Wind in the European Energy Transition

Diletta Zeni
## Our members make wind energy work

<table>
<thead>
<tr>
<th>Category</th>
<th>Members</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wind turbine manufacturers</td>
<td>GE Renewable Energy, Siemens Gamesa, Vestas, Acciona, Equinor, Res, Orsted, Shell</td>
</tr>
<tr>
<td>Wind farm developers</td>
<td>RWE, EDF Renewables, Enel, Iberdrola Renewables, Vattenfall</td>
</tr>
<tr>
<td>Power utilities</td>
<td>LM Wind Power, Master Builders Solutions, ZF, Hitachi, ABB</td>
</tr>
<tr>
<td>Component manufacturers</td>
<td>Jan De Nul Group, Port of Amsterdam, Van Oord, Jan De Nul</td>
</tr>
<tr>
<td>Installation / logistics</td>
<td>Allianz, Baker McKenzie, Fraunhofer IWES, TU Delft, DTU</td>
</tr>
<tr>
<td>Financial &amp; legal services</td>
<td>Catapult Offshore Renewable Energy, Fraunhofer IWES, TU Delft, DTU</td>
</tr>
<tr>
<td>Research institutes</td>
<td></td>
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</tbody>
</table>

+ NATIONAL WIND ASSOCIATIONS
Wind energy in Europe

220 GW

16% of Europe’s electricity demand
Offshore wind in Europe

25 GW

3% of Europe’s electricity demand

GW installed

Wind share of electricity demand
Europe’s Offshore Wind Farms
Wind energy capacity factors have risen 1983-2019

Source: IRENA (2019)
Onshore wind auction prices 2013-2020
Cost of offshore wind is decreasing

Auction results

<table>
<thead>
<tr>
<th>Project</th>
<th>Price (€/MWh)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Walney Extension</td>
<td>1.32 USD/EUR</td>
</tr>
<tr>
<td>Beatrice</td>
<td>1.11 USD/EUR</td>
</tr>
<tr>
<td>Dudgeon</td>
<td>1.11 USD/EUR</td>
</tr>
<tr>
<td>Horns Rev One</td>
<td>1.13 USD/EUR</td>
</tr>
<tr>
<td>East Anglia</td>
<td>1.18 USD/EUR</td>
</tr>
<tr>
<td>Neart Na Gaoithe</td>
<td>1.20 USD/EUR</td>
</tr>
<tr>
<td>Kriegers Flak</td>
<td>1.25 USD/EUR</td>
</tr>
<tr>
<td>Borssele 1 and 2</td>
<td>1.30 USD/EUR</td>
</tr>
<tr>
<td>Borssele 3 and 4</td>
<td>1.35 USD/EUR</td>
</tr>
<tr>
<td>Triton Knoll</td>
<td>1.40 USD/EUR</td>
</tr>
<tr>
<td>Hornsea 2</td>
<td>1.45 USD/EUR</td>
</tr>
<tr>
<td>Moray offshore</td>
<td>1.50 USD/EUR</td>
</tr>
<tr>
<td>Gode Wind 4</td>
<td>1.55 USD/EUR</td>
</tr>
<tr>
<td>Baltic Eagle</td>
<td>1.60 USD/EUR</td>
</tr>
<tr>
<td>Dunkirk</td>
<td>1.65 USD/EUR</td>
</tr>
<tr>
<td>2024 projects</td>
<td>-75%</td>
</tr>
<tr>
<td>2025 projects</td>
<td>-75%</td>
</tr>
</tbody>
</table>

Source: WindEurope, February 2020
Wind employs 300,000 people in Europe
Port of Esbjerg, Denmark

Source: Port of Esbjerg
Basque country and Navarra, Spain

Source: Acciona (Instagram)
Onshore & offshore wind will be the main sources of electricity generation by 2040
Huge increase in wind capacity coming

2020 WindEurope: 165 GW Onshore, 15 GW Offshore
2030 European Commission: 361 GW Onshore, 73 GW Offshore
2050 European Commission: 1,000 GW Onshore, 300 GW Offshore

EU27. Source: 2030 & 2050 EC MIX (2030 Impact Assessment)
How do we get there?
Accelerating RES-based direct electrification

**2018**
- Final energy demand: 13k TWh
  - Power: 31%
  - Heat: 45%
  - Transport: 18%

**2050**
- Final energy demand: 9k TWh
  - Power: 62%
  - Heat: 21%
  - Transport: 17%

Share of renewables in the sector:
- 2018: 24%
- 2050: 61%
How do we get there?

Auctions and Contracts for Difference (CfD)
How do we get there?
Getting permitting right!
Permitting: theory vs reality

Renewable Energy Directive:
- 2 years max (1 year for repowering)
- One-stop-shop

Member States:
- Lengthy processes: 5+ years!
- Fragmentation
- Spatial (regulatory!) constraints: military, housing distance rules, ...
- Understaffed public authorities
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Keep up-to-date with WindEurope products & events
THANK YOU

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