Offshore wind energy Poland – the next Baltic Sea market?

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Offshore wind energy

- 40 GW – energy potential of the Baltic Sea (10 GW until 2030)
- South Baltic – main area for offshore wind energy development in the Baltic
- Poland – one of the key markets until 2030
- After 2030 new market in Sweden and Baltic states will be unlocked,

Baltic Sea

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Turbines and foundations

Vessels

- Cable laying: 4-6 vessels*
- Installation: 2-3 vessels*
- O&M: 20-40 vessels*
* - solely for installation and servicing of 8-15 GW

Subsea cables

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Offshore stations

- 30 – 40 stations

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Offshore wind energy in Poland
Does Poland need new generation capacities?

**Facts about NPS***

- **Actual demand** for peak capacity:
  - Summer peak 22.7 GW
  - Winter peak 26.2 GW

- **Forecast of growth of demand** for peak capacity in 2030 + 25%:
  - Summer peak 32.7 GW
  - Winter peak 30.1 GW

- **5.6 GW** will be phased out until 2030, **13.9 GW JWCD** until 2035 (BAT modernisation scenario)

- **Forecast shortfall of overcapacity**, impossible to compensate by the operator can occur from 2023 (1 GW) and in 2035 may reach 13 GW

- **Vital increase in installed capacity** 6.5 GW by 2030 and 15.8 GW by 2035

*based on „Prognosis of peak demand for power in 2016-2035. PSE Operator 2016
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**OWE potential**

- **2,500 km²** – area dedicated for OWF development based on draft of spatial plan for maritime areas
- **2,000 km²** – real area for development EW
- **4 MW/km²** – forecasted density (conservative approach)
- **8 GW** – real market potential in the perspective of the year 2035

**Region of potential development of offshore wind energy on Polish maritime areas**

- **"Central Bank" Region - 1.8 GW**
  - Total area: 450 km²
  - Area available for WTG: 360 km²
  - Density: 5 MW/km²

- **"Odra Bank" Region - 1.8 GW**
  - Total area: 560 km²
  - Area available for WTG: 420 km²
  - Density: 4 MW/km²

- **"Słupsk Bank" Region - 4.4 GW**
  - Total area: 1,570 km²
  - Area available for WTG: 1,100 km²
  - Density: 4 MW/km²
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Does Poland need new generation capacities? (2)

Preferred features

- They can be put into service in the years 2020 - 2030
- Ensure security of supply up to 2060
  - National sources
  - Inexhaustible or renewable sources
  - Sources with a diversified and reliable delivery
- Will be competitively priced
- They will allow to meet emissions reduction goals
- Will allow the fulfilment of the objectives on the use of RES
- Their use will positively affect the development of the national economy
- Their use will not cause significant social and environmental conflicts

Average construction time

EU Climate Policy

Growth trend of emission fees CO2

Increasing cost of energy production from conventional sources

Greater competitiveness and profitability of investments in non-emission sources

7th Future Conference: Wind & Maritime 2018
Offshore wind energy in Poland
Available area for offshore wind

Available area for OWE development

<table>
<thead>
<tr>
<th>Bank</th>
<th>Available area (km²)</th>
<th>Area including constraints (km²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Slupsk Bank</td>
<td>1570</td>
<td>1100</td>
</tr>
<tr>
<td>Oder Bank</td>
<td>560</td>
<td>450</td>
</tr>
<tr>
<td>Middle Bank</td>
<td>450</td>
<td>360</td>
</tr>
</tbody>
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1. **Constraints related to maritime spatial planning:**
   - Construction free zones around navigational routes
   - Navigational routes among offshore wind farms
   - Spatial constraints due to protected winter birds and migratory birds
   - Other planned investments

2. **Other constraints:**
   - Inward buffer around issued permits free of constructions
   - Provisions in environmental decisions (migration corridors, temporary stopping of wind turbines)
   - Geological conditions
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Project status

- **I group** – projects which will have environmental decisions and connection agreements at the end of 2018 – 2,2 GW
- **II group** – projects which have legally valid PSZW, but which do not have connection conditions – 3,8 GW
- **III group** – projects boundaries can be defined in the areas designated in the plan for the development of maritime areas for development of offshore energy – 2 GW

OWF Projects in Poland
Minister for Maritime Economy expressed support for offshore wind energy at BEIF 2018 (Feb 2018)

Statoil enters the Polish market by partnering with Polenergia

PGE announces plans for 2,5 GW until 2030

Orlen announces a tender related to offshore wind energy

Other state owned utility companies expressed interest in offshore wind

Polish TSO (PSE S.A.) - possible connection of 4 GW by 2030 and 8 GW by 2040 in OWE. Possible interconnection
1. Implementation of system mechanisms in 2018-2020 enabling:
   a. Determination of investment conditions for the first group of projects
   b. Issue of connection conditions for the second group of projects
   c. Determination of the boundaries of location and connection conditions for the third group of projects

2. Organization of two logistic and construction centers Gdańsk-Gdynia and Szczecin-Świnoujście

3. Construction of the offshore grid, including transboundary connections with connection points for the OWF

4. Planning and design construction of subsequent projects in such a way as to minimize the cumulative impact on the environment and other users of the sea areas

5. Starting system of training and educational programs enabling employment growth in the Polish offshore energy industry companies
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Advantages of offshore grid:

- Increasing safety of power supply:
  - in the case of calm weather, inter-system transmission,
  - alternative connection Słupsk Wierbiczino – Żarnowiec (connection redundancy)

- Reduction of project connection costs – common infrastructure

- Limited space in maritime areas – grouping (clustering) projects means fewer cables and more efficient use of space

- Fulfilment of EU requirements in terms of transboundary connections - planned increase of up to 15% of the system's capacity

- The potential for EU funding (only for transboundary connections)
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Supply chain for offshore wind farms in Poland

Supply chain analysis

- High interest of international companies in the Polish market – high competition
- High share of companies located in Poland – potential local content
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