Nature-inclusive design offshore grid - WindEUROPE

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Drivers for NID

National and international

- **Marine Strategy Framework Directive (MSFD)** as it is legislation of the European Union put in place to protect the marine ecosystem and biodiversity upon which our health and marine-related economic and social activities depend.
- **United Nations Sustainable Development Goals (SDG)**, an agenda developed and adopted by all United Nations member states to act as a blueprint for peace and prosperity for people and the planet, now and into the future. TenneT entire business revolves around SDG 7 - affordable and clean energy.
- **The OSPAR convention (Oslo and Paris Conventions)** as it is aimed at the protection and conservation of the North-East Atlantic and its resources). Specifically, the parameters are matched to the OSPAR Guidance on Environmental Considerations for Offshore Wind Farm Development.
- **The Nature Restoration Law** which went into force in 2024, aimed at restoring degraded ecosystems
- **Aandeelhoudersbeleid Staatsdeelnemingen** by Ministry of Finance. Revised policy with explicit focus on CSR
- **The Development framework for offshore wind energy** by the Ministry of Economic Affairs. Specifically, chapter 3.12: "*Shared services en natuur-inclusief ontwerp*".

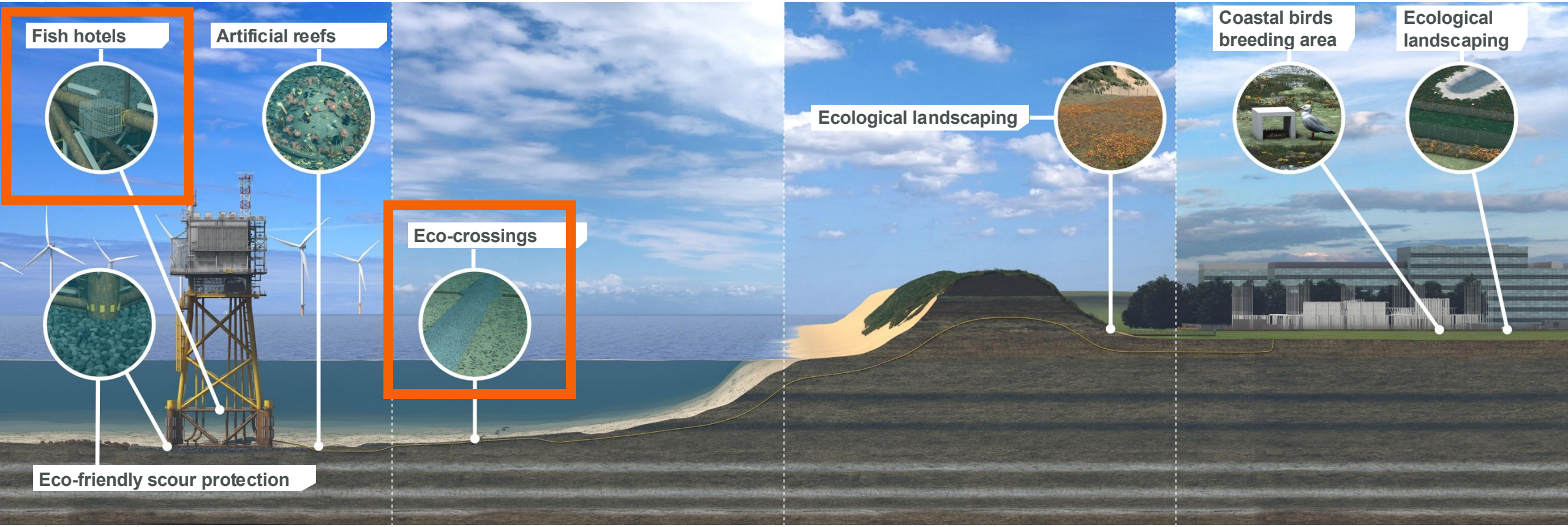
End goal

Actively contribute to the conservation and restoration of the southern North Sea ecosystem, fostering native biodiversity and biomass by using sustainable environmental practices.

As much as reasonably possible, taking into account:

- Technical feasibility
- Risk
- Costs (comparable to park developers)
- Project specific circumstances

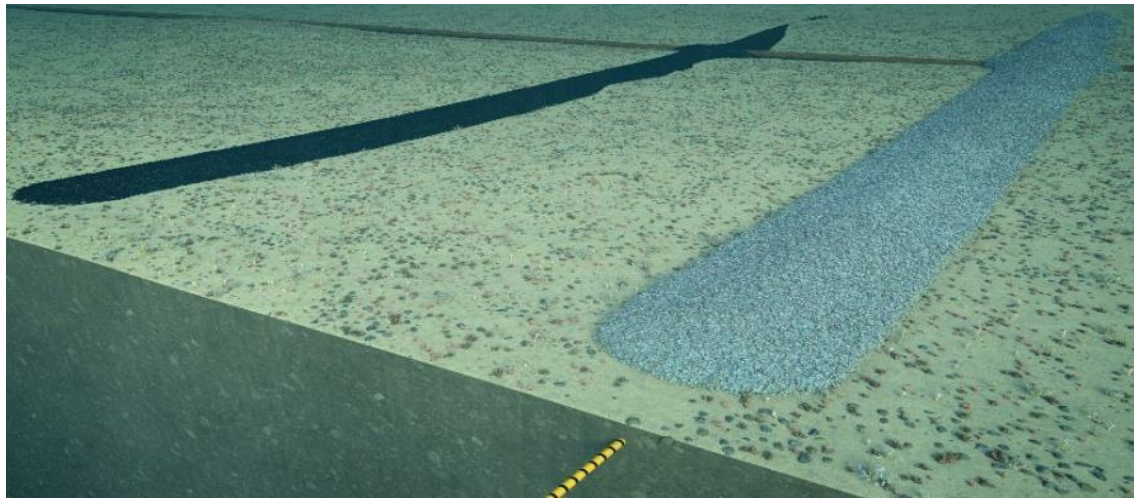
Nature-inclusive design



Eco-crossings

Cable crossings export cables Hollandse Kust (zuid)

Installed in 2021



- **Aim**
  - Research the effect of implementing calcareous rock in cable crossing design
- **Why**
  - Lab research shows calcareous rock might attract more shellfish larvae (improve settlement)
- **What was done**
  - Installing and monitoring 3 cable crossings with a granite sprinkler layer, and 3 with a marble sprinkler layer (calcareous rock)

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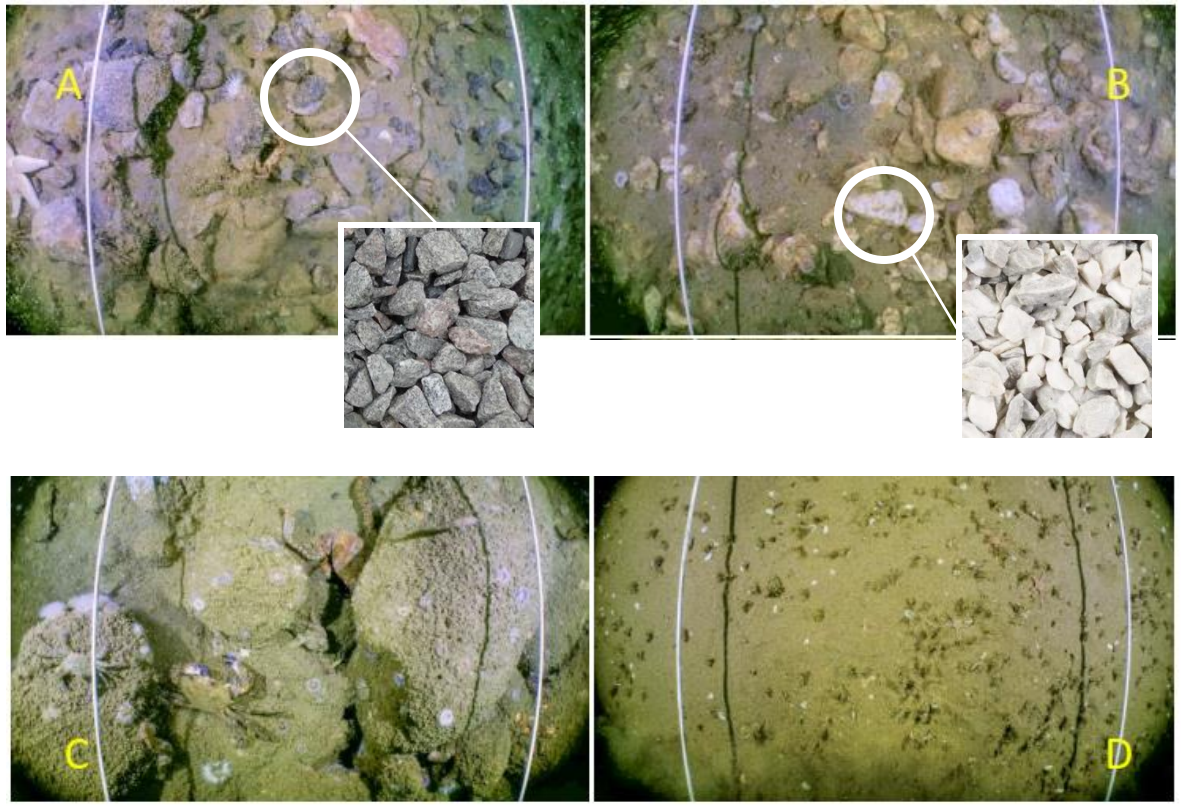

- **Monitoring – technical aspects**
  - Drop-cam monitoring in 2022, 2023, 2024
  - Analysis of video stills
  - Sprinkler layer largely gone (scattered), armour layer often visible

Eco-crossings
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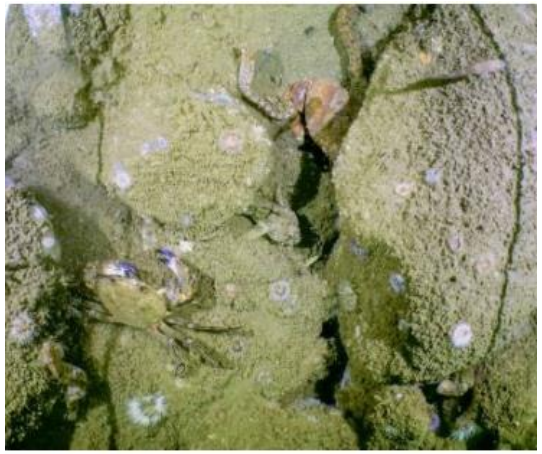


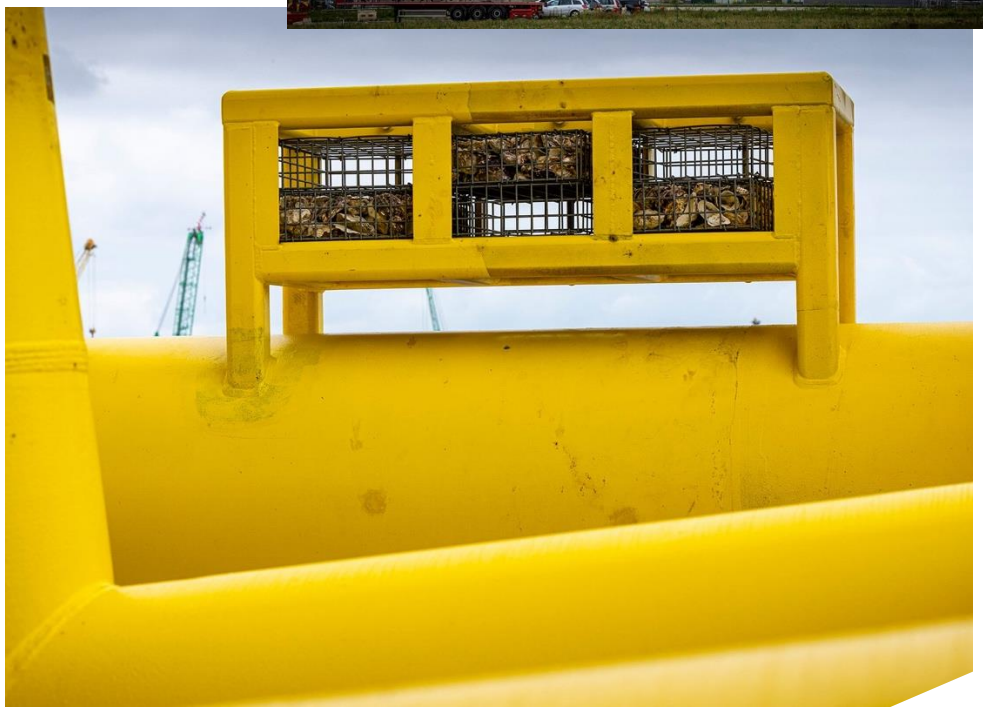
- **Monitoring – ecological observations**
  - Biodiversity (species richness) higher on hard substrates than on surrounding sand
  - Crossings with a marble sprinkler layer did not support higher numbers of species
  - Habitat requirements for species (stable substrate, shelter) seem to be **provided by the armour layer, <u>not</u> the sprinkler layer**
  - **Stability / elevation** in this case more important than rock type

Eco-crossings
Cable crossings export cables Hollandse Kust (zuid)

- **Next steps**
  - 2026: another monitoring round (year 5 after installation)
  - Expanding:
    - As part of NL Roadmap 2030+, many more cable crossings to be installed
    - Review design; exploring removal sprinkler layer and/or safety zone (legislation)
  - Enriching:
    - Implementation of other NID options on cable crossings, e.g. contributing to flat oyster restoration.

Fish hotels
Platform Hollandse Kust (noord)
Installed in 2021

- **Aim**
  - Provide durable resting and spawning locations for fish (provide shelter)
  - Contribute to biodiversity around platforms
- **Why**
  - General: biodiversity in decline
  - Especially juvenile fish vulnerable to predation
- **What was done**
  - Frame with 3 ‘biohuts’, attached to jacket foundation of Hollandse Kust (noord)
  - Placed at 6-7 m elevation

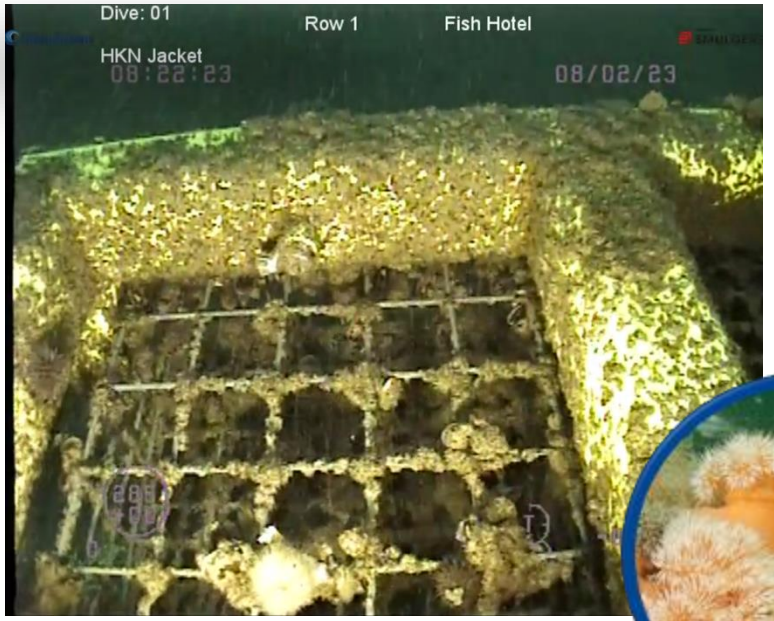


Fish hotels
Platform Hollandse Kust (noord)
Installed in 2021

- **Monitoring – technical observations**
  - Monitoring February 2023
  - South side of platform
  - **Secure attachment, no signs of damage or corrosion**
  - Coating in good condition
  - 1 earthing cable intact, 2 disconnected

Fish hotels
Platform Hollandse Kust (noord)

- **Monitoring: ecological observations**
  - Common species (algae, anemones, hydrozoa, starfish, sea urchins) on jacket and cage frame;
  - Mussel growth starting on the steel cages (limited mussel growth observed on jacket and frame);
  - Because of marine growth, hard to look inside the cages; no specific species observed



Fish hotels
Platform Hollandse Kust (noord)

- **Next steps**
  - Repeated monitoring and additional monitoring where other fish hotels have been installed
  - Based on results: further optimisation of design and investigating possibilities for upscaling

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