The Humber Offshore Wind Cluster

Humber Region, England

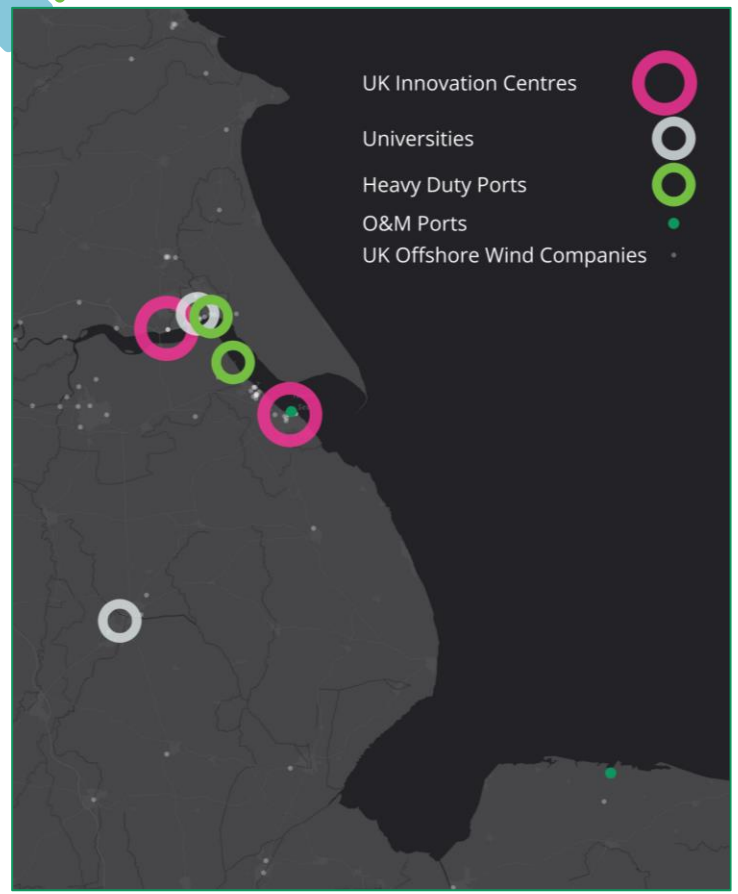
THE HUMBER OFFSHORE WIND CLUSTER

Commissioned by:

Offshore Wind Industry Council

THE CROWN ESTATE

THE HUMBER OFFSHORE WIND CLUSTER



Delivering our regional growth through

Advanced Turbine Technology

Next Generation Installation and O&M

Industrialised Foundations & Substructures

Enabled by

13.8GW by 2030
>10GW consented project pipeline

Plus:

- Strong cross-industry and renewables focus – CCS (UK Centre of Excellence), hydrogen & negative emission power (NZT Power, H2 Teesside & Teesside Hydrogen CO2 Capture)
- Humber Freeport
- Mature and advanced offshore wind cluster
- Hull – strong manufacturing and installation capabilities
- Grimsby – One of UKs leading O&M centres

Working with

LOCAL STAKEHOLDERS

- Supply Chain enabling – Humber Marine and Renewables & The Supply Chain Network
- Public enablers - Hull & East Riding CA, Greater Lincolnshire CCA, Local Authorities (HCC, ERYC, NELC & NLC), Hull & Humber Chamber of Commerce
- Humber Energy Board (offshore wind, H2 & CCS)
- Humber Freeport

And building on

SKILLS

- Private education & training – HOTA, HETA, HFR, CIC & CATCH (Maersk & Modal)
- Further education colleges – Grimsby Institute, Hull, Bishop Burton, East Riding, Hull College Group & North Lindsey
- University Technical Colleges (UTCs) - Engineering UTC Northern Lincolnshire and Ron Dearing UTC

INNOVATION

- Pioneering history – First GW offshore wind farm operated from Grimsby, first Siemens 6 MW turbine installation & first recyclable blades from Hull
- Aura Innovation Centre
- ORE Catapult – O&M Centre of Excellence
- Universities of Hull & Lincoln

INFRASTRUCTURE

- Green Port Hull (Siemens Energy turbine facility, Energy Works, ABP/Drax Biomass, Yorkshire Energy Park, Humber International Business Park,
- Able Humber Port
- Operational Ports of Grimsby, Immingham, Goole and Hull (ABP), Port of Grimsby East (Grimsby Fish Dock Enterprises)

Humber Offshore Wind Cluster: Blades excellence and installation on the north bank, O&M expertise on the south

UK blade manufacturing supplying the European market, and opportunities to grow. O&M expertise built up serving some of the world's biggest wind farms, and opportunities for manufacturing growth

The Humber Offshore Wind Cluster is home to the successful Siemens Energy blade factory and installation port. This makes the Cluster a leading light in UK efforts to double blade capacity as well as grow UK footprint in offshore wind installation.

On the south bank the ports of Grimsby and Immingham play a leading role supporting the operation and maintenance of a wide range of wind farms, including mature assets served by CTVs and GW+ farms supplied by a fleet of SOVs. New wind farm growth in the North Sea and beyond provides future market opportunities for the region. These capabilities align well to the national priority areas of **Advanced Turbine Technology** and **Next-Generation Installation, Operations, and Maintenance**.

Port of Hull's role as an installation port, alongside Grimsby port's longstanding experience as an O&M hub, add strength to the region's offer. Increased utilisation of Immingham by SOVs working in region highlight the ability of the region to grow with increasing demand.

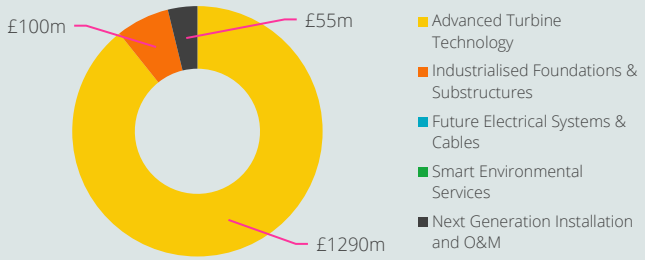
The most substantial economic opportunity in offshore wind lies in supporting the region to grow blade production capacity, while also evolving its deep O&M capability to respond to market pressures as new innovation and digital skill requirements are adopted.

There are also opportunities within region to support the Industrial Growth Plan's (IGP) commitment to treble UK manufacturing. Plans for new port development at the Able Humber Port on the south bank could provide dedicated deep-water quayside to suit a range of installation and manufacturing activity, including **Industrialised Foundations and Substructure** and turbine manufacturing.

This strong offshore wind expertise also sits within the Humber Vision 2030 which aims to grow and transition an active energy region to a lower carbon future.

Relevant Investment Need

Shared between relevant clusters



Cluster's unique proposition

Respond:
- Support Siemens Energy and the region grow blade capacity to respond to rising blade demand and installation requirements
- Opportunities to grow O&M presence as part of Next-Generation Installation, Operations, and Maintenance

Expand:
- Support wide SME base to secure larger packages of work within O&M phase
- Capture service package value from wide SOV presence in region

Disrupt:
- Significant port capacity expansion suitable for future construction, installation and manufacturing

Analysis

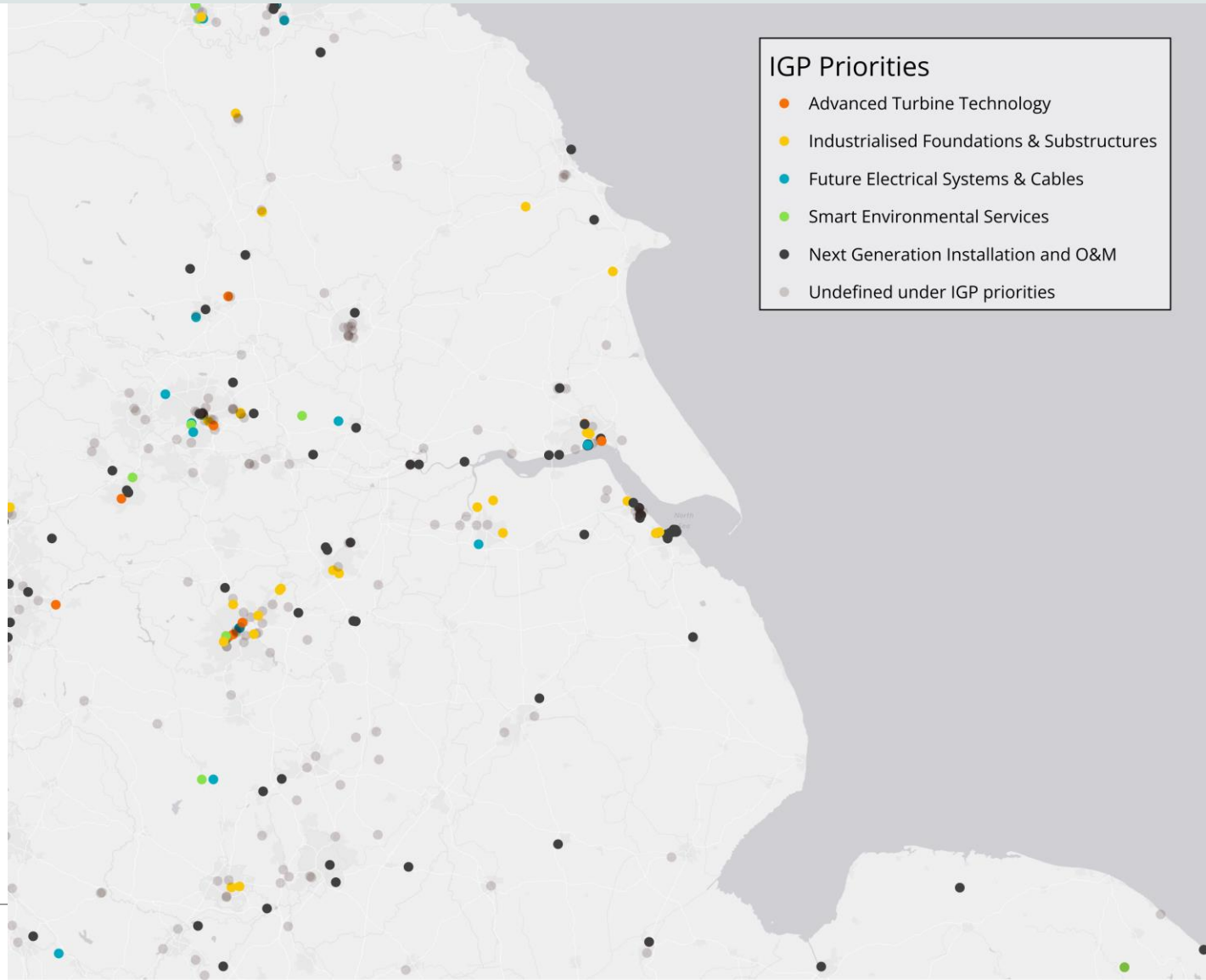
THE HUMBER OFFSHORE WIND CLUSTER – Company mapping

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 the Humber Offshore Wind Cluster. 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 across the Humber and adjoining region from Grimsby, based on the Supply Chain Capability Assessment commissioned by OWIC and the OWGP complimented with additional data from the cluster.

Clearly visible is the regional focus of Next Generation Installation and O&M on both the north and south banks of the Humber, as well as turbine and foundations capability.

The region has foundations capability in Grimsby, Immingham, Scunthorpe and Hull, as well as across the wider region, particularly around Sheffield and Rotherham. There is also wider sector capability around the Leeds-Bradford conurbation.



THE HUMBER OFFSHORE WIND CLUSTER – IGP aligned priorities

Investment £722-1,445m

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 the Humber Offshore Wind Cluster, 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 if this investment is made.

IGP priorities	Opportunity		Target date	Investment	National level GVA
Advanced Turbine Technology	Increase UK blades capacity by 50% from 2023	Respond	2027	£200-400m	£ 1.8-2.7bn
Industrialised Foundations & Substructures	Expand UK foundation manufacturing for designs catering to deep waters	Respond	2030	£70-100m	£ 1.2 – 2.0 bn
Next Generation Installation and O&M	Increase the UK's supplier base of EPCI companies	Respond	2027	£1-5m	£0.4-0.8 bn
Advanced Turbine Technology	Double UK blade capacity from 2026, and develop capability to produce >15 MW turbine blades	Expand	2030	£200-400m	£ 1.8-2.7bn
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	Increase in UK blade manufacturing productivity by 20%	Disrupt	2032	£20-80m	£ 0.3-0.5bn
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	-
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	-
Industrialised Foundations & Substructures - materials	Grow UK steel supply into offshore wind fabrication	N/A	-	-	-

THE HUMBER OFFSHORE WIND CLUSTER – IGP aligned priorities

Investment £722-1,445m
Investment needed, shared between relevant clusters

The Humber Cluster has two key strengths: blade manufacture, and installation and O&M.

Advanced Turbine Technology

The Siemens Energy Hull blade plant expansion is a key part of delivering the IGP opportunities relating to doubling UK blade capacity production. Longer term this expertise will be critical for UK efforts to increase productivity, automating production and development of new leading edge protection technologies.

However, while the Siemens Energy plant has benefited from regional expertise in composite fabrication, it relies on a supply chain that is outside of the UK. There are opportunities for growing UK supply into UK blade production supporting Siemens Energy's growth.

Next Generation Installation and O&M

As well as its blade factory, the Siemens Energy facility serves as an important UK installation base. South of the river a wide network of supply chain companies supply a range of O&M services out of Grimsby and increasingly Immingham. This expertise can support the IGP in securing opportunities that come from commercialising next generation inspection, monitoring and installation services in the UK.

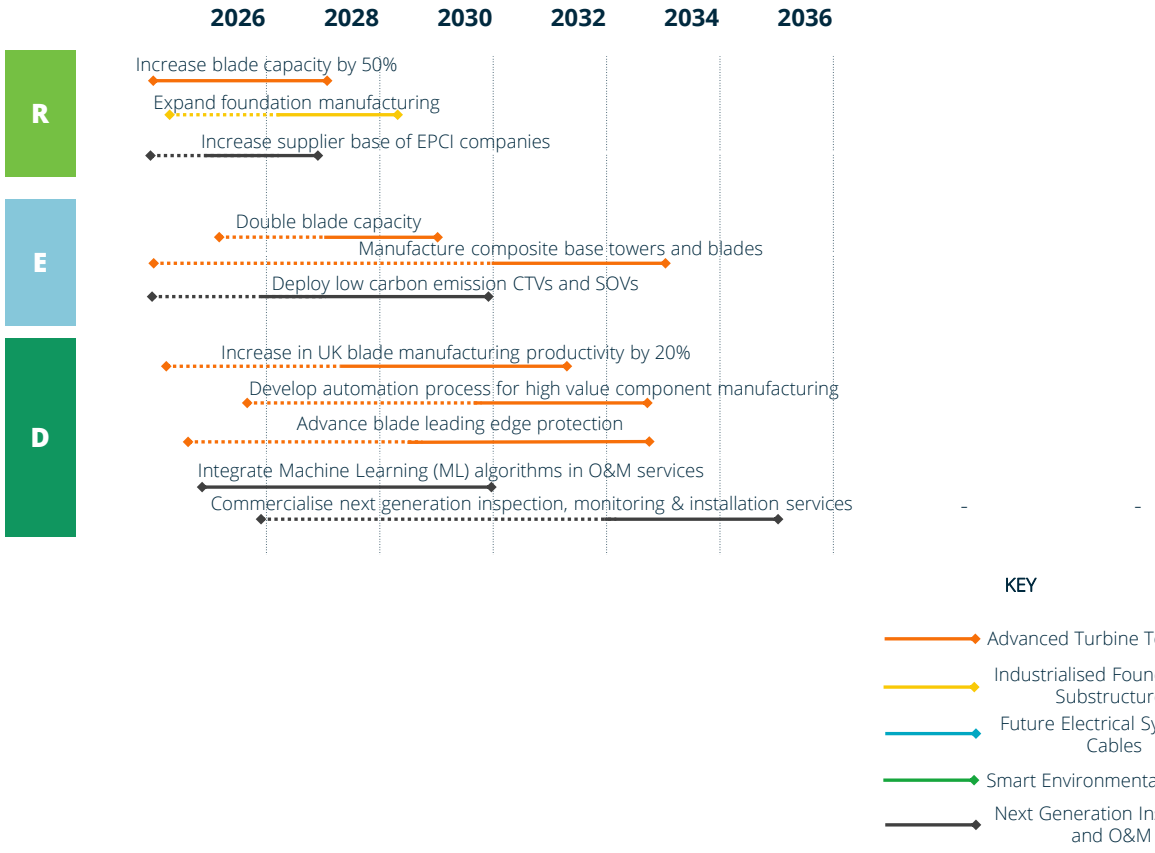
Vessel expertise within the region can also be utilised to support UK efforts to deploy low carbon emission CTVs and SOVs. The presence in the region of the ORE Catapult O&M Centre of Excellence provides an important hub for testing and commercialisation of a range of IGP opportunities.

Industrialised Foundations & Substructures

The region has wider steel capability, currently at risk, but also potential port development space to support manufacturing of both turbine components and foundations.

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

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



Analysis

THE HUMBER OFFSHORE WIND CLUSTER – Ports summary

The Humber Offshore Wind Cluster is a dynamic initiative aimed at strengthening the UK's offshore wind supply chain. Several key ports play a crucial role in this cluster, serving as vital hubs for manufacture, assembly, and maintenance of offshore wind projects:

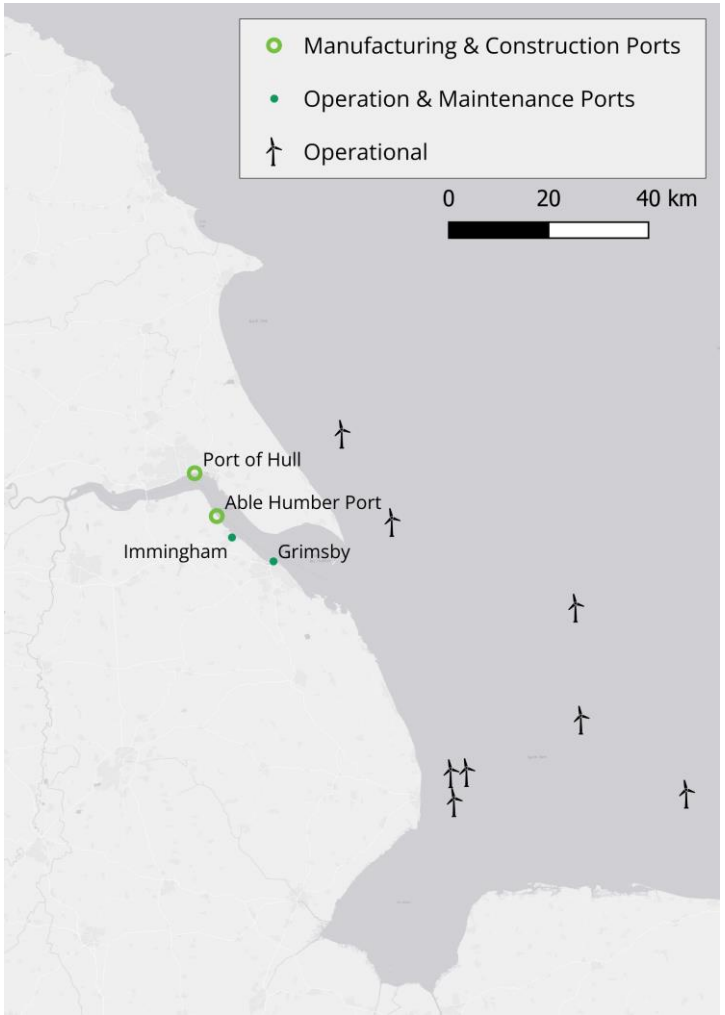
- **Port of Hull:** This port is a major hub for the assembly and installation of offshore wind turbines. It features the Siemens Energy factory at Alexandra Dock, a state-of-the-art facility for manufacturing wind turbine blades.
- **Able Humber Port:** Located on the south bank of the River Humber, the site is expected to become a leading hub for manufacturing, assembly, and storage of offshore wind components, featuring heavy-duty deep-water quays and extensive laydown areas.
- **Port of Grimsby and Port of Grimsby East:** Known for its strong maritime infrastructure, Grimsby is pivotal for the operation and maintenance (O&M) of offshore wind farms. It hosts several O&M bases and offers substantial expertise in the sector.

The Humber's Freeport status provides tax incentives and simplified customs, potentially boosting offshore wind activities in the cluster. Siemens Energy's blade factory at Alexandra Dock and the proposed Able Humber Port development are likely to be the most significant beneficiaries within the Humber Offshore Wind Cluster.

The Siemens Energy blade factory at the Port of Hull has produced nearly 2,000 blades for projects like Race Bank and Hornsea Two. It plans to expand by 4.16 hectares, doubling capacity and creating 200 additional jobs. The factory has supplied recyclable blades to RWE's Sofia offshore wind project and the quay can directly support load out of turbine components.

The proposed 400ha Able Humber Port was nominated for £75 million in grant funding from the Offshore Wind Manufacturing Investment Scheme (OWMIS) to support the development of port infrastructure for manufacturing offshore wind components. The project has experienced delays, and the Development Consent Order has been extended to October 28, 2025.

The Port of Grimsby is a major hub for offshore wind operations and maintenance (O&M) activities, supporting multiple wind farms and acting as a "living lab" for testing and developing digital technologies for O&M services.



Analysis

THE HUMBER OFFSHORE WIND CLUSTER – Ports and O&M

Over time the Port of Grimsby has grown into a major hub for offshore wind operations and maintenance (O&M) activities, with significant expertise now located in and around the port.

The port supports wind farms such as Lynn and Inner Dowsing, Lincs, Hornsea One, Hornsea Two, Race Bank, Triton Knoll and Westermost Rough, with key operators such as Ørsted and RWE.

Grimsby, together with Immingham, has also evolved into a significant Service Operation Vessel (SOV) operations base and is the home to the ORE Catapult O&M Centre of Excellence (OMCE). OMCE features the world's largest offshore wind "living lab" with a 5G testbed, designed to test and develop digital technologies to provide safer, greener, and more efficient O&M activities.

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 SOVs that stay out at a windfarm for longer periods before returning to a base port for resupply and crew changeover. Grimsby's early experience of this shift to SOVs is important for the UK, as it has expertise in supporting both CTV and SOV based operations. RWE's Sofia project, currently under construction, will be supported out of Grimsby, highlighting that with the shift to SOV based operations, projects further out of region can be supported.

While different projects may choose different ports depending on individual project needs, there are opportunities for clustering of activities such as SOV supply and support to improve operational efficiency. Such clustering of O&M activities can potentially also enable further supply chain clustering in support of multiple projects. This clustering has taken place in oil and gas, so as the number of projects in offshore wind grows, this may also take place in offshore wind.

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**.

Port of Grimsby
Courtesy of Ørsted

Analysis

THE HUMBER OFFSHORE WIND CLUSTER – Installation & manufacturing ports

Fabrication
Marshalling/Storage
Assembly and Integration
Installation

Able Humber Port *

- Deepwater quayside
- Sheltered water
- Expansive quayside
- Land available for future development
- Freeport

Port of Hull

- Deepwater quayside
- Sheltered water
- Expansive quayside
- Significant laydown space
- Turbine manufacturing facilities
- Suitable for turbine assembly
- Dedicated quay space for offshore wind

* Under Development: Port upgrades underway, FID reached, or secured grant funding for expansion

Analysis

THE HUMBER OFFSHORE WIND CLUSTER – IGP alignment (installation & manufacturing ports)

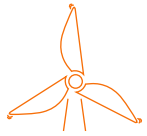
Port specifications and input from the Humber Offshore Wind Cluster have been used to evaluate each port's ability to support manufacturing activities, and services such as assembly and installation. These ports were selected and assessed based on track history and their installation and manufacturing 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	Able Humber Port	Port of Hull
Manufacture	Expand		 
	Respond		
Services	Expand		 
	Respond		