Presentation at launch event 02.03.2022

By Marte Rusten, Principal Consultant at DNV

A collaborative project between Nordic Energy Research and DNV

Team at Nordic Energy Research
Marton Leander Vølstad
Svend Søyland
Astrid Bratli

Team at DNV
Kjersti Myhre
Tor Jensen
Eirik Færøy Sæbø
Marte Rusten

Aim:

Identify key elements and recommended actions to accommodate biodiversity and stakeholder engagement in the Nordic region.

Illustrate key elements of existing practices through case studies

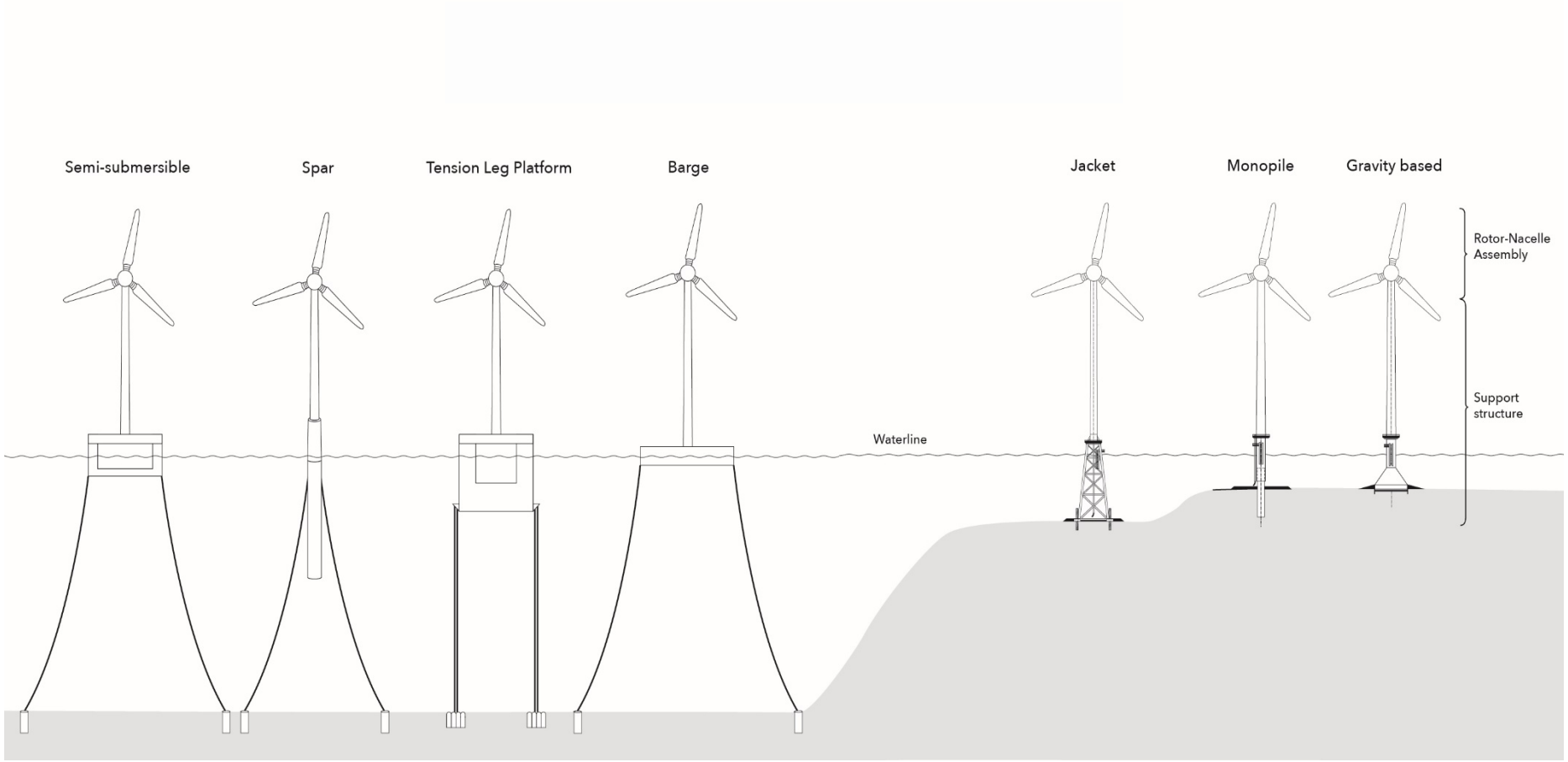
Process

- **Review of authorative literature and reports**
- **Discussions with stakeholders:**
  - **Offshore wind operators** (Equinor, Vattenfall, Parkwind and Ørsted)
  - **Manufacturers** (Vestas)
  - **Regulators** (The Norwegian Environment Agency, The Norwegian Institute of Marine Research, The Danish Energy Agency, NatureScot)
  - **Scientific institutions** (The Norwegian Institute for Nature Research, The Royal Belgian Institute of Natural Sciences, The Rich North Sea Programme)
  - **NGOs** (WWF Norway, The Norwegian Fishermen's Association).

Offshore wind energy and biodiversity

- Biodiversity is under increasing pressure
- Biodiversity and climate change are tightly interconnected
- Wind energy can help preserve biodiversity by reducing GHG emissions
- Properly planned and designed projects can have a positive effect on nature conservation and restoration in a local perspective.
- Poorly sited or poorly designed wind farms can have negative impacts

Offshore wind farm - concepts



Offshore wind farm – project phases

- Site characterization (e.g. baseline studies)
- Construction (e.g. installing foundation)
- Operation (including maintenance)
- Repowering (upgrading turbines in an existing wind farm)
- Decommissioning (removing the wind farm and individual turbines)
- End of life (disposal of turbine blades)

Nordic offshore wind in the energy transition

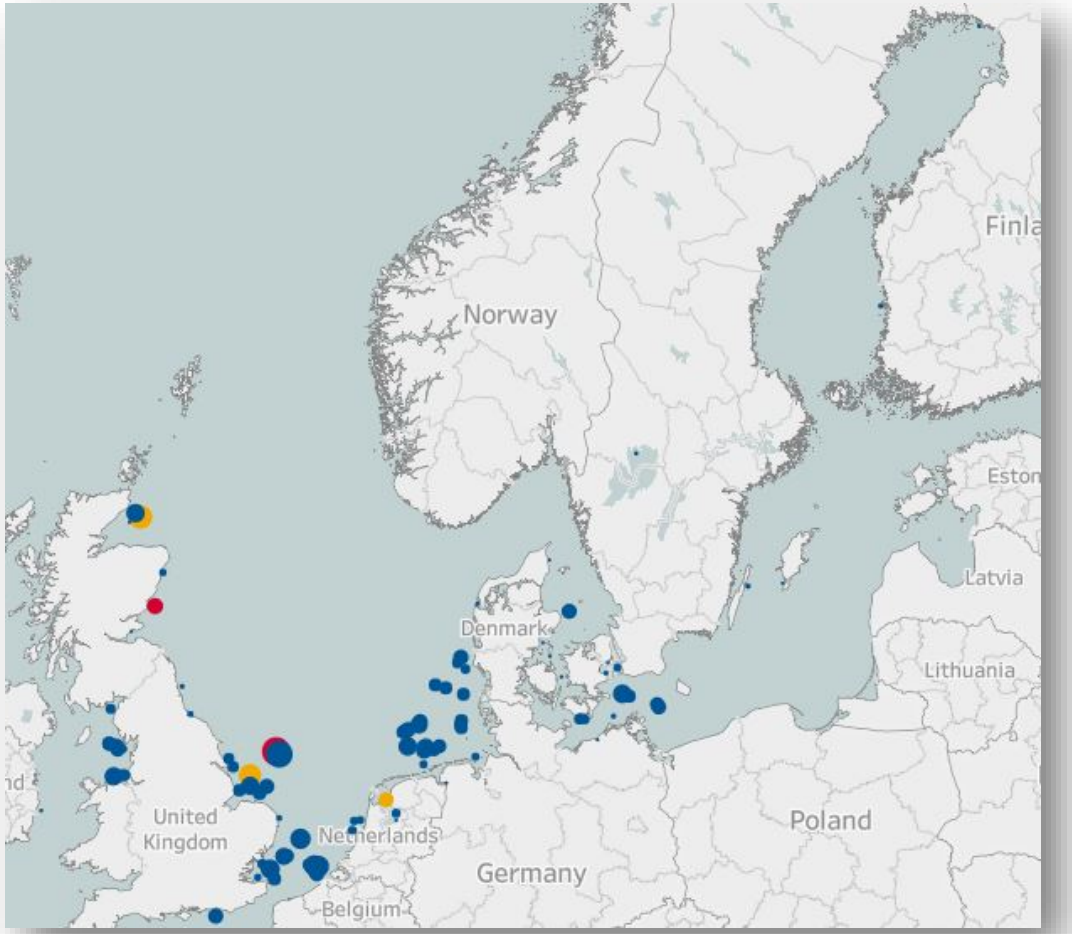
Development of offshore wind will be a key factor to reach future energy demands and climate goals in a cost-effective way

A twentyfold increase in Europe's offshore wind capacity is needed to reach climate neutrality by 2050.

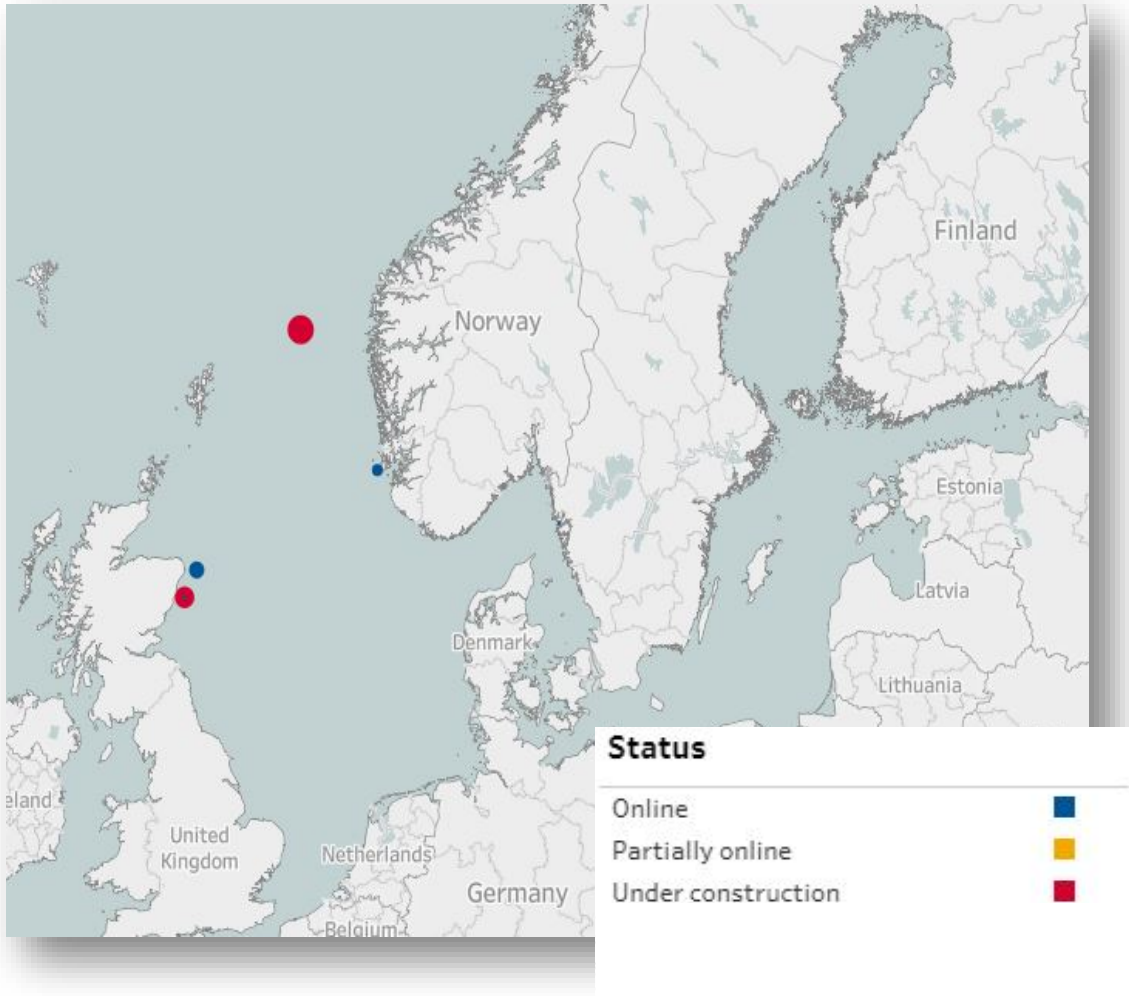
The Nordic region will play a key role : the North Sea can supply around 200 GW and the Baltic Sea around 80 GW by 2050

Current situation

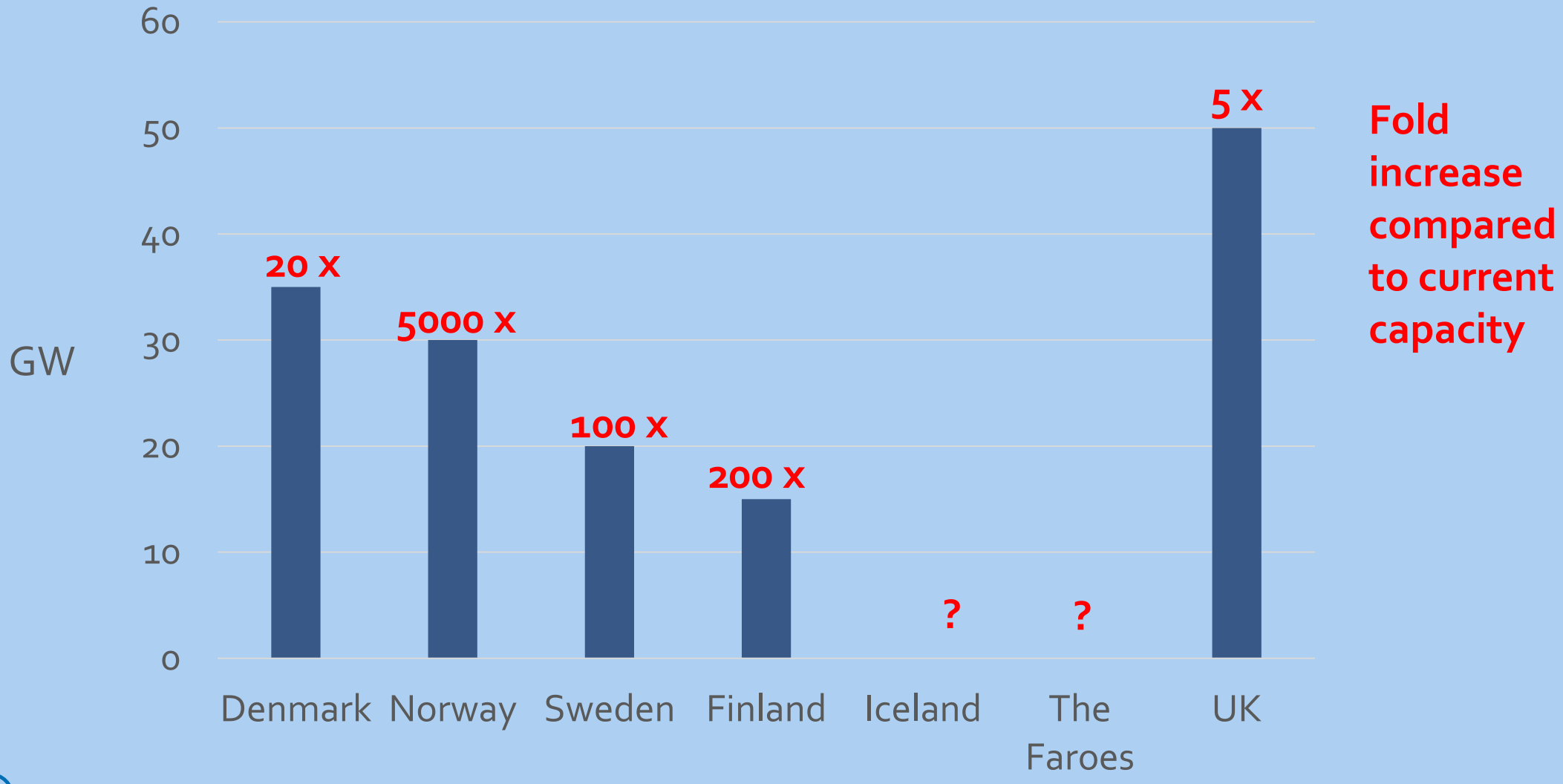
Bottom fixed



Floating



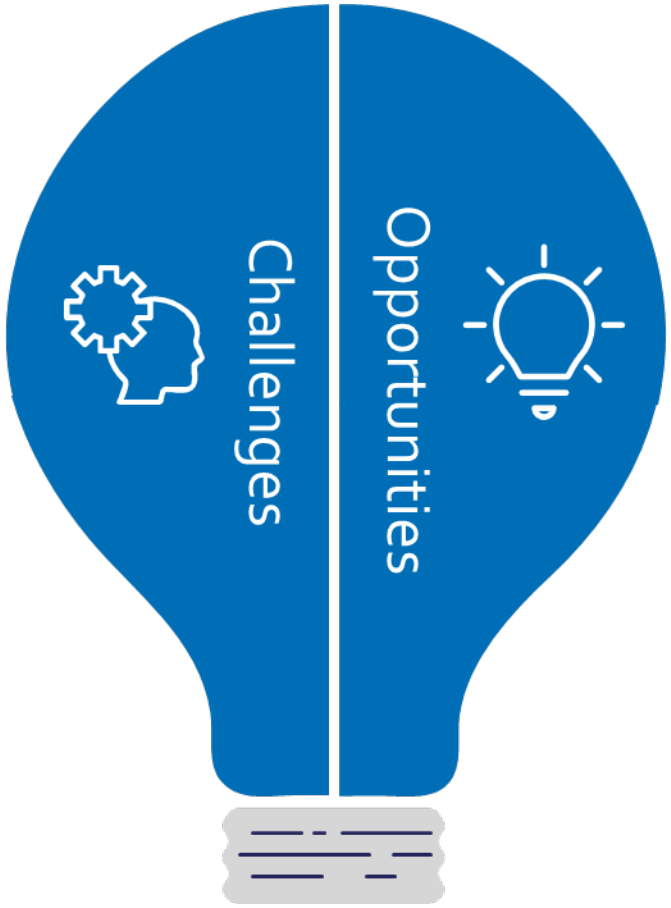
Connected capacity in 2050



Fold increase compared to current capacity

Expansions entail challenges & opportunities

- Additional pressure on ecosystems
- Lack of data on ecosystems and impact
- Conflicts for space (fisheries)
- Complex stakeholder engagement processes



- Knowledge-base increasing
- Certain flexibility for siting
- Opportunities for co-existence
- Ecosystem restoration/enhancement
- Significant offshore experience

Leverage existing collaboration frameworks

Biodiversity impacts

Indirect

Conserve biodiversity by reducing GHG emissions

Direct

Physical changes (habitats, barriers, hydrodynamics)

Underwater noise (disturbance)

Electromagnetic fields (disturbance?)

Cumulative

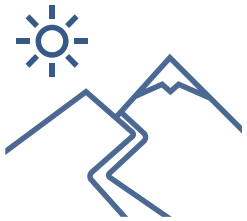
Total impact arising from all activities in an area over time

Mitigating impacts

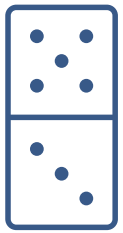
- Avoid
- Minimize
- Offset
- Restore

Key elements to accommodate biodiversity

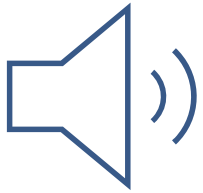
Strategic planning



Environmental data



Cumulative impacts



Underwater noise

Stakeholder engagement

Case studies

Strategic planning process	Environmental data	Cumulative impacts	Underwater noise

Stakeholder engagement

- Danish Process of Opening Areas
  Continuous stakeholder process
- Hywind Scotland Pilot Park
  Continuous stakeholder process
- Sound Mitigation by Bubble Curtains
  Stakeholder trust
- Coordinated Environmental Monitoring: examples from Belgium and O&G in Norway
  Stakeholder involvement, transparency of data, trust
- Research on Cumulative Effects: CEF (Scotland) and MARCIS (2021-2025) (Norway)
  Stakeholder trust

Concluding remarks

- Large planned expansion in the Nordics entails challenges and opportunities
- Significant offshore experience to build upon
- Important to leverage existing Nordic frameworks for data collection and cumulative impact assessments
- Important to establish dialogue and multinational processes for marine spatial planning at sea basin-scales to understand and accommodate biodiversity and stakeholders

Thank you for your attention!

Marte Rusten
Principal Consultant at DNV
marte.rusten@dnv.com
+47 99224198

Nordic Energy Research
nordicenergy.org