Wind EUROPE

Financing and investment trends

The European wind industry in 2022

Financing and investment trends

The European wind industry in 2022

Published in March 2023

WindEurope

windeurope.org

TEXT AND ANALYSIS:
Guy Brindley, WindEurope

EDITOR:
Rory O'Sullivan, WindEurope

DESIGN:
Laia Miró, WindEurope

PHOTO COVER:
Jason Bickley

All currency conversions are made at EUR-GBP 0.8528 and EUR-USD 1.0530

MORE INFORMATION:
policy@windeurope.org

DISCLAIMER

This report summarises financing activity across the European wind energy sector from 1 January to 31 December 2022. 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, Serbia, Turkey and the UK.

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 2021 have been restated from the previous report.


Photo: Nordex SE

Contents

Executive summary

Europe invested just €17bn in new wind farms in 2022. This was the lowest investment figure since 2009 and comes as a stark warning to Governments and policymakers. If we do not restore investor confidence quickly, we will not be able to meet Europe's energy and climate targets. The capital raised financed 12 GW of new wind capacity in 2022 which will be built over the next few years. This was the lowest capacity financed since 2017. There were no large-scale offshore wind Final Investment Decisions.

In the EU just 10 GW of new wind farm capacity was financed, well short of the 31 GW a year on average that we need to install between 2023 and 2030 to meet the EU's 40-45% renewable energy targets. Installations in the EU were 16 GW in 2022. All this points to a drop in installations over the next couple of years at exactly the time when we need to be ramping up.

Russia's invasion of Ukraine hit Europe's economy hard when it was only beginning to recover from the shock of COVID-19. Rising costs for raw materials, supply chain bottlenecks and inflation have all added to costs and risks for developers as well as the supply chain.

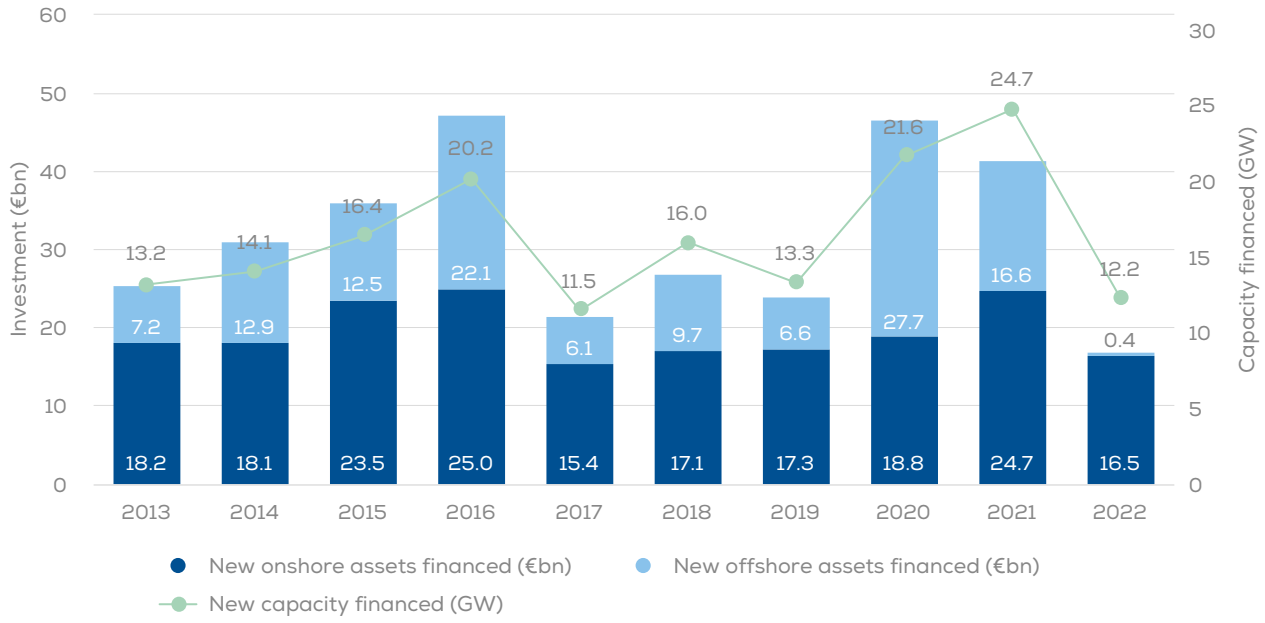
National Governments brought in emergency measures in good faith, aimed at protecting consumers from the high energy costs. But many of the measures undermined generator revenues. And all were uncoordinated leading to a patchwork of different market interventions. This created uncertainty and damaged investor confidence.

Finally, financing conditions have been made more difficult. Interest rates have risen as central banks try to control inflation and increased risks for projects, including of delays and failure, have led lenders to increase their risk premiums.

But there is still plenty of appetite for renewables investment, and well-structured projects will continue to have access to plentiful capital. Project economics will adapt to the new reality and this will inevitably lead to further price increases. Governments need to fully index auction and tender prices and raise any ceiling prices to adjust to the new economic reality.

And National Governments must restore investor confidence through regulatory stability. The EU's market design reform proposal is a positive first step in restoring confidence and kick-starting wind energy investments once again.

FIGURE 1. New wind power capacity financed 2013-2022 (GW and €bn)



Source: WindEurope

2022 Annual figures

- Europe invested €17bn in the construction of new wind farms in 2022. This was less than half the figure of €41bn invested in 2021.
- The €17bn financed the construction of 12.2 GW of new wind farm capacity. Nearly all of the financed capacity was for onshore wind farms.
- Two floating offshore wind projects worth 60 MW reached Final Investment Decision (FID). There were no large-scale offshore wind farms taking FID in 2022.
- Average capital expenditure (CAPEX) required for each MW of new onshore wind capacity was €1.4m, more than the average for 2021. Inflation and rising costs of raw materials will likely mean further CAPEX increases. The average CAPEX of the two floating demonstrator wind farms was €7m per MW.
- Banks provided just €3.7bn in non-recourse debt for the construction of wind farms. This was less than a quarter of the amount offered in 2021 and the lowest amount since 2005.
- Total non-recourse debt provided by banks for the construction and refinancing of wind farms was €10.4bn.
- Non-recourse debt accounted for 22% of all investment in onshore wind farms. This was the lowest proportion since 2013.
- Project acquisitions, where investors purchase a share of a wind farm (in development, construction or operation), were worth an estimated €16.1bn. Note that these investments are separate from the €17bn invested in new wind farms.

Country highlights

- Germany invested the most in new wind farms in 2022 (€2.3bn) followed by Finland (€2.1bn). Poland was next, investing a record €1.9bn in new onshore wind farms.
- Estonia also saw record investments with €0.6bn.
- France was the only country which saw investments in offshore wind. Two floating wind farms with a combined capacity of 60 MW, EolMed and Éoliennes Flottantes du Golfe du Lion (EFGL), both took FID.
- 87% of the investments were in the EU.

Investment trends

- Inflation hit record highs in 2022, brought on by Russia's invasion of Ukraine.
- Central banks have raised interest rates faster than at any time in the last 20 years in order to contain record levels of inflation.
- Higher interest rates, and increased bank lending margins, to compensate for more risks associated with inflation and increased CAPEX, have led to higher borrowing costs.
- Investors are delaying signing long-term debt by looking to raise capital through other means, for example equity or private loans.
- Risk sharing between original equipment manufacturers (OEMs), developers and lenders will need to be more flexible than in the past, and negotiations may take longer.
- Regulatory risk is key. Increasing financial risks and higher project costs can be managed, but regulatory risk leads to uncertainty and damages investor confidence.

Supply chain challenges

- Supply chain, commodity and logistical costs have risen up to 50% over the last two years.
- OEMs are adding indexation to their contracts with developers to protect against further price rises for steel and other commodities. This gives developers additional risk which they will need to mitigate. They will have to demonstrate to lenders that the risks are identified and hedged.
- The shift in risk appetite of OEMs, the need to raise prices and indexation in contracts could all lead to lower achievable rates of return for developers and investors.
- Auction prices will need to rise to cover increases in the cost of raw materials and financing.

Policy highlights

- Russia's invasion of Ukraine has shifted the political landscape towards more renewables. Policymakers see the benefits that renewables bring to energy dependence, in addition to the fight against climate change.

- The REPowerEU Action Plan aims to reduce Europe's dependence on global fossil fuel imports. It envisages a renewable energy target for the EU of 45% by 2030.

- In order to meet the renewable energy target, WindEurope estimates 440 GW of wind power capacity will need to be installed by 2030. To achieve that, the EU needs to install 31 GW a year between 2023 and 2030. Despite signs that improvements in permitting are starting to happen, we expect to build just 20 GW a year over the next five years.

- The Market Design Reform proposes the use of 2-sided Contracts-for-Difference for all renewables support and promotes PPAs. Both are key to financing the build-out of renewables. The Council and Parliament must now stick to this balanced proposal and end the current investment uncertainty caused by unhelpful and uncoordinated national market interventions.

- The Net-Zero Industry Act aims to provide valuable support to European manufacturing supply chains of 'net zero emissions' technologies. As it stands Europe's Industrial Plan falls short of what's needed to support and expand Europe's wind supply chain.

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 partly responsible for bringing the initial concept 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 to finance new assets. Refinancing debt is raised to finance 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 the 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 the 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 greater 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 can vary considerably depending on the project specifics, the availability of capital and risk profile of the project owners. For wind projects, they average between 70-80% debt and 20-30% equity.

A company's capital structure is 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 the 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 vital from a very early stage. Fundraising will occur at the project level, through debt and equity vehicles alike. Project owners will need to form consortia to provide the necessary equity whereas lenders will come together to provide syndicated project loans on the debt side.

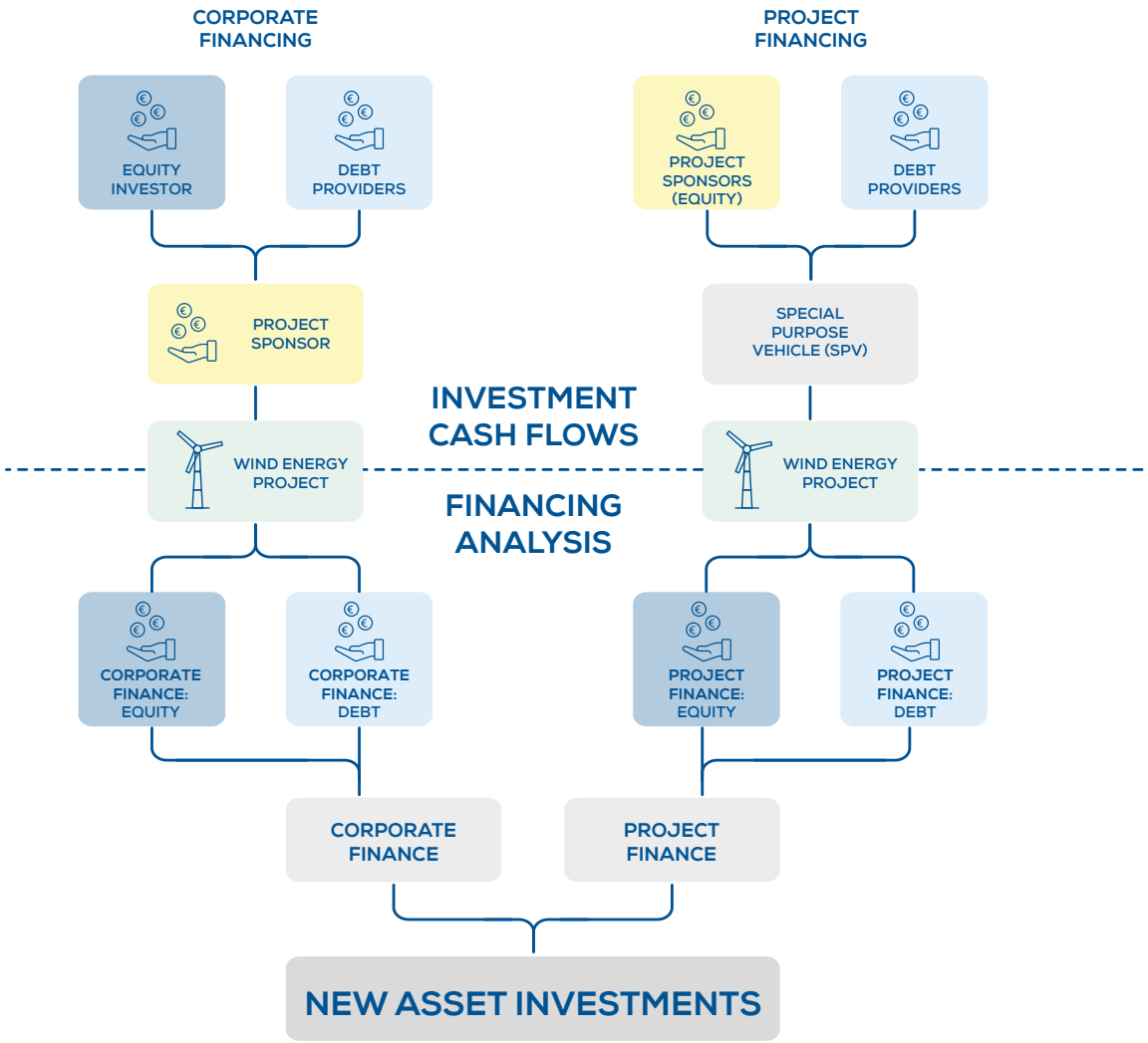
Raising debt and equity

The project owners and sponsors can raise capital for project development from different sources. These might 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 in raising both debt and equity in wind energy financing.

Debt is usually raised through issuing bonds either at the corporate or project level. When a bond is issued at the corporate level, the proceedings help to finance a portfolio of projects. The bond can carry the 'green' label when the portfolio of projects it is financing is exclusively made up of renewable energy investments. When the bond is issued at the project level, the proceedings are used for the specific renewable energy project and are therefore considered '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. Under this classification, these bonds have a high chance of meeting investor payment obligations.

FIGURE 2. Corporate finance vs Project finance



Source: WindEurope

Capital available for wind power projects

The financial markets have supported the growth of the wind energy sector with strong liquidity on both debt and equity. The environment 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 when commercial bank financing has not been available. International banks have also strengthened their presence in the European wind sector and have brought in more competition. 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 from institutional and strategic investors has picked up significantly, and both are now looking to 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 industry's positive track record 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 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 share 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.

Example of financing structure for typical **offshore wind project**

882 MW | 60 Turbines | €2.9bn

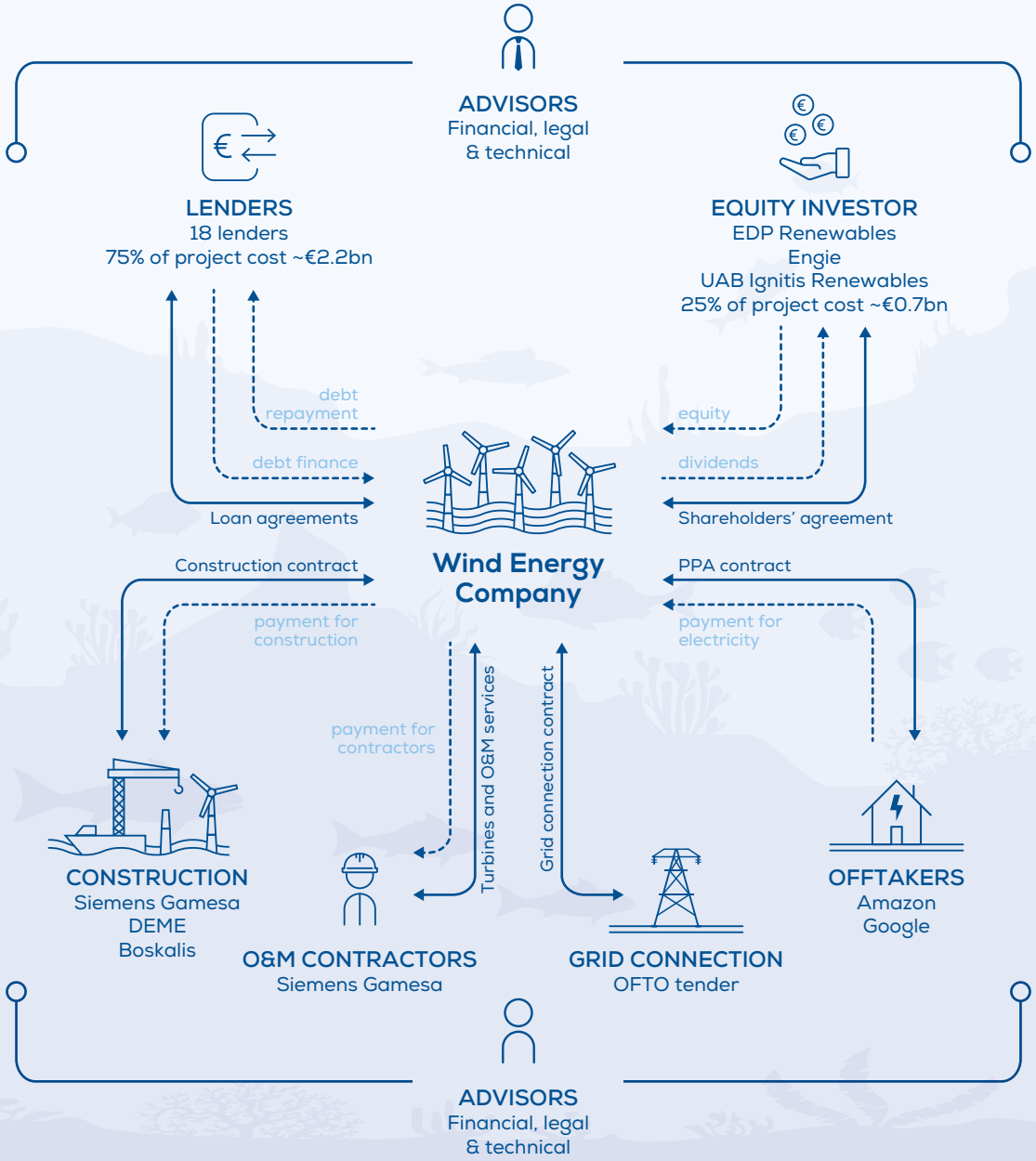


FIGURE 3. Example of finance structure of typical offshore wind farm

Source: IJ Global and WindEurope

1.

Investment numbers in 2022

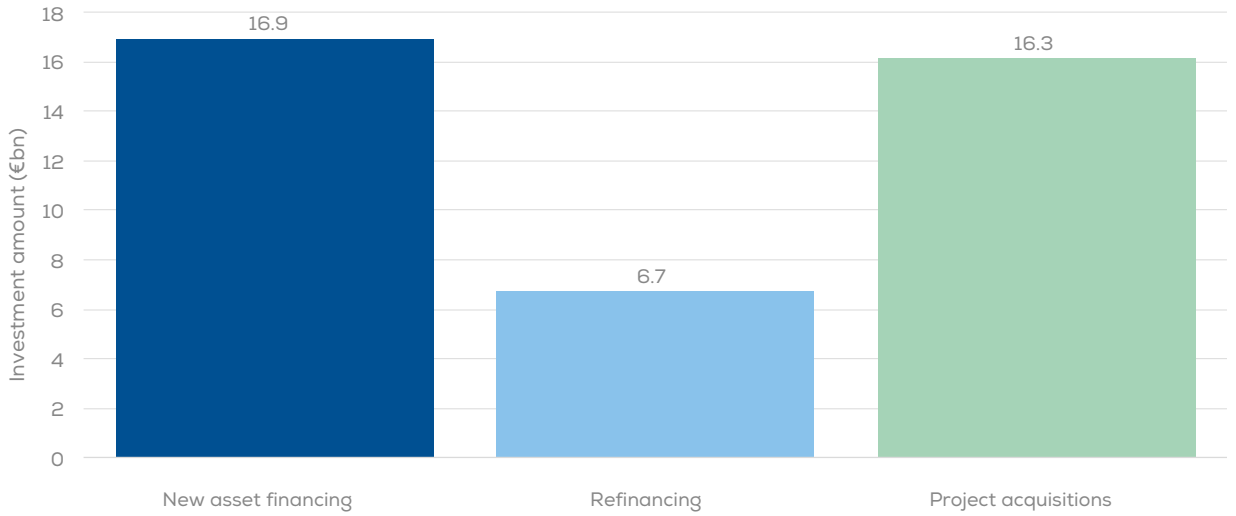
1.1 Wind energy investments

In 2022 investments in new onshore and offshore wind farms were €16.9bn, financing the construction of 12 GW of new wind power capacity which will be built over the next few years. This was less than half the amount invested in 2021, and the lowest absolute investment figure since 2009. Separately there was €16.3bn worth of investment in shares of wind projects at various stages of development. And there was €6.7bn of project finance debt which was refinanced.

Overall, while project acquisitions were consistent in 2022 and wind farm refinancing was comparable with previous years, investments in new wind farms was down significantly compared with previous years.

Europe recovered quickly from the effects of COVID-19, but now faces a deteriorating economic outlook. A surge in energy prices was triggered by Russia's invasion of Ukraine. Inflation in Europe hit highs not seen since the early 1980s in 2022 and central banks raised interest rates to try to control it. The European Central Bank increased its benchmark interest rate from 0%, where it had been since 2016, to 2.5% over the course of the year. Increased risk from rising costs of raw materials, inflation and project construction delays have added to bank risk margins. This has led to a higher overall cost of financing.

FIGURE 4. European wind energy investments in 2022 by asset class (€bn)



Source: WindEurope

It has not been a good time to raise capital through debt, and project developers have delayed financing decisions until the economic outlook improves. There were no final investment decisions taken for large-scale offshore wind farms in 2022.

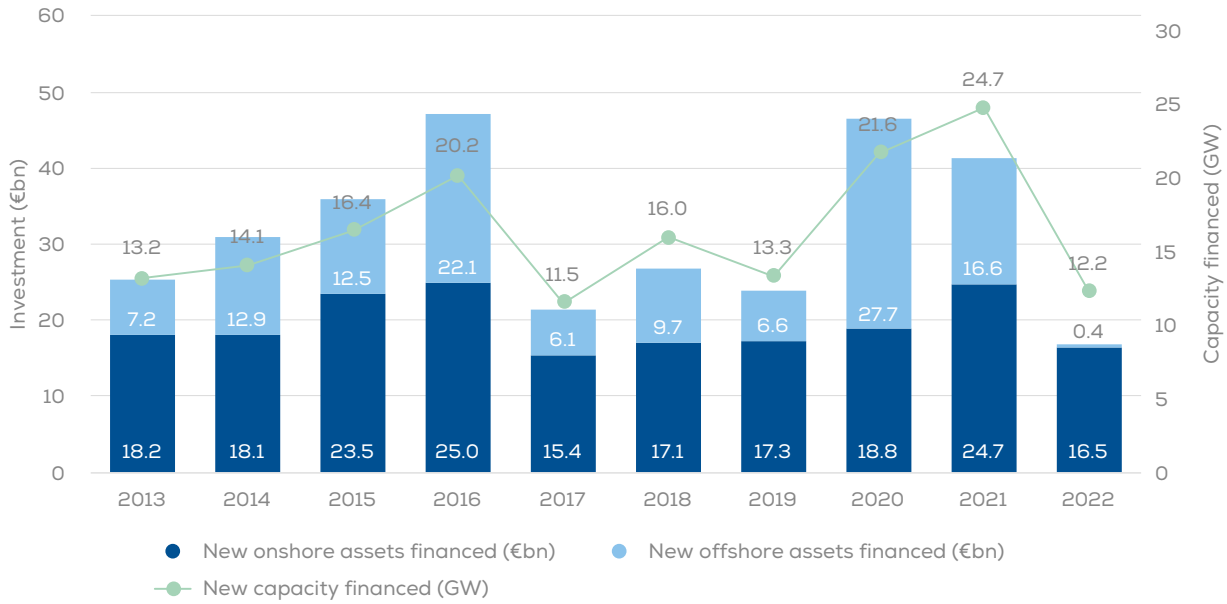
Refinancing transactions were down 33% on 2021, but comparable with recent years. The general trend of refinancing is not likely to be heavily impacted by the current environment. When refinancing, borrowers can still keep their underlying, low base interest rates, which could make these transactions more attractive than new project financing.

Project acquisitions – where a share of a wind farm is purchased – grew by 4% to €16.3bn in 2022. But the amount of capacity changing ownership was up 32% from 2021. Investors purchased a higher proportion of projects in the early stages of development - where their cost per MW is lower and there is greater potential for higher returns.

1.2 New wind farm financing

Investment in new wind farms totalled €16.1bn in 2022, financing 12.2 GW of new capacity which will come online over the next few years. Almost all of the total capacity financed was onshore - just 60 MW from two floating offshore demonstrator wind projects reached FID. Although the figure for financed onshore capacity is comparable to 2018 and 2019, it is a signifcant drop compared with 2021, at a time when installation rates need to ramp up for Europe to meet its climate and energy targets.

FIGURE 5. New wind power capacity financed 2013-2022 (GW and €bn)



Source: WindEurope

Governments are starting to tackle permitting bottlenecks and new REPowerEU rules should help. Under the emergency measures agreed in December 2022, EU Member States have signed up to the principle that renewables are of overriding public interest. This means that National Governments can speed up renewables permitting while ensuring a good working balance with other societal interests such as the protection of biodiversity. In addition, permitting of repowering projects must now take place within six months, including the Environmental Impact Assessment (EIA) and the grid permits.

Fixing the supply of projects is not the only issue facing investors. Over the course of 2022 National Governments introduced measures designed in good faith to protect consumers from the abnormally high electricity prices. But many of the measures undermined generator revenues. And all were uncoordinated leading to a patchwork of different market interventions. This created huge uncertainty and severely impacted investor confidence.

The Commission's Electricity Market Design Proposal which confirms that the emergency measures are to be temporary, is a good first step to restoring that confidence. At its core, it proposes that all revenue support for non-fossil generators should be in the form of 2-sided contracts for difference (CfDs). It encourages Member States to design their auction schemes to allow a combination of CfDs and PPAs and allows merchant projects (where no support is provided). This will give developers the flexibility to finance projects in the best way for them.

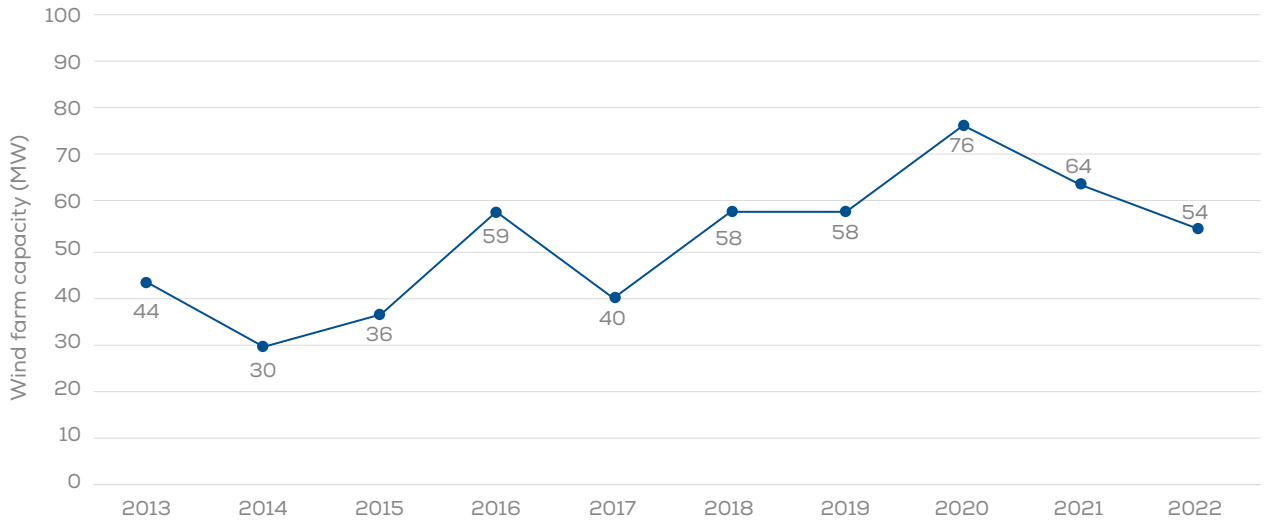
Developers have also had to face sudden cost increases over the last two years. Global spikes in the cost of steel, energy and other commodities have forced OEMs to increase turbine prices, in some cases by up to 40% over the same period. OEMs are also starting to include indexation in their contracts to protect against further cost increases. This has heightened the risk for developers and they have to demonstrate to lenders that the increased risk has been identified and mitigated.

In this challenging political and sectoral environment, OEMs, developers and lenders need to work together to ensure that lending is carefully structured to share risks between all parties. Ultimately with rising complexities and additional risks to consider, the financing of wind farms may be more time-consuming than in the past and could lead to more delays to project financing.

The cost of capital has also been affected by the new risks and recent volatility in the market. Interest rates and higher bank margins have increased the cost of debt. Equity investors will also need higher returns as their cost of capital increases.

Wind farm developers will have no problem accessing capital but project economics are changing. It is important that Governments accept higher auction prices as this will allow developers and the supply chain to absorb the higher costs, not just in commodities and energy, but also for financing.

FIGURE 6. Size of new onshore wind farms taking final investment decision in 2013 - 2022 (MW)



Source: WindEurope

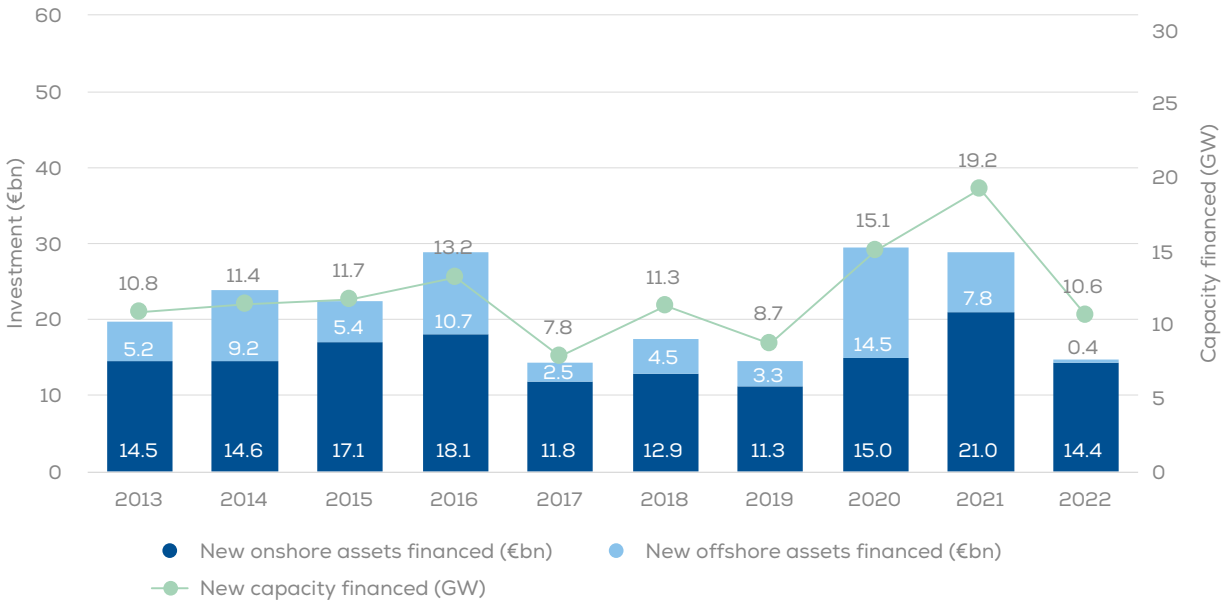
Smaller wind farms have been able to take advantage of the fact that there are many more of them than larger projects. The more liquidity for the deal size (i.e. the more similarly sized wind farms competing for loans), the more likely that borrowers will find attractive rates. But this effect will be cancelled out somewhat by higher operational costs relative to the deal size, which drags down returns.

Smaller wind farms might also be preferrable for investors in times of greater political and economic uncertainty. This is because they generally have a lower capital requirement and so there is less risk on the table. In 2022 the average wind farm financed was 54 MW onshore. This was the lowest average size since 2017.

Offshore wind farms have been growing in size over the last decade, but no large-scale offshore wind farms took FID in 2022. The two floating wind farms which were financed both have nameplate capacities of 30 MW. Significant offshore project Final Investment Decisions were delayed in 2022, including Moray West (882 MW) in the UK, and Le Tréport (496 MW) and Noirmoutier (496 MW) in France. All are expected to take FIDs in 2023.

In EU countries, investments in new wind farms totalled €15bn financing 11 GW of new wind power capacity. WindEurope estimates that the EU will need 440 GW of installed wind power capacity by 2030. This means EU countries need to install 31 GW a year between 2023 and 2030.

FIGURE 7. Investment in new wind farms in the EU 2013 - 2022 (GW and €bn)



Source: WindEurope

Onshore wind raised around €16.5bn to finance 12.2 GW of new capacity. The financed capacity was comparable to the amounts for 2018 and 2019 but reversed the trend of rising investment in onshore wind. It was also well below the amount which Europe needs to be investing each year to meet its climate and energy goals.

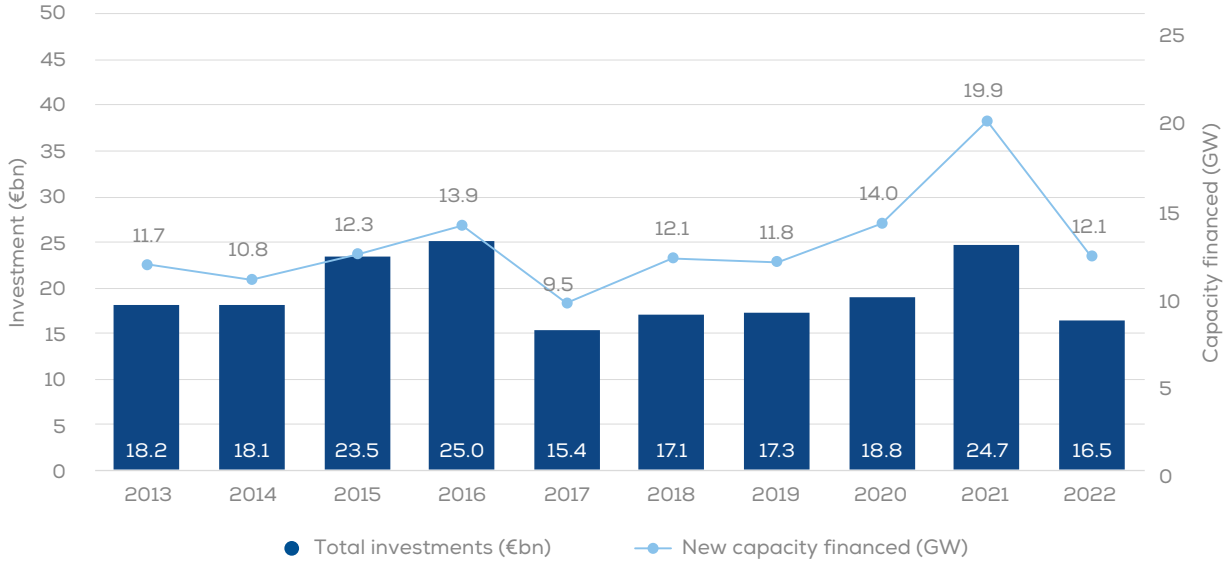
Financing data gives an indication of what is likely to be built over the next few years. We estimate the time from Final Investment Decision (FID) to a wind farm's commissioning date to be up to one year for onshore wind and 2-3 years for offshore wind.

The wind energy installation target of 31 GW a year across the EU breaks down to approximately 19 GW a year for onshore wind and 12 GW a year for offshore wind respectively.

In the wake of the Russian invasion of Ukraine there has been more support for renewables from National Governments, who now recognise the value that they bring, not just in the battle against climate change, but for their long-term energy independence. National Governments have boosted their 2030 wind energy targets, particularly for offshore wind. The increase from the target of 7 GW a year of offshore wind between 2022 and 2030 in the previous report to 12 GW a year in this report follows on from these revisions.

For onshore wind there is a gap of around 7 GW between the capacity financed in 2022 and the average rate of installations we need to see for onshore wind between 2023 and 2030.

FIGURE 8. Investment in new onshore wind farms in Europe 2013 - 2022 (GW and €bn)



Source: WindEurope

In our Market Outlook[1] we lay out a scenario where installation rates rise over the next few years. As part of this REPowerEU Scenario, onshore wind installations would need to average around 15 GW a year over the period from 2023 to 2025 whilst supply chain capacities are ramped-up.

Compared with the REPowerEU scenario, there is a gap of around 3 GW between the required rate of installations over the next three years and the capacity financed in 2022. But investments need to bounce back quickly to stay on track, giving the supply chain the right investment signals to scale-up production.

Under the REPowerEU Scenario, the EU needs to build 24 GW a year on average between 2028 and 2030. These installations will need to be financed in the years preceding.

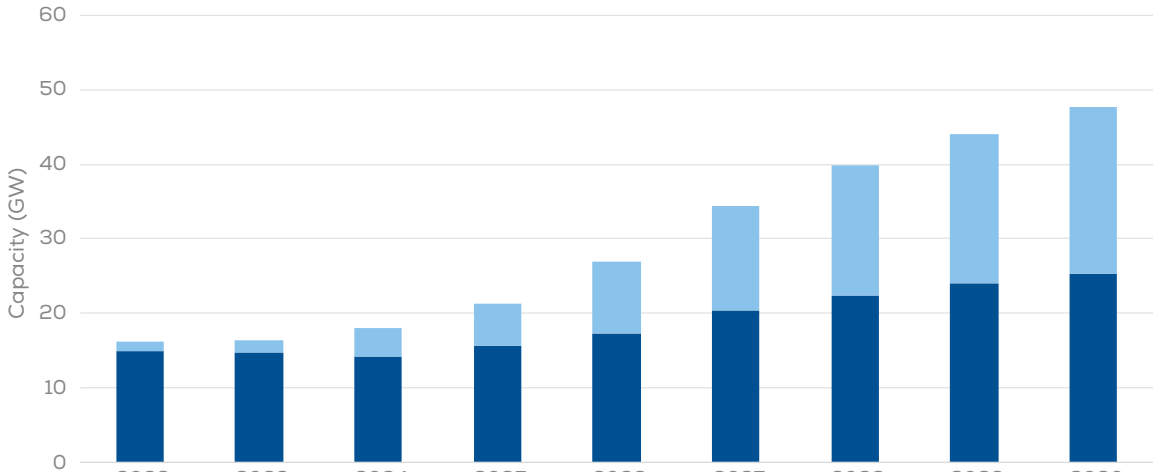
Investments in new **offshore wind** totalled just €0.4bn after only two pre-commercial floating wind farms reached FID. These were the EolMed and the EFGL wind farms in the Meditarranean Sea which will reach 30 MW each once commissioned. There were no FIDs for large-scale offshore wind farms in 2022. A number of FIDs were delayed due to heightened risks, especially inflation.

National Governments have set ambitious targets for offshore wind which will require a ramp-up in installations over the next few years. Under the REPowerEU Scenario the supply chain will need to deliver 20 GW a year between 2028 and 2030.

We are already seeing monopile shortages in Europe and without proper investment now, there will likely be shortages in vessels from 2025 as well.The delays in offshore wind investment have come at a crucial time, but very few projects, if any, are likely to be cancelled because of changing risk profiles. Developers may want to renegotiate their power prices, and auction prices are likely to rise slightly.

Renewables are still attracting a large pool of investors and there is plenty of debt available for financing. But we've seen an increase in the cost and complexity of project finance. Developers who are able to raise corporate debt cheaply and finance wind energy projects on their balance sheet (corporate finance) are likely to do so, and to avoid delays.

FIGURE 9. Build out of wind energy in the EU under the REPowerEU Scenario



	2022	2023	2024	2025	2026	2027	2028	2029	2030
Onshore wind	14.9	14.7	14.2	15.7	17.2	20.3	22.3	23.9	25.2
Offshore wind	1.2	1.8	3.8	5.7	9.8	14.1	17.5	20.1	22.4

Source: WindEurope

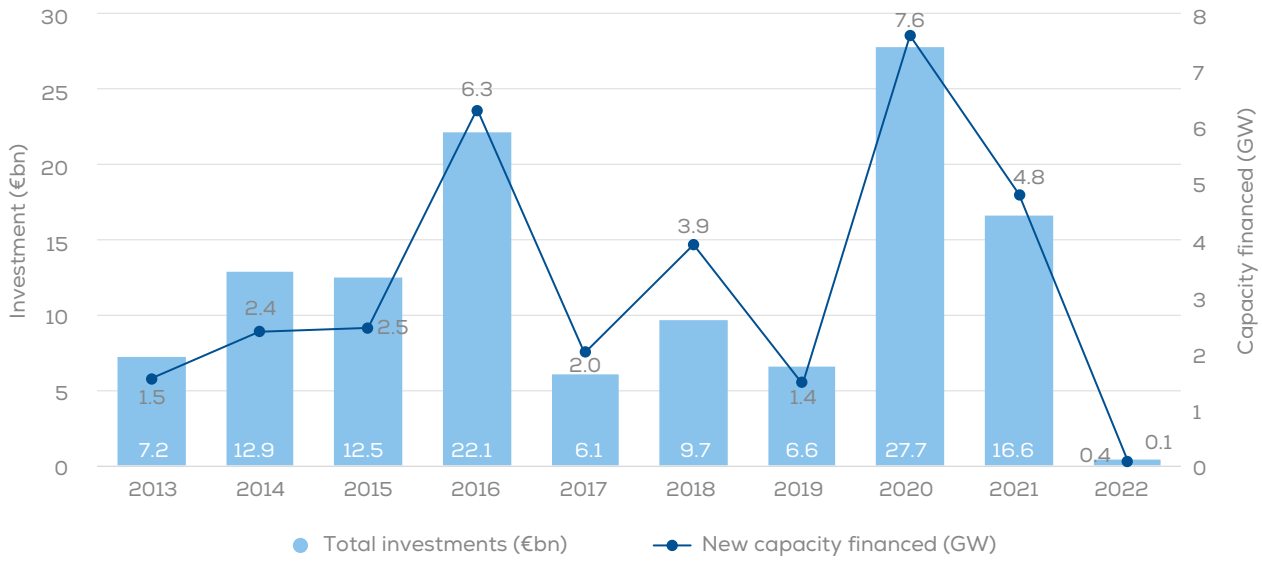
1. Wind energy in Europe: 2022 Statistics and the Outlook for 2023-2027

In recent years, offshore financing has been driven 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 2, Hornsea 1 and East Anglia 1).

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 succeeded 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 capital invested.

In 2022 the UK carried out the largest renewable energy auction to date with almost 7 GW of CfDs awarded to bot-tomfixed offshore projects. The five project are all expected to come online by 2026/27.

FIGURE 10. Investment in new offshore wind farms in 2013 - 2022 (GW and €bn)



Source: WindEurope

1.3 Capital cost trends

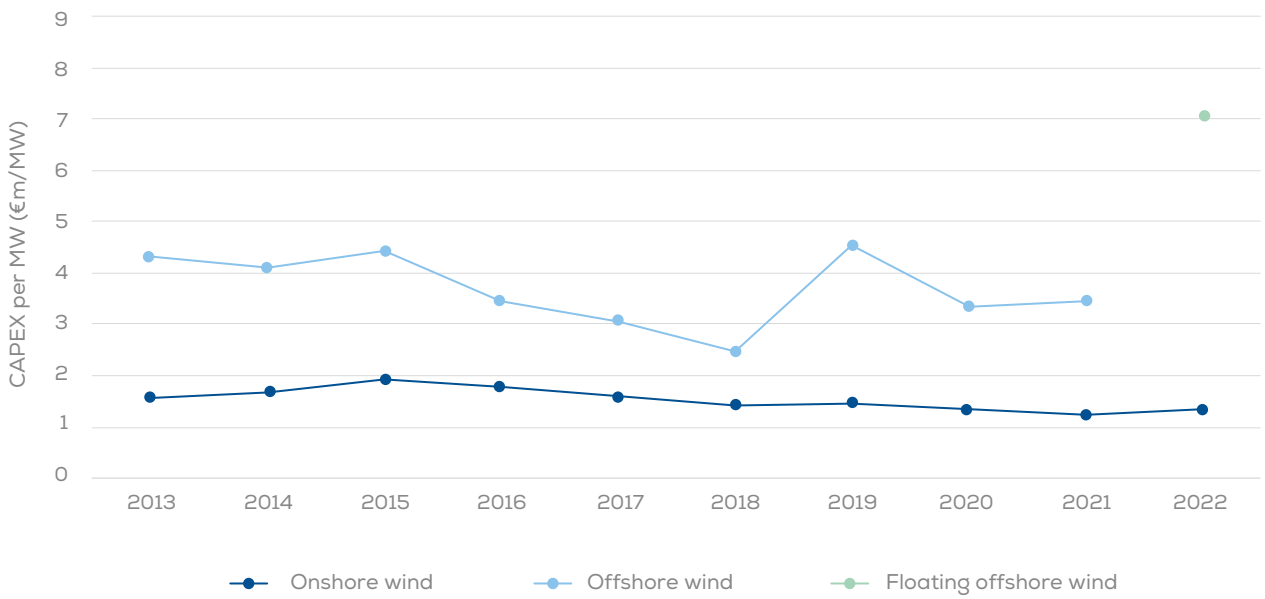
Capital expenditure per MW for new onshore wind farms fell between 2015 and 2021 from €1.9m/MW to €1.3m/MW on average. The average CAPEX per MW for onshore wind farms financed in 2022 was €1.4m. Capital expenditure per MW was already expected to rise compared with last year as the growing cost of raw materials, supply chain disruptions and inflation were beginning to show. We expect these cost increases to continue until new project costs and economics stabilise.

Norway saw the cheapest onshore wind farms in 2022 with projects being financed at just under €1.2m per MW on average. Spain (€1.2m/MW), Sweden (€1.3m/MW) and Poland (€1.3m/MW) were the larger markets with the lowest costs. In 2022 Croatia, Romania and Azerbaijan all had costs of around €1.2m/MW, albeit with fewer projects including just one project financed in Azerbaijan.

The differences in onshore wind costs between countries are largely driven by two factors: land and permitting constraints and maturity of the market. The lowest costs are generally found in more mature markets with established supply chains and fewer land constraints - with no strict setback rules for example. In these places (Norway, Spain and Sweden) developers are able to take advantage of economies of scale.

Countries with stringent permitting and land constraints, and/or with little history of wind energy development tend to see higher capital costs. Examples for restricted space or permitting include Germany (€1.4m/MW), Ireland (€1.4m/MW), France (€1.5m/MW), and the Nethelands (€1.6m/MW). Serbia which has a less established supply chain and recorded its first investment in onshore wind since 2018, financed the 103 MW Krivaca wind farm at €1.7m/MW.

FIGURE 11. Capital expenditure per MW financed in wind energy 2013 - 2022 (€m/MW)



Source: WindEurope

There were no large-scale offshore wind farms taking FID in 2022, but two floating demonstrators were financed. The capital expenditure per MW for the floating offshore wind farms was €7m.

Floating wind energy technology is currently in its pre-commercial phase. As the technology matures, the supply chain develops and the risks are better understood and accurately priced, the costs are likely to fall. We expect it will have similar costs to bottom-fixed offshore wind by 2040.

We also expect capital expenditure for both onshore and fixed-bottom offshore to increase over the next few years, because of the rising price of raw materials. But generally speaking bottom-fixed offshore wind is less susceptible to sudden price hikes than onshore wind. This is mostly because of longer project lead times – meaning developers have more room to source cheaper supplies.

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 in 2021, 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 endeavour. 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, Princess Amalia (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 bottom-fixed 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 a report on financing offshore wind which was published by WFO, and kindly provided to WindEurope by Jérôme Guillet, formerly vice-chair of WindEurope's Finance Working Group.

2. https://wfo-global.org/wp-content/uploads/2023/03/WFO_Global-Offshore-Wind-Report-2022.pdf

1.4 New wind farm financing by country

Germany invested the most capital in new wind farms, with €2.3bn raised for new onshore wind farms. Finland (€2.1bn), Poland (€1.9bn) and Sweden (€1.8bn) came next respectively. Poland was the only country in the top four to invest more in onshore wind in 2022. These projects were the final ones to be approved before the introduction of the restrictive "10H" rule in 2016.

France was the only country to see any investment in offshore wind, albeit just €0.4bn. With €1.2bn raised for onshore wind as well, it had the fifth highest investment figure in Europe.

Only seven countries in total invested €1bn or more in new wind farms. This is compared with 11 in 2021.

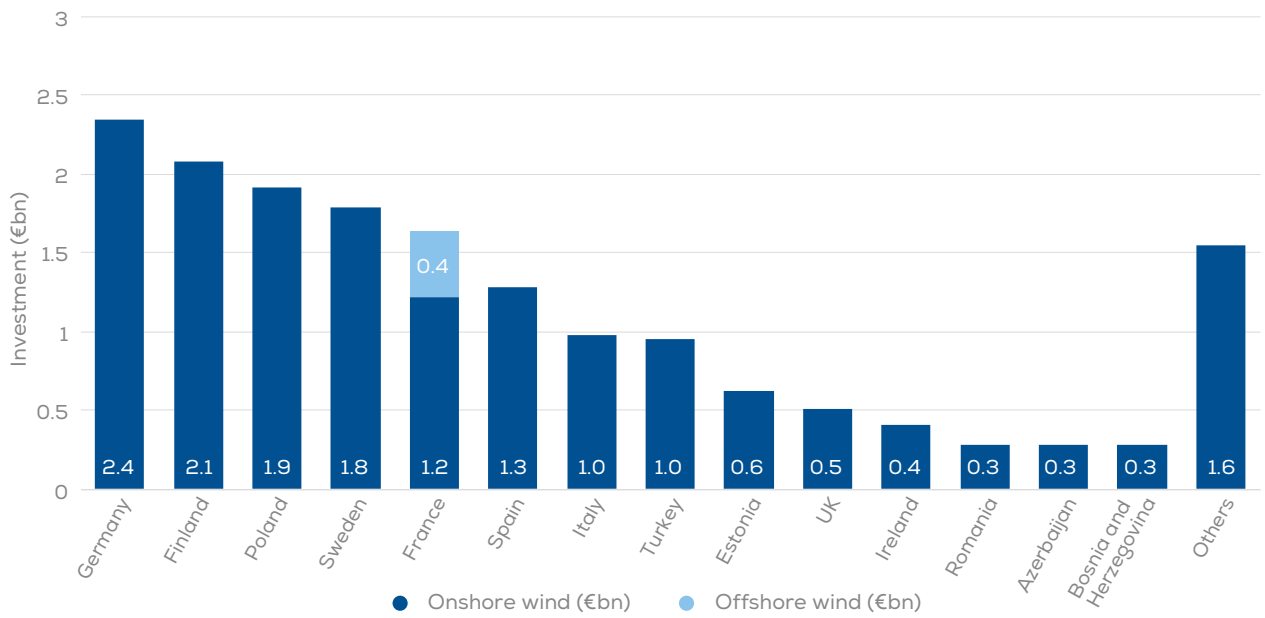
Northwest Europe[3] saw the most investment, but at a lower proportion than in previous years. 55% of the capital raised for new wind farms was in Northwest Europe, amounting to €9.4bn in 2022. In 2021 and 2020 the proportion was 75% and 85% respectively.

In South Eastern Europe[4] (SEE), 860 MW of new projects were financed with investments totalling €1.1bn, representing 7% of all new onshore wind farms financed in Europe. Many EU markets have still seen no investments in wind energy, despite having significant potential for the expansion of wind power.

National energy policies and an unclear regulatory environment have dampened investment and financial commitments across half of the EU Member States, including many in the SEE region.

The 860 MW of capacity financed in 2022 was more evenly split between countries in the region than in previous years.

FIGURE 12. Investment in new wind farms by country in 2022 (€bn)



Source: WindEurope

Three projects reached FID in Romania, with a combined capacity of 250 MW. 220 MW each of new capacity was financed Bosnia & Herzegovina and in Croatia, with another 170 MW in Greece.

Outside of these regions, Turkey saw the most investment with €1bn financing 700 MW of new onshore wind projects. Estonia had a record year for financing with four projects reaching FID for a total of 438 MW. Another two projects were financed in Lithuania for 90 MW and the first wind farm in Azerbaijan reached FID. This is a 240 MW project being developed by ACWA Power.

3. Belgium; Denmark; Finland; France; Germany; Ireland; Luxembourg; Netherlands; Norway; Sweden; UK
4. Albania; Bosnia & Herzegovina; Bulgaria; Croatia; Cyprus; Greece; Kosovo; North Macedonia; Moldova; Montenegro; Romania; Serbia; Slovenia

Photo: Vestas Wind Systems A/S

2.

Sources of finance in 2022

2.1 Corporate and project finance

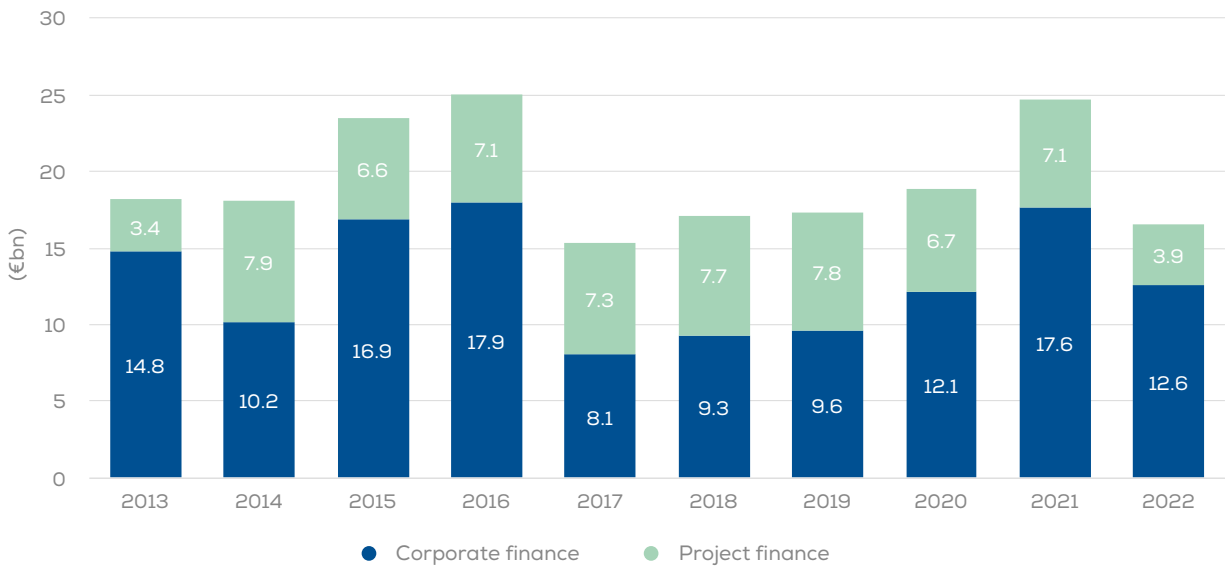
Corporate finance transactions – where a company raises the capital to build a wind farm on its own balance sheet – normally makes up 50-70% of the capital raised for onshore wind. In 2022 76% of the capital raised for onshore wind was raised on the balance sheet.

This is the highest proportion since 2013 and this recent increase is probably the result of worsening financing and economic conditions. With interest rates rising to tackle inflation and with new risks of project delays, bank margins have also increased, leading to higher costs of borrowing.

Lenders, developers and OEMs are having to carefully consider their risk sharing, dragging out negotiation times and the complexity of deals. Developers who can finance a project with equity or through corporate loans are able to do so more cheaply, more easily and therefore more quickly.

It is useful to take a look at the capacity financed to better understand the 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 13. Onshore wind corporate and project financing 2013 - 2022 (€bn)



Source: WindEurope

The amount of capacity financed on a project finance basis has generally averaged between 4 and 6 GW in recent years. But investments of this kind were particularly small last year with just 3 GW of new capacity financed. This is the lowest amount in a decade and points to the changing project financing dynamics.

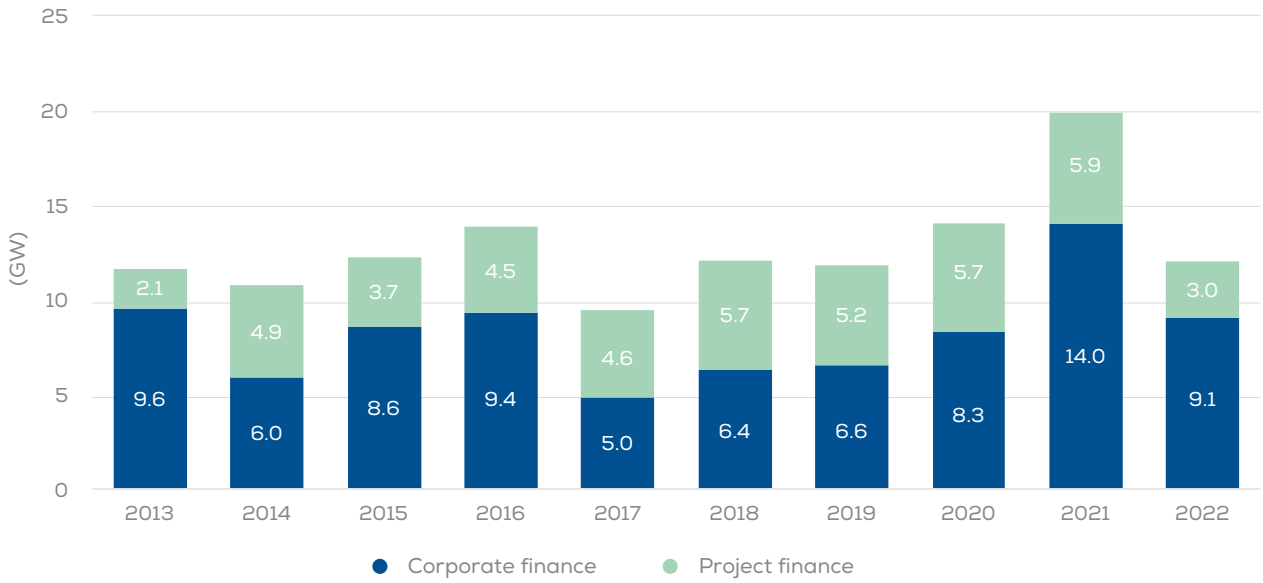
There is plenty of project finance debt available, particularly for renewables, but these results show the difficulties that stakeholders are currently facing. Project finance deals are taking longer to draw up in the current climate. This includes the time needed to negotiate risks more carefully and to find the right lenders. We are seeing these delays in the 2022 project finance numbers.

Onshore investments on a corporate finance basis were fairly positive in 2022, with 9.1 GW of new capacity financed. Aside from 2021, which was a record year, this was the largest capacity financed on a corporate finance basis since 2016.

In 2017 there was a stark drop in corporate finance activity, from 9.4 GW in 2016 to just 5 GW in 2017. In Germany, the largest onshore market in Europe by a considerable margin, the change from the Feed-in Tariff support system to the auction system had a particularly strong effect. Developers fast-tracked projects so they could be submitted before the system was introduced – at the expense of less developed projects[5]. 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.

There are also fewer wind farms financed on a project finance basis in Germany compared with the European average. More than 90% of project capital is typically raised on a corporate finance basis. So the tanking 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.

FIGURE 14. Onshore wind capacity financed: corporate and project financing 2013 - 2022 (GW)



Source: WindEurope

5. Szabo, J., Brückmann, R., Menzies, C., & del Río. P. Competition dynamics revisited.

Debt ratios for project financed wind projects are usually in the region of 80-90%, which reflects the maturity of the technology. More mature technologies can raise more debt capital because banks can understand and price the risks, and a proven track record of successful projects helps to boost confidence. As debt is a lower risk investment than equity – since it is repaid first in the event of bankruptcy – it is a cheaper form of financing. Usually therefore, the higher the debt ratio, the lower the cost of capital.

In 2022 debt accounted for 92% of the capital raised on a project finance basis for new onshore wind farms.

Offshore wind projects tend to be much larger than onshore projects and often lend themselves to project finance structures. This is because few developers can raise the necessary funds for these large projects on their own balance sheets.

In 2022 there were no FIDs for large-scale offshore wind farms but both of the French floating demonstrator projects were financed on a project finance basis, with support from the European Commission through the European Investment Bank.

FIGURE 15. Offshore wind corporate and project financing 2013 - 2022 (€bn)

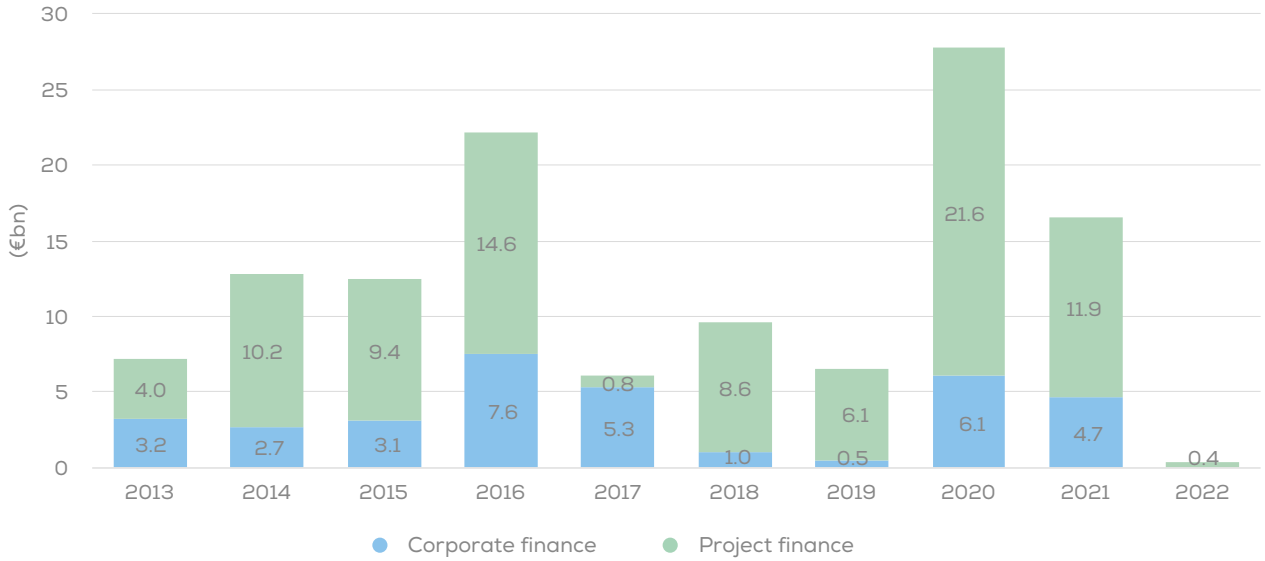
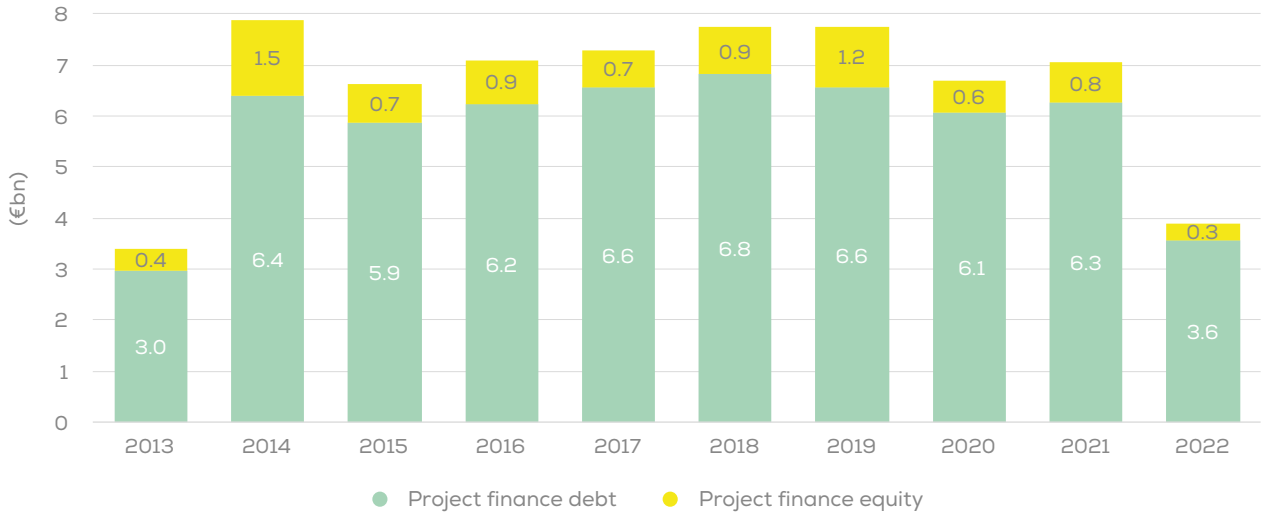


FIGURE 16. Onshore wind project financed debt and equity 2013 - 2022 (€bn)



Source: WindEurope

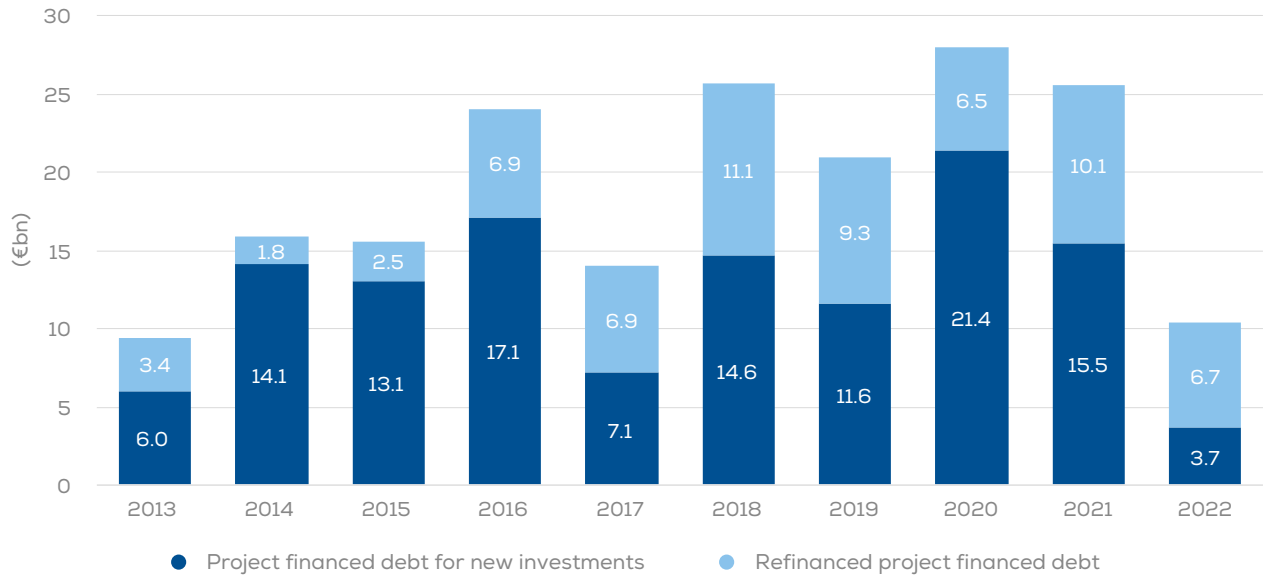
2.2 Project financed debt

Project financed debt (non-recourse debt) has become more important in financing wind projects in recent years. 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 lendors and Export Credit Agencies (EACs). This has led to a high level of affordable debt, particularly in the form of non-recourse financing.

In the current economic climate non-recourse financing is still readlily available for renewables, particularly well structured projects, albeit with higher rates of interest. But the extra risks, costs and time needed to organise lending on a project finance basis has led investors to look elsewhere - such as equity for example - to finance their projects in the short-term, with a view to financing the projects with debt later on.

Offshore wind projects typically make up more than half of new project finance investments. In 2022 the lack of FIDs in large-scale offshore and the lowest project financed onshore capacity since 2013 led to just €3.7bn of total investments on a project finance basis in 2022, the lowest amount since 2005.

FIGURE 17. Project finance debt: new investments and refinancing 2013 - 2022 (€bn)



Source: WindEurope

When a wind energy project is commissioned, its risk profile changes significantly. The risks during construction are replaced by operational risks. This affects the likelihood 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.

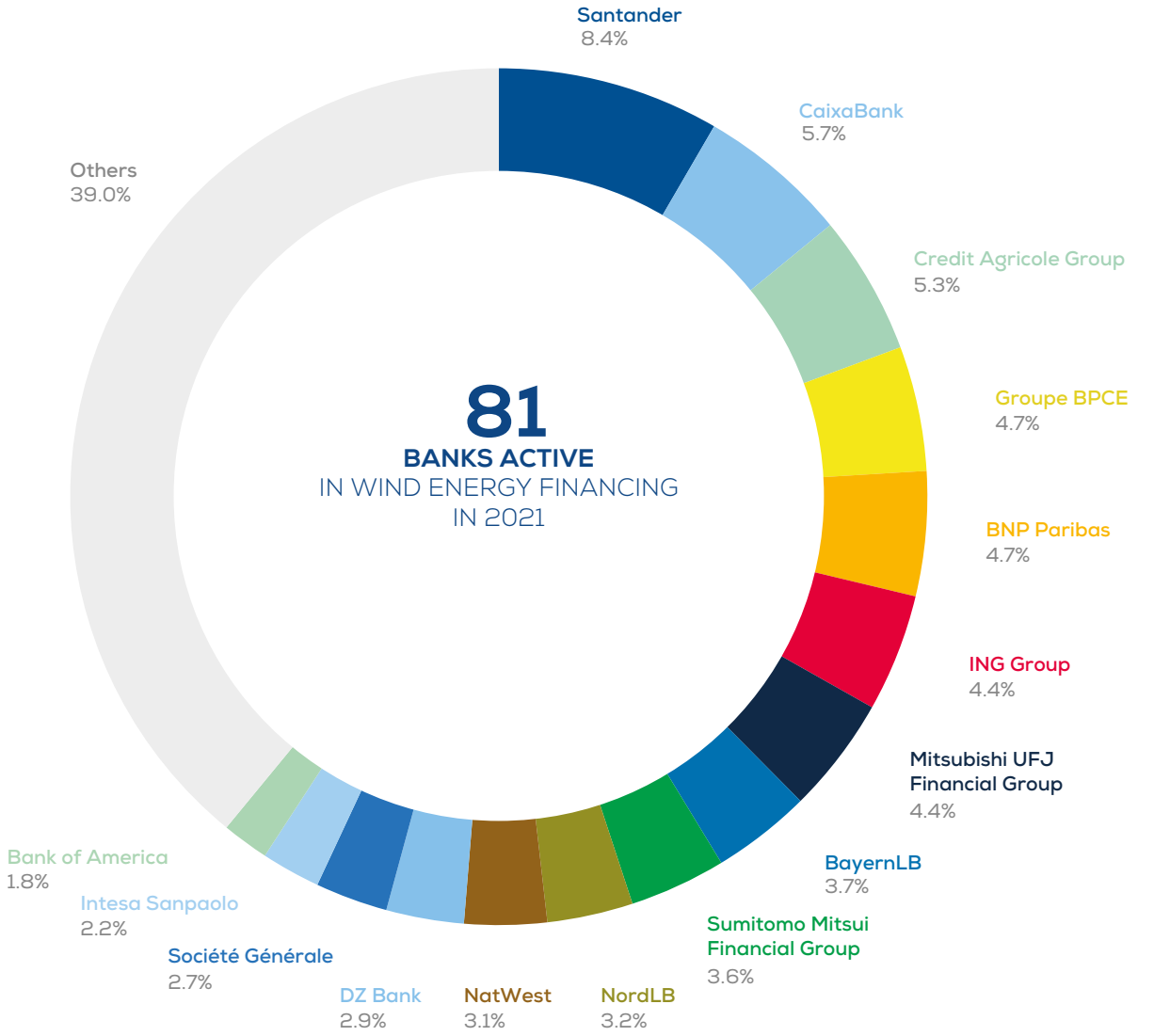
Banks for example might provide debt to cover the construction of a wind farm, which usually takes around a year for onshore projects and 2-3 years for offshore wind projects. During this period the wind project doesn't produce any revenue. There are other risks as well, such as losses from accidents 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.

In the current economic climate, the trend for refinancing has not slowed to the same degree as new project financing. There may be more incentives for refinancing since investors are able to stick to the underlying low cost of money which they previously agreed to.

In 2022 all refinancing activity centred on onshore wind projects – there was no offshore wind project refinancing that year. In 2020 and 2021 onshore wind accounted for 50% and 59% of refinancing activity respectively. Of the €6.7bn of refinancing activity for onshore wind farms, 70% of this was asset owners refinancing onshore wind farm portfolios.

FIGURE 18. Market share of banks in wind energy financing in 2022



Source: WindEurope

This shows that asset managers and developers are optimising their current portfolio of assets while in many cases holding off decisions on new investments until there is greater regulatory, financial and economic stability.

Market turbulance following supply chain shortages, high energy prices and inflation have altered project dynamics in the short-term. Interest rates have increased at their fastest rate for at least 20 years as banks try to reign in inflation.

On top of this, heightened risks of project delays or non-delivery, and new risks for borrowers brought on by volatile raw material prices, have increased risk premiums charged by lenders. For many years lenders had been cutting premiums as they became more at ease with the risks in light of the technology's positive track record.

But the growing cost of debt affects all players equally, and there is a corresponding rise in the cost of equity which means rising costs of capital for everyone.

Even though project finance investments in wind energy were down in 2022, there were still over 81 lenders active. This is down from a record 96 in 2021 but still significantly more than in 2020 when only 67 lenders were active. These lenders include multilateral financial institutions, export credit agencies and commercial banks.

2.3 Project acquisitions

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 changing risks and characteristics of the different stages attract a wide range of investors.

The Netherlands saw the greatest acquisition activity in monetary terms (€2.6bn). Almost all of this was in respect of BASF's acquisitions of shares of Hollandse Kust 1-4 (1,400 MW), Swiss Life Asset Managers and Luxcara's purchase of shares of Borssele III & IV (731.5 MW) and Octopus Energy Generation's acquisition of the 19 MW Borssele V wind farm. The total capacity changing ownership in the Netherlands was 969 MW, of which these transactions came to 945 MW.

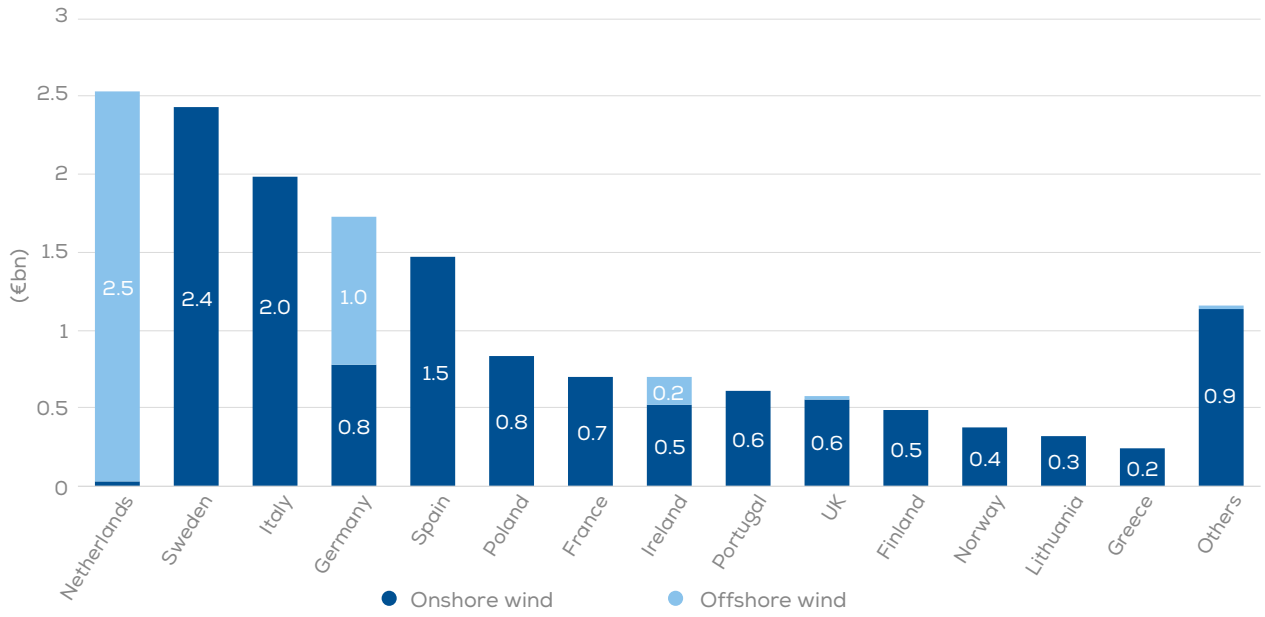
Sweden saw the most onshore wind acquisition activity with €2.4bn of wind project equity investment involving 2.8 GW of capacity.

Spain saw more capacity changing hands then any other country. In fact almost 23% of all the nameplate capacity involved in project acquisitions in Europe was in Spain. There were 5.1 GW of potential onshore projects being acquired, with €1.5bn of equity investment. A few developers have been active in buying up large project portfolios in early stages of development so as to benefit from potential extra returns from taking on early development risk.

Project acquisition activity in 2022 totalled €16.3bn. In monetary terms this is slightly more than in 2020 (€14.1bn) and 2021 (€15.6bn).

These project acquisitions help developers to finance projects efficiently. In the current economic climate, even though equity investors will want to be compensated for greater risks (making equity more expensive), it allows project development to continue without the need to commit to long-term financing. Developers can then take more time to organise debt finance or can delay the transaction until market conditions improve.

FIGURE 19. Project acquisitions by country in 2022 (€bn)



Source: WindEurope

In terms of capacity acquired 2022 was a record year, with 22.3 GW changing hands, 29% up on 2021 and almost 60% higher than activity in 2018. This suggests investors continue to target earlier stage development projects, not just in Spain, but across Europe as a whole. Whether this is to try to boost returns in a competitive field by taking on more early-stage risk, or to gain market share, investors have had to become more sophisticated to enter projects at earlier stages.

Investors acquired 8.6 GW and 9 GW of wind farms in operation or under construction in 2021 and 2022 respectively. Acquisitions of projects in development grew by 30% with 10.7 GW changing ownership in 2022, up from 8.2 GW in 2021. Acquisitions of projects in pre-development increased fivefold, with 2.7 GW of these very early stage projects being bought up in 2022.

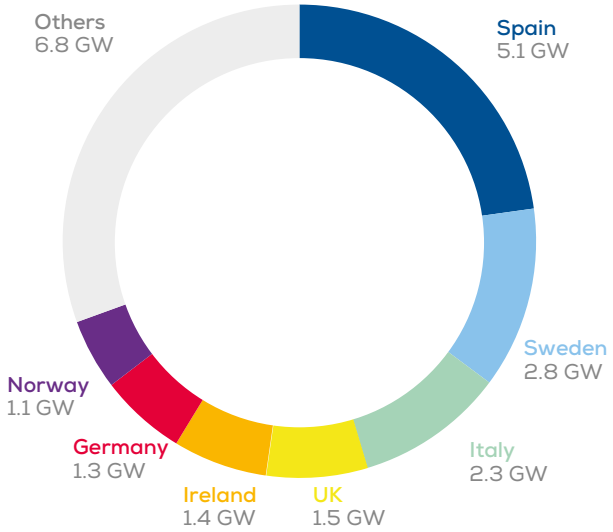
The relative value of a wind farm depends on its stage of development. Wind farms gain value through development stages. This is followed by a large increase in value during construction as tangible assets are installed. A wind farm is at its most valuable on its commissioning date, after which the value depreciates slowly.

Since Spain saw the highest acquisition activity with 5.1 GW but only €1.5bn in transactions, we can see that most of these acquisitions were for early-stage projects – pre- and during development. At the other end of the spectrum, all acquisitions in the Netherlands were for operational offshore wind farms or offshore wind farms under construction. The amount of capacity changing hands was around 1 GW, seventh in Europe, but these transactions had the highest value, totalling €2.6bn.

FIGURE 20. Capacity acquired by wind farm phase in 2021 and 2022 (GW)

Source: WindEurope

FIGURE 21. Capacity acquired in wind energy projects by country in 2022 (GW)



Source: WindEurope

2.4 Corporate renewable PPAs

Corporate sourcing of renewable electricity through Power Purchase Agreements (PPAs) has been growing steadily since 2015. Corporates have a variety of reasons to source power from renewables, but the potential to cut down and fix electricity costs is a big rationale for these deals. A survey of 1,200 companies across six countries in 2019 showed that among those sourcing renewables, 92% of them were doing it to cut down on energy costs[6].

Although renewable electricity contracted through PPAs in 2022 was not as high as the record set in 2021 – when 7.6 GW of PPAs were signed – 6.6 GW of wind, solar and other renewable projects outputs were contracted in 2022. This was more than double the next highest figure contracted in 2020.

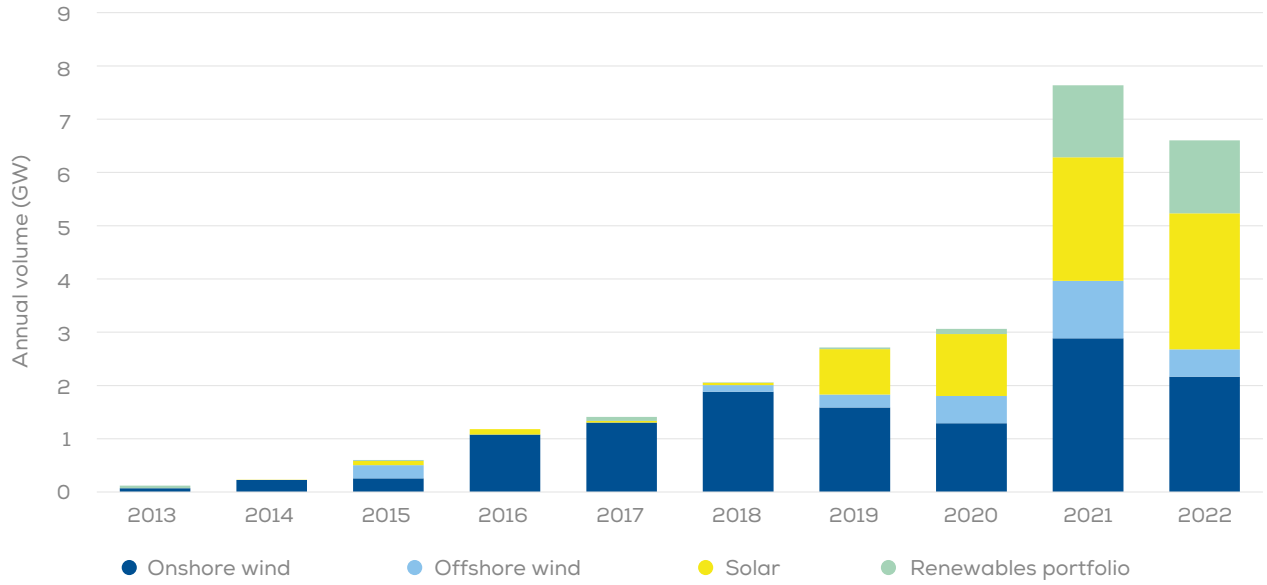
But 2022 was a record for the number of PPA contracts signed with 106, 44 of which were for wind energy, 53 with solar power and the remaining with renewable portfolios. In terms of capacity wind and solar came out even with 2.7 GW contracted for wind energy – including 0.5 GW offshore – and 2.6 GW contracted for solar plants.

Until 2018 wind accounted for 90% of contracted capacity in Europe. But the last few years have seen a rapid expansion in solar PPAs, which has really helped to drive market growth. In 2022 wind accounted for around half of the contracted capacity, and cumulatively, wind makes up two thirds of contracted capacity in Europe at around 16 GW.

Wind energy is very well placed to accommodate corporate needs for renewable electricity because of its modular scale, cost-competitiveness and low risk profile. Typically around 10-20% of new wind farm capacity financed is supported by a corporate PPA.

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 financing cost. Lenders usually 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 variable revenue.

FIGURE 22. Renewable energy corporate sourcing through PPAs (GW)



Source: WindEurope

6. BayWa r.e. Energy Report 2019, published in partnership with the RE-Source Platform.

Renewable portfolios have become more popular in the last few years. These include wind and solar assets and in some cases hydropower as well. The asset owners can use the portfolio to diversify risks across technologies and geographies. The renewable projects are usually already operational but some of them feature projects under construction or in development – offering the buyer some degree of additionality. Importantly this type of contract can have a shorter tenor and allows corporates with lower credit ratings to benefit from renewables (since they do not need to be investment grade to provide downside protection to lenders). At the same time the asset owners gain some degree of price stability for their own portfolio.

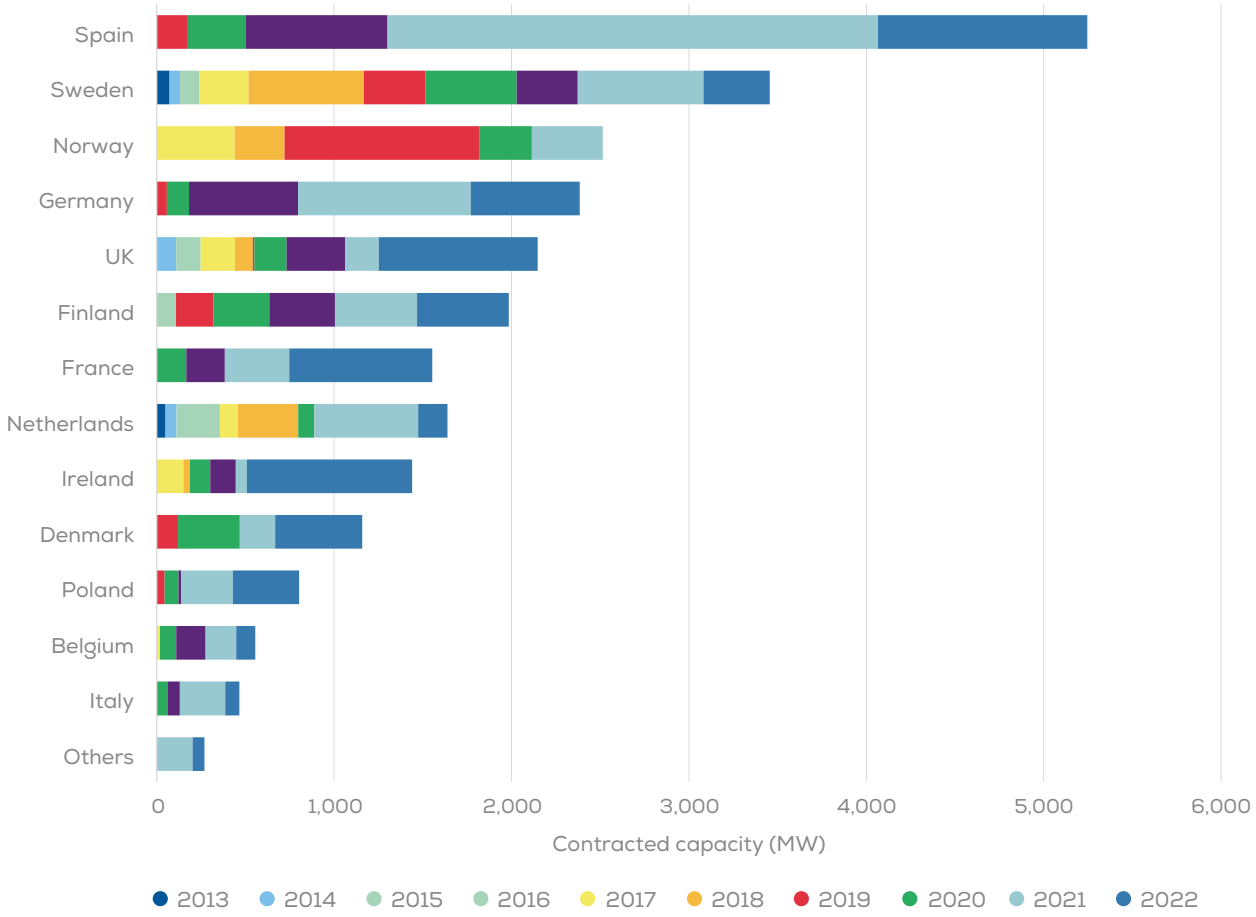
The Nordic countries were traditionally the largest markets for PPAs, followed by the UK and the Netherlands. Since 2020 however, both Spain and Germany have seen significant volumes of PPAs signed, and France and Ireland both signed large volumes in 2022. Spain now leads Europe in contracted PPA volumes with over 5 GW.

PPAs are being signed by more companies, across a growing number of sectors and countries. They will play an increasingly important role in meeting corporate demand for renewable electricity in the years ahead, and in supporting the financing and build-out of renewable electricity in Europe.

Demand for renewable electricity comes from a wide range of industrial sectors and we've seen a diversification in off-takers signing PPAs in recent years. As it stands, ICT and heavy industry have contracted most corporate renewable PPAs in Europe. In 2022 four of the top five buyers were global ICT corporations, namely Microsoft (910 MW), Amazon (715 MW), Google (249 MW) and Meta (210 MW). Renault contracted the third largest capacity of renewable energy in 2022 with a 350 MW supply contract with Voltalia for solar power.

But it is not just the largest companies that are signing PPAs. To date more than 220 companies have signed renewable PPAs and 60 companies have contracted over 100 MW from renewable power generators across Europe.

FIGURE 23. Renewable energy corporate sourcing through PPAs (GW)



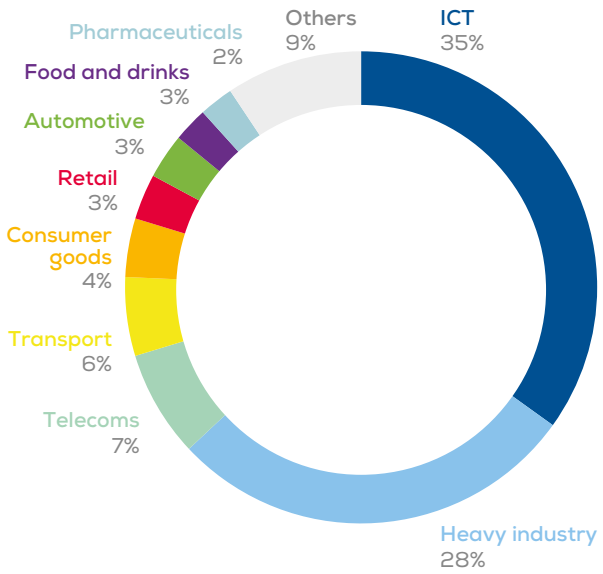
Source: WindEurope

Decarbonising energy-intensive industries is key to decarbonising the European economy as a whole. It is positive that progress is being made here. Aluminium smelters make up almost half of contracted PPA volumes but other sectors are now working more closely with renewables. The chemicals industry has made progress in recent years, having signed more than 1.4 GW of renewable capacity since 2020.

A number of other sectors saw significant volumes of PPAs signed in 2022. There was 786 MW of PPAs signed by the telecoms sector which now has a contracted volume of almost 2 GW in total. The automotive sector has signed over 420 MW of new PPA capacity, driven by the 350 MW Renault PPA. And the consumer goods and retail sectors combined signed almost 500 MW.

The largest volumes in 2022 were signed by the ICT (2.3 GW) and heavy industry sectors (1.5 GW).

FIGURE 24. Total renewable energy capacity contracted through corporate PPAs by sector (MW)



Source: WindEurope

Photo: Shutterstock

3.

Wind energy finance policy

3.1 REPowerEU

The Russian invasion of Ukraine transformed the narrative on energy policy. The war has underlined the critical importance of energy independence and the value that renewable technologies can deliver together with their primary benefit of reducing greenhouse gas emissions.

In response, the European Commission issued the REPowerEU Action Plan which aims to cut the EU's reliance on fossil fuel imports from Russia and reduce fossil fuel imports in general by accelerating the build out of renewables and renewable hydrogen. Under the plan the EU's binding renewables target would be increased to 45% of total energy demand, up from 40% in the Fit-for-55 proposal.

WindEurope estimates that the installed wind power capacity required to meet a 45% renewable energy target in the EU would be 440 GW. This is based on calculations involving new onshore and offshore wind farms with capacity factors in the region of 35% and 45% respectively.

To meet these targets the right policies must be put in place to provide regulatory stability, revenue stability for renewables and support for the scale-up of wind energy manufacturing in the EU.

For a number of years, permitting has been the largest bottleneck for renewable projects. A lack of common practices, understaffed agencies, complicated and restrictive rules and ambiguity leading to legal challenges have all helped to delay projects for many years across Europe.

The Action Plan defines new policies for permitting. It calls on National Governments to define renewable 'go-to' areas with shortened and simplified permitting processes in areas with lower environmental risks. Renewable projects in 'go to' areas should take no longer than one year if onshore and two years if offshore to obtain all permits.

3.2 EU emergency measures

The war in Ukraine put huge strain on Europe's economy. In the process, it highlighted the dependence of its energy and electricity needs on global supply chains, which are vulnerable to geopolitical tensions.

Article 122 of the European Union Treaty gives the Council the power to quickly adopt emergency economic measures. It allows Qualified Majority Voting (QMV) on European Commission proposals, effectively bypassing negotiations with the Parliament to speed up the process.

In 2022 emergency measures were put into place to reduce the impact of the crisis in Europe, with mixed results for the wind industry.

In December 2022 the EU formally agreed emergency measures on permitting. Under the new rules Member States have signed up to the principle that renewables are of overriding public interest. This means EU Member States can fast-track renewables permitting while ensuring a good working balance with other societal interests such as biodiversity protection.

And under the new measures, Member States have to grant permits to new repowering projects within six months, including the Environmental Impact Assessment (EIA) and the grid permits. These new rules apply to all new permitting applications but Member States can apply them to permits already in the pipeline.

Governments are now actively working to tackle permitting bottlenecks and we are already seeing progress in this area.

As part of another emergency measure introduced in October 2022 – designed to address high energy prices – Member States agreed to impose caps on inframarginal electricity generators of €180/MWh. The aim was to temporarily limit the effect of extremely high gas prices on electricity generation.

Unfortunately, Member States were allowed to deviate from the €180/MWh, which they did. This has led to different caps and interventions in markets across Europe, creating great uncertainty and severely damaging investor confidence.

3.3 Market design reform

In March 2023 the European Commission issued a reform to the EU's internal electricity market. This is intended to accelerate the deployment of renewables, phase-out fossil fuels and protect consumers against future spikes in electricity prices, like those seen over 2022.

The proposal also seeks to cut price dependence on fossil fuel generation and to make the EU's industry cleaner and more competitive.

At its core, it proposes that all Government revenue support for non-fossil generators should be in the form of 2-sided contracts for difference (CfDs).

Revenue stability is key to delivering wind energy at the lowest possible cost, and CfDs are the most efficient way to provide that revenue stability. When electricity prices are lower than the strike price (agreed in a competitive auction) the Government pays the wind farm a top-up so they receive the strike price. And when electricity prices are higher than the strike price, the wind farm pays the Government back the extra, so again in effect they still receive the strike price.

In times when electricity prices are very high like in 2022, the Government receives income from wind energy which can be used to protect consumers. When electricity prices are lower the Government does provide support but the cost is set out in advance and fixed for the tenor of the contract, which is valuable in reducing cost volatility.

Given the impact of inflation, it is vital that CfDs are fully indexed to inflation to protect developers and the supply chain from project costs increasing significantly.

The proposed reform also encourages Member States to design their auction schemes to allow a combination of CfDs and PPAs. This is important as the EU's industry decarbonises. And Member States are to put in place guarantee schemes to reduce financial risks associated with creditworthiness of off-takers which could open up PPAs to a wider pool of corporates. Merchant projects (where no support is provided) are also feasible under the proposal giving developers the flexibility to finance projects in the best way for them.

Negative bidding is currently allowed under the proposal. Negative bidding, especially without a cap, adds costs to wind energy development at a time when the supply chain is already under extreme pressure and when supply chain, commodity, logistical and financing costs are all rising sharply.

Finally the emergency measures designed to protect consumers from high energy prices at the peak of the crisis in 2022 are not part of the Market Design proposal. It is vital for investor confidence that regulatory certainty is restored and a unified market, fit for renewables investment, is introduced as soon as possible.

This Market Design Reform is advancing in parallel to the Green Deal Industrial Plan which aims to enhance the competitiveness of Europe's net-zero industry and accelerate the transition to climate neutrality. Other initiatives under the Plan include the Net-Zero Industry Act and the Critical Raw Materials Act.

3.4 Net-Zero Industry Act

The Net-Zero Industry Act aims to support investment in European manufacturing capacities in 'net zero emissions' technologies. These are wind energy, solar, renewable hydrogen, Carbon Capture and Storage (CCS) and energy storage.

Each technology has a manufacturing capacity objective – in the case of wind energy the target is 36 GW a year. The financial support will be provided from existing EU funds, for example the Innovation Fund.

Access to finance will be overseen by a Net-Zero Industry Platform, to be coordinated between National Governments and the Commission, and targeted at financial needs and bottlenecks in manufacturing supply chains.

In the Market Design Reform, Member States are encouraged to design CfD auctions to be combinable with PPAs. The Net-Zero Industry Act states that Member States should have non-price criteria in their CfD auctions covering environmental sustainability, energy system integration and supply chain resilience. These non-price criteria should be worth between 15% and 30% of the overall rating.

However the non-price criteria on supply chain resilience is very narrowly defined. And National Governments are free not to apply them if the resulting additional costs would be more than 10%. As it stands, the Commission proposal will do little to support the European supply chain.

And at the same time the European Commission issued more flexible State Aid Guidelines which allow National Governments to temporarily support their domestic clean technology supply chains. Support must be awared by December 2025.

The European Green Industrial Act's proposals are a good first step. The market design proposals send a positive signal to investors and the Council and Parliament must now stick to this balanced proposal and end the current uncertainty caused by uncoordinated market interventions.

For the Net-Zero Industry Act the 36 GW annual manufacturing target is a good objective but we need meaningful measures on funding. This can be done through altering the scope of the Innovation Fund by removing the innovation pre-condition (Europe needs to be increasing volumes

rather than focusing solely on innovation) and developing a practical and impactful Sovereignty Fund later this year. Improvements also need to be made to the non-price criteria in auctions which are curently unhelpful.

Overall investors need some degree of certainty on prices, revenues and returns and importantly they need a stable regulatory and political environment. It is not possible to hedge against regulatory and political risk.

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):** the final decision to go ahead with a project once the permitting and financial arrangements are in place.
- **Capacity factor:** a measure of how often during a year a power generator is operating at its maximum output. A 100% capacity factor would imply a generator produces at its nameplate capacity for every hour of the year.
- **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.
- **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 500+ 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.

Wind EUROPE

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