North Sea Energy Nature-inclusive hub design Workshop 3 - report

December 3rd, 2024, 13:00 – 16:30
Location: TNO, Princetonlaan 6, Utrecht
Participants: see appendix.
Programme and presentation: see slide deck (separate document).

Welcome and introduction

Anne-Mette Jørgensen (MSG) welcomes the participants to the workshop, introduces the programme of the day and describes the aims of North Sea Energy (NSE), the work package on nature-inclusive design (NID) and this third workshop of the series (see the attached slides).

Plenary presentation

Sarina Versteeg and Luuk van der Heijden present the draft report that was shared with the participants: the contents of the nature-inclusive design and the qualitative comparative impact assessment (see the attached slides).

Questions and remarks:

- Is the shelter function that many offshore constructions have included in the assessment? It isn't in the figures shown in the presentation, but it is in the report.
- There are uncertainties about many ecological impacts of offshore energy technologies. An example are the subsurface vibrations caused by wind turbines.
- The colour of the red arrows in the impact flow charts can be misleading, as it suggests a negative impact while it means a decrease.
- Many of the impacts of floating solar are still theoretical, as the availability of measurement data is limited.
- How have the models for ocean dynamics and the impacts of offshore wind farms on these been validated? The models for ocean dynamics have been extensively validated. The impact of offshore windfarms cannot be empirically validated yet.
- Will (flying) migratory birds also benefit from the bird corridor? As of yet, this is uncertain.
- How will the conclusions on the bird corridor hold if other uses are allowed, like fishing and shipping? In the design, we assume they are not. The impacts of other users are uncertain, but likely to be negative.

Discussion on the results

The participants split into three subgroups, to discuss the spatial design, the asset-level assumption on ecological impacts, and the assessment of the comparative impacts of the NID and reference design.

Spatial design

General

It would be good to explicitly assign a function to the area that is now left 'empty' because more seasonal stratification occurs here and a larger percentage of long-lived species live there. Nature, for example.

Otherwise, it is difficult at a policy level to avoid human action in the area. The same goes for the active oyster restoration that is part of the spatial design.
Hub North borders Germany directly to the east. That part of the North Sea will also be built up with wind farms. It would be good to show that on the map as well.

Use of the term ‘Nature-inclusive design’: in policy language this refers specifically to mitigating and nature-enhancing measures applied at the asset-level, not to spatial designs. Good to make clear that we use this term differently or adapt our terminology (e.g. nature-inclusive spatial planning instead).

Bird corridor
The 40 km corridor is based on one study that shows that guillemots avoid wind farms up to 20 km away. This could possibly be adjusted or taken less strictly. The question was raised whether birds (such as guillemots) get used to wind farms. Then you could, for example, slowly narrow the corridor. However, the time scale of 'getting used to' is much larger than the time scale of construction.

Does bird migration follow a concentrated path? And what are the differences between autumn and spring migration routes? These are important questions to consider for the corridor.

The bird corridor is now based on the location of the Oyster Grounds and the Frisian Front. However, the location of the Oyster Grounds does not accurately reflect the historical oyster grounds, which were located more to the east. The eastern part is actually richer in biodiversity and species (this may be checked using a study by Waardenburg Ecology). It would therefore be good to see whether we can also place the bird corridor a bit further east.

Protected bird area
It is also good to mention that the area of Hub North may in the future be designated as a Birds Directive area, given the concentration of seabirds there.

Technical (spatial) design
The area that is currently reserved for wind energy is probably too small for 6+8GW. It could be that in reality this has to be larger (for the same number of GW). A suggestion is to look at jackets instead of monopiles, to reduce the influence on the stratification.

The H2 platforms should be more spread out, to reduce recirculation and to increase dilution of the brine and warm water plumes.

Helicopter platforms have not been taken into account in the design. Hopefully, regulations will evolve so these have a smaller spatial impact (especially as the platforms are located at the edge of the windfarms and are approachable from a wide angle).

Floating solar has not been assigned to a specific location in the design. Participants will share some information with us about this, so that we can possibly include this as an option.

Climate change
Climate change raises complex questions for the design. How does the area/ecosystem and associated species change under the influence of climate change? Are there, for example, more or fewer auks or guillemots (in a scenario without construction). And should you then include this in your research now?

Asset-level ecological impacts

Positioning the charts

- Participants miss the link between the charts by technology and the volume of that technology in the NID.
- The charts are meant to provide information for the spatial design of the hub. Communicating that fact would help clarify the intended uses to readers.
- Participants would like more insight into the trade-offs between technologies, such as wind and solar.
- The charts do not show what impacts are expected to be minor compared to other ones. A risk-based approach (chance x impact) could help, but seems too hard to implement at the moment.
- The charts also don't show for what impacts the magnitude is uncertain or as of yet theoretical. This could be indicated using dotted lines.

Biotic factors

- The flow charts of the impacts of wind turbines, hydrogen production and floating solar currently mainly show abiotic impacts. These are not linked to species. Including these would be nice, but this would require a separate visualization due to the number of additional relationships.
- It is hard to look at the installations without the ecology though. An example are shellfish growing on floating solar, which may drop to the seabed when they die or get too thick a layer and in that way affect physical dynamics and biodiversity on the seabed.
- Including scour more prominently in the charts would be an improvement. The study on extra-legal measures for the Noordzeeoverleg includes more information that would be useful for this.

Extra-legal measures

- The impacts are based on a 'standard design' of the technologies, without mitigation measures. The relevance of this design for the Dutch North Sea is limited, as parties to the North Sea Agreement have already agreed that infrastructure should be nature-enhancing (based on the 'extra-legal measures).
- Nature-enhancement measures cannot be mandated outside of the windfarm.

Specific impacts

- The light emissions of vessels are confusing in the charts. The difference between the blockage of natural light and the introduction of artificial light (e.g., at night) could be clarified.
- Does H_2 leakage mean leakage into the sea or venting into the air? Venting should be included, as should O_2 emissions.
- A line is included between fouling species and nutrients. Phytoplankton could be included.
- For the impact of brine from H_2 production, dilution is possible. As of yet, it is not mandated though.

Other

- The charts are from the perspective of the mitigation hierarchy, meaning they focus on avoiding and mitigating impacts. They don't pay attention to the positive impacts that may take place. Taking the perspective of nature restoration, for instance with regard to reef restoration, would yield a different picture.
- Participants are not sure why this area would be relatively unsuitable for floating solar.

Comparative impacts

General remarks

- It is difficult to read the tables on their own and therefore the tables in the current form might not be the most accurate way to conclude the two chapters. The suggestion is to rethink what the aim of the tables is, be clear on stating this in text and rethink the table format that best suits this aim.
- Be more consistent in what is presented in the table (e.g. on the relation between the columns and what is compared exactly).
- Clearly state the amount of GWs for the different designs, and how this relates to the total amount of offshore energy (ambitions) for The Netherlands.
- It was suggested to consider different types of turbines (e.g. jackets and floating).
- Make sure the difference between active (oyster) and passive (connectivity within OWF area) nature restoration is clearly described.
- We have made a decision to assess measures related to scour protection as asset-level and not spatial. However, these measures can have an effect on spatial scale and are, or can be, strongly connected to oyster restoration and passive restoration. We should consider connecting the two or including habitat enhancement related to scour protection as a spatial measure.

Comparative table abiotic conditions

- The effects of strategic placement of H2 platforms are not addressed explicitly in the table (on temperature and salinity)
- The rationale behind suspended sediment decrease is not fully understood
- No measures are mentioned in the table, but in the report deeper burying of cables was mentioned somewhere (this should be removed)

Comparative table biotic effects

- Artificial reefs and oyster restorations are no measures against benthic habitat degradation
- Consider starting by looking from the intervention level and link that to species groups instead of the other way around
- Be consistent in the use of noise or ambient noise, and/or describe the difference more clearly

Lessons and recommendations

The participants split into two subgroups to discuss the lessons and recommendations that they take away from this study. The first subgroup discussed lessons specific to the Hub North area, the second for NID in general.

Lessons for Hub North

Starting point

- Use the correct starting points: 20 GW wind, O&G, CO_2 potential, UHS, fishing, windfarms in Germany.
- Realistic volumes of wind at sea mean not producing for exports (i.e., we may not really need 70GW of offshore wind in the Dutch North Sea).

Current state

- Get data to understand the current ecological state.
- Look at the environment that is there now.
- Learning to deal with uncertainties. On what things do we have insufficient knowledge?

Baseline (biodiversity)

- T=0 measurement of biodiversity is urgent
- Biodiversity of O&G platforms around Hub North.
- Define target species for the hub.

Corridor
- 40 km corridor
- Assess the nature value of the bird corridor if there are other users.

Monitoring
- Monitoring
- Good monitoring programs

NID design
- First consider NID throughout the NID hierarchy (avoid, minimise, …).
- Develop mitigating measures.
- Minimize negative impact and maximize positive impact with NIDs.

Industry/research/policies
- Using examples and experiences from similar industries elsewhere, incl. onshore (e.g., brine, accident with wind turbine).
- Install a pilot and monitor the outcome and impact.
- Define and use an assessment methodology to verify what NID interventions work.

Adaptive
- Adaptive: implement, monitor, evaluate, adapt, implement (in a cycle).
- Adaptive policy.

Cumulative/localizing
- Collaboration between North Sea countries for nature (and energy).
- Multi-use of space: what can be combined? Where are synergies and smart use of space possible?
- Consider also offshore floating solar
- The platforms together.

Decision tree / stop or continue
- Conducting a risk assessment with different experts and insight to categorize likelihood and impact.

General lessons for nature-inclusive design

Process
- Include a definition of NID. To many people, it is about construction and asset-level interventions. The fact that NSE also includes 'nature-inclusive marine spatial planning' is not obvious.
- To many people, a hub is an island or platform. It is important to communicate that NSE means an area.
- Draw in other factors, such as safety, costs, installation and CO_2, to make sure it can be realized and is affordable.
- Stakeholder consultation is very important.

Relevance
- Doing marine spatial planning from the perspective of ecology is very relevant. Often, this is done better for other uses.
- Keep an eye on political processes, to give input in time. The results of this study may be too late for wind search area 6/7. There is some discussion on this. In general, starting and being in time for policy discussions is crucial to any NID process. Constant communication with policymakers is important to match their deadlines for decisions.

Monitoring and data
- Data (monitoring) is key.
- Don't exclude areas because of a lack of (sufficient) evidence of effects but look for solutions.
- Use existing structures with marine growth to improve understanding of the existing ecosystem.

- Start monitoring before construction and adjust the design to the in-situ situation.
- Start early with the design of a monitoring plan, as it is complex and very expensive.
- Monitor the effectiveness of NID measures.
- Collect and share more ecological data for knowledge development.
- Possible effects are hard to quantify.
- There are big knowledge gaps, so consider precaution and adaptive capacity.
- The end result will remain (mostly) unsure.

Design choices

- Look at the whole mitigation hierarchy.
- Also look at the interconnections between asset-level measures. A lot of small interventions may amount to a lot, especially when including spatial considerations.
- Think outside the box: so not only what is now permitted.
- Think outside the box: include NID measures outside the area of concern.
- Build with what you've got: scour protection, turbines, cable crossings, etc.
- The presence of different species may lead to contradictory measures.
- A stronger focus is needed on NID rather than the installations themselves.
- Which effects (on which species) are most important?

Seascape

- Location is very important. NID measures are location specific.
- Ideally, an NID should fit in an integrated plan for the North Sea.
- Zoom out and look at connectivity.
- Try to combine NID into a larger spatial planning (so not only on the asset-level).
- The baseline is important: what is already required and what could be developed additionally?
- We are working in an already degraded system.

Specific measures

- The report on extra-legal measures contains a lot more information on no-regret NID measures. It's good to reference it more, as it provides a lot of complementary insights.
- Concentrate negative impacts to leave undisturbed zones.
- Floating wind might alleviate the mixing effect.
- The NID might affect the yield (due to spatial use of wind).
- Think about decommissioning.
- It is important to state what legal bottlenecks there are for desirable NID measures.
- How can you close areas to human activity?

Recap and close

Anne-Mette thanks the participants for their active contributions and shares the planning for the next steps (see the attached slides).

Appendix: Participants

The following people attended the workshop:

- Anne-Mette Jørgensen (MSG)
- Audrey Roustiau (EBN)
- Bert Fokkema (Shell)
- Brigitte Vlaswinkel (Oceans of Energy)
- Cas Dinjens (Arcadis)
- Eline van Onselen (De Rijke Noordzee)
- Ewa Spiesz (DMEC)
- Isabel Gerritsma (Deltares)
- Ivo de Klerk (MSG)
- Jelle Rienstra (Deltares)
- Joep Breuer (TNO)
- Liselotte van Cranenburgh (Total Energies)
- Luuk van der Heijden (Deltares)
- Madelaine Halter (TNO)
- Nazila Fotoohi (EBN)
- Niels Verdoodt (DEME)
- Remco Groenenberg (TNO)
- Roger Hollman (EBN)
- Sarina Versteeg (Arcadis)
- Sonja Fortuin (LVVN)
- Sophie de Reus (Stichting de Noordzee)
- Thomas Kerkhove (Instituut voor Natuurwetenschappen)
- Tim Raaijmakers (TU Delft)
- Tim van Ooijen (Vogelbescherming)