Financing and investment trends

The European wind industry in 2021

WindEurope

Financing and investment trends

The European wind industry in 2021

Published April 2022

windeurope.org

This report summarises financing activity across the European wind energy sector from 1 January to 31 December 2021. Unless stated otherwise the data and analysis covers the 27 EU Member States and the following countries: Bosnia and Herzegovina, the Faroe Islands, Kosovo, Montenegro, North Macedonia, Norway, Russia, Serbia, Turkey, the UK and Ukraine.
The report includes investment figures for the construction of new wind farms, refinancing transactions for wind farms under construction or operation and project acquisition activity. Rounding of figures is at the discretion of the author.
New asset figures for 2020 have been restated from the previous report.

TEXT AND ANALYSIS:
WindEurope Business Intelligence
Guy Brindley, WindEurope

EDITORS:
Rory O'Sullivan, WindEurope
Jérôme Guillet, WindEurope's Finance Working Group vice-chair

DESIGN:
Lin Van de Velde, Drukvorm

INVESTMENT DATA:
Clean Energy Pipeline
IJ Global
All currency conversions made at EURGBP 0.8596 and EURUSD 1.1827.
Figures include estimates for undisclosed values.

COVER PHOTO:
© Enercon

MORE INFORMATION:
policy@windeurope.org
+32 2 213 18 68

CONTENTS

EXECUTIVE SUMMARY

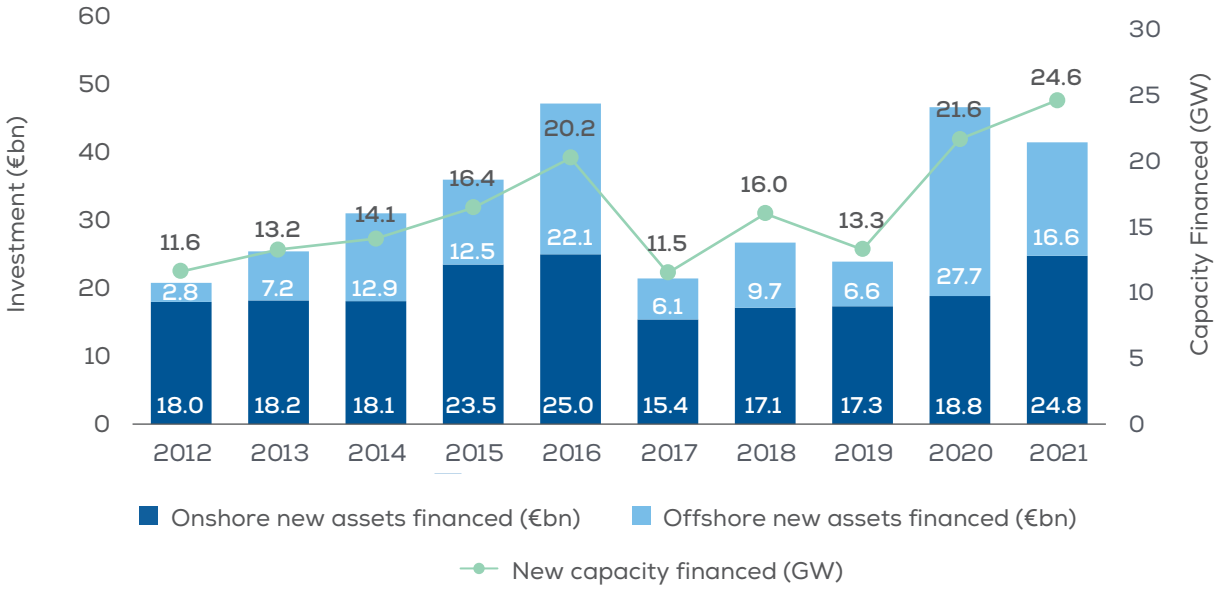
Europe invested €41.4bn in new wind farms in 2021. Although this was less than 2020, the investments financed 24.6 GW of new wind energy capacity, more than any previous year.

In the EU 19 GW of new wind farm capacity was financed - also a record - but this falls well short of the 30 GW which needed to be installed each year between 2021 and 2030 to meet the EU's 40% renewable energy target. Installations in the EU in 2021 totalled just 11 GW, meaning the rate of installations needed from 2022 to 2030 has risen to 32 GW per year to meet the existing targets.

The record capacity financed is partly the result of a relative growth in financed onshore wind capacity. Since onshore wind has lower capital expenditure per MW financed, more capacity can be financed with the same investment. Over the next five years, we expect onshore wind to make up 76% of all new installations in Europe.

Wind energy remains an attractive investment, and there is plenty of capital available to finance it. But it is critical that Governments tackle existing bottlenecks in project pipelines, by improving and simplifying permitting procedures, so that Europe can meet its climate targets and reduce its dependence on imported fossil fuels from Russia and elsewhere.

FIGURE 1
New asset finance in wind energy 2012 – 2021 (GW and €bn)



Source: WindEurope

2021 highlights

- Europe invested €41.4bn in the construction of new wind farms. This was 11% less than the €46.6bn[1] invested in 2020.
- The €41.4bn covered 24.6 GW of new capacity: 19.8 GW of onshore wind capacity (a record amount) and 4.8 GW of offshore wind capacity.
- Investments in new onshore wind projects were worth €24.8bn, the highest amount on record since 2016.
- Investments in new offshore wind farms were worth €16.6bn.
- Average capital expenditure required for each MW of new onshore wind energy capacity was €1.3m, the lowest on record. For offshore wind, the figure was €3.5m/MW.
- Banks provided €25.7bn in non-recourse debt for the construction and refinancing of wind farms. This continues the general trend of increased lending since 2013.
- Non-recourse debt accounted for 26% of all investment in new onshore and 56% of all investment in new offshore wind farms, highlighting the importance of banks in wind energy financing.
- For onshore wind farms using project finance, the debt/equity ratio was 89:11. For offshore wind it was 78:22.
- Project acquisitions, where investors purchase a share of a wind farm (in development, construction or operation), were worth an estimated €15.6bn. Note that these investments are separate to the €41.4bn invested in new wind farms.

Country highlights

- The UK again invested the most in new wind farms in 2021, €9.4bn, followed by Germany (€8bn) and France (€4.6bn).
- There were also record amounts invested in new wind farms in four other countries; Sweden (€3.2bn), Finland (€2.8bn), Poland (€1.6bn), and Lithuania (€0.4bn).
- In Spain investments in new wind farms totalled €3.2bn, the highest amount since 2009.
- Offshore wind investments were concentrated in the UK (€8.8bn), Germany (€4.9bn), France (€2.2bn) and Denmark (€0.7bn).
- Northern and Western Europe accounted for €30.9bn of the investments in new wind farms, approximately 75% of the total.

Investment trends

- Interest rates remain low for the time being but there has been market turbulence caused by supply chain shortages and high energy prices, resulting in record high inflation rates in Q4 2021.
- Russia's invasion of Ukraine has added to the upward pressure on inflation and may weaken growth by disrupting trade. Market movements suggest that investors believe that the ECB and other central banks will tighten monetary policies more slowly than previously anticipated.
- In the medium term, the conditions for financing wind farms should remain favourable.

1. Figure restated from 2020

- 46% of the capital raised for new wind farms was on a project finance basis. The other 54% of investments in new wind farms were on a corporate finance basis.
- Debt remains instrumental in wind energy financing with non-recourse debt providing 38% of all capital raised for new wind energy projects.
- 2021 was a record year for corporate renewable PPAs. The cumulative capacity contracted by corporate PPAs in Europe rose by 58% to 18.8 GW.
- There were 41 new PPAs signed with onshore wind farms and 11 with offshore wind farms, up from 18 and 6 in 2020 respectively.
- Approximately 10% of new wind farm capacity was supported by a corporate PPA in 2021. To date, 13 GW of wind energy capacity is contracted under a PPA in Europe.
- Permitting continues to be the main bottleneck for the financing and construction of onshore wind in Europe. Wind energy will not be able to deliver its share of the 2030 climate targets if this problem is not addressed.

Policy highlights

- The EU is now committed to climate neutrality by 2050 and a 55% reduction in greenhouse gas (GHG) emissions from 1990 levels by 2030. This translates to a target of 40% renewables in the energy mix by 2030.
- To achieve the 55% target, the EU needs to increase its 2030 renewable energy target to at least 40%. And to achieve the latter the EU needs to build at least 32 GW of new wind farms each year. As things stand with the permitting bottlenecks, we expect to build only 18 GW a year over the next 5 years.
- REPowerEU, the EU Commission's response to the current crisis, envisages the expansion of wind energy capacity in the EU from 190 GW today to 480 GW by 2030 to reduce the EU's dependence on imported fossil fuels from Russia and elsewhere.
- Clawback measures designed to shield consumers from high energy prices must not apply to energy sold through long-term, fixed-price contracts. They should also avoid interfering with energy market dynamics, they should be time-limited and should not apply retroactively.
- Power sold under CfDs at fixed prices benefits end consumers by protecting them from peaks in wholesale spot prices. These long-term fixed price contracts have the extra advantage of attracting cheaper financing, leading to lower costs overall.
- The importance of contracts-for-difference underpinning wind farm investments continues to rise with more and more countries using them in their auction models.
- Assuming Governments design their wind energy auctions in the right way, the financing of new projects will not be a problem. The problem is the number of new projects coming through. Tackling permitting delays is a key priority.
- Governments urgently need to simplify permitting rules and procedures for new wind farms. They also need to boost staffing levels at the permitting authorities.
- Guarantees of Origin (GOs) should be made available for all renewable electricity. In cases where Governments withhold GOs to avoid double compensation, this should only apply to supported electricity production.

WIND ENERGY FINANCE BASICS

Debt and equity

The two main sources of capital in European wind energy finance 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 faces the highest risk in the project because the owners are the party responsible for bringing 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 financial protection if 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 with 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 used, will determine the capital or financial structure of the project. There are two types of financial structure: corporate finance and project finance. In a corporate finance structure, investments are carried out 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 thus quicker and usually less expensive than project finance.

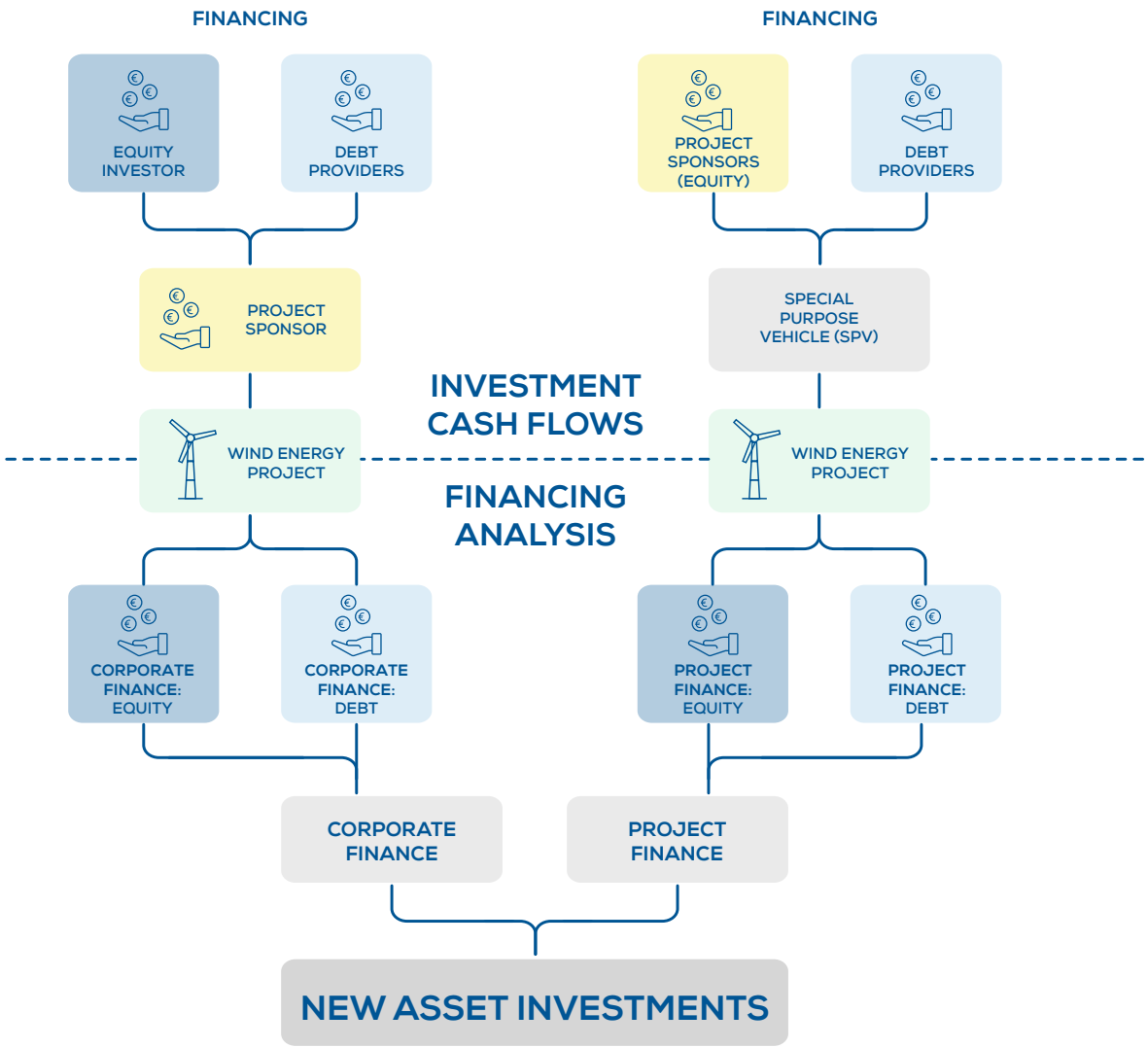
In a project finance structure, typically called non-recourse finance, the investment is carried off the balance sheet of the original owners and project sponsors. The investment or the project is turned into a separate business entity called a Special Purpose Vehicle (SPV) with its own management team 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 can take longer to finalise than corporate finance.

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

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

Unlike utilities, independent power producers with smaller balance sheets and 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.

FIGURE 2
Corporate Finance vs. Project Finance



Source: WindEurope

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 last of these in particular has become more prominent for raising both debt and equity in wind energy financing.

Debt can be raised either through loans provided by banks or on public capital markets through the issuance of bonds. Typically in Europe, the most common debt instrument has been loans from banks in contrast to the United States where bond issuances are the more common method for raising debt. Debt raised through the issuing of bonds can be either at corporate or project level. Where a bond is issued at corporate level, the proceeds can be used towards financing a portfolio of projects. The bond can carry the 'green' label when the portfolio of projects it is financing is made up 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 there- fore '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 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 increased trust in the technology all contribute to a healthy deal flow of projects.

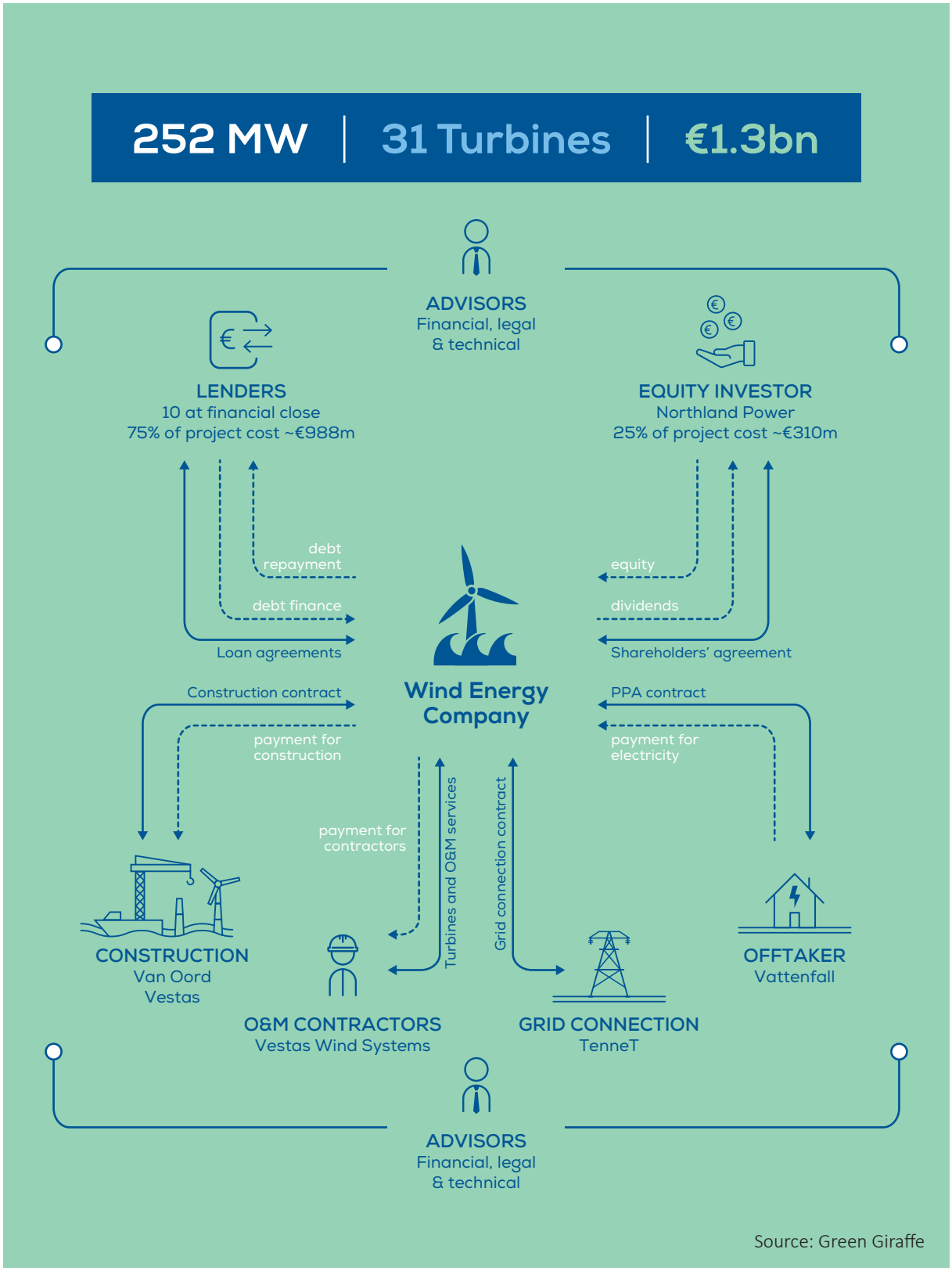
Debt liquidity has been available from the construction phase with new financing and refinancing transactions in major markets. Lenders include a range of bank and non-bank institutions such as Export Credit Agencies (ECAs). Multilateral Development Banks (MDBs) and other International Financial Institutions (IFIs) have provided debt liquidity where commercial bank financing has not been available. International banks have also strengthened their presence in the European wind sector and have introduced more competition to the sector. Japanese banks, driven by a prolonged low-interest rate environment in their domestic market, feature prominently 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 both from institutional and strategic investors who are now looking at wind projects for steady, predictable returns to meet long-dated liabilities. Much like the banks, investor appetite for the technology applies to both greenfield and existing assets. However, as confidence in wind grows and the positive track record of the industry continues, investors are also targeting more greenfield projects earlier in the construction phase.

SUMMARY

- Projects can be financed on the balance sheet of a company – **corporate finance**
- Capital can be raised with equity (**issuing company shares**) or debt (**bonds issued by the company**), the proceeds of which can be used to develop a wind farm
- Projects can also be made into a "company" in their own right with a Special Purpose Vehicle (SPV) structure – **project finance**
- Capital can be raised with equity (**issuing shares in the project**) or debt (**banks lend to the project on a non-recourse basis**), the proceeds of which can be used to develop the wind farm
- Non-recourse debt is only repaid from project revenues. If the project fails to repay the debt, banks do not have recourse to the project sponsors' assets for compensation, only the assets of the project itself

FIGURE 3
Example of financing structure for typical offshore wind farm

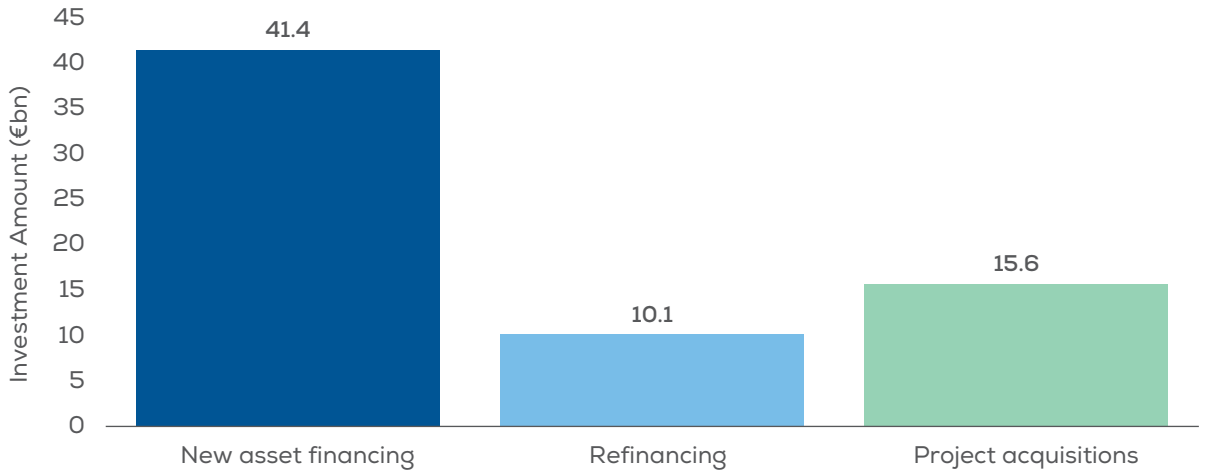


Source: Green Giraffe

1. INVESTMENT NUMBERS IN 2021

1.1 WIND ENERGY INVESTMENTS

FIGURE 4
European wind energy investments in 2021 per asset class (€bn)



Source: WindEurope

In 2021 €41.4bn was invested in new onshore and offshore wind farms; there was €15.6bn worth of investment in shares of wind projects at various stages of development and a further €10.1bn worth of project finance debt which was refinanced.

Overall, the amount of investment activity was similar to 2020, with both years seeing a significant increase on previous years. Investments in new assets in 2020 were worth €46.8bn[1]. This means that 2021 saw a 12% decrease in new wind farm investment. Refinancing and

1. Figure differs from 2020 report after taking account of events recorded after 31 December 2020.

project acquisitions - where a share of a wind farm is purchased - increased by 55% and 11% respectively.

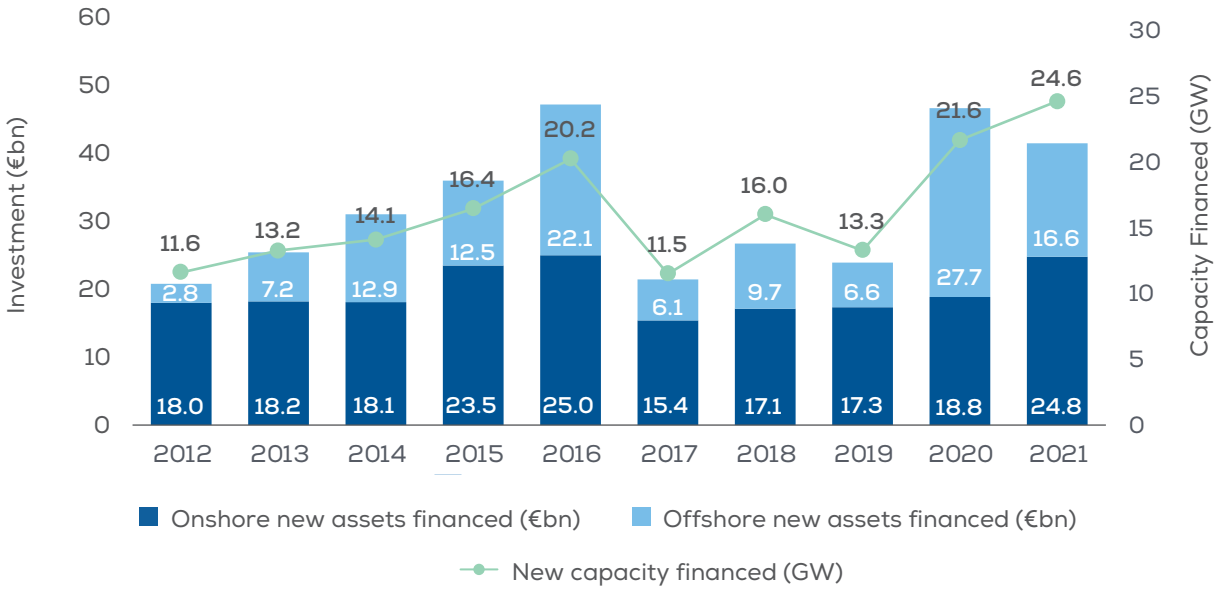
Importantly the investments in new wind farms will result in almost 25 GW of new capacity being added to the grid over the next few years. And although this is the most capacity financed on record in a single year, it falls well short of what Europe needs to build year on year to meet its own climate and energy targets.

The tragic events in Ukraine have underlined the need for Europe to become more energy independent and European Governments are taking steps to reduce their dependence on fossil fuels from Russia and elsewhere. There will need to be significant investment in grid infrastructure and new technologies to help integrate the huge increase in renewables expected in Europe. Only with this in place can Governments aim to provide energy security and tackle climate change.

1.2 NEW WIND FARM FINANCING

Investment in new wind farms totalled €41.4bn in 2021, financing 24.6 GW of new capacity which will come onto the grid over the next few years. The capacity financed is a record in Europe - driven by both a higher proportion of onshore wind, which has a lower capital expenditure (CAPEX) per MW than offshore, and by a fall in the CAPEX per MW for onshore in recent years.

FIGURE 5
Investment in new wind farms 2012 - 2021 (GW and €bn)



Source: WindEurope

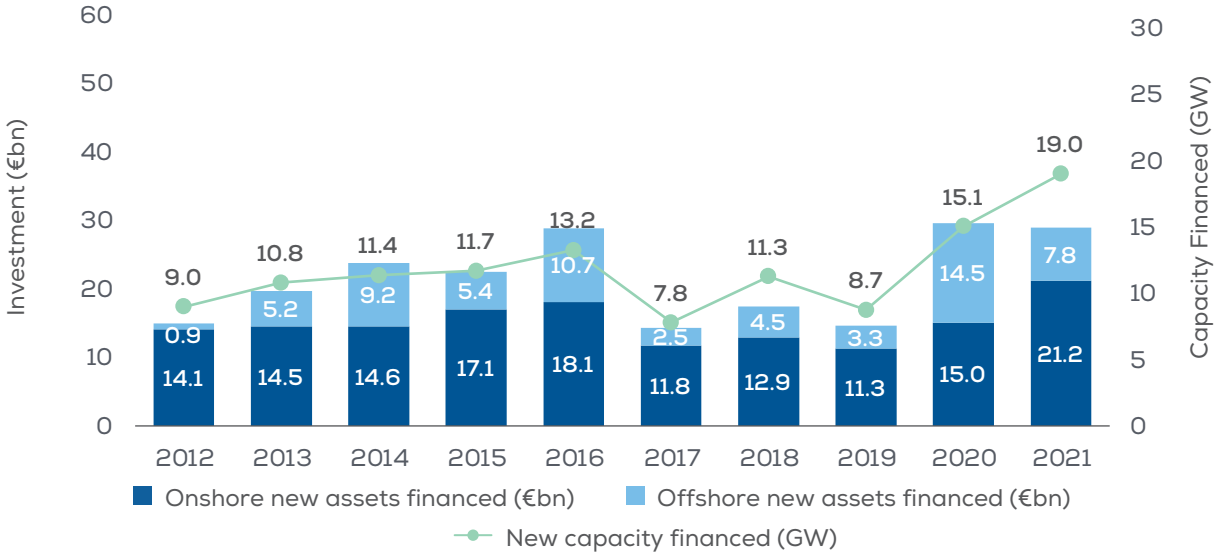
Investments in new onshore wind farms totalled €24.8bn. This was equal in monetary terms to the previous peak in 2016, when developers rushed to get projects financed before the regulatory uncertainty that came about after the transition to auctions and feed-in premiums in 2017.

Investments in new offshore wind farms were worth €16.6bn. This was after another year where a number of enormous projects reached final investment decision (FID), including Sofia (1.4 GW) and Dogger Bank C (1.2 GW) in the UK and Borkum Riffgrund 3 (900 MW) in Germany.

The investment and capacity financed figures show how the wind industry has been able to cope remarkably well with disruptions associated with COVID-19. As it stands, it is vital that it continues to attract investment to deliver on the 2030 climate and energy security objectives. This is discussed further in Part 3.

FIGURE 6

Investment in new wind farms in the EU 2012 - 2021 (GW and €bn)

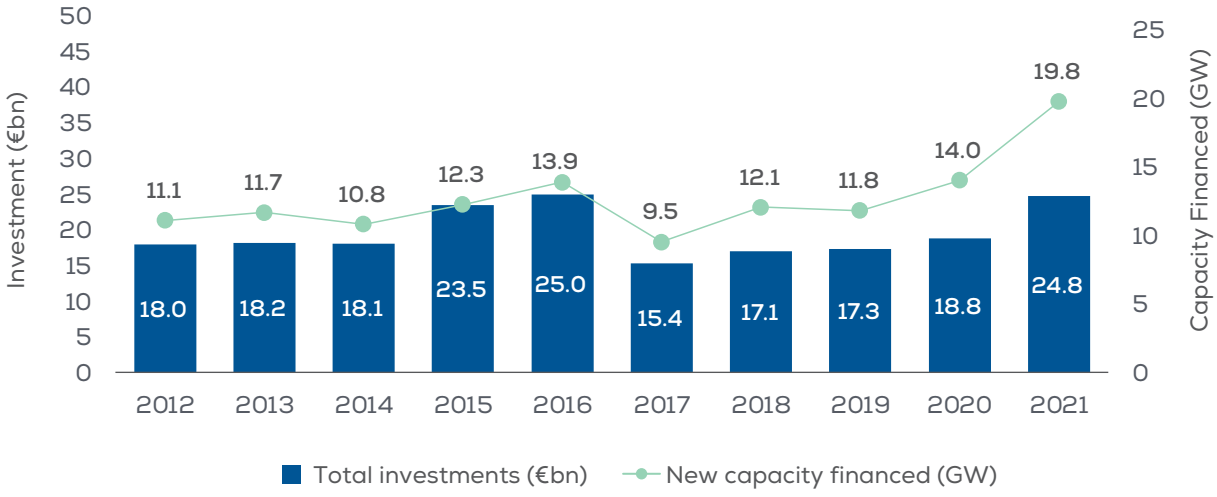


Source: WindEurope

In EU countries, investment in new wind farms totalled €29bn financing 19 GW of new capacity. In order to meet the existing EU target of 40% renewables in the final energy mix by 2030, EU countries need to install 32 GW a year between 2022 and 2030. The current trajectory is positive and 2021 was a record year for capacity financed. But a lot more needs to be done - from streamlining permitting procedures (without compromising on environmental standards) to ensuring that electricity grids are modernised and equipped for a higher penetration of renewables in the electricity mix.

FIGURE 7

Investment in new onshore wind farms 2012 - 2021 (GW and €bn)



Source: WindEurope

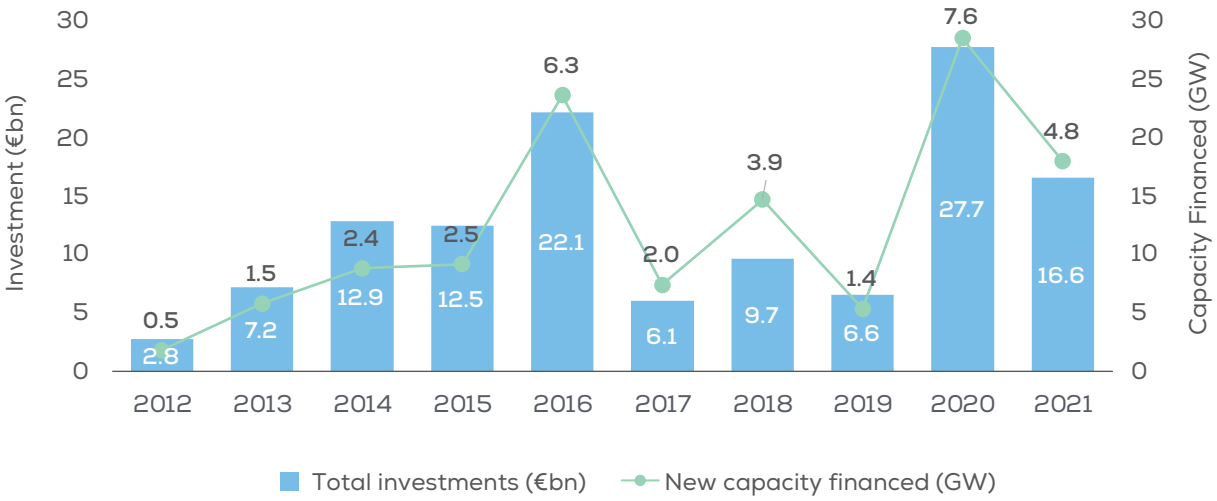
Onshore wind raised around €24.8bn to finance a record 19.8 GW of new capacity. This was made possible by falling costs, particularly since 2015 when €10m worth of investment in new onshore wind would finance 6 MW of new capacity on average. In 2021 an investment of €10m financed 8 MW of new capacity.

It is a great achievement that the industry can now finance more wind farm capacity for the same investment, as a result of growing efficiencies and technological developments. But there is a limit to how far costs can fall while ensuring supply chain competitiveness in Europe. In some markets that limit might be on the horizon, or it may well have been reached already. Costs are likely to be impacted by higher global prices for raw materials and inflation caused by rising energy prices.

Financing data gives an indication of what is likely to be built over the next few years. We estimate the time from Final Investment Decision (FID) to a wind farm's Commissioning Date to be up to one year for onshore wind and 2-3 years for offshore wind.

The wind energy installation target of 32 GW per year across the EU breaks down to approximately 25 GW a year for onshore wind and 7 GW a year for offshore wind respectively. Therefore there is a gap of around 5 GW between the onshore wind capacity financed in 2021 and the required rate of installations for onshore wind between 2022 and 2030.

FIGURE 8
Investment in new offshore wind farms 2012 - 2021 (GW and €bn)



Source: WindEurope

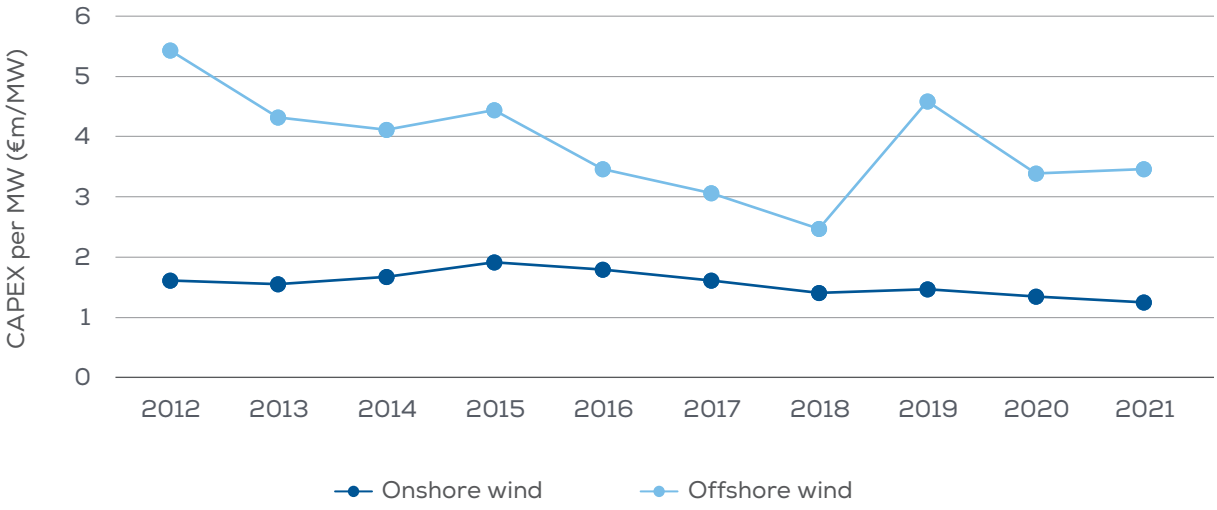
Investments in new **offshore wind** totalled €16.6bn after seven wind farms reached FID - with an average CAPEX per MW of €3.5m. Offshore wind patterns have been driven by auction schedules, particularly by the UK's CfD rounds. In 2016 almost €10.5bn was raised for three offshore wind farms which were awarded CfDs in UK auction rounds in 2014 and 2015 (Beatrice, Hornsea 1 and East Anglia One).

In 2020 €12.8bn of investments concerned Dogger Bank phases A&B and Seagreen Alpha & Bravo following the award of CfDs in the 2019 auction round. In 2021 two more projects which were successful in the 2019 auction round reached FID: Dogger Bank C (1.2 GW) and Sofia (1.4 GW), raising approximately €8.8bn, more than 50% of the total capital invested.

In Germany, Borkum Riffgrund 3 (900 MW), Arcadis Ost 1 (257 MW) and Gode 3 (242 MW) reached financial close raising a combined total of €4.9bn. In France, Courseulles-Sur-Mer (450 MW) became the fourth offshore wind farm to reach FID since the first in 2019. Finally, Vesterhav North and South wind farms reached financial close in Denmark raising capital to finance 344 MW of capacity.

CAPITAL COST TRENDS

FIGURE 9
Capital expenditure per MW financed in wind energy 2016 - 2021 (€m/MW)



Source: WindEurope

Capital expenditure per MW for new onshore wind farms has fallen on average since 2015, from €1.9m per MW down to €1.3m per MW for onshore wind farms financed in 2021. Given the growing cost of raw materials, further supply chain disruption and inflation triggered by high energy prices, we are unlikely to see any notable cost decreases going forward.

Spain and Finland saw the cheapest onshore wind farms in 2021 with projects being financed with €1.1m per MW on average. This was closely followed by Sweden, the Netherlands, Poland, Ukraine and Portugal which all saw average capital expenditures of €1.2m per MW financed.

These countries in general have fewer land constraints and can build larger wind farms, benefiting from economies of scale. Countries facing greater permitting issues and land constraints tend to see higher capital costs. This is the case in Germany and France which both had average capital expenditures of €1.5m per MW.

Capital expenditure per MW for new offshore wind farms has seen a major decrease, from around €5.5m per MW in 2012 to €3.5m per MW in 2020 and 2021. In the meantime the technology has matured and supply chains have become more efficient in more mature markets. But over the last few years, there have been no further decreases – for a number of reasons.

The four French wind farms that have reached FID since 2019 have been financed with higher capital expenditures (€4.6m-€5m per MW), partly due to significant delays in the permitting of the projects. This was also a result of the 2011 tender which specified that wind turbine factories for the projects had to be built on French territory.

Other projects have been financed with higher capital expenditures for a variety of reasons, including increased distance from shore, deeper waters, or challenging seabed conditions. All these factors add time to construction schedules and/or require specialist vessels or equipment, impacting capital costs.

But these increased capital expenditures are offset to some extent by the size of the wind farms being financed, with very large wind farms using the largest available turbines being able to take advantage of significant economies of scale.

Finally, the country an offshore wind farm is located in is important as the amount of support provided through the development phases has a big impact on the capital expenditure required at the point of the final investment decision. For example in Denmark (and the Netherlands), the Government pays for the grid connection and supports all pre-development work - wind resource assessment, seabed condition analysis and permitting (including environmental impact assessments). This is reflected in their average capital expenditures, and in 2021, the Vesterhav North and South wind farms in Denmark were financed at €2.1m per MW.

HISTORY OF OFFSHORE WIND FINANCE

Offshore wind is increasingly seen as a key component in the energy transition, helping to decarbonise power generation. The sector is especially attractive to utilities, investment funds and, increasingly, oil & gas companies.

The technology is already well–demonstrated, projects tend to be very large and allow the deployment of large volumes of capital in one transaction. This favours the complex project management skills of these companies.

Two facts have put this industry in a favourable light recently: (i) an ability, almost unique amongst large infrastructure projects, to get projects built on time and on budget, and (ii) in parallel, an unprecedented reduction in the cost of generating electricity over the long term, from above €150/MWh at the beginning of the 2010s to below €50/MWh today, making it competitive with traditional power generation sources.

A core reason for both of these facts has to do with the way the industry was financed almost from the beginning, through "project finance" or "non–recourse debt". Non-recourse debt is provided to projects and not to their owners, and is repaid only from the proceeds generated by that project, without recourse to the project owners in case of any problems. The result of this arrangement is that lenders need the projects to be built on budget, on time, and to operate at their specified output throughout their full lifetime in order for the debt to be fully repaid. This involves detailed and rigorous checks on the technology, construction methodology and planning, the management team and the economics of the project.

Building an offshore wind farm is an inherently complex endeavor. Working at great heights with heavy components out at sea carries certain risks which need to be properly understood and carefully managed. No party is usually responsible for more than 30-40% of the overall construction costs, meaning that no one is willing to take responsibility for the full scope of the project. As a result the construction is done under a "multi-contracting" approach, with many technical and commercial interfaces. This is seen as inherently riskier.

Despite this, several early projects needed bank debt to get the full go ahead, as their owners could not finance them in full out of their own pocket. A handful of banks agreed to look into how to take on construction risk in a way that would be acceptable to them while still economic for project owners. The structures that were designed for the very early projects, Egmond ann Zee (originally Q7) (2006) in the Netherlands, C-Power (2007) and Belwind (2009) in Belgium provided a framework that turned out to be very successful. This was then adopted for many projects thereafter.

As a capital-intensive sector, offshore wind is very sensitive to the cost of capital. This is affected by how investment decisions are made for new projects, what risks are involved across the phases of a project, who the investors are in each phase and what returns they expect.

The chief risks for offshore wind are (i) the traditional infrastructure risk (political risk, counterparty risk, merchant risk), (ii) wind sector risk (wind resource, turbine technology), and (iii) specific offshore wind risks (construction, operation).

Terms for debt and equity have been steadily improving over the years. This is especially true as the risks are better understood - and have been increasingly well managed by the industry. We have seen regular improvement across all fronts, including debt pricing, leverage (debt:equity ratio), maturity and contingency budgets.

Multiple different structures have allowed the capital structure of projects to be optimised, and have brought down the cost of electricity in the process.

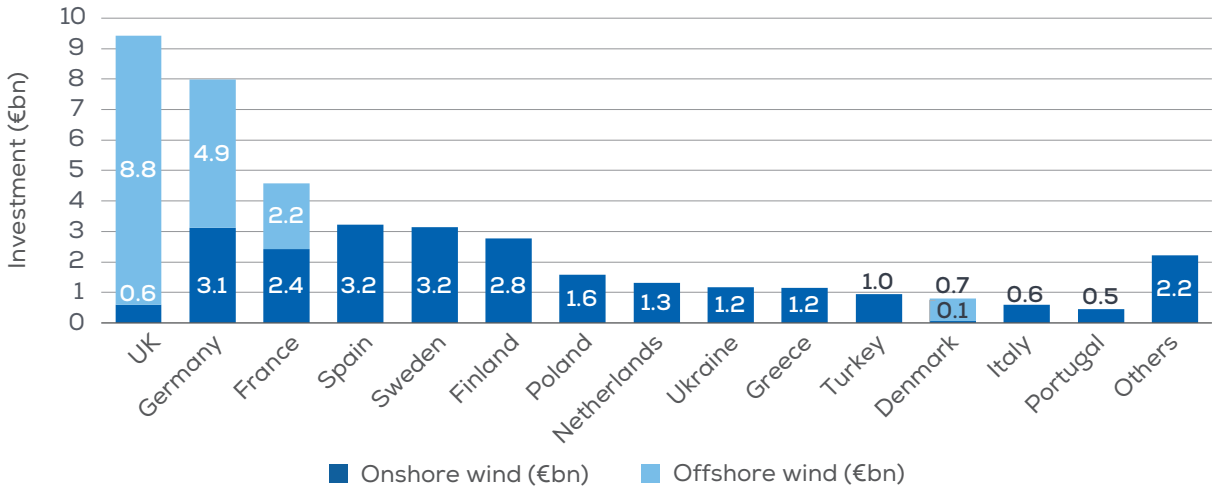
Everything that has been learnt from financing fixed bottom offshore wind can also be applied to floating offshore wind, and it is very likely that the floating sector will see a similar trend of improved financing conditions and lower costs of production.

This is a summary of report on financing offshore wind which will be published by WFO[2] and kindly provided to WindEurope by Jérôme Guillet, vice-chair of WindEurope's Finance Working Group.

1.3 NEW WIND FARM FINANCING PER COUNTRY

2021 saw new wind farm investments in 28 different countries in Europe. The top three investor countries – the UK, Germany and France – were responsible for 53% of all capital raised.

FIGURE 10
Investment in new wind farms per country in 2021 (€bn)



Source: WindEurope

The UK saw the most capital raised to finance new wind farms, with more than 90% of the capital destined for offshore wind. The total figure of €9.4bn raised in the UK makes up 23% of all capital raised for new wind farms in Europe.

Eleven countries in Europe invested at least €1bn in new wind farms. In the EU the most capital for new wind farms was raised in Germany with €3.1bn for new onshore wind farms and €4.9bn for new offshore wind farms. This was followed by France with €2.4bn of new onshore wind projects and €2.2bn for offshore.

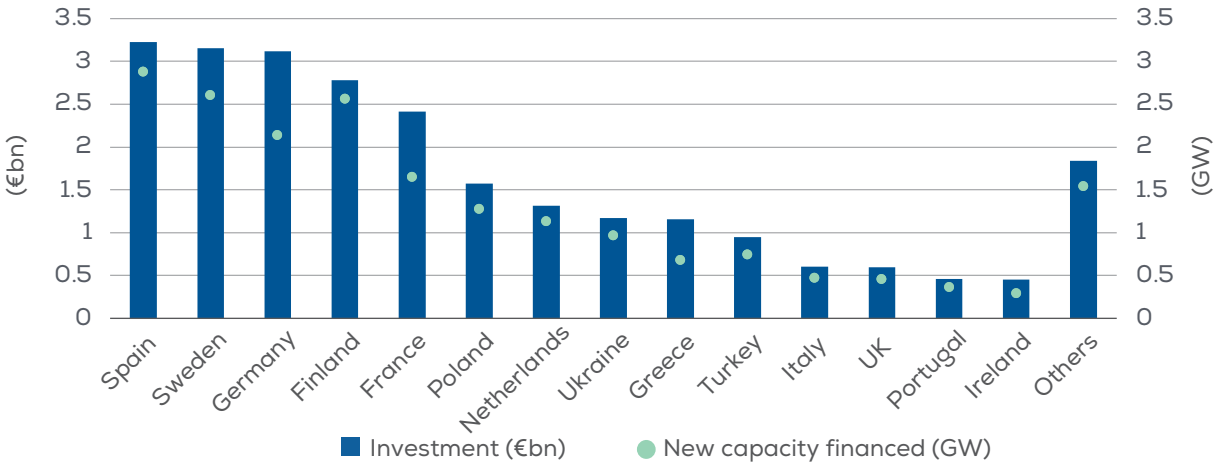
2. https://wfo-global.org/

Northwest Europe[3] still sees the bulk of investments with 75% of the capital raised for new wind farms in Europe (€30.9bn). This is less than the 85% share of investments seen in northwest Europe in 2020.

In **South Eastern Europe**[4] **(SEE)**, 880 MW of new projects were financed with investments totalling €1.4bn, representing 6% of the new onshore wind farms financed in Europe. In many EU markets there are no wind investments at the moment, despite some of these countries having significant potential for a further expansion of wind power. National energy policies and the lack of a stable regulatory environment have affected the level of investment and financial commitments across half of the EU Member States, including many in the SEE region. Of the 880 MW of financed capacity, 685 MW or 78% was in Greece.

Of the €41.4bn of total capital raised for new wind farms, €12.5bn was in non-EU countries: the UK, Ukraine, Turkey, Norway, Russia, Bosnia and Herzegovina, the Faroe Islands, North Macedonia and Serbia. After the UK, Ukraine raised the most capital out of the non-EU countries with €1.2bn, followed by Turkey with €1.0bn and Russia €0.4bn.

FIGURE 11
Investment in new onshore wind farms per country in 2021 (€bn and GW)



Source: WindEurope

In Figure 11, the point's position inside the bar gives an indication of the capital expenditure per MW financed. If the point is at the very top of the bar, wind farms have been financed with €1m per MW on average. If the point is halfway down the bar, wind farms have been financed with an average of €2 per MW etc. The average onshore CAPEX per MW in 2021 was €1.3m per MW. In Germany, France and Greece, the average CAPEX per MW was clearly greater than €1.3m. This is likely the result of extended delays to project permits which have been particularly noticeable in these three countries.

It is not a surprise that Spain was the country with the largest investment in new onshore wind farms in 2021. In 2020, the Spanish Government announced a five-year auction schedule (8.5 GW available to wind energy) with the first Contract-for-Difference (CfD) support round taking place in January 2021. Wind energy won 1 GW of support. The high visibility of future auction rounds and strong installation targets are a great source of certainty, which in turn attracts investors. The CfD revenue support complements the country's merchant projects and PPAs at a portfolio level[5]. In 2021, €3.2bn was invested in new assets, the highest figure since 2009.

3. Belgium; Denmark; Finland; France; Germany; Iceland; Luxembourg; Netherlands; Norway; Sweden; UK
4. Albania; Bosnia & Herzegovina; Bulgaria; Greece; Kosovo; North Macedonia; Montenegro; Romania; Serbia
5. Szabo, J., Bruckmann, R., Menzies, C., & del Río, P. Competition dynamics revisited.

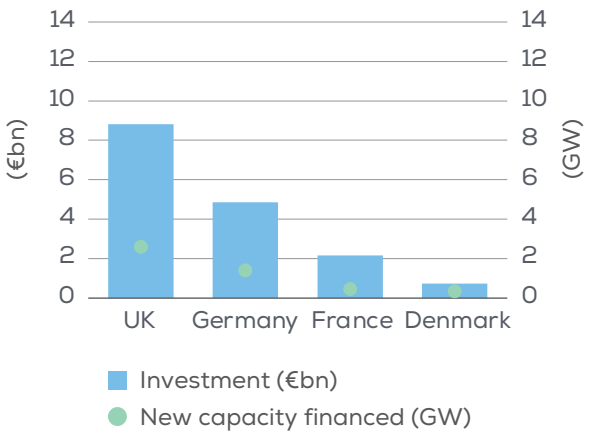
Investments in new wind farms in Sweden exceeded €3bn, a record amount of capital raised in a single year. This ultimately financed 2.6 GW of new capacity. Investments in new wind farms in Finland also reached record levels, with €2.8bn raised to finance the same capacity. High-capacity factors in these countries due to strong wind resources and their ability to install the latest technology, coupled with limited Government support and a liquid balancing market, have led to liquid and mature PPA markets. Developers can offer utilities and corporates competitive prices for off-take agreements, allowing new wind energy projects to be financed.

In Germany 2.1 GW of new wind farms were financed with €3.1bn. This higher investment figure compared with previous years reflects the improving permitting situation. The new Government is set to strengthen this by introducing special planning reforms aimed at boosting onshore installation rates. Permitting has been the major bottleneck in recent years. And together with the break in project pipelines – following pressure to get projects over the line before the generous Feed-in Tariff (FiT) support was replaced in 2017 – investment in new onshore wind plummeted between 2017 and 2019. The release of many blocked projects and the clear schedule of auctions should rejuvenate the market and bring investors back to the largest onshore market in Europe.

Poland (€1.6bn) and Lithuania (€0.4bn) also had record years for investments in new onshore wind farms, financing a combined capacity of 1.6 GW.

FIGURE 12

Investment in new offshore wind farms per country (excluding additional grid investments) in 2021 (€bn and GW)



Source: WindEurope

The UK saw the most investment in new offshore wind farms in 2021, raising €8.8bn financing two wind farms with a combined capacity of 2.6 GW.

Three offshore wind farms in Germany reached FID, raising €4.9bn to finance 1.4 GW of new capacity. France and Denmark each had one wind farm reaching FID.

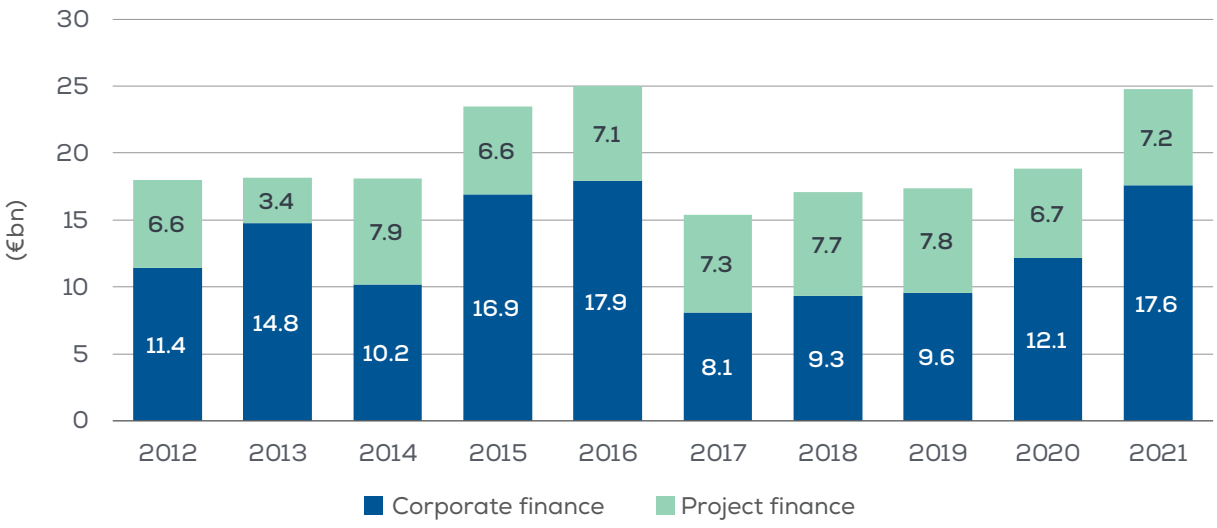
The average CAPEX per MW for offshore wind farms in Europe in 2021 was €3.5m per MW. Vesterhav North and Syd Offshore wind farms (344MW) in Denmark had the lowest CAPEX per MW with €2.1m, and Coursuelles-sur-Mer in France the highest at €4.8m. The reasons for the large differences are laid out above.

2. SOURCES OF FINANCE IN 2021

2.1 CORPORATE AND PROJECT FINANCE

Corporate finance transactions - where a company raises the capital to build a wind farm on its own balance sheet - typically accounts for 50-70% of the capital raised for onshore wind. In 2021, 71% of the capital raised for onshore wind farms was raised on the balance sheet. This is a return to the sort of level seen before 2017 when the Feed-in-Tariff support systems were replaced by competitive auctions. Since onshore wind has seen even greater cost reductions since 2016, 2021 was a record year for capacity financed.

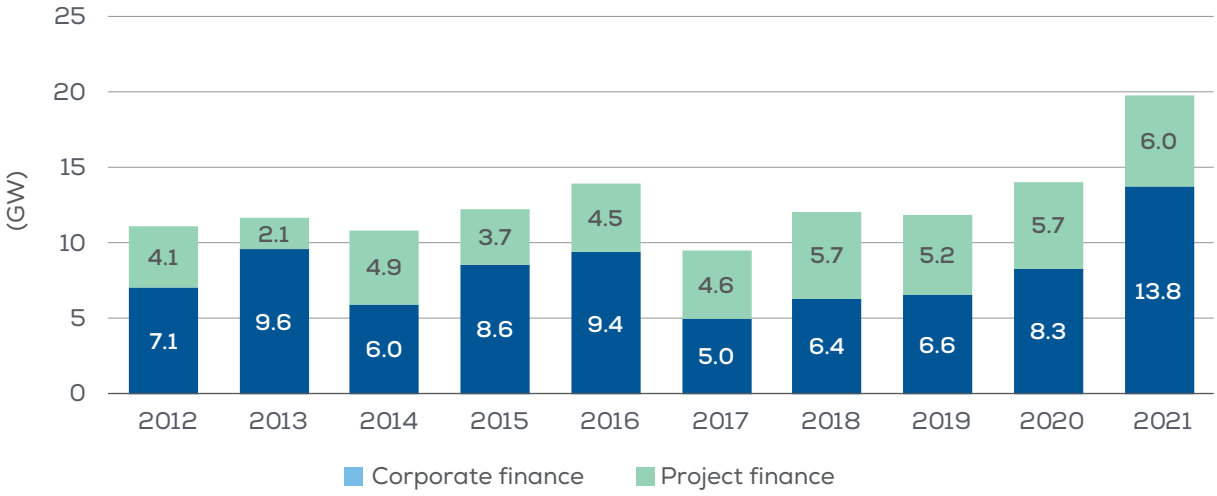
FIGURE 13
Onshore wind corporate and project financing 2012 - 2021 (€bn)



Source: WindEurope

It is useful to look at the capacity financed to better understand financing trends since the capital raised depends on the cost of new projects and the countries where they are financed. Figure 14 shows the capacity financed in GW.

FIGURE 14
Onshore wind capacity financed: corporate and project financing 2012 - 2021 (GW)



Source: WindEurope

2021 was a record year for new capacity financed onshore. We expect greater capacity to be financed throughout the rest of the decade, especially as countries provide more visibility by setting long-term decarbonisation targets. Governments that set out a clear schedule of future auctions will create the an air of certainty that will be key to attracting future investments in wind. It is also possible that the strong onshore financing figures seen in 2021 are due in part to projects which had been delayed in 2019 and 2020 by COVID-19.

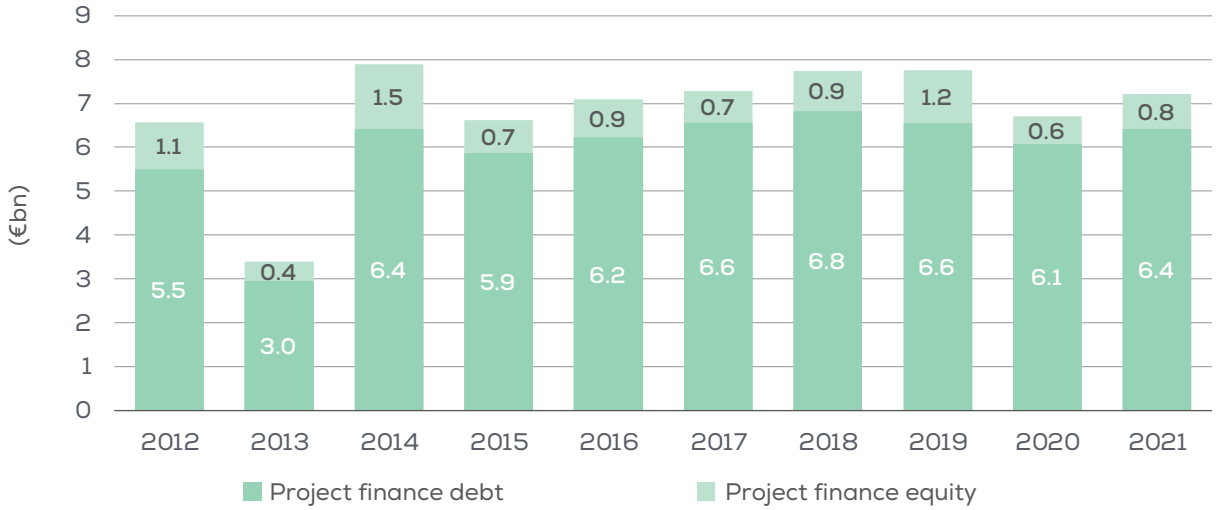
The amount of capacity financed on a project finance basis has generally come out between 4 and 6 GW in recent years, however the drop in corporate financed capacity in 2017 was stark.

In Germany the largest market in Europe by far, the change from the Feed-in Tariff support system to the auction system had a particularly profound effect. Developers fast-tracked projects so they could be submitted before the auctions system was introduced – at the expense of less developed projects[6]. This led to a break in the project supply and a collapse in the project pipeline. From 4.8 GW of projects financed in 2016, there were just 900 MW financed in 2018.

In addition, in Germany there are relatively fewer wind farms financed on a project finance basis compared with the European average. More than 90% of project capital is typically raised on a corporate finance basis. Thus the tanking of the German project pipeline had a significant effect on the overall European picture, accounting for more than 60% of the drop in corporate financed capacity in 2017.

6. Szabo, J., Bruckmann, R., Menzies, C., & del Río, P. Competition dynamics revisited.

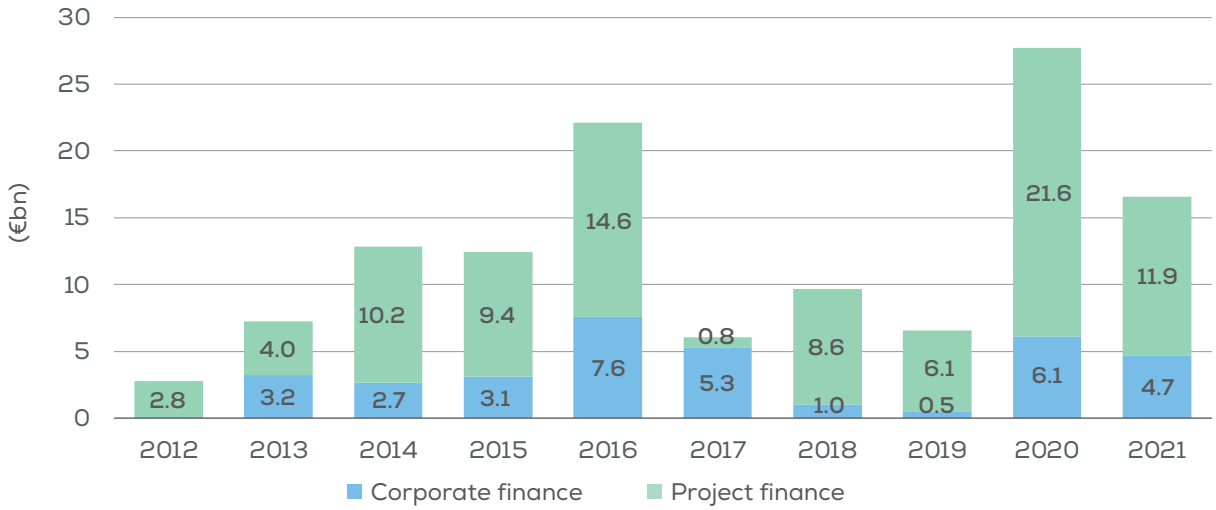
FIGURE 15
Onshore wind project financed debt and equity 2012 - 2021 (€bn)



Source: WindEurope

Debt ratios for project financed onshore wind projects are usually in the region of 80-90% reflecting the maturity of the technology. More mature technologies can raise more debt capital because banks understand and can price the risks, and a proven track record of successful projects boosts confidence. As debt is a lower risk investment than equity – since in the event of bankruptcy it is repaid first – it is a cheaper form of financing. Usually therefore, the higher the debt ratio, the lower the cost of capital. In 2021, debt accounted for 89% of the capital raised on a project finance basis for new onshore wind farms.

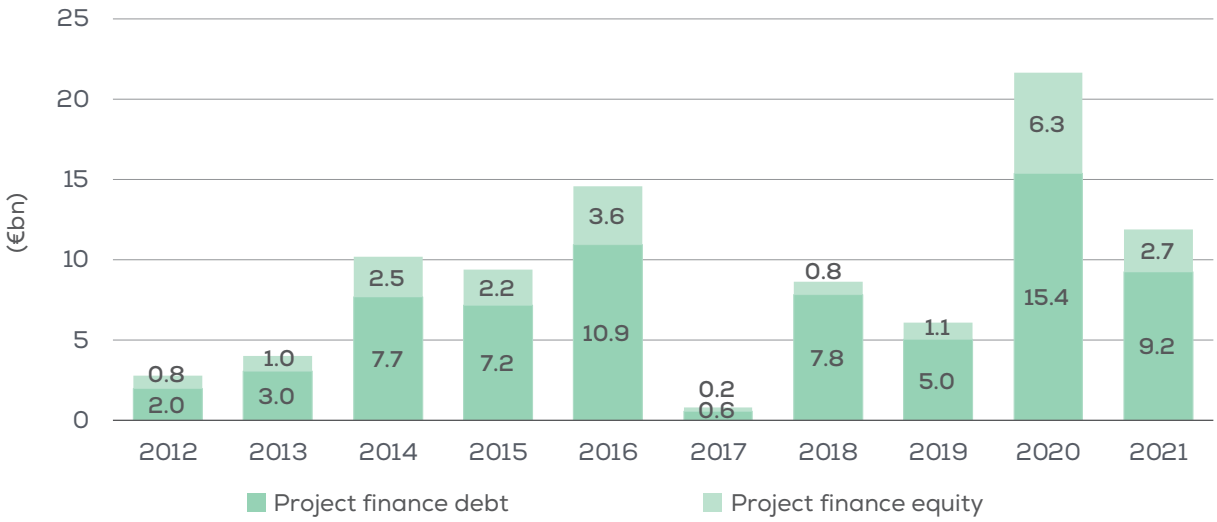
FIGURE 16
Offshore wind corporate and project financing 2012 - 2021 (€bn)



Source: WindEurope

Offshore wind projects tend to be much larger than onshore projects and often lend themselves to project finance structures – since very few developers can raise the necessary funds for these large projects on their own balance sheets. In 2021, €11.9bn was raised on a project finance basis, making up 72% of the total.

FIGURE 17
Offshore wind project financed debt and equity 2012 - 2021 (€bn)



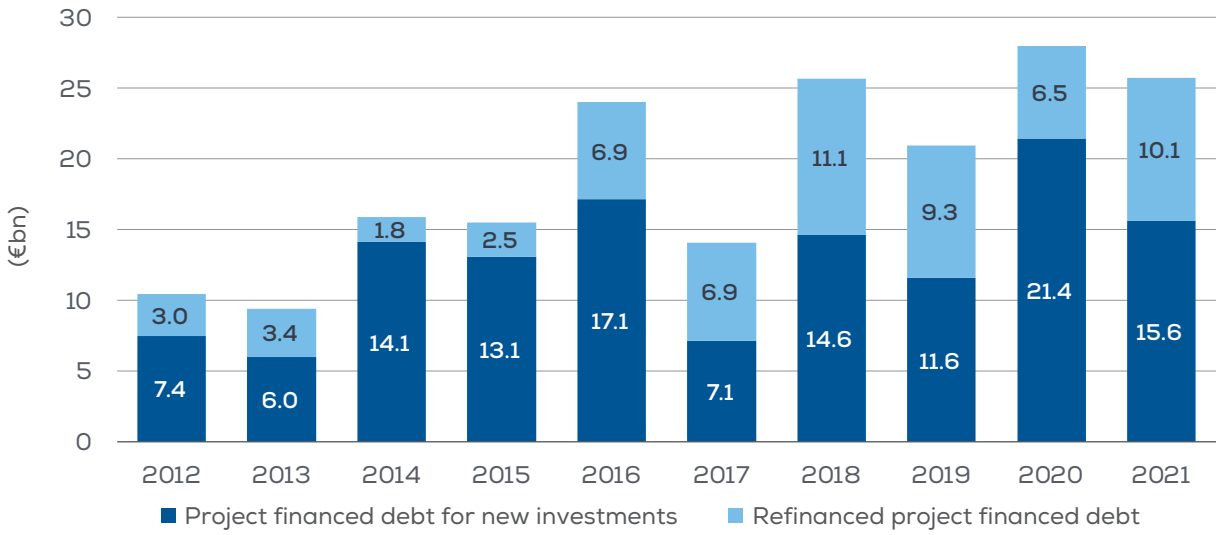
Source: WindEurope

Of the project finance transactions, debt made up 78% of the capital raised, with €9.2bn of capital loaned by banks to five projects in the UK, Germany and France.

2.2 PROJECT FINANCED DEBT

Project financed debt (non-recourse debt) has become more important in financing recent wind energy projects. New business and ownership models have diversified the pool of investors in wind energy and are unlocking the potential for long-term sources of finance from banks, institutional lenders and Export Credit Agencies (ECAs). This has led to a large amount of affordable debt, particularly in the form of non-recourse financing.

FIGURE 18
Project finance debt: new investments and refinancing 2012 - 2021 (€bn)



Source: WindEurope

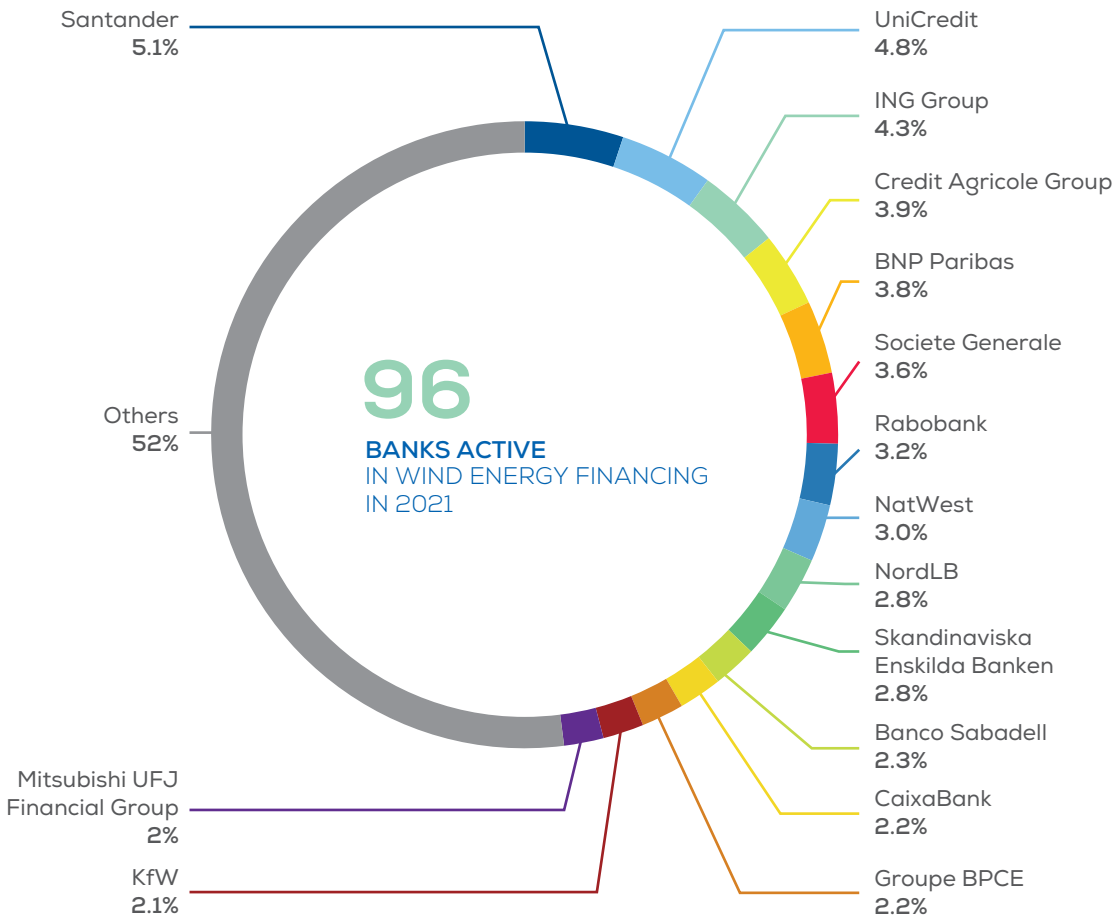
In 2021 €15.6bn of debt were raised to finance new wind farms on a project finance basis. There was also an additional €10.1bn of non-recourse debt refinancing. The total €25.7bn of non-recourse debt transactions keeps up the strong pattern of activity we have witnessed in recent years and underlines the importance of banks in financing wind energy.

When a wind energy project is commissioned, its risk profile changes significantly. The risks during construction are replaced by operational risks. This affects the probability of repaying lenders. In addition, lenders specialise in pricing risks at various stages of project development. It is therefore common for a project to restructure its debts once completed.

Banks for example might provide debt to cover the construction of a wind farm, which usually takes 1-2 years for onshore projects and 2-3 years for offshore wind projects. During this period the wind project doesn't produce any revenue. There are other risks as well, such as losses from accidents or delays in construction – due to bad weather, for example. Once the wind farm has been commissioned, the risks of construction are transferred to operation.

Since there are fewer potential losses and risks for operational wind farms, they can attract better interest rates. The restructuring of debt in this way is known as refinancing.

FIGURE 19
Market share of banks in wind energy financing in 2021



Source: WindEurope

The debt markets have supported construction activity on attractive terms. This shows that the main drivers for interest rate premiums are technological maturity and long-term project risks and characteristics.

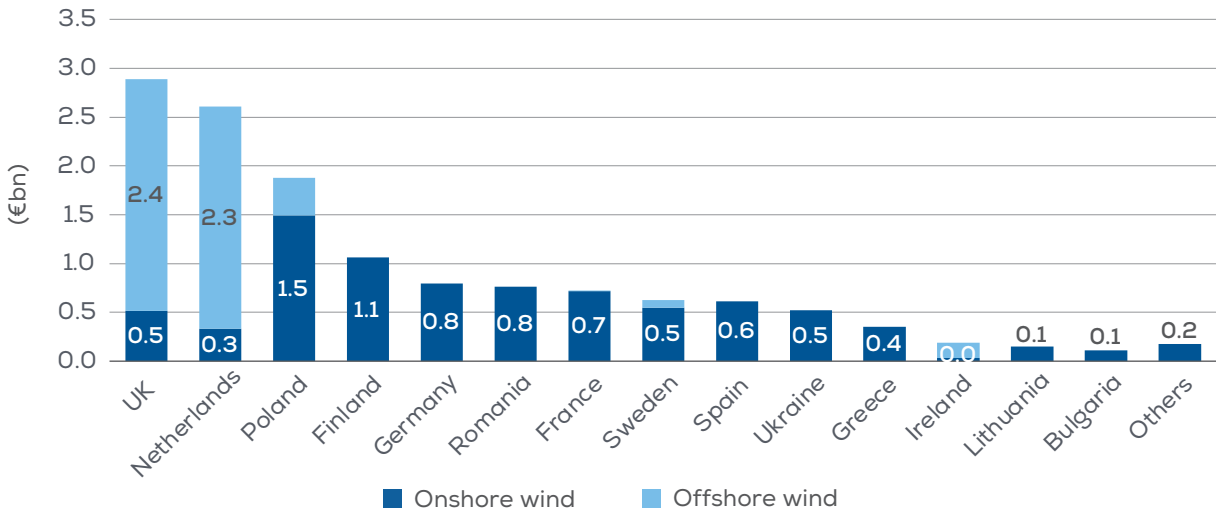
For now, the low interest rate environment still provides wind energy projects with competitive pricing and low financing costs. But in recent months there has been growing market turbulence following on from supply chain shortages and high energy prices. This led to record high inflation rates in Q4 2021. The European Central Bank (ECB) expected this to decline towards its target of 2% over the course of the year, but the outlook for inflation and the overall economy depends on how the situation develops in Ukraine.

The risk premium charged by lenders has fallen consistently as wind energy markets mature and lenders become more comfortable with the risks in the wake of the technology's positive track record.

Over 96 lenders were active in 2021, up significantly from the 67 present in 2020. These lenders include multilateral financial institutions, export credit agencies and commercial banks.

2.3 PROJECT ACQUISITIONS

FIGURE 20
Project acquisitions by country in 2021 (€bn)



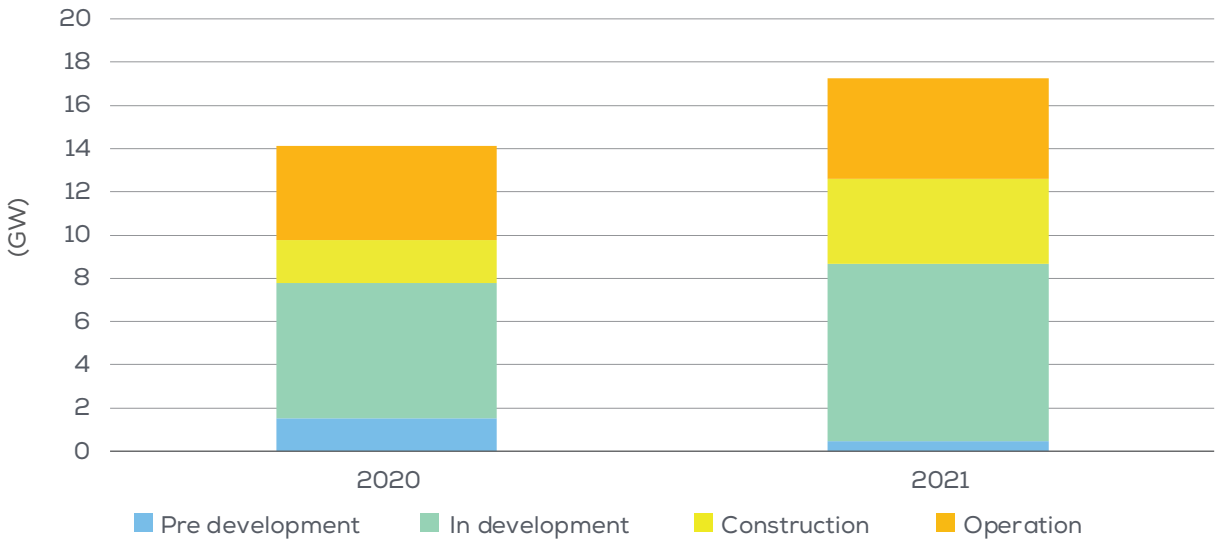
Source: WindEurope

In a project acquisition an investor purchases a wind farm or a share of it. Wind energy projects can be acquired at any stage, from pre-development, through development and construction, to operation. The varying risks and characteristics of the different stages attract a wide range of investors.

The UK market saw the greatest acquisition activity in monetary terms (€2.9bn) with 1.4 GW of capacity acquired. In the Netherlands there was €2.6bn of project acquisition activity, and 2.3 GW of capacity changed ownership. Poland saw the most onshore wind acquisition activity out of any market, with €1.9bn of wind project equity investment involving 3.8 GW. The amount of capacity changing hands in Poland suggests that investors are targeting projects earlier in development.

Indeed project acquisition activity in 2021 totalled €15.6bn – including the acquisition of offshore grid infrastructure. This is similar to the figure for 2020 (€14.1bn) and less than the previous two years (€17.5bn and €19.6bn in 2019 and 2018 respectively). However in terms of capacity acquired, 2021 saw 17.3 GW of wind farm ownership changing hands, more than in previous years (14.1 GW, 14.9 GW and 15.5 GW in 2018, 2019 and 2020 respectively). This suggests that investors are not just actively targeting earlier investments in Poland, but across Europe as a whole. Whether this is to try and increase returns in a competitive field by taking on more early-stage risk, or to gain market share, investors have clearly had to become more sophisticated to be able to enter into projects at earlier stages.

FIGURE 21
Capacity acquired by wind farm phase in 2020 and 2021 (GW)

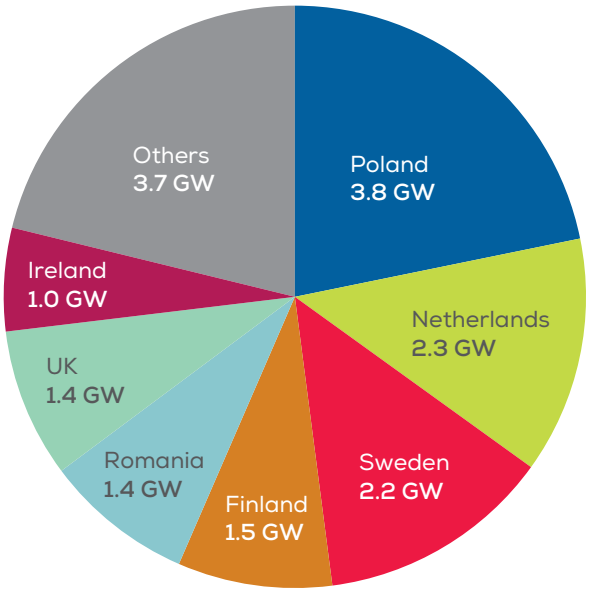


Source: WindEurope

In 2020 and 2021, investors acquired 4.4 and 4.7 GW of operational wind farms respectively. But project acquisitions in the construction phase doubled from 2 to 4 GW and project capacity acquired in the development phase grew by 33% from 6 GW to 8 GW.

The relative value of a wind farm depends on its stage of development. Wind farms gain value through development stages. This is followed by a large increase in value during construction as tangible assets are installed. A wind farm is at its most valuable once it is commissioned, after which there is slow depreciation. Since Poland saw some of the highest acquisition activity in capacity terms but only €1.9bn in transactions, we can assume that most of these acquisitions were for early-stage projects – during development and construction.

FIGURE 22
Capacity acquired in wind energy projects by country in 2021 (GW)



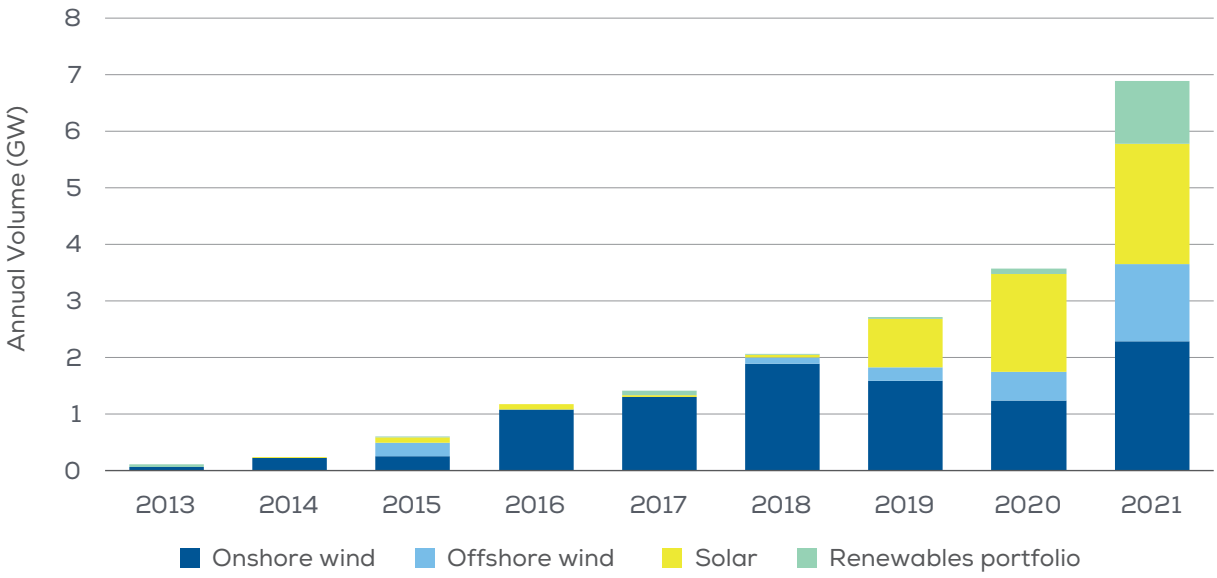
Source: WindEurope

2.4 CORPORATE RENEWABLE PPAS

The corporate sourcing of renewable electricity through Power Purchase Agreements (PPAs) has been growing steadily since 2015. Corporates have a variety of motives to source power from renewables, but the potential to lower and fix electricity costs is a big part of the rationale for these deals. A recent survey of 1,200 companies across six countries showed that among those sourcing renewables, 92% of them are doing it to cut down on energy costs[7]. 2021 was another record year in Europe for volumes of renewable electricity contracted through corporate PPAs - with 6.9 GW in wind, solar and other renewable projects. It was also a record for the number of deals finalised in a year with 97 overall, including 52 signed for wind energy – of which 11 were for offshore wind – and 33 for solar.

Until 2018 wind accounted for 90% of the contracted capacity in Europe. But the last few years have seen a rapid expansion in solar PPAs, which has really helped drive market growth. In 2021 wind accounted for almost 60% of the contracted capacity, and cumulatively, wind makes up two thirds of contracted capacity in Europe, around 13 GW. Wind energy is very well placed to accommodate corporates' needs for renewable electricity because of its modular scale, cost-competitiveness and low risk profile. Approximately 10% of new wind farm capacity financed in 2021 was supported by a corporate PPA.

FIGURE 23
Renewable energy corporate sourcing through PPAs (GW)



Source: WindEurope

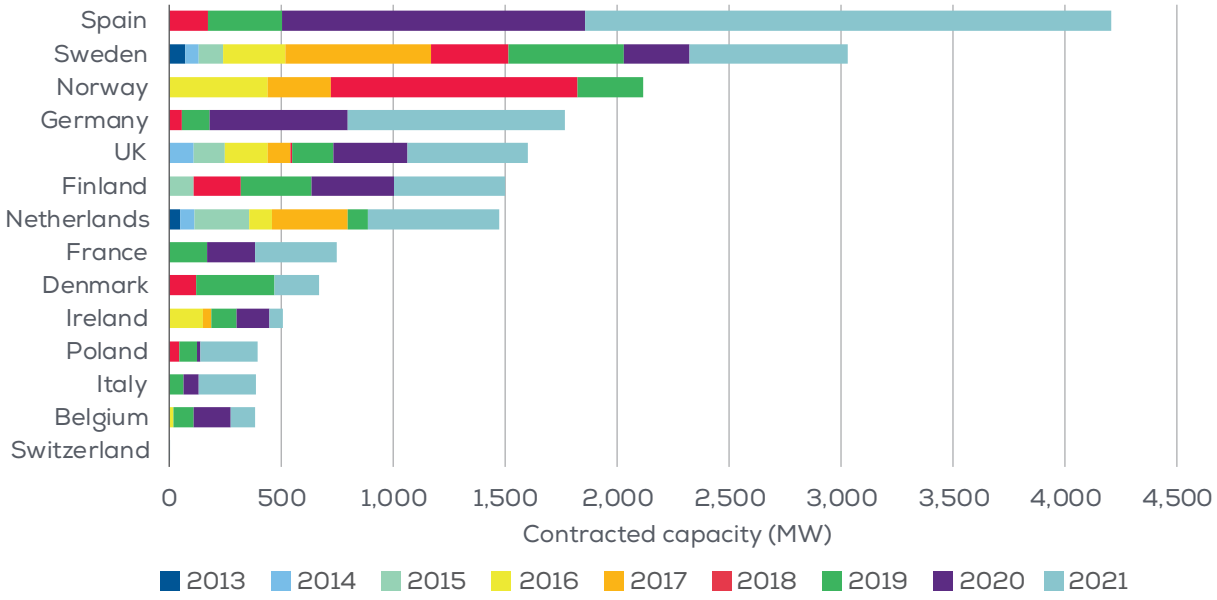
Corporate renewable PPAs also come with benefits for generators. Price visibility over a long period of time and a guaranteed off-taker are important in cutting the cost of financing. Lenders would typically need downside protection – a floor – in project revenues to ensure that debt repayment obligations are met. As such they tend to prefer lower revenue over a long period of time – matching the loan term – rather than higher but more uncertain revenue.

There were 11 offshore wind PPAs signed in 2021 with a combined capacity of 1.4 GW. This continues the trend seen in the development of offshore wind PPAs – from the first signed in 2018, to at least 25 deals with 16 offshore wind farms to date in the Netherlands, Belgium, Germany, Denmark and the UK. There is now more than 2.4 GW of offshore capacity contracted through corporate PPAs in Europe.

7. BayWa r.e. Energy Report 2019, published in partnership with the RE-Source Platform. Available here: https://www.baywa-re.de/en/energy-report-2019/

Offshore developers look to corporate PPAs for revenue stability. They allow them to free up risk capital – if they are financing projects on their balance sheet – or to finance more costs with cheap debt. The large size of offshore wind farms makes them suitable for corporates with large demand, and it is the energy intensive sector which has been driving growth in offshore PPAs. Almost 50% of the capacity has been contracted by large ICT conglomerates with another 20% contracted by chemicals and industrial gas companies.

FIGURE 24
Renewable energy corporate sourcing through PPAs (GW)

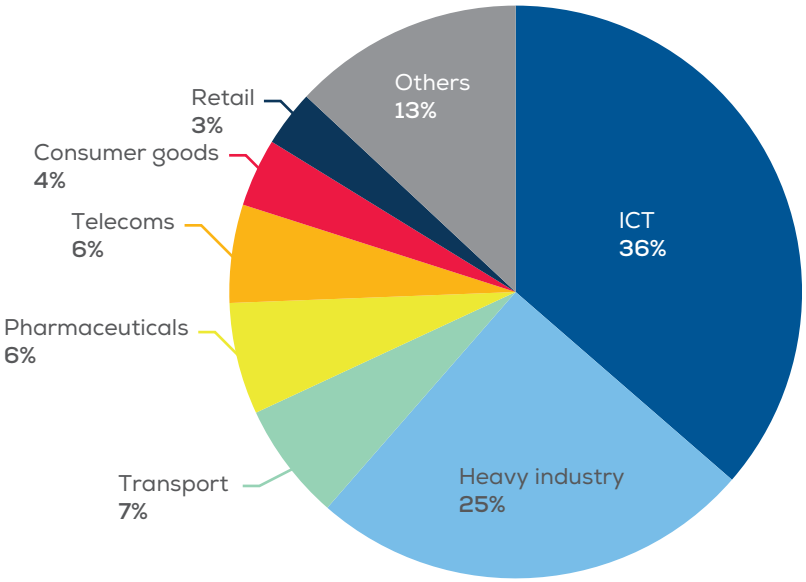


Source: WindEurope

The Nordic countries, followed by the UK and the Netherlands have generally been the biggest markets for corporate PPAs. In 2020 and 2021 however, both Spain and Germany saw significant volumes of PPAs signed. Spain in particular contracted more than 2.3 GW in 2021 alone including 1.2 GW of solar and over 500 MW of wind PPAs.

PPAs are being signed by more companies, across an increasing number of sectors and countries. Going forward they will play an increasingly important role in meeting corporate demand for renewable electricity, as well as supporting the finance and build-out of renewable energy in Europe.

FIGURE 25
Total renewable energy capacity contracted through corporate PPAs by sector (MW)



Source: WindEurope

Demand for renewable electricity comes from a wide range of industrial sectors. Indeed there has been a diversification in off-takers signing PPAs in recent years. As it stands, heavy industry and ICT have contracted the majority of corporate renewable PPAs in Europe.

In 2021 Amazon was once again the largest corporate buyer of renewable electricity, contracting a further 2.3 GW (in the Netherlands, Germany, Sweden, Italy, Spain, Finland and the UK). This means they have now contracted 3.7 GW of renewable electricity in Europe, 2 GW more than the next largest buyer.

But it isn't just the biggest companies that are signing PPAs. To date more than 140 companies have signed renewable PPAs and 40 companies have contracted over 100 MW from renewable electricity generators in Europe.

The chemicals industry has started to fully engage with the renewables sector and are looking for renewable projects to partner with. In 2021, BASF was the second largest buyer, contracting more than 500 MW of wind energy in Germany and Spain. Decarbonising energy intensive industries is key to decarbonising the European economy as a whole and it is great to see the progress being made.

A number of other sectors saw significant volumes of contracted PPA capacity in 2021. The telecommunications sector contracted another 466 MW of renewable power capacity, taking its total contracted capacity in Europe to more than 1 GW. Furthermore, the food and drinks and automotive sectors contracted 363 MW and 323 MW respectively, significantly boosting their market size.

The greatest volumes in 2021 were signed by the ICT (3 GW) and heavy industry sectors (1.3 GW).

3. WIND ENERGY FINANCE POLICY

3.1 REPowerEU

In October 2021 the European Commission published a toolbox for Member States to tackle the high electricity prices seen across Europe – driven by high gas prices – and to build up resilience against future shocks.

The Russian invasion of Ukraine has not only exacerbated high gas prices but it has also underlined the importance of energy security. In response, in March 2022 the Commission published the REPowerEU communication setting out the EU's plan to end Russian fossil fuel imports ahead of 2030.

The proposal aims to kick-start the electrification of Europe's industry, buildings and transport by ramping up the deployment of electric heat pumps, EV charging points, electricity storage and renewable hydrogen.

It also proposes a massive scale up of renewables. The 2030 target for wind energy in the EU has been revised up from 453 GW – in the Commission's most ambitious previous scenario – to 480 GW. This comes at a time when we are not yet financing the numbers we need to meet existing targets. At the same time, raw material prices are rising, inflation is expected to increase further and material shortages are putting pressure on supply chains.

But these targets can be met if the right policies are put in place, and above all, if permitting procedures are improved across Europe.

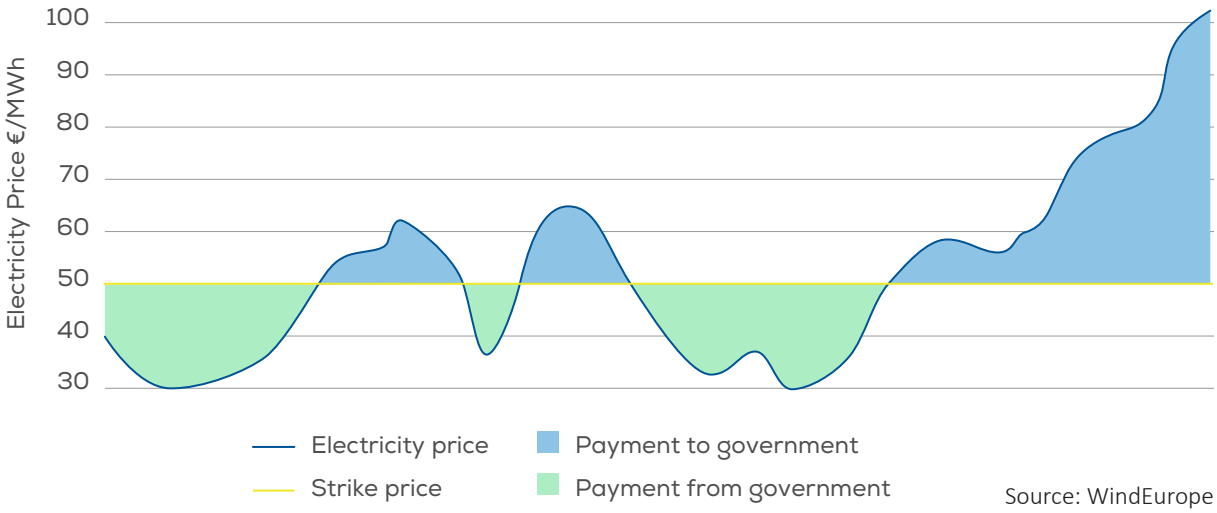
3.2 REVENUE STABILITY

The current situation with high electricity prices and high uncertainty on future prices makes the benefits to society of 2-sided contracts-for-difference (CfD) very clear. Since wind farm costs are known up-front, generators can commit to a fixed price for many years to come, so that when energy prices do spike, wind energy continues to provide electricity at an agreed strike price. Any excess revenue is returned to the National Government.

Revenue stability is important in providing wind energy at the lowest possible cost. Wind farms have high upfront costs but the generation cost is mostly fixed (the repayment of the initial investment) and variable costs – such as operation and maintenance – are very low. This makes the financing cost a high proportion of the overall cost of wind energy production.

Debt is the cheapest form of capital and so it is more efficient to finance wind farms with high proportions of debt. But it needs to be paid back in regular fixed payments, regardless of the volumes of energy being produced and the price at which the electricity is sold. This means that even if wind energy is cheaper on average than thermal generation, a wind farm's operation is put at risk if it fails to make a loan repayment at any point, as the owners could have their assets seized.

FIGURE 26
Revenue stabilisation from two-sided CfD



Source: WindEurope

In the example above, the wind farm developer, or wind farm in a special purpose vehicle (SPV) structure, is supported by a two-sided CfD with a strike price of €50 per MWh. For every MWh produced by the wind farm, the developer will receive €50 regardless of the electricity market price.

The resulting stable price makes investments in renewable energy possible and more efficient. It also allows wind farms to attract cheaper capital and achieve a lower cost of electricity production. If the two-sided CfD is awarded through a competitive tender, the resulting price can be considered the long-term market price of electricity. This is something that otherwise can't exist in the market beyond more than five years.

The importance of CfDs underpinning wind farm investments continues to rise with more and more countries using them in their auction models.

As mentioned above, corporate PPAs are another way that projects can achieve some level of price stability, as well as an off-taker for the tenor of the debt. In some markets where there is no central revenue support, corporate PPAs are the main revenue stabilisation mechanism. They will be crucial in decarbonising the industrial sector and have a large role to play in the energy transition. But corporate PPAs introduce credit risk and so they are limited to some extent by the pool of corporates which are large and creditworthy enough to make a PPA bankable (i.e. to attract debt from banks).

If Governments want to ensure that enough wind energy projects are properly financed, they need to enable revenue stabilisation mechanisms through 2-sided contracts-for-difference. They should also remove barriers to corporate PPAs. This would give wind farms additional revenue stabilisation options and would ensure that industries could decarbonise their own operations.

3.3 MARKET DESIGN

The REPowerEU proposal allows Member States to apply temporary taxes to protect consumers from high energy prices. It is vital that any claw-back measures – or windfall taxes – which Governments apply should acknowledge that most wind energy is sold under long-term, fixed-price contracts for the reasons mentioned above. Projects that sell electricity on truly fixed-price contracts, for example two-sided CfDs, do not make undue profits from high wholesale electricity prices. On that basis, these projects should not be affected by clawback measures. Applying an inappropriate extraordinary tax on their revenue would not only render a wind energy project unviable in the short-term, but could also seriously impact investor confidence for years to come. It could potentially lead to project pipeline disruption and would seriously undermine national efforts to meet climate targets. Note that this is not the case for other support mechanisms such as premium mechanisms or one-sided CfDs.

The REPowerEU plan proposes that the clawback measures should not tax revenue from the sale of electricity in long-term, fixed-price contracts. Taxes should also be time-limited, should not impact the dynamics of the energy market and should not apply retroactively. These conditions are good but aren't legally binding, and countries that do not apply them could risk undermining confidence in their energy markets.

With the need for greater electrification and a ramp up of renewable deployment, several countries in Europe are now looking at their long-term energy market design. In April 2020, WindEurope published a position paper on the energy market design[8], looking at what adjustments were needed. These changes would send the right investment signals needed to deploy more wind, guarantee energy security and ensure a cost-effective management of a fully decarbonised energy system.

3.4 RULES FOR GUARANTEES OF ORIGIN

Guarantees of Origin (GOs) are crucial for corporate buyers to demonstrate the use of renewable electricity. Corporate PPAs cannot be signed without the issuance and cancellation of GOs, to prove the link between renewable electricity production and consumption.

Some Member States continue to retain GOs from renewable projects benefiting from State Aid, even when the State Aid only applies to a part of the project. Of course it is vital to avoid any sort of double compensation, and to ensure that corporates are not unduly benefiting from renewable electricity supported by the taxpayer.

Guarantees of Origin should thus be made available to renewable generators to sell or trade for all unsupported renewable electricity generation.

Where renewable generation benefits from State Aid, Member States should have the right to cancel related GOs on behalf of the generator, or to sell related GOs in a central auction. Current systems like these exist in Croatia, France, Germany, Italy, Luxembourg, Portugal, and Slovakia. But this should only apply for GOs representing renewable electricity which has received public support.

8. 20220412-WindEurope-position-paper-on-electricity-market-design.pdf

3.5 GUIDANCE FOR PPAS

In line with 'better regulation' principles, the Commission has launched a public consultation. The purpose of this is to gather stakeholder views on good practices which accelerate permit-related procedures for renewable energy projects and facilitate Power Purchase Agreements.

National policymakers should favour measures which support businesses who want to enter into PPAs, such as the schemes developed in Norway and Spain which provide credit-risk guarantees to energy intensive industries. In the meantime, they should continue to remove administrative barriers.

Finally, to ensure a healthy pipeline of projects, Governments should lift permitting barriers and accelerate the build out of the electricity grid to support a greater penetration of renewables.

GLOSSARY

- **Wind farm finance:** covers all infrastructure investments in onshore and offshore wind farms, including refinancing transactions.
- **New wind farm finance:** includes all infrastructure investments in the construction of new onshore and offshore wind farms, excluding refinancing transactions.
- **Final Investment Decision (FID):** for project finance, the final decision to go ahead with a project once the permitting and financial arrangements are in place.
- **Financial close:** for corporate finance, the final decision to go ahead with a 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.
- **Corporate finance / on-balance sheet financing:** includes all investments in wind power generation 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 generation 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 spun-off 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:** a corporate bond, the proceedings of which are used to finance a portfolio of renewable energy projects. Unless specified, the use of money is often unallocated.
- **Northwest Europe:** the geographical region of Europe including Belgium, Denmark, Finland, France, Germany, Iceland, Luxembourg, the Netherlands, Norway, Sweden and the UK.
- **South East Europe (SEE):** the geographical region of Europe including Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Greece, Kosovo, Montenegro, North Macedonia, Romania, Serbia and Slovenia.
- **Project bond:** includes bonds issued at project level, the proceedings of which are used to finance a specific project.
- **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.
- **Weighted Average Cost of Capital (WACC):** the WACC is calculated as the weighted average of the cost of debt (the interest rate charged by lenders), the cost of equity (compensation required by shareholders for bearing risk of ownership) and the cost of any other category of capital (preferred stock, long-term debt etc.). It represents the cost to a business of raising capital, and is a measure used to assess whether or not to invest in a new project.

WindEurope is the voice of the wind industry, actively promoting wind power in Europe and worldwide. It has over 400 members with headquarters in more than 35 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.

Rue Belliard 40, 1040 Brussels, Belgium
T +32 2 213 1811 · **F** +32 2 213 1890
windeurope.org