



The European offshore wind industry - key trends and statistics 1st half 2015

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

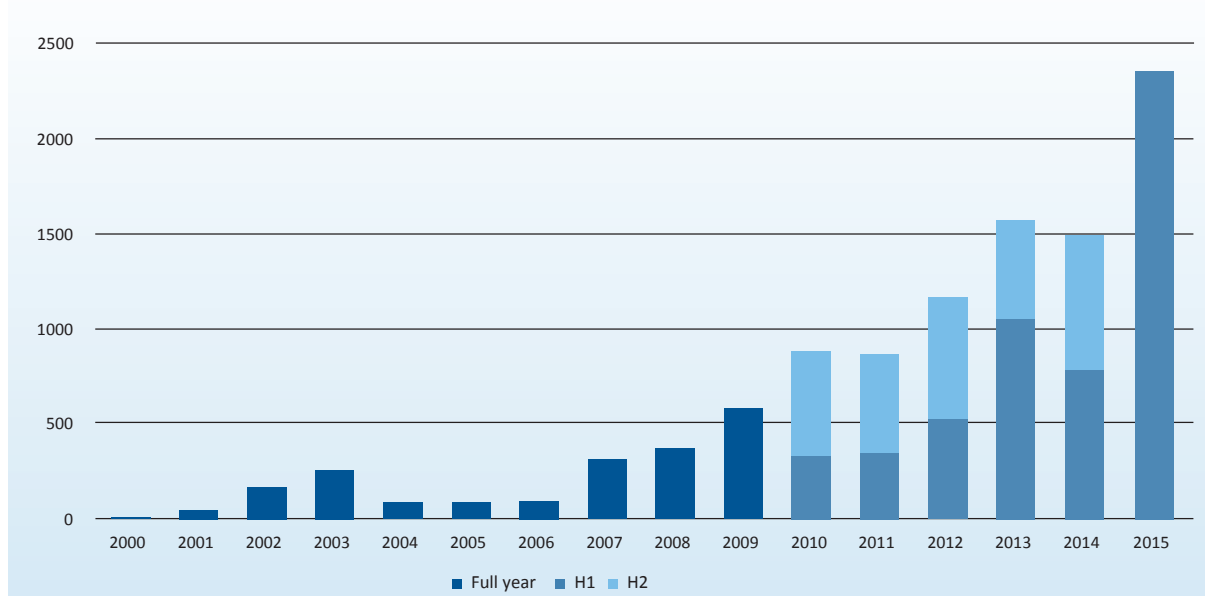
Cover photo: MHI Vestas Offshore Wind

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.

FIGURE 1: ANNUAL INSTALLED OFFSHORE WIND CAPACITY IN EUROPE (MW)



Source: EWEA

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), Westernmost 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), Westernmost 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 Winpark 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

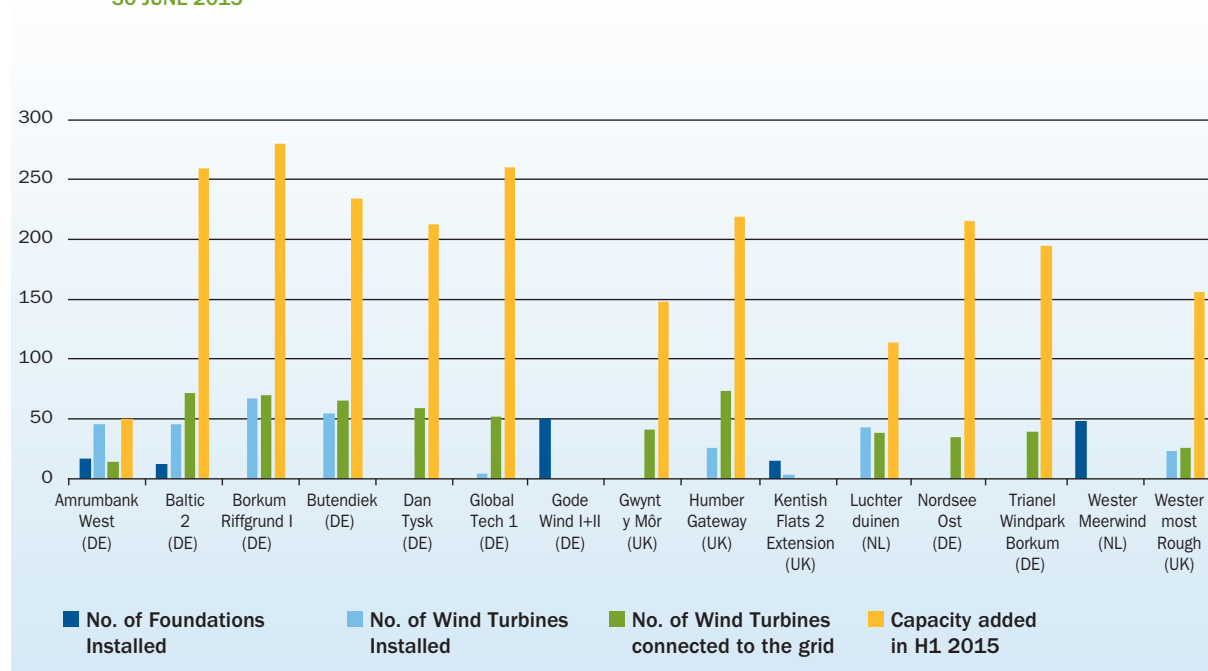
During the first six months of the year, work was carried out on 15 offshore wind farms. Foundations and turbines were installed and/or grid connected in three countries: Germany, the Netherlands and the United Kingdom.

TABLE 1: SUMMARY OF WORK IN OFFSHORE WIND FARMS BETWEEN 1 JANUARY AND 30 JUNE 2015

	GERMANY	THE NETHERLANDS	UK	TOTAL
No. of farms	9	2	4	15
No. of foundations installed	75	48	15	138
No. of turbines erected	218	43	52	313
No. of turbines connected	406	38	140	584
MW fully connected to the grid	1,706.3	114.0	522.6	2,342.9

Source: EWEA

FIGURE 2: INSTALLATION AND GRID CONNECTION OF WIND TURBINES IN OFFSHORE WIND FARMS BETWEEN 1 JANUARY AND 30 JUNE 2015



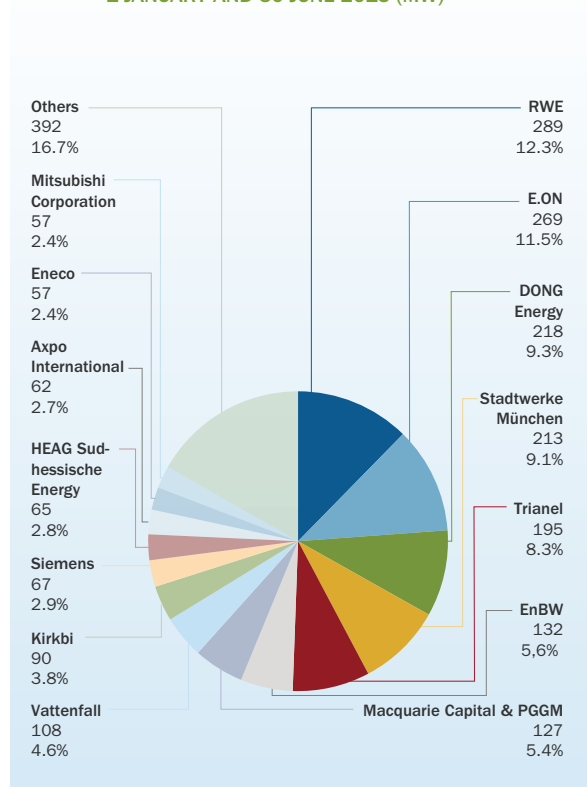
Source: EWEA

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.

FIGURE 3: OFFSHORE WIND DEVELOPERS' SHARE OF NEW GRID CONNECTED CAPACITY BETWEEN 1 JANUARY AND 30 JUNE 2015 (MW)



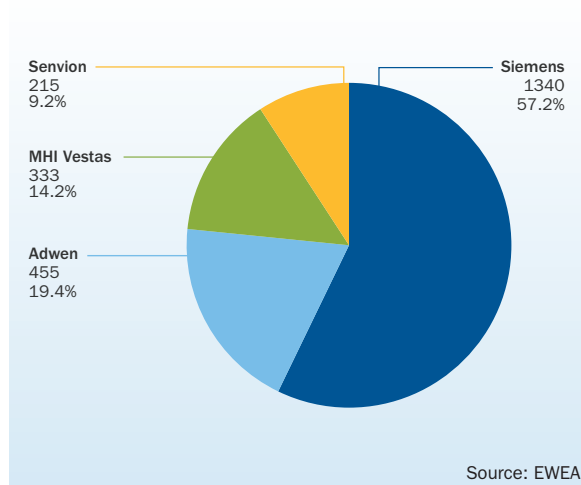
Source: EWEA

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%).

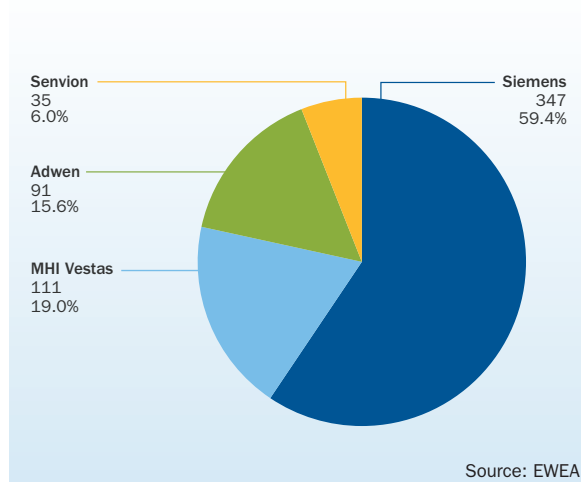
FIGURE 4: WIND TURBINE MANUFACTURERS' SHARE OF GRID CONNECTED CAPACITY (IN MW) IN EUROPE BETWEEN 1 JANUARY AND 30 JUNE 2015



Source: EWEA

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%).

FIGURE 5: WIND TURBINE MANUFACTURERS' SHARE OF GRID CONNECTED TURBINES IN EUROPE BETWEEN 1 JANUARY AND 30 JUNE 2015 (IN UNITS)



Source: EWEA

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

Financial Close	TOTAL INVESTMENT REQUIREMENT (EUR MM)	FINANCED NEW GROSS CAPACITY (MW)
Germany	3,510	843
UK	3,590	980
Total	7,100	1,823

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

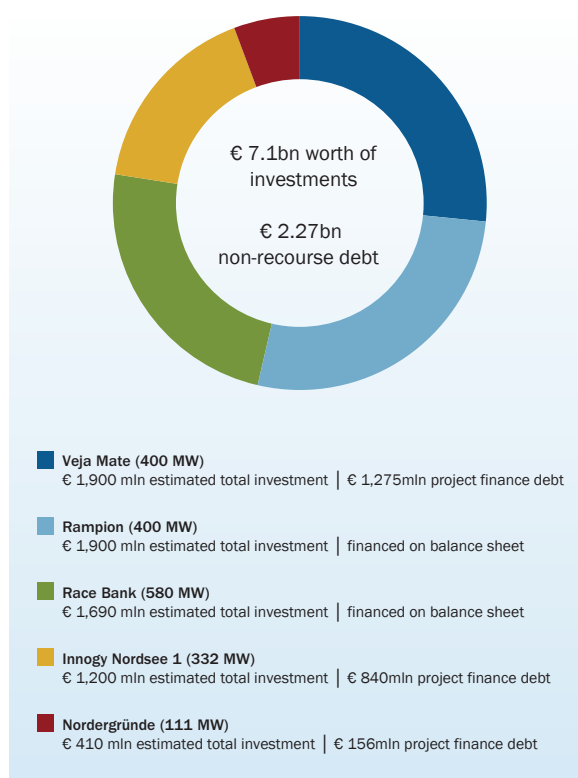
Non-recourse debt

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 determinant 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.

FIGURE 6: PROJECTS REACHING FINAL INVESTMENT DECISION



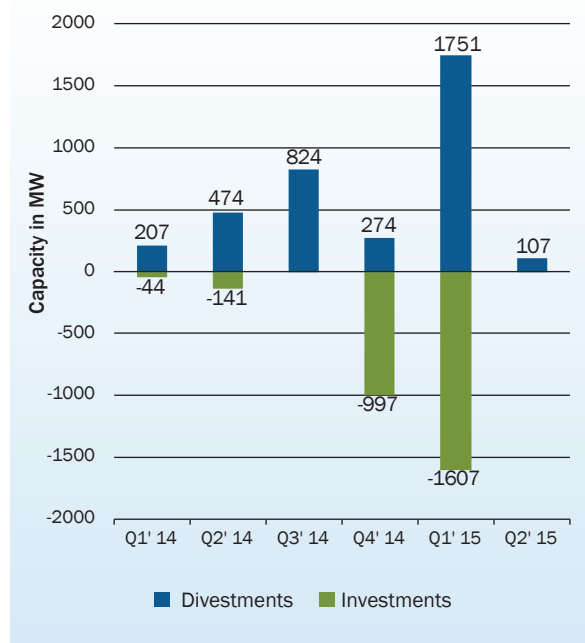
Transaction highlights

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

FIGURE 7: INVESTMENTS AND DIVESTMENTS; MERGERS AND ACQUISITIONS



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).

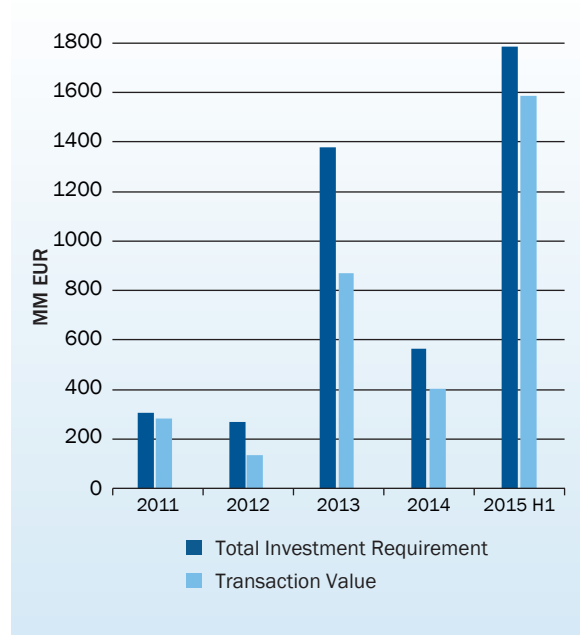
Notable transactions in the first quarter of 2015 include DONG Energy's 66.66% stake acquisition of Hornsea 1 (1.2 GW), Statkraft's 50% stake acquisition in Triton Knoll (900 MW), and Scottish Power Renewables' acquisition of a 50% stake in East Anglia 1 (714MW) wind farm.

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 (288MW) 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 (496MW). 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

FIGURE 8: INVESTMENT IN 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

Project Pipeline	COUNTRY	TOTAL INVESTMENT REQUIREMENT (EUR MM)	CAPACITY (MW)
Nobelwind	Belgium	650	165
EnbW Hohe See	Germany	1,500	492
Luchterduinen ¹	Netherlands	420	129
Dudgeon	United Kingdom	2,190	402
Beatrice	United Kingdom	2,979	664
Gallopier	United Kingdom	2,162	340
Total		9,901	2,192

Notable deals that have been announced in the financial close process include Nobelwind, Hohe See, Gallopier, 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.



EWEA 2015
PARIS
EUROPE'S PREMIER WIND ENERGY EVENT

17 - 20 NOVEMBER

Book your stand today

www.ewea.org/annual2015

IN PARTNERSHIP AND SUPPORTED BY:



EWEA
THE EUROPEAN WIND ENERGY ASSOCIATION

ORGANISED BY: