Challenging offshore wind: Guiding experiences from the North Sea region

Executive Summary

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Pushing Offshore Wind Energy Regions

A Report about the major challenges and opportunities in the deployment of the offshore wind potential in the North Sea Region.
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EXECUTIVE SUMMARY & CONCLUSIONS

Challenging offshore wind: guiding experiences from the North Sea region discusses the major challenges and opportunities in the exploitation of the offshore wind potential in the North Sea region. This report is based on 6 themes: *planning practices, grid issues, environmental impact, project management and finances, stakeholder involvement and regional economies*. For five North Sea countries (Denmark, Germany, The Netherlands, Belgium and the United Kingdom) these themes are discussed. These discussions result in opportunities, strengths and weaknesses per country. Table 1 shows the main strengths and weaknesses of the various countries. In order to fully understand the content of this table and the recommendations, the reader is strongly advised to read the specific chapters in this report.

The strengths and weaknesses mentioned in the table lead to recommendations and challenges for the different countries. In *Denmark* turbines were used that were not finished testing. This gave problems during operation. Recent experiences show this will not happen again. A long-term prospect on offshore wind energy gives the market more certainty. It is essential that the Danish government establishes such a prospect. Another challenge for Denmark is the use of shared offshore grid infrastructure. Denmark, being one of the countries with an early experience in offshore wind energy, can play a leading role in adjusting operation and maintenance strategies. This experience should be used to standardize Environmental Impact Assessment requirements for the North Sea region.

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Table 1: Comparison of the POWER countries.

	Main strengths	Main weaknesses
Denmark	Direct and stable government involvement *One stop shop* approach A lot of experience in offshore wind	Ports not suitable for installation next generation turbines Uncertain long-term prospect for offshore wind energy
Germany	Consistent financial support Extensive stakeholder consultation	Complicated bureaucratic setting Time consuming licence procedures Few suitable cable routes
The Netherlands	Broad range of stakeholders involved Good ports for logistics, construction and servicing Growing institutional belief in wind energy	Instable government involvement Time consuming implementation procedures
Belgium	Consents have a high level of freedom Regional partners in the consortium lead to employment in the region	No specific requirements for offshore wind farms taken into account during location selection No long-term perspective on offshore wind energy
United Kingdom	Stable side conitions for the market Room for technological changes	Grid connection possibilities are limited Poor onshore infrstructure

German wind farms are planned far from the coast in deep waters, resulting in a poor ratio between investment and reimbursement. The next generation 5 MW turbines can improve this ratio. Because suitable cable routes crossing the Wadden Sea are rare, a shared cable infrastructure is a solution. German government should actively support the realisation of this infrastructure. Different governmental bodies judge proposed cable routes and proposed project sites. This leads to time consuming procedures. Institutional changes should be explored to shorten implementation procedures.

In *The Netherlands*, a secure and stable policy perspective is crucial in making a successful and structural growth of offshore wind activities possible. A long-term perspective, in which a gradual growth of capacity is adapted to financial support regulation, should be established. Most importantly, the policy framework must be stable over time. In order to benefit from learning effects and to keep financial support at a reasonably low level a step-by-step approach has to be adopted.

A strategic perspective on offshore wind energy should be developed in *Belgium*. Developers are less hesitant when there is a strategic outlook. This perspective should include policy targets, grid reinforcement requirements, financial support, environmental impact and a flexible consent regime. In Belgium projects are, like in Germany, located relatively far from the coast. The use of next generation turbines is crucial to increase financial security and feasibility.

In the *United Kingdom*, the main challenge is reinforcement of the onshore grid infrastructure. Setting up a durable economic relationship with other regions in the

North Sea is another challenge. The East of England region, being a forerunner in offshore wind energy, can be at the forefront of such developments.

1. Guiding principles

The recommendations and challenges for the different countries have common grounds. These common grounds are the basis for the generic guiding principles for a successful exploitation of the offshore wind potential.

Planning practices: A stable and structural policy framework is very important for a young industry to mature. A gradual growth of capacity installed allows the market to fully benefit from technological innovations and allows the government to reduce financial support. Countries should strive for one single regulatory regime and legislative framework applicable to both territorial waters and the Economic Exclusive Zone.

Grid issues: The use of common offshore cables and onshore connection facilities should be encouraged on national or even transnational level. A Trans European perspective, embedded in a Trans European regulatory framework on power exchange, is necessary to allow the future development of transnational cable routes and cross-border grid connections. Existing and future interconnection cables between the countries surrounding the North Sea may be used to connect offshore wind farms with the onshore grid.

Environmental impact: The results of the first monitoring programmes must be used to reconsider EIA standards and requirements. Furthermore, a transnational Strategic Environmental Assessment for the North Sea should be established in order to combine minimal environmental damage with an efficient use of resources on a European level. Such a transnational SEA creates a strategic perspective that unites all stakeholders in the world of offshore wind.

Project management and finances: Onshore testing and assembling is crucial and should not be rushed, as offshore work is generally up to 5 times more expensive. To reduce insecurities to the market, governments need to provide structural and stable support adjusted to a country's strategic perspective on offshore wind industry in general. Although in general the costs for a project differ up to 20 percent between an EPC- or Multicontracting approach, the actual choice is depends on the capability of a consortium to manage processes and to bear risks.

Stakeholder involvement: Various licence procedures during the realisation of projects ensure extensive stakeholder involvement. Public participation, consultation and information allow a more fact-oriented discussion. Cooperative-ownership is mentioned frequently to increase public involvement and acceptance. In order to be successful, the reimbursement rates of such initiatives need to be rather high and initial investments relatively low. This can be achieved by initiatives that are relatively small-scale and close to the coastline. A media strategy has to focus on providing extensive information during the actual building process and operation.

Regional economics: Offshore wind energy offers a considerable opportunity for North Sea regions to create or safeguard a substantial number of jobs. Employment is generated during the construction period of the wind farms, while operation and maintenance of wind farms create a long term though limited amount of employment. None of the regions is completely self-sufficient in serving the whole offshore wind supply chain for its forecast level of development. Together the regions can deliver a fully capable Trans European supply chain, capable of supporting projects in the North Sea region and developments elsewhere in the world. Such a supply chain offers a unique opportunity to use and enlarge the market potential in the region. The parts on Regional economics are mainly based on the Transnational Offshore Wind Supply Chain Study by POWER's work package on regional economics.

2. Strategic collaborative perspective

What this study calls for (and what is repeatedly confirmed in the recommendations and guiding principles) is cooperation and fine-tuning amongst the members of the North Sea region. To do so, a strategic cross-border outlook on offshore wind energy should be established. Ideally, a strategic cross-border outlook is closely related to a Trans European energy infrastructure perspective and the implementation of a transnational Strategic Environmental Assessment for the North Sea. When this transnational SEA incorporates non-environmental issues relevant to offshore wind energy, this brings spatial planning in the North Sea on a higher level. The countries should work together to make it possible to develop offshore wind energy in the North Sea on another level. Looking at the offshore wind energy industry, the supply chains in the different POWER regions perform best when complementary. In this way, a fully capable supply chain will be established. Again, transnational cooperation and international fine-tuning is the key to a successful and prosperous exploitation of the offshore wind energy potential.

The full report is available for download on the POWER website at www.offshore-power.net

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