

Offshore Wind: Opportunities and Challenges to Irish Development

Offshore wind energy has been a prominent feature of the Danish, UK, and other European markets for several years, and now presents an emerging opportunity to transform Ireland’s energy markets. However, significant obstacles lie ahead, including political, regulatory, and commercial challenges. This KBRA report examines these opportunities and challenges, as well as how Ireland’s ambitious renewable energy targets could transform into a realistic proposition over the coming years.

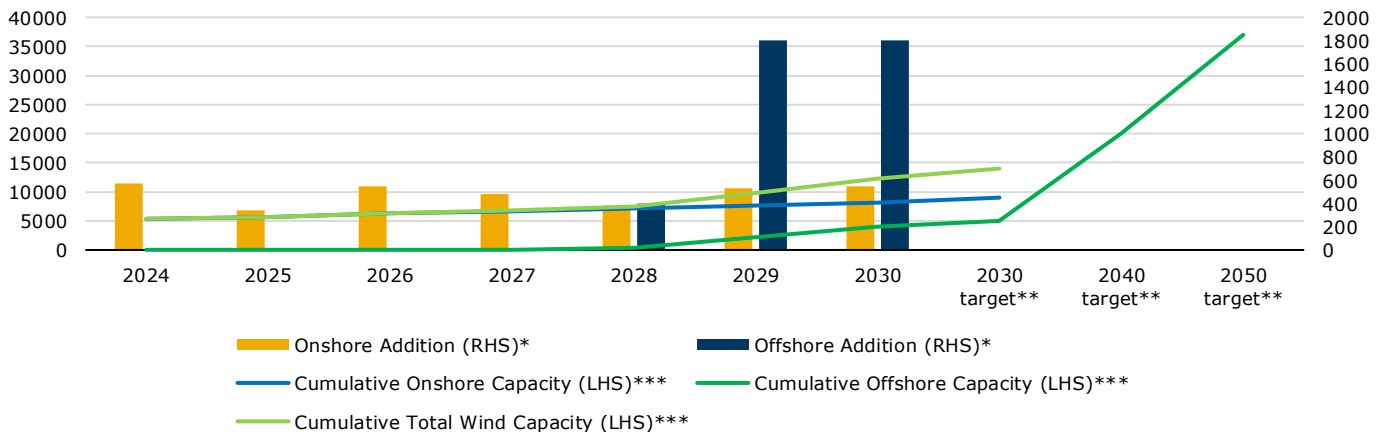
Key Takeaways

- Ireland has outlined ambitious plans to deliver 20GW of offshore wind power by 2040, more than triple the current nameplate capacity.
- These plans come with regulatory, commercial, technological, and other challenges. Specifically, construction risk, development cost risk, permit-related matters, ensuring a robust auction process, and enabling infrastructure are all important for Ireland to develop a strong market.
- Multibillion euro projects mean both private and public capital markets are key to support the renewable transition. The use of contracts for difference (CFD) and power purchase agreements (PPA) are important to help support and reassure potential financiers.

Ireland Targets Ambitious Growth

Ireland’s offshore renewable energy (ORE) targets include 5GW of grid-connected offshore wind in addition to 2GW of non-grid connected floating offshore wind in development by 2030. The country aims to deliver 20GW of ORE by 2040, rising to 37GW by 2050, which is approximately six times the country’s current peak electricity demand (see Figure 1). Ireland’s nameplate capacity has been historically around 4GW-4.5GW.

Figure 1: Ireland’s Planned Offshore Wind Production (MW)



* WindEurope projections.
 ** Excluding decommissioning and repowering.
 *** Where government target information is announced.
 Source: WindEurope

The Journey to a Major Renewable Energy Source Begins

The 2030 and beyond targets are split into phase 1 and phase 2 projects. It is anticipated that a large proportion of the 2030 target will be achieved through the initial phase 1 of offshore wind development in Ireland, which includes Ireland’s first ever offshore wind auction under the Renewable Electricity Support Scheme. However, with a combined capacity of phase 1 projects totalling around 4.4GW, coupled with prospects that some phase 1 projects may fail to secure a route to market or development consent, additional offshore projects are needed to meet the targets for the end of this decade. This transition from phase 1 to the longer-term offshore regime is referred to as phase 2.

In May 2023, a significant milestone on the journey to deliver Ireland’s ORE capacity targets was achieved when the country successfully held its first offshore wind auction. The auction (launched by EirGrid) is key to delivering Ireland’s 2030 Climate Action Plan and central to the government’s target to provide 80% of electricity from renewables by 2030 and allowed for the conclusion of phase 1 projects. Four projects with a combined capacity of 3GW were awarded. The winning bids were the North Irish Sea Array (Statkraft, 500MW), Dublin Array (RWE and Saorgus Energy, up to 850MW), Codling Wind Park (EDF and Fred Olsen, up to 1,450MW), and Sceirde Rocks (Corio Generation, 450MW). The winning bids will be granted a



20-year CFD with the average price of the winning bids at EUR86/MWh—one of the lowest prices paid by an emerging offshore wind market in the world. Three wind farms will be built off the East Coast and one off the West Coast. We understand the first projects could be operational by 2028, depending on how fast they attain planning permission.

Attention has now shifted to phase 2 for Ireland to fully meet its 2030 targets. Under phase 2, projects will be required to plug the gap in delivering the 5GW offshore (plus 2GW of floating) 2030 targets. To this end, in Q1 2024 the government published a document entitled *Powering Prosperity*, which describes the medium- and long-term strategy for delivering offshore wind in Ireland. The strategy highlights, among other things, the following: supply chain capacity and opportunities of offshore wind energy (OWE); measures to mitigate the risk to achievement of Ireland’s OWE targets arising from supply chain constraints; measures to develop both indigenous and export demand for OWE-derived energy; and an integrated spatial and economic framework for the development of clusters of economic activity in locations critical to the development of the offshore wind sector. The plan aligns with a policy document published at the same time relating to phase 2 offshore wind (*Accelerating Ireland’s Offshore Energy Programme*), as well as Ireland’s broader National Energy and Climate Plan (NECP) for 2021-2030.

Other key developments over the past year include the following:

- In July 2023, Ireland established a maritime regulator, the Maritime Regulatory Authority (MARA), responsible for the tendering process and granting of licences for phase 2 offshore wind works (such as seabed permits, dredging/port works, and cables).
- In May 2024, the Minister for the Environment, Climate and Communications published the draft South Coast Designated Maritime Area Plan (DMAP). This is Ireland’s first ever spatial plan for renewable energy at sea. The plan identifies four maritime areas off the South Coast where development of ORE is proposed to take place over the next decade. The DMAP is currently part of a public consultation that expires in mid-June 2024.
- The first phase 2 auction is expected to be launched in early 2025 (900MW).

SSE Renewables recently announced that it plans to submit an offshore planning consent application to Ireland’s planning authority (An Bord Pleanála) for the offshore infrastructure required for its proposed Arklow Bank Wind Park 2 project in the Irish Sea. The next phase of wind energy development at Arklow Bank will have a maximum export capacity of up to 800MW. The first part of the Arklow project is operated by GE Energy under a sublease to the foreshore lease and remains Ireland’s first and only operational offshore wind farm.

Progress with phase 1 and phase 2 signals Ireland’s emerging status as a future contributor to the EU’s overall offshore wind targets. While a relatively small share of the EU’s total offshore wind projects have been auctioned in the country, the longer-term ambitions through 2040 could transform the domestic energy sector in material ways if fully implemented. Ireland could potentially move from being a market that is largely reliant on energy imports to meet its domestic demands to a surplus energy producer exporting to other markets.

Growth in a European Context

Offshore wind energy accounts for a small (2%) portion of the European electricity mix (see Figure 2). However, cumulative capacity represented about 34GW at year-end 2023 when including Europe and the UK offshore wind, according to WindEurope, up from 22GW in 2019.

Figure 2: European Offshore Wind Energy as a Percentage of Total Electricity Mix

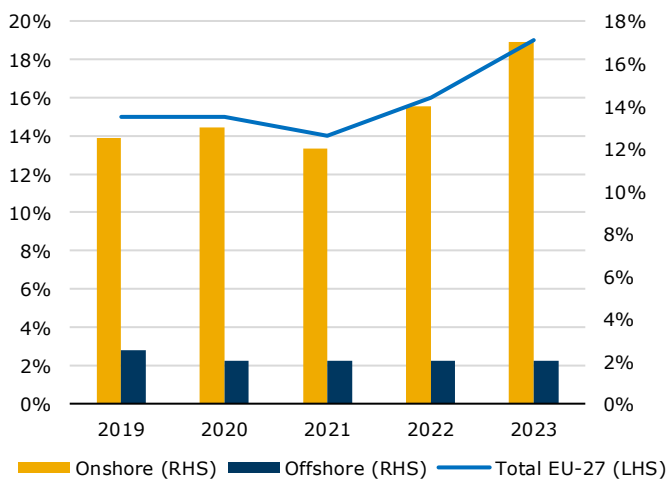
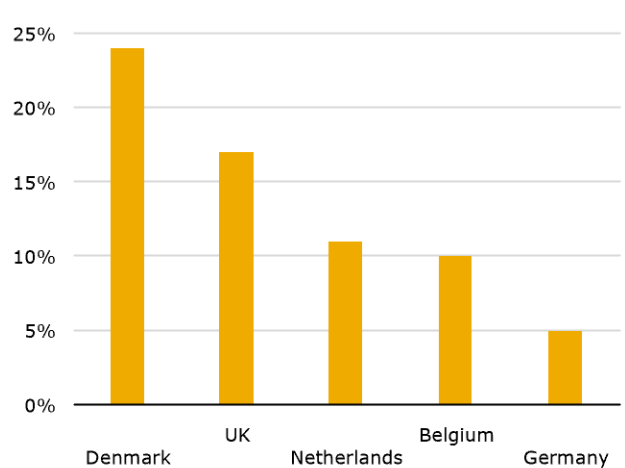


Figure 3: Offshore Wind Contribution to Energy Demand by Country



Note: 2019 data includes the UK and Europe.
Source: WindEurope



Building on the Offshore Renewable Energy Strategy from 2020, Europe aims to install more than 100GW of offshore wind capacity by 2030 as part of new plans running up to 2050, up from 33GW at the start of 2024. Key EU targets such as carbon neutrality by 2050 (supported by the European Green Deal), as well as the Fit for 55 package requiring a 55% reduction of CO₂ emissions (from 1990 levels through 2030) set the stage for the role of offshore wind, which may require installed capacity of at least 400GW. The publication of last year's EU Green Industrial Plan—aimed at enhancing Europe's net zero industry, supporting the fast transition to climate neutrality, and complementing the European Green Deal and REPowerEU—also serves to open the door for more policy support from the EU for offshore wind.

In addition, the European Commission published its Wind Power Action Plan towards the end of 2023, with 15 immediate actions to support the sector. Further, 26 governments signed the European Wind Charter, promising to implement the policies laid out in the EU plan. The wind power package included measures to accelerate permitting and improve auction design.

This year is expected to be pivotal in terms of the number of auctions, after a relatively disappointing amount of new projects were awarded in 2023 (this was largely attributed to a failure in auction design in the context of spiralling costs and supply chain disruptions across the industry). As much as 50GW of offshore wind capacity will be up for auction this year in Europe, according to various market sources. The road map spans established markets around the North Sea, such as the UK, Germany, the Netherlands, and Denmark, as well as relative newcomers such as Ireland, Norway, and Finland.

The EU is targeting 42.5% of gross energy consumption coming from renewable sources by 2030. This is the centrepiece of the Renewable Energy Directive (RED III), which forms part of the Fit for 55 package. The latter will act as a major driver for Ireland to increase its use of renewable energy sources. The European Council adopted the amended RED III in October 2023. Crucially, member states (including Ireland) must transpose RED III into national law by May 2025. However, certain provisions—most notably those aimed at accelerating permit-granting procedures—must be transferred into national law by 1 July 2024.

KBRA notes that delays in granting of permits and licences (and attainment of final investment decisions (FID) by developers) have been key obstacles delaying the delivery of EU targets. For example, according to WindEurope, Europe will build 5GW annually over the coming three years (2024-27), falling short of climate goals. For Ireland, it will be important to understand how these directives will be acted upon in the context of domestic policies and procedures pertaining to planning and granting of awards/contracts.

Challenges to Progress

In KBRA's view, there are several material challenges and obstacles to the delivery of Ireland's (and other EU members) offshore wind targets, as outlined below.

Getting the Auctions Right

2023 was characterised by a dearth of new project awards, a theme reflected in the failure of the UK's allocated round (AR) 5 wind auction to grant a single offshore wind project. The auction design set CFD strike prices too low relative to the costs faced by the industry. This has resulted in significant pressure on the new auction rounds in 2024, including AR 6 in the UK and auction rounds in Ireland, Germany, and France over the next 12 months. Considerations for non-price qualitative factors such as adherence to environmental and conservation requirements and removal of uncapped bidding (where the highest bidder is typically a large utility with a very strong balance sheet) are now important for future tenders. Further, discussions around contract length have come to the fore as renewable technologies and their lifespans become better understood. The useful life of offshore wind farms can be up to 30-40 years rather than the 15 years typically granted for CFDs. Flexibility to allow a portion of revenues to be deployed under PPAs or predicated on merchant cash flows is also something wind developers have been asking for that can improve appetite on tenders. Ireland's first offshore wind auction last year suggests higher project costs are starting to be factored in.

Development Cost Risk

While the levelised cost of energy has come down since the first offshore wind projects two decades ago, the last two years experienced a spike in costs of approximately 40% relative to the start of 2022. This reflects higher raw material prices (steel, copper), higher interest rates, general input cost inflation, and structurally higher commodity prices. Supply chain bottlenecks and disruptions (including the impact of the Houthi attacks on the Red Sea as well as temporary Suez Canal blockages) have further exacerbated cost inflation. These increased upfront development costs resulted in fewer final investment decisions by developers last year with some projects cancelled. This puts extra emphasis on guardrails being introduced as part of future auctions to ensure cost risk is adequately mitigated.



Permit Delays

Permit delays can lead to a significant interval between the date an auction is awarded, FID, and actual commencement of construction. This intervening period can be associated with significant changes in market conditions. Regulatory and geopolitical conditions can make a relatively robust commercial contract award uncompetitive. This may then require a second round of commercial negotiations between developers and the regulators or government. For example, Saint-Nazaire, built by French state-owned Electricité de France SA, took more than 10 years to go from tender award to commissioning. This dynamic could become a significant obstacle to the development of Irish offshore wind, given the infrastructure planning process has historically presented obstacles and challenges to efficient execution.

The Irish government's multiphased spatial planning processes through the phase 1, phase 2, and eventually phase 3 initiatives (involving floating offshore solutions) are designed to centralise the process and ensure an accelerated outcome in meeting renewable objectives. The European Commission has offered support to member states to improve slow permitting, with revision of the TEN-E Regulation, the Renewable Energy Directive, as well as the adoption of new rules on permitting during the energy crisis in 2022. For Ireland, the challenge to meeting energy transition targets will be to ensure that the priorities and objectives of multiple stakeholders including the Department of Energy and Climate Change (DECC), EirGrid, MARA, the Commission for Regulation of Utilities (CRU), An Bord Pleanála, environmentally focused nongovernmental organisations, and the general public remain aligned and focused.

Infrastructure Development and Procurement Constraints

An entire ecosystem needs to be developed to facilitate the offshore wind industry. For example, the transmission system operators will need to ensure sufficient grid connection capacity is available. This has been a source of delays in project execution in Europe in the past. Developers can and do provide some of their own funding, such as to support port infrastructure works. Access to lifting and service operation vessels will be required from developers, as well as offshore fibre connections and battery capacity. Ensuring sufficient and adequately priced procurement contracts are in place for raw materials and equipment, as well as transportation (adequately sized vessels under charters) will be key in providing developers with financial reassurance. Further, delivering on concrete procurement and transport infrastructure arrangements is fundamental to convince developers that Ireland is the right market to invest in.

Competition for Limited Resources

Given the scale of the EU's renewable plans, several markets will be competing for a limited number of contractors or sponsors and expert staff who can deliver on offshore wind. Sponsors will carefully select which markets they choose to enter based on their comfort with the market, regulatory, infrastructure, and commercial contract conditions. They will want to ensure they can deliver quickly on their plans and at the profit levels desired. Ireland as a less mature market in offshore wind with a relatively limited track record of operations (notwithstanding Arklow 1, and last year's auction) will need to demonstrate it has the foundations in place to entice sponsors to continue investing in the offshore wind proposition presented.

An Ambitious Opportunity for Ireland

Offshore wind presents several opportunities and advantages over other technologies for Ireland (and other EU markets), which include:

- Northern European countries, including Ireland, have plentiful wind and access to acreage. This can result in a relatively reliable resource despite challenges with upgrade of maritime and port infrastructure. Wind energy generation in the region has proven to have robust energy value with a more stable generation profile throughout the year and intraday compared to mature technologies such as solar.
- Ireland's ambitious plans for offshore wind energy generation could provide ample energy to meet its current demands and industry ambitions, with the potential to make the country a net exporter of energy to the UK and Europe.
- The cost of offshore wind has decreased dramatically in the past decade to about EUR60/MWh from EUR200/MWh. That said, previously mentioned costs have recently started to rise as the technology has become more advanced and input costs have increased.
- Offshore wind has demonstrated high capacity factors compared to other renewable technologies such as solar and onshore wind.
- Regulatory support through CFDs has helped provide stability in cash flow profiles of offshore wind projects.
- Offshore wind energy generation has a significantly lower carbon impact than fossil fuels.

Ireland's execution of its offshore wind plans would support its strategy to reduce carbon emissions, develop sufficient electricity capacity to deliver on its industrialisation plans, and reduce its reliance on energy imports from markets such as the UK (for gas). Current Irish plans include further development as a hub for sectors such as digital technologies, data centres, and big technology. Although Ireland benefits from the wind conditions and potential coastal infrastructure to fully exploit offshore wind technology, the country will need to overcome certain challenges. The scale of the investment required is such that they need to attract domestic and international capital to help deliver the infrastructure without burdening the government. Therefore, projects will need to be profitable so that private finance can participate and provide wind developers with the necessary funding.



Financial Considerations for Offshore Wind

Offshore wind projects are characterised by having significant construction risk at the outset, as well as operational and potentially market risk in operations, and are typically financed on a project finance basis. Lenders will need to be comfortable that engineering, procurement, and construction (EPC) contracts have been signed, which ensure that construction overrun and delay risks are passed onto contractors and that the projects have secured the supply chain in terms of vessels and equipment. On the operational side, lenders will want to know that a viable route to market has been established and that there are commercial contractual arrangements allowing for a predictable cash flow stream over the term of financing. If there is inherent market risk, lenders will need to understand the power market dynamics in the country and whether sufficient reserves are put in place to mitigate against periods of low power prices. Technological considerations may also be important for lenders, noting the increasing size of turbines. For example, to what extent might projects become obsolete based on designs submitted at auction and subsequently superseded by newer and more efficient technologies; this has not been a major credit concern to date. Also, if less mature technology is being considered such as floating offshore wind, financiers will want to know if the technology and operational risk is heightened. Ultimately, if financed on a project basis, lenders need to be ensured that projects can deliver a healthy debt service coverage ratio over the period of the debt tenor.

Commercial arrangements such as CFDs have typically been used to support offshore wind project financing and are generally backed by highly-rated government entities; therefore, they are typically very popular with project financing banks. A corporate PPA entails lower regulatory risk but does not isolate projects from the impact of energy price caps imposed in recent years. They have proven to be a very useful revenue stabilisation substitute when subsidies are not available. Banks recognise the strong value such contracts bring to the energy market, stimulating both industrial decarbonisation and additional renewable build-out. However, corporate PPAs can present increased risk from counterparty credit exposure compared to CFDs.

Recent years have demonstrated that the wind sector, like many others, is not immune to the impact of conflict or black swan events such as the global pandemic. Developers who locked in fixed price auction bids based on best estimates but find those figures outdated and insufficient some years later are exposed to the brunt of cost increases. This triggered a degree of pain across the industry but has also shed light on the need for governments and regulators to introduce flexibility in commercial arrangements to account for volatility in input costs.

Offshore wind projects have typically derived their funding sources during construction through equity, bank lending, and export credit agencies in the first instance. However, there has been an increased interest on the part of wind developers to consider alternative financing schemes, particularly for the multibillion euro (or dollar) schemes in place involving a cluster of wind projects or to coincide with the transition of offshore wind projects from construction to operations. The attractiveness for sponsors seeking out capital market solutions includes more efficient pricing and longer tenors.

Despite this, capital markets (including both public and private debt) have been willing to accept construction risk for such large infrastructure projects in numerous energy-related sectors over the past decade. Investors have been comfortable with execution whether they are in the liquefied natural gas (LNG) sector such as the Ras Laffan projects in Qatar, a portfolio of combined-cycle gas turbine (CCGT) power projects, or more recently in the emerging telecommunications space, such as fibre-to-the-home (FTTH). Getting institutional investors comfortable with construction risk on such large projects has required the same type of mitigants that bank project finance lenders use, such as sufficiently robust EPC contracts that pass through overrun or delay risks, sufficient committed sources of funds at the outset to meet uses, and adequate liquidity to meet unexpected changes in business and financial conditions. This asset class is suitable for the capital markets if appropriate mitigation measures are in place.

An Opportunity to Transform Irish Energy

In KBRA's view, offshore wind has the potential to transform Ireland's energy markets, and important progress has been made. This is supported by EU policy and offers Ireland an opportunity to be energy independent. While this opportunity exists, there remain important obstacles ahead. How Ireland navigates some of these challenges will determine how the ambition transforms into a realistic proposition over the next several decades. The principal challenge is financing. Commercial structures need to be awarded at a level that ensures the projects can raise funding in the private finance market at acceptable rates to those sponsors. In addition, the ability to attract and retain experienced sponsors by offering them competitive pricing and profitability will help Ireland compete with resources dedicated to more mature markets such as Germany, the UK, or the Netherlands. These countries are also looking at similar plans to develop a pipeline of offshore wind projects. The country's target is ambitious, but the potential rewards are significant.



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