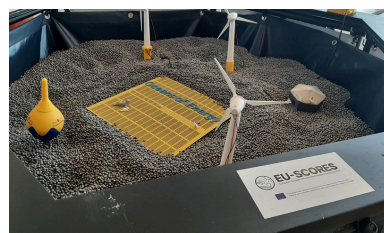


# ADVANCING NATURE-INCLUSIVE OFFSHORE RENEWABLE ENERGY SOLUTIONS CONFERENCE

SEPTEMBER 17, 2024

## Summary and Future Outlook



# OFFSHORE & NATURE

## PLENARY SESSION 1



### SESSION OVERVIEW

The opening session set the scene by discussing what does “nature-inclusive design” mean and by showcasing multiple initiatives and projects focusing on NID. NID could be defined as an (offshore renewable energy) project of which objectives include nature protection measures. Another definition states that NID can be integrated in or added to an anthropogenic structure with the aim of enhancing ecological function.

Other names that are often used interchangeably with NID include nature-based design, biodiversity-positive design, environmentally-friendly design ... Do they actually mean the same? We had a lively discussion also with the audience on the semantics of the topic.



Benjamin Lehner,  
Moderator,  
Dutch Marine  
Energy Centre  
(DMEC)



Dení Aguilar Bellamy,  
Renewables Grid Initiative



Ewa Spiesz,  
Dutch Marine  
Energy Centre  
(DMEC)



Marjolein Kelder,  
The Rich North Sea

# OFFSHORE & NATURE

## PLENARY SESSION 1

### KEY FINDINGS

Beyond semantics, also various interventions (both physical and operational) are considered NID by the speakers and audience of the session. Mitigation measures, for example adaptive operation of slowing down offshore wind park turbines to allow for a safe passage of migratory birds, are considered a potential nature-inclusive design options for some but not for others.

Generally it could be considered that NID measures are possible to apply throughout the environmental impact mitigation hierarchy, but on the contrary, it could be defined more clearly as only physical add-on options. This is to be clarified by an offshore validation in the coming years provided the sector will remain welcoming to testing various NID options and this may need political support, for example by continuous inclusion of NID measures in non-price criteria for offshore renewable energy installations.



The term “nature-inclusive design” has multiple interpretations and synonyms being used in the sector with the most general definition encompassing offshore (renewable energy) infrastructure design that has an objective of including nature protection measures.



Multiple initiatives focusing on NID exist in the sector including the [North Sea 2040 vision](#), [Offshore Coalition for Energy and Nature \(OCEAN\)](#), [North Sea Energy 5](#) designing a NID energy hub, and other emerging initiatives.



Efforts in protecting the North Sea and other basins through implementation of various NID measures, both physical and operational are yet to be evaluated, since many are just starting. A standardised framework for evaluation of the effectiveness of NID measures is yet to be developed and implemented.

## NATURE INCLUSIVE DESIGN

### OPTIONS FOR OFFSHORE WIND FARMS & GRID INFRASTRUCTURE

For this infographic Nature-Inclusive Design (NID) is taken to cover modifications and/or additions to the design of offshore wind turbines and grid infrastructure that aim to enhance, either directly or indirectly, biodiversity and ecological functioning, such as nature-friendly scour protection layer, cable protection layer, and add-ons.

The measures included have been, or are currently being, developed and tested. They represent possible options and are not intended to be comprehensive. Their application should be considered on a project-by-project and site-specific basis and accompanied by appropriate ecosystem monitoring to understand their effects on biodiversity. The inclusion of specific measures doesn't constitute or imply endorsement.



Further information on NID measures can be found in the OCEAN Energy & Nature Database



Artificial reefs create habitat

Water replenishment holes provide shelter for marine wildlife

Protective enclosures facilitate establishment of reef-building species (e.g., oysters, mussels, ross worm)

Biohuts provide food and shelter for young fish

# NON-PRICE CRITERIA

## PLENARY SESSION 2



### SESSION OVERVIEW

In the second session of the conference, we dived into the role that non-price criteria (NPC) play for the integration of innovations in offshore wind farms. NPC are not linked to a financial contribution but focus on more qualitative criteria. Several European countries, such as the Netherlands, Germany, Belgium and Portugal, have added NPC in the past years to their offshore wind tenders. Two prominent NPC themes are system integration, which is important to improve the integration of electricity generated offshore with the infrastructure and demand onshore, and environmental impact and biodiversity to improve the nature-friendliness of offshore renewable energy projects.

Due to their qualitative nature, it can be challenging to compare different NPC measures and their effectiveness. For that, it can help to focus on safety risks and chances for permitting, the contributions to nature protection or enhancement, as well as the technology readiness level (TRL), and the associated costs. While NPC create an external motivation for project developers to include innovations, this can also happen without NPC, as the example of the Princess Elizabeth Energy Island in Belgium shows, where the inclusion of NID measures is also seen as a way of stakeholder engagement.



Sarah Kluge,  
Moderator,  
Dutch Marine  
Energy Centre  
(DMEC)



Benjamin Lehner,  
Dutch Marine  
Energy Centre  
(DMEC)



Just van der Endt,  
Witteveen + Bos



Thomas Donders,  
TenneT



Kristien Veys,  
De Blauwe  
Cluster

# NON-PRICE CRITERIA

## PLENARY SESSION 2



### **NPC contribute to sustainable development:**

NPC stimulate sustainable development by encouraging project developers to maximise their positive environmental and social impacts. By integrating innovative practices that promote sustainability and minimise potential negative effects of offshore wind projects, developers enhance their chances of securing permits.



### **Need to improve data sharing and transparency:**

More data should be shared about the measures that are implemented and their effectiveness. Greater transparency would be crucial to maximise the lessons learned from individual projects and improve (environmental) measures in future tenders, which would ultimately benefit nature.



### **NPC and industry-driven approaches both have their advantages:**

In the past, NPC have significantly contributed to integrating innovations in offshore energy projects. But innovation can also be added based on industry incentives. While NPC provide more security regarding the financing of the innovations and foster competition between companies, industry-driven approaches can be quicker and drive more out-of-the-box thinking.

# OFFSHORE RENEWABLE ENERGY: DEEP DIVE INTO NATURE- INCLUSIVE PROJECTS AND DEVELOPMENTS

## PLENARY SESSION 3



### SESSION OVERVIEW

In this session, industry experts explored how NID can make offshore wind farms more sustainable by enhancing marine biodiversity while supporting energy generation. The session emphasized that NID must be scalable, practical, and integrated into standard wind farm operations.

Achieving this, requires collaboration across sectors, including developers, regulators, and governments, with a focus on long-term ecological goals. The importance of regulatory support, cross-border coordination, and addressing data gaps was repeatedly highlighted to ensure that NID can be effectively adopted on a large scale.



Yuki Esser,  
Dutch Marine  
Energy Centre  
(DMEC)



Roel Ooij,  
RWE



Karin Bilo,  
Ørsted



John Breslin,  
BlueWise Marine



Pim Somers,  
Stichting De  
Noordzee

# OFFSHORE RENEWABLE ENERGY: DEEP DIVE INTO NATURE- INCLUSIVE PROJECTS AND DEVELOPMENTS

PLENARY SESSION 3

## KEY FINDINGS

The discussion revealed that while NID hold great promise for enhancing offshore wind farm sustainability, several challenges must be addressed. Key areas of focus include scaling-up solutions that balance environmental sustainability with operational feasibility, and ensuring that NID becomes a part of the standard planning process. Government support through regulations and policies is essential to create a level playing field for developers. Cross-border collaboration will be key to standardizing NID approaches, enabling wider adoption and achieving broader ecological benefits. Finally, the mitigation hierarchy should guide the integration of NID into a broader strategy that includes avoidance and minimization measures to reduce human impact at every stage of offshore wind development.



### Scaling Nature-Inclusive Designs (NID):

To ensure NID can be successfully integrated into offshore wind farms, it is critical to focus on scaling solutions that are practical, environmentally sustainable, and easy to implement.



### Government Involvement is Essential:

A level playing field must be established through consistent regulations and policies across countries, encouraging developers to adopt NID without added economic or logistical barriers.



### Cross-Border Collaboration:

Collaboration between developers, regulators, and governments from different countries is key to standardizing NID approaches. This ensures wider adoption and enables long-term ecological benefits across regions.

## BIODIVERSITY-FRIENDLY DESIGN OPTIONS FOR OFFSHORE WIND ENERGY FARMS (OWF) IN IRELAND.

@ BlueWise Marine

BLUEWISE  
MARINE

As offshore wind development advances in Ireland, it's crucial to protect and enhance biodiversity. This infographic presents the findings from the BlueWise Marine's report "Options for biodiversity-friendly design and approaches for offshore wind farms in Ireland". The analysis identified 13 options for integrating biodiversity-friendly design into the development of offshore wind farms in Ireland.

### Development Stage

Design Construction Operation Decommissioning

Analysis  
Software for

Marine Protected  
Areas around

Bird and Bat  
Curtailment and

Bat and Bird  
Monitoring

# ENVIRONMENTAL MONITORING

## PLENARY SESSION 4



### SESSION OVERVIEW

This session focused on understanding the ecological impacts of offshore wind farms. It stressed the importance of advanced, long-term monitoring to fully understand these impacts. The session explored how offshore installations influence primary production, underwater noise, and fish behavior, while emphasizing the need for a holistic approach to monitoring that accounts for both localized and broader regional effects.

As offshore wind energy scales up, challenges such as assessing the cumulative effects and differentiating human-induced changes from natural variability require sustained, collaborative efforts. The discussion underscored the importance of innovation in monitoring technologies and stressed the value of cross-border data sharing to ensure that the ecological effects of offshore wind farms are adequately managed for the long term.



Yuki Esser,  
Moderator,  
Dutch Marine  
Energy Centre  
(DMEC)



Lisa Schneider,  
Deltares



Edwin Kardinaal,  
Waardenburg  
Ecology



Inês Machado,  
WavEC Offshore  
Renewables



Ine Moulart,  
Flemish Marine  
Institute



# ENVIRONMENTAL MONITORING

## PLENARY SESSION 4

### KEY FINDINGS

The session highlighted four major priorities for advancing environmental monitoring in offshore wind projects. First, long-term and continuous monitoring is essential to capture the full scope of ecological impacts, such as changes in marine productivity and species behavior. Second, innovative monitoring technologies, including AI-driven species recognition, acoustic monitoring and e-DNA sampling, are transforming how environmental data is collected and analyzed. Third, distinguishing between human-induced impacts and natural variability remains a key challenge, requiring sophisticated methods and comprehensive data collection. Lastly, collaboration and data sharing across countries are vital to understanding cumulative impacts and refining best practices for future offshore wind developments.



#### **Long-Term Environmental Monitoring:**

Sustained, long-term monitoring efforts are critical to capturing the full ecological impact of offshore wind farms and to adapting strategies as new data emerges.



#### **Collaboration and Data Sharing:**

Cross-border collaboration and data sharing are vital to understanding cumulative environmental impacts and refining nature-inclusive designs that benefit both energy production and marine biodiversity.



#### **Innovative Monitoring Techniques:**

Technologies like AI for species recognition, acoustic monitoring, and e-DNA sampling are transforming environmental assessments, improving accuracy, and enhancing our understanding of marine ecosystems.



#### **Distinguishing Human Impact from Natural Variability:**

One of the biggest challenges is differentiating between human-induced effects and natural environmental changes, which requires advanced methods and comprehensive data.

# RECOMMENDATIONS

To close DMEC's first NID conference, we made an outlook into the future state of nature in the North Sea and what we should do now. The film [De Wilde Noordzee](#) by Peter van Rodijnen shows in impressive pictures what is at stake: the richness of the North Sea. To protect and enhance this richness while achieving an energy transition that includes offshore renewable energy sources, it is crucial to collaborate and work together towards a shared vision.



## Act now:

When responsible action is taken, for instance by using sustainable materials in NID technologies, it is better to act now even though not everything is already fully understood than to just wait and see.



## Scale up:

Scaling up is needed to amplify the effect of NID measures. This includes learning locally and growing sequentially. Scaling up can also encompass expanding geographically by adopting and introducing technologies in different environments.



## Standardise data:

Standardisation of data requirements, collection and provision is important to enable learnings beyond individual projects. Templates and EU-wide platforms can contribute to that.

## Contacts



Yuki Esser

[yuki@dutchmarineenergy.com](mailto:yuki@dutchmarineenergy.com)  
Dutch Marine Energy Centre  
(DMEC)



Ewa Spiesz

[ewa@dutchmarineenergy.com](mailto:ewa@dutchmarineenergy.com)  
Dutch Marine Energy Centre  
(DMEC)