



**Pondera's experience
for Estonian
wind energy development**

Sõbrapäeval...



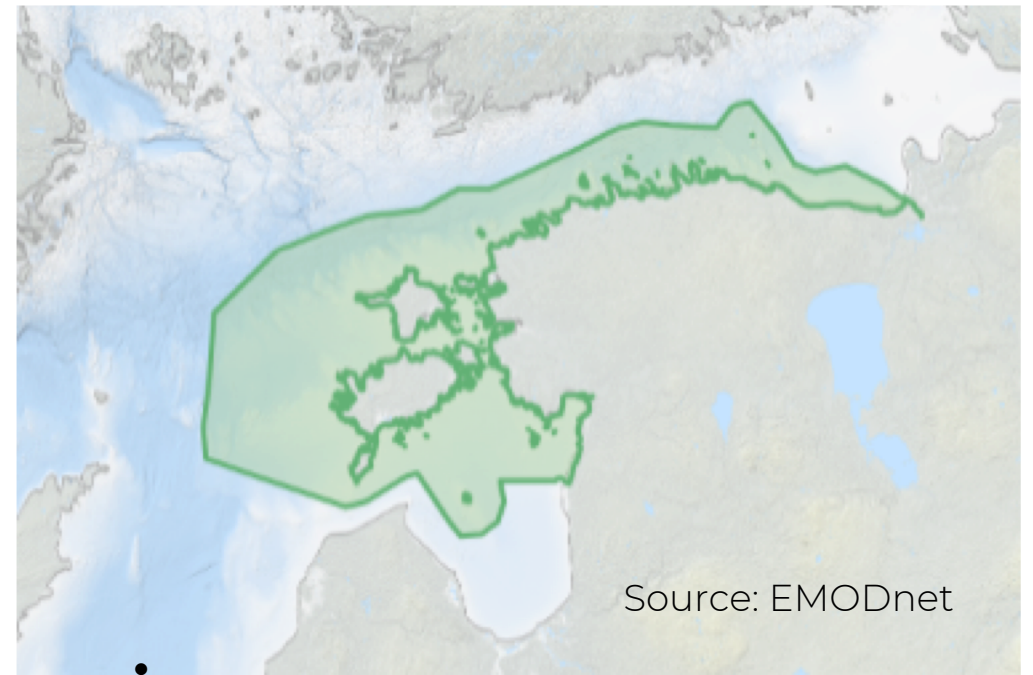
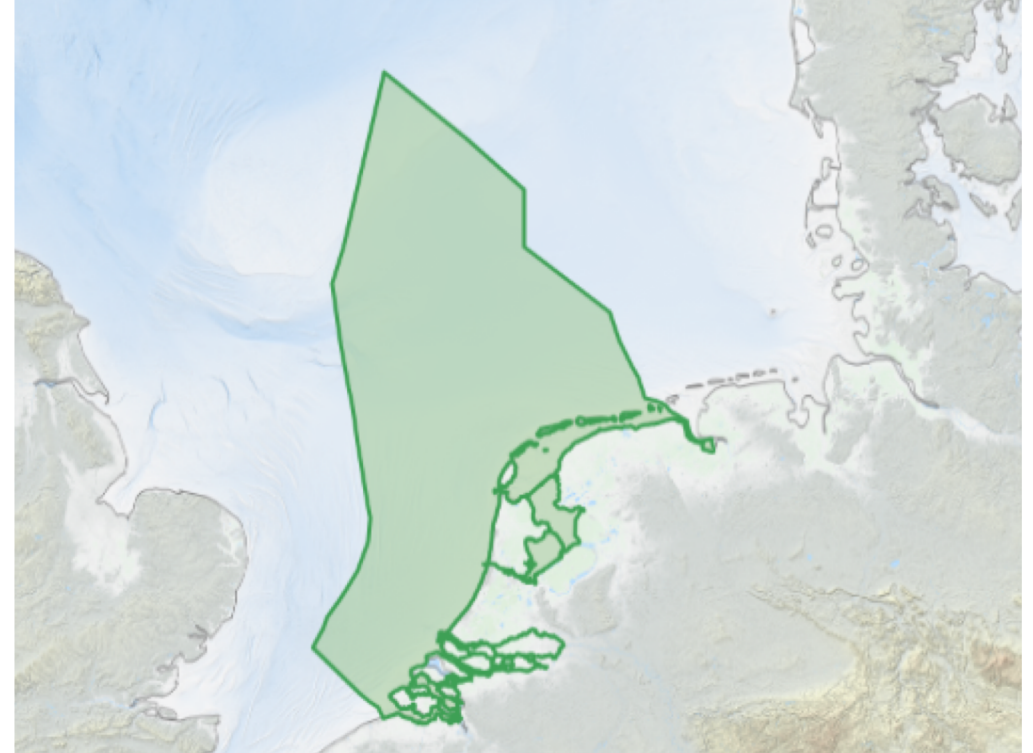
Estonia The Netherlands

Area (land) 45.339 km² 41.865 km²

EEZ 37.000 km² 57.000 km²

Coastline
(WFB/WRI) 3.794 km /
2.956 km 451 km /
1.914 km

Population (2024) 1.373.101 18.019.400



The Netherlands exceeds the 2023 offshore wind target

Published on: 9 November 2023

The Netherlands will exceed the target set in its Offshore Wind Energy Roadmap 2023 this year. The country's first offshore wind roadmap follows the Dutch Energy Agreement signed ten years ago. It sets the goal of 4.5 gigawatts (GW) of installed capacity by the end of 2023. However, the Netherlands is on its way to having 4.7 GW up and running by December 2023.

<https://english.rvo.nl/news/netherlands-exceeds-2023-offshore-wind-target>

A long road...



At Pondera, we envision a world powered solely by renewables.

As a recognized and leading consultancy, our devoted team pushes for new frontiers in sustainable energy generation, transport, conversion, and storage.

Our work transcends borders, through international collaboration and with innovative solutions we pioneer in renewable energy.

We are Pondera: pursuing new horizons in renewable energy.



Consultancy services - Offshore Wind



Early-stage development

- Technical Due Diligence
- Wind Resource Assessment and modelling
- Layout optimization
- Grid connection studies
- Environmental Impact Assessment (EIA)
- Permitting / consenting
- Stakeholder engagement
- Market entry assessment



Tender Management

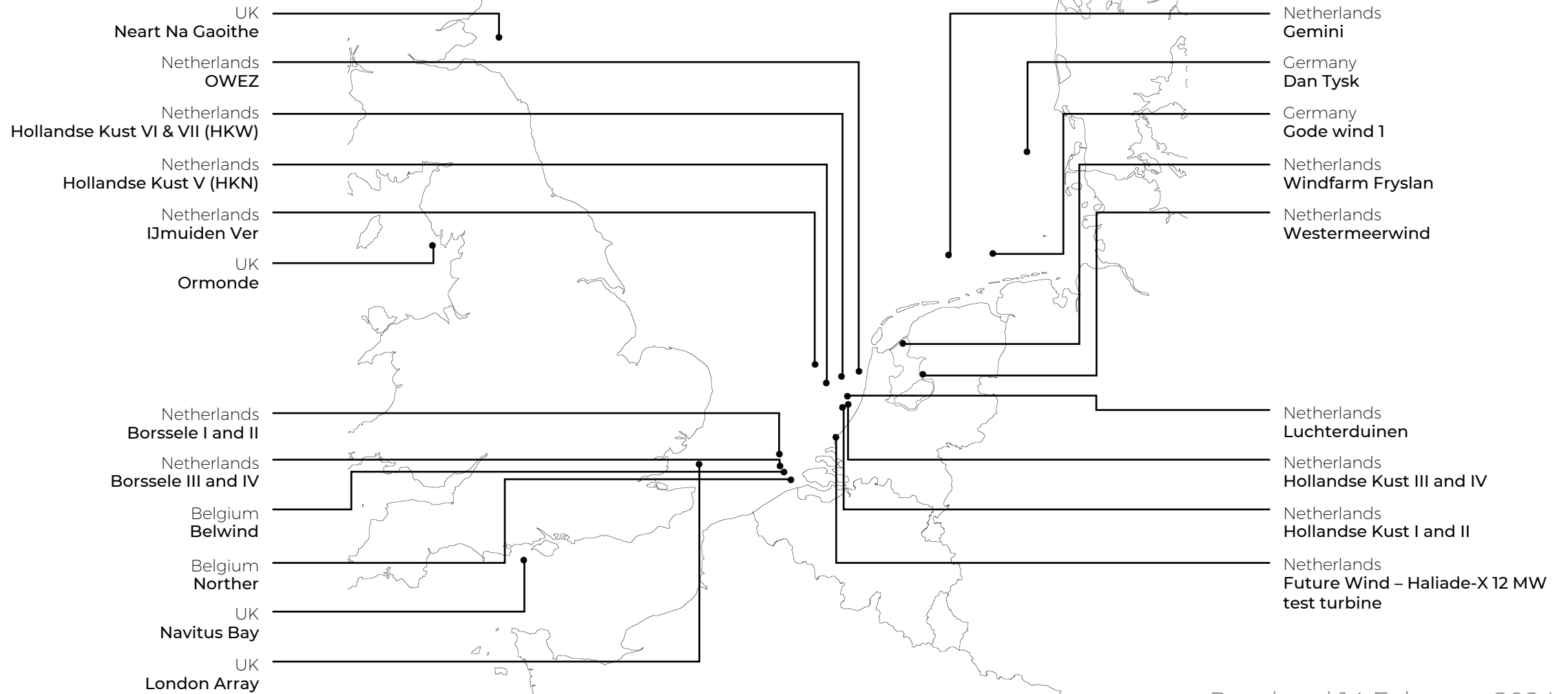
- Tender / contract strategy
- Strategy storyline
- Bid writing
- Manage tender processes
- Compliance checks
- Procurement / contracting



Project Delivery

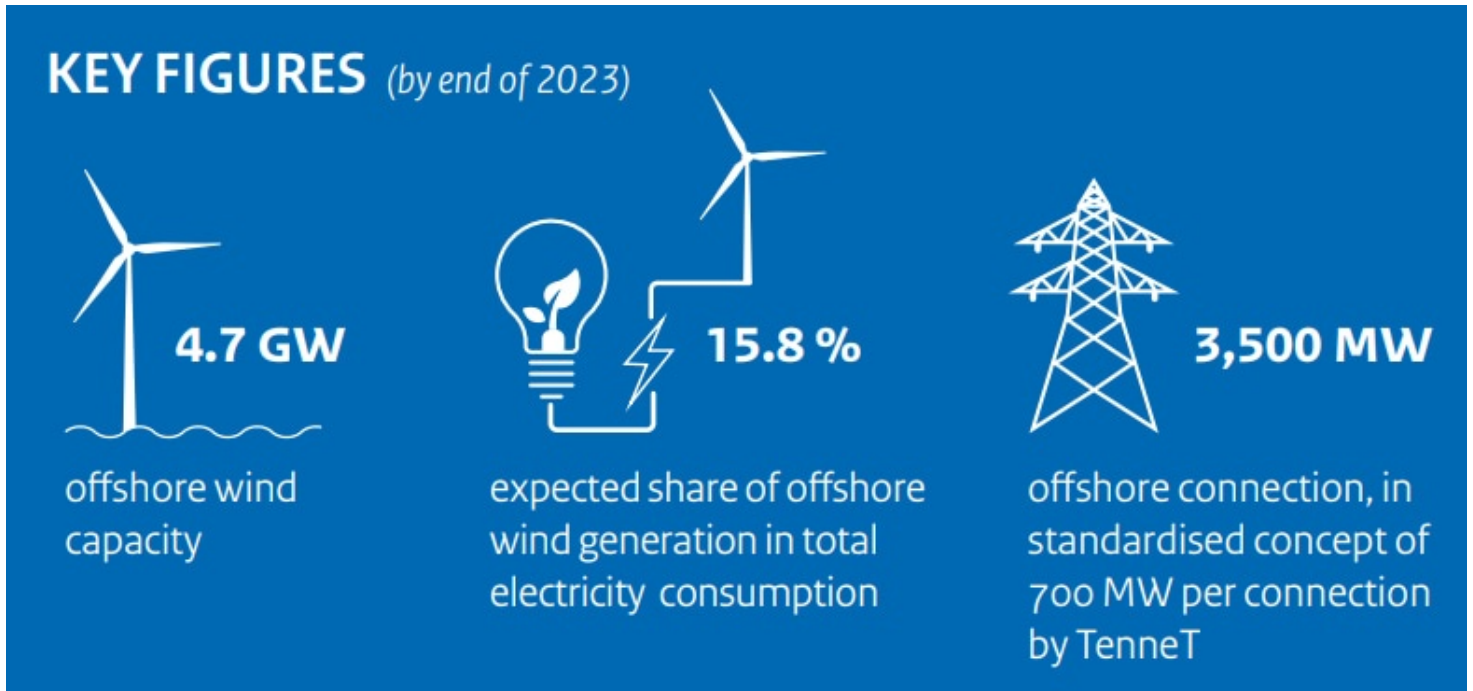
- Risk Management
- Execution planning
- Package management
- Owners' Engineering
- Permit management
- Key personnel
- Works supervision
- Construction management
- Contract management

Our offshore projects in the North Sea



Dutch offshore wind energy: current situation

~4,7 GW operational
~1,5 GW under construction
~4,0 GW tender phase (2024)
~11 GW planned



source: offshorewind.rvo.nl

Dutch offshore wind energy: high ambitions

Roadmap shows current and future Wind Farm Zones with cable routes for offshore grid.

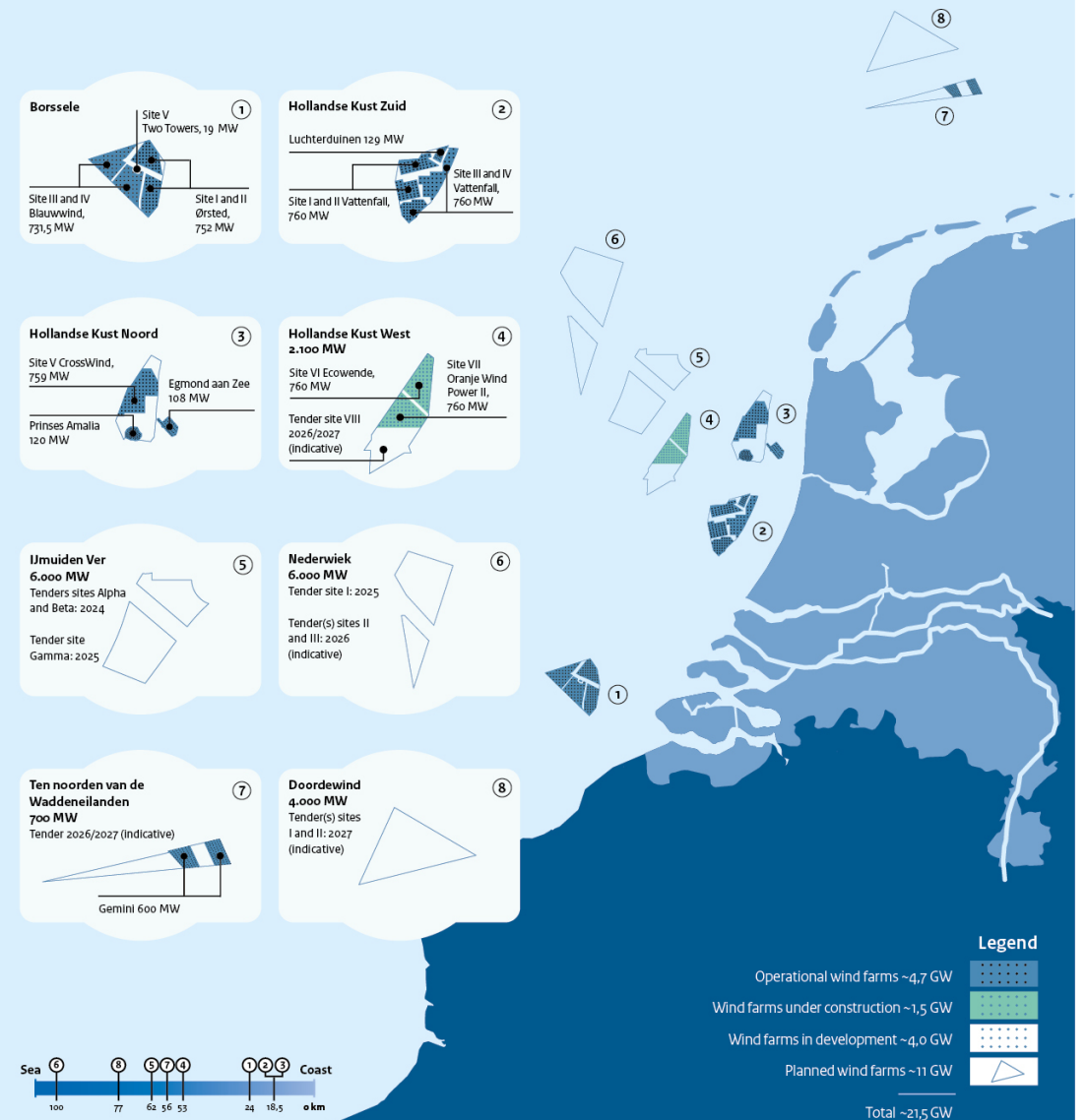
Roadmap provides clarity to all stakeholders and certainty for wind farm developers

Installed 4,7 GW in 2023

~21,5 GW in 2030 : 15 GW to tender

~72 GW in 2050 : 66 GW to tender

Offshore Wind Energy Roadmap



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Offshore Wind Energy Roadmap

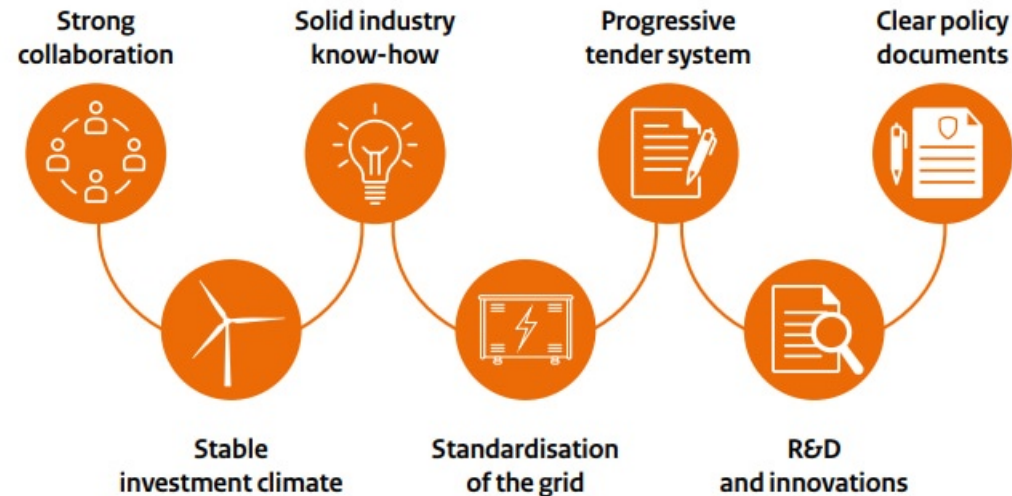
with cable routes from the offshore grid



Dutch offshore wind development: key drivers

An integrated approach with a proactive government policy:

1. Strong collaboration
2. Stable investment climate
3. Solid industry know-how
4. Standardisation of the grid
5. Progressive tender system
6. R&D and innovations
7. Clear policy documents



<https://english.rvo.nl/news/netherlands-exceeds-2023-offshore-wind-target>

De-risking projects

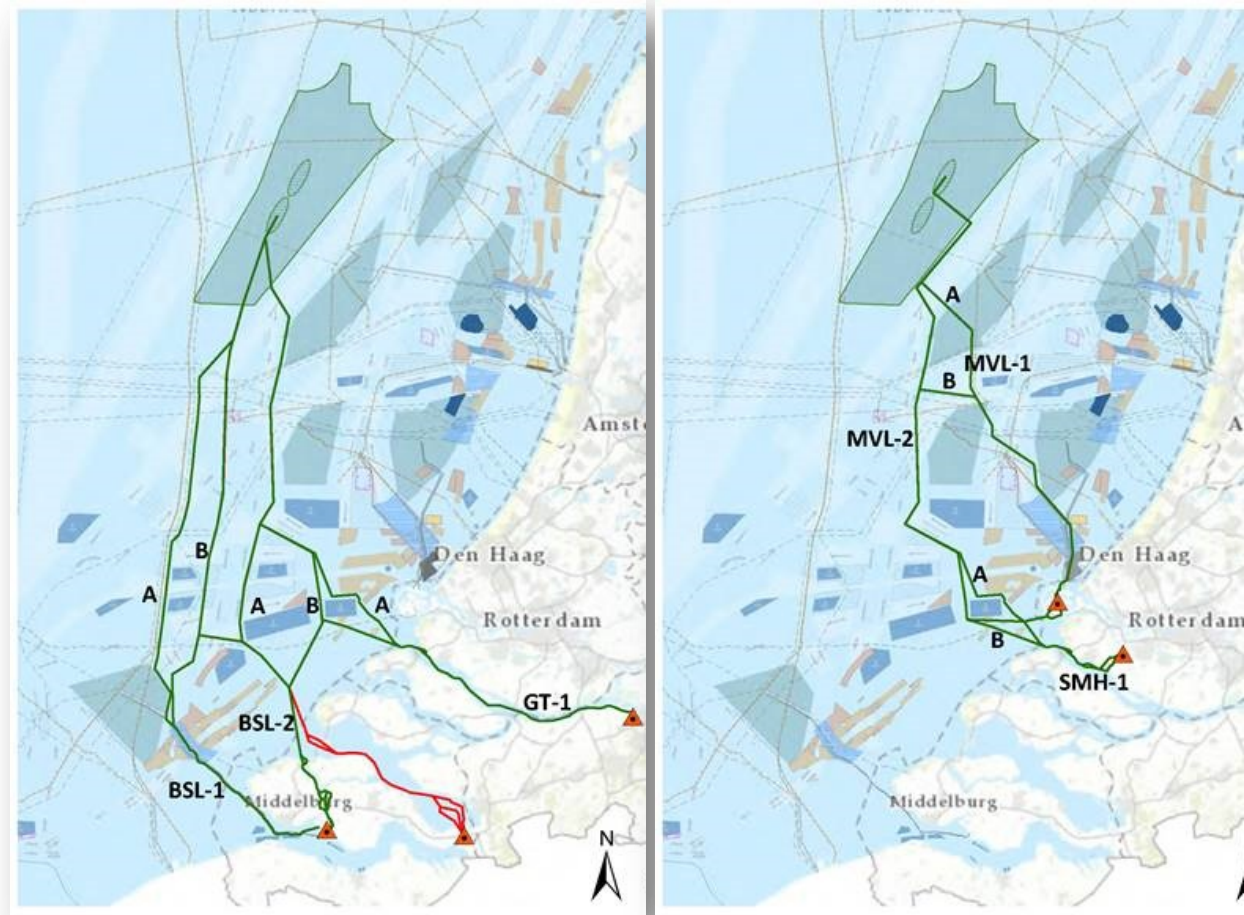
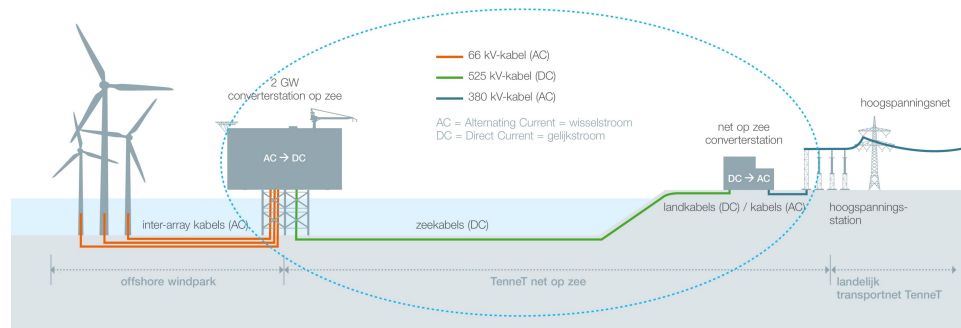
- Marine spatial planning (MSP) by government
- First solve stakeholder acceptance issues (fisheries, ecology, communities, shipping, etc.)
- Place risks where they can be controlled, e.g. solve grid connection
- Mitigate Environment, Social and Governance (ESG) risks and impacts (IFC cat. A).
- EIA studies for early and reliable risk assessment
- Optimize wind farm design using advanced modelling



Wind farm IJmuiden Ver offshore grid connection

TSO TenneT responsible for offshore grid (3x2 GW DC)

Pondera drafted the Environmental Impact Assessment and integral effect assessment, prepared the permit applications for the platform, offshore and onshore cables and substations, supported stakeholder management

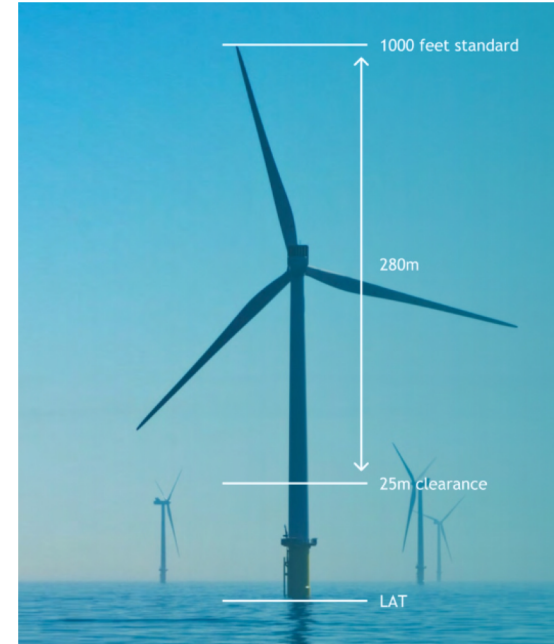


Standardization

700 MW Substation

66 kV inner park cabling, standardized 700 MW AC offshore substation, 220 kV AC export cable.

> minimize costs and increase reliability



North Sea Standard (2023)

Max. tip height: 1,000ft | 305m above mean sea level (MSL), min. clearance 25m

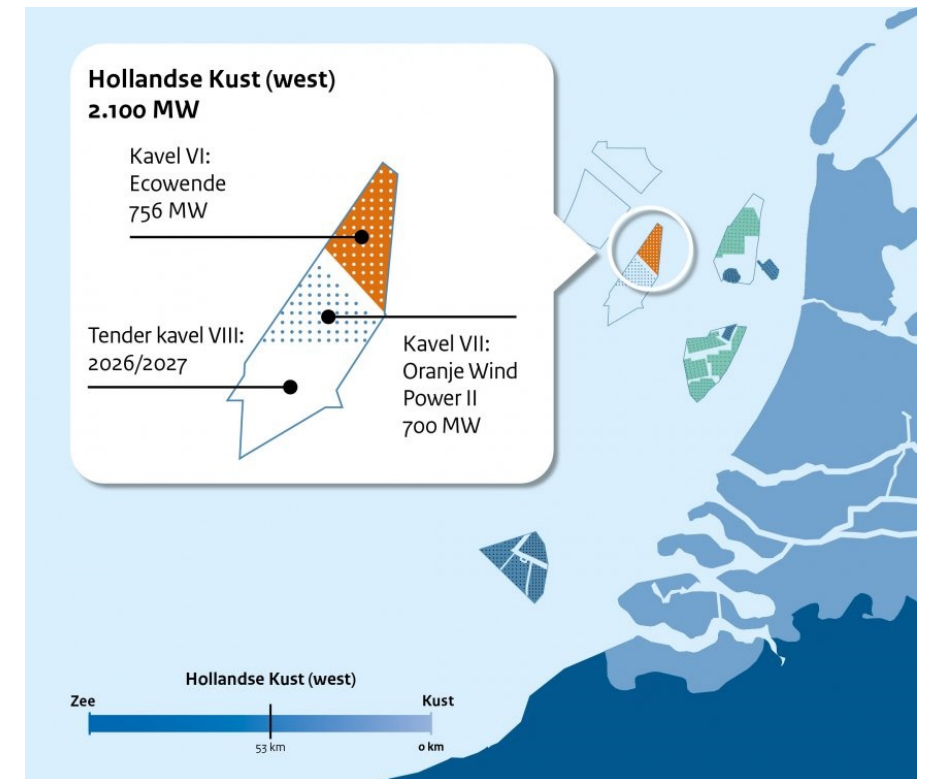
Min. installed capacity per foundation: 14 MW

Tenders as of today (IJVER Alpha and Beta), until built and commissioned 2037

> capture scale economies and deliver

Tender management for HKW “Holland Coast West”

- 1400 MW: 2 sites of 750 MW each
- Fully permitted and surveyed sites
- Permits for hydrogen hub & floating solar
- Comparative assessment (point-based evaluation)
 - financial offer
 - certainty of (fast) realisation
 - maximalisation of energy production
 - site criteria (ecology, system integration)
- Innovation (hydrogen, floating solar, battery storage, nature inclusive design, etc.)



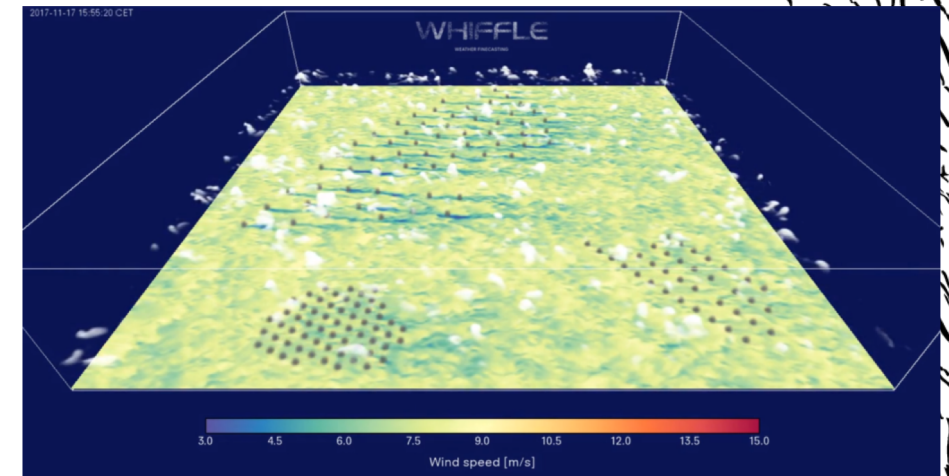
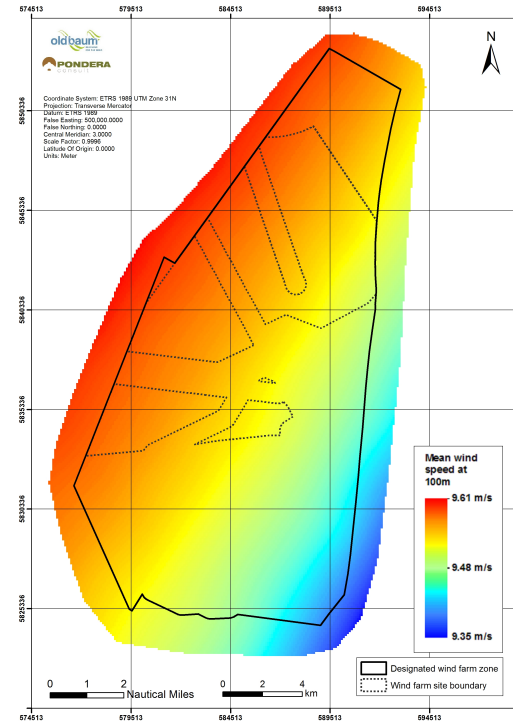
Map source: Ministry of Economic Affairs and Climate Policy / RVO

Innovations: GRASP

- Traditional offshore wind resource measurements are expensive
- Solution: combine onshore wind measurements with advanced modelling
- Pondera uses high-resolution local weather model and LES with Whiffle's GRASP-model (10-140m horizontal grid)

Take away:

SAR-data with GRASP can help reduce costs in the OWF development stage, e.g. WRA for site lay out / deep wakes

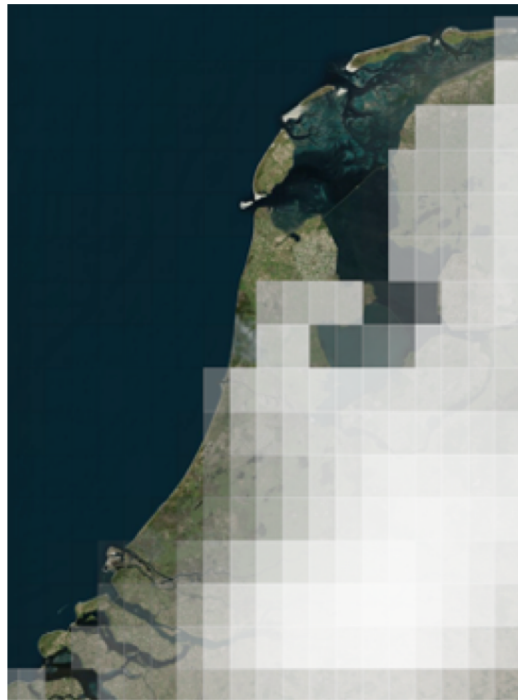


LES: High-resolution weather model

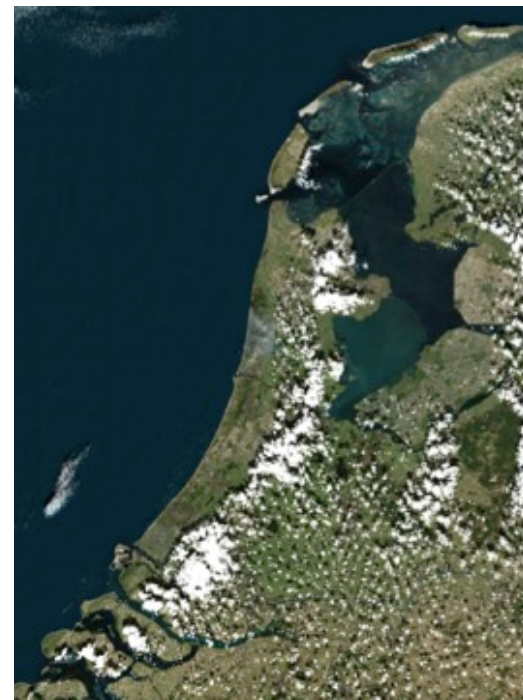
Real situation:
Satellite image



Traditional
weather model



GRASP

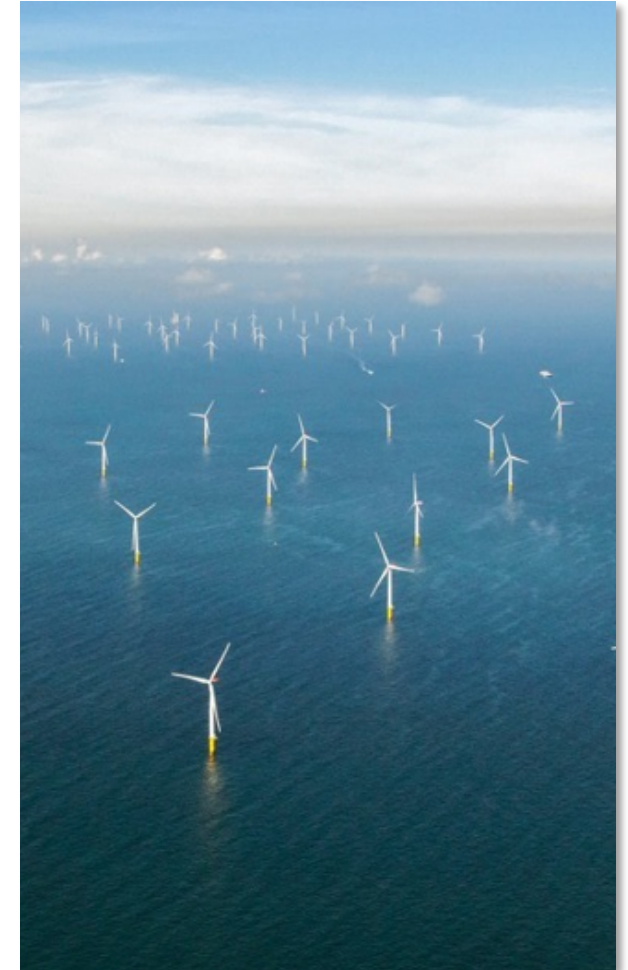


Dutch

Looking at lessons learnt in wind energy

An integrated approach to de-risk projects:

1. Provide certainty (*marathon*: large, complex, long lead times)
2. Delve into the specifics of the site (from an early stage)
3. Mitigate ESG impacts > enhance nature
4. Use tender management for winning bids (non-price criteria)
5. Consider standards for costs reduction
6. Take advantage of innovations in data and modelling
7. The power of collaboration in the supply chain





Together we push for new frontiers in sustainable energy generation, transport, conversion, and storage.

We are Pondera – Pursuing new horizons in renewable energy.

Meet us @ Estonian Wind Energy Conference



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