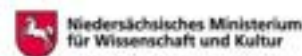


Potential Interactions of Uses – Implication for Storage Capacity Estimates

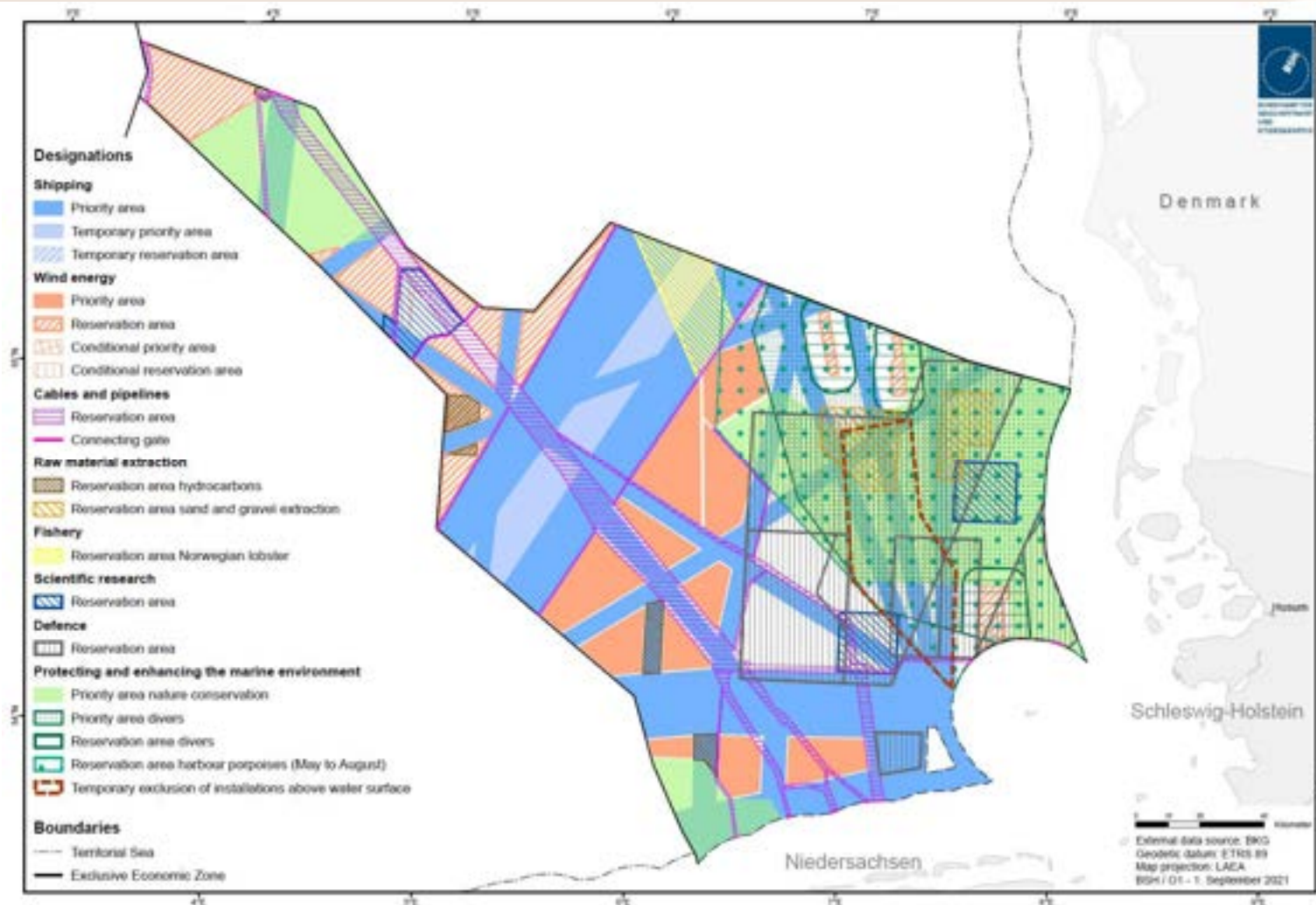
Heike Rütters, Alexandra Ruales, Stefan Knopf, BGR



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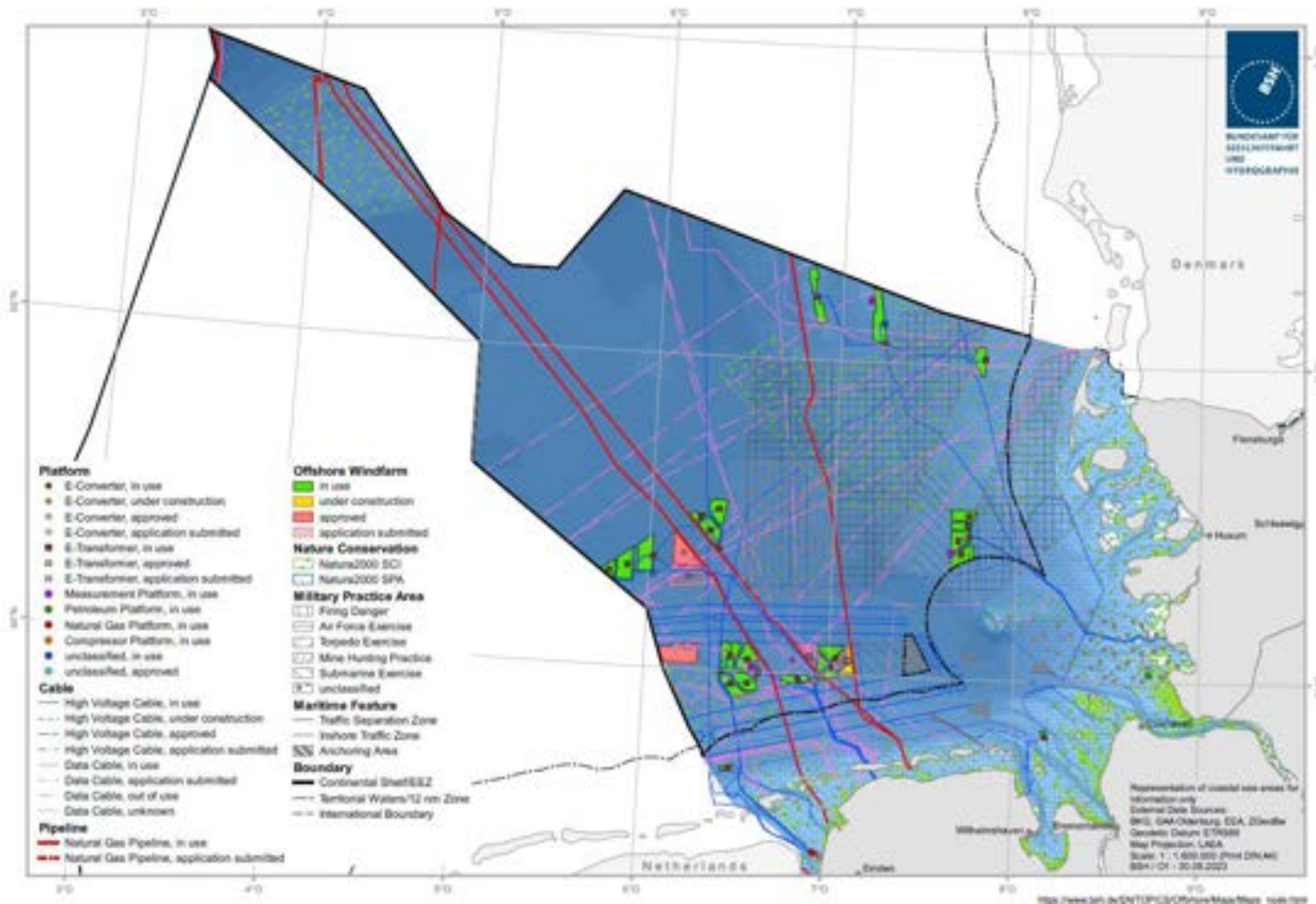


Maritime Spatial Plan (German EEZ) – Map North Sea



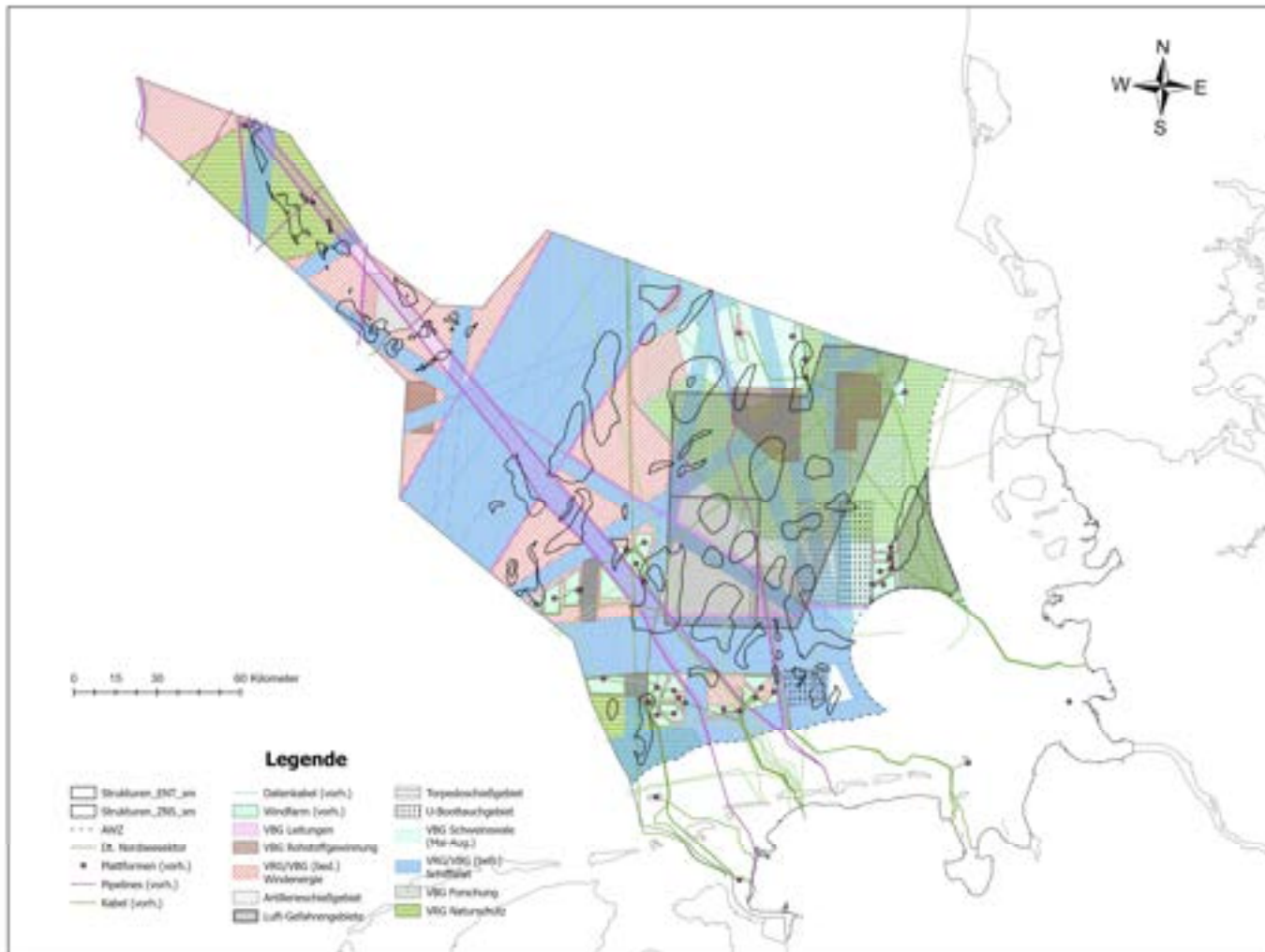
As of September 2021

Current Uses and Nature Conservation Areas



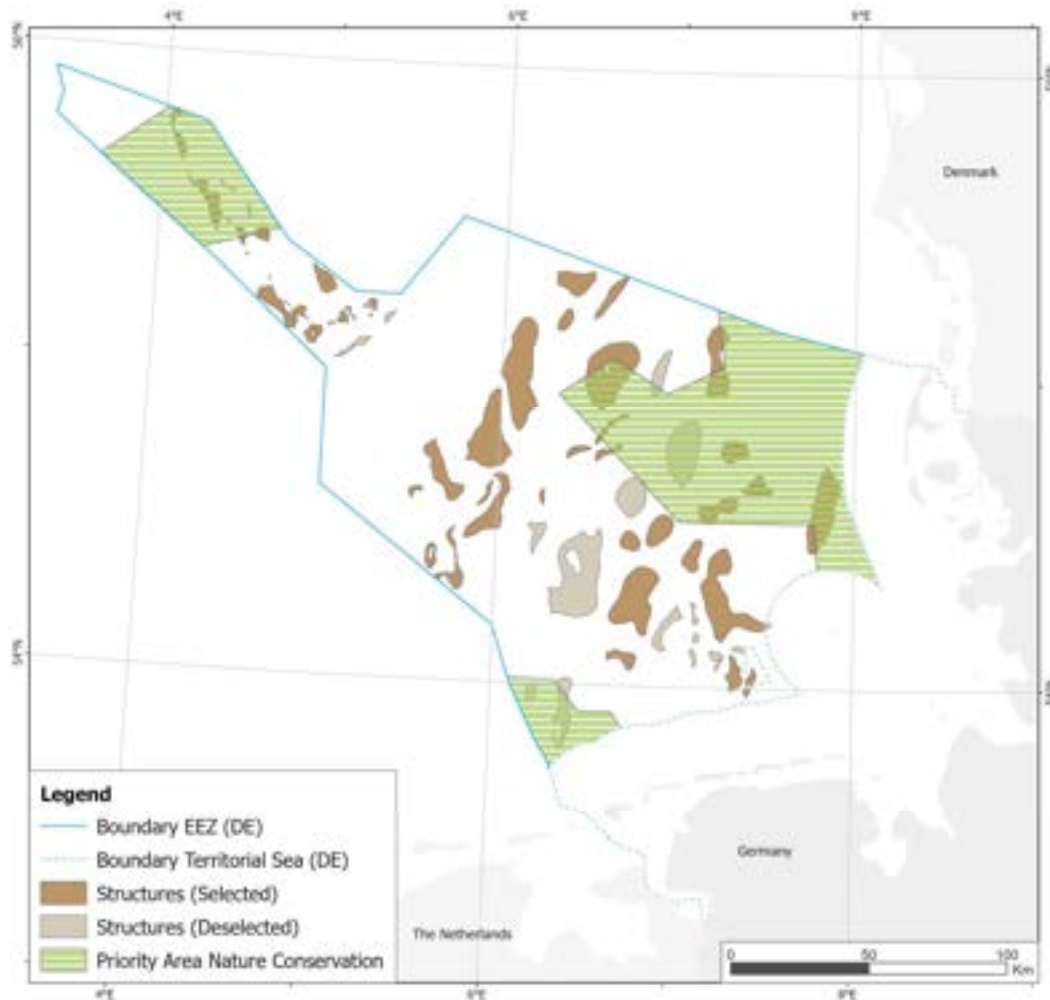
As of August 2023

Current Uses and Planning vs. Structures of Interest

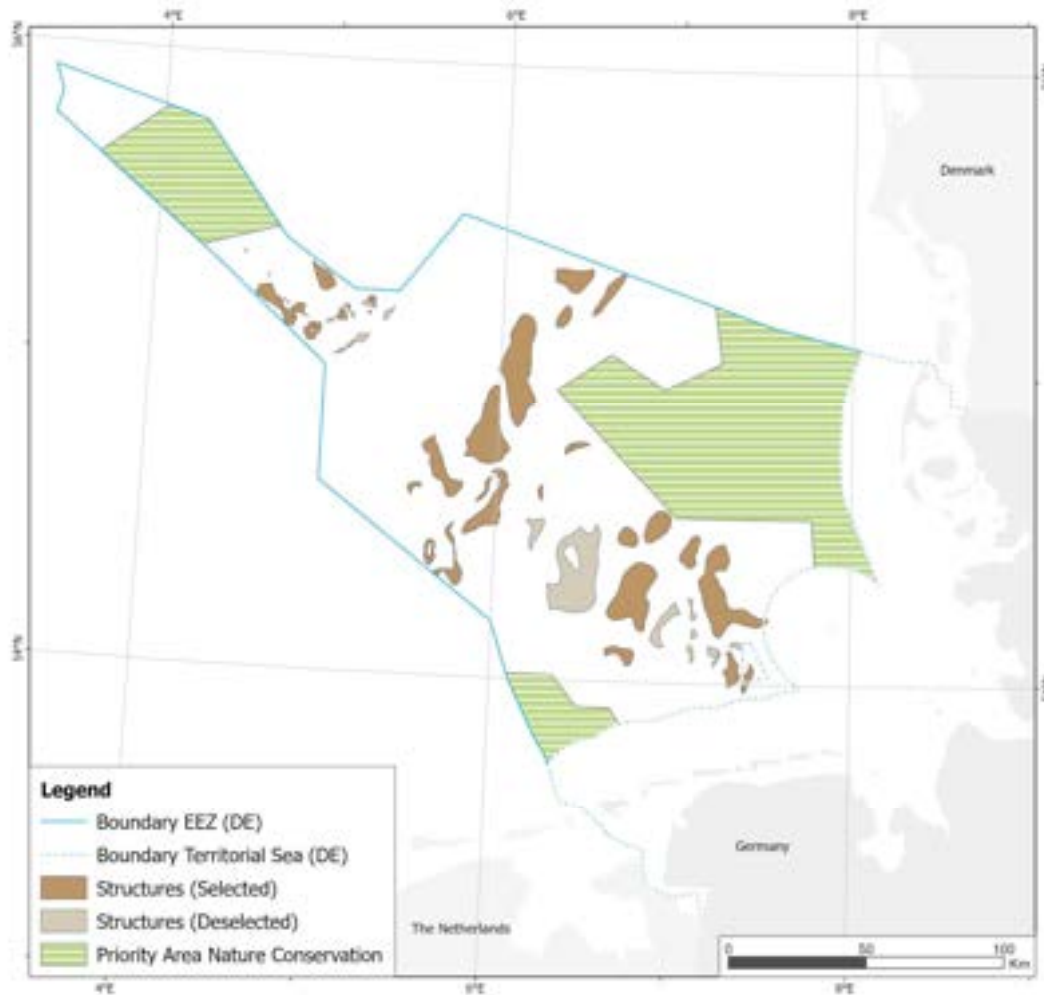


Structures of Interest:
Buntsandstein

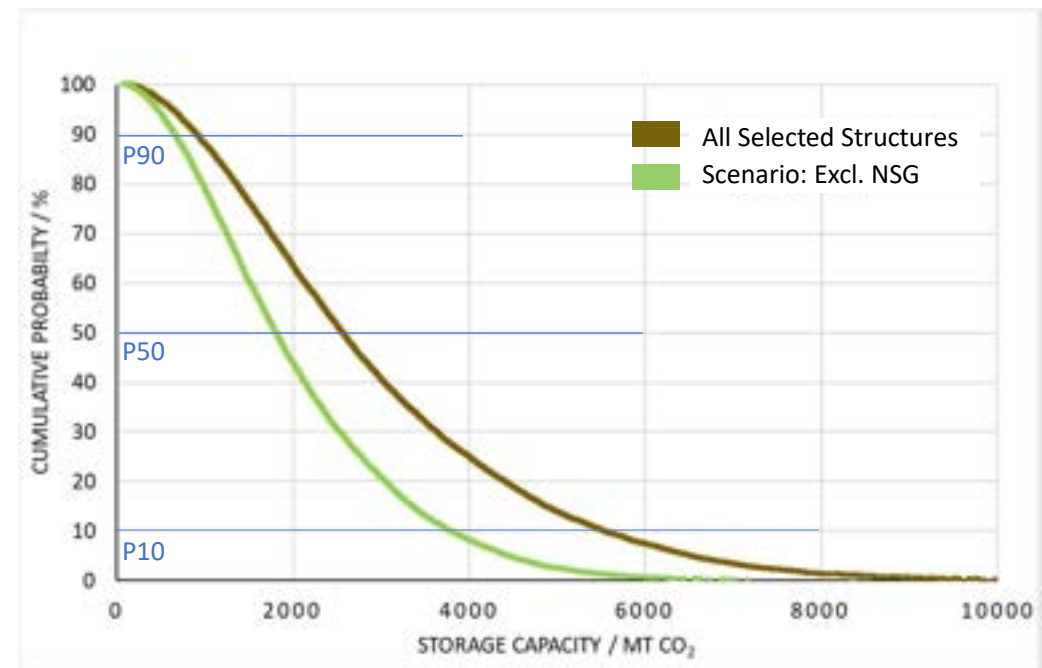
What-if-Scenario: Structures of Interest vs. Priority Areas Nature Conservation



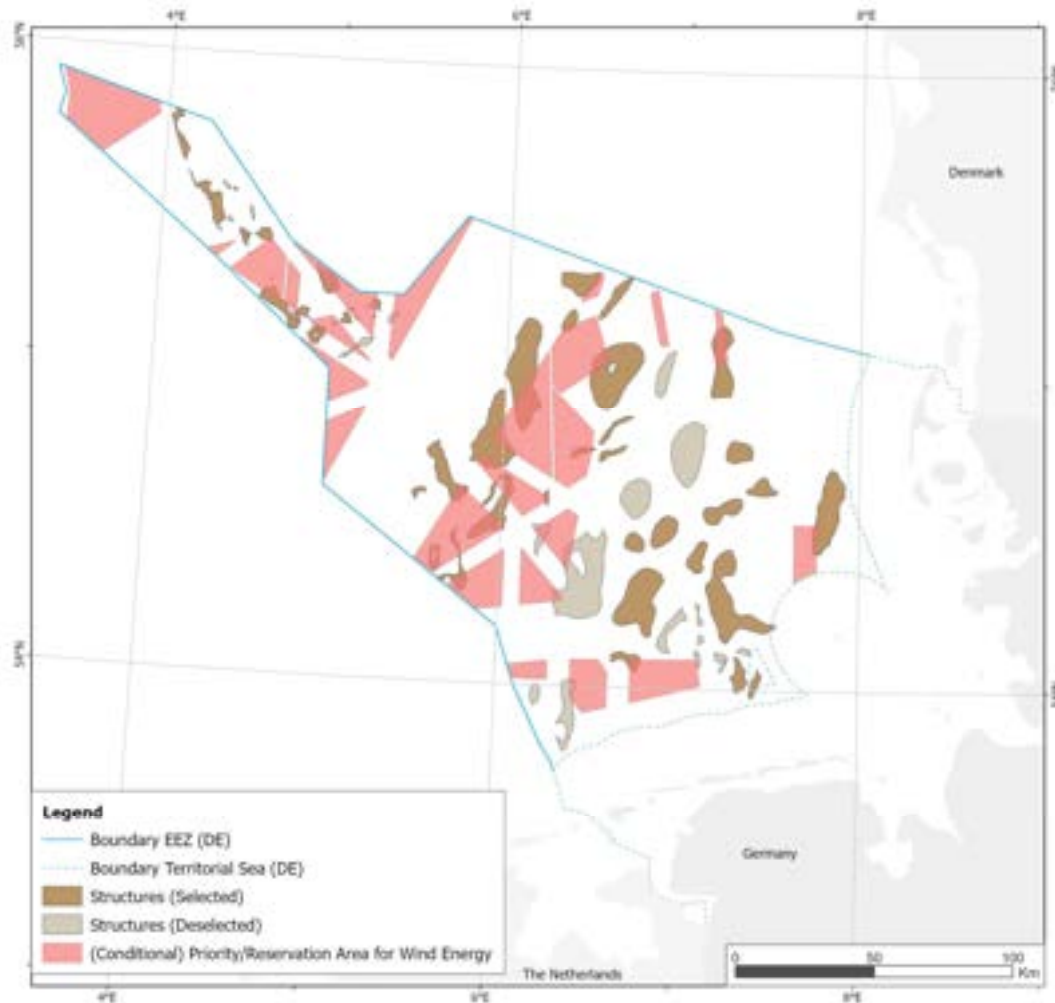
What-if-Scenario: Structures of Interest vs. Priority Areas Nature Conservation



Estimated Storage Capacities for Buntsandstein Structures



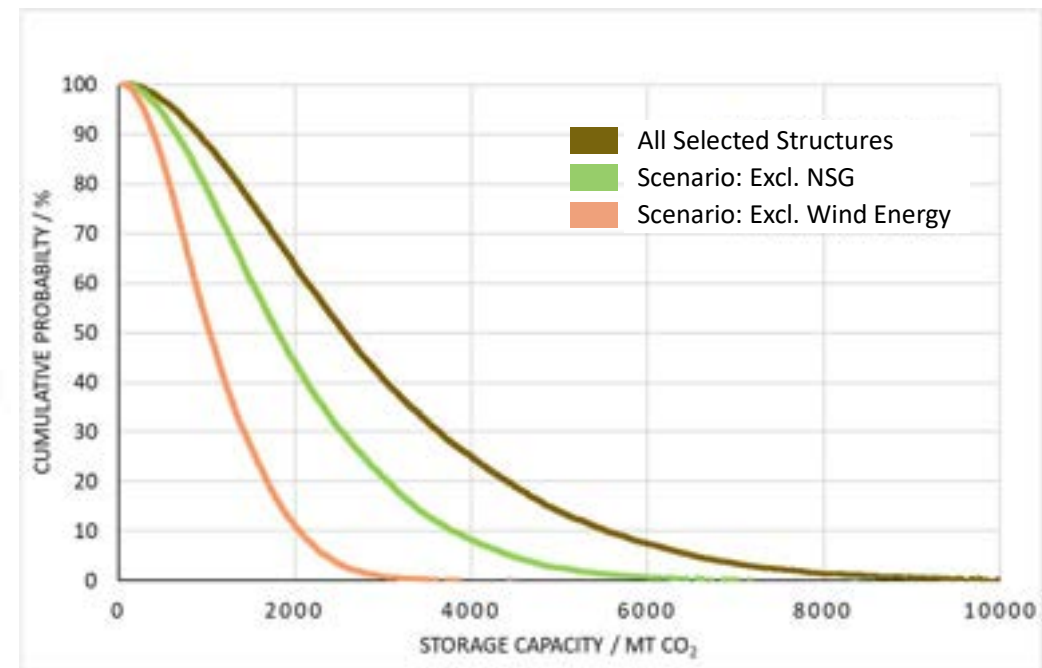
What-if-Scenario: Structures of Interest vs. Priority Areas/Reservation Areas Wind Energy



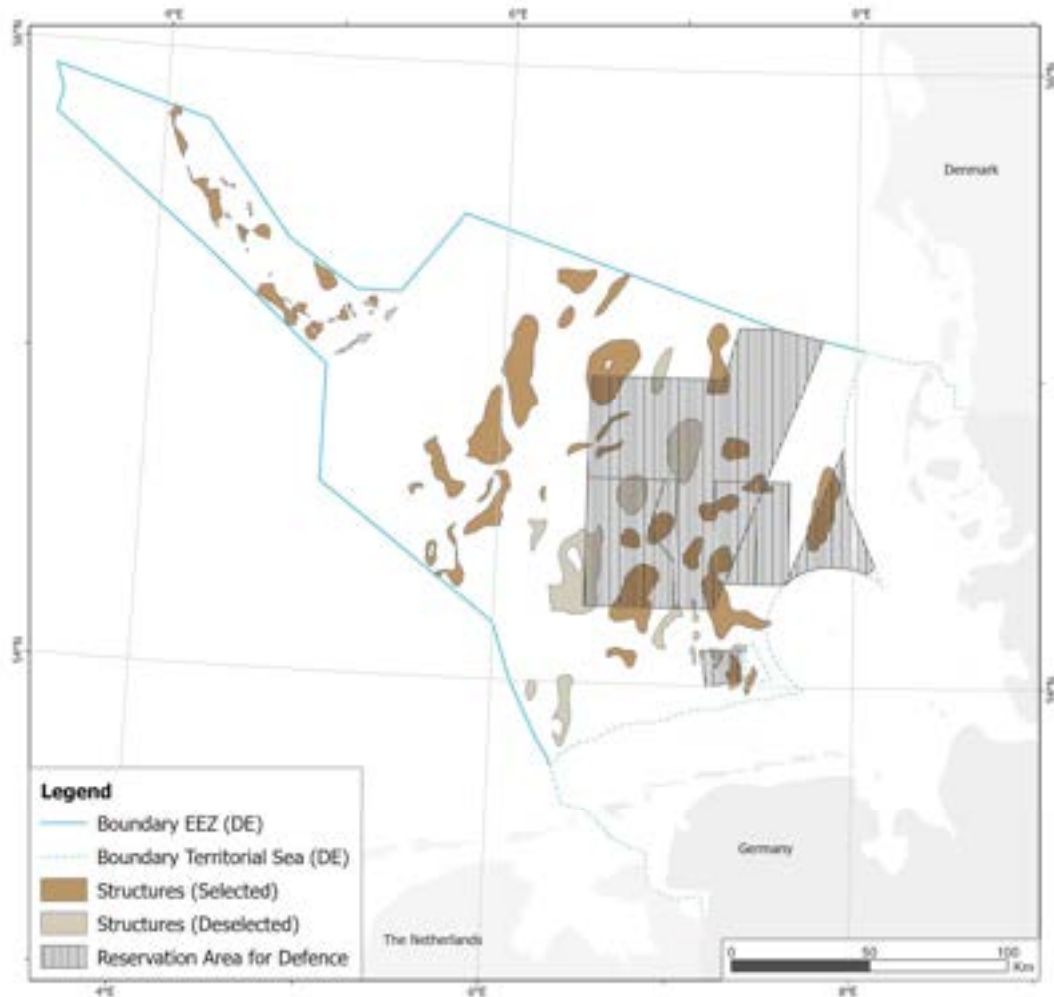
What-if-Scenario: Structures of Interest vs. Priority Areas/Reservation Areas Wind Energy



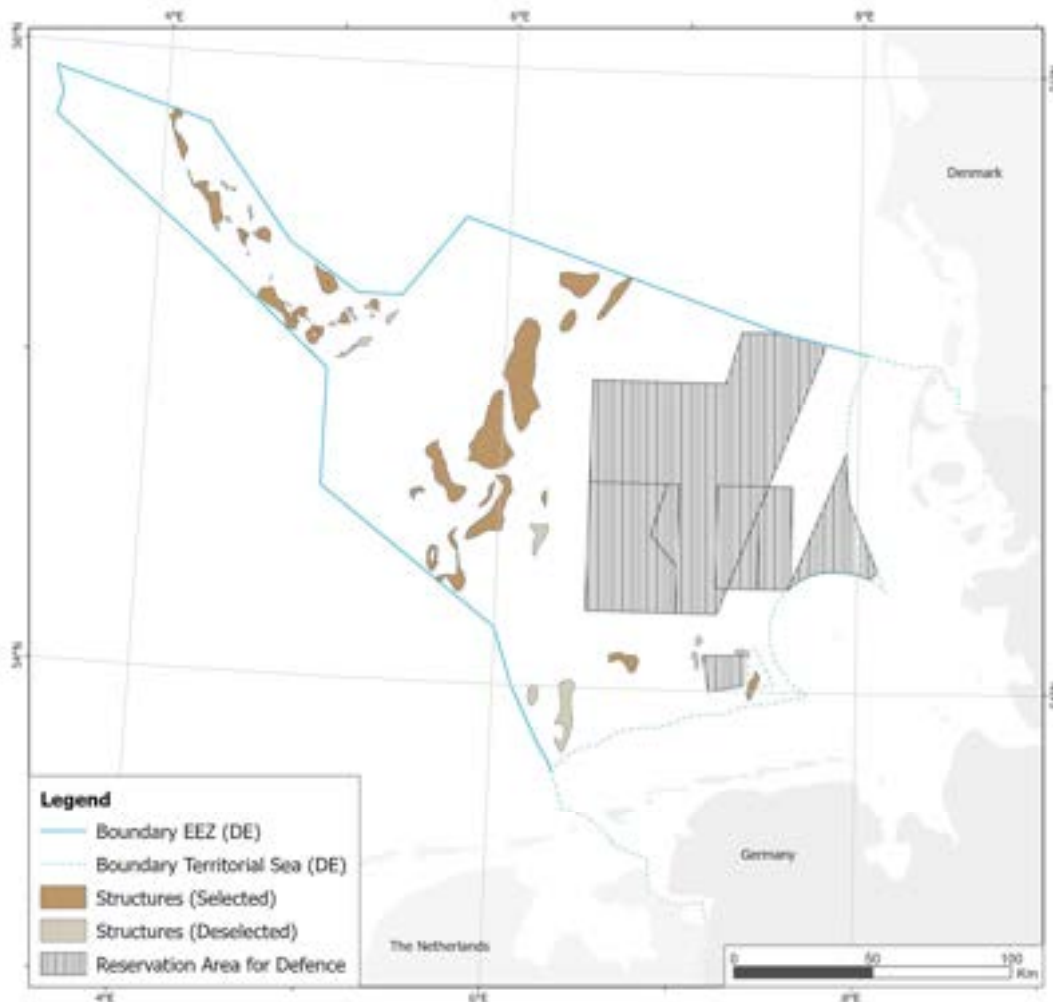
Estimated Storage Capacities for Buntsandstein Structures



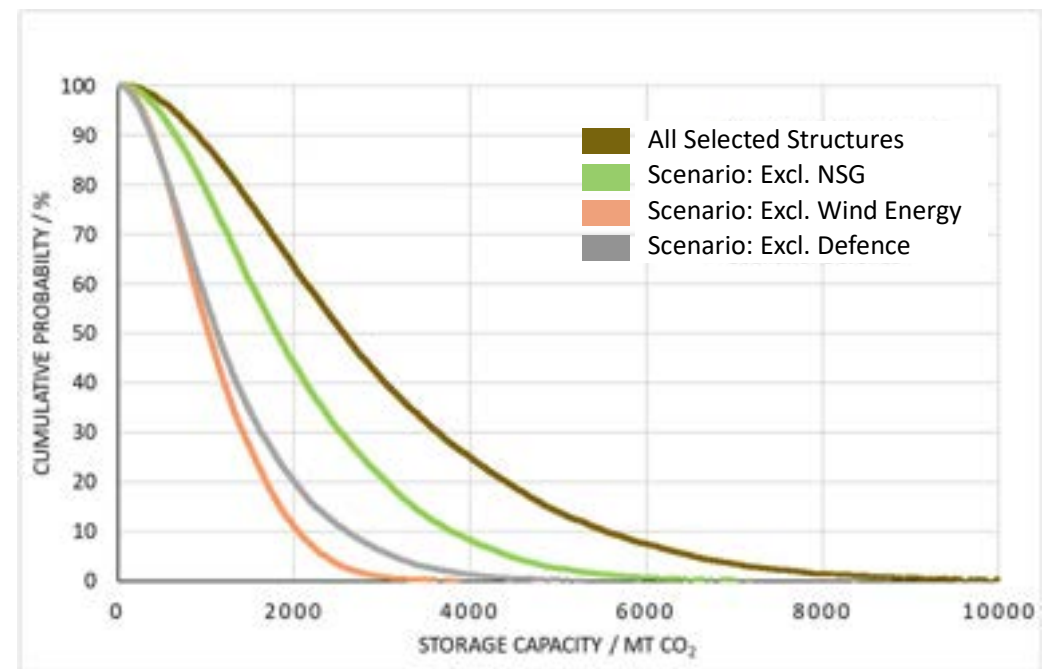
What-if-Scenario: Structures of Interest vs. Reservation Areas Defence



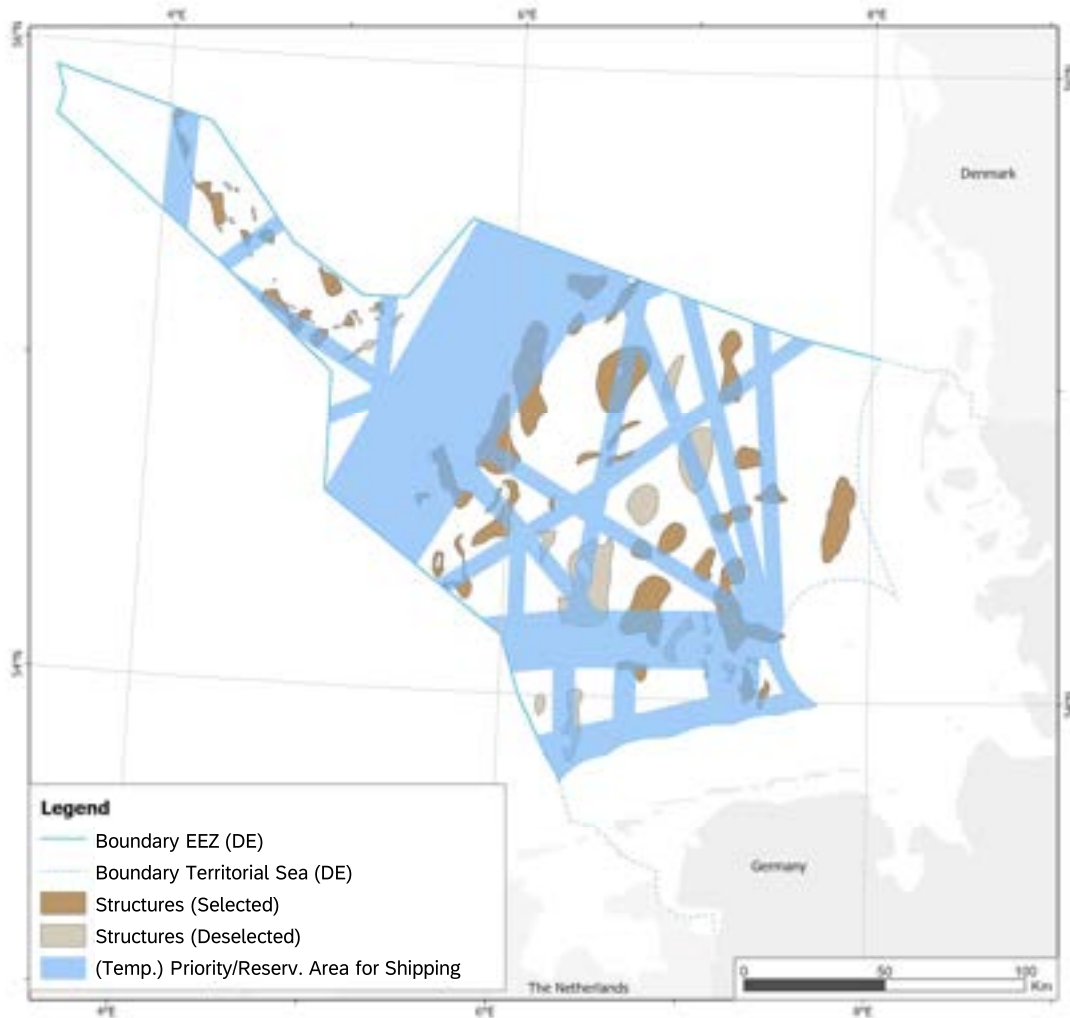
What-if-Scenario: Structures of Interest vs. Reservation Areas Defence



Estimated Storage Capacities for Buntsandstein Structures



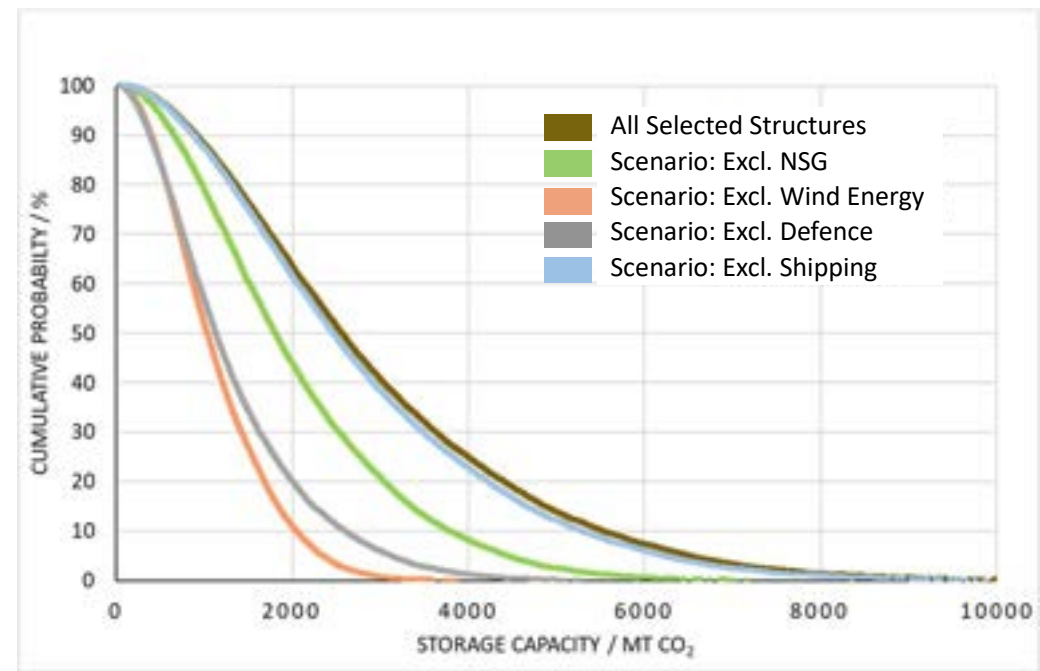
What-if-Scenario: Structures of Interest vs. (Temporary) Priority Areas/Reservation Areas Shipping



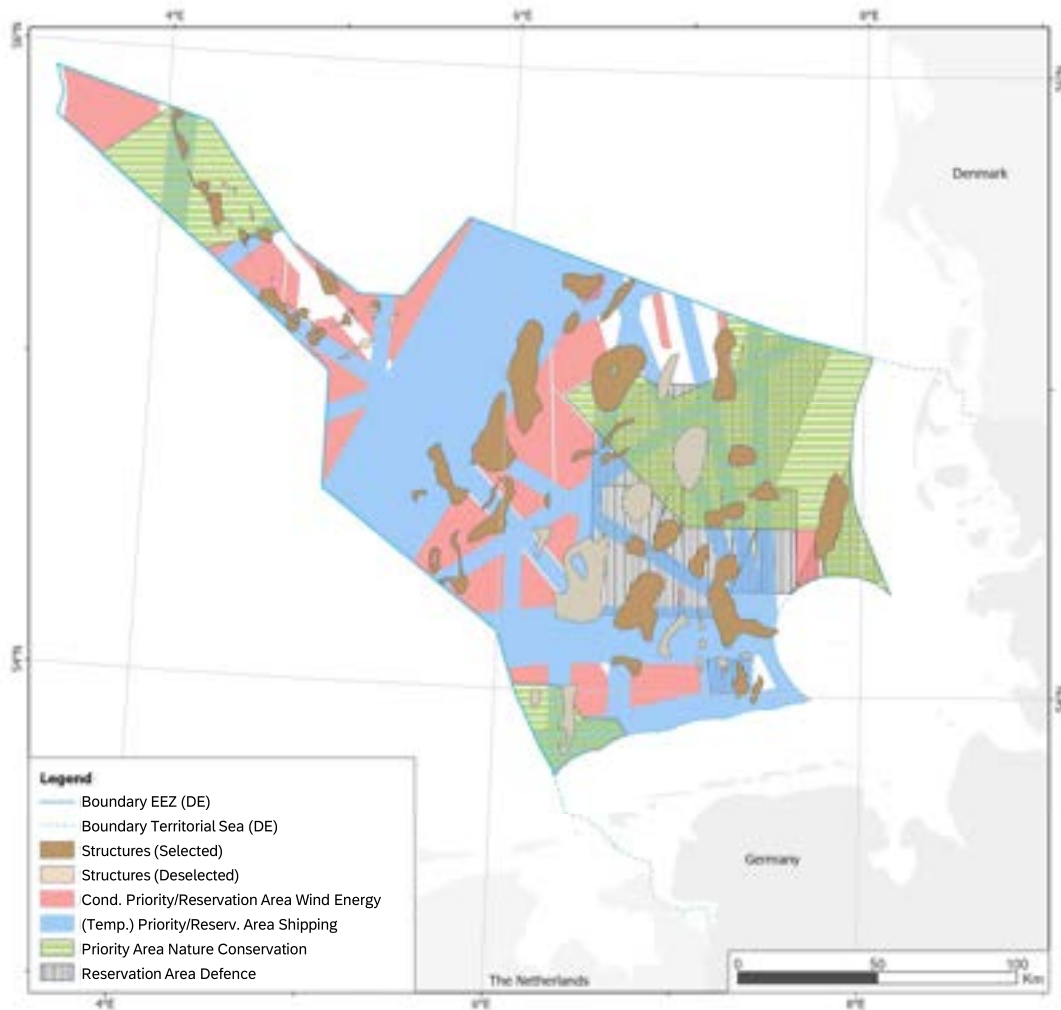
What-if-Scenario: Structures of Interest vs. (Temporary) Priority Areas/Reservation Areas Shipping



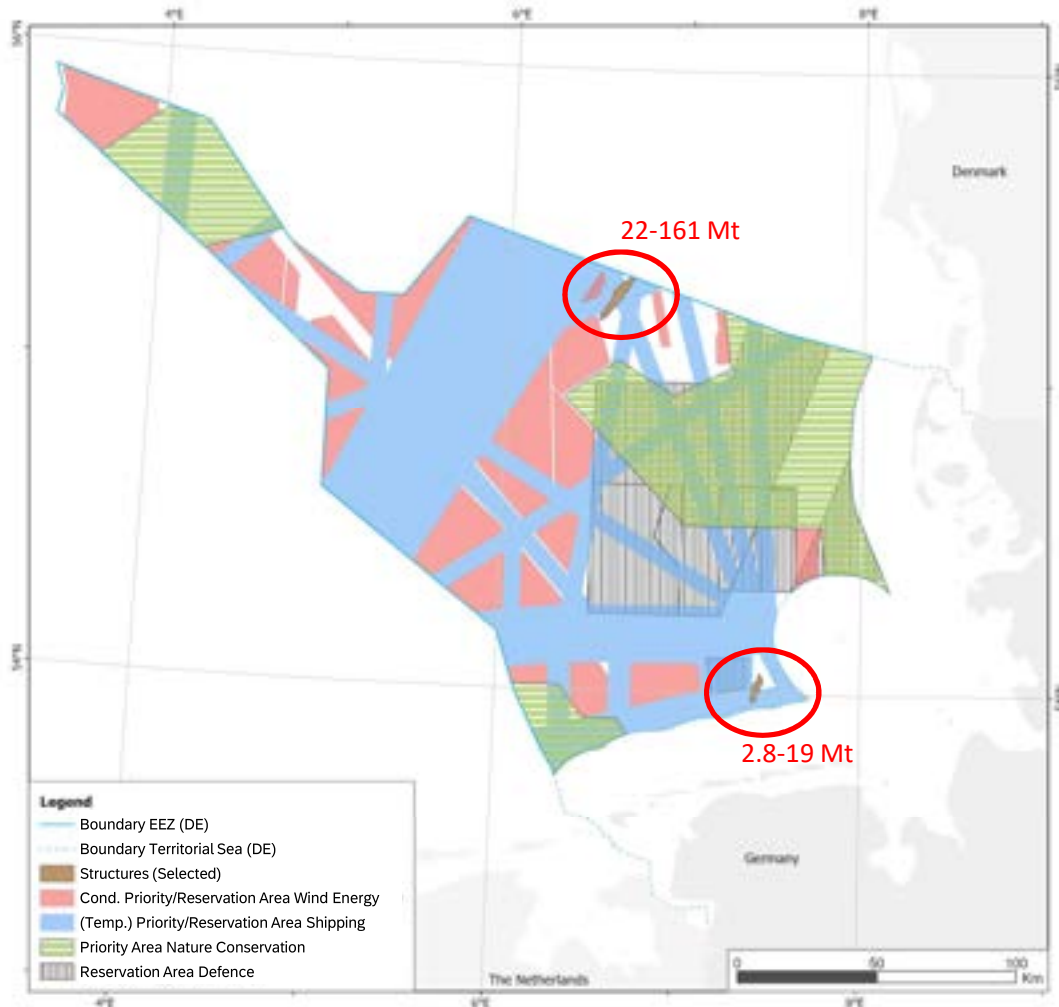
Estimated Storage Capacities for Buntsandstein Structures



What-if-Scenario: Structures of Interest vs. All Considered Priority Areas/Reservation Areas



What-if-Scenario: Structures of Interest vs. All Considered Priority Areas/Reservation Areas



For implementing CO₂ storage projects in the EEZ (North Sea)
⇒ find ways to avoid or resolve conflicts.

For conflict avoidance or resolution
⇒ study interactions in more detail,
⇒ consider different uses in same area, but at different depths (and times),
⇒ use currently still existing opportunity for subsurface exploration (before wind farms are built).

Workshop „Offshore CO₂ Storage – Conflicts of Use and Consideration in Maritime Spatial Planning?“



Workshop:
CO₂-Speicherung im Meeresgebiet – Nutzungskonflikte und
Einbeziehung in die Meeresraumplanung?

AGENDA

11. Oktober 2023 // Gr. Sitzungssaal, Geozentrum Hannover

| | |
|---------------|--|
| 09:00 – 10:00 | Anmeldung |
| 10:00 – 10:30 | Begrüßung und Einführung |
| 10:00 | Begrüßung und Organisatorisches Heike Rütters (BGR), Sina Löschke (fr. Wissenschaftsautorin) |
| 10:10 | CO ₂ -Speicherung im Meeresgebiet – Raumbedarf und mögliche Nutzungskonflikte Heike Rütters (BGR) |
| 10:20 | CDRMare und Projekt GEOSTOR – eine Kurzeinführung Klaus Weilmann (GEOMAR) |
| 10:30 – 12:30 | Impulse |
| 10:30 | CO ₂ -Speicherung unter der Nordsee – geologische Voraussetzungen und Potenziale Stefan Knopf (BGR) |
| 10:55 | CO ₂ -Speicherung im Recht Alexander Proeß (UWI) |
| 11:25 | Aktuelle Entwicklungen der räumlichen Planung auf See Ulrich Scheffler (BSH) |
| 11:55 | Untertageraumplanung – Ergebnisse einer Arbeitsgruppe der Staatlichen Geologischen Dienste (SGD) Roland Strauß (GD NRW) |
| 12:10 | Untertageraumplanung im Meeresuntergrund – Möglichkeiten und Herausforderungen aus planerischer und rechtlicher Sicht Gerold Jonssen (IÖR) |
| 12:25 – 12:30 | Ankündigung der Diskussionsrunden am Nachmittag |
| 12:30 – 13:30 | Mittagspause |



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Example: Potential conflicts of CO₂ storage projects and protection/conservation of marine environment



| | | ← Phases of CO ₂ Storage Project → | | | |
|---------------------|---|---|---|---|---|
| | | Site exploration, characterisation & assessment | Project development/ installation & start | Operation | Closure and post-closure phase (incl. transfer of responsibility) |
| Goods of Protection | Red-List Species | | | | CO ₂ leakage |
| | Benthic ecosystems | Exploration well (areal footprint) | Pipeline installation and operation | | |
| | | | | Leakage (CO ₂ + formation water) | |
| | Bottom fish | | | | CO ₂ leakage |
| | Marine mammals (esp. harbour porpoises) | Seismic surveys (noise) | Noise from service ships | Seismic surveys (noise) | |
| | Nature-protected areas | General space use conflict | | | |

— Identified Key conflicts

Selected examples: Potential ways for conflict resolution in case of...

CO₂ leakage

- > **Regulatory:**
 - distinguish between (very) low and high leakage rates
- > **Organisational/technical:**
 - i) existing boreholes
 - thoroughly investigate their condition during site exploration;
 - monitor at well sites;
 - consider existing boreholes when setting up CO₂ injection strategy
 - ii) in case of leakage, corrective and remediative measures are needed



Report on Workshop „Offshore CO₂ Storage – Conflicts of Use and Consideration in Maritime Spatial Planning?“



**Soon available on
GEOSTOR-Homepage!**

Thank you for your attention!

Contact: heike.ruetters@bgr.de

<https://geostor.cdrmare.de/en>

