Contents

Mid-year European offshore wind energy statistics .................................................................2
Summary of offshore work carried out during the first half of 2015 ......................................2
Developers ..................................................................................................................................3
Wind turbines .................................................................................................................................5
Financing highlights and developments in 1st half 2015 and outlook ...............................6

Data collection and data analysis:

Author: Andrew Ho (European Wind Energy Association, EWEA) – Industry highlights
        Ariola Mbistrova (EWEA) - Financing highlights

Editor: Iván Pineda (EWEA)

Review: Kristian Ruby (EWEA)

Design: Clara Ros (EWEA)

Finance data: Clean Energy Pipeline. All currency conversions made at GBPEUR 1.400

Cover photo: MHI Vestas Offshore Wind
Mid-year European offshore wind energy statistics

In the first six months of 2015, Europe fully grid connected 584 commercial offshore wind turbines, with a combined capacity totalling 2,342.9 MW. Overall, 15 commercial wind farms were under construction. Once completed, these wind farms will have a total capacity of over 4,268.5 MW.

New offshore capacity installations during the first half of 2015 were up 200% compared to the same period the previous year.

The work carried out in European wind farms during the first six months of 2015 is detailed below:

- **584 wind turbines were fully grid connected**, totalling 2,342.9 MW (up 200% compared to the same period last year) in twelve wind farms: DanTysk (DE), Gwynt y Mor (UK), Humber Gateway (UK), Westermost Rough (UK), Amrumbank West (DE), Baltic 2 (DE), Borkum Riffgrund I (DE), Butendiek (DE), Global Tech 1 (DE), Luchterduinen (NL), Nordsee Ost (DE), and Trianel Windpark Borkum (DE),

- A further **102 turbines**, totalling over 422.6 MW, were installed but are currently awaiting grid connection,

- **138 foundations** (95 units fewer than the same period last year) were installed in five wind farms: Gode Wind I+II (DE), Westermeerwind (NL), Amrumbank West (DE), Baltic 2 (DE), and Kentish Flats Extension (UK),

- **313 turbines** (31 units or 11% more than during the same period last year) were erected in nine wind farms: Humber Gateway (UK), Westermost Rough (UK), Amrumbank West (DE), Baltic 2 (DE), Borkum Riffgrund I (DE), Butendiek (DE), Global Tech 1 (DE), Luchterduinen (NL), and Kentish Flats Extension (UK),

- In the first days of July, turbine grid connection was **fully completed** at Luchterduinen and Trianel Windpark Borkum, which will be reflected in the 2016 Annual Offshore Wind statistics,

- A **5.4 MW upgrade** at Riffgat (DE) increased site capacity to 113.4 MW. No extra turbines were installed.

As of 30 June 2015, cumulatively, there are 3,072 offshore wind turbines with a combined capacity of 10,393.6 MW fully grid connected in European waters in 82 wind farms across 11 countries, including demonstration sites.
Summary of offshore work carried out during the first half of 2015

During the first six months of the year, work was carried out on 15 offshore wind farms. Foundations and turbines were installed and/or grid connected in three countries: Germany, the Netherlands and the United Kingdom.

<table>
<thead>
<tr>
<th>Table 1: Summary of work in offshore wind farms between 1 January and 30 June 2015</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>No. of farms</strong></td>
</tr>
<tr>
<td>No. of foundations installed</td>
</tr>
<tr>
<td>No. of turbines erected</td>
</tr>
<tr>
<td>No. of turbines connected</td>
</tr>
<tr>
<td>MW fully connected to the grid</td>
</tr>
</tbody>
</table>

Source: EWEA

**Figure 2: Installation and grid connection of wind turbines in offshore wind farms between 1 January and 30 June 2015**

Source: EWEA
Developers

12 commercial wind farms connected wind turbines to the grid totalling 2,342.9 MW.

Figure 3 shows the share of connected MW per developer from 1 January to 30 June 2015 taking into account each company’s share in the projects. Power producers account for over 60% of the installed capacity.

Wind turbines

During the first six months of 2015, 584 offshore wind turbines were connected to the power grid, or 160.7% more turbines than during the same period in the previous year. The average size of the wind turbines was 4.2 MW, a 20% increase from H1 2014, as larger turbines make their way from order books to the water.

Units made by four turbine manufacturers were connected to the grid during the period: Siemens, MHI Vestas, Adwen, and Senvion. Siemens has the largest share of newly connected capacity (1,339.6 MW, 57.2%), followed by Adwen (455 MW, 19.4%), MHI Vestas (333 MW, 14.2%), and Senvion (215.3 MW, 9.2%).

In terms of units, Siemens grid connected 347 turbines (59.4%), MHI Vestas 111 turbines (19%), Adwen 91 turbines (15.6%), and Senvion 35 turbines (6%).
Financing highlights and developments in 1st half 2015 and outlook

The first half of 2015 was a period of positive developments for the European offshore wind sector. Successful projects were able to attract sufficient financing, reflecting an increased appetite on multiple transactions from both debt and equity markets.

Table 2: Investments in offshore wind farms H1 2015

<table>
<thead>
<tr>
<th>Financial Close</th>
<th>Total Investment Requirement (EUR MM)</th>
<th>Financed New Gross Capacity (MW)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Germany</td>
<td>3,510</td>
<td>843</td>
</tr>
<tr>
<td>UK</td>
<td>3,590</td>
<td>980</td>
</tr>
<tr>
<td>Total</td>
<td>7,100</td>
<td>1,823</td>
</tr>
</tbody>
</table>

Five projects worth €7.1bn in total reached final investment decision stage, financing 1.8 GW of new gross capacity.

Non-recourse debt

Project finance remained an important tool throughout H1 2015. Non-recourse debt increased significantly from the same period last year to €2.27bn. 843 MW, or the equivalent of 46% of the new gross capacity, was financed on a non-recourse basis.

The general trends of easing loan terms such as loan margins and maturity continued in the first half of 2015 as well. This is due to the favourable conditions in the financial markets, the attractiveness of the sector and the considerable experience that has been accumulated throughout a decade.

Commercial banks are increasingly taking a larger share of financing. Multilateral backing is still important. It appears nonetheless to be less determinist in the closing of a deal. Debt-to-equity ratios remain largely in the margins of 70:30. However, there is sufficient appetite from commercial banks to push the margins further on the debt side.

Transaction highlights

Nordergründe offshore wind farm secured financing contracts from KfW IPEX Bank and the European Investment Bank. Earlier this year, Nordsee 1 became the first large scale offshore transaction to be completed without the presence of any multilateral financial institution.

Non-recourse debt hit its highest ever volume in Germany with the financing of Veja Mate wind farm. Project sponsors Highland Group Holdings, Siemens Financial Services and Copenhagen Infrastructure Partners II will provide the equity requirements in the form of share capital and mezzanine loans, whereas the €1.27 bn debt requirements will be provided by a consortium of eight financial institutions.
Equity Finance

The equity markets have remained active in particular during the pre-construction phase, as the offshore wind sector rushes in to recycle capital.

The general tendency for bigger offshore wind farms has resulted in a peak volume of MW divested in H1 2015 (figure excludes undisclosed values).

Notable transactions in the first quarter of 2015 include DONG Energy’s 66.66% stake acquisition of Hornsea 1 (1.2 GW), Statkraft’s 50% stake acquisition in Triton Knoll (900 MW), and Scottish Power Renewables’ acquisition of a 50% stake in East Anglia 1 (714 MW) wind farm.

The large scale investment and stable income returns of the offshore wind sector have continued to attract institutional investors, who are increasingly looking at assets under construction. In Germany, Macquarie Capital acquired a 49.89% stake in Baltic 2 (288 MW) windfarm in January 2015. Later in the year, PGGM invested an undisclosed amount in Baltic 2, alongside Macquarie Capital.

In France, Caisse des Dépôts (CDC) will hold a 7.5% stake in Saint Brieuc offshore wind farm (496 MW).

In the UK, Green Investment Bank invested £236 mln (or the equivalent of 70 MW) in Rampion wind farm, as part of its larger strategy to help the industry with equity capital.

Transmission Assets

Transmission lines are rapidly evolving as a strategic asset class due to their stable revenue streams.

In Germany, Dutch grid operator TenneT raised €1 bn for DolWin 1 transmission line, through a green bond issuance that was twice oversubscribed.

In the UK, two projects reached financial close: the Gwynt y Mor transmission line and Walney 1, which together raised approximately €587 mln of commercial debt.
Outlook for H2 2015 and 2016

TABLE 3: OFFSHORE WIND PROJECT PIPELINE

<table>
<thead>
<tr>
<th>Project Pipeline</th>
<th>COUNTRY</th>
<th>TOTAL INVESTMENT REQUIREMENT (EUR MM)</th>
<th>CAPACITY (MW)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nobelwind</td>
<td>Belgium</td>
<td>650</td>
<td>165</td>
</tr>
<tr>
<td>EnBW Hohe See</td>
<td>Germany</td>
<td>1,500</td>
<td>492</td>
</tr>
<tr>
<td>Luchterduinen1</td>
<td>Netherlands</td>
<td>420</td>
<td>129</td>
</tr>
<tr>
<td>Dudgeon</td>
<td>United Kingdom</td>
<td>2,190</td>
<td>402</td>
</tr>
<tr>
<td>Beatrice</td>
<td>United Kingdom</td>
<td>2,979</td>
<td>664</td>
</tr>
<tr>
<td>Galloper</td>
<td>United Kingdom</td>
<td>2,162</td>
<td>340</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>9,901</strong></td>
<td><strong>2,192</strong></td>
</tr>
</tbody>
</table>

Notable deals that have been announced in the financial close process include Nobelwind, Hohe See, Galloper, Dudgeon, Beatrice, and the refinancing of Luchterduinen1. Next year, the Dutch Borssele tender and the French tender are expected to reach the market.

There is an overall healthy pipeline of offshore wind projects expected to reach financial close by 2015 / 2016, which in total would require the mobilisation of over €10 bn for financing.

---

1 The initial investment value was estimated around €420 mln.
Always aim high
EWEA 2015 Annual Event
17 - 20 November

The must-attend offshore & onshore wind energy event in 2015

• The United industry for offshore wind initiative will be expanded at the EWEA 2015 Annual Event to help develop new partnerships, maximise cost reduction and share best practice.

• Participants will benefit from the most powerful marketing and sales tools needed to expand their business: face-to-face interaction with leading industry executives and the world’s best tech experts attending the event’s conference.

Book your stand today
www.ewea.org/annual2015