Financing and investment trends

The European Wind Industry in 2016

WindEurope

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This report summarises financing activity in the European wind sector from 1 January to 31 March 2017. It includes investment figures for the construction of new wind farms, refinancing transactions for wind farms under construction or operation, project acquisition activity, and capital market funding. Rounding of figures is at the discretion of the author.

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GLOSSARY

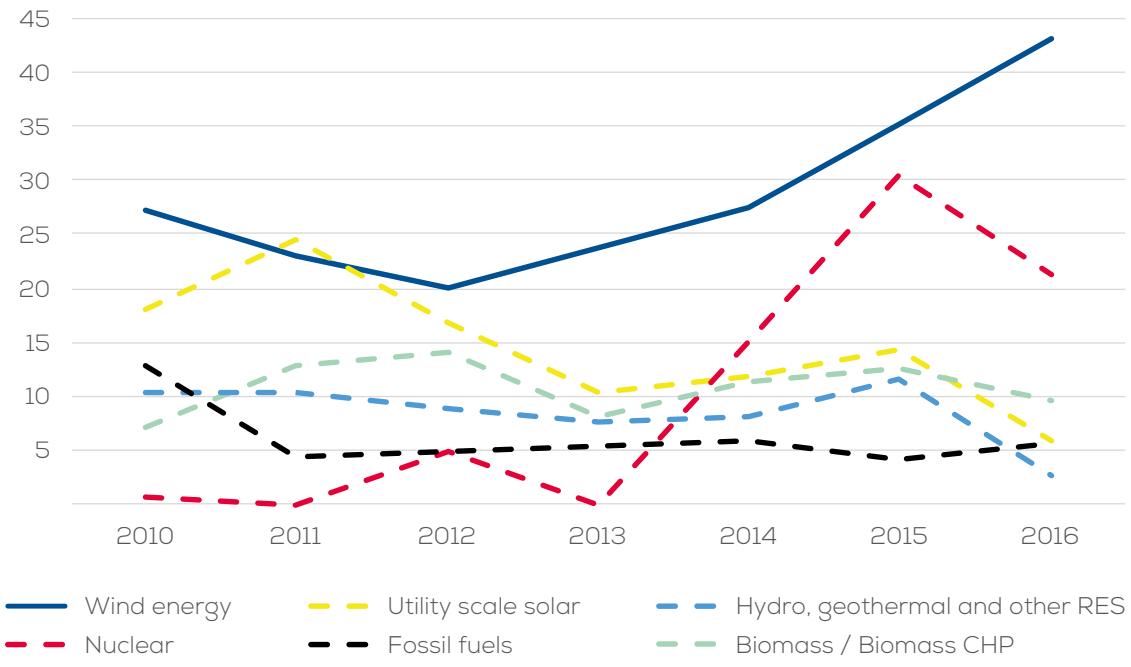
- **Asset finance:** includes all infrastructure investments in onshore and offshore wind farms, including refinancing transactions.
- **New asset finance:** includes all infrastructure investments in the construction of new onshore and offshore wind farms, excluding refinancing transactions.
- **Final Investment Decision (FID):** the final decision to go ahead with the project once the permitting and financial arrangements are in place.
- **Public markets:** includes equity investments in specialised publicly quoted companies developing wind power projects and/or renewable energy technologies.
- **Venture capital and private equity (VC/PE):** includes investments by venture capital and private equity funds in the equity of specialised companies developing wind power projects and/or renewable energy technologies.
- **Mergers and acquisitions:** includes the acquisition of interest in onshore and offshore wind projects.
- **Corporate finance / on – balance sheet financing:** includes all investments in wind power generating and transmission assets financed either through the equity of project owners or through debt raised at corporate level.
- **Project finance / off – balance sheet financing:** includes all investments in wind power generating and transmission assets where the project debt and equity used to finance the project are paid back from the cash flow generated by the project as opposed to the balance sheet of project owners. To this end, projects are a spin-of as a separate entity.
- **Non-recourse debt:** debt raised in project finance transactions.
- **Syndicated loan:** a loan provided and structured by a group of lenders.
- **Green bond:** corporate bond, the proceedings of which will be used to finance renewable energy projects. Unless specified, the use of money is often unallocated.
- **Project bond:** includes bonds issued at project level, the proceedings of which will be used to finance a specific project.
- **Initial Public Offering (IPO):** the very first sale of stock issued by a company.
- **Corporate renewable power purchase agreement (PPA):** a long term bilateral agreement for the purchase of power from a specific renewable energy project, where the power off-taker is a corporate as opposed to a power producer.

EXECUTIVE SUMMARY

Wind was the largest destination for power sector investments in 2016. Most of this investment represents financing for greenfield assets. This suggests that wind energy is seen as a major driver to exit from fossil fuels. Cost competitiveness and reduced risk perceptions have brought in market players who are looking to diversify their oil and gas portfolios.

FIGURE 1

European investments in power capacity 2010 - 2016 [1] (bnEUR)



Source: WindEurope

1. Figures do not include fuel supply, distributed generation or residential ownership

2016 annual figures

- Europe raised a total of €43bn for the construction of new wind farms, refinancing operations, project acquisitions, and public market fundraising.
- Banks extended €12bn in non-recourse debt for the construction of new wind farms and the refinancing of existing ones.
- Project acquisition activity stood at 9.8 GW of capacity, with more corporate, financial and overseas investors entering the market.
- A total of €5.2bn were raised in IPOs in 2016, representing the highest level of issuance in the last seven years.
- Wind was the largest investment destination in the power generation mix in Europe.

Country highlights

- Investment flows in 2016 were very concentrated, with the UK, Germany, Belgium and Norway taking 80% of the new capacity financed.
- Investments in Southern and Eastern Europe remain low due to regulatory and macroeconomic constraints.
- In Norway the largest onshore wind farm in Europe reached FID. Fosen wind farm has a capacity of 1 GW and a cost of €1.1bn.
- In the UK Hornsea 1 offshore wind farm reached FID. With a capacity of 1.2 GW, this is the largest offshore wind farm to date to be constructed.

Investment trends

- The low interest rate environment has given rise to a dynamic refinancing market.
- Mature onshore wind markets are undergoing a certain aggregation, taking advantage of the favourable economic context.
- Offshore wind financing is evolving under competitive pressures across the value chain. Refinancing activities or the sale of project minority stakes are now incorporated early in the financial arrangements of projects.

2017 Outlook

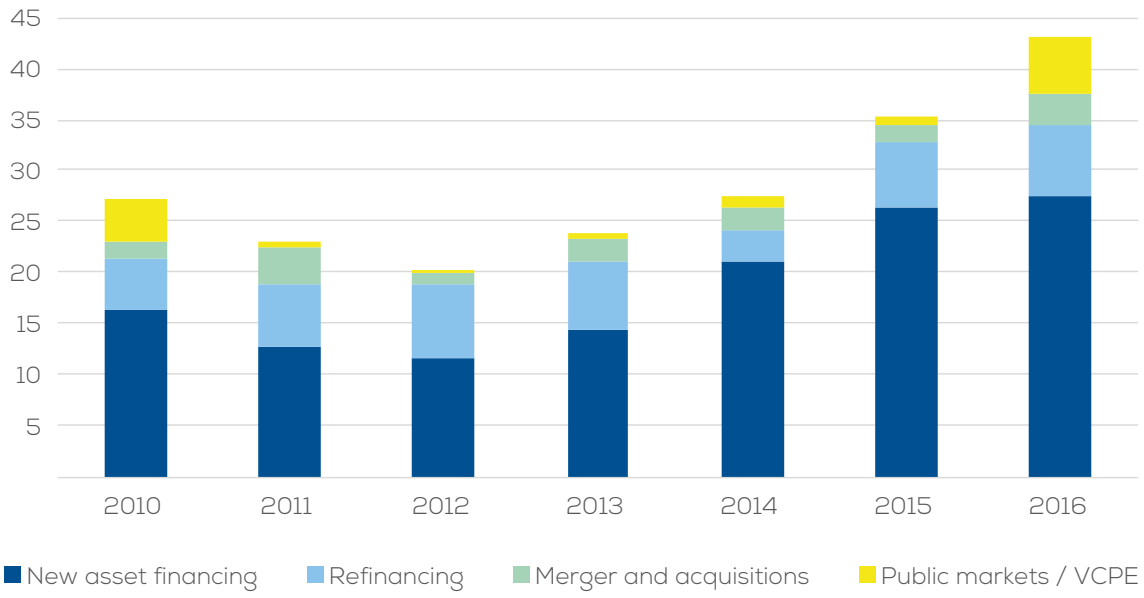
- During the first quarter of 2017, €1.8bn[2] were invested in Europe in new projects, projects under construction and those in operation.
- Lower investment volumes are expected in 2017 with the transition to tenders slowing down the activity in major wind energy markets.
- Established refinancing markets such as France, Germany and the UK will remain very active. Spain is another potential country, with investors returning for long-term under-priced assets.
- The downward trend in interest rates is expected to slow down, with existing commercial banks establishing their competitive position in the market.

2. Excludes undisclosed project values

1. INVESTMENT NUMBERS IN 2016

1.1 WIND ENERGY INVESTMENTS PER ASSET CLASS

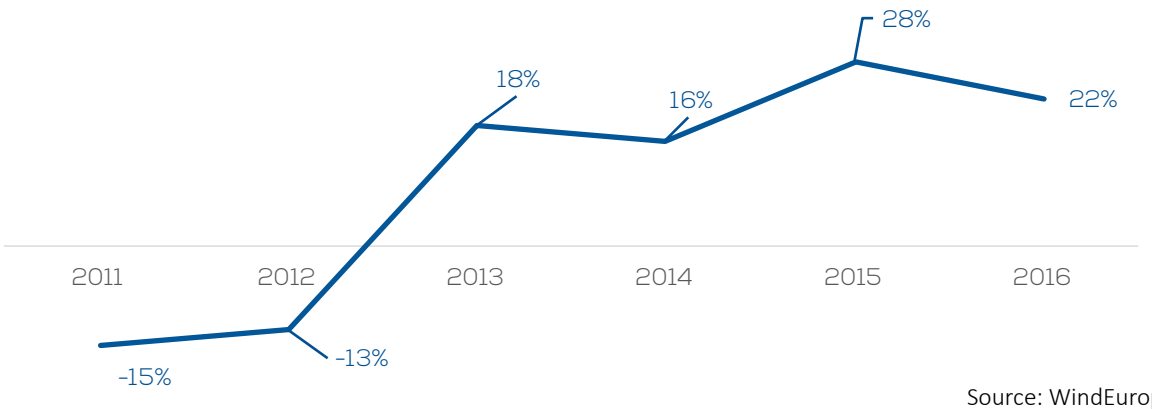
FIGURE 2
European total wind energy investments 2010 – 2016 (bnEUR)



Source: WindEurope

Europe invested a total of €43bn in the wind power sector during 2016. This includes investments in new assets, refinancing transactions, mergers and acquisition activity for wind power projects, public market transactions, venture capital and private equity raised.

FIGURE 3
Year on year rate of increase in total wind energy investments



Source: WindEurope

22% INCREASE
IN WIND ENERGY INVESTMENTS IN 2016

Overall, investments rose by 22% in 2016, up from €35bn in 2015. This is largely due to new financing activity in offshore wind, which increased by 39% on 2015. The high level of investments was also driven by major initial public offerings, such as those of DONG Energy, Senvion, and RWE Innogy. Together they accounted for over €5bn.

New asset financing for wind power projects stood at €27.6bn[3]. Offshore wind broke a record with €18.2bn.

Onshore wind investments dropped by 5% to €9.4bn[4], the first decrease for five years. In total there were 10.3 GW of new capacity financed, compared to 9.7 GW the previous year. Cost reductions across the industry's value chain have made it possible for investors to finance more capacity for less cash.

Refinancing transactions, mergers and project acquisitions were slightly higher, driven by a favourable lending environment and the sale of interest in operational onshore and offshore wind farms.

3. Updated values to reflect new investments in Austria
4. Idem

1.2 NEW ASSET FINANCE PER COUNTRY

FIGURE 4
European new asset financing by country

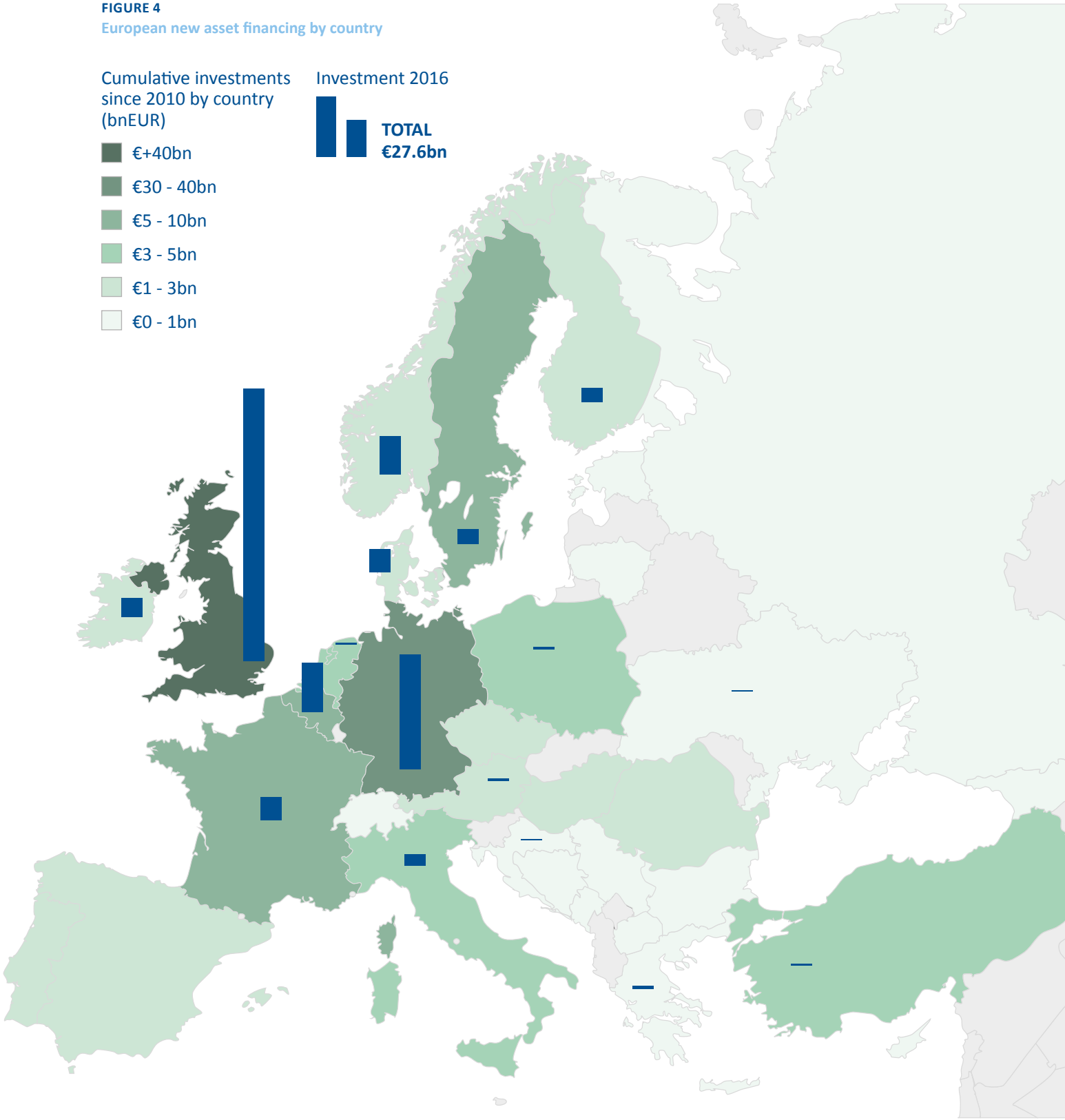


TABLE 1

European new asset financing by country

EU-28 (MW)	INVEST-MENT 2015 (€bn)	NEW CAPACITY FINANCED 2015 (MW)	INVEST-MENT 2016 (€bn)	NEW CAPACITY FINANCED 2016 (MW)
Austria	0.49	272	0.11	-
Belgium	0.92	297	2.3	688
Bulgaria	-	-	-	-
Croatia	-	-	0.06	44
Cyprus	0.03	10	-	-
Czech Republic	-		-	
Denmark	0.2	76	1.08	445
Estonia	-	-	-	-
Finland	0.95	501	0.66	363
France	1.36	600	1.07	583
Germany	5.32	1,735	5.33	1,790
Greece	0.08	40	0.15	73
Hungary	-	-	-	-
Ireland	0.52	280	0.89	520
Italy	0.92	504	0.54	327
Latvia	-	-	-	-
Lithuania	0.12	60	-	-
Luxembourg	-		-	
Malta	-		-	
Netherlands	0.11	62	0.07	22
Poland	0.65	355	0.1	56
Portugal	0.16	67	-	
Romania	-	-	-	-
Slovakia	-	-	-	-
Slovenia	-	-	-	-
Spain	0.01	5	-	-
Sweden	0.56	276	0.68	415
UK	12.64	3,800	12.68	3,535
TOTAL EU-28	**25.04**	**8940**	**25.72**	**8861**

CANDIDATE COUNTRIES (MW)	INVEST-MENT 2015 (€bn)	NEW CAPACITY FINANCED 2015 (MW)	INVEST-MENT 2016 (€bn)	NEW CAPACITY FINANCED 2016 (MW)
Bosnia	0.07	48	-	-
FYROM	-	-	-	-
Montenegro	0.15	72	-	-
Serbia	0.25	129	-	
Turkey	0.82	418	0.09	50
TOTAL	**1.29**	**667**	**0.09**	**50**

EFTA (MW)	INVEST-MENT 2015 (€bn)	NEW CAPACITY FINANCED 2015 (MW)	INVEST-MENT 2016 (€bn)	NEW CAPACITY FINANCED 2016 (MW)
Iceland	-		-	
Liechtenstein	-		-	
Norway	-		1.77	1,436
Switzerland	0.05	24	-	
TOTAL	**0.05**	**24**	**1.77**	**1436**

OTHER (MW)	INVEST-MENT 2015 (€bn)	NEW CAPACITY FINANCED 2015 (MW)	INVEST-MENT 2016 (€bn)	NEW CAPACITY FINANCED 2016 (MW)
Belarus	-	-	-	
Faroe Islands	-	-	-	
Russia	-	-	-	-
Ukraine	-	-	0.05	41
TOTAL	**0**	**0**	**0.05**	**41**

	INVEST-MENT 2015 (€bn)	NEW CAPACITY FINANCED 2015 (MW)	INVEST-MENT 2016 (€bn)	NEW CAPACITY FINANCED 2016 (MW)
TOTAL EUROPE	**26.38**	**9,631**	**27.63**	**10,388**

Source: WindEurope

80% OF NEW INVESTMENTS

WERE IN THE UK, GERMANY, BELGIUM & NORWAY

Wind energy markets in 2016 were very concentrated in Northern and Western Europeand were driven mainly by offshore wind.

Investments in Southern and Eastern Europe (SEE) remain very low. Regulatory concerns and macroeconomic stability have reduced investments in some of the SEE markets over the last years.

For the second consecutive year, the UK saw the highest level of funding for new projects. In total, €12.7bn were raised for the construction of new onshore and offshore wind farms. This accounts for 46% of new assets financed in Europe.

Germany represented the second biggest market in 2016: the €5.3bn raised accounted for 19% of new assets financed in Europe.

Two landmark projects reached FID in 2016. The largest offshore wind farm to date, Hornsea 1, adds 1.2 GW of new capacity to projects awaiting construction in the UK.

Later in the year came Fosen onshore wind farm in Norway, with a cost of €1.1bn and a capacity of 1 GW. The project brought in major financiers as investors and heavy electricity consumers like Norsk Hydro as power off-takers.

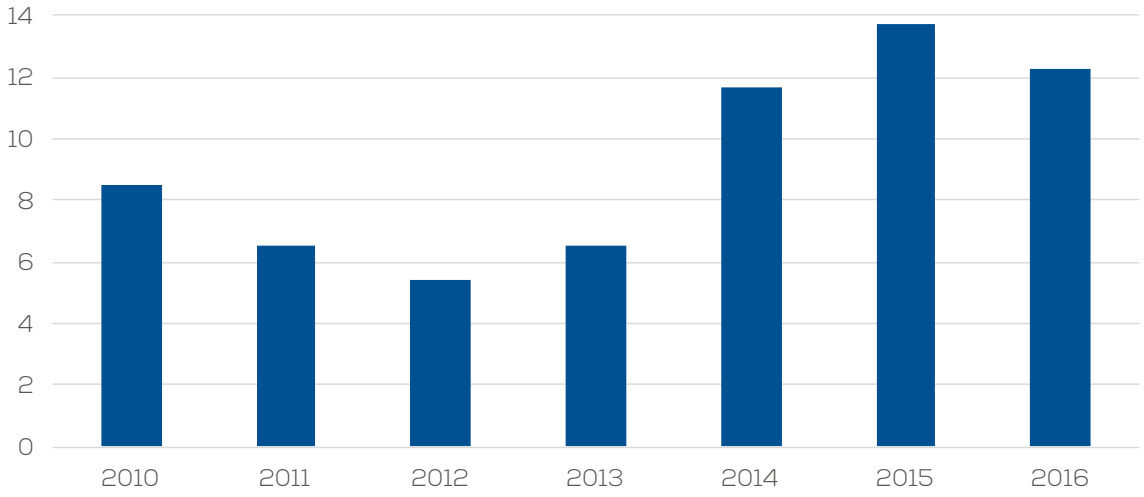
NORWAY

LARGEST ONSHORE WIND FARM IN EUROPE TO REACH FID

2. INVESTMENT SOURCES IN 2016

2.1 DEBT MARKETS AND NON-RECOURSE FINANCING

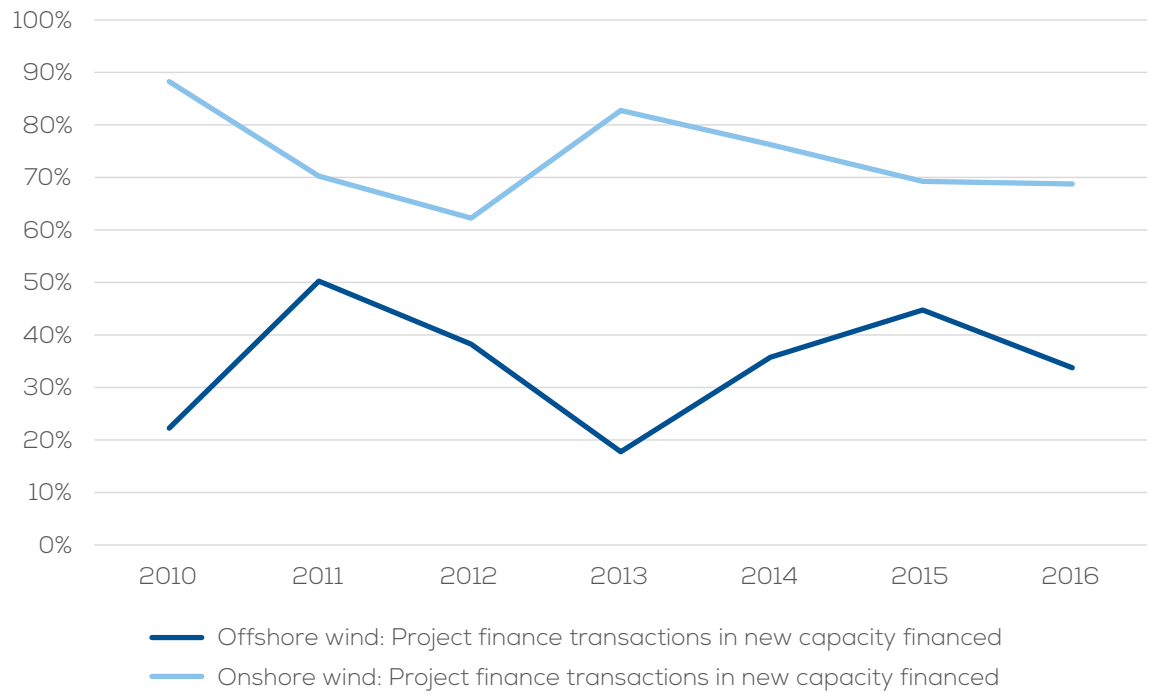
FIGURE 5
Non-recourse debt within new asset financing 2010 – 2016 (bnEUR)



Source: WindEurope

Emerging new business and ownership models have unlocked the potential for long term sources of finance. This has led to a significant amount of affordable debt, in particular in the form of non-recourse financing. Over €12.3bn in non-recourse debt were raised in 2016 for the construction of new projects and the refinancing of operational ones. This represents a decrease of 10% on 2015, with lower investments in onshore wind and an increase in uptake of corporate finance from utilities.

FIGURE 6
Project finance transactions in new capacity financed 2010 - 2016



Source: WindEurope

Non-recourse finance has traditionally been the predominant model for onshore wind, leveraging on average 70% of the capital expenditure requirements.

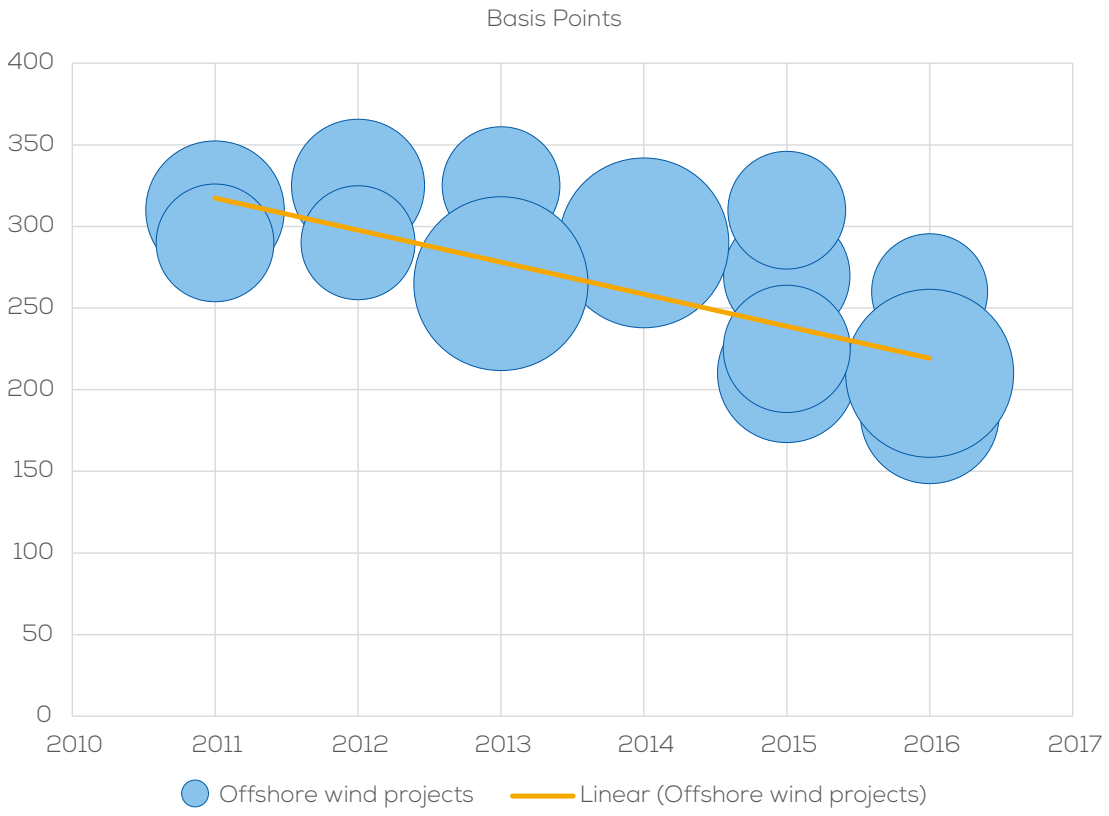
In the recent years, offshore wind has also witnessed a growing demand for off-balance sheet, non-recourse financing. Two segmentations have emerged in offshore wind non-recourse financing. In Belgium, Germany and the Netherlands, offshore wind farms are usually completed by utilising non-recourse structures in off-balance sheet financing. In the UK, power producers have favoured corporate finance for new offshore wind farms and non-recourse structures for refinancing activities. However, recent project finance transactions such as Galloper and Beatrice reflect a move towards more frequent use of project finance also in the UK.

In 2016 33% of the new capacity in offshore wind was financed on this basis, down from 44% in 2015. Increased market competition across the value chain and changing financial structures were the main factors driving this trend.

The latter in particular has given rise to a dynamic market for refinancing transactions in operational projects or those undergoing construction. Power producers are carrying projects on their balance sheets through the development phase, spinning them off at a later stage as construction begins.

2.2 FINANCING TERMS

FIGURE 7
Offshore wind interest rates: basis points per MW financed 2010 - 2016[5]



Source: Green Giraffe

13% OF MARKET SHARE
OWNED BY JAPANESE LENDERS

The debt markets have shown a willingness to support construction activity on attractive terms. Transactions this year continued to reflect the general trend of easing loan terms when it comes to loan pricing, maturity and tranche. The low interest rate environment has provided wind energy projects with competitive funding and lower financing costs. Larger projects are now able to fundraise under more favourable market conditions.

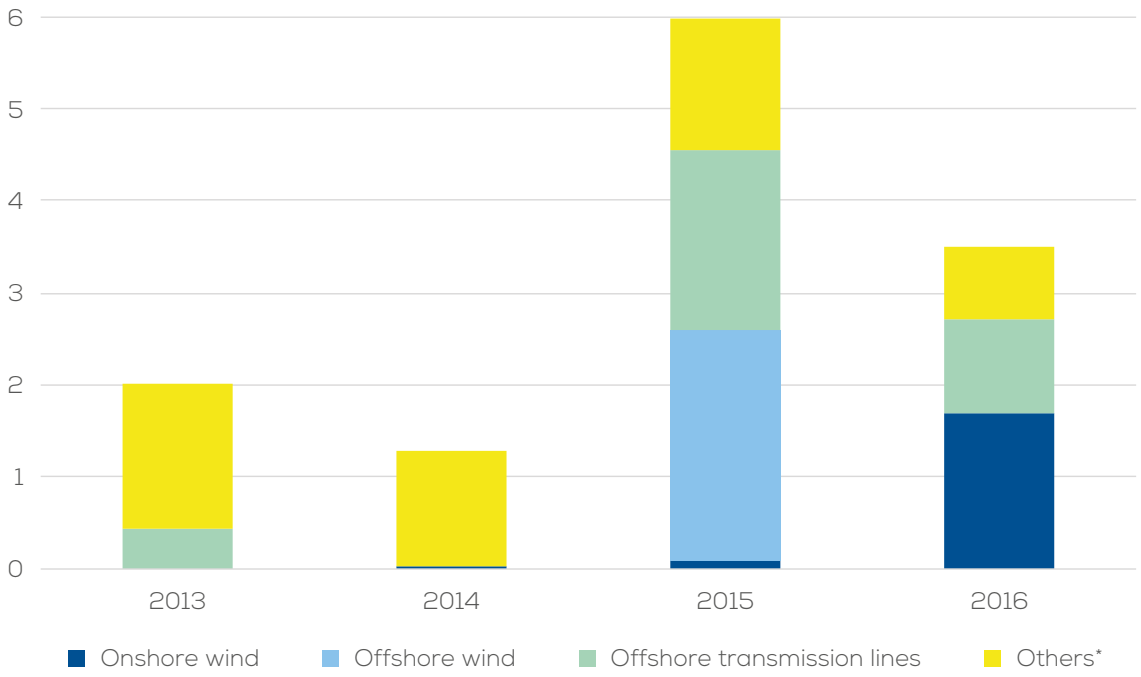
The European Investment Bank (EIB) alone, backed also by the European Fund for Strategic Investments (EFSI), has provided a combined value of €1.5bn in 2016 for the construction of onshore and offshore wind farms.

The arrival of new financial investors has diversified the profile of lenders. Low risk – low return investors pension funds are now willing take the role of debt providers as equity becomes more expensive. Driven by a low interest rate environment in their home market, Japanese banks have also strengthened their presence in European offshore wind projects.

5. The size of the bubble represents the capacity of the projects.

2.3 BOND FINANCING

FIGURE 8
Project and green bond issuances 2013 – 2016 (bnEUR) [6]



Source: WindEurope

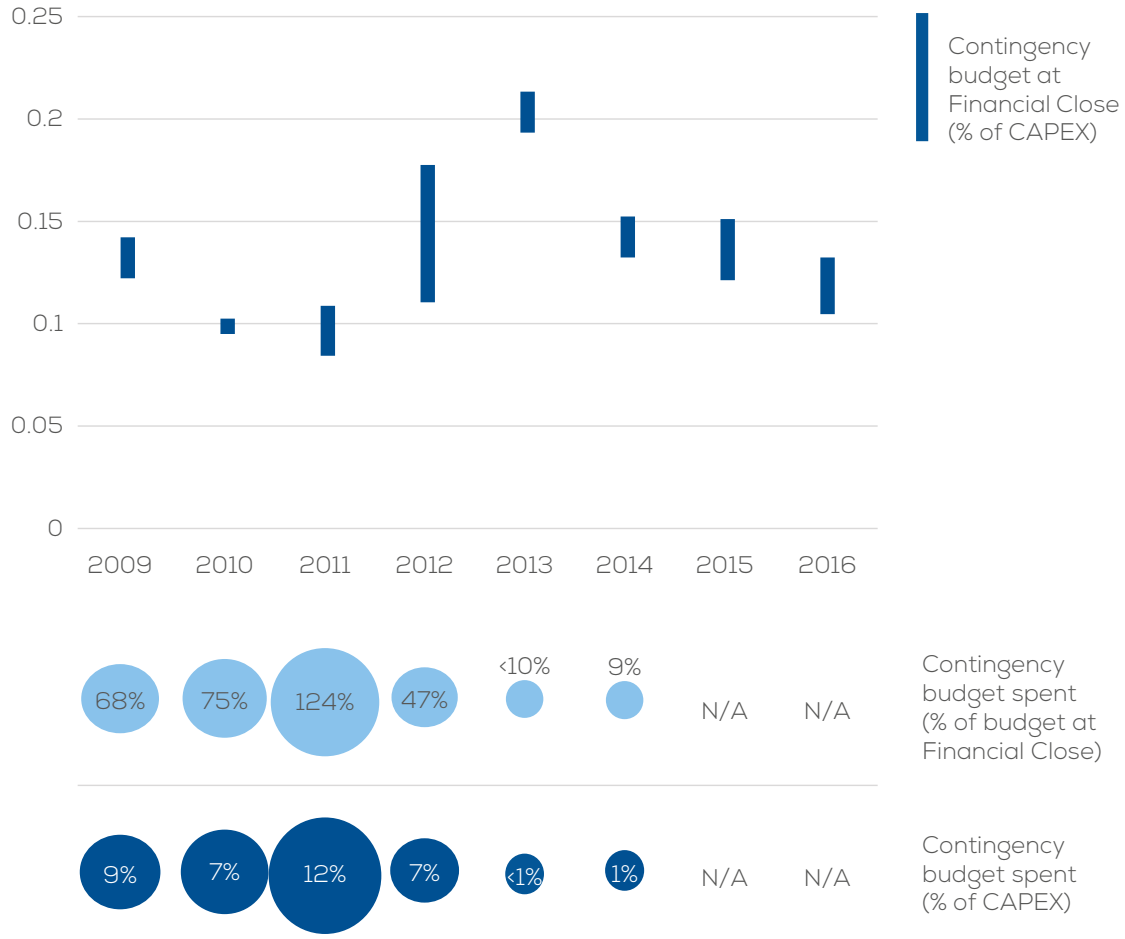
Bond financing for wind power projects, transmission and distribution lines fell to €2.7bn in 2016 from €4.5bn in 2015. Iberdrola raised €1.7bn in green bonds for new onshore wind farms and refinancing of existing ones. TenneT issued the third in a series of Green Bond transactions that have raised a total of €2.5bn over the last two years.

Despite the slowdown in 2016, project bonds are slowly emerging as alternative sources of debt. To date there have only been a few transactions of capital market financing, mainly in offshore wind and transmission lines. For onshore wind project bond transactions are attractive when projects are aggregated in larger portfolios.

6. Figures include unallocated green bonds categorised under "Others"

FIGURE 9

Planned and spent contingency budgets in offshore wind 2009 - 2016



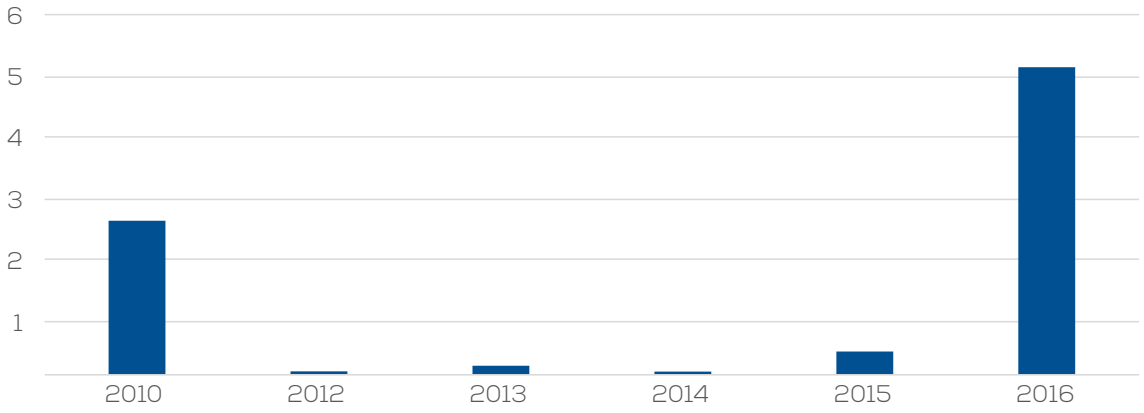
Source: Green Giraffe

The successful investment grade rating of offshore wind project bond transactions to date demonstrates the progress achieved in better understanding and assessing sector risks. Recent project finance transactions suggest that project sponsors are budgeting and spending less for contingency allowances.

2.4 CAPITAL MARKETS: IPOS

FIGURE 10
Initial Public Offerings 2010 – 2016 (bnEUR)

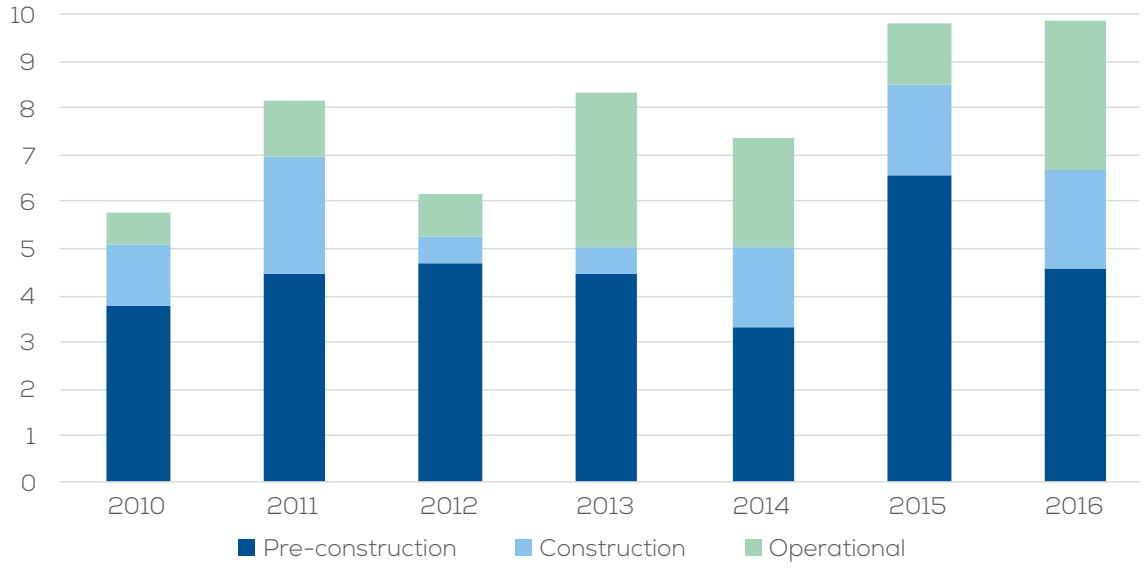
In 2016, Europe saw some of the largest Initial Public Offerings in the energy sector, such as those of DONG Energy, RWE Innogy and turbine manufacturer Senvion. A total of €5.2bn were raised in IPOs in 2016, representing the highest level of issuance in the last seven years. This suggests a strong demand for regulated assets and stable returns in a low yield financial context.



Source: WindEurope

2.5 EQUITY FINANCING

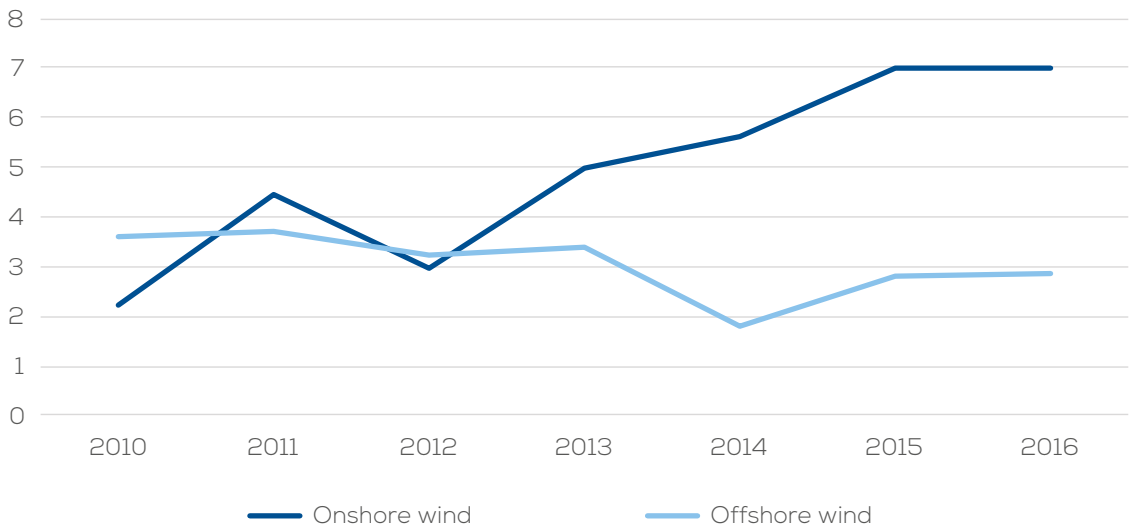
FIGURE 11
Merger and acquisition activity by project phase 2010 – 2016 (GW)



Source: WindEurope

Merger and acquisition activity in 2016 stood at 9.8 GW of capacity divested: 2.8 GW of which was in offshore wind, and 7 GW in onshore wind. The majority of transactions took place at pre-construction stage, one of the most critical phases in the fundraising for a project. Transactions at operation phase almost tripled in value compared to 2015.

FIGURE 12
Merger and acquisition activity by technology 2010 – 2016 (GW)



Source: WindEurope

Two major trends in onshore and offshore wind markets respectively are aggregation and financial optimisation. Mature onshore wind markets are undergoing an aggregation phase taking also advantage of the attractive financial conditions. Offshore wind financing is evolving under competitive pressures across the value chain. Refinancing activities or the sale of minority stakes are now incorporated early in the financial arrangement of projects.

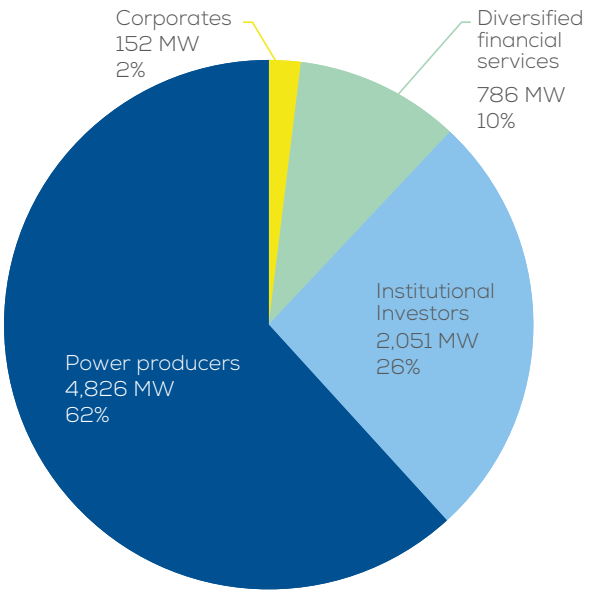
FIGURE 13
Merger and acquisition activity in 2016 by country (GW)

9.8 GW
125 TRANSACTIONS

UK
France
Germany
Sweden
Norway
Spain
Poland
Ireland
Portugal
Finland
Others

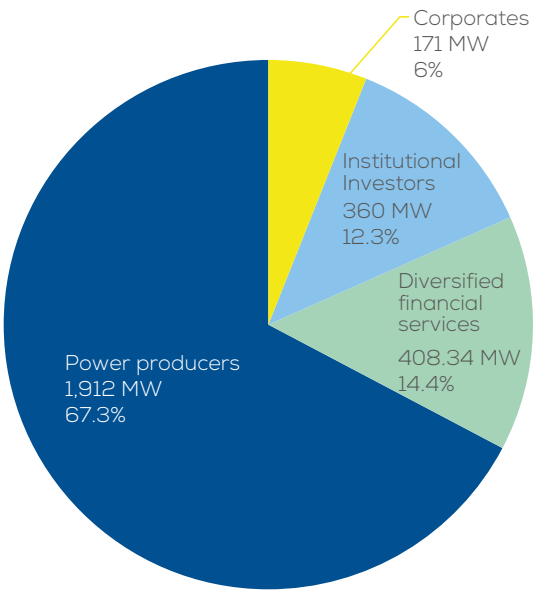
Source: WindEurope

FIGURE 14
Major equity investors in 2016: onshore wind (MW)



Source: WindEurope

FIGURE 15
Major equity investors in 2016: offshore wind (MW)



Source: WindEurope

The equity mix continues to bring in more corporate, financial and in particular for offshore wind, overseas investors. However, power producers still lift most of the equity requirements, especially through development phase.

Financing houses, such as pension, insurance, infrastructure and private equity funds, are gradually increasing their participation in both onshore and offshore wind markets. In 2016, they acquired 36% of the divested onshore wind capacity and 27% of the divested offshore wind capacity.

Institutional investors have a substantial exposure to onshore wind, equal to a quarter of the 2016 merger and acquisition activity. Three out of the top 10 onshore wind acquirers were institutional investors. This is largely due to sector maturity, adequate asset size and risk profile.

Corporate players have long made their debut in the wind sector, with increasing shares on a yearly basis. Both sustainability and economic reasons are the main drivers for this trend. The different asset scale and risk profile of onshore and offshore wind projects have attracted different types of corporates.

Japanese trading houses or major industrial retailers looking for infrastructure investments as an asset class are more present in offshore wind projects. Other corporates looking for clean energy to power their facilities will invest in onshore wind farms, with location and cost competitiveness as the main drivers.

2.6 CORPORATE RENEWABLE POWER PURCHASE AGREEMENTS (PPAS)

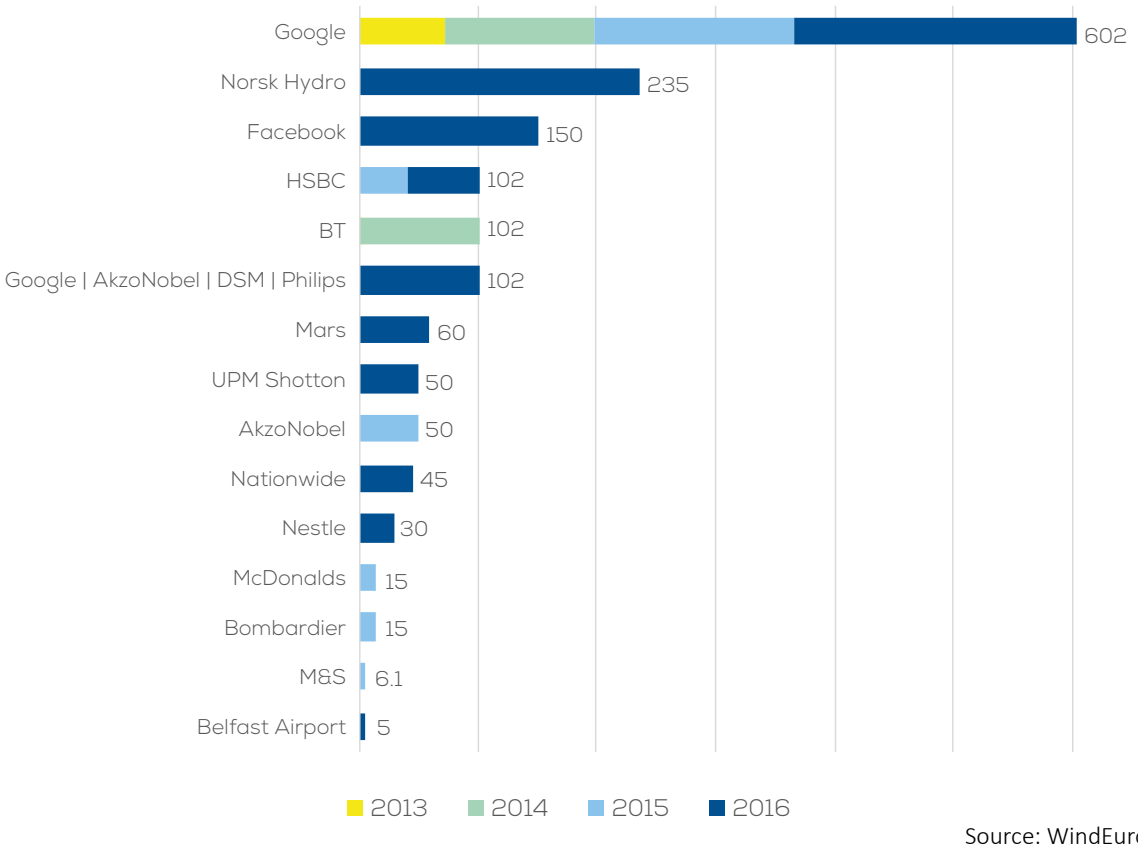
There are different models of corporate engagement, which could be broadly summarised in two segments: investing directly in projects and owning the underlying asset, or acting as an off-taker through power purchase agreements.

The latter in particular is rapidly emerging as a business model in Europe facilitating investments for utility scale projects. Corporate renewable PPAs volume almost tripled in size in 2016 compared to the year before, with over 1 GW of capacity contracted.

From a corporate's perspective, this is a feasible model to meet any renewable energy targets they might have set themselves. Owning the asset comes with certain cost of capital implications for corporates. This is due to the large pay-back period for wind energy projects, as well as the increasing competition in the market for attractive risk-return infrastructure assets.

Onshore wind is very well placed among other low carbon technologies to accommodate corporates' needs for renewable electricity due to its scale, cost competitiveness and risk profile. Over 80% of the contracted renewable capacity in the last four years has been provided by wind power projects.

FIGURE 16
Major corporate off-takers in Europe 2013 - 2016 (MW)



Source: WindEurope

3. OUTLOOK FOR 2017

Whilst 2016 saw a record level of new investments, lower volumes are expected in 2017. The transition from Feed-in-Tariffs to auctions and Feed-in-Premiums is slowing down activity in major wind energy markets. While the first auctions are being set up and run, there will be a lull in investments before they lead to new project FIDs. These low investment levels are also part of a cycle, given the high number of projects that have received financing in the last years. Many projects in the pipeline were squeezed through development phase before the transition to auctions.

New announced offshore wind transactions are estimated at a combined capacity of 2.8 GW, as tendered projects awarded support are expected to go through FID. Multiple tenders are also expected in 2017, namely Germany, the UK, Netherlands, France and Spain.

TABLE 2
Indicative calendar of auctions [7]

COUNTRY	OPENING DATE	CAPACITY (MW)	SOURCE
United Kingdom	April 2017	Budget auction	Offshore wind
Netherlands (SDE+)	April 2017	Budget auction	Onshore wind
Spain	April 2017	3,000	Onshore wind
Spain (Canary Islands)	April 2017	500	Onshore wind
Germany	April 2017	1,550	Offshore wind
Germany	August 2017	800	Onshore wind
Netherlands (SDE+)	Autumn 2017	Budget auction	Onshore wind
Germany	November 2017	1,000	Onshore wind
Germany/Denmark	To be decided	To be decided	Onshore wind
France	To be decided	1,000	Onshore wind
France (Dunkirk)	To be decided	TBD	Offshore wind
Netherlands (Zuid Holland I+II)	To be decided	700	Offshore wind

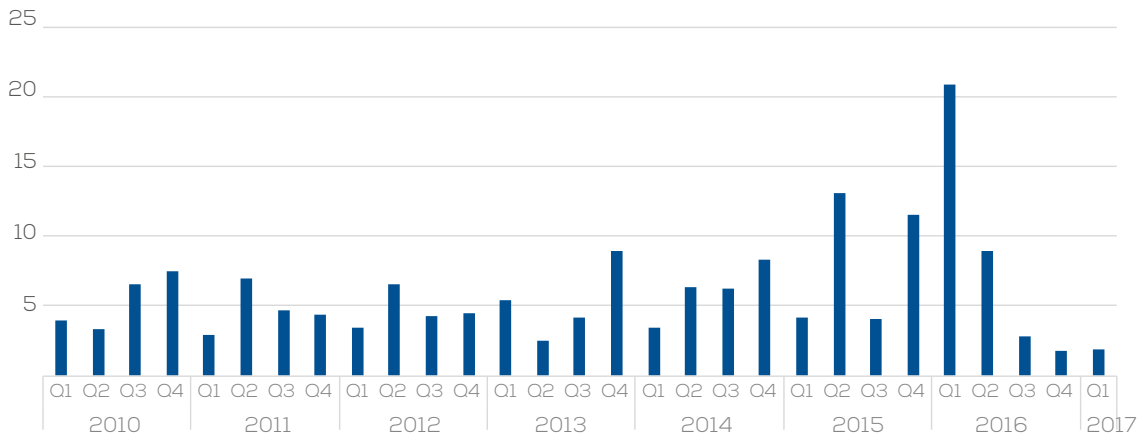
7. Based on publicly available information

Moving forward, both the number of projects and level of investments are expected to fall as European member states complete their National Renewable Energy Action Plans (NREAPs) under the current Renewable Energy Directive which covers the period up to 2020. According to WindEurope estimates and outlook for capacity additions, €25bn of new annual investments will be needed to meet the 2020 targets.

Refinancing markets in both onshore and offshore wind will remain very active. Current market trends suggest that the larger markets for refinancing of operational assets will be Germany, France and the UK. Investors are also returning to Spain, looking for value in long-term existing assets.

Financial markets will continue to support wind energy projects with similar loan pricing, maturity and other commercial terms. A reboot of the bank syndication market is expected in 2017, following a heavy corporate finance and utility-dominated market in 2016. However, the downward trend in interest rates is expected to slow down, as existing commercial banks establish their competitive position in both onshore and offshore wind markets.

FIGURE 17
Asset financing 2010 – 2017 ytd (bnEUR) [8]



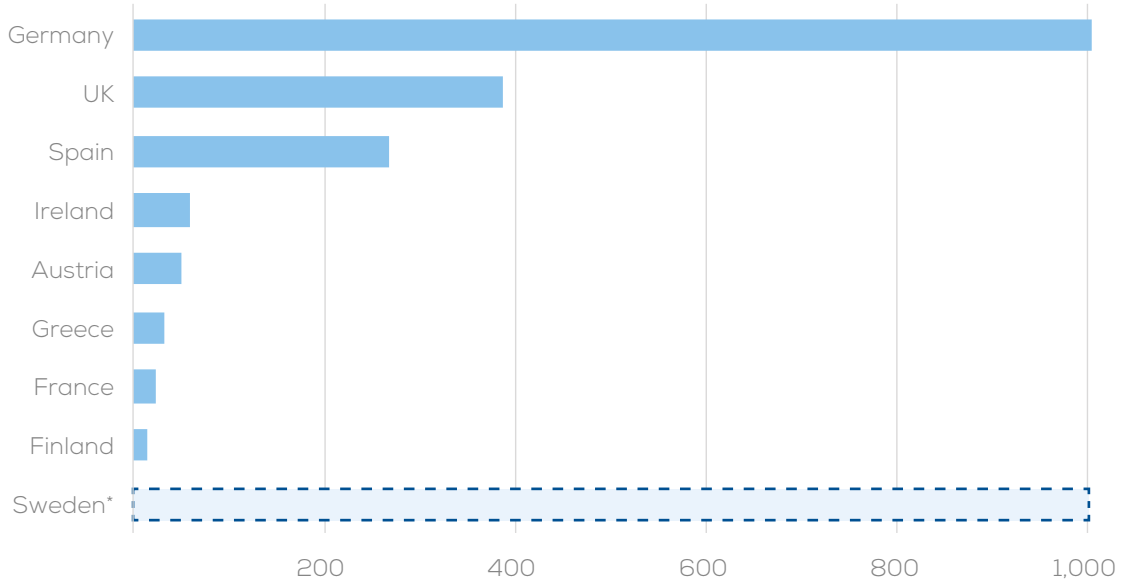
Source: WindEurope

During the first quarter of 2017 Europe invested a total of €1.8bn[9] in wind energy for new projects and the refinancing of those in operation. Eight new onshore wind projects with a total capacity of 1.1 GW reached FID, with only one refinancing transaction in offshore wind.

8. Data includes refinancing transactions
9. Figure does not include the undisclosed value for Markbygden onshore wind farm in Sweden

FIGURE 18
Asset financing in Q1 2017 per country (mEUR) [10]

Much of the activity in the first quarter of 2017 is due to refinancing transactions in Germany, UK and Spain. In Sweden, the biggest onshore wind cluster in the country - Markbygden (650 MW) - reached FID, with financing backed by the European Investment Bank.



Source: WindEurope

10. Undisclosed project values for Sweden

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