Northern Ireland

Northern Ireland Maritime & Offshore

Commissioned by:

Offshore Wind Industry Council

The Crown Estate

NIMO Northern Ireland Maritime & Offshore

Delivering our regional growth through

Advanced Turbine Technology

Future Electrical Systems & Cables

Next Generation Installation and O&M

Industrialised Foundations & Substructures

Enabled by

1GW from 2030
19GW of OSW in 'trading range'

Plus:

- Leasing activity to enable the NI OREAP target of 1GW of offshore wind from 2030
- Access to wider ROI east coast, Liverpool Bay, Celtic Sea & Scottish west coast projects
- Strong core supply chain across a number of OSW lifecycle elements particularly in engineering and manufacturing
- Aerospace: Airbus wings & local composite knowledge

Working with

LOCAL STAKEHOLDERS

- NIMO – Northern Ireland Maritime & Offshore
- Manufacturing NI
- Invest NI
- Department for the Economy
- Renewable NI
- Developers – SBM Offshore, Simply Blue, SPR, Ocean Winds & ESB
- Mineral Products Association Northern Ireland - MPANI

And building on

SKILLS

- Horizon Engineering HV training as an enabler in cables
- Fabrication and welding skills base from local industries
- Ballymena Hydrogen Academy, Mid & East Antrim Hydrogen Training Academy
- Ulster & Queens Universities offer courses in wind energy and Belfast Met offers turbine and composites training

INNOVATION

- Advanced Manufacturing Innovation Centre incl. £100m investment into composites
- Queens University (Strangford Lough), have access to x2 demo tanks
- Engineering Composites Research Centre
- Centre for Secure Information Technologies
- Centre for Advanced Sustainable Energy
- Cognitive Analytics and Digital Robotics Innovation Centre

INFRASTRUCTURE

- Belfast Harbour
- Harland & Wolff (Navantia)

Northern Ireland: a haven for offshore wind industrialisation

World-class port facilities and a depth of industrial and digital capability

Northern Ireland is a key UK offshore wind industrial hub. Its primary focus is the deep-water infrastructure at Belfast Port, which has played a pivotal role in project installations across the Irish Sea, in Liverpool Bay. Strategically positioned for ongoing activity in the **Next Generation Installation and Operations & Maintenance** Industrial Growth Plan (IGP) priority area, Belfast is also set to benefit from ambitious port investment plans, enhancing its capability to serve projects in England, Scotland, Ireland and future development in Northern Ireland.

Key players such as Doyle Shipping and CASC have built up significant expertise from supporting installation of projects in the region, and both now work internationally in offshore wind and are well placed to secure future work.

Northern Ireland has emerging capability in **Future Electrical Systems and Cables**, along with some tier 2 expertise in **Advanced Turbine Technology**, particularly through regional expertise and capability in composites.

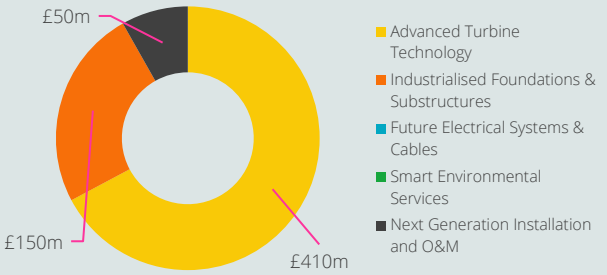
Navantia's purchase of Harland & Wolff brings international expertise in **Industrialised Foundations and Substructures**. As a group Navantia already has expertise in jacket fabrication and steel semi-submersible floating platforms that could potentially support regional growth (alongside its four other UK sites). Closeness to UK and Irish projects in the Irish Sea and Atlantic offer potential opportunities for use of Navantia facilities and expertise.

The region's strong aerospace and composite materials sectors could add value to turbine and cable innovation, while its thriving digital industry presents further opportunities in O&M including cyber security, digital twins, machine learning and robotics.

Northern Ireland has wider sector capability, including supplying aggregates for offshore wind scour protection, with potential applications in concrete floating wind substructures, reinforcing its industrial role in the sector's future, and wider decommissioning and circular economy capability.

Relevant Investment Need

Shared between relevant clusters



Cluster's unique proposition

Respond:
- Established hub for offshore wind installation activity across the western seaboard

Expand:
- Installation role for new generation of projects in England, Scotland, Northern Ireland and Ireland

Disrupt:
- Machine learning and digital skills for next generation projects
- Provision of composites for turbine manufacturing
- Manufacture of jacket and steel floating platforms

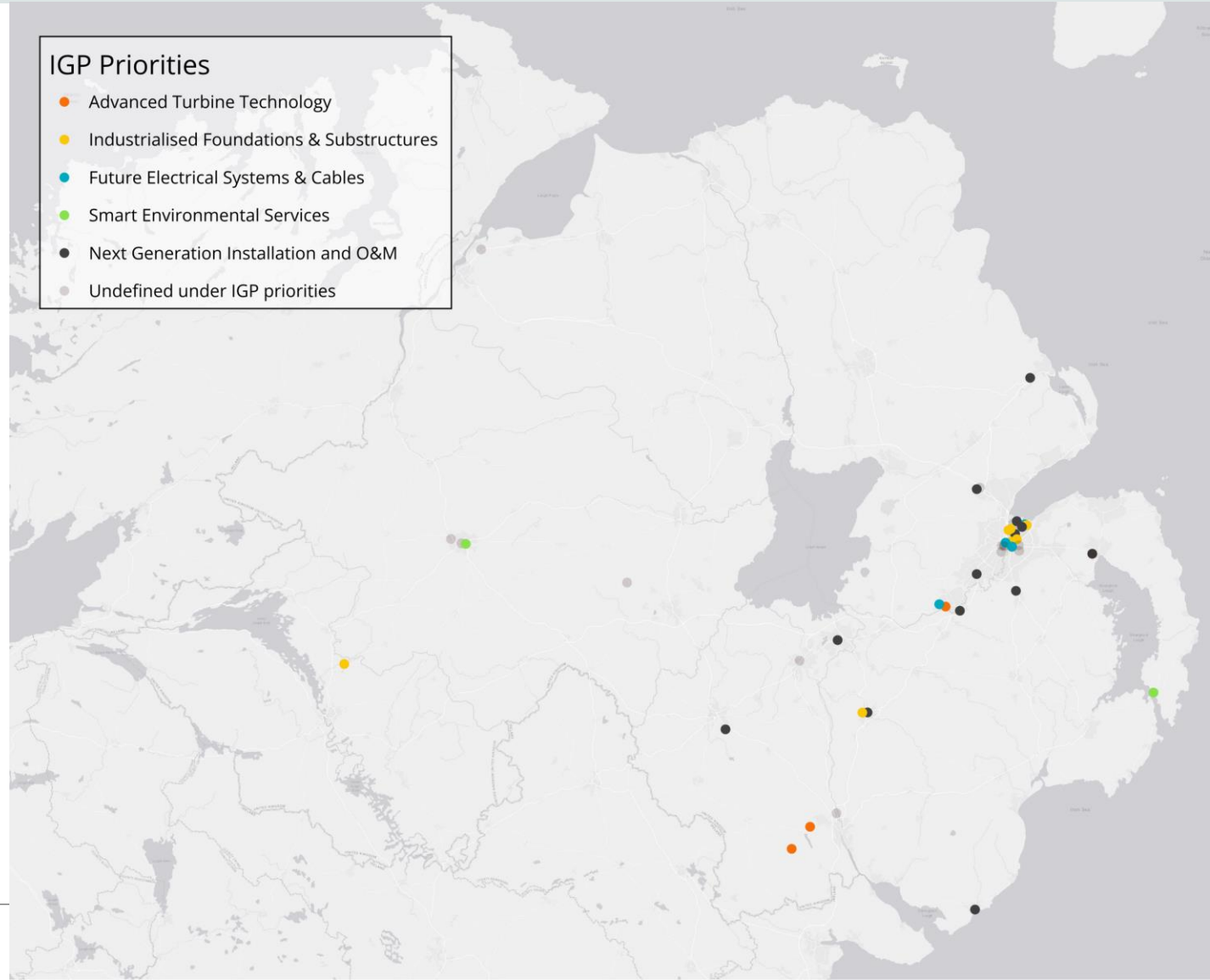
Analysis

Northern Ireland Maritime & Offshore – Company mapping

The UK's Industrial Growth Plan has identified a series of opportunities, grouped under five priorities, for the UK to prioritise and grow value. The Regional Growth Prospectus assessment shows a strong mapping of current capabilities in Northern Ireland. While current capability is not the sole determinant of future capability, it is a clearly a good place to start. The UK can then supplement this as needed through innovation, investment in start ups and foreign direct investment.

The map to the right shows the distribution of existing capability clustered particularly around Belfast but with a presence across Northern Ireland as a whole, based on the Supply Chain Capability Assessment commissioned by OWIC and the OWGP complimented with additional data from the cluster.

Most prevalent is capability in **Next Generation Installation and O&M** in Belfast and eastern counties, plus **Industrialised Foundations and Substructures** capabilities around Belfast.



Northern Ireland Maritime & Offshore – IGP aligned priorities

Investment £250-510m
Investment needed, shared between relevant clusters

Based on a national 'make or buy' analysis of critical components and services, the IGP highlights areas essential to domestic supply or where the UK has the potential to build global competitiveness.

While national in scope, the IGP emphasises the vital role of the UK's clusters in driving local supply chain growth and attracting targeted investment based on regional strengths.

This Regional Growth Prospectus helps to set out how the IGP can best build on these regional strengths. Developed with input from NIMO, the table right shows the most relevant Investment Opportunities set out in the IGP for this region. Also set out is IGP data showing target dates for investment, the value of required UK level investment and expected UK GVA expected if this investment is made.

IGP priorities	Opportunity		Target date	Investment *	National level GVA*
Industrialised Foundations & Substructures	Expand UK foundation manufacturing for designs catering to deep waters	Respond	2030	£70-100m	£ 1.2–2.0 bn
Advanced Turbine Technology	Introduce manufacturing capability to produce advanced composite material blades and towers for fixed and floating	Expand	2033	£170-280m	£ 1.1-2.1bn
Next Generation Installation and O&M	Use only low carbon emission vessels for all installations, operations and maintenance services in the UK	Expand	2030	£10-20m	N/A
Advanced Turbine Technology	Develop automation process for high value component manufacturing	Disrupt	2032	£10-40m	-
Advanced Turbine Technology	Develop world leading solutions that reduce leading edge erosion by 60% in the UK	Disrupt	2032	£30-90m	-
Industrialised Foundations & Substructures	Develop UK manufacturing capability to produce advanced material for part of the floating substructure production to reduce the weight of the floating substructures by 20%	Disrupt	2035	£20-50m	£ 0.8-1.6m
Future Electrical Systems & Cables	Develop new wet and dry cable designs and materials	Disrupt	2035	-	-
Next Generation Installation and O&M	Integrate Machine Learning (ML) algorithms optimising operations and maintenance services	Disrupt	2030	£1-5m	-
Next Generation Installation and O&M	Commercialise next generation inspection, monitoring and installation services, implementing autonomous vehicles, robotic system and ML algorithms to process data from sensors	Disrupt	2035	£10-25m	-

* Investment and GVA figures taken from IGP. When no figures are used, this stems from IGP not being able to estimate GVA and/or investment need

Northern Ireland Maritime & Offshore – IGP aligned priorities

Investment £250-510m

Investment needed, shared between relevant clusters

Next Generation Installation and O&M

The region has significant supply chain capability and infrastructure, plus a track record from providing installation services to wind farms in Liverpool Bay and the Irish Sea. With a new pipeline of projects to be built in the region, Northern Ireland can respond to this demand and grow its supply chain offer.

This supply chain should be supported as part of a UK-wide offering to integrate Machine Learning (ML) algorithms in O&M services, and commercialise next generation inspection, monitoring & installation services, building on wider regional digital skills.

The region also has important vessel and shipbuilding expertise that could be valuable in IGP work to develop and deploy low carbon emission CTVs and SOVs.

Industrialised Foundations & Substructures

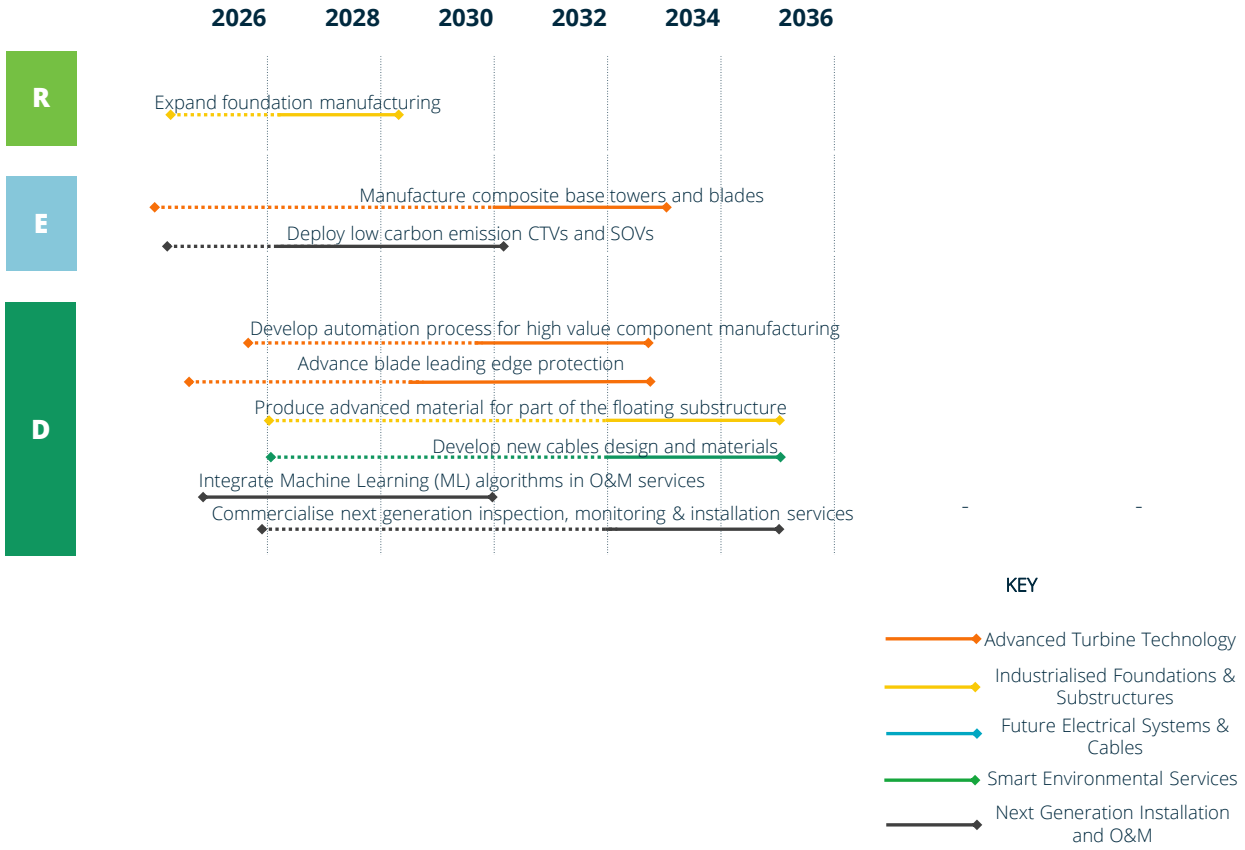
The region has existing capability in foundations including around Belfast and Harland & Wolff. Belfast Harbour also offers a deep-water port with capacity to support volume manufacturing of foundations, as well as potential for other component manufacture.

Composites & Advanced Manufacturing

Northern Ireland has capability in advanced manufacturing and composites that has been built around its aerospace industry. This capability could be relevant to blade and component manufacturers and aligns with a number of IGP opportunities, particularly within **Advanced Turbine Technology, Industrialised Foundations & Substructures** and **Future Electricity Systems and Cables**. While this wider capability is tightly defined, it also demonstrates the importance of IGP delivery taking account of UK wide expertise and looking to leverage other experience from wider sectors.

(R)espond, (E)xpand and (D)isrupt Programmes

Below are shown the IGP Investment Opportunities identified as most relevant to Northern Ireland. Investment data and timelines are taken from the IGP to help focus regional and national conversations on investment priorities.



Analysis

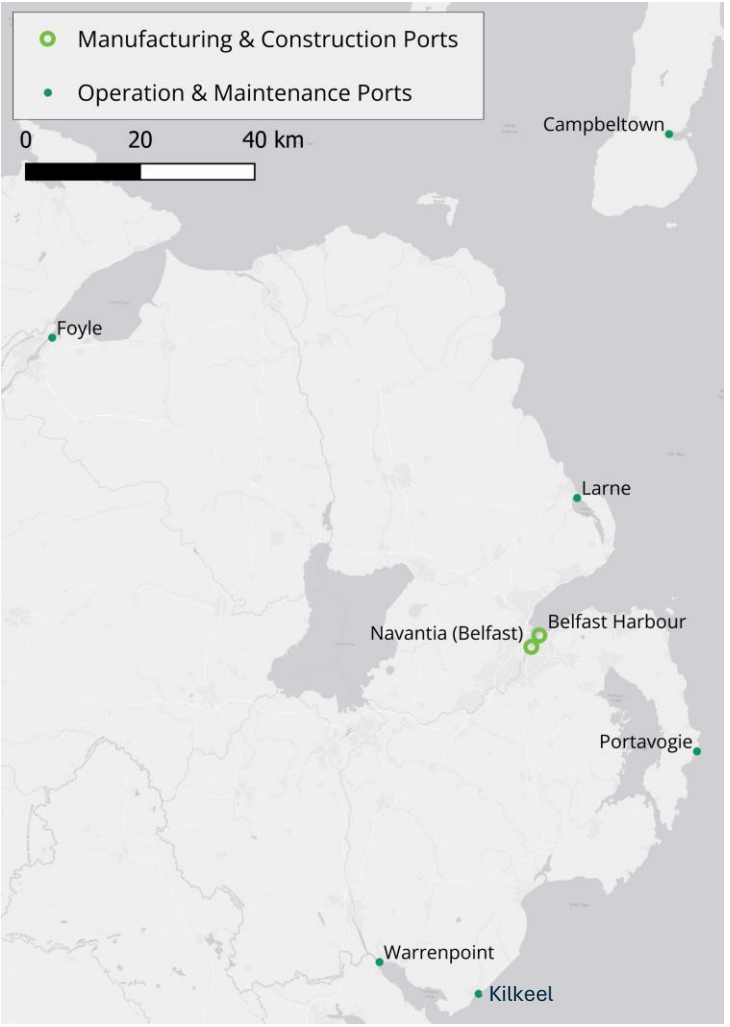
Northern Ireland Maritime & Offshore – Ports summary

The Northern Ireland Maritime and Offshore Cluster is a dynamic initiative aimed at bolstering the region's offshore wind supply chain. Bordering the Celtic, Atlantic, and Irish seas, this region could prove vital to support offshore wind development, complimenting existing policy and public affairs offering from Renewable NI. Several key regions play a crucial role in this cluster, and may well serve as crucial hubs for logistics, assembly, and maintenance of offshore wind projects:

- **Belfast and Surrounding Areas:** A key part of positioning for Northern Ireland's supply chain, this region benefits from extensive coastal areas and a deep-water port with a track record in offshore wind foundation fabrication and installation. This region offers significant potential for offshore wind projects.
- **Derry/Londonderry (Foyle):** Renowned for its robust maritime infrastructure and expertise in energy, this area is crucial for the development and maintenance of offshore wind projects.
- **County Down**: Due to their strategic location and industrial capabilities, the County Down ports of Portavogie, Warrenpoint and Kilkeel can provide essential services for the manufacturing and assembly of wind turbine components.

The D1 Terminal at Belfast Harbour, developed in 2012, is a purpose-built offshore wind logistics facility. It features a 500m quay wall and deep-water berth, ideal for marshalling and assembling wind turbine components. The terminal has supported major projects like West of Duddon Sands, Burbo Bank Extension, and Walney Extension. With a promising pipeline of offshore wind projects in the Irish Sea, Belfast Harbour is planning to develop it's D3 site to provide an additional 340m quay and approximately 15ha of storage space to further enhance its role in offshore wind construction.

Navantia is the new owner of the historic Harland and Wolff shipyard renowned for its fabrication and ship building expertise. The facility has supported assembly and construction of notable projects like East Anglia 1, Barrow, Ormonde and Robin Rigg. With large fabrication halls and deep-water access, Harland and Wolff (Navantia) is strategically positioned to support both fixed-bottom and floating offshore wind projects, although laydown areas are limited. Without expansion and upgrades, future activities could be limited to modular fabrication, depending on scale of the components to be produced.



Analysis

NIMO Northern Ireland Maritime & Offshore – Ports and O&M

Ports like Foyle, Kilkeel, Larne and Warrenpoint have significant potential for offshore wind operations and maintenance. They can serve as bases for service operation vessels and maintenance crews, providing essential storage and repair facilities, and supporting towage and pilot operations.

With a significant pipeline of new development ahead in the Irish Sea and Liverpool Bay, as well as the Atlantic, there will be a need for further port infrastructure to support future O&M activities.

Larger ports may be able to act as bases for a range of activities, with space to support manufacturing, installation and/or O&M. In the following pages, there is a focus on those ports also able to potentially support installation and manufacturing activities identified within the IGP.

Across the UK, there is a general shift to larger projects further from shore, often in deeper waters. Projects further from shore cannot easily be serviced by Crew Transfer Vessels (CTVs) that take O&M staff out to wind farms from port each day. This will mean more use of Service Operations Vessels (SOVs) that stay out at a windfarm for longer periods before returning to a base port for resupply and crew changeover.

With the shift to SOV O&M for both fixed and floating, there is potential for ports in Northern Ireland to act as SOV bases and support projects that are further afield. This could include acting as a base for fixed and floating projects. Northern Ireland has wider supply chain expertise seeking to bring vessel innovation to market.

Floating offshore wind O&M will have much in common with fixed, but there will be some differences. A critical one is the potential use of ports for providing periodic maintenance and larger component replacement. Instead of these activities being conducted in situ, turbines may be towed back to port for this work. It is expected that ports which undertake assembly and integration activities will be maintained in readiness to carry out such future maintenance work.

The IGP identifies UK expertise in O&M as a strength. UK projects and the supply chain are also leading offshore wind sector work to develop new and more efficient methods for O&M, such as remote monitoring and inspection. The UK also has capability in vessel design, operation and on-deck equipment.

IGP opportunities relating to O&M concern **low carbon emission CTVs and SOVs**; **integration of machine learning into O&M services**, and **commercialisation of next generation inspection, monitoring and installation services**.

Foyle Port
Courtesy of Foyle Port

Analysis

Northern Ireland Maritime & Offshore – Installation & manufacturing ports

Fabrication
Marshalling/Storage
Assembly and Integration
Installation

Belfast Harbour

- Expansive quayside
- Significant warehouse facilities
- 2030 net zero operations target
- Dedicated terminal for offshore wind
- Continuous year-round port access
- Experience supporting offshore wind projects

Harland & Wolff (Navantia)

- Heavy lift capability
- Manufacturing facilities under development
- Ongoing green energy investment efforts
- Experience supporting offshore wind projects

Analysis

Northern Ireland Maritime & Offshore – IGP alignment (installation & manufacturing ports)

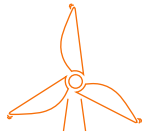
Port specifications and input from the NIMO cluster have been used to evaluate each port's ability to support manufacturing activities, and services such as assembly and installation. These ports were selected and assessed based on track history and their installation and manufacturing characteristics, such as extensive quay lengths, large laydown areas, and high bearing capacities.

This evaluation adopts the "Expand" and "Respond" terminology set out in the 2024 Offshore Wind Industrial Growth Plan, set against priority symbols to reflect the opportunity for the key ports located in this cluster.

In this context: "Expand" indicates a port has good infrastructure, with upgrades required to fully facilitate the underlying activities; and "Respond" defines a port to have strong infrastructure, with minor to minimal improvements needed.

Notes on this assessment:

- "Disrupt" has been omitted from the evaluation as there are many ports that, with sufficient investment, could support the IGP priorities over the coming decade.
- A port is classed as being able to support a particular priority if it could host a range of the varied activities within the priority (for example it could host towers or blades or drive train components, not just one type of facility).
- The IGP priority "Smart environmental services" has been omitted from this analysis as these services are less constrained by port infrastructure. For the IGP priority "Next Generation Installation, Operations and Maintenance" only installation activities have been considered, as it is assumed there is widespread capability across multiple ports to support O&M.

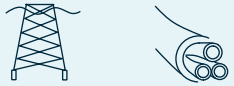


Advanced Turbine Technology
- Turbine design and engineering
- Tower
- Blades
- Drive train components
- Composite-based components
- Automation of manufacturing process
- Leading edge protection

Future Electrical Systems and Cables
- Array cables
- Export cables
- Dynamic inter-array cables at 132kV
- HVDC system interoperability
- Standardised systems

Industrialised Foundations & Substructures
- Floating foundation design
- Deeper water & floating foundations
- Moorings and anchors
- Automated welding
- Composites for light weight foundations
- Synthetic mooring line materials

Next Generation Installation
- Wind turbine installation
- Cables installation vessels operation

Activity	Actions	Belfast	Harland & Wolff (Navantia)
Manufacture	Expand		
	Respond		
Services	Expand		
	Respond		