Denmark: Offshore Wind and Interconnectors

Professor Birgitte Egelund Olsen
School of Law, Aarhus University
BIRGITTE EGELUND OLSSEN

PROFESSOR PH.D. LL.M.

Deputy Head
International Affairs & External Funding

Director of Study
Master of Environmental & Energy Law

Vice Chairman
Energy Board of Appeal

Chairman
Wind Turbine Valuation Authority

Legal Expert
Better and Simpler Legislation Project

Ministry of Environment and Food

AARHUS UNIVERSITY
School of Business and Social Sciences
Department of Law
M: beo@law.au.dk

au.dk
Outline

- Status and future – offshore wind farms, offshore grids and interconnectors
- Legal framework and institutional set-up
- Preliminary remarks on an integrated Baltic Sea solution
Offshore Wind - then, now and the future

Offshore Wind Farms in Denmark
1. Vindeby (1991) 11 turbines, 4.95 MW
2. Tunø Knob (1995) 10 turbines, 5 MW
5. Rønland (2003) 8 turbines, 17.2 MW
7. Samsø (2003) 10 turbines, 23 MW
8. Frederikshavn (2003) 3 turbines, 7.6 MW
10. Avedøre Holme (2009/10) 3 turbines, 10.8 MW
12. Rødsand II (2010) 90 turbines, 207 MW
13. Anholt (2013) 111 turbines, 399.6 MW

Planned Coastal Wind Farms

Horns Rev III

Kriegers Flak

Planned Offshore Wind Farms

Source: Danish Energy Agency, 2016

Source: Vattenfall, 2016

Source: Energinet.dk, 2016
State of play:
- Radial connections

Planned future:
- Horns Rev III: Radial connection
- Kriegers Flak: An interconnected connection (a meshed solution)
Interconnectors - now and the future

Danmarks elektriske udlandsforbindelser
- Eksisterende
- Under bygning
- Under planlægning

Source: Energinet.dk
Procedures for the Establishment of an Offshore Wind Farm

Offshore  Nearshore
Tender  Open door
# Overview of the Legal Framework and institutional Set-Up

<table>
<thead>
<tr>
<th>Infrastructure</th>
<th>Phases</th>
<th>Legal basis</th>
<th>Competent authority</th>
<th>Implementing authority</th>
</tr>
</thead>
<tbody>
<tr>
<td>Offshore wind</td>
<td>Strategic planning, tender etc.</td>
<td>RE-Act</td>
<td>DK Energy Agency</td>
<td>Energinet.dk (TSO)</td>
</tr>
<tr>
<td></td>
<td>Project planning, EIAs, permitting and licensing</td>
<td>RE-Act</td>
<td>DK Energy Agency</td>
<td>Energinet.dk</td>
</tr>
<tr>
<td>Only coastal wind</td>
<td>Public Acceptance</td>
<td>RE-Act</td>
<td>Valuation Aut. Energinet.dk</td>
<td>Energinet.dk</td>
</tr>
<tr>
<td>Support schemes</td>
<td>Premium</td>
<td>RE-Act</td>
<td>Energinet.dk</td>
<td>Energinet.dk</td>
</tr>
<tr>
<td>Offshore grid</td>
<td>Step-by step approach, planning, EIAs etc.</td>
<td>RE-Act</td>
<td>DK Energy Agency (Nature Agency)</td>
<td>Energinet.dk</td>
</tr>
<tr>
<td>Interconnectors</td>
<td>Strategic and project planning, permits etc.</td>
<td>ES Supply Act Bilateral agree.</td>
<td>DK Energy Agency</td>
<td>Energinet.dk</td>
</tr>
</tbody>
</table>

**Energy Board of Appeal**
Speeding up the process
### Offshore Wind (tender) vs. Coastal Wind (tender)

<table>
<thead>
<tr>
<th>Super shallow approach</th>
<th>Offshore Wind</th>
<th>Coastal Wind</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>The plant developer covers the costs of the connection to shore</td>
<td>Yes</td>
</tr>
<tr>
<td>Yes</td>
<td>The TSO covers all costs not related to the internal infrastructure</td>
<td>No</td>
</tr>
<tr>
<td>No</td>
<td>The plant developer is obliged to compensate land owners inflicted by the transmission net on land</td>
<td>Yes</td>
</tr>
<tr>
<td>No</td>
<td>The plant developer is obliged to offer a minimum of 20 percent ownership to local citizens</td>
<td>Yes</td>
</tr>
<tr>
<td>No</td>
<td>The plant developer is obliged to compensate neighbors for loss of value to their dwellings</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Source: www.hvidesande.dk
Issues that may constitute barriers

- Political, economic and legal framework
- Grid regulation and infrastructure
- Market structure
- Administrative processes
- Public perception and local acceptance
- ....