NSWPH in the context of the North Seas Offshore Energy Clusters study

NSWPH Consultation Session

European Commission

Hamburg, 27 September 2018
Together with commercial and public stakeholders, we aim to trigger early-stage hybrid offshore development in the North Seas region.

Context and objectives

The hybrid project concept is currently gaining momentum – Stakeholders show genuine interest and start own project initiatives.

The objective of North Seas Offshore Energy Clusters study is twofold:

1. Demonstrate the benefits of the hybrid approach, by comparing costs / benefits of hybrid projects to conventional reference cases.
2. Develop measures to overcome barriers to hybrid project development and agree concrete actions with stakeholders.

The study analyses hybrid project ideas with 'real' assets in early stage planning – Focus on projects with a realistic chance of implementation.

Hybrid projects can pave the way towards a more coordinated and more efficient offshore development – Prerequisite for exploiting the offshore wind potential in the North Seas region.

Source: Roland Berger
In a two-step approach we selected six hybrid project ideas across all clusters to focus on

Selected hybrid project ideas

Source: Roland Berger
Five key learnings from the selection process show that hybrid projects are an important part of the future energy system

Key learnings

1. Assessments reveal no general principle
2. Hybrid projects show significant lifetime benefits
3. Hybrid projects may trigger new IC / RES capacity
4. Hybrid projects reduce environmental impact
5. Hybrid project barriers exist but can be overcome

Source: Roland Berger
NSWPH hybrid project is an offshore hub concept with an artificial Dogger Bank island linking multiple OWFs in vicinity to shore.

Reference and hybrid case profile

**Reference case**
- ~300 km IC cable
- 6 offshore substations
- From-shore O&M

**Hybrid case**
- 0 km IC cable
- 0 offshore substations
- From-island O&M

- - 300 km
- - 6 units

Less effort

Source: 4COffshore; Roland Berger
Initial cost assessment during selection process yielded significant lifetime cost reduction for NSWPH when compared to ref. case.

**Deep-dive learning 2: Significant lifetime benefits [EUR bn] \(^1\)**

<table>
<thead>
<tr>
<th>Component</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total lifetime cost reference case</td>
<td>43.4</td>
</tr>
<tr>
<td>Add. hybrid case CAPEX (add. assets)</td>
<td>2.5</td>
</tr>
<tr>
<td>Red. hybrid case CAPEX (cheaper assets)</td>
<td>-1.4</td>
</tr>
<tr>
<td>Total lifetime cost hybrid case</td>
<td>40.9</td>
</tr>
<tr>
<td>Add. value from P2X solutions</td>
<td>2.5</td>
</tr>
<tr>
<td>Red. hybrid case lifetime OPEX</td>
<td>-1.0</td>
</tr>
<tr>
<td>Add. hybrid case lifetime OPEX</td>
<td>-2.6</td>
</tr>
</tbody>
</table>

\(\geq 6\%\)

Hybrid projects show **significant lifetime benefits**

- Add. assets include artificial island and on-island HVAC equipment.
- Red. assets include elimination of add. IC assets and cheaper on-island equipment.
- Red. OPEX from usage of island as maintenance hub.

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1) Results are subject to barriers; currently no deal-breakers (8% discount factor) assumed.

Source: Roland Berger
Throughout the remainder of the study, we will further try to foster progress towards the realisation of the NSWPH project idea.

Deep-dive learning 5: Barriers can be overcome

**Roland Berger Study**
- Identify project-specific barriers (up to 16 barriers to be overcome for comm. project development)
- Conceptualise mitigations
- Define Action Plans to develop and implement mitigations

**Action Plan implementation**
- Conceptualise missing mitigations
- Implement conceptualised mitigations through
  - Short-term project-specific intergovernmental agreements (IGA)
  - Long-term harmonisation of EU / national rules and regulation
- Pre-develop project by commercial stakeholders

**Hybrid project implementation**
- Initiate commercial hybrid project development based on certainties provided through implemented barrier mitigations

*Source: Roland Berger*

Hybrid project barriers exist but can be overcome

- No general "showstoppers"
- Barriers concern
  - Legal clarifications
  - Planning procedure
  - Energy market rules
  - Business case and financing
  - Political support