

# Celtic Sea Cluster

South Wales and  
South West England



Commissioned by:

OffshoreWind  
IndustryCouncil

THE CROWN  
ESTATE



## Delivering our regional growth through



**Smart  
Environmental  
Services**



**Next Generation  
Installation and  
O&M**



**Industrialised  
Foundations &  
Substructures**



**Enabled by**



**4.5 GW in Celtic Sea Leasing Round 5  
15-50GW total regional potential**

Plus:

- Wider opportunities for fixed offshore wind in English Channel
- Established capabilities in aggregates, concrete and steel
- Celtic Freeport, Plymouth and South Devon Freeport
- Cross-sector leverage – defence, maritime, civil nuclear and steel
- Wales Offshore Wind Task & Finish Group looking at offshore wind supply chain opportunities

**Working with**

**LOCAL STAKEHOLDERS**

- UK and Welsh Government
- Regional Councils and Corporate Joint Committees
- Celtic Sea Developers Alliance & Celtic Sea Power
- RenewableUK Cymru



**And building on**

**SKILLS**



- FLOWmark curriculum initiative
- Numerous FE and HE institutions
- SPARC & Destination Renewables
- Wales Net Zero Skills Action Plan
- Industrial skills programmes including National College Nuclear, Welding and Construction Centres. Bridgwater & Taunton College/University of Somerset expertise in building nuclear skills

**INNOVATION**



- National Composites Centre, Bristol
- Cornwall FLOW Accelerator
- Offshore Renewable Energy and High Value Manufacturing Catapults
- Pembroke Dock Marine – MEECE, Pembroke Dock Developments, META & PDZ
- FAST Cluster / Plymouth's Smart Sound
- Universities across the region with strengths in Environmental Science, renewable energy engineering, cyber security & clean propulsion
- National Hydrographic Office, Taunton
- Appledore Clean Maritime Innovation Centre

**INFRASTRUCTURE**



- High potential port infrastructure
- O&M and assembly & marshalling ports (potential) - Port Talbot, Port of Milford Haven (Pembroke Dock), Swansea, Falmouth, Plymouth, Bristol, Yelland, Appledore & Portland
- Plans for major port upgrades in Portland with potential for manufacturing capacity

## Celtic Sea Cluster: strong foundations for industrial growth

*A rising star in deep-water wind technology powered by industrial knowhow, a world-class maritime services sector, and a dynamic innovation ecosystem*

The Celtic Sea Cluster was originally established to help set the market conditions for floating offshore wind. However, its scope and ambition have since expanded both geographically and industrially. While the cluster does not yet have offshore wind projects in construction or operation, it has a strong pipeline of floating wind developments, including both commercial and test and demonstration projects. The Celtic Freeport covers the South Wales section of the cluster. Across the cluster region, there is significant existing capability in marine services, supporting offshore wind projects in both the UK and international markets. These capabilities align well to the national priority areas of **Smart Environmental Services** and **Next-Generation Installation, Operations, and Maintenance**.

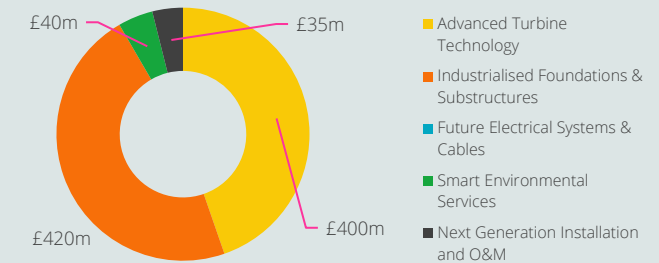
The cluster also benefits from strategic port infrastructure, with existing facilities and expansion plans at key locations such as Port Talbot, Pembroke Dock, Falmouth, Plymouth, Bristol, and Portland, and active cross-port working and engagement. Several research-intensive universities in the region contribute expertise in renewable energy engineering, energy networks, and cyber security. Innovation is actively supported, with significant investment in facilities such as the Offshore Renewable Energy and High Value Manufacturing Catapults and the Clean Maritime Innovation Centre, set to open in Appledore, Devon in 2026.

The most substantial economic opportunity in offshore wind lies in **Industrialised Foundations and Substructures**. South Wales has established steel capabilities, including steel production for concrete rebar supply, with potential future growth in new steel production and growth in fabrication. South Wales is also home to substructure designer Marine Power Systems.

South West and West of England have strong concrete expertise, supported by aggregate extraction, concrete production, and experience in handling and assembling large concrete structures—particularly from the Hinkley Point civil nuclear project. The region has a strong civil engineering sector, already engaged in onshore renewables and coastal infrastructure projects. Portland Port is advancing plans for significant port expansion, which could support large-scale offshore wind manufacturing. Investment in the broader defence industry presence around Plymouth and in South Wales also offers transferable expertise for **Smart Environmental Services** and **Next-Generation Installation, Operations, and Maintenance**.

### Relevant Investment Need

Shared between relevant clusters



### Cluster's unique proposition

#### Respond:

- Live opportunities in Smart Environmental Services and Next-Generation Installation, Operations, and Maintenance in fixed offshore wind can act as springboard into floating

#### Expand:

- Policy/ business case for deep-fixed technology
- Skills and capability transfer from civil nuclear and defence industry
- T&D projects and R&D in Celtic Sea
- Regional contractors
- Next Generation eVessels

#### Disrupt:

- Significant port capacity expansion and regional port coordination
- Data standards for environmental surveys
- Operational cyber security services

## Analysis



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# – Company mapping

The UK's Industrial Growth Plan (IGP) 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 Celtic Sea Cluster. While current capability is not the sole determinant of future capability, it is a clearly a strong foundation to build on. The UK can supplement this as needed through innovation, investment in start ups and foreign direct investment

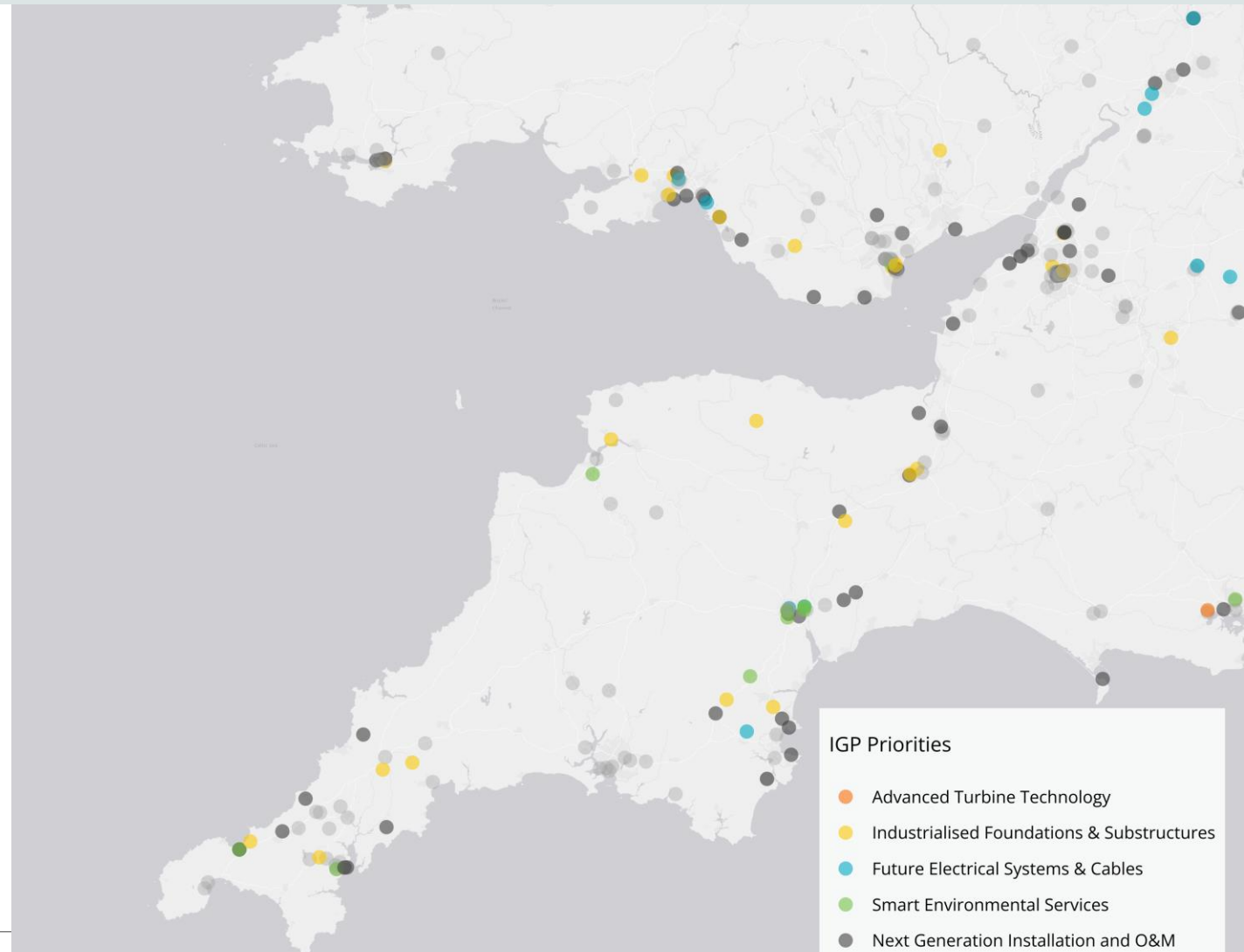
The map to the right shows the distribution of capability across the cluster regions, based on the Supply Chain Capability Assessment commissioned by OWIC and the OWGP complimented with additional data from the cluster.

The geography of the Celtic Sea Cluster is divided into South Wales, South West England and West of England.

Broadly speaking, Industrialised Foundations and Substructures capability is well represented across the entire cluster, with specific capabilities relating the steel industry found in South Wales and concrete materials and manufacture found in South West and West of England.

Capability in Next Generation Installation and O&M can be found across both regions while Smart Environmental Services Capability tends to be focused in South West England.

Cluster expertise in composites can be seen due to the presence of the National Composites Centre in Bristol.





## - IGP aligned priorities



**Investment £458-915m**

*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 Celtic Sea Cluster, the table on the 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 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
Industrialised Foundations & Substructures	Increase UK capacity of mooring and anchors by 50% from 2023	Respond	2030	£20-50m	£ 0.3-0.5 bn
Industrialised Foundations & Substructures	Develop UK manufacturing capability to produce 50 units of floating foundation per year	Respond	2030	£100-200m	£ 4.0-8.1 bn
Smart Environmental Services	Build extensive marine datasets	Respond	2026	£5-10m	£ 80-120m
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	Introduce manufacturing capability to produce advanced composite material blades and towers for fixed and floating	Expand	2033	£170-280m	£ 1.1-2.1bn
Industrialised Foundations & Substructures	Develop UK manufacturing capability to produce advanced material for mooring and anchors	Expand	2035	£10-20m	-
Smart Environmental Services	Claim the top position globally in providing surveying services across global serviceable markets, with more than 30% of contracts awarded to UK suppliers	Expand	2030	£10-20m	£ 0.2-0.3bn
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	-
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
Smart Environmental Services	Integrate multiple Machine learning techniques optimising environmental surveys and minimising ecological impact in the UK	Disrupt	2030	£1-10m	-
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	-	-	-
Industrialised Foundations & Substructures - materials	Grow UK concrete capability to supply into offshore wind	N/A	-	-	-



## – IGP aligned priorities



Investment **£458-915m**

*Investment needed, shared between relevant clusters*

### Industrialised Foundations & Substructures

The clear focus of the Celtic Sea Cluster is supporting the delivery of a floating offshore wind supply chain able to support a pipeline of floating projects. This focus gives the region significant strength. There is expertise across the in floating system designs, and a capable steel and concrete supply chain active supplying other sectors. Regional ports are working together to support these manufacturing and assembly opportunities.

Our assessment of Celtic Sea Cluster's strengths to secure value from floating substructures is based on its vision of future capability growth, plus the strong business and innovation ecosystem being developed by regional and devolved governments. There are opportunities to align growing expertise in floating structures with supply into fixed offshore wind foundation markets.

### Next Generation Installation and O&M

The Celtic Sea region has a wide group of companies already active in installation and O&M services for offshore wind. This expertise can support the IGP in delivering opportunities for next generation installation and O&M. Critically, as the region sees a build out of floating offshore wind, regional ports and companies will play a vital role in installation, and there is learning needed on how to maintain floating projects.

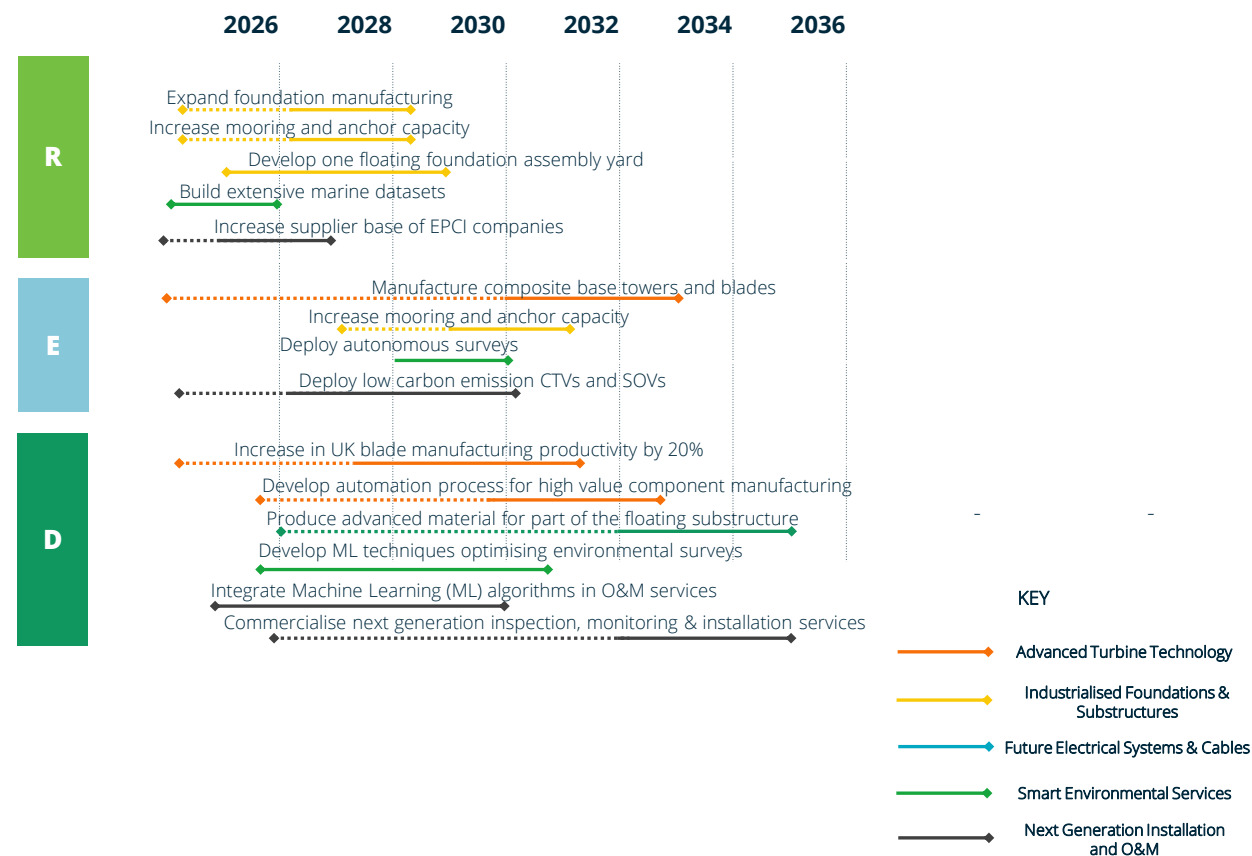
### Smart Environmental Systems

The region has a strong maritime base, offering expertise to accelerate use of digital capability in offshore wind present both in South Wales and SW England. Wider defence capability is also a strength as is the region's strong maritime and digital innovation presence.

The presence of the Bristol based National Composites Centre also highlights the active role of the region in bringing to market commercial propositions for using new materials in towers, blades, substructures and moorings as well as introducing new manufacturing techniques into component manufacturing.

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

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



## Analysis



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## – Ports summary

There are currently no UK ports ready to build floating offshore wind structures. The Celtic Sea Cluster is a driving force behind the region's development in offshore wind, re-energising the region to support work streams and foster industry growth. Several key regions serve as vital points for future industry growth:

- **South Wales:** Boasting of extensive fabrication and laydown spaces, ports such as Milford Haven and Port Talbot are pivotal for the development and installation of future offshore projects.
- **Bristol:** With significant deepwater quayside, this fast-growing port is positioned to support large vessels and cargo loads, as well as provide sheltered water docking as needed.
- **South West England:** Including Plymouth and Falmouth, these ports provide modern berthing facilities for ship servicing, large laydown facilities, and experienced cargo handling.

ABP's development plans for Port Talbot include extensive laydown space and high bearing capacity to support floating offshore wind. With a £500 million investment, the project aims to create jobs in South Wales and is advancing through the Floating Offshore Wind Manufacturing Investment Scheme.

Milford Haven has freeport status, and its Port Authority has considered the expansion of Pembroke Port for

fabrication and marshalling, however it is expected to primarily focus on O&M activities. Milford Haven is also home to Wales's Marine Energy Test Area which aims to deploy, de-risk and develop marine energy technology.

The Port of Bristol plans to expand on their fully consented container terminal development to develop the Bristol Wind Terminal (BWT) at Avonmouth to support the production, marshalling, integration, and deployment of floating offshore wind turbine units.

On the southwest coast, the Port of Falmouth is expanding, building on its existing capabilities in cargo handling and ship repair. The port has access to extensive sheltered temporary mooring locations and has pursued a new deep channel, upgraded vessel repair facilities, and improved bunkering services, which could benefit offshore wind development and operations.

The Port of Plymouth is considering expansion to develop laydown space with substantial bearing capacities for marshalling and storage, while leveraging existing strengths in marine technology and engineering.

The proposed Channel Gateway development at the Port of Portland could be a strategic offshore wind hub with 700–1000 m of berth and 40–50ha of manufacturing, marshalling, and storage quay. Deliverable by 2030, the port could offer deep water, shelter, and extensive wet storage, making it ideal for UK and European offshore wind projects.





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## – Ports and O&M

The Celtic Sea Cluster is focused on supporting growth of offshore wind in the region. It is a region without operational offshore wind projects, which means that we have assessed likely potential locations for offshore wind O&M bases in the region.

Ports such as Port Talbot, Bristol, Falmouth and Plymouth are expected to focus on larger offshore wind packages relating to installation and manufacturing. As larger sites they would also be able to provide O&M facilities, depending on project need and location. A wider group of ports such as Swansea, Newport, Appledore, Newlyn and Fowey are potentially suitable for O&M, depending on future project needs.

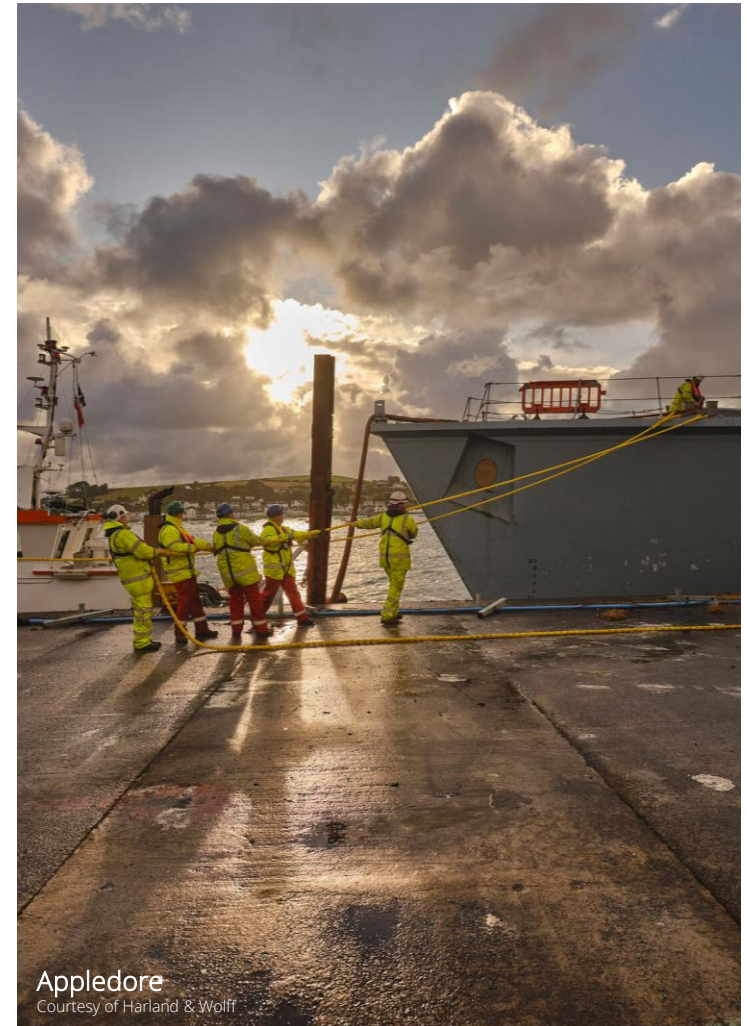
Across the UK there is a general shift to larger projects further from shore, often in deeper waters, meaning more use of Service Operations Vessels (SOVs) that stay out at a windfarm for longer periods before returning to a base port for resupply and crew change over. A Clean Maritime Innovation Centre is being set up at Appledore. This Centre could support UK efforts to commercialise clean propulsion in CTVs and SOVs.

The region is also supporting work to be ready for supply of O&M services to future floating offshore wind. Floating offshore wind O&M will have much in common with fixed, but there will be some key 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. Cornwall's Nerth has secured The Crown Estate Accelerator funding to support development of its dedicated servicing hub in the SW. Celtic Sea Power's Piranha Hub is also supporting consortia formation for companies interested in O&M and logistics services in the region,

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.** Local technical and digital capability as well as maritime expertise already working in fixed offshore wind projects that can be refocused on floating offshore wind O&M support in the region.



Appledore  
Courtesy of Harland & Wolff

## Analysis



# - Installation & manufacturing ports

## Bristol



- Deepwater quayside
- Expansive quayside

- Land available for further development
- Rail access within port

## Falmouth



- Deepwater quayside
- Sheltered water

- Berths designated for vessel repair

## Plymouth



- Significant laydown space
- International Port

- Freeport

## Port Talbot\*



- Deepwater quayside
- Expansive quayside
- Significant laydown space

- Manufacturing facilities under development
- Freeport

## Milford Haven



- Fabrication facilities available for redevelopment
- Heavy lift capability

- Proximity to wave, tide, and floating wind energy sources
- Free port

## Portland



- Deepwater quayside
- Extensive wet storage area

- Land available for further development
- Low tidal range

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

## Analysis



# – IGP alignment (installation & manufacturing ports)

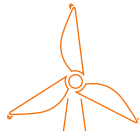
Port specifications and input from the Celtic Sea Cluster have been used to evaluate each port's ability to support manufacturing activities, and services such as assembly and installation. These ports were selected and assessed based on track history and their installation and manufacturing characteristics, 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 how to use 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	Bristol	Falmouth	Milford Haven	Plymouth	Port Talbot	Portland
Manufacture	Expand						
	Respond						
Services	Expand						
	Respond						