

Nature inclusive building in OWFs in the Netherlands

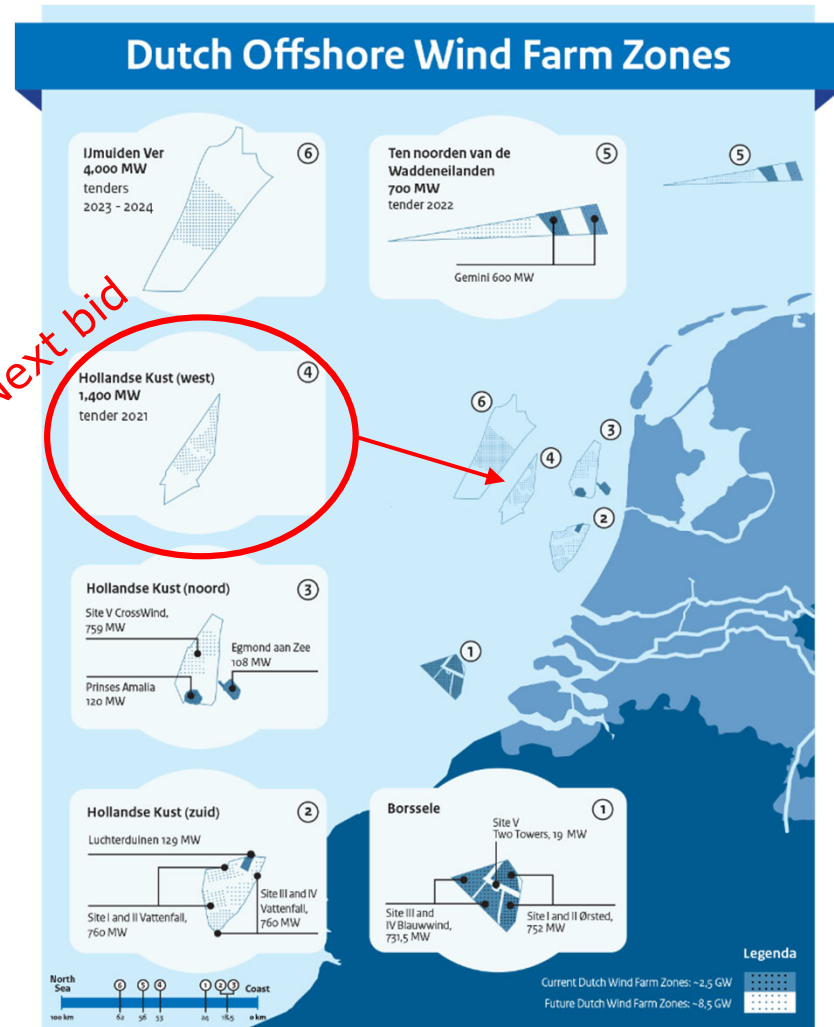
12 Oct 2022

Oscar Bos, Wageningen Marine Research



Development of Offshore Wind in NL

- Offshore wind 2015->2030: 11 GW
- Ecology is important
- Next bids: points for ecology
 - Mitigation (birds, bats)
 - Nature inclusive building (benthos, fish)



<https://offshorewind.rvo.nl/>

Nature restoration pilots

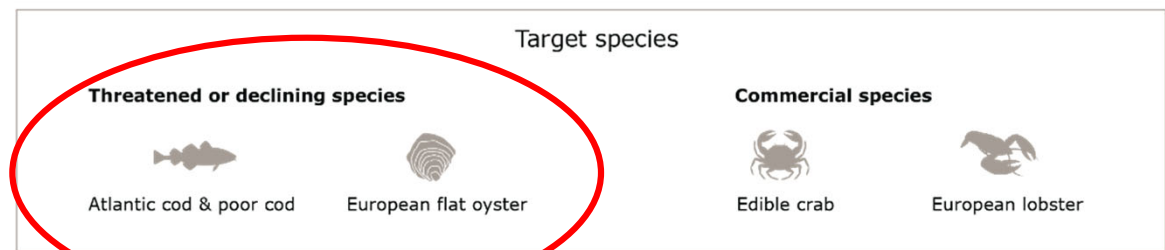
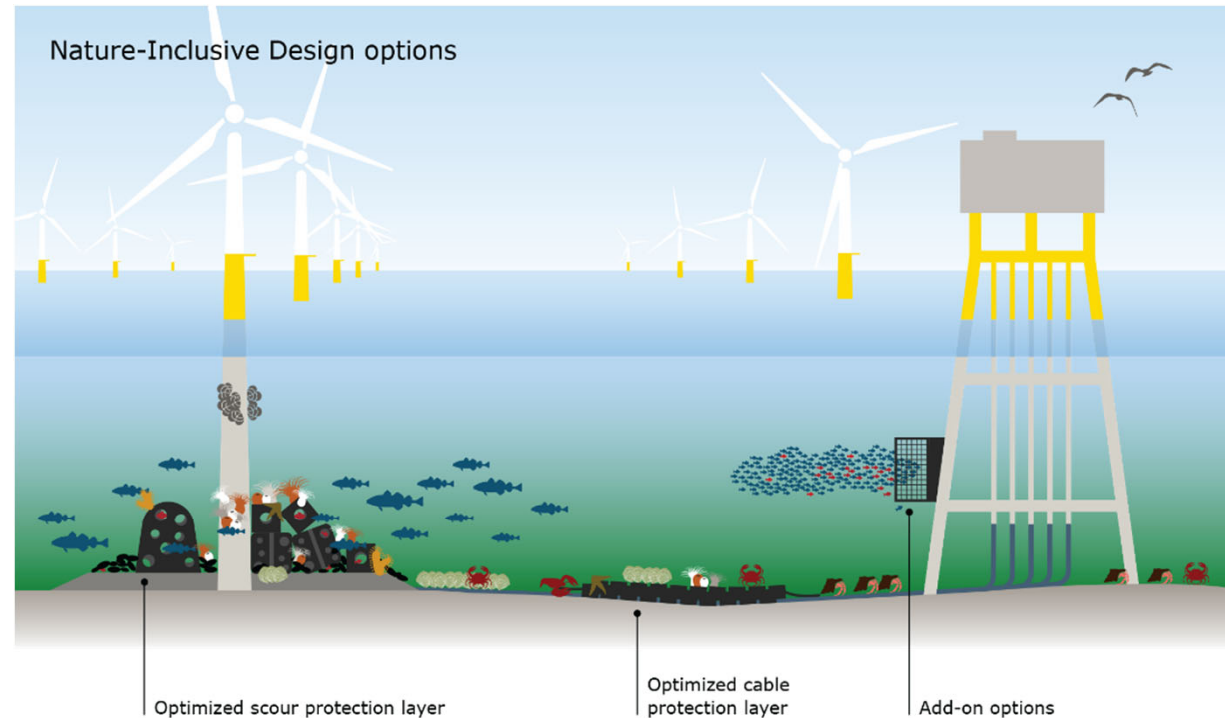


- Focus on policy species (Natura 2000, OSPAR, MSFD, commercial species)
 - Native oysters (OSPAR)
 - Cod (OSPAR)
 - Sharks/rays (OSPAR,MSFD)
 - Crabs / lobsters (commercial)



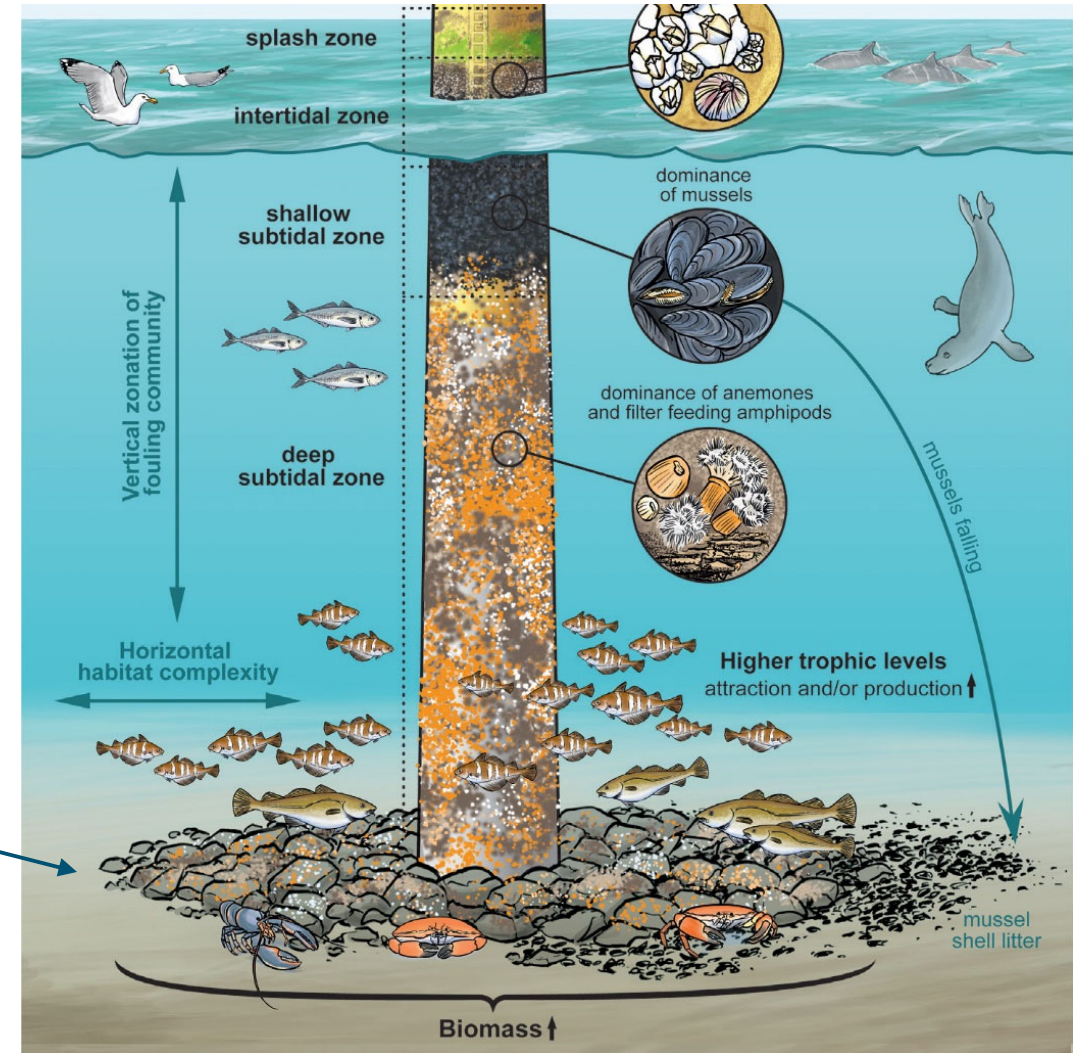
Nature inclusive design options

- Optimized scour protection
 - Larger stones: hiding spaces
- Optimized cable crossings
 - Limestone: attract species
- Stand alone and add-ons
 - Artificial reefs: nursery



Optimized scour protection

- Increase reef effect
 - larger stones
 - hiding spaces
 - feeding area



BENSO - Dogger Bank expedition Sept 2021



Photo: Klaudie Barteling/DMP

Optimized Scour protection layers

- Test different scour protection configurations (BENSO project)
- Deployed NL Dogger Bank in 2021
- 2022+2023 assess biodiversity and retrieve.



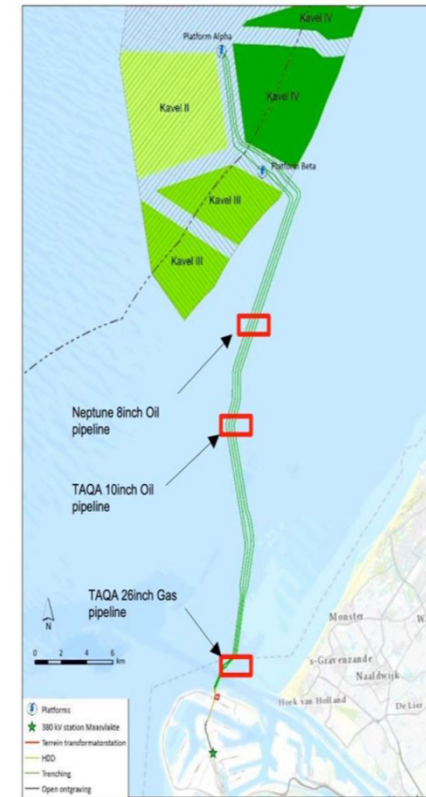
Photo: Udo van Dongen/BuWa

Optimized cable protection layers

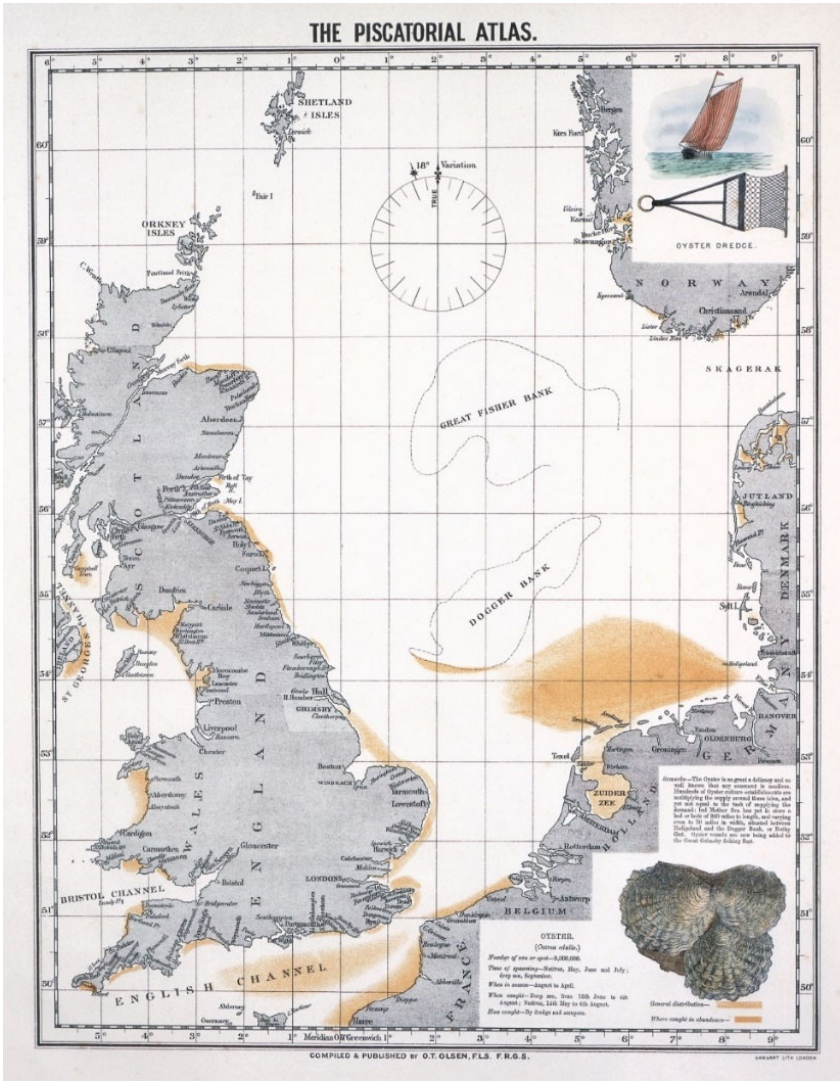


Figure 2 - Overview of possible nature inclusive design options

TenneT



Flat oyster restoration - map Olsen (1883)



Flat oyster restoration

- Near shore
- Offshore



NORA: <https://noraeeurope.eu/>

Pilots in OFW

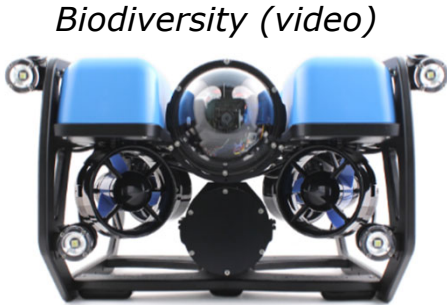
- Growth and survival
- Reproduction
- Recruitment
- Oyster activity
- Biodiversity



Monitoring



Gemini OFW park



Biodiversity (video)



oyster activity

Fish biodiversity (eDNA)



image analysis



oyster growth



oyster reproduction



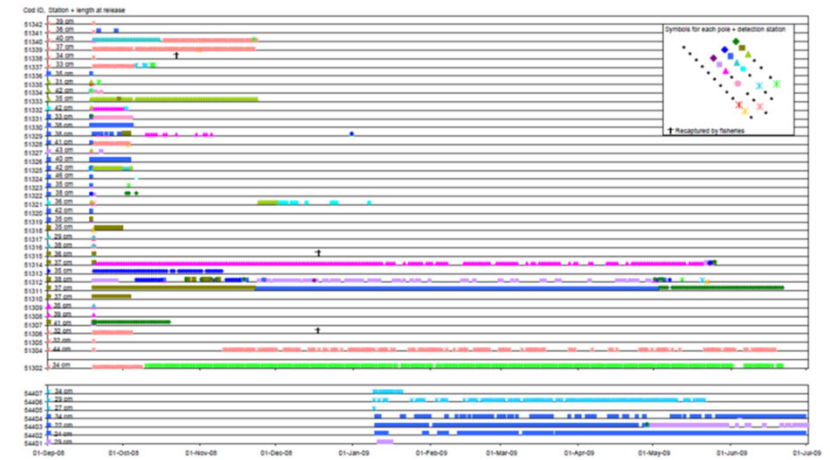
Tagged cods and lobsters

- Habitat use (cod, lobsters)
- Tags + receivers



<https://www.wur.nl/en/Research-Results/Research-Institutes/marine-research/show-marine/Research-on-cod-and-lobster-behaviour-around-artificial-reefs-in-wind-farm-Borssele-1-2.htm>

*Tagged cod
(year patterns)
(research E.
Winter, WUR)*



*Artificial
reefs
Borssele 2*



Nature Inclusive Design (NID) in offshore windfarms in NL

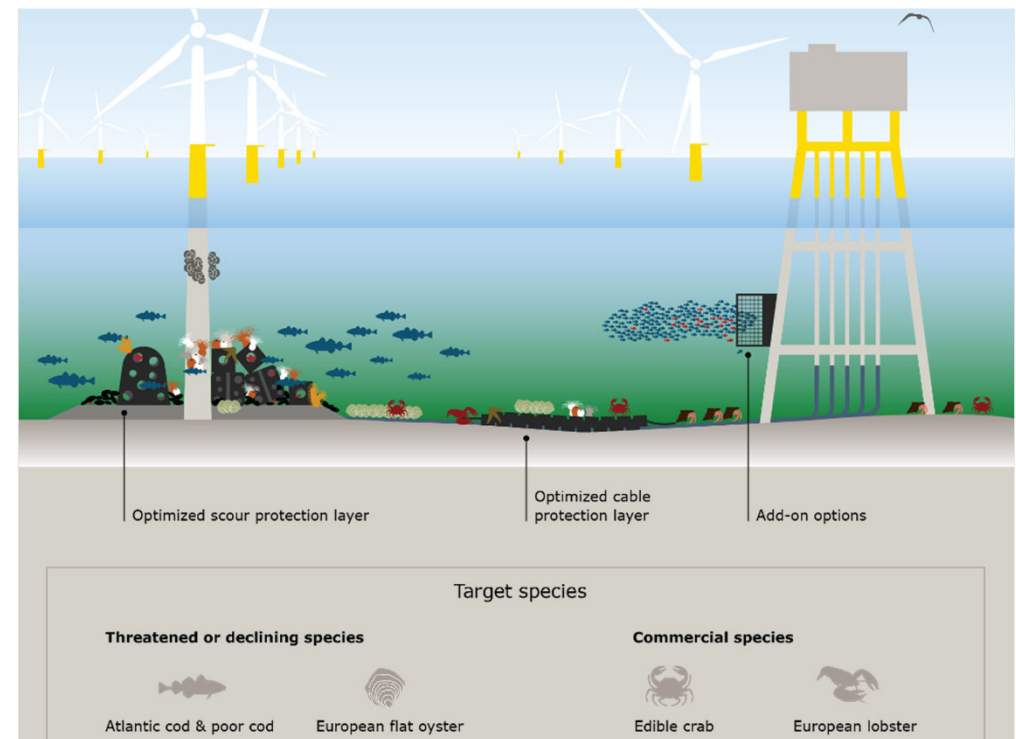
- Incentivised by NL government
- Focus on policy species and improving native biodiversity
- Small scale: test concepts
- Rollout: apply proven concepts



<https://offshorewind.rvo.nl/>

Research 2022-2030

- Government
 - Impact on ecosystem
 - Costs and benefits
 - Fail and succes factors
- Offshore wind parties
 - Local impact
- Government, industry, research institutes and NGOs work together



Thank you for
your attention!

To explore
the potential
of nature to
improve the
quality of life

