivision.

In Doordewind Wind Farm Zone, four wind farms are envisaged with a (jointly) power set-up of up to 4.6 GW (four lots of 1 to 1.15 GW each). The area of the entire wind farm zone is approx. 553 km².

Points of attention are: Shipping, mining and other infrastructure (including platform safety zones, cable and pipe maintenance zones and obstacle-free zone for helicopter traffic).

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5. Environmental assessment methodology EIA

5.1 Introduction

Pursuant to Article 3(3) of the Offshore Wind Energy Act, the following interests are involved in the taking of parcel decisions:

- the fulfillment of societal functions of the sea, including the importance of a. efficient use of space in the sea;
- the consequences of a designation for third parties;
- the environmental interest, including the ecological interest;
- the costs of realizing the wind farm in the area;
- the importance of an efficient connection of a wind farm to a connection point.

The EIA states the expected environmental impacts of the construction, operation and disposal of the wind farm in the relevant lot (both positive and negative). These are both temporary and permanent effects. These impacts are assessed in the EIA against the baseline situation using the assessment framework established for this purpose.

The EIA and the appropriate assessment also describe the cumulation of effects of the intention with already authorized but not yet realized projects (both national and international). These are effects of other projects (including offshore wind farms), which, together with the effects of the proposed activity, lead to a greater overall impact. The effects are described qualitatively, but also quantitatively where possible.

Finally, the EIA deals separately with the effects that are cross-border. Think of effects on ecology and other wind farms in the area (in the Netherlands and Germany).

Plan and study area
In the context of the EIA, a distinction must be made between the plan area (the area within which the proposed activity will take place) and the study area (the area that will be investigated for possible effects). The study area varies depending on the impact being investigated and may be larger than the plan area (e.g. in the case of the impact on migratory birds). The geographical scope of the impact description will be substantiated as far as possible for each type of impact.

Assessment scale
A +/- score relative to the reference situation is used to assess the impacts. The assessment scale is shown below:

Table 5.0 Impact assessment scale

Score	Assessment relative to the reference situation
--	The proposal will lead to a significant negative change
-	The proposal will lead to a noticeable negative change
0	The proposal does not differ from the reference situation
+	The proposal will lead to a noticeable positive change
++	The proposal will lead to a significant positive change

5.2 Reference situation and alternatives

Reference situation
The EIA compares the effects of the alternatives with the reference situation. The reference situation is the situation that will arise in the future if the project is not realised, but autonomous developments do take place. The reference situation is therefore the sum of the current situation and the autonomous developments. Autonomous development is understood to mean a development in the area without the project for which a decision has already been taken.

Alternatives
The EIA describes reasonable alternatives to the project with their specific characteristics. By assuming worst-case scenarios, the EIA describes the maximum environmental impact of the decision to be taken. In the case of the EIA for this project, this concerns alternatives in the subdivision as well as alternatives within the bandwidth.
The difference in effect is looked at by choices that can be made for the number of turbines, dimensions of turbines and foundation techniques (incl. different pile driving techniques). The effect of transplantation is also investigated. Transplantation involves increasing the total installed capacity, so that the capacity on the maritime transport network can be used optimally.

5.3 Assessment framework
The environmental effects of the topics listed below must be investigated in the EIA.
A, B, D and E must be explicitly assessed against the applicable legal frameworks.

Table 5.1 EIA assessment framework

Impact assessment by environmental aspect	Aspects to be included in impact assessment
A. Birds (colony birds, local seabirds, migratory birds) and bats	- disturbance from underwater noise - disturbance from above water noise - disturbance due to barrier action - habitat loss disturbance (including loss of foraging sites) - indirect effects (food availability, impact of alternative shipping routes, etc.) - collision victims (including barotrauma) - light disturbance - passthrough to populations of species
B. Marine mammals	- disturbance due to continuous and impulsive underwater noise during (preparatory) activities - other disruptions during work - disturbance by continuous underwater noise from ships and turbines during the operational phase - disturbance by electromagnetic fields of cables - indirect effects (food availability, impact of alternative shipping routes, etc.) - consequences of the presence of hard substrate and the possible prohibition of bottom-impacting fishing - optical impact / visual disturbance - passthrough to populations of species
C. Morphology and hydrodynamics	- effect on waves - effect on water movement (water level and flow) - effect on water depth and soil shapes

Impact assessment by environmental aspect	Aspects to be included in impact assessment
	- effect on soil composition - effect on turbidity - effect on stratification in the water column - effect on sediment transport - effect on erosion and erosion protection
D. Benthos and fish - disturbance from underwater noise	- disturbance by electromagnetic fields of cables - consequences of clouding - consequences of habitat destruction - positive consequences for the presence and development of hard substrate in the event of a ban on bottom-impacting fishing - effects on food availability - effect on plank transport (food availability, larval distribution) - passthrough to populations of species
E. Ecology other	- consequences for conservation objectives of legally protected areas - ecosystem effects and effects on primary production - ecological consequences of emissions from construction, operation and disposal - effect on the introduction / distribution of non-native species
F. Shipping safety	- risk of collisions and drives with wind turbines and installations in the area - risk of collisions between ships - alternative options for crossing shipping - consequences for those involved in collisions and drives (including death and personal injury) - environmental consequences of collisions and drives
G. Fisheries	- impact on available area and fishing opportunities - consequences of possible circumnavigation - socio-economic consequences for sector, chain and communities
H. Mining	- consequences for oil and gas extraction (detection, extraction) - consequences for CO2 storage - consequences for (air-sided) accessibility of platforms - consequences of circumnavigation to reach platforms
I. Aviation	- consequences for civil aviation - consequences for helicopter traffic (including helicopter traffic to G14-A platform) - consequences for coastguard (SAR-Search and Rescue) - consequences for military aviation
J. Ship, shore and aviation radar, aviation systems and (other) measuring equipment	- interference aviation radar - interference communication, navigation and surveillance (CNS) systems - interference in shore and shipping radar - interference measuring equipment on and around platforms at sea
K. Telecommunication	- interference jet paths
L. Cables and pipes	- consequences for existing / licensed cables and pipes
M. Military activities and explosive remnants of war	- consequences for military activities - consequences for unexplosible remnants of war
N. Recreation and tourism	- consequences for recreational shipping and recreational diving
O. Cultural history and archeology	- consequences for archaeological remains (objects and paleol landscapes)
P. Existing wind farms	- influencing electricity yield from existing wind farms
Q. Air quality and climate change	- emissions of harmful substances to the air - avoided emissions (such as CO2, SO2, NOx) compared to the use of other energy sources
R. Chemical water quality	- effect on chemical water quality (leaching effects and microplastics)

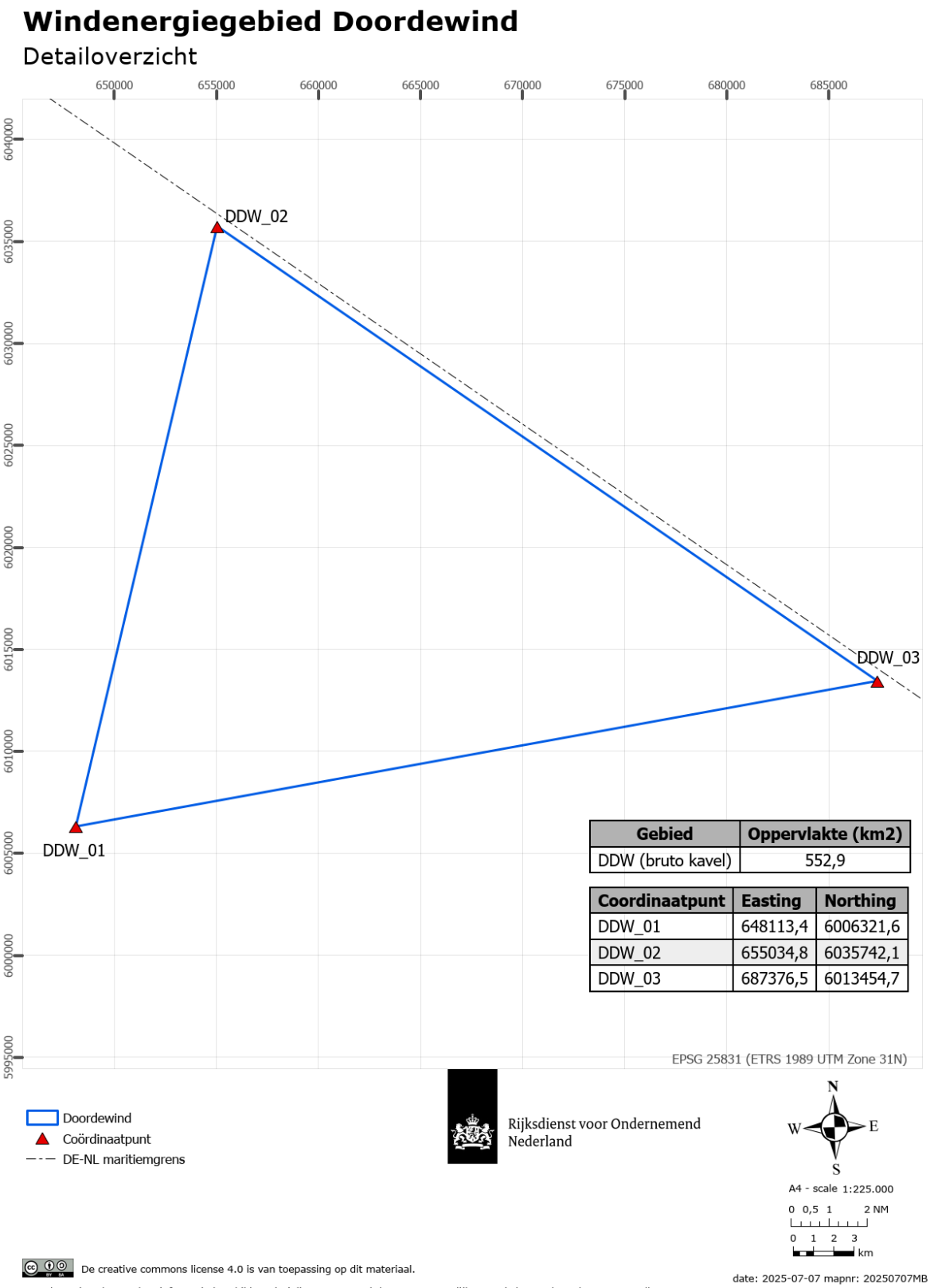
5.4 Mitigating measures

The EIA addresses mitigation measures and their effect. The EIA also addresses opportunities/possibilities for nature enhancement measures, insofar as these are measures that can form part of the wind farm and can be prescribed in a plot decision. The nature enhancement measures will be described qualitatively and, where possible, quantitatively in the EIA and are separate from the assessment framework.

5.5 Knowledge gaps, monitoring and evaluation

The starting point for the EIA is that the most up-to-date and best available knowledge is used. The EIA indicates which important information is not available or is available with a very high degree of uncertainty, and what consequences this has for the impact assessment and evaluation. Where possible, it indicates which additional studies could fill these gaps. The national government has set up the Offshore Wind Ecological Programme (Wozep) to address generic knowledge gaps. The EIA indicates which environmental aspects should be monitored and evaluated during and after the realisation of the proposal in order to ascertain the actual environmental effects and gain insight into the knowledge gaps.

6. Doordewind Wind Farm Zone overview and coordinates



Gebied	Oppervlakte (km2)
DDW (bruto kavel)	552,9

Coordinaatpunt	Easting	Northing
DDW_01	648113,4	6006321,6
DDW_02	655034,8	6035742,1
DDW_03	687376,5	6013454,7