



Government of the Netherlands

Site Investigations HKN

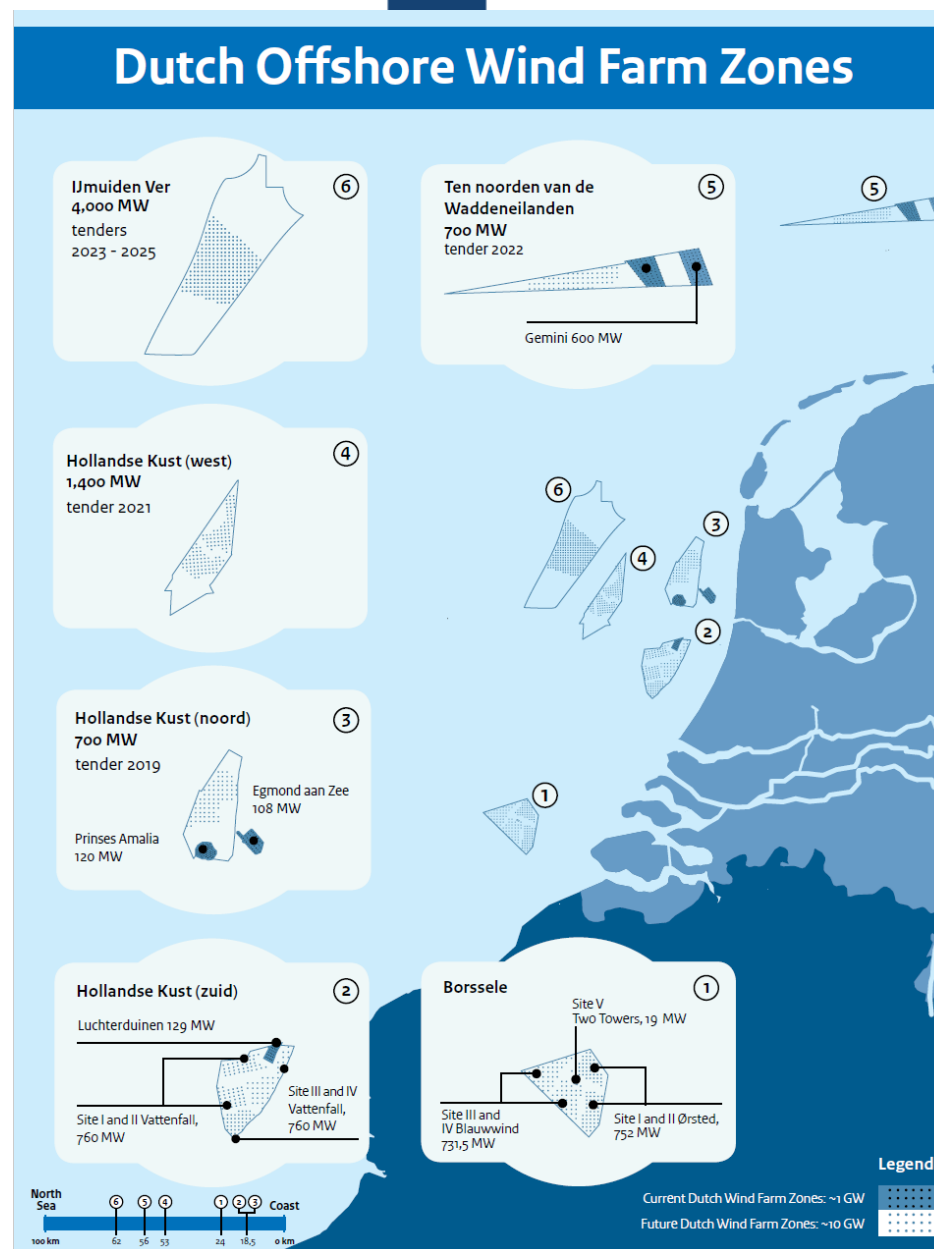
Matté Brijder - RVO.nl

wind &
water
works®

Workshop – 8 October 2019 Amsterdam



Roadmap



High quality

- Market consultation in expert workshops and stakeholder meetings
- Lessons learned incorporated
- SoW drafted in consultation with internal, external experts, industry and agencies
- Draft reports and final deliverables reviewed by internal and independent external experts
- Certification for studies with results becoming part of the design basis
- Statement of Compliance:
 - Complete and fulfill requirements
 - Risks and uncertainties minimised
 - State-of-the-art methods

STATEMENT OF COMPLIANCE

Statement No.:
SC-DNVGL-SE-0190-04805-0

Issued
2019-07-22

Issued for:

Site Conditions Assessment

of

Wind Farm Zone Hollandse Kust (noord)

Comprising:

Wind Turbines, Substation and Power Cables

Specified in Annex 1

Issued to:

Netherlands Enterprise Agency

Croeselaan 15
3521 BJ Utrecht
The Netherlands

According to:

DNVGL-SE-0190:2015-12

Project certification of wind power plants

Based on the documents:

CR-SC-DNVGL-SE-0190-04805-01

Certification Report, dated 2019-07-15

Changes of the site conditions are to be approved by DNV GL.

Hamburg, 2019-07-22

For DNV GL Renewables Certification

Digitally signed by
Angela W. Koenig
Date: 2019.07.22 17:31:28
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in place of
I.V. Fabio Pollicino
Service Line Leader Project Certification



By DAKKS according to EN ISO/IEC 17065
accredited Certification Body for products. The
accreditation is valid for the fields of certification
listed in the certificate.

Hellerup, 2019-07-22

For DNV GL Renewables Certification

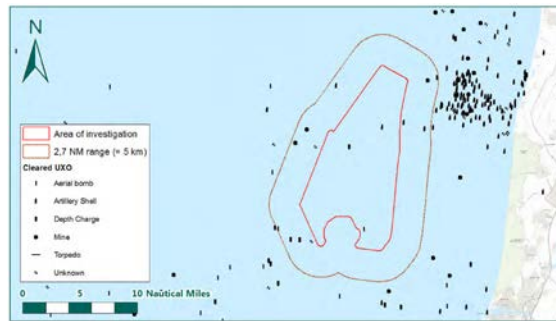
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by Erik Asp
Date: 2019.07.22
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Erik Asp
Project Manager

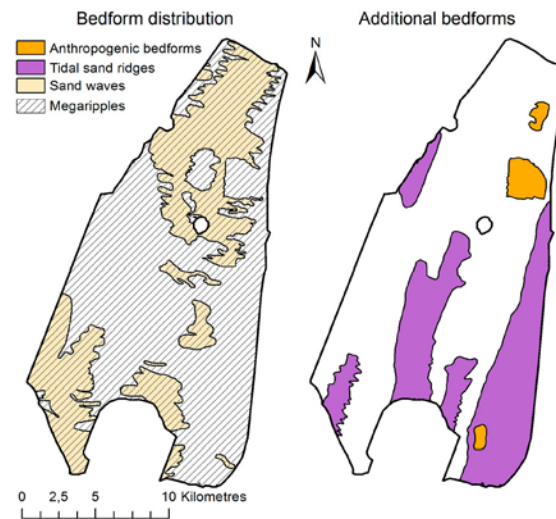


Hollandse Kust (noord) Wind Farm Zone

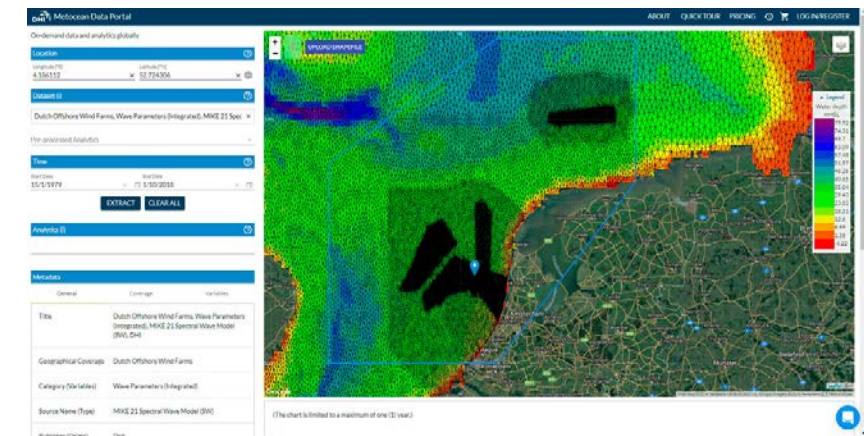
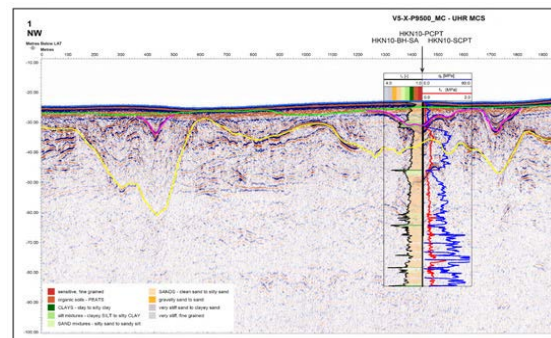
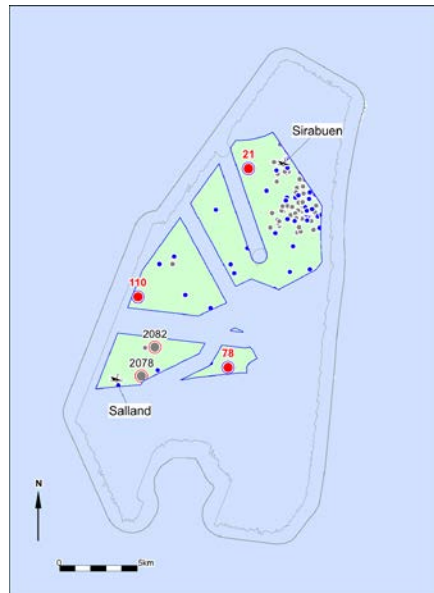
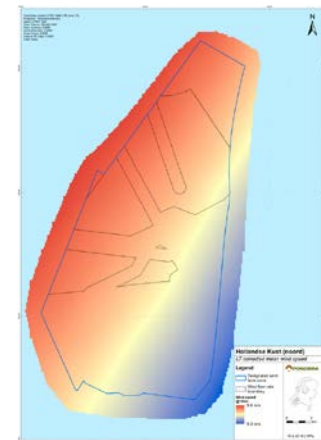
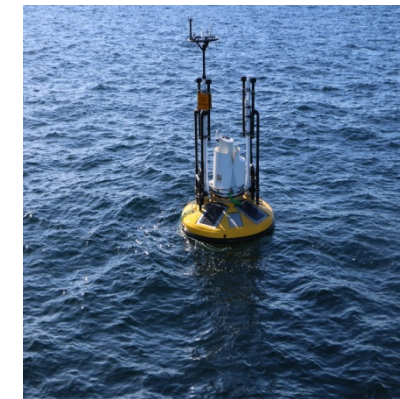
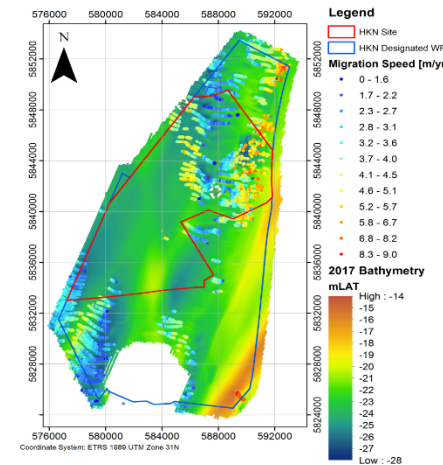
Obstructions



Soil



Wind and water





Hollandse Kust (noord) finished

- Webinars in May 2019
- Geotechnical survey conducted in 2018, reporting finished with report on characteristic values and all data of laboratory tests and SCPT published
- Metocean campaign conducted from April 2017 – April 2019. Final report published including raw data.
- WRA: long term mean wind speed at 100m at center of HKNWFZ $9.53 \text{ m/s} \pm 0.38 \text{ m/s}$
- MDS: no change in outlines and conclusions
- New Statement of Compliance





Hollandse Kust (west) update

- Geological, UXO and archaeological desk study published
- Geophysical survey: all reports published
- Geotechnical survey: survey completed, reporting phase
- Metocean campaign to be conducted from Feb 2019 - Feb 2021
- Metocean Desk Study on feasibility level. Design level Q2 2020
- WRA aligned with MDS Q2 2020
- Morphodynamic study Q2 2020
- Set of site studies available Q2-Q3 2020





TNW update

- Geological, UXO and archaeological desk study published
- Geophysical survey: survey completed summer 2019, reporting phase
- Geotechnical survey: survey to be commissioned and execution in Q2 2020
- Metocean campaign from Jun 2019 - Jun 2021
- Set of site studies available Q4 2021





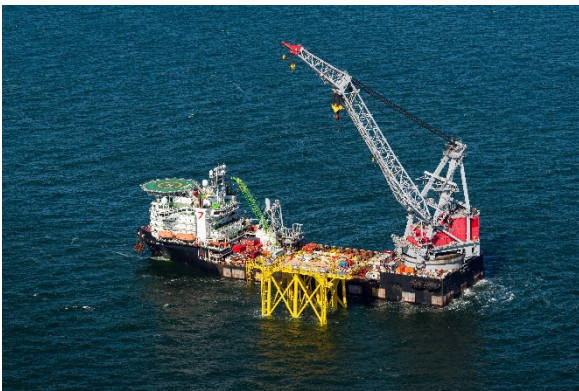
Development of (3D) ground models

› Content

- Quantitative data in a 3D volume with geotechnical properties

› Objectives

- Provide relevant geotechnical data for the design of a Wind Farm, including, but not limited to foundations and cables
- Reduce (RVO.nl and your) resources to go from soil data collection to Wind Farm design



› HKN

- Geotechnical parameter report (disclosed)
- Pilot 3D Geotechnical Ground Model (October)

› HKW

- Geotechnical parameters
- Pilot GIS visualisation and 3D

› TNW

- Upcoming tender; separate lots;
 - Geotechnical works
 - Ground model



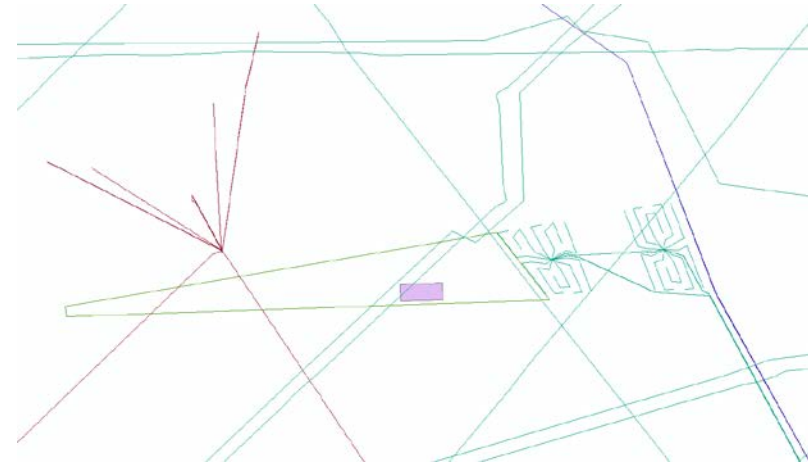
3D UHRS Survey TNW

> Content

- 3D UHRS Survey of an area of almost 6 km²

> Objectives

- Provide insight in some potential geohazards for TNW area as input for the design of a Wind Farm, including, but not limited to foundations and cables
- Reliable high quality data to pick the best location for the TenneT substation



> Geometry

- 3 Sparker sources and 6 multichannel streamers

> Penetration / Resolution

- 60 m below seabed
- Bin size of 0.5 m

> Results

- To be integrated in ground model TNW



Planning and intended tender scheme offshore wind energy

GW	WFS	Tender	Site studies
0,7	HKN V	Q4 2019	Q1 2019
0,7	HKW VI	Q2 2021	Q3 2020
0,7	HKW VII		
0,7	TNW	Q4 2022	Q4 2021



Communications

- Website: <https://offshorewind.rvo.nl>
- Regular workshops, e-mail updates register: woz@rvo.nl
- Site data: webinars
- Each tender: project and site description

Netherlands Enterprise Agency

HomeHollandse Kust (noord)Hollandse Kust (west)Hollandse Kust (zuid)TNWAncillary StudiesSearch

Welcome

Development of offshore wind farms in the Netherlands

Between 2015 and 2030 the following wind farm zones will be developed in the North Sea: Borssele, Hollandse Kust (zuid), Hollandse Kust (noord), Hollandse Kust (west), Ten Noorden van de Waddeneilanden and IJmuiden Ver. This will bring the total capacity to 11 GW.

On this website you can find all available site data on soil, wind & water conditions and obstructions of the wind farm zones. The Netherlands Enterprise Agency (RVO.nl) is responsible for the collection of the site data which provide information for FEED studies and make competitive bids in the permit tenders possible. Once new information is available we will organise workshops, webinars and/or send a newsletter to inform you. Minutes and presentations can be found separately.

Information: Want to be kept informed? Register for newsletters, invitations for workshops and webinars by sending your contact details to woz@rvo.nl.

Content per wind farm zone

- General information: Introduction to the wind farm zone, Project and Site Description, Maps, GIS Viewer, Revision Log and Q&A Log
- Obstructions: UXO and Archaeology
- Soil: Geological desk study, geophysical and geotechnical surveys and morphodynamics
- Wind & Water: Wind Resource Assessment, Metocean desk study and Metocean measurement campaign

More information about the Dutch roadmap towards 11,500 MW offshore wind energy

TSO TenneT progress on the offshore grid ([Dutch](#)) ([English](#)) ([German](#))

Tender regulations and related Q&A ([Dutch](#)) ([English](#))

North Sea information and offshore wind energy ([Dutch](#)) ([English](#))

Commissioned by the Dutch Ministry of Economic Affairs and Climate Policy

Next events

OKT 08	Workshop Dutch Offshore Wind Energy	868
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Data Borssele

The tenders for wind farm sites Borssele I & II, Borssele III & IV, and Innovation Site V have been closed and awarded in 2016 and 2018. You will find all data for wind farm sites Borssele I, II, III, IV and V via the next link: [Data Borssele](#).

Wind & Water Works

The name of this campaign conveys a clear message and reflects the expertise and professional approach of Dutch companies and government bodies in the field of wind energy at sea. Wind & Water Works demonstrates how Dutch companies are now applying their offshore expertise developed over many years to offshore wind energy.

[See more about Dutch Offshore Wind](#)