Danish Offshore Wind Tender Model

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Agenda

1. The Danish Political targets and the road map
2. Focus on wind energy
3. Focus on offshore wind energy
4. The Danish Tender Model
5. Case Study – Kriegers Flak
6. Tender results
01. The Danish political targets and the road map
A very ambitious political energy agreement (2012/2014)

- Currently under review – expected adjustment during 2018

<table>
<thead>
<tr>
<th>(Current) Planned Targets</th>
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<tr>
<td><strong>2020</strong></td>
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<tr>
<td>35% renewable energy in total energy consumption</td>
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<tr>
<td>50% electricity consumption supplied by wind power</td>
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<td>7% reduction in gross energy consumption compared to 2010</td>
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<tr>
<td><strong>2035</strong></td>
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<tr>
<td>100% electricity and heat consumption supplied by renewable energy</td>
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<tr>
<td>Coal to be phased out in 2030</td>
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<tr>
<td><strong>2050</strong></td>
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<tr>
<td>100% of total energy consumption supplied by renewable energy</td>
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How will the 2020 ambitions be achieved?

**Wind Power**
- 1,000 MW increase from offshore wind farms
- 350 MW increase from nearshore wind farms
- Planning tools to encourage 500 MW increase from onshore wind farms

**Biomass**
- Conversion from coal to biomass at large-scale Combined Heat and Power plants (CHP) and smaller open field plants

**Other**
- Support development of photovoltaic, wave power etc.
- Support development and use of biogas
- Smart grids
02. Focus on wind energy
# The future development of Danish wind energy production

## Onshore
Municipalities must actively plan to provide sites. Four incentives to do so:
1. 20% local co-ownership
2. Compensation for loss of property value for neighbours
3. Green scheme for municipalities
4. Guarantee fund to support feasibility studies

Subsidy: 33.5 EUR/MWh and 77.9 EUR cap on market price + subsidy

## Offshore Open Door
- Based on public license to carry out preliminary investigations
- Exclusivity to site if preliminary investigations are successful
- Subsidy: 33.5 EUR/MWh and 77.9 EUR cap on market price + subsidy

## Offshore Tender
- Sites are reserved for public tender based on preliminary investigations
- All development is carried out by the State
  a) EIA
  b) Met-ocean data
  c) Geotechnical surveys
- Tender based on “contract for difference” (Agreed fixed tariffs)

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Tenders for offshore wind attract the most interest
03. Focus on offshore wind energy
Current offshore wind turbine farms in Denmark
03. Focus on offshore wind energy

Current, planned and future developments

- **Current**: 1,270 MW
  - Middelgrunden
  - Avedøre
  - Nysted
  - Rødsand II
  - Vindeby
  - Sprogø
  - Samsø
  - Tuno Knob
  - Anholt
  - Frederikshavn
  - Rønland
  - Horns Rev II
  - Horns Rev I

- **Planned**: 2,770 MW
  - Middelgrunden
  - Avedøre
  - Nysted
  - Rødsand II
  - Vindeby
  - Sprogø
  - Samsø
  - Tuno Knob
  - Anholt
  - Frederikshavn
  - Rønland
  - Horns Rev II
  - Horns Rev I

- **Future**: 5,600 MW
  - Middelgrunden
  - Avedøre
  - Nysted
  - Rødsand II
  - Vindeby
  - Sprogø
  - Samsø
  - Tuno Knob
  - Anholt
  - Frederikshavn
  - Rønland
  - Horns Rev II
  - Horns Rev I

- **Store Middelgrunden**
- **Jammerbugt B**
- **Ringkøbing Fjord C**
- **Kriegers Flak B**
- **Ringkøbing Fjord B**
- **Horns Rev B**
- **Ringkøbing Fjord A**
- **Jammerbugt A**
- **Ronne Banke**
- **Kriegers Flak A**
- **Nysted**
- **Horns Rev III**
- **Middelgrunden**
- **Avedøre**
- **Nysted**
- **Rødsand II**
- **Vindeby**
- **Sprogø**
- **Samsø**
- **Tuno Knob**
- **Anholt**
- **Frederikshavn**
- **Rønland**
- **Horns Rev II**
- **Horns Rev I**

- **Future**: 2,800 MW

Gorissen Federspiel

Danish Offshore Wind Tender Model

September 2017
04. The Danish tender model
The Danish offshore tender model

1. Relevant sites have been reserved by the Danish state based on preliminary investigations
2. Site-specific pre-investigations are carried out by the Danish state (EIA, Met-ocean data, geotechnical surveys)
3. Free and guaranteed access to grid
4. Tender based on “contract for difference” (fixed tariff ÷ market price)
5. Centralized permitting process, including permits for development, construction and operation
6. A well-structured tender process including Q&A and the possibility of negotiations
7. Strong national and local political support welcoming foreign investment
Tender model overview

Identification of possible sites

Technical project material is made available and meetings and technical dialogue with potential tenderers and investors

Deadline for application for prequalification

Deadline for submitting preliminary tender offer

Deadline for binding tender offer

Preliminary investigation of possible sites carried out by the state

Contract notice

Preliminary tender specification and EIA report published

Negotiations with tenderers and final tender specifications
From tender award to production of kWh

1. Submission of binding tender offers
2. Tender winner is announced based on lowest price per kWh (and best use of tender MW)
3. Tender winner to sign Concession Agreement with Danish Energy Agency (and become “Concessionaire”)
4. Concessionaire will then be granted
   a) licence to conduct pre-investigations in addition to Energinet.dk’s EIA report, geotechnical report, geophysical report and MetOcean data.
   b) licence for the construction of an electric power generating plant and related internal grid
5. Concessionaire submits a detailed time schedule to the Danish Energy Agency
From tender award to production of kWh

6. Concessionaire must agree on a plan with grid operator (Energinet.dk) with respect to installation and commissioning of cables and transformer platform.

7. Concessionaire submits a detailed project plan for approval by the Danish Energy Agency.

8. After commencement of construction work Concessionaire is granted a licence to exploit wind power.

9. Finally, the Concessionaire will be granted an authorisation to produce electricity.
05. Case Study – Kriegers Flak
Kriegers Flak

- 600 MW offshore wind farm
- Located in the Baltic Sea
- Expected operational commencement 2021
- 7 companies/consortia prequalified
Kriegers Flak

- Prequalifications awarded for:
  - Energie Baden Württemberg AG (EnBW AG)
  - European Energy A/S and Boralex Europe S.A.
  - Vattenfall Vindkraft A/S
  - Statoil ASA and E.ON
  - ScottishPower Renewable Energy Limited
  - DONG Energy Wind Power A/S
  - Wpd, HOFOR and Stadtwerke München (withdrawn)
Kriegers Flak

- Final tender bids 8 November 2016
- Winner announced on 9 November 2016
- Won by Vattenfall Vindkraft A/S
- Winning Bid 49.93 EUR/MWh for 600 MW
- Tariff guaranteed for 50,000 full load hours for 600 MW = 30 TWh
Kriegers Flak

- **Formal steps**
  - Approval by Danish Parliament of tender terms (19 December 2016)
  - Concession Agreement signed (22 December 2016)
  - Licence to conduct pre-investigations (22 December 2016)
  - **EC-approval** of state aid (28 March 2017)
Kriegers Flak

- Concession Agreement
  - 1 March 2017: Detailed timetable
  - 1 June 2021: Commence construction
  - 1 January 2022: Grid-connection
Kriegers Flak

- Concession conditions
  - Joint and several liability if Concessionaire has relied on other companies financially during prequalification (Consortia and JV’s)
  
- Penalties for defective performance
  - 0-12 months from Concession Agreement = mEUR 13.5
  - Thereafter = mEUR 60
Kriegers Flak

- Concession conditions (continued)
  - **Guarantees**
    - Equal to penalty sizes
    - Released when
      - Investment costs > mEUR 135 or
      - First kWh from first turbine
  - **Delay**
    - If less than 95% grid-connected by 1 January 2022 => reduction of subsidized capacity by 0.3 TWh for every 6 months
Danish results

- Clear decreasing trend
  - Anholt (400 MW) – 141.1 EUR/MWh (2010-prices)
  - Horns Rev III (400 MW) – 103.4 EUR/MWh (2015-prices)
  - Nearshore turbines (350 MW) – 63.8 EUR/MWh (2016-prices)
  - Kriegers Flak (600 MW) – 49.9 EUR/MWh (2016-prices)
07. Contact
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