



Missing the Boat:

Port Infrastructure as a Critical Barrier to Offshore Wind Energy Development in Ireland

Authors: Dr James G. Carton, Bill Duggan, John Doody

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In Summary

- There are limited marshalling ports suitable for fixed bottom offshore wind development in Ireland.
- Port space is a key limiting factor. Ireland has only 44ha of planned offshore renewable wind energy (ORE) port laydown space.
- A Government-managed and coordinated plan-led approach to ORE development should be applied to the development of ORE marshalling ports, including empowering the Irish Maritime Development Office (IMDO) to prioritise ORE.
- Capital funding and other funding mechanisms are required to deliver offshore renewable wind energy port infrastructure in Ireland.

1 Executive Summary

Delivery of offshore renewable energy (ORE) at scale is a critical component of Ireland's proposed decarbonisation pathway. The 2025 *Climate Action Plan* (CAP) has retained a headline target of at least 5 GW of offshore renewable wind energy installed capacity by 2030¹, while the *Future Framework for Offshore Wind*, sets ORE targets of 20 GW of installed capacity by 2040². Without these renewable energy sources, Ireland does not have a credible path to meet its legally binding emissions reduction targets. Against a backdrop of a recent WindEurope statement that 'one of the most pressing challenges today is the lack of timely investment in vessel manufacturing and port infrastructure', a look at Ireland's policy on ORE port facilities is timely³.

ORE development has been identified as a once in a generation opportunity for economic growth and job creation; it can reduce the cost of energy for consumers and reduce our reliance on fossil fuels, ensuring energy security; essential to decarbonise sec-

tors such as industry, transport, and heating. *Powering Prosperity – Ireland's Offshore Wind Industrial Strategy* was published in 2024 and it advocates for the huge economic benefits of reaching Ireland's offshore renewable energy targets⁴.

However, port infrastructure in Ireland represents a fundamental constraint and barrier to the quantity of ORE capacity that can be installed each year, raising questions around the feasibility of these targets. At present, there is no marshalling port in the Republic of Ireland equipped to deliver an offshore wind project, and current Government policy does not include a plan to provide the port infrastructure to bridge this gap in the years ahead, nor does it empower the Irish Maritime Development Office (IMDO) to prioritise this. Without intervention, port capacity will endanger the delivery of the committed offshore renewable wind energy targets, inhibit the country's ability to attain its climate targets, and lead to a missed opportunity for job creation and cheaper energy.

This policy paper draws on research conducted by academics based in Dublin City Uni-

¹Climate Action Plan 2025

²Future Framework for Offshore Wind

³Europe needs stronger ports and more vessels to meet its offshore wind goals — WindEurope

⁴Powering Prosperity – Ireland's Offshore Wind Industrial Strategy - DETE

versity (DCU) under the Next Generation Energy Systems (NexSys) research programme, which has identified limited port capacity as a key constraint for Ireland's planned roll-out of critical ORE projects. NexSys targeted project DVY_TP1 has explored key challenges in delivering offshore wind projects in Ireland. The policy insights derived from this targeted project are presented here, with a full paper in press [1]. This paper seeks to outline this issue in clear terms and to identify the necessary policy measures required to address this infrastructure deficit.

This research has identified, through modelling, that based on the published schedule of planned ORE activity, 4 ports will be needed in order to deliver 5 GW of ORE, and this will only be achieved by 2034/2035 at the earliest. However, even this delayed date is only feasible if:

1. A Government-led strategy for multi-port ORE delivery is implemented.
2. Ports are incentivised to provide sufficient quayside space and laydown area to maximise efficient ORE rollout.
3. There is centralised coordination across multiple ports to ensure efficient specialisation in different ORE implementation activities.
4. The geophysical limitations of Irish ports for ORE delivery are identified, in the context of growing component size.
5. The required number of ORE marshalling ports are identified.
6. ORE marshalling ports are given equal priority to other energy facilitating infrastructure (e.g. interconnection, transmission infrastructure) and are allocated sufficient investment to prepare for ORE marshalling; estimated at €2-3 billion.

Glossary of Terms

Operations and Maintenance (O&M) port:

A port which serves as a base for the long-term servicing of offshore wind farms.

ORE: Offshore renewable energy.

Fixed-bottom offshore wind: Offshore wind using turbines installed on foundations that are fixed to the seabed, limiting deployment to shallower waters.

Gravity feed base: A type of foundation that uses its own weight to keep an offshore wind turbine stable.

Jacket foundation: A type of foundation, resembling an oil and gas platform, that is used in deeper waters (typically over 30-40 meters). Unlike simpler monopile foundations, jacket foundations consist of a lattice of steel tubes that are driven into the seabed and provide a robust, multi-point support system that is more cost-effective than alternatives in deeper water conditions.

Marshalling port: A designated port area used to assemble, store and prepare wind turbine components before they are transported and installed offshore.

Monopile: A type of foundation for offshore wind turbines, consisting of a single, large-diameter steel cylinder driven deep into the seabed to provide stability for the turbine. A transition component is the link between the monopile and the turbine tower.

Nacelle: The housing at the top of a wind tower that contains the turbine and the other components that convert wind's kinetic energy into electrical energy.

2 Irish Government Policy and Industry Perspectives on Port Infrastructure

There are, at present, a complex set of overlapping national policy documents which, in aggregate, represent Ireland's official plans for ORE and ports. Some of these plans make reference to a need for port capacity to support ORE rollout, but none explicitly provide a roadmap to do so. The authors have attempted to briefly summarise the evolution of these policies since 2013 with reference to the needs identified by the industry. This analysis has identified a policy gap which needs to be filled by a centralised, Government-led plan for ORE ports.

Ireland's *National Ports Policy* (NPP), published in 2013⁵, predates existing ORE targets and has a primary policy focus on ports for the movement of goods and connectivity⁶. At time of writing, this policy has been under review for approximately 2 years. It remains to be seen whether the revised ports policy will align with ORE targets in the CAP and elsewhere. The NPP does not support or allow for direct funding of Irish ports by Government, which in the main, are state owned⁷.

In 2018, the Irish Maritime Development Office published a *Review of Irish Ports Offshore Renewable Energy Services* (IPORES)⁸. This report sought to provide an updated description of current port capacity in Ireland to support ORE development. Since the publication of this report the size of ORE development infrastructure has grown significantly, necessitating that this be revisited.

In December 2021, the Department of Transport issued a policy statement on the facilitation of offshore renewable wind energy by commercial ports in Ireland⁹. It stated that:

"It is clear that a minimum of two port facilities will be required from 2025 onwards for offshore renewable wind energy deployment activity. A multiple of typically smaller ports will be needed for O&M operations".

⁵National Ports Policy (2013)

⁶Implementing Marine Spatial Planning Workshop: Offshore Renewable Facilitation & Ports Policy Thursday 13th June 2024

⁷National Ports Policy (2013), p.14

⁸IPORES 2018 - A Review of Irish Ports Offshore Renewable Energy Services

⁹Facilitation of Offshore Renewable Energy by Commercial Ports in Ireland

ities will be required from 2025 onwards for offshore renewable wind energy deployment activity. A multiple of typically smaller ports will be needed for O&M operations'.

The policy statement went on to say that:

'A multiport approach removes the risk of a single point of failure that could occur for financial, operational, environmental, or planning reasons. A multiport approach will ensure sufficient flexibility to deal with these uncertainties and that port capability can come on stream as required at a number of locations.'

The Minister for Transport at that time, Eamon Ryan, was also clear that a multi-port solution was required¹⁰.

An industry report, the Wind Energy Ireland (WEI) *National Port Study*¹¹, published in 2022, sought to understand the extent of existing port infrastructure, and how it could support offshore wind projects, but a clear pathway was not put forward as to how the projects would be delivered, which ports could do what, and what an operational strategy would look like.

The IMDO's 2023 *Irish Ports Capacity Study* did not consider ORE as part of its capacity considerations for Irish ports, due to its reliance on the 2013 NPP¹².

A 2024 issues paper¹³, published as part of the National Ports Policy consultation process, stated that:

'Ireland will potentially need to build around four to five offshore renewable wind energy port facilities (each capable of building 500 MW of offshore renewable wind energy annually) that will act as construction and deployment ports over the next 25-30 years.'

This would be inclusive of marshalling ports to facilitate offshore floating wind, but existing policy is that the State will not directly

¹⁰Government sets policy for Ireland's Commercial Ports to develop infrastructure to support Offshore Renewable Energy

¹¹National Port Study — Wind Energy Ireland

¹²Irish Ports Capacity Study — Irish Maritime Development Office

¹³Review of National Ports Policy (Issues Paper)

fund this development work. Irish ports do not have the balance sheet capacity to be able to fund the level of development required and this has hindered development to date and will be a huge challenge going forward to build the necessary port infrastructure¹⁴.

A 2023 report published by Royal HaskoningDHV on behalf of the Netherlands Enterprise Agency identified key capacity challenges for Ireland's ports¹⁵. As part of Ireland's membership of the North Seas Energy Cooperation (NSEC), the report analysed the offshore wind port infrastructure needs in each of the member states. Using the WEI study mentioned above, it concluded that Belfast (a UK port) was the only existing marshalling port facility that could support any development of offshore renewable wind for Ireland.

In April 2025, the Department of Enterprise, Trade and Employment issued a progress report for *Powering Prosperity – Ireland's Offshore Wind Industrial Strategy (2024)*¹⁶, with an Implementation Progress Report, followed a month later by an Offshore Wind Potential Report (May 2025)¹⁷. The latter identified 18 GW of potential fixed wind sites off the coast of Ireland. Its significance to ORE ports is that this extends the timeline for potential return on any investment that could be made and improves the business case for a port. Longevity of a fixed offshore project improves the ability of a port to receive a return on its investment.

Government policy is therefore clear that **more than one port and possibly four to five are required to deliver offshore wind projects**, but this has not been translated into a national strategy for these ports.

In summary:

- *Ireland's policy on offshore wind has identified a need for 3-5 large marshal-*

ing ports and multiple small O&M ports for effective deployment of fixed ORE

- *Ireland's National Ports Policy is out of date and does not allow for effective ORE port funding*
- *There is no centralised and coordinated policy to deliver ORE port development*

3 ORE Development & Ports in Other Jurisdictions

ORE capacity continues to grow rapidly worldwide¹⁸. Few countries have ports that are fully equipped to deploy modern large-scale ORE, but many countries are more proactive and further developed than Ireland. Globally, port operators have been under pressure to upgrade facilities to accommodate larger vessels and provide more space for larger turbines and blades to meet decarbonisation goals.

The deployment of offshore wind energy is at the core of delivering the European Green Deal¹⁹. European ports are primarily funding their offshore wind development through a combination of public and private investments, including grants from the European Union, loans from the European Investment Bank, and direct funding from national governments. WindEurope has identified ports as a critical component for the delivery of the EU's energy transition²⁰.

A 2024 report from the Copenhagen Infrastructure Partners (CIP) Foundation states that the development of port infrastructure in Denmark, a country which developed the first offshore wind farms, poses a limitation to achieving its wind goals²¹. Sweden, Brazil, and Poland have developed fixed offshore wind farm installation processes, helping to build a knowledge base of port requirements.

¹⁴Ireland's Ports - unlocking offshore renewable energy

¹⁵ North Seas offshore wind port study 2030 - 2050 — HaskoningDHV

¹⁶Powering Prosperity – Ireland's Offshore Wind Industrial Strategy Implementation Progress Report

¹⁷Offshore wind potential in Ireland — A report for Department of the Environment, Climate and Communications

¹⁸Wind industry installs record capacity in 2024 despite policy instability

¹⁹The European Green Deal Offshore renewable energy — European Commission

²⁰WindEurope response to the European Commission's Call for Evidence on the EU Ports Strategy

²¹New report: Insufficient port capacity blocks Denmark's climate targets — CIP Fonden

The UK has become the leader in Europe in offshore wind installation, with the UK Government actively involved in the development process. UK ports are primarily funding their offshore wind development through a combination of government grants, private investment, and potentially innovative financing models. Private investment, including from entities like the Crown Estate, is also crucial, with programs like the Supply Chain Accelerator²² providing funding for manufacturing facilities and port infrastructure. Additionally, public-private partnerships and innovative financing solutions are being explored to address the unique needs of each port. For example, in June 2025, Crown Estates announced two new programmes; the first is a £350m Supply Chain Investment Programme which is targeting the development of port and related infrastructure essential for offshore wind project delivery. The second scheme is a Supply Chain Accelerator which has been broadened to include ports²³. There is a history of such innovation but what is key is the fact that the UK Government acknowledges ports as a critical part of the supply chain. Scotland is very much a beneficiary of the UK funding approach, where the Scottish government uses a combination of government grants and strategic investments. One such scheme is the Scottish Government's Strategic Investment Model (SIM)²⁴ which facilitates collaboration and investment in port infrastructure.

In the United States, a report from the National Renewable Energy Laboratory (NREL) in 2022 found that few existing ports on the East or West Coast of the United States have sufficient capabilities to fully support offshore renewable wind energy activities²⁵. Despite recent changes to wind energy plans associated with the change in administration in the U.S., the work of the NREL in developing the

marketplace is still relevant. In 2022, US ports generally required additional investment in heavy-duty quays, lay-down areas, manufacturing facilities, dredging, and other improvements before they could serve as marshalling ports for onshore wind projects. Although the U.S. has already committed more than \$1.5Bn through public-private investment, it was stated that private and state funds could be leveraged further with federal programs such as the Maritime Administration's Port Improvement Development Program, the Department of Transportation's Better Utilizing Investments to Leverage Development (BUILD) Grant Program, and the Water Resources Development Act²⁶.

In summary, countries within and outside of the EU are finding mechanisms to fund ORE port development. EU member states use a combination of public and private investments, including European Investment Bank loans, government grants and private sector funding. This combination is also available to Ireland, but will require Government leadership, as acknowledged by the MoS for Transport²⁷.

4 NexSys Targeted Project Methodology

DCU research conducted for NexSys first assessed the construction phase of fixed ORE globally as well as turbine technology encompassing the expected large turbine and blades characteristics and the ORE vessels that transport them. The research then reviewed all ports potentially suitable for ORE on the island of Ireland, including operations & maintenance ports, recognising the limited research completed in Ireland. A matrix of port attributes was constructed which was used as an assessment tool against Irish ports. This matrix takes into account the growth of the equipment that is being used offshore and, in turn, the size of the vessels that will be needed for both inbound and outbound port movement.

²²Offshore wind supply chain and port infrastructure set for £15m boost through The Crown Estate's Supply Chain Accelerator

²³Crown Estate announces £400M worth of funds for UK offshore wind supply chain — New Civil Engineer

²⁴Navigating the winds of change: Scottish ports and offshore wind — Port of Aberdeen

²⁵The Demand for a Domestic Offshore Wind Energy Supply Chain — NREL

²⁶OFFSHORE WIND PORT INFRASTRUCTURE NEEDS — American Clean Power Association

²⁷Ports Policy — Wednesday, 28 May 2025 — Parliamentary Questions (34th Dáil) — Houses of the Oireachtas

Info Box 1: Offshore Renewable Energy and Ports

Ports are the focal point through which the installation process for ORE is managed and implemented. They serve as hubs for the inbound consolidation of the equipment, its storage and assembly, and finally, outbound shipment of the equipment to the installation site. Ports are a critical 'enabler'.

Establishing the port location relative to installation sites is only the first stage of a delivery model. Other significant aspects to be considered are criteria such as; the vessel fleet to be used on both inbound and outbound journeys on the project (vessels are getting bigger and the port needs to be able to cater for this); the physical attributes required of the port such as quay lengths, load-bearing capacity within the port on the quay and in the laydown area, crannage, channel width and depth, etc; and answering questions such as: are both foundations and turbines going to be delivered from the one port?

Gonzalez et al (2024) identify significant logistical challenges for offshore wind projects due to the specialised infrastructure required as both the size of offshore wind farms and associated components continue to grow in size and weight. The actual installation strategy of the developer will also have a direct impact on the port and its layout; what pre-assembly will be needed in port and component storage, dictating the storage space required and the timeline for completing the installation.

Parkinson and Kempton (2022) mention four distinct types of ports required for offshore wind. These consist of smaller ports for survey work, manufacturing ports, marshalling ports and Operations and Maintenance (O&M) ports. Ireland has excellent potential and plans for survey ports and O&M ports. The key challenge for Ireland is ORE marshalling ports.

DCU proceeded to build a model, incorporating the attributes of the geophysical characteristics of each port, and matched that to planned ORE development over the next 2 decades.

Key Findings

The analysis found that Ireland's existing port infrastructure to deploy fixed bottom offshore wind is not fit for purpose. This finding is echoed by a recent KPMG report²⁸.

Ireland has limited commercial ports. State owned ports include Dublin, Shannon Foynes, Waterford, Galway, Cork Ringaskiddy, Rosslare Europort, and Drogheda (including the proposed port at Bremore). Greenore (O&M) and Bantry are both private commercial ports.

Of these ports, several have, to date, chosen not to focus on ORE deployment or are precluded from doing so due to geophysical constraints. Dublin has focused on the movement of goods and container shipping and not ORE. Shannon Foynes is not currently being considered for fixed bottom ORE development due to its location distance from the proposed fixed wind installation sites. Galway and Waterford are suitable O&M ports but not for ORE marshalling / development. Belfast has previously been used for ORE projects off the west coast of the UK and has been recently selected for investment by the UK Government, but was discounted from our analysis as it will be heavily engaged with UK projects within its area of operations on the west coast of the UK. Both Bremore and Bantry have potential for ORE development, as mentioned later.

Only two ports, Cork Ringaskiddy and Rosslare Europort, are engaged with early plans and have allocated some limited space to support fixed bottom offshore wind farm construction and marshalling. In aggregate, our analysis is that Irish ports are constrained by location, geophysical attributes and a lack of space and investment to support the logistics of planned offshore renewable wind energy development.

²⁸Ireland's Ports - unlocking offshore renewable energy – KPMG

5 Key Policy Measures for Ports to Deliver Fixed Bottom Offshore Renewable Wind Energy in Ireland

Based on the findings of our research, we have identified 6 key enabling actions to support Irish ports to take the necessary measures to prepare for the proposed rollout of ORE projects:

1. Create a coordinated national implementation plan for ORE development at Irish ports

In 2021, the Department of Environment, Climate and Communications issued a Policy Statement on the *Framework for Ireland's Offshore Electricity Transmission System*²⁹. As a result, Ireland went from a developer-led to a Government-led approach to ORE development, but this plan has yet to incorporate a strategy for ORE marshalling port infrastructure. European legislation, particularly the European Green Deal and related initiatives e.g. FuelEU Maritime, are driving the transformation of European ports into "green energy hubs". A Government strategy is necessary for ports to develop ORE, incorporating the requirements in total from all aspects of port activity and the assistance in planning and funding to make it happen. Ireland cannot dilute the potential impact of ORE by leaving port development for ports to make individual decisions that may not be in the national interest.

The Irish Maritime Development Office (IMDO) is a statutory organisation that exists to support activity across ports, and is therefore well placed to support overarching policy objectives for ORE from the perspective of port infrastructure. IMDO enabling legislation (the Harbours (Amendment) Act 2009) does not include ORE within the organisation's functions and may be in need of reform³⁰.

²⁹Policy Statement on the Framework for Ireland's Offshore Electricity Transmission System

³⁰About Us — IMDO - Irish Maritime Development Office

2. Maximise quayside space in ports for efficient ORE rollout

Modern wind turbines, blades and towers are huge, with individual parts exceeding 150m and some parts weighing over 2,500 tonnes each. Recently, a set of 153m blades were shipped to a Chinese site³¹. Parkinson and Kempton (2022) highlight that, '*larger components disproportionately increase area required for storage and marshalling due to turning radius considerations in port*' and that a minimum laydown area of 40-80 hectares (ha) of quay space is necessary for marshalling approximately 1 GW of ORE. This is also echoed by the Core Report on Swedish Strategic Port Planning³², COWI³³ and the NREL³⁴ reports. These reports suggest that a 1 GW project will take two years to complete with this amount of laydown area.

At present, Rosslare Europort has plans to provide 21 ha for marshalling activities, while Cork Ringaskiddy has potential for 23 ha. Therefore 44 ha nationally is currently available for ORE development in Ireland, implying a maximum production output of 500 MW per year, or 1 GW every 2 years.

3. Adopt a specialised multiport approach

Our research found that fixed offshore wind projects globally are using multiple ports simultaneously for their installation work. 18 current and completed ORE projects were reviewed and 67% of the projects used multiple marshalling ports, typically with foundations being staged from one port and the installation of the turbine element from a separate port. The port sizes are typically

³¹Extra-large offshore wind turbine blades were loaded and shipped in Yantai, Shandong — Gov.cn

³²Strategic Port Planning: Key to Sweden's Offshore Wind Future

³³Port Development Considerations for Offshore Wind — NYSERDA (The New York State Energy Research and Development Authority)

³⁴The Demand for a Domestic Offshore Wind Energy Supply Chain — NREL

25 ha or more. This method also allows overlapping installation processes to be followed, with turbines being installed before the foundation installation step was completed. Of the other 33% of projects delivered from a single port, they are typically much larger ports with 50 ha or more laydown space available, and multiple quays, allowing parallel operations to be run at the same site.

Currently there are only two Irish ports that have been identified for ORE marshalling (Cork Ringaskiddy and Rosslare Europort) and both aim to do all aspects of ORE delivery. Aligning with global norms specialisation should be considered for each port to focus on one aspect of the installation / ORE marshalling process.

Specialisation would support a multi-port strategy working in an efficient manner and minimise the rollout timeline, reducing costs. A plan-led approach for a national installation strategy should consider such designations and direct development accordingly.

4. Identify the geophysical limitations of Irish ports for ORE

Ports are defined by the geophysical terrain that they have been located in and there is little that can be done to change these features. ORE equipment is growing in size as developers look to install larger turbines. Ports need to be expanded and attributes such as access channel width and depth, quay water depth, quay berth length and depth as well as the load bearing capacity of the quay and the laydown area have all grown. To cater for the larger turbines, inbound/outbound vessels have become bigger and, as a result, the turning basin of the ship requires more room.

Table1 shows the key dimensions of selected potential ORE ports in Ireland and outlines the challenge. (A port catering for floating wind will be similar but there are also significant differences

so it cannot be assumed that both types of installation/marshalling can be completed from the same port).

Cork Ringaskiddy and Rosslare Europort are identified in the National Ports Policy as Tier 1 and Tier 2 ports respectively, based on the percentage of overall goods tonnage of Irish ports which they handle. They also conduct other port activities, specifically freight and passengers, so there will be limited quay space and berth space. For example, in Cork Ringaskiddy the container port area may have to be moved to accommodate ORE.

Ports will limit the size of vessels that can be used. As the equipment grows both the vessels bringing in components and the outbound installation vessels are growing in size. Ports should not be dictating to the developer what type of vessels that can be used on a project, as this will increase cost, so ports need to be able to accommodate the current vessel trends, within reason. Analysis of the inbound and outbound vessels employed for installation indicates that vessel draft is becoming a constraint. This is particularly relevant to inbound monopile cargo from Asia. The tendency is to use larger heavy lift vessels with a deep draft (11m), as large volume shipments are taken in. This is done for both cost and schedule efficiency reasons.

Similar issues with the beam of outbound vessels can be seen. Wind turbine installation vessels (WTIV) have a width of up to 50m, but when loaded with turbine blades this can increase to 130m. This width can cause traffic management issues in the access channel at an ORE marshalling port.

Opportunities to custom build both Bantry and Bremore are worth considering as they are 'blue field' sites and can be customised for ORE marshalling work. Bantry, for example, has the physical attributes to transition from fixed

bottom and accommodate floating off-shore wind installations in the future.

5. Identify the number of marshalling ports needed for Ireland's ORE targets

To calculate the total ports needed based on the contracts awarded in ORESS-1, the potential of DMAP 2.1 and the schedule issued as part of the output from the North Sea Energy Cooperation (NSEC) tender planning document, a port requirement and timeline model was generated for Ireland by DCU³⁵ ³⁶ ³⁷.

The requirements for ports identified by the model ranged from 2 to 6. With some levelling of the installation schedule, a requirement for 2 foundation marshalling ports and 2 turbine marshalling ports was identified. It is assumed in the model that port roles will be centrally defined in a Government-led approach, with each port designated as either a foundation or a turbine marshalling port. This will allow for the installation of turbines to commence before all the foundations are installed within a site. **Figure 1** provides an indicative overview of the number of ORE ports which would be required during each year of the first 10 years of an ORE rollout in Ireland, with an assumption of 9 GW of ORE being targeted over this timeframe, based on the results of the ORESS-1 auction and the South Coast Renewable Energy DMAP Proposal.

Capacity is driven by many variables and project planning parameters. It is feasible to install up to 50 turbines in a season³⁸, which is equivalent to a 750 MW project, but this is dependent on the foundations having been installed the previous season. This is dependent

on available space at a port, with 40 turbines a season a more realistic estimate. The port would need the space to manage project delays, possibly causing congestion on a smaller site, but also cater for an accelerated rate of installation should the weather window be positive for the project. Variables in this include: seasonality / weather conditions, the size of the project, the vessels being used and their capacity, and other project specific factors.

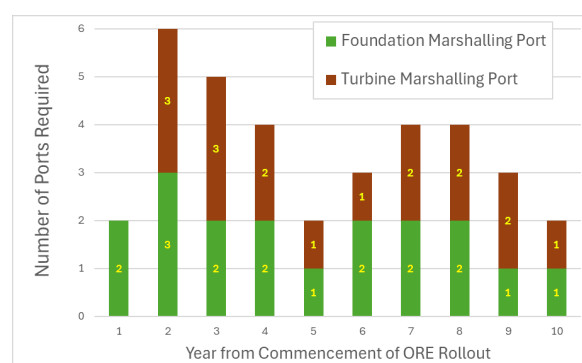


Figure 1: Indicative number of ports required for each year of an ORE rollout in Ireland, assuming 9 GW of ORE capacity installed over a 10 year period (c.25 Ha/port capable of marshalling one 15-17 MW turbine per Ha)

Currently, Ireland has 2 marshalling ports on track to be able to deliver ORE fixed wind projects within the 26 counties of Ireland and this is considered a limiting factor. As stated earlier, both of these ports have challenges. The analysis demonstrates that Ireland needs 4 dedicated ORE marshalling ports to meet our own planned fixed bottom ORE development requirements.

There will need to be centralised project coordination to ensure that an efficient schedule is generated utilising Ireland's limited resources. Where the other two ports will come from will depend on the commitment to a centralised plan and whether plans for the development of Belfast (more of an availability question), Bremore, or Bantry come to fruition.

³⁵ Offshore Renewable Electricity Support Scheme (ORESS)

³⁶ Minister Ryan publishes draft plan identifying proposed areas off the south coast suitable for offshore wind projects

³⁷ 241023 NSEC tender planning - October 2024

³⁸ Port of Roenne selected as wind turbine installation port for Baltic Eagle offshore windfarm — Baltic Wind

6. Provide funding for critical ORE port infrastructure

In a study for the North Seas Energy Cooperation (NSEC), Royal HaskoningDHV (RHDHV) estimated that, if Ireland wants to do the main offshore wind activities in its own ports, a total investment of €2-3 billion would be required. If the focus is just on O&M and partial construction support, the investment needed is expected to be closer to €1 billion³⁹.

On the O&M front, the Doyle Group have announced their plans to develop Greenore as potentially hosting three sites (investment €25m)⁴⁰, as well as Arklow (Arklow Bank 2 (investment €15m by SSE)⁴¹, Dún Laoghaire (Dublin Array by RWE)⁴², and Wicklow (Codling Wind farm EDF & Fred Olsen)⁴³. All have been designated as O&M ports, fulfilling Ireland's current O&M port requirements.

Investment in ORE marshalling ports, however, remains a challenge. The Doyle Shipping Group withdrew from the development of their site in Cork Harbour, creating a shortfall of €70m in the Cork Development Plan. The Cork Ringaskiddy quay received funding of €88.5m from the Irish Strategic Investment Fund in October 2024⁴⁴. This has given the port a quay that is suitable for ORE development, but this will only be 200m long. Development of the lay-down area is still required and there is a need for the use of an additional quay.

Rosslare Europort has valued its announced plans at over €220m, but that

funding has yet to be obtained⁴⁵. An initial cost of €1 billion has been suggested by the Drogheda / Bremore port development team to deliver an ORE marshalling port⁴⁶.

The option surrounding the two private ports, Bremore and Bantry, offers a solution that needs further exploration. Bremore is, at present, a blue field site with a major port project mooted since the early 2000s by the Drogheda Port Company as an alternative to the capacity issues in Dublin. The existing Bantry port is undeveloped for ORE at present. Both options would require major investment and it will be years before either could be operable to service ORE projects. Obtaining capacity from Belfast port is also an option, but it is likely there will be competition for space with UK ORE projects.

With the indicated potential additional 18 GW noted in the *Offshore Wind Technical Assessment* (May 2025)⁴⁷ investment on a commercial basis in a port becomes more viable with a longer activity project timeline. In the interim, however, uncertain demand and delays in planning are limiting investment options. A guaranteed revenue stream is a requirement to raise capital for both state and private ports in Ireland, with permitting and consenting procedures needing to be accelerated. Development in the international port sector since the 1980s has followed a public-private partnership approach sometimes referred to as “public ownership and private operation”. Therefore, investment costs are not the sole responsibility of the ports or the State. However, as publicly-owned bodies, ports need to innovate and look to long term funding instruments that match the lifespan of the assets paid

³⁹North Seas offshore wind port study 2030 - 2050 — HaskoningDHV

⁴⁰Green light for Greenore Port wind turbine facility that could create 200 jobs — Irish Independent

⁴¹Arklow Bank O&M Base Gets Green Light — Offshore Wind

⁴²Dublin Array Offshore Wind Farm to Submit Planning Application

⁴³Codling Wind Park selects Wicklow Port as preferred location for new Operations and Maintenance Base

⁴⁴Port of Cork: Investment a big boost for offshore wind

⁴⁵Major boost for Rosslare Europort — Southeast Radio

⁴⁶Plans for new deep-water Bremore Ireland Port outlined

⁴⁷Major milestones reached as State continues to plan for its long-term offshore renewable energy future

for. Irish ports do not have the balance sheet capacity without Government support to raise the capital required to build ORE marshalling ports⁴⁸. Support and funds are required to support Irish ports with their business case to invest. A Government led plan supported by funding needs to be developed.

To date, the Government, through the *National Development Plan*, has committed in excess of €5 billion capital investment for domestic and international grid and transmission infrastructure with more planned. By contrast, no funding has been directed to marshalling port infrastructure. Objective 55 of the National Planning Framework (2025)⁴⁹ sets out: *'To support, the progressive development of Ireland's offshore renewable energy potential, the sustainable development of enabling onshore and off-shore infrastructure including domestic and international grid connectivity enhancements, non-grid transmission infrastructure, as well as port infrastructure for the marshalling and assembly of wind turbine components and for the operation and maintenance of offshore renewable energy projects.'*

The timeframe for the completion of these actions is changing. Due to recent planning delays and Requests for Information (RFI) from An Bord Pleanála⁵⁰, the considered opinion within the industry is that the target of 2030 for 5 GW is not achievable and that ORE vessels will not be required until 2028/29. This extends the opportunity timeline for ports to gear up and be ready to support the rollout of offshore wind.

⁴⁸Ireland's Ports - unlocking offshore renewable energy

⁴⁹National Planning Framework 2025

⁵⁰Offshore wind farm rulings on hold as planners request further information on impact — Irish Independent

Info Box 2: Ireland's ORE Port Needs

Ireland has ports available to support survey work and O&M requirements. However, no port in Ireland currently exists to provide the required capability for marshalling to support any fixed offshore wind project.

Two types of marshalling port are therefore required in Ireland:

1. **Foundation marshalling ports** manage the inbound of the equipment; staging and installation of the offshore fixed bottom wind turbine foundations. These ports will also manage the transition pieces, modify, and prepare them for installation.
2. **Turbine marshalling ports** provide a consolidation hub for fixed bottom wind farms, where turbine towers, nacelles and blades can be off-loaded, stored, partially assembled / readied before they are put on an installation ship to be deployed at sea.

These ORE marshalling ports can co-exist on the same site if sufficient space and quays are available, or if the foundations and turbines are installed sequentially with no or limited overlap in activities.

If a full ORE project is completed from one port there is little opportunity for parallel installation of the foundations and turbines infrastructure and this extends the timeline of installation as well as having to reconfigure the port between the two stages of installation, increasing costs. The most time and cost efficient strategy therefore is for individual ports to specialise as either foundation marshalling or component marshalling ports.

Table 1: *Irish Ports' Geophysical Attributes vs Ideal ORE Port Specifications*

ORE Port Specifications	Access Channel Width (m)	Access Channel Depth (m)	Quay Water Depth (m)	Suitable Quay Berth Length (m)	Laydown Area (Ha)
"Ideal" Fixed-bottom	300	12.5	12	400	25
"Ideal" Floating	260	16.5	16.5	440	25
Cork Ringaskiddy (Current)	150	11	12	200	13 (not on quay side)
Cork Ringaskiddy (Proposed)	150	11	12	200	23 + 13 (not on quay side)
Rosslare Europort (Current)	180	7.2	7.2	0	5.4
Rosslare Europort (Proposed)	300	9	11	330	21

6 Conclusion

The most recent Climate Action Plan (CAP)⁵¹ has retained a headline target of at least 5 GW of installed Offshore Renewable Energy (ORE) capacity by 2030, a cornerstone of achieving Ireland's carbon emissions targets. However, Ireland does not have the requisite ORE marshalling ports to deliver the number of offshore wind farms necessary to meet existing ORE targets in that timeline. Current Government policy does not include a plan to provide the port infrastructure to bridge this gap in the years ahead.

NexSys research conducted in DCU has identified that Ireland's ORE port capability is limited by geophysical limitations but has identified that 4 ORE marshalling ports are necessary to build planned ORE. Ireland has a Government “**plan-led**” approach to ORE⁵². The same approach to limited port capacity is needed to maximise investment and economic return and minimise environmental impacts and risk. This would help to **strategically allocate, prioritise, resource manage and fund** the required ORE O&M & marshalling port infrastructure. It would enable effective **port specialisation** to maximise efficiency, reduce costs and enable substantial economic activity and necessary skilled employment and training. It can take 4 to 5 years to prepare an existing port to support this work, so this is urgently needed if Ireland is to meet its ORE targets⁵³.

Ireland needs to invest €2-€3 billion in its offshore port infrastructure, but does not currently have a plan to do so. ORE port infrastructure needs to be put on the same footing as other critical energy infrastructure. The recommendations outlined in this paper seek to provide a path forward which would enable Ireland to realise the potential of its offshore wind resources.

⁵¹Climate Action Plan 2025

⁵²Future Framework for Offshore Renewable Energy

⁵³The role of ports in offshore wind — Haskoning

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