Case Study 2: Sweden – Germany (-Denmark)
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1. Case Study Area
2. Scenario Description
3. Marine Uses
4. Final Remarks
Case Studies

Case Study 1: Poland – Sweden with extension to Lithuania

Case Study 2: Germany – Sweden with possible extension to Denmark (area west of Bornholm)
1. Case Study Area

- SE: 245 km²
- DK: 93.5 km²
- DE: 90 km²

Legend:
- CS2
- 2a. Part. Int - High OWP
- HV system
  - CS2 2a. OCP
  - CS2 2a. HVDC converters
  - CS2 2a. 640 kV lines
  - CS2 2a. AC export cable
- OWP system
  - CS2 Turbines High OWP
  - CS2 High OWP areas
- Grid
  - CS2 2a. Substations
  - CS2 2a. 240mm
  - CS2 2a. 630mm
- Export items
  - EEZ
  - Bathymetry (m)
    - 48.000000
    - 43.2000000
    - 37.4000000
    - 31.2000000
    - 25.000000
    - 18.7000000
    - 12.5000000
    - 6.2400000
    - 0.00000
There are six scenarios for each case study:

<table>
<thead>
<tr>
<th>Integration level</th>
<th>OWP level</th>
<th>Scenario</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zero Integration</td>
<td>High OWP</td>
<td>Scenario 1a</td>
</tr>
<tr>
<td></td>
<td>Low OWP</td>
<td>Scenario 1b</td>
</tr>
<tr>
<td>Partial Integration</td>
<td>High OWP</td>
<td>Scenario 2a</td>
</tr>
<tr>
<td></td>
<td>Low OWP</td>
<td>Scenario 2b</td>
</tr>
<tr>
<td>Max. Integration</td>
<td>High OWP</td>
<td>Scenario 3a</td>
</tr>
<tr>
<td></td>
<td>Low OWP</td>
<td>Scenario 3b</td>
</tr>
</tbody>
</table>

Vision + Roadmap
2. Scenario Description

(1a) Zero Integration: High OWP (Vision 2045)

(2a) Partial Integration – High OWP (Vision 2045)

(3a) Max Integration – High OWP (Vision 2045)

(1b) Zero Integration: Low OWP (Vision 2045)

(2b) Partial Integration – Low OWP (Vision 2045)

(3b) Max Integration – Low OWP (Vision 2045)
2. Scenario Description

Example: (2a) Partial Integration – High OWP (Vision 2045)

<table>
<thead>
<tr>
<th>Offshore wind capacity</th>
<th>1 132 MW (DE), 1236 MW (SE), 516 MW (DK)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Offshore wind area:</td>
<td>~90 km² (DE), ~245 km² (SE), ~93.5 km² (DK)</td>
</tr>
<tr>
<td>Cable length:</td>
<td>HVDC: 233.74 km AC Export: 311.74 km</td>
</tr>
<tr>
<td>Number of offshore substations:</td>
<td>HVDC Converter (2), AC substations (7)</td>
</tr>
</tbody>
</table>
2. Scenario Description

Example: (2b) Partial Integration – Low OWP (Vision 2045)

<table>
<thead>
<tr>
<th>Description</th>
<th>DE</th>
<th>SE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Offshore wind capacity:</td>
<td>928 MW</td>
<td>660 MW</td>
</tr>
<tr>
<td>offshore wind area:</td>
<td>76 km²</td>
<td>121.23 km²</td>
</tr>
<tr>
<td>Cable length:</td>
<td>HVDC 219.2 km</td>
<td>AC Export 163.59</td>
</tr>
<tr>
<td>Number of offshore substations:</td>
<td>HVDC Converter (2),</td>
<td>AC substations (4)</td>
</tr>
</tbody>
</table>
Main difference between 6 scenarios:

- Offshore wind capacities (high / low scenarios)
- Variations in proposed routes and cable length
- Grid connection points
- Number of HVDC converters and AC substations
3. Marine Uses
• The Baltic Sea is a heavily utilized marine area.

• Great diversity of interests
  (Offshore wind energy as a new marine use)

• Interest must be balanced and space must be used efficiently.

→ Efficient use of space is central when planning offshore wind energy systems in highly utilized areas.

→ Joint efforts are necessary to overcome obstacles in spatial planning for energy production and transmission
What are the biggest challenges when planning cross-border linear infrastructure?
(How can we overcome the challenges?)

How can corridors for offshore grids make it into the maritime spatial plans?
Thank you for your attention!

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MSP in the German EEZ

Responsible Authority: Bundesamt für Seeschifffahrt und Hydrographie (BSH)
MSP in the Swedish EEZ

Responsible Authority: Agency for Marine and Water Management (SwAM)