ECOWENDE
Windpark Hollandse Kust West

Reef restoration HKW VI

NERA netwerkdag - November 7th, 2024

Pauline Roos
Marine ecologist

Agenda

01 **Introduction Ecowende**

02 **Sabellaria mapping & restoration**

03 **Scour protection**

04 **Nature inclusive design on cable crossings**

05 **Questions?**

Introduction Ecowende

01

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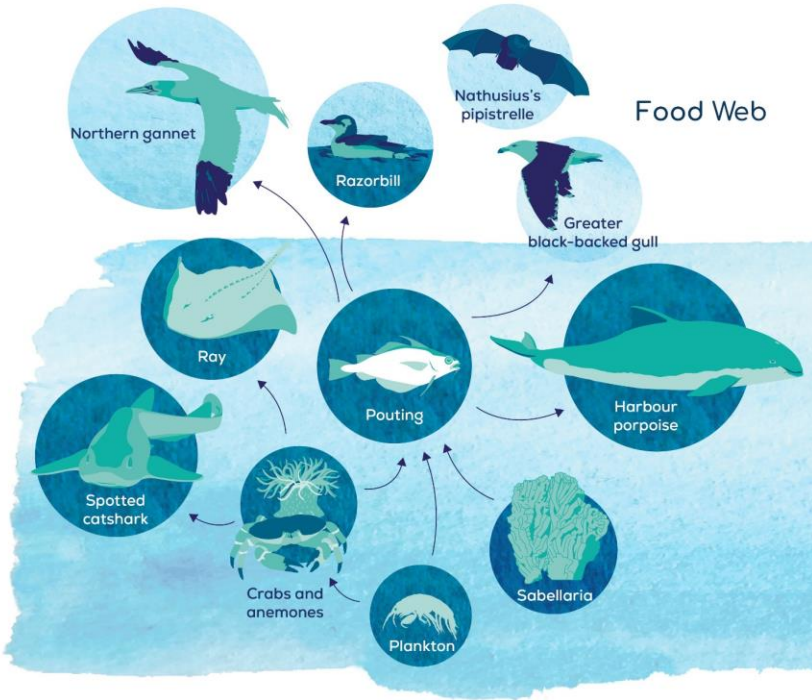
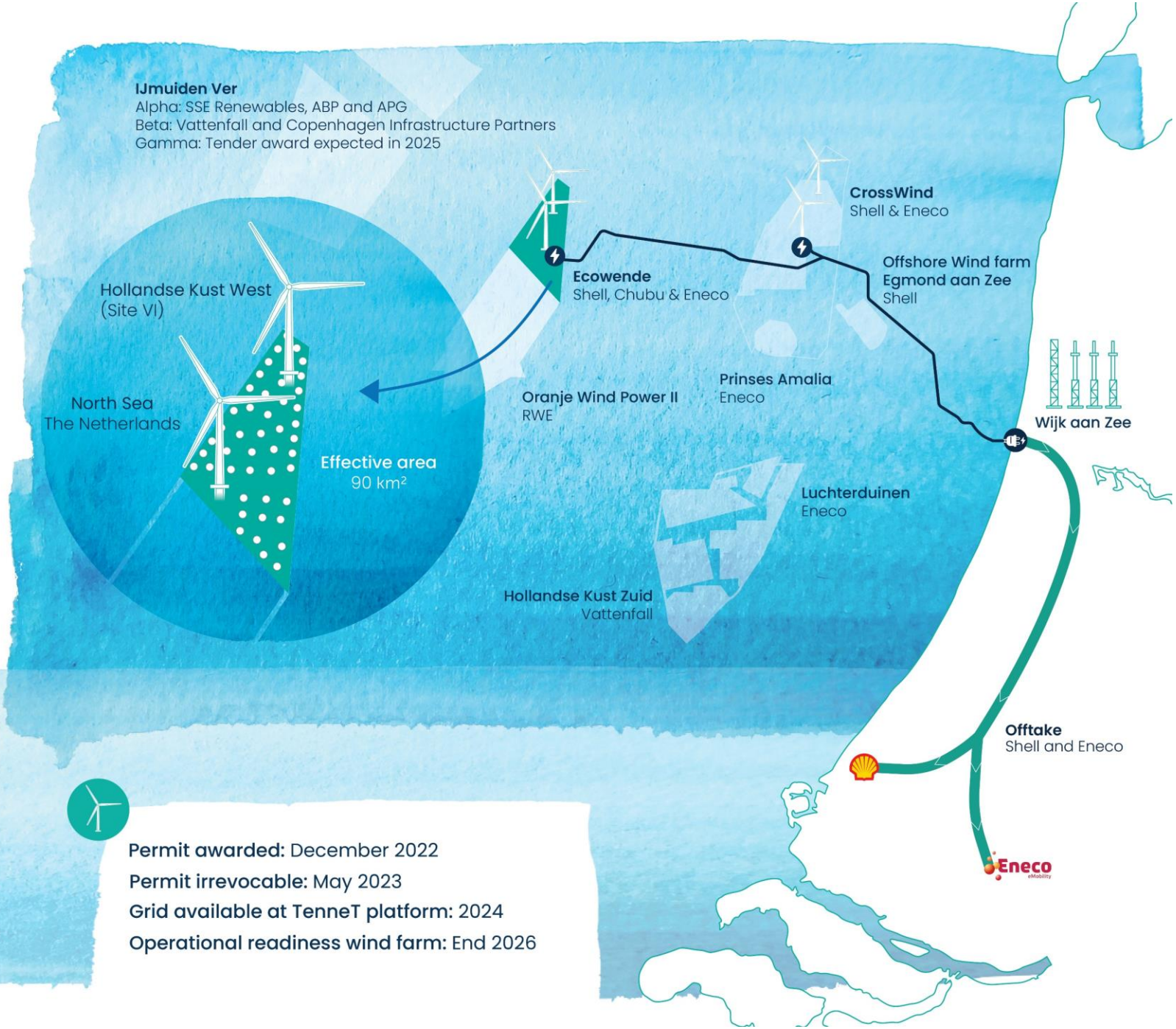
Hollandse Kust West

Specifications

Location: 53 km from IJmuiden
Operational capacity: 760 MW
Production: 3.3 TWh/year
Average wind speed: 10 m/s
Water depth: 26-30 m
Good soil conditions: sand





Permit awarded: December 2022
Permit irrevocable: May 2023
Grid available at TenneT platform: 2024
Operational readiness wind farm: End 2026

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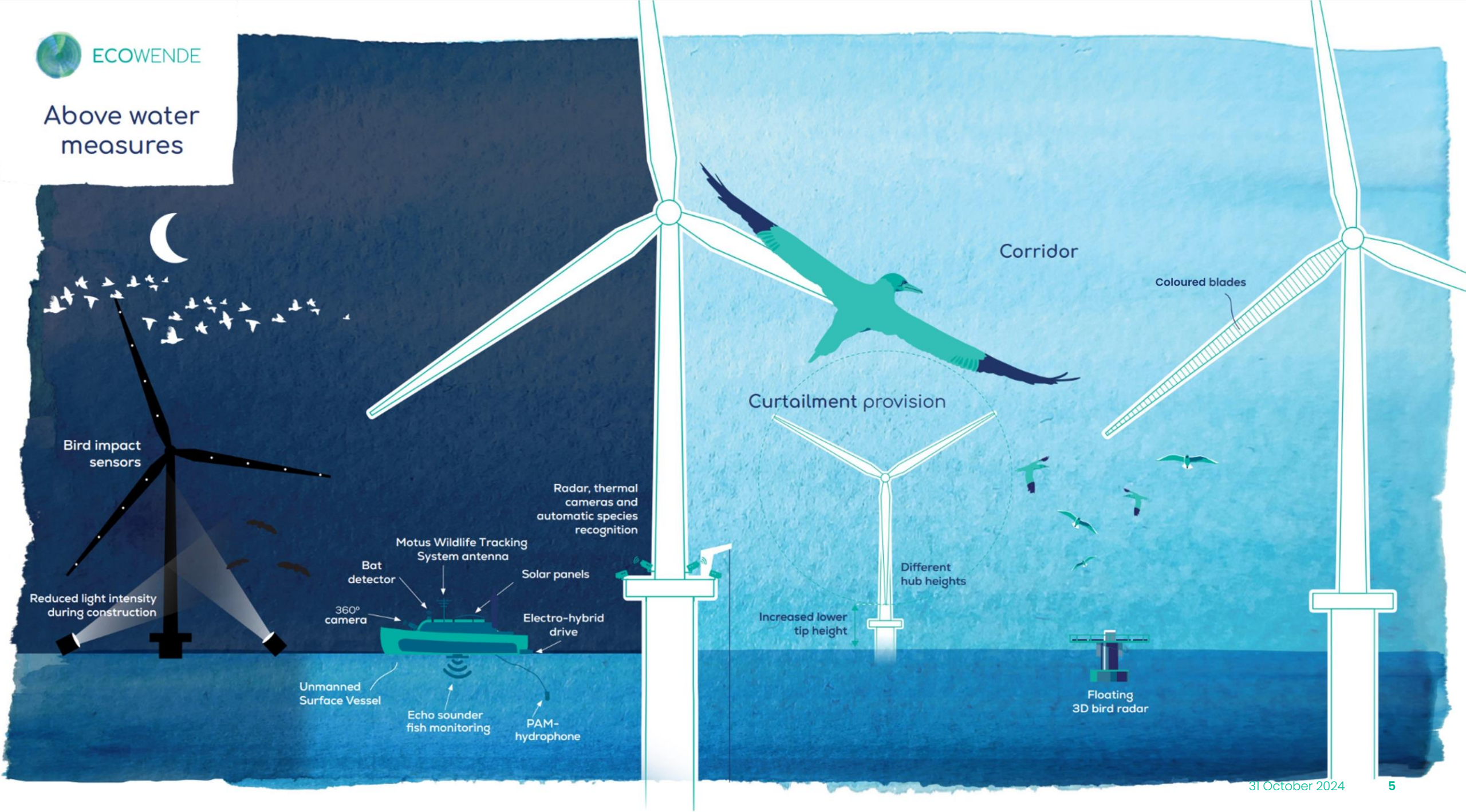
Above water measures



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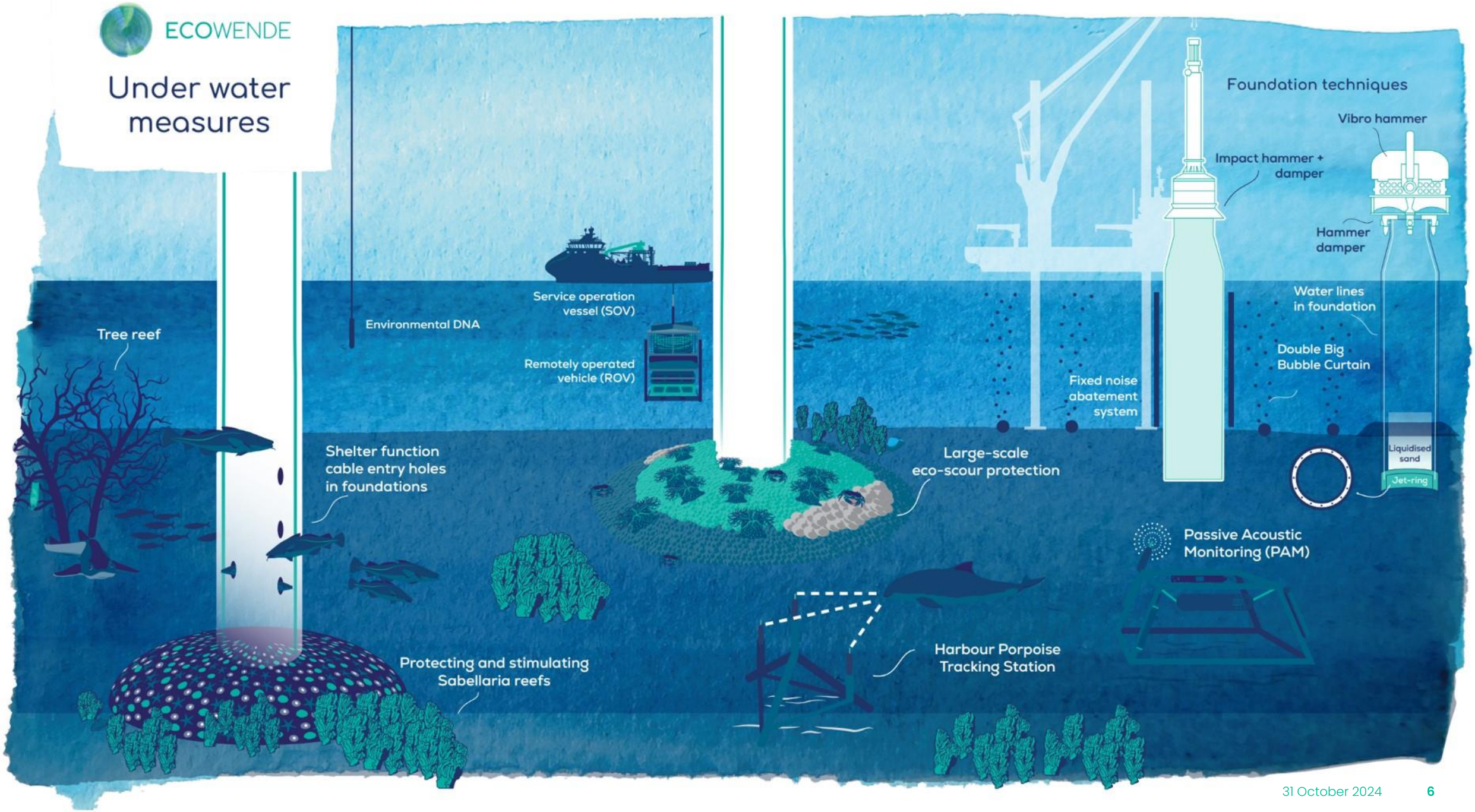
Under water measures



Partners

Vestas

Sif OFFSHORE FOUNDATIONS

robin radar systems

WAARDENBURG Ecology

GBM Works

SEAMARCO SEA MAMMAL RESEARCH COMPANY

RAMBØLL

MIDO

Van Oord Marine ingenuity

PONDERA

NIOZ

HUB Ocean Centre for the Fourth Industrial Revolution

WATER PROOF

DHI

WAGENINGEN UNIVERSITY & RESEARCH

Shareholders

Shell
CHUBU Electric Power
Eneco

Government

Ministerie van Economische Zaken en Klimaat
Rijkswaterstaat Ministerie van Infrastructuur en Milieu
Rijksdienst voor Ondernemend Nederland
Staatstoezicht op de Mijnen Ministerie van Economische Zaken en Klimaat
Ministerie van Infrastructuur en Waterstaat

Neighbours

oranjewind
CROSSWIND
wintershall

TSO

TenneT

Main contractors

Vestas
Van Oord Marine ingenuity
GBM Works
Sif OFFSHORE FOUNDATIONS
SPT OFFSHORE
BUSS
Zeehaven IJmuiden NV
RAMBOLL
TKF
Proeon SYSTEMS

ECOWENDE

3rd Party Data Platforms

Informatiehuis Marien
HI IR Ocean
ICES CIEM
EMODnet European Marine Observation and Data Network

Ecology Partners

WATER PROOF
WAARDENBURG Ecology
PONDERA
Seamarco
HI IR Ocean
DHI
MIDO
TNO innovation for life
bat
dtbird dtbat
robin radar systems
BLIJDORP ROTTERDAM ZOO
DE OUDE BIBLIOTHEEK ACADEMY
IUCN
COGNITE

Academia

WAGENINGEN UNIVERSITY & RESEARCH
NIOZ

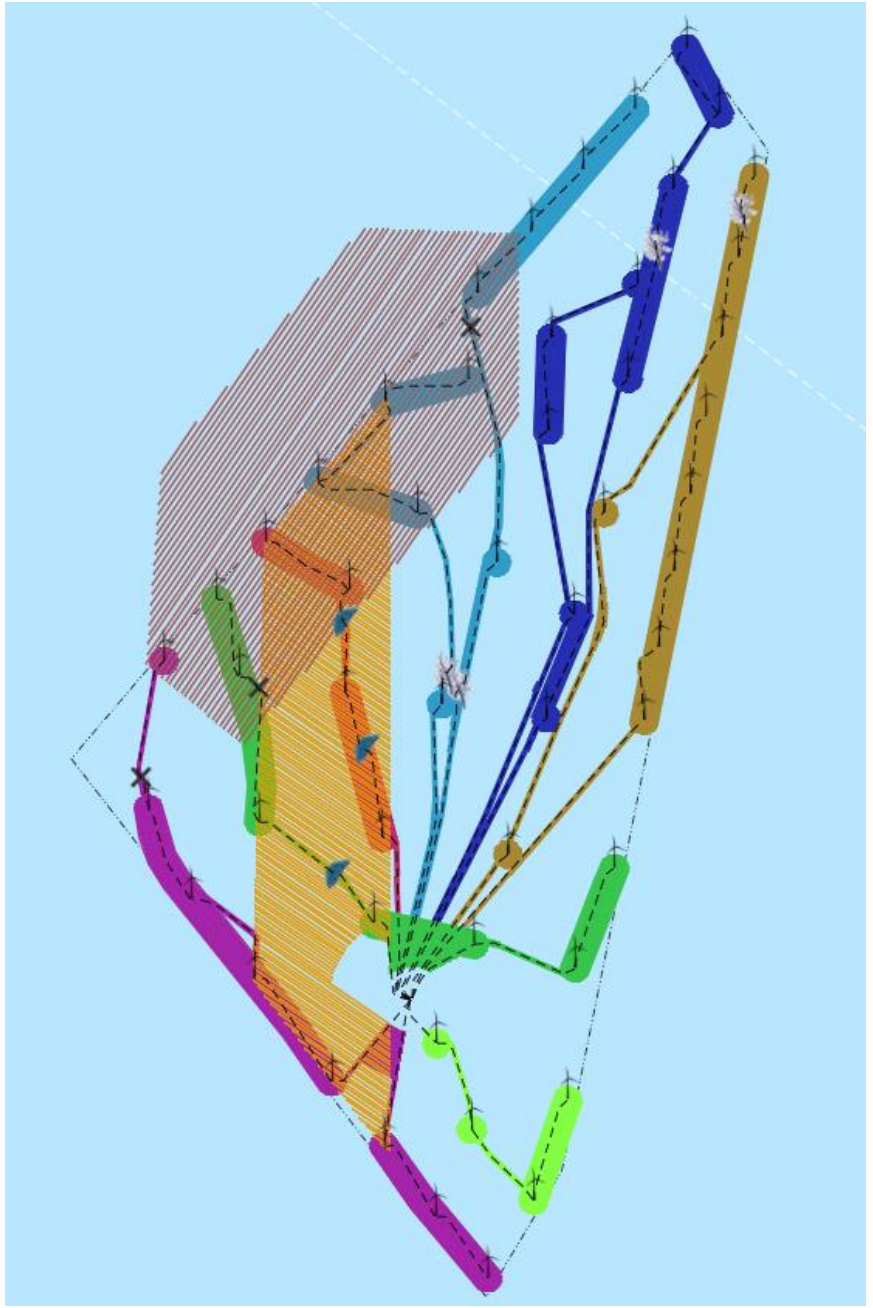
Sabellaria mapping & restoration

02

Sabellaria Roadmap

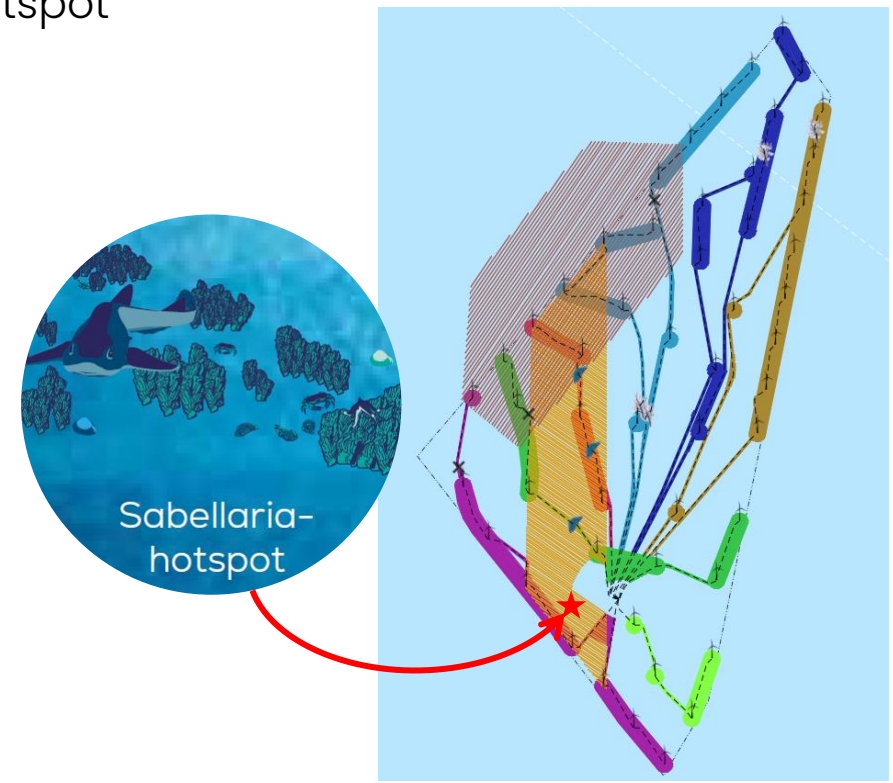
Step 1:

- According to MONS approach (ID56)
- MBES/SSS Survey just completed
- Visual ground truthing in 2025



Sabellaria Roadmap

Step 2: Protect previously confirmed Sabellaria hotspot

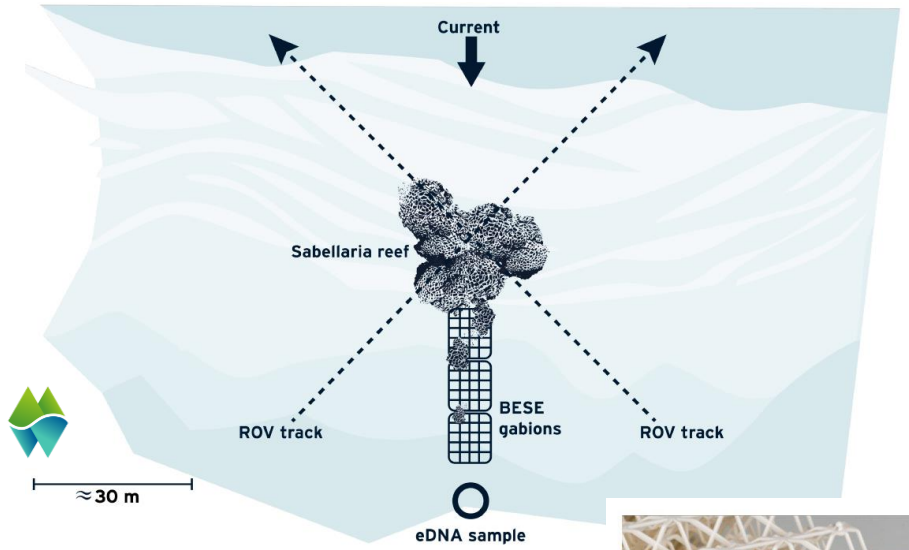


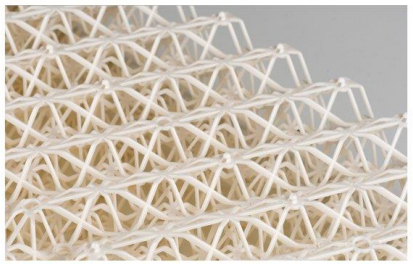
Step 3: Micro-siting where possible

- Where possible we will avoid Sabellaria reefs with the installation of our cables
- A balancing act between engineering timelines and the opportunistic nature of Sabellaria

Sabellaria Roadmap

Step 4: Sabellaria restoration (including monitoring)





Step 5: Sabellaria transplantation experiment

- After settlement of Sabellaria on BESE elements one or a few will be transplanted at least 50m away.
- Goal is to determine if transplantation could be a succesful Sabellaria restoration method for future projects.

Sabellaria Roadmap

Step 6: Plan B

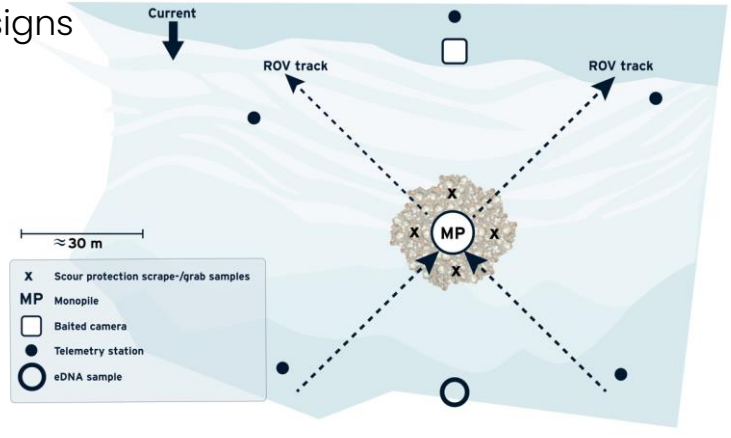
Lanice conchilega

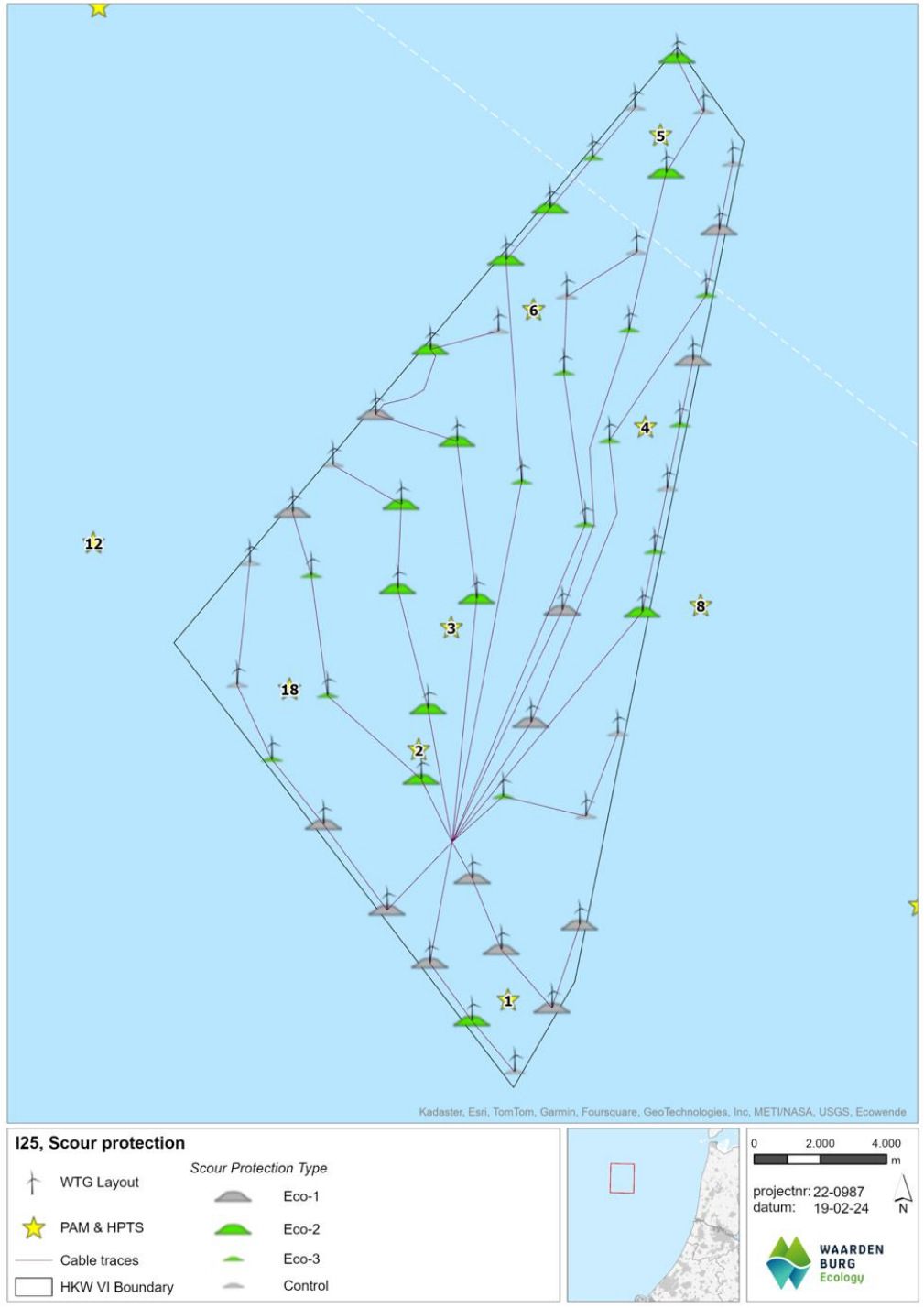
03

Scour protection

Scour protection

- Four designs distributed evenly across the farm. Experimenting with:
  - Rock sizes
  - 3D complexity (rock berms)
  - Geometry (bays to increased perimeter and complexity in shape)
- Large scale monitoring at 24 monopile locations
  - ROV monitoring
  - Scrape/grab samples
  - Baited camera
  - Vemco telemetry & fish tagging
  - eDNA
- PhD to assess effectivity of designs





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Nature inclusive design on cable crossings

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Nature inclusive design on cable crossings

- 4 cable crossings large scale artificial TreeReefs
- 3 cable crossings with oyster hubs
- 3 ‘regular’ cable crossings for reference

TreeReefs

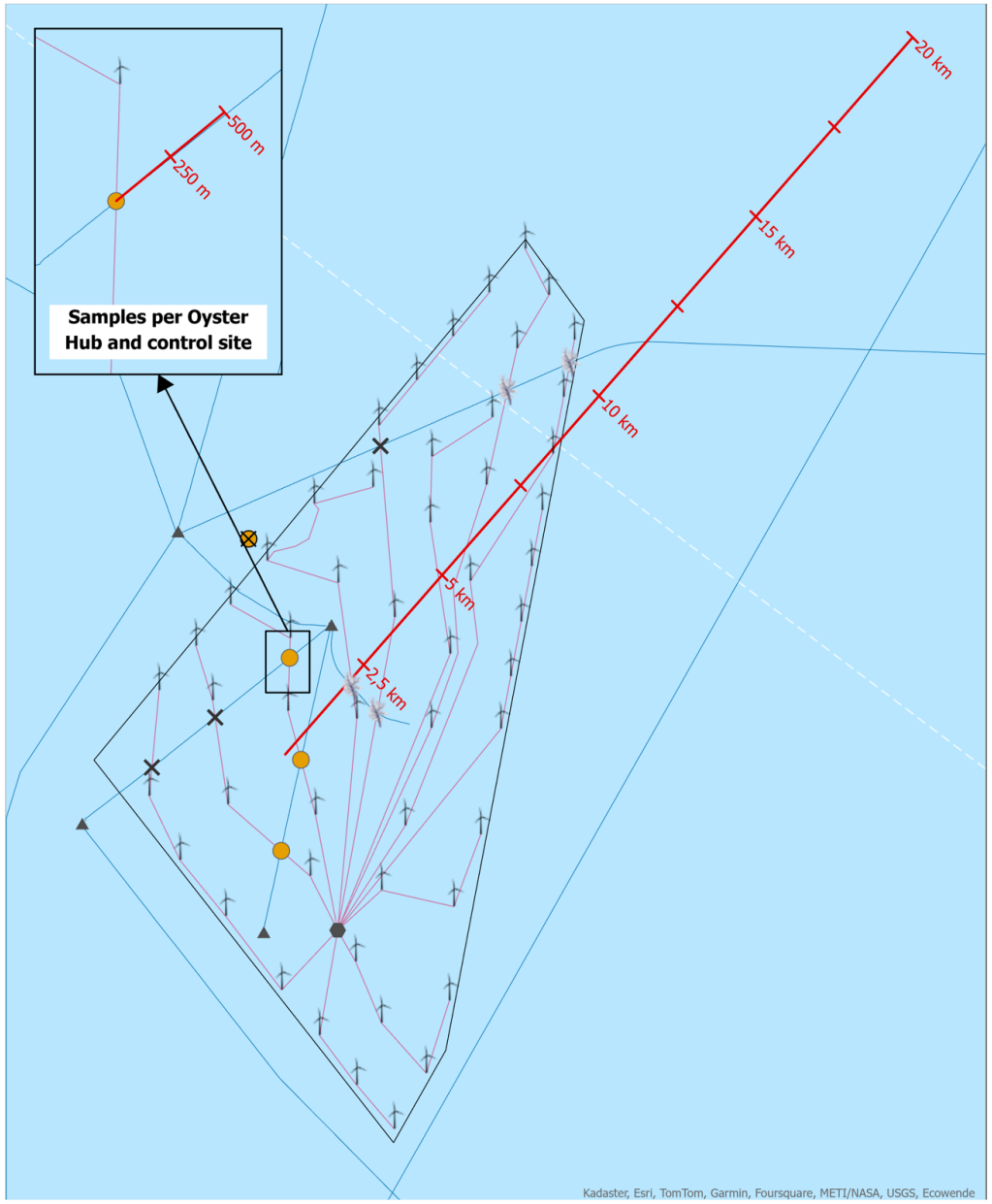
- Roughly 1000 fruit trees divided over 4 crossings
- Hoistable sub frames for visual monitoring and strength tests on deck
- Reef stimulating paste applied to a subset of trees
- Large scale monitoring of all reefs
  - ROV monitoring
  - Visual monitoring on deck
  - Scrape/grab samples
  - Baited camera
  - Vemco telemetry & fish and Decapod tagging
  - eDNA
  - Mechanical strength test
  - Acceleration sensors
  - Downwards looking echosounder
  - Abiotic & hydrodynamic parameters
  - Stable isotope analysis
- PhD to assess effect on biodiversity and stability of reefs

Photo by Oscar Franken NIOZ

Oyster hubs

- Roughly 1500 oysters divided over 3 crossings
- Monitoring of spawning events
  - Larvae sampling
  - ROV monitoring

Photo of oyster tables Luchterduinen



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Any questions?