



# Financing and investment trends

The European wind industry in 2017



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**Wind**<sup>•</sup>  
**EUROPE**

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This report summarises financing activity in the European wind sector from 1 January 2017 to 31 March 2018. It includes investment figures for the construction of new wind farms, refinancing transactions for wind farms under construction or operation, project acquisition activity, company acquisitions and capital market funding. Rounding of figures is at the discretion of the author.

# Wind<sup>o</sup>

## EUROPE

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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.
- **Capital markets:** refers to activities that gather funds from the issuance of shares and bonds.
- **Venture capital and private equity (VC/PE):** refers to the provision of long term equity funding to emerging companies as a direct investment.
- **Mergers and acquisitions:** includes company mergers and acquisitions as well as 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 the project owners. To this end, projects are established as a separate business 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 a portfolio of 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.

# WHAT ARE THE DIFFERENT SOURCES OF FINANCE FOR WIND ENERGY?

## Debt and equity

The two main sources of capital in wind energy finance in Europe have been sponsor equity and debt. Sponsor equity refers to a traditional equity investor, typically the owner(s) of the project and/or the developer. Equity capital face the highest risk in the project because the owners are the responsible party to bring the initial concept idea through development, construction and commercial operation. In addition, the owners are also the last investors to be liquidated in case of a project default. Because of the tough requirements that equity capital faces, the returns are also higher.

Debt refers to a contractually-arranged loan that must be repaid by the borrower. The lender has no ownership shares in the company or project. However, it has some collateral coverage as a financial protection in case the project is unable to meet the debt repayment schedule. In the case of project default, the lenders are the first party to be liquidated, before equity type investors. As such, debt is generally considered a lower-risk investment and therefore comes with lower-cost financing compared to equity.

There are two major types of debt in wind energy finance: construction debt and refinancing debt. Construction debt is raised for the purpose of financing new assets. Refinancing debt is raised for the purpose of financing construction debt at a longer maturity and/or lower interest rate.

## Corporate finance and project finance

The proportion of debt and equity in a project, as well as the way they are utilised, will determine the capital or financial structure of the project. There are two types of financial structures: corporate finance and project finance.

In a corporate finance structure, investments are carried on the balance sheet of the owners and project sponsors. Debt is raised at corporate level, with the lenders having recourse to all the assets of the company to liquidate a non-performing project. The project management and many of the contractual obligations are internalised with the owners and project sponsors. Corporate finance is therefore quicker and usually less expensive than project finance.

In a project finance structure, typically called non-recourse finance, the investment is carried off the balance sheet of the original owners and project sponsors. The investment or the project is turned into a separate business entity called a Special Purpose Vehicle (SPV) with its own management team and financial reporting, capable of raising debt on its own. Because debt is raised at project level, the lenders do not have recourse to the company assets of the owners and project sponsors in cases of project default. Due to increased contractual obligations and a more sophisticated risk management structure, project finance can be more expensive and lengthier to finalise than corporate finance.

Debt-to-equity ratios in a project finance transaction may vary considerably depending on the project specifics, availability of capital and risk profile of the project owners. For wind projects they range between 70% - 80% debt and 30% - 20% equity.

The capital structure a company chooses will be determined by its particular risk profile, size and industry sector. Power producers and utilities with a large balance sheet will opt for a corporate finance structure and bring the project through construction as a single player. Fund-raising will occur at corporate level through debt and equity vehicles alike.

Unlike utilities, independent power producers with smaller balance sheets and those companies whose primary business is not wind energy have better project finance capabilities. In a project finance structure, partnerships are key from a very early stage. Fundraising will occur at project level through debt and equity vehicles alike. Project owners will need to form consortia to provide the required equity whereas lenders will come together to provide syndicated project loans on the debt side.

### Raising debt and equity

The project owners and sponsors can raise capital for project development from different sources. These may include own-balance sheet financing, external private investors, funding from commercial banks and public capital markets. The latter in particular has become more prominent in recent years in wind energy financing for raising both debt and equity.

Debt is usually raised through the issuance of bonds either at corporate or project level. Where a bond is issued at corporate level, the proceedings go for the financing of a portfolio of projects. The bond can carry the “green” label when the portfolio of projects it is financing is made exclusively of renewable energy investments. Where the bond is issued at project level, the proceedings are used for the specific renewable energy project and are therefore “green”. Project bonds are issued on behalf of the SPV and are usually part of a non-recourse, project finance structure.

A bond is considered investment grade if its credit rating is a minimum of BBB- by Standard & Poor’s or a minimum of Baa3 by Moody’s. Investment grade bonds are considered by rating agencies as likely to meet payment obligations for investors.

### Capital availability for wind power projects

The financial markets have supported the growth of the wind sector with a strong liquidity on both debt and equity. The financing conditions of low interest rates, cost improvements and further trust gained in the technology have all contributed to a healthy deal flow of projects.

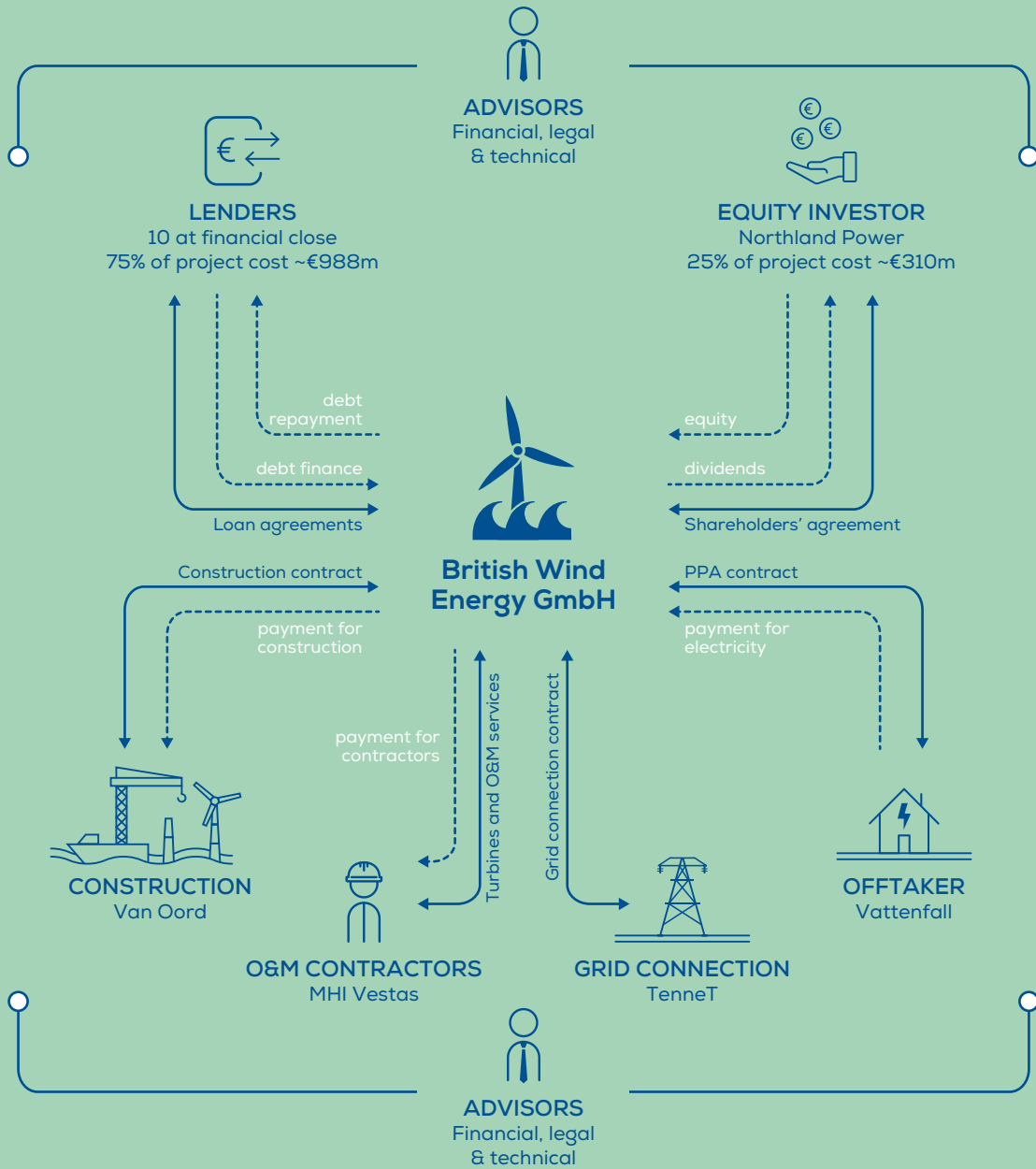
Debt liquidity has been available from construction phase with new financing and refinancing transactions in major markets. Lenders include a variety of bank and non-bank institutions such as Export Credit Agencies (ECAs). Multilateral Development Banks (MDBs) and other International Financial Institutions (IFIs) have also provided debt liquidity where commercial bank financing has not been available. International banks have also strengthened their presence in the European wind sector and introduced more competition to the sector. Japanese banks, driven by a prolonged low interest rate environment in their domestic market, feature predominantly in the top lending institutions for European wind power projects.

On the equity side, institutional investors are also bidding more aggressively for wind assets. Interest in the technology has picked up significantly from both institutional and strategic investors who are now looking at wind projects for steady, predictable returns to meet long-dated liabilities. Much like with the banks, investor appetite for the technology applies to both greenfield and existing assets. However, as confidence grows in the sector and a positive track record continues, investors are also targeting more greenfield projects earlier in the construction phase.



EXAMPLE OF FINANCING STRUCTURE  
FOR TYPICAL OFFSHORE WIND PROJECT

**252 MW | 31 Turbines | €1,3 bn**



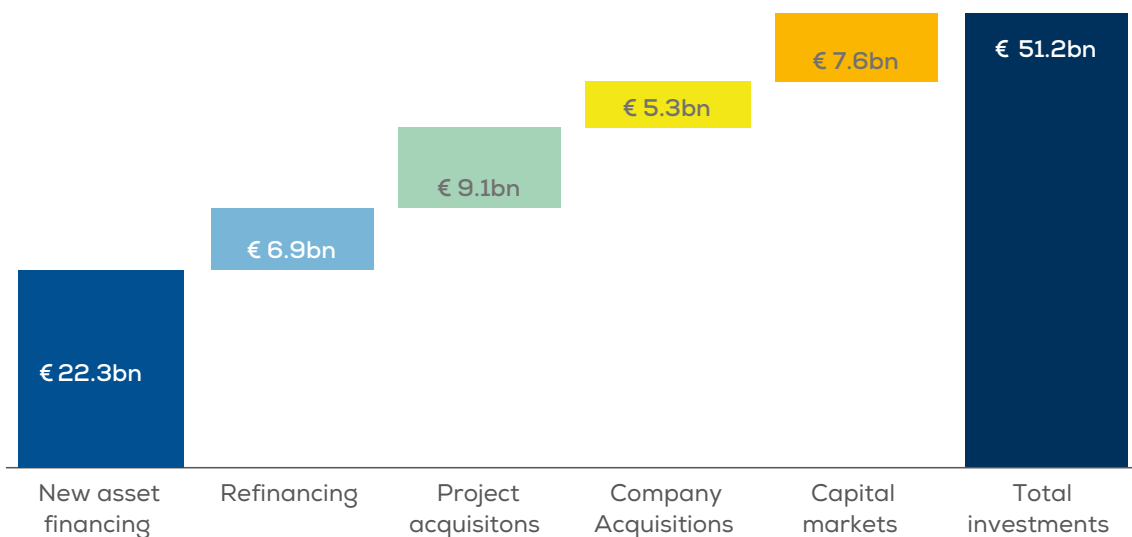
Source: Green Giraffe

# EXECUTIVE SUMMARY

In 2017 the wind energy industry invested €51.2bn in Europe. This included investments in new assets, refinancing transactions, mergers and acquisition at project and corporate level, public market transactions, and private equity raised. Wind energy represented the largest investment opportunity in the power sector, accounting for half of all

investments in 2017. The technology is seen as a major driver for moving beyond fossil fuels and conventional power assets. Cost competitiveness and reduced risk perceptions have brought in domestic and international market players looking to diversify their portfolios and/or align with their sustainability targets.

**FIGURE 1**  
European wind energy investments in 2017 per asset class (€bn)



Source: WindEurope

## 2017 annual figures

- Europe raised a total of €51.2bn for the construction of new wind farms, refinancing operations, project and company acquisitions as well as public market fundraising.
- Investments in new wind farms amounted to 22.3bn, a decrease of 19% from 2016.
- Project acquisitions doubled in value in 2017 to €9bn, from €4.3bn in 2016.
- Company acquisitions also doubled in value as a result of industry consolidation, from €2.5bn in 2016 to €5.3bn in 2017.
- Banks extended €15.5bn in non-recourse debt for the construction of new wind farms and the refinancing of existing ones.
- Green bonds raised €17.5bn in 2017, representing the highest level of issuance in the last five years.
- Wind energy was the largest investment opportunity in the power sector in Europe.

## Country highlights

- Investment flows in 2017 were less geographically concentrated than in 2016, with 20 countries announcing FIDs compared to 16 countries in 2016.
- Northern and Western Europe held the bulk of new investments. Germany and the UK accounted for half of the new FIDs announced in 2017.
- Investments in Southern and Eastern Europe (SEE) remained low. With a total of €3.5bn, the SEE region represented only 16% of the total new assets financed in Europe.
- The largest onshore wind farm to reach FID in 2017 was Markbygden in Sweden, with a capacity of 650 MW. The project brought in major financiers as investors and large electricity consumers as power off-takers.

- In the UK, the Hornsea 2 offshore wind farm reached FID. With a capacity of 1.4 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.
- Offshore wind has experienced an uptake in corporate finance transactions over the past two years. However, offshore wind project finance has declined for new FIDs.
- Refinancing activities and the sale of project minority stakes are now incorporated much earlier in the financial arrangements of projects.

## 2018 Outlook

- Investment volumes are expected to increase in 2018. This is due to the roll-out of auctions across Europe and the fact that many projects already awarded support will reach FID.
- Over 14 GW of capacity was awarded support through 2017 and the first quarter of 2018.
- During the first quarter of 2018 Europe invested €3bn in new wind energy projects. 30 new onshore wind projects, for a combined capacity of 1.9 GW, reached FID.
- Wind energy projects currently awaiting FID are estimated at over €23bn.
- Strong equity and debt liquidity is expected to continue for both onshore and offshore wind projects.
- In the near term, the downward trend in interest rates is expected to slow down, with the quantitative easing coming to an end and existing commercial banks establishing their competitive position in the market.
- In the longer term, the merchant risk exposure in wind power projects will likely change both the landscape and investor profiles of wind energy financing.

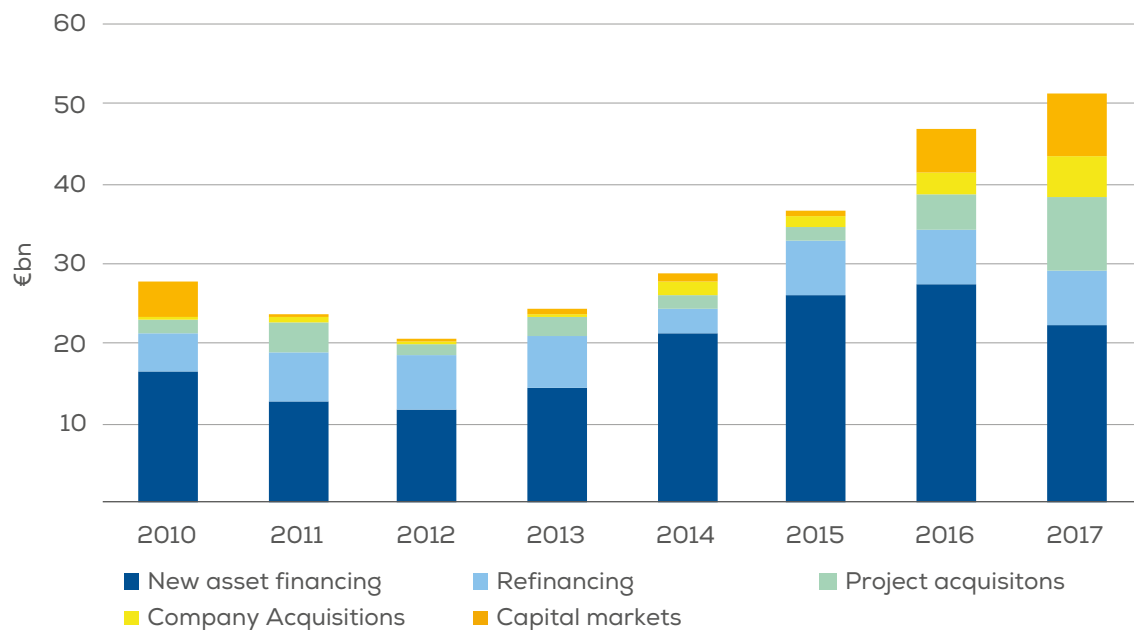
# 1.

# INVESTMENT NUMBERS IN 2017

## 1.1 WIND ENERGY INVESTMENTS PER ASSET CLASS

FIGURE 2

Total wind energy investments in Europe 2010 – 2017 (€bn)



Source: WindEurope

Wind energy saw €51bn in financing activity in 2017. This represents a 9% increase compared to 2016. The biggest category within wind energy investments is new asset financing. In 2017, new asset financing for wind power projects stood at €22.3bn, a 19% decrease on 2016. Technological cost reductions and lower offshore wind investments were the two main reasons for the drop in investments in monetary terms.

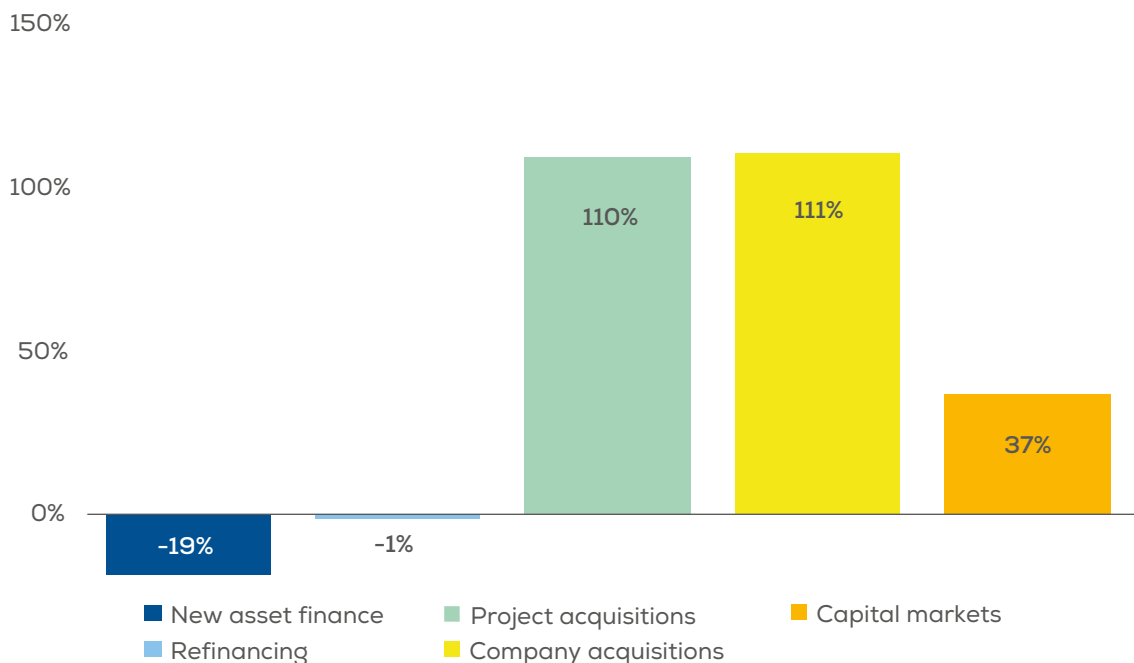
Project and company acquisitions were the main drivers for the overall growth in wind energy investments. Project and corporate acquisitions provided a combined €14.4bn in investment activity. This compares to only €6.8bn in 2016.

With €5.3bn, company acquisition deals doubled in value in 2017 as a result of the consolidation phase the wind energy industry has experienced in recent years across the supply chain. Project acquisitions also doubled in value in 2017 to €9bn, up from €4.3bn in 2016. Sector maturity and technology competitiveness have brought in more investors as equity partners in projects, in particular from the financial services industry. These partnerships are

key for power producers who need to recycle capital to finance new assets.

The overall increase in wind energy investments was also a result of higher deal flow in public capital markets. Companies are making more use of the low interest rate environment and liquidity in the financial markets by raising debt and equity via capital markets. In 2017 companies in the wind energy sector raised €7.6bn in 2017 from public capital markets.

**FIGURE 3**  
Annual change in the main categories of wind energy investments (%)

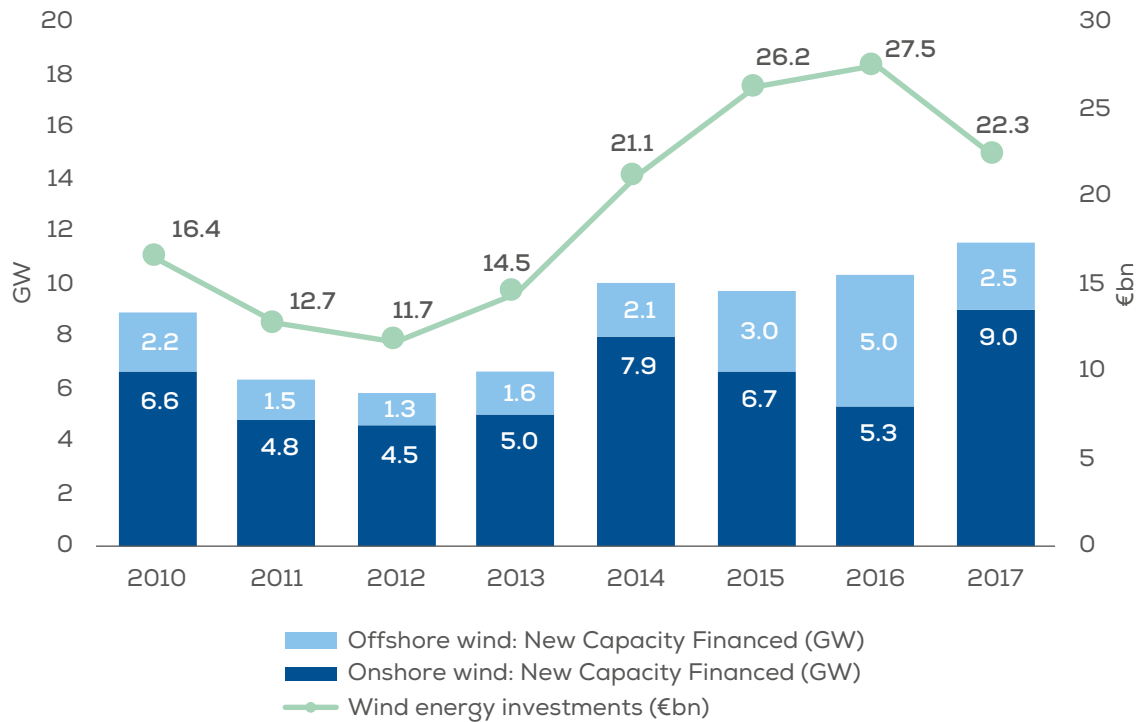


Source: WindEurope

## 1.2 NEW ASSET FINANCE PER COUNTRY

**FIGURE 4**

New asset finance in wind energy 2010 – 2017 (GW and €bn)



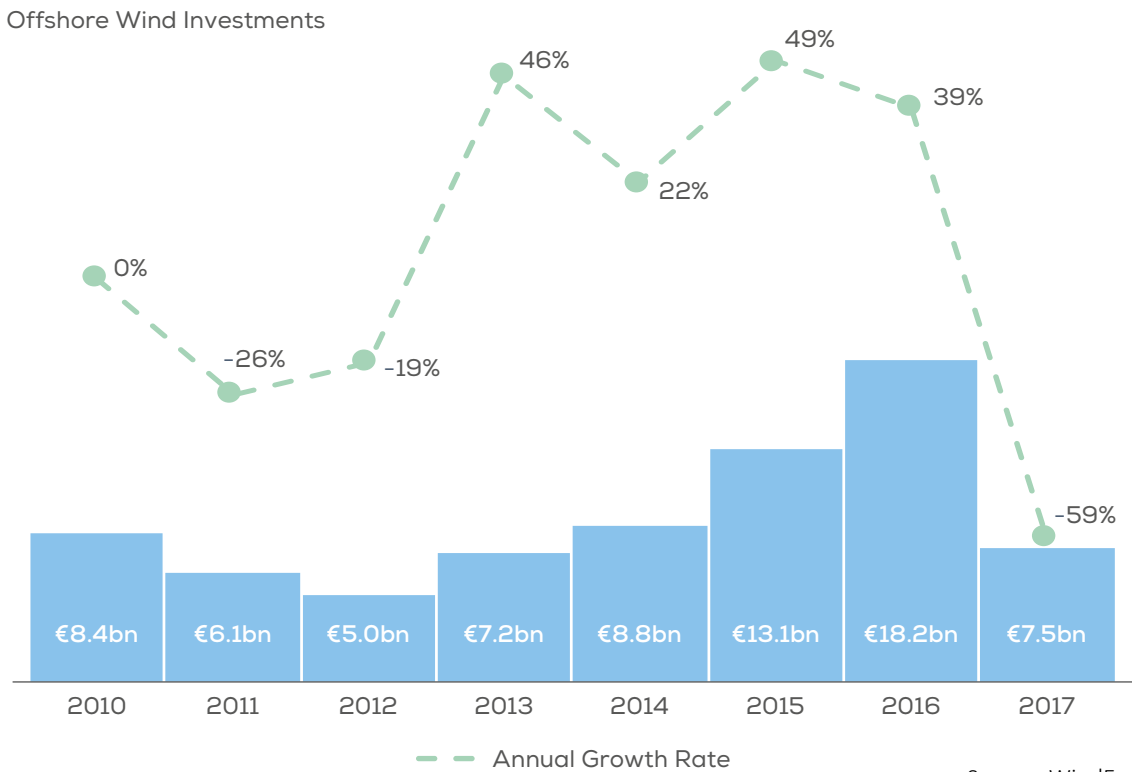
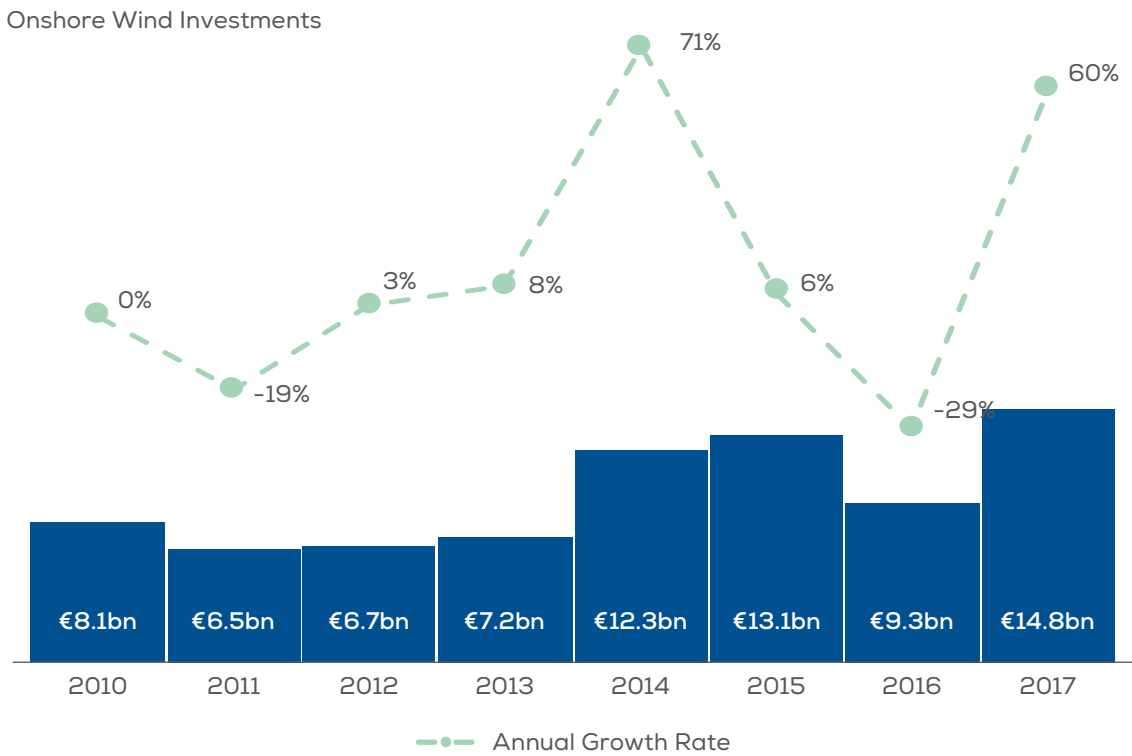
Source: WindEurope

2017 was a record year for new capacity financed. 11.5 GW of new capacity, 12% more than in 2016, reached Final Investment Decision (FID) in Europe across 200 projects in 20 countries. Onshore wind projects were the main drivers for this growth with 9 GW of new capacity financed. New offshore wind FIDs dropped to 2.5 GW of new capacity financed in 2017, half of the 2016 level.

In monetary terms, investments in new projects were down by 19% to €22.3bn. Reduced offshore wind FIDs have brought down the overall level of investments in new projects. Offshore wind has higher Capex requirements compared to onshore wind. Therefore its impact on the level of investments is much more visible.

As a general industry-wide trend, sector maturity and competitive auctions for new renewable energy capacity have resulted in cost reductions across the wind industry's value chain. The financial sector has also made its fair contribution to this trend by offering cheaper financing for the development and construction of wind power projects.

**FIGURE 5**  
**New asset finance in wind energy per technology, 2010 – 2017 (€bn)**



Source: WindEurope

Wind energy investments in 2017 were less geographically concentrated than in 2016. The top three investor countries owned 64% of FID announcements in 2017, compared to 73% in 2016. However, European wind energy markets are maturing at different paces.

Northern and Western Europe held the bulk of new investments. Germany was the biggest investor in 2017. Germany generated a total financing activity of €6.7bn for the construction of new onshore and offshore wind farms. This accounts for 30% of the total wind energy investments made in 2017. The UK came second to Germany with €5bn, or 22% of the total wind energy investments in 2017.

Two landmark projects in Northern and Western Europe reached FID in 2017. The largest offshore wind farm to date, Hornsea 2 – an Ørsted wind farm – adds 1.4 GW of new capacity to projects awaiting construction in the UK. Earlier in the year came Markbygden onshore wind farm in Sweden, with a capacity of 650 MW. The project brought in major financiers like Green Investment Group as investors and heavy electricity consumers like Norsk Hydro as power off-takers.

Nevertheless, investments in Southern and Eastern Europe (SEE) remained low in 2017. Investor confidence has been slow in recovering mainly due to macroeconomic and political factors. With a total of €3.5bn, the SEE region represents only 16% of the total new assets financed in Europe. The discount rate, a proxy for the cost of capital

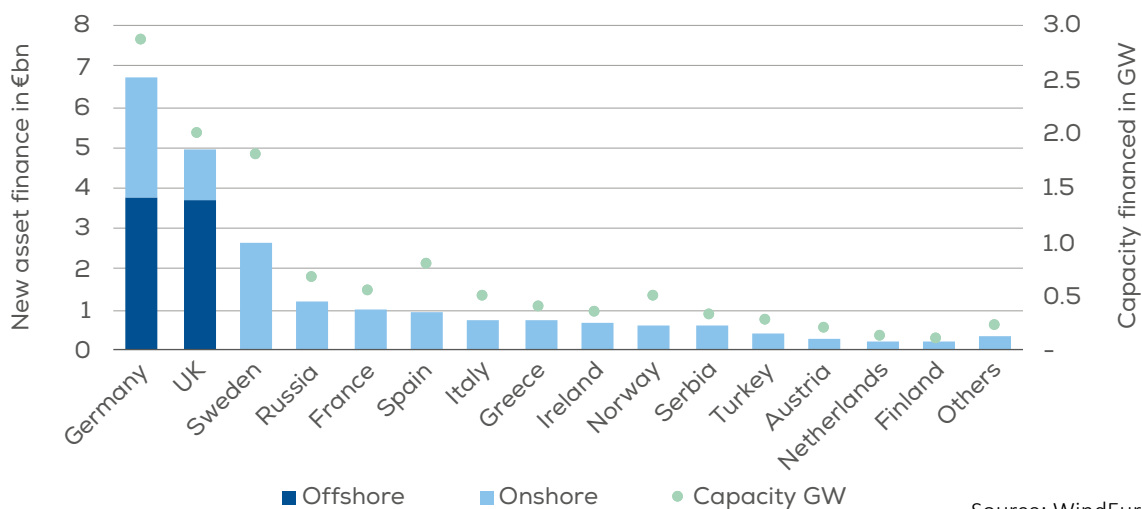
remains higher in the SEE countries compared to Northern<sup>1</sup> and Western Europe. For onshore wind this varies from 9% in Italy and 8.5% in Spain to 6.5% in Germany and 7.25% in the Nordics.

There have been positive developments in Southern and Eastern Europe (SEE). Following the auctions in recent years Spain is starting to attract some investments. The Greek market is also reviving, in particular with the help of foreign capital and multilateral financial institutions like the European Investment Bank (EIB) and the European Bank for Reconstruction and Development (EBRD).

In many EU markets there are currently no wind investments taking place, despite the significant potential these countries have for further expansion of wind power. The lack of a stable regulatory environment has affected both the level of investment and financial commitments of half of EU Member States. Closely tied to regulatory stability is the cost of capital, which prices in uncertain future political events as risk premiums. Higher risks will lead to higher costs of capital and negative impacts on the economic viability of wind projects in these countries.

2017 saw European non-EU countries investing more in wind energy. While the value of new FIDs in EU countries dropped by 25%, FIDs in non-EU Europe increased by 60% to €2.9bn. Russia alone announced €1.2bn in new investments. The remaining €1.7bn came from Norway, Ukraine and the Western Balkans.

**FIGURE 6**  
New asset finance in wind energy per country, 2017 (€bn and GW)

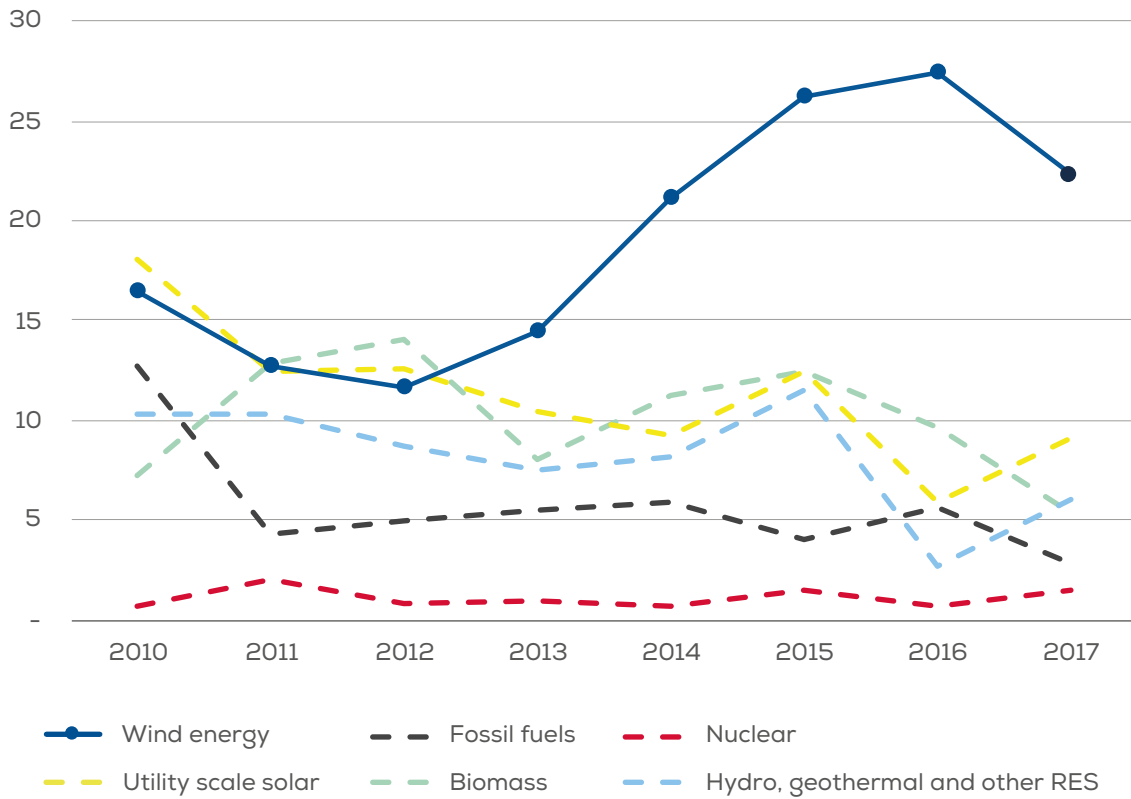


Source: WindEurope

1. Grant Thornton (2018): Renewable energy discount rate survey results.



**FIGURE 7**  
Investments in new power capacity in Europe, 2010 – 2017 (€bn)



Source: WindEurope

In 2017 wind energy represented half of the renewable energy investments in new power capacity. Onshore wind alone made up one third of the market. Overall, investments in new wind power capacity have been steadily

increasing in the last five years at a compound annual growth rate (CAGR) of 6%. All other technologies have seen falling investments for the same period.

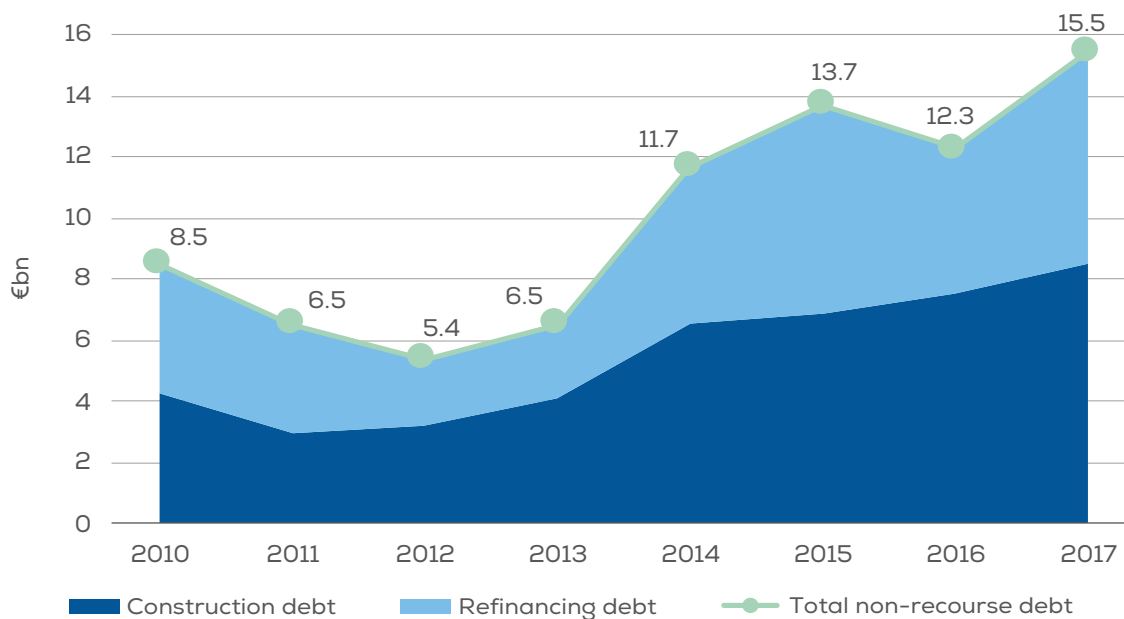
# 2.

## SOURCES OF FINANCE IN 2017

### 2.1 DEBT FINANCING

FIGURE 8

Non-recourse financing 2010 – 2017 (€bn)

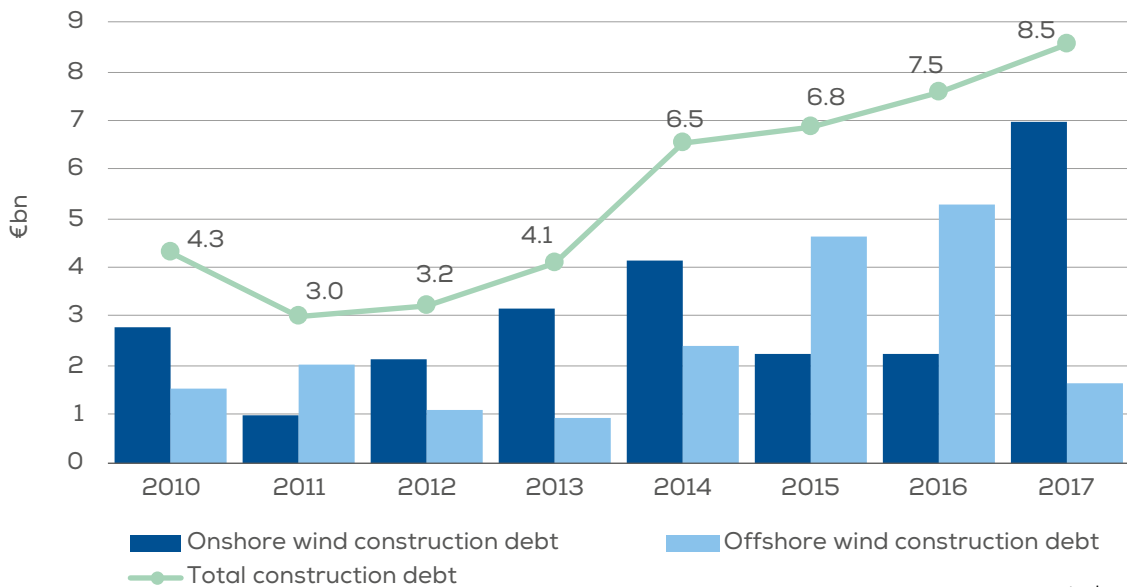


Source: WindEurope

There has been a healthy flow of debt finance over the last five years. Emerging new business and ownership models have diversified the pool of investors in wind energy and unlocked the potential for long-term sources of finance from banks, institutional lenders and Export Credit Agencies (ECAs). This has led to a significant amount of affordable debt, in particular in the form of non-recourse financing.

In 2017 over €15.5bn in non-recourse debt were raised: €8.5bn for the construction of new projects and €6.9bn for the refinancing activities of wind farms under construction or operation. This represents a 26% increase on 2016.

**FIGURE 9**  
Non-recourse construction debt per technology 2010 – 2017



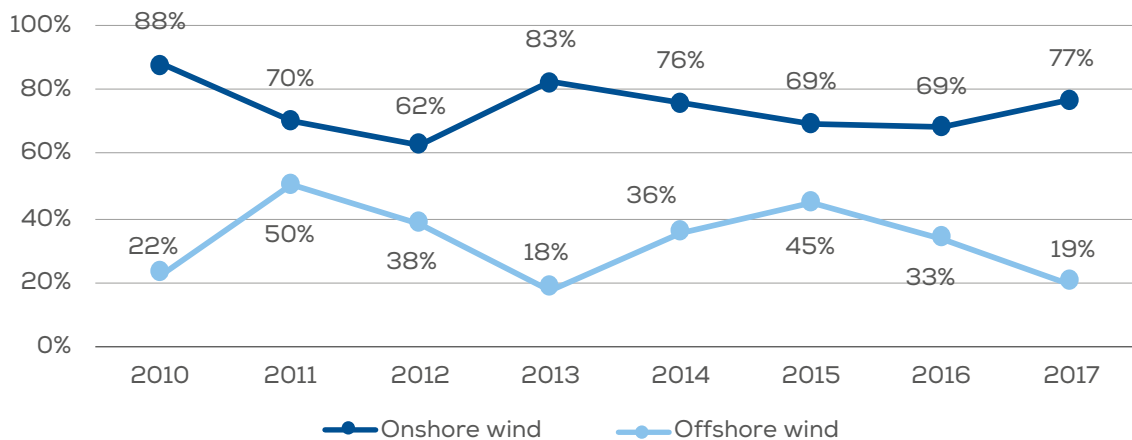
Source: WindEurope

In the last two years two different patterns have emerged for onshore and offshore wind financing. While onshore wind has used non-recourse structures primarily for the financing of new assets, offshore wind has used non-recourse structures for the refinancing of wind farms under construction or operation.

Non-recourse finance has been the predominant model for onshore wind. This trend continued in 2017 with non-recourse debt leveraging 77% of new capital expenditure requirements. Onshore wind raised the majority of construction debt, a total of €6.9bn. Only €1.6bn

in non-recourse debt were raised for the construction of new offshore wind farms. Following an uptake in corporate finance from offshore wind developers in recent years, new capacity financed on a non-recourse basis fell to 19% in 2017, down from 33% in 2016 and 44% in 2015.

**FIGURE 10**  
Share of non-recourse debt in new capacity financed 2010 – 2017



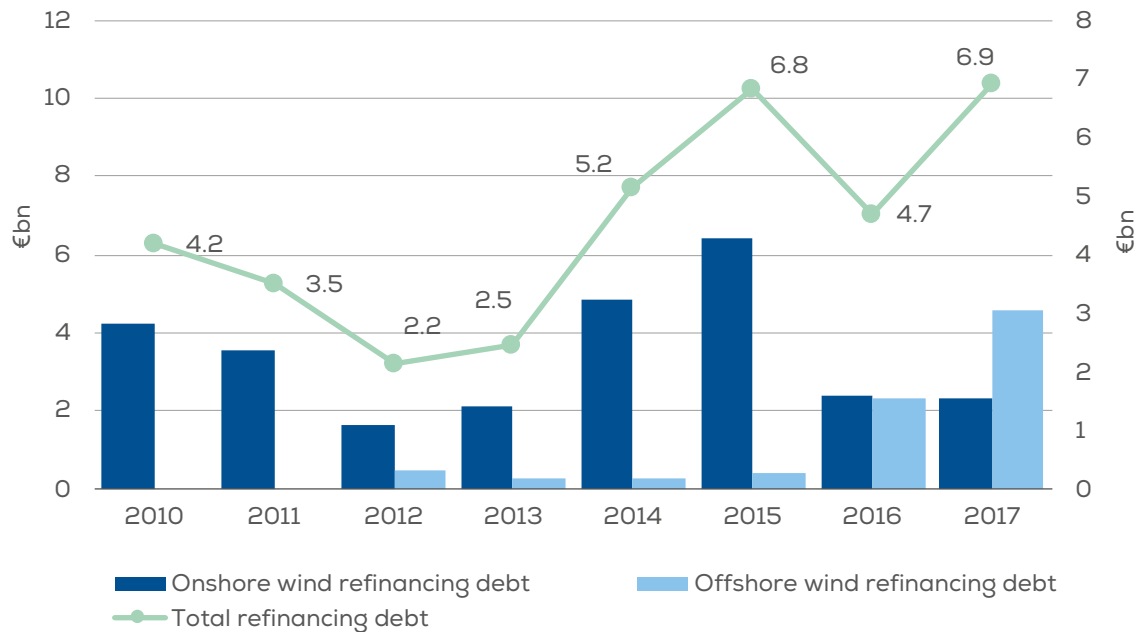
Source: WindEurope

In 2017 the wind sector witnessed a dynamic market for refinancing transactions, in particular for offshore wind. Of the €6.9bn in non-recourse debt raised for refinancing activities, €4.6bn was for offshore wind projects and €2.3 for onshore wind.

The current financing conditions of low interest rates have contributed to this trend. Developers are now restructuring old debts for more favourable terms, be it for price or loan duration. However, some part of this growing refinancing trend consists in changes to how wind projects, particularly offshore projects, are financed.

Competitive pressures driven by the surge in auctions have altered the financial arrangements in wind energy investments. Opting for a corporate finance structure

where you internalise project management allows power producers to raise cheaper debt at corporate level during construction phase, and therefore lower the cost of finance. But the refinancing or the sale of minority stakes are now incorporated much earlier in the financial arrangements of a project. Owing to years of sector experience, partnerships have already been developed. Power producers know at a very early stage when and to whom part of the project is going to be disposed. The growing confidence and demand for wind energy assets has made it easier for power producers and developers to exit their projects and sell them on to different investors who then use project finance to purchase their ownership share.

**FIGURE 11****Non-recourse refinancing debt per technology 2010 – 2017**

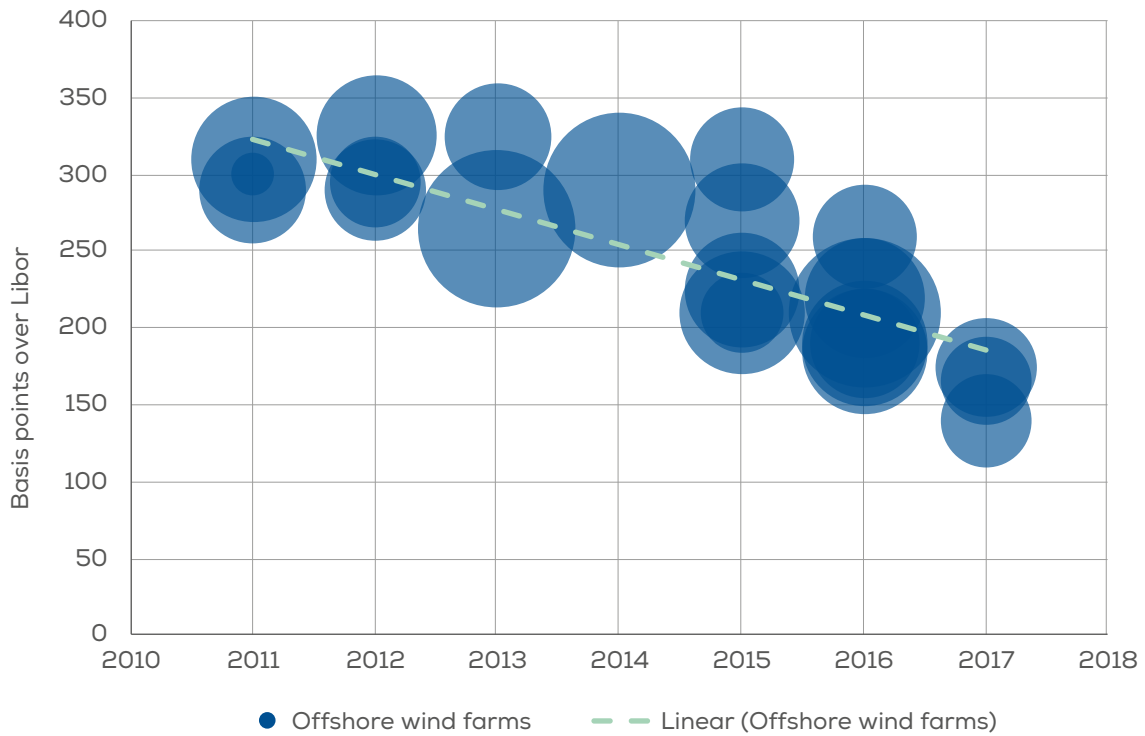
Source: WindEurope

The debt markets have supported construction activity on attractive terms. Transactions this year have continued to reflect the general trend of easing loan terms when it comes to 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. Debt/Equity structures can vary considerably between countries. However, they remain within the range of 70/30 to 80/20.

**FIGURE 12**

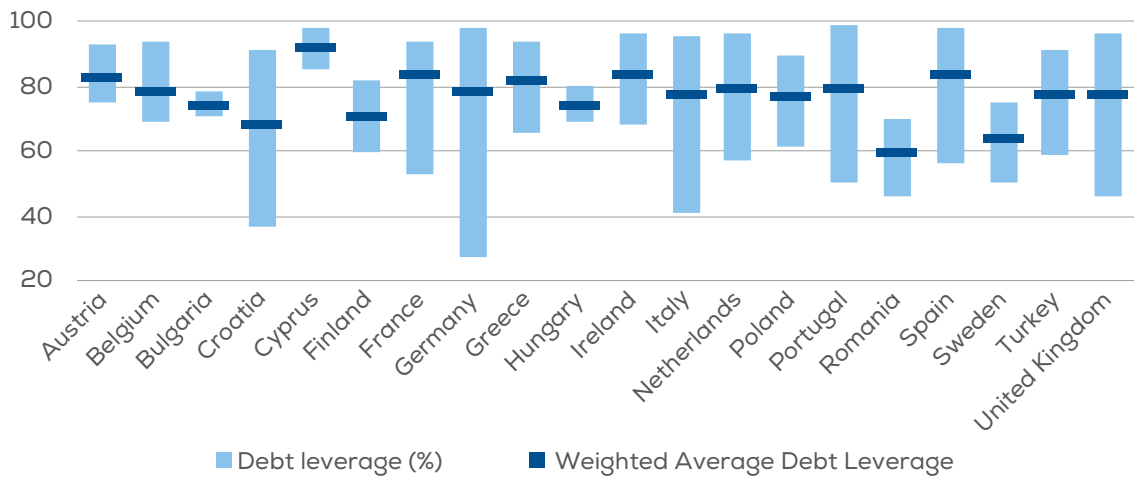
Interest rates: basis points per MW financed 2010 – 2017 (size of the bubble represents project capacity)



Source: Green Giraffe, WindEurope

**FIGURE 13**

Debt / Equity structures for wind projects in different countries



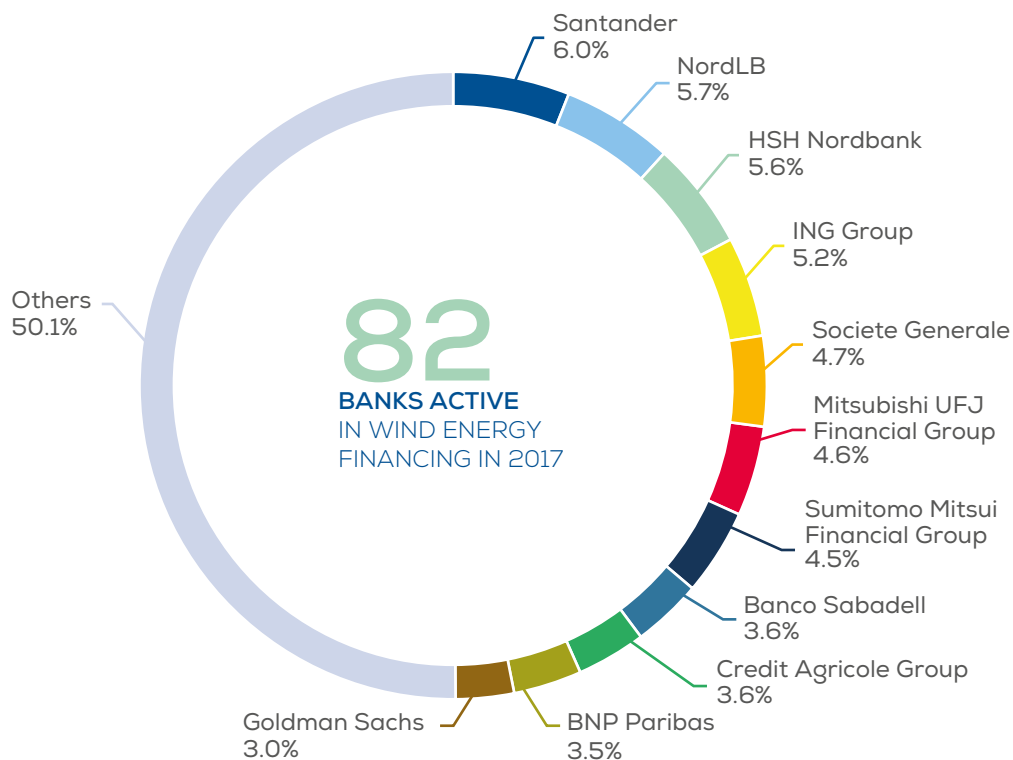
Source: WindEurope

The attractive sector yields have diversified the profile of lenders. Over 82 lenders were active in 2017, including multilateral financial institutions, export credit agencies and commercial banks. As confidence grows in the

European wind sector international banks continue to strengthen their presence in the market.

**FIGURE 14**

Market share of banks active in wind energy financing in 2017



Source: WindEurope

## 2.2 GREEN BOND ISSUANCES

Bond issuances have been an important part of debt financing for wind energy projects. The issuance of green bonds has been steadily growing over the last five years. At €17.5bn 2017 was a record year for green bonds issuances, both at project and corporate level. The funding raised from these issuances serves to finance renewable energy portfolios, including wind power projects and offshore transmission lines. Institutional investors have been the main subscribers to these bonds.

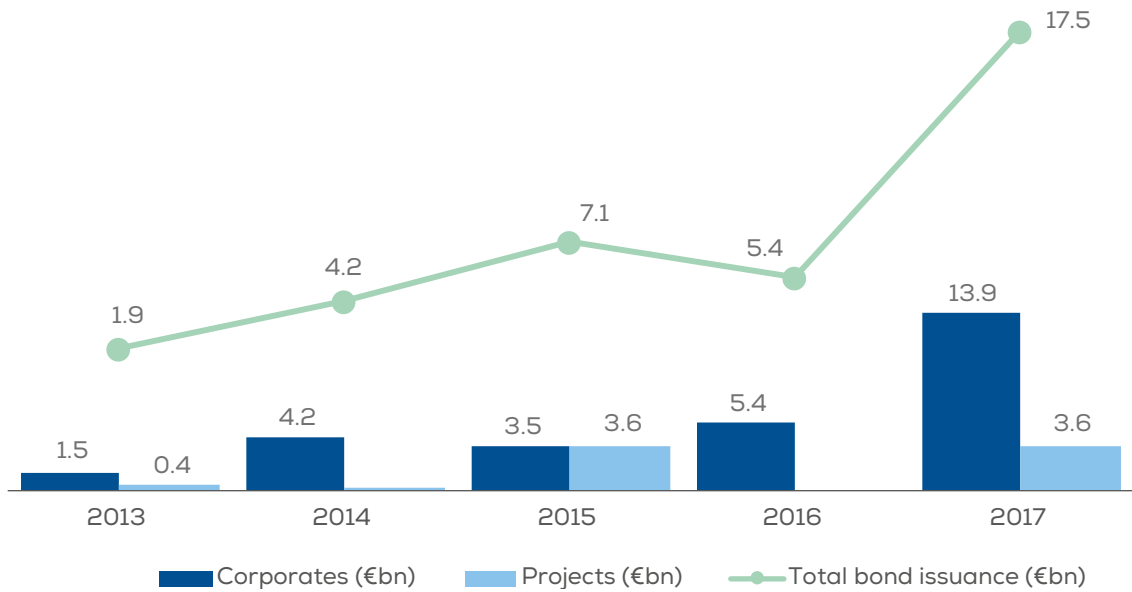
The majority of these issuances, a total of €13.9bn, came from corporate bonds. Amongst the top issuers are Iberdrola with €3.5bn, ENGIE with €2.7bn, TenneT with €1.9bn, Innogy with €1.7bn and Ørsted with €1.3bn.

Despite a 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 fi-

ancing, mainly in offshore wind and transmission lines. There have been fewer project bond transactions in onshore wind. For onshore wind to access this market, projects will need to be aggregated in larger portfolios.

In 2017 wind energy projects raised €3.6bn in project bonds, including three offshore wind issuances. These three issuances combined raised a record €2.5bn and supported the refinancing of 1.3 GW of capacity under construction in Borkum Riffgrund 2, Walney Extension and Northwind. The latter two also represent the first investment grade project bonds issued in the UK and Belgium for offshore wind farms under construction.

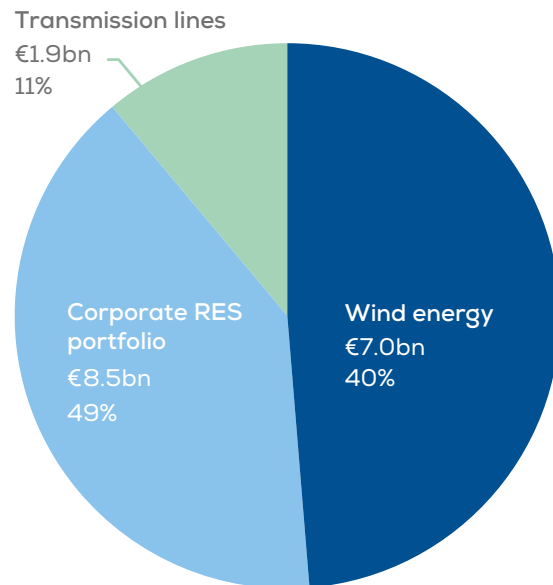
**FIGURE 15**  
Green bond issuances 2013 – 2017 (€bn)<sup>2</sup>



Source: WindEurope

**FIGURE 16**  
Green bond issuances in 2017 by technology

At least 40% of all the green bond issuances in 2017 came from companies directly operating in the wind industry, either through project or corporate bonds (for those companies operating uniquely in the wind energy sector). Corporate RES portfolio refers to renewable energy portfolios which include wind energy but are not exclusively wind-based.



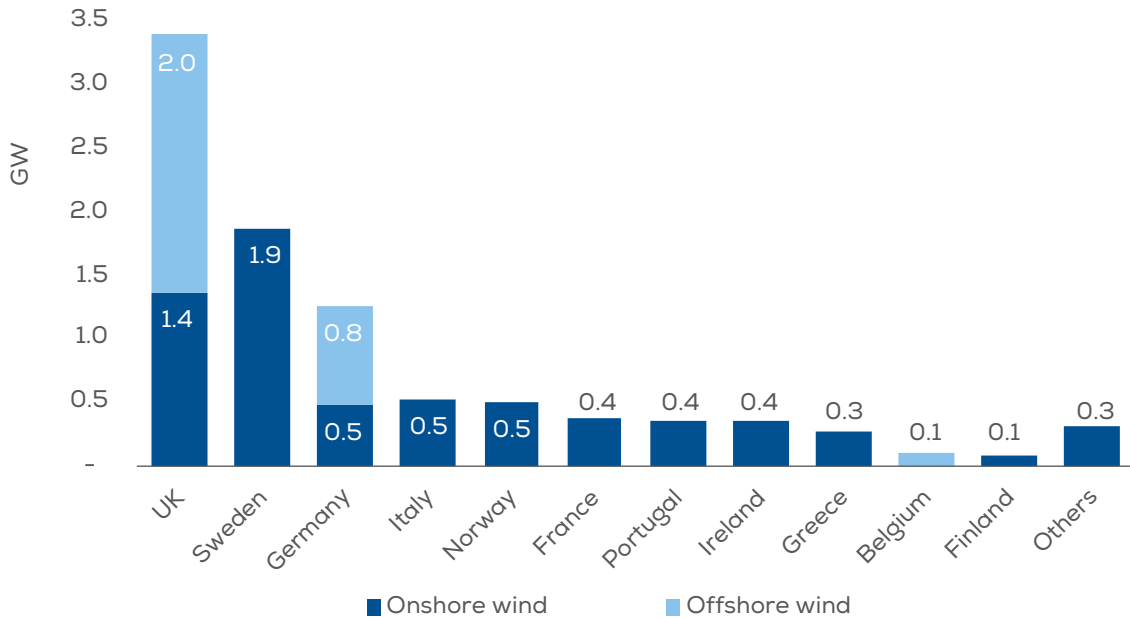
Source: WindEurope

2. Figures include unallocated green bonds categorised under “Others”.



## 2.3 EQUITY FINANCING

**FIGURE 17**  
2017 project acquisitions by country (GW)



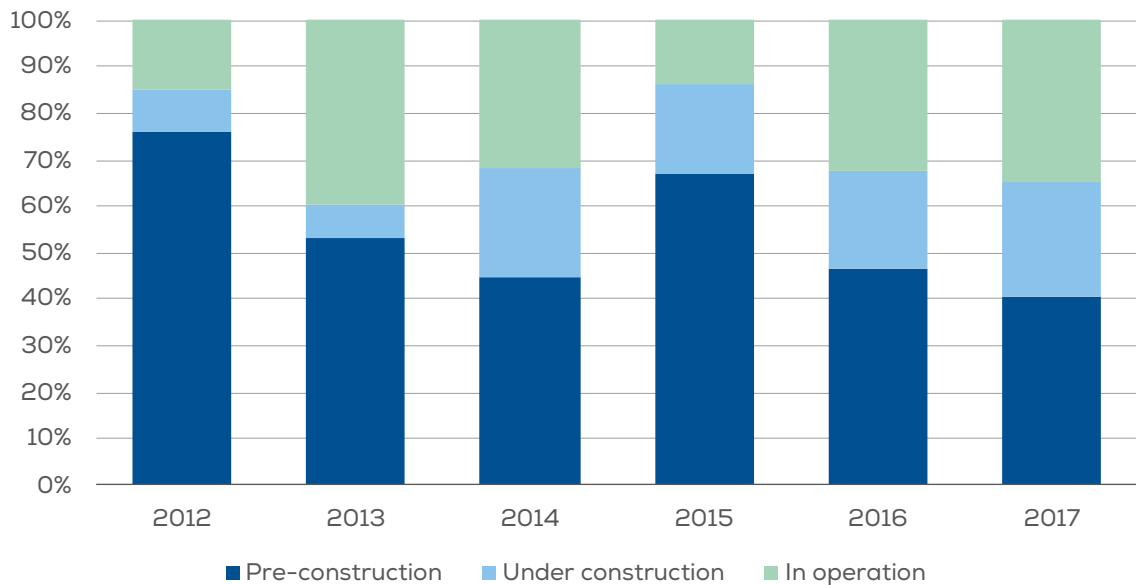
Source: WindEurope

Project acquisition activity in 2017 stood at 9.4 GW of capacity traded: 2.9 GW of which was in offshore wind, with the remaining 6.5 GW in onshore wind. The UK is the biggest secondary market, followed by Sweden and Germany. The combined activity in these three countries accounted for 70% of all the wind power capacity traded at the development, construction and operational phases.

The majority of transactions happened at the pre-construction stage, where development capital is still scarce

and primarily limited to power producers. However, in the last five years there has been a steady increase in demand for assets under construction. As confidence grows in the wind energy sector, institutional investors and the financial services industry are more willing to invest in these projects during the construction phase, long before they become operational.

**FIGURE 18**  
Project acquisition activity by project phase (GW)

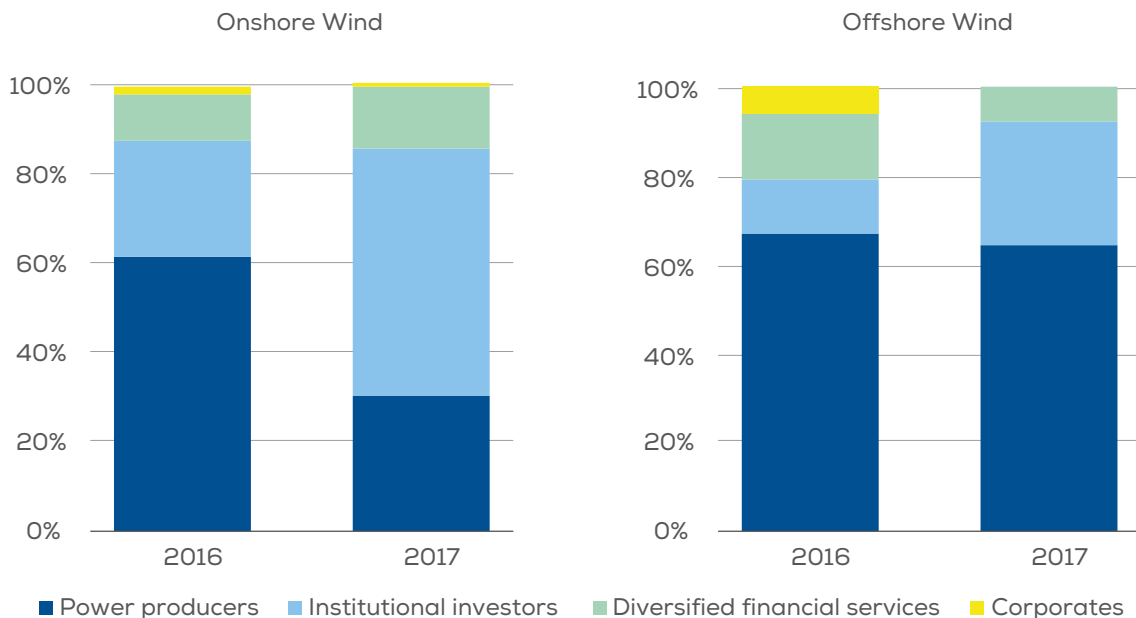


Source: WindEurope

In 2017 both onshore and offshore wind brought in a more diverse mix of corporate, financial and institutional investors. Notably for onshore wind asset acquisitions,

the financial services industry purchased a total of 4.5 GW, or 70%, of onshore wind assets available for sale. This compares to 36% in 2016.

**FIGURE 19**  
Project acquisition activity by type of investor in 2016 – 2017 (GW, %)



Source: WindEurope

The financial services industry has made an increasing contribution to offshore wind. Infrastructure funds, pension funds, asset managers and diversified financial services owned 35% of the capacity traded throughout 2017. This compares to only 27% in 2016.

Corporate players such as IKEA, Lego, Colruyt and Marubeni are well established in the wind energy sector, with shares increasing on a yearly basis. Both sustainability and economic factors are the main drivers for this trend. The different scales and technology risk profiles of onshore and offshore wind 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. Corporates looking for clean energy to power their facilities will more likely invest in onshore wind farms. For the latter, cost competitiveness, location and the proximity of the wind farm to their facilities are the main drivers for these investments.

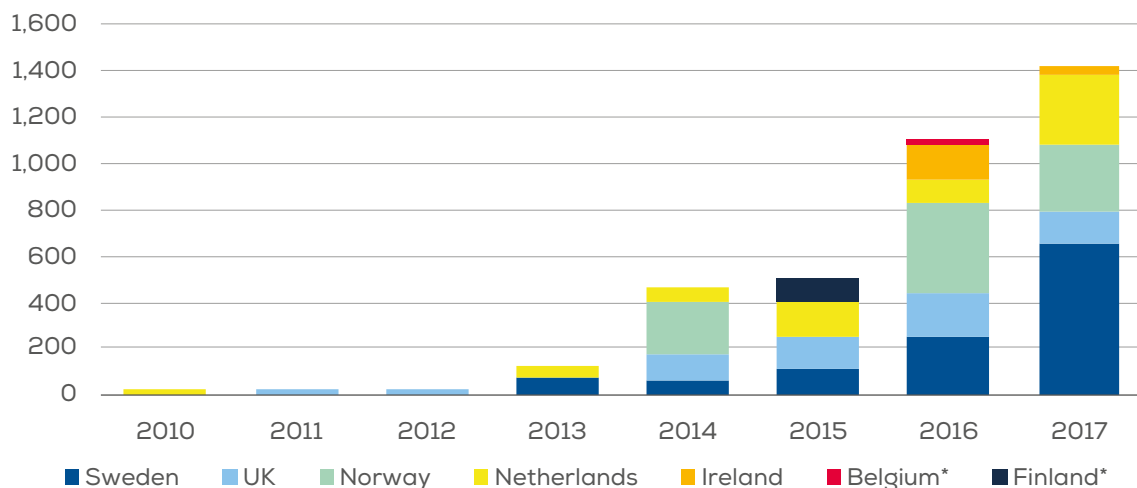
## 2.4 CORPORATE RENEWABLE POWER PURCHASE AGREEMENTS (PPAs)

Recent years have seen a growth in corporate renewable PPA deals in Europe. The volume and demand for corporate renewable PPAs has tripled in the last three years. There was just 500 MW of contracted capacity in 2014. Today, over 1.4 GW of new capacity has been contracted through corporate power purchase agreements in Europe.

Wind energy 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 20**

Renewable energy corporate sourcing through power purchase agreements (MW)<sup>3</sup>



Source: WindEurope

3. There have been two cross-border PPAs, between the Netherlands-Belgium and Finland-Belgium.

There are different models of corporate engagement. The most important can be broadly summarised according to two categories: investing directly in projects and owning the underlying asset, or acting as an off-taker through power purchase agreements (PPAs).

From a corporate's perspective, acting as an off-taker is a feasible model to meet sustainability targets, diversify energy sources and control energy costs over long periods of time, at times for up to 20 years. Owning the asset may come with certain cost-of-capital implications for corporates. This is due to the large pay-back period for wind energy projects, but also due to increasing competition for ownership in wind energy assets. Corporates not operating in the wind sector might find it hard to win renewable contracts at better prices when compared to power producers or other businesses with more experience.

Corporate renewable PPAs also come with certain benefits for generators. Price visibility over a long period of time and a guaranteed off-take are important to lower the cost of debt financing. Lenders would typically need protection for a downside in project revenues to ensure debt repayment obligations are met. As such, lenders tend to prefer lower revenues over a long period of time rather than higher but uncertain revenues.

Corporate renewable PPAs to date are still limited to a handful of countries. The Nordic region, followed by the UK and the Netherlands are the biggest market for such deals.

These markets share a good track record in renewable energy development, coupled electricity markets, sufficient demand for green electricity from corporates and, most importantly, a lack of explicit regulatory barriers to sign corporate renewable PPAs.

One important element for corporate PPAs is the underlying renewable energy support scheme in the country of the PPA. In Feed-in Tariff jurisdictions, for instance it can be challenging to find the value proposition for such contracts. Therefore, market-driven countries will likely see the volume of corporate renewable PPAs increase in the near future. Elements of merchant financing that are starting to emerge in the wind sector will require some form of additional revenue stabilisation through support schemes, corporate renewable PPAs and other hedging instruments.

In spite of the recent European and global growth of renewable energy corporate sourcing, the potential of this business model is largely untapped. In terms of both speed and volume, the amount of investments in this business model is currently insufficient to bring the volume of renewable energy needed to meet the 2030 targets. To date, corporate renewable PPAs still face regulatory barriers in certain EU Member States. The new Renewable Energy Directive opens the door to addressing regulatory barriers and challenges related to the traceability of green electricity procurement.

# 3.

## OUTLOOK FOR 2018

Both 2016 and 2017 have been transitional years for the wind sector. While there was a dip in investments in 2017, the large volume of investments in 2016 reflected the regulatory uncertainty that would come as a result of the transition to auctions and Feed-in Premiums. However, investment volumes are expected to stabilise in 2018 with the roll-out of auctions across Europe and projects awarded support expecting to reach FID.

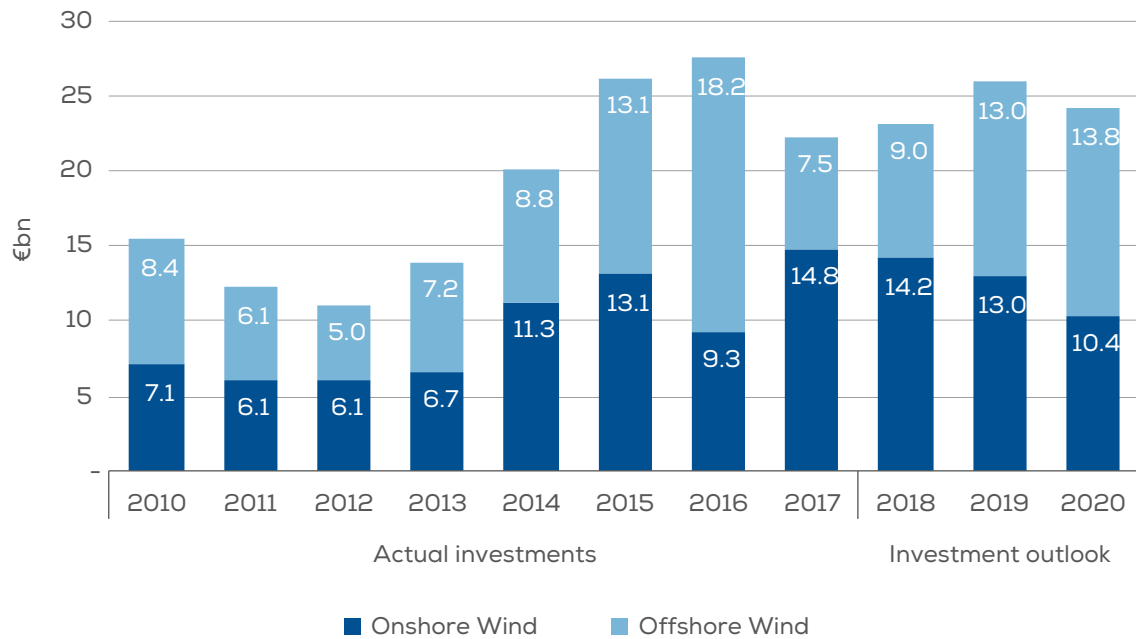
Over 14 GW of capacity was awarded support in 2017 and the first quarter of 2018: 5.3 GW in Germany, 4.1 GW in Spain, 3.2 GW in the UK, 1.4 GW in the Netherlands, 500 MW in France.<sup>3</sup> The majority of the auctioned capacity was in onshore wind. Some of these projects have already reached FID. Others awaiting construction are estimated at over €14bn.

New announced offshore wind transactions are estimated at a combined capacity of 3.9 GW, as tendered projects awarded support are expected to go through FID. This includes a number of projects in the UK, Denmark and the Netherlands, as well as floating offshore wind projects in Portugal and France. Financing needs could top €9bn based on disclosed transaction costs.

Between 2018 and 2020, more than 17 GW of additional onshore and offshore capacity is set in the auctioning plans of four countries: Germany, France, the Netherlands and Turkey. Most of this capacity is expected to be auctioned in 2018.

3. Detailed auction schedule is available at [windeurope.org](http://windeurope.org).

**FIGURE 21**  
Investment outlook to 2020 (€bn)



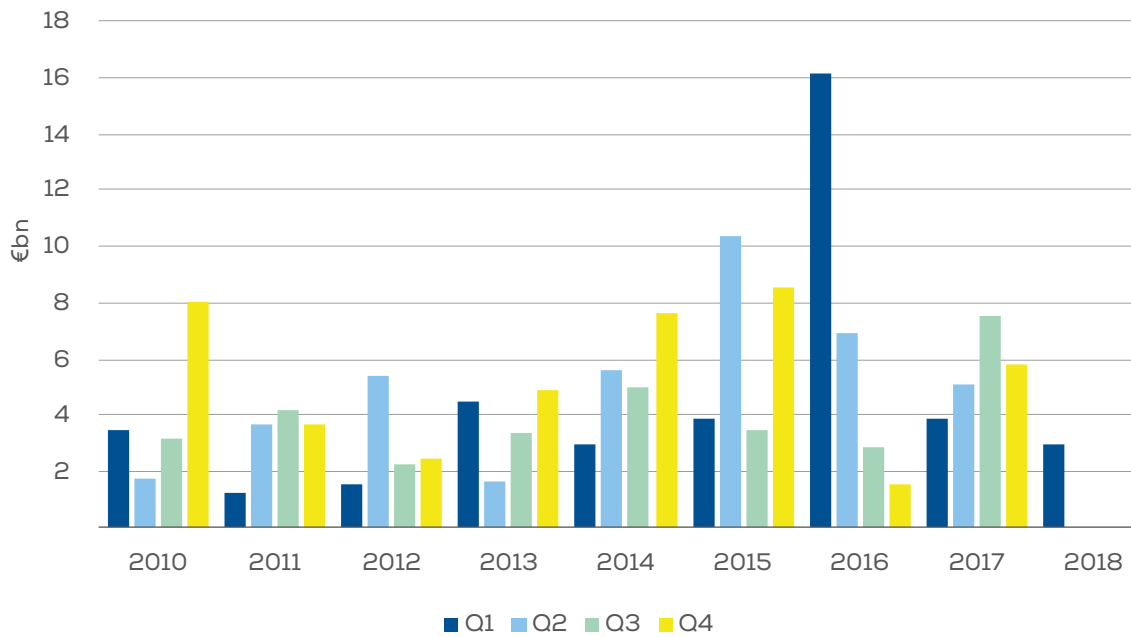
Source: WindEurope

Financial markets will continue to support wind energy projects with similar loan pricing, maturity and other commercial terms. However, the downward trend in interest rates is expected to slow down, as existing commercial banks establish their competitive position in the market and the quantitative easing program of the European Central Bank comes to an end in 2018. A reboot of the loan syndication market for offshore wind financing is yet to come in 2018, following an increased uptake in corporate finance transactions by power producers in recent years.

In the longer term, wind asset owners will have to address the merchant element in wind power projects. WindEurope expects that by 2030 more than 25% of the wind installed capacity will be fully exposed to market risk.<sup>4</sup> While banks are used to dealing with portions of merchant financing, equity institutional investors may find it challenging to adapt to the new reality. This underscores the importance of financing solutions that factor in the nature of merchant risk and stabilise the revenue flows in these projects.

4. WindEurope (2017), The value of hedging: New approaches to managing wind energy resource risk.

**FIGURE 22**  
New asset financing 2010 – 2018 ytd (€bn)



Source: WindEurope

During the first quarter of 2018 Europe invested €3bn in new wind energy projects. 30 new onshore wind projects, for a combined capacity of 1.9 GW, reached Final Investment Decision (FID). Non-EU countries like Russia,

Ukraine and Turkey are having a more prominent role in wind energy financing, with 0.6 GW of new announced FIDs and over €1bn in investments.

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WindEurope is the voice of the wind industry, actively promoting wind power in Europe and worldwide. It has over 450 members with headquarters in more than 40 countries, including the leading wind turbine manufacturers, component suppliers, research institutes, national wind energy associations, developers, contractors, electricity providers, financial institutions, insurance companies and consultants. This combined strength makes WindEurope Europe's largest and most powerful wind energy network.

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