

MAPPING OFFSHORE WIND CAPABILITIES IN SCOTLAND SUPPLY CHAIN QUESTIONNAIRE

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1. Executive Summary

Purpose

Industry context

Scotland is in the top ten of global offshore wind markets with a pipeline of almost 46GW all potentially deliverable before 2035 and 48 offshore wind projects under development, construction or in operation in Scottish waters.

The east coast of Scotland is currently home to the majority of Scotland's offshore wind farms with the region boasting a rich diversity of supply chain companies from developers to SMEs supported by world class infrastructure with a diverse range of ports and Forth Green Freeport.

The potential value of supply chain opportunities in offshore wind in Scotland is substantial, driven by the country's ambitious renewable energy targets, abundant wind resources and commitment to decarbonisation.

The Scottish Government estimates that the offshore wind sector could generate tens of billions of pounds in economic value over the coming decades with investments in infrastructure, fabrication yards, ports and other facilities expected to contribute significantly.

Developers are committed to maximising local content and creating opportunities across the supply chain with ScotWind alone estimated to deliver £25 billion to £30 billion in supply chain opportunities over its lifetime.

This report aims to identify supply chain companies either active and supporting the sector already or those exploring the possibility of becoming active in the sector, with analysis on capabilities and numbers of people employed.

Our questionnaire aimed to map the capabilities of the Scottish offshore wind supply chain by collecting data from companies actively involved, previously involved, or those exploring opportunities to enter the sector. The survey identified the services offered, project experience, and economic impact of companies currently contributing to offshore wind, as well as those with potential to support the growing sector. Ultimately, the goal is to position Scotland as a leading destination for offshore wind by showcasing regional companies, particularly along the east coast, and enhancing engagement within the supply chain.

Methodology

An online questionnaire was distributed, asking participants to complete the section relevant to their activity in the offshore wind sector: currently active, previously active, or aspiring to enter. We received 80 responses from a membership of approximately 400, representing a response rate of 20%. To broaden the insights, this report also includes supplementary data from our supplier database, providing a fuller picture of Scotland's offshore wind capabilities.

Key Findings

- **Locations**: 54 companies have their headquarters in Scotland, and 59 have a site in Scotland, accounting for 116 sites across the country.
- **Activity Status**: 49% of respondents are currently active in the offshore wind sector, while 43% are looking to enter, indicating substantial potential for supply chain growth.



- **Economic Impact**: 28 companies reported 60 active contracts, with an average contract value of £2.3 million, totalling £51.6 million in active contracts.
- **Employment**: Responding companies employ 3,989 people in Scotland, with 2,843 (71%) working directly on offshore wind projects. An additional 1,817 people from companies planning to enter the sector could add nearly 30% more capacity to the workforce.
- **Contracts**: Scottish businesses are involved in 9 offshore wind projects in Scotland and 12 projects outside Scotland, showcasing an expanding market reach.

Interpretation

The findings indicate a thriving and growing offshore wind supply chain in Scotland. With 71% of the workforce directly engaged in offshore wind projects, and 30% additional capacity available from companies aiming to diversify, the sector is well-positioned for continued growth. Scottish companies are not only supporting local projects but are also actively engaged in international projects, reinforcing the sector's expanding global presence. The economic contribution of offshore wind, with £51.6 million in active contracts, highlights the sector's significant impact on local economies. These results suggest a maturing, adaptable supply chain ready to meet both local and international demands. Additional capacity exists within our membership, which is further detailed in the full report.

Recommendations and next steps

- 1. Support Emerging Companies: Provide targeted resources, guidance, and training to help 34 companies seeking to enter the offshore wind sector.
- 2. Expand Contract Opportunities: Enhance the visibility of Scottish companies both locally and globally to increase involvement in regional and international projects. Encourage investment in local companies to diversify capabilities within the supply chain and reduce reliance on external suppliers.
- 3. Repeat survey to gain broader data, track trends and conduct a deeper analysis of workforce skills and gaps to target training and development opportunities.

2. Introduction to Forth & Tay Offshore

Forth & Tay Offshore is home to a thriving, growing and internationally-recognised offshore energy supply chain contributing to the whole project lifecycle - from design and development through construction, operations & maintenance to decommissioning on local, national and international projects.

Our Mission

The Forth & Tay Offshore Cluster's mission is to accelerate and further the growth of the offshore energy sector on the east coast of Scotland and wider afield, through a series of activities designed to support innovation, collaboration, investment in skills, and market awareness amongst relevant businesses.

It also works to attract inward investment from leading national and international developers and suppliers to help make Forth & Tay the location of choice for supply chain investments.

The Forth & Tay cluster is supported by developers and public organisations including Scottish Enterprise, South of Scotland Enterprise, Dundee, Fife, Angus, East Lothian and Scottish Borders Councils, EDF Renewables, SSE Renewables, ESB and Red Rock Renewables as well as Forth Ports and Montrose Port.

Our Aims & Objectives



With a world-leading supply chain and coastal infrastructure, Forth & Tay Offshore is geographically positioned to meet the full lifecycle needs of the offshore renewables sector. The cluster:

- Promotes the regional supply chain to prospective customers developer and Tier one decision makers - in the offshore wind sector and develop collaborative working across the industry
- Promotes the area as the destination of choice for new investments in the UK offshore energy supply chain
- Works with our world-renowned colleges and universities to deliver innovative new solutions within the sector, while continuing to develop and promote the skills required to meet the sector's needs
- Shares and develops knowledge of the offshore wind sector to enable the supply chain to capitalise on all opportunities
- Supports members who want to compete for contracts across the UK and internationally
- Develops the business case for infrastructure investment which will enhance the cluster's offshore proposition as one of the UK's prominent renewable energy hubs.

Scotland's Offshore Wind Opportunity

The Offshore Wind Sector Deal announced in March 2019 will provide a pathway to 30GW of deployed capacity in the UK by 2030 ensuring that the UK maintains its position as one of the global leaders in offshore renewables. The announcement will see £48 billion invested in UK infrastructure, potentially creating 27,000 skilled jobs across the UK (up from 11,000 today) mainly in coastal areas.

With more than 18GW of projects at various stages of development now situated in the Forth & Tay estuaries and within the wider east coast area, the cluster is preparing to support every aspect of the next generation of wind farms, both fixed foundation and floating.

The Forth & Tay Cluster is home to world-leading innovative institutions, industry-leading vocational skills providers and a coastal infrastructure that has benefited from significant investment. The Forth & Tay is home to a number of offshore wind resources:

Operational

- Seagreen 1,075MW (SSE Renewables/TotalEnergies/PTTEP)
- Levenmouth Demonstration Turbine 7MW (ORE Catapult)

Under Construction

Neart na Gaoithe – 448MW (EDF Renewables/ESB)

Consented

- Inch Cape up to 1080MW (ESB/Red Rock Renewables)
- Seagreen 1A up to 500MW (SSE Renewables/TotalEnergies)
- Forthwind –18MW demonstration (Cierco Ltd)

Planned

• Berwick Bank – up to 4.1GW (SSE Renewables)

Scotwind projects:

- Bellrock 1.2GW (Renantis/BlueFloat Energy)
- Ossian 3.6GW (SSE Renewables/CIP/Marubeni)
- Morven 2.9GW (BP/EnBW)



Bowdun – 1.0GW (Thistle Wind Partners)

INTOG projects:

- Cedar 1.0GW (Cerulean Winds)
- Cenos 1.35GW (Flotation Energy/Vargronn)



With this investment and increase of offshore wind construction around our shores, we at Forth & Tay Offshore want local Scottish companies to deliver the products and services needed. By presenting our survey findings, we hope to show that supply chain here in Scotland is ready to expand and take on the upcoming growth in the sector.

3. Supply Chain Survey – Mapping Offshore Wind Capabilities in Scotland

We issued a questionnaire to our membership with the intention of understanding and mapping the capabilities of the Scottish offshore wind supply chain, and so gathered data from companies who are currently active in the supply chain, previously active, or looking to diversify into the sector. We wanted to find out which companies are already contributing to the sector, the services they offer, the contracts they've worked on and the benefits to local employment and economies.

The questionnaire was issued asking participants to respond to the section relevant to them (currently/previously active or with ambitions to enter). We received 80 responses from our membership of approx. 400, which is a response rate of around 20%. In this report we will also supplement the information gathered through the questionnaire with data from our supplier database to give a broader picture of Scotland's capabilities.

Ultimately, we hope to showcase Scotland as a destination of choice for offshore wind, highlight companies, projects and supply chain active in Scotland as well as in our own geographical area of the east coast of Scotland, and further support supply chain engagement opportunities.

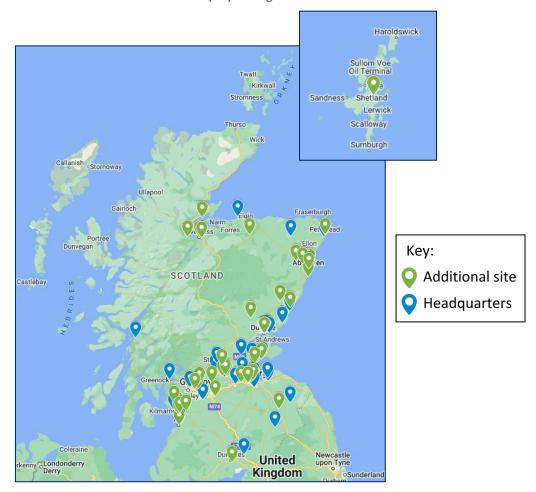
a. Locations



We asked respondents to tell us where their head office is and which sites they have within Scotland:

- 54 responded they have their HQ in Scotland
- 59 respondents have a site location in Scotland
- From all respondents, 116 sites were included across Scotland

Below we have plotted all of the Scottish site locations on a map, with headquarter locations displayed in blue and additional site locations displayed in green.



This map is interactive - <u>click here</u> to view the full map, where you can zoom in on each location and see company details.

b. Status

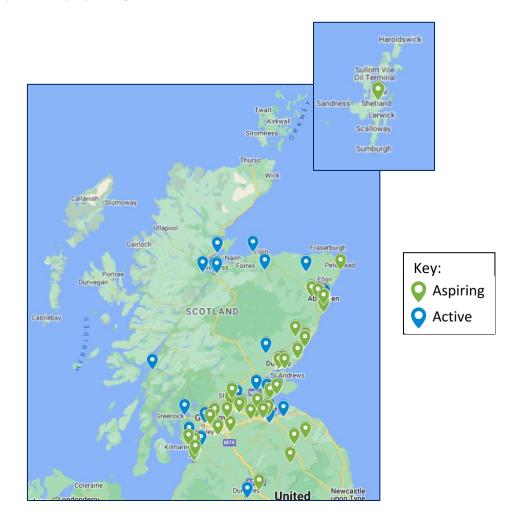
We were interested to know the activity status of respondents – that is, whether they are currently supplying the sector, did previously or are hoping to enter. This gives us a sense of the companies already engaged and the potential capacity for the supply chain to grow with the expected demand detailed in the introduction.

From this question we found the following:

- 39 companies are currently active in the sector in Scotland
- 34 companies want to enter the sector
- 4 companies previously supplied the sector and no longer do.



Below we have plotted all of the respondents on a map, with active companies displayed in blue and aspiring companies displayed in green.



This map is interactive: <u>click here</u> to see the map in more detail and zoom in on each point of interest.

c. Economy

The details shared allowed us to look at the effect of the offshore wind sector on the local economy and communities within Scotland, namely through contract values where this information could be shared and through the number of people employed by these companies in the sector, as well as the workforce available to the sector in the case of the companies looking to enter.

Of our respondents, 28 companies currently have a total of 60 active contracts between them. We asked approximate contract values per year, however not all respondents could share this information due to confidentiality considerations. From the data we did gather:

- The average offshore wind contract is worth £2,316,339
- The total value of active contracts is £51,620,450

These figures are based on the data we were able to gather, so the effect on Scotland's economy is even greater in real terms. With the work that FTO and other organisations are doing to increase the work undertaken in Scotland for Scotlish projects, rather than importing parts and services, we hope that this economic impact can grow and benefit more of our supply chain.



Below we have displayed the total value of contracts by local authority, along with the number of contracts included in the calculation.

Local Authority	Total value of active contracts per region	Number of active contracts per region
Aberdeen	£13.4M	11
Angus	£3M	2
Argyll & Bute	£900K	3
Dundee	£245K	4
East Lothian	£400K	1
Edinburgh	£3.3M	11
Fife	£2.4M	4
Highlands	£27.8M	8
Moray	£10K	1
Perth & Kinross	£175K	1
Grand Total	£51.63M	46*

^{*}There are currently 60 active contracts, but we were only able to attain values for 46 of them.

d. Employment

Our respondents also shared figures on their workforce, allowing us to understand the effect of the offshore wind sector on employment in local communities. It also gave an understanding of the potential workforce available to support the sector, by way of companies in Scotland not yet involved in the offshore wind supply chain but looking to begin work in the sector.

We asked how many staff are employed per site in Scotland and how many are working on each Scottish offshore wind project, either based onsite or working offshore/remotely. Our findings were:

- 1,230 people are employed on site in Scotland across survey respondents
 - 84 of these people are based on site and working on Scottish offshore wind projects (either working on products or services from the site)
- An additional 2,759 people are currently working offshore or are working remotely delivering services to Scottish offshore wind projects
- This is a total workforce of 3,989*, with 2,843 working on Scottish offshore wind projects. This equates to 71% of the responding workforce.
- A further 1,817+ people available to support the sector, from companies looking to diversify. This represents almost 30% extra capacity within the supply chain.

Below we have displayed the workforce count by local authority. To calculate this, we asked respondents to tell us how many people are employed at each site, and then split them by local authority.

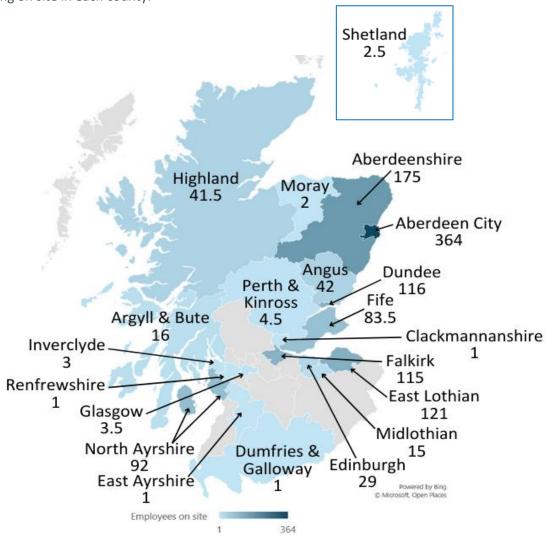
i. Map of active workforce

^{*}Based on 37 respondents as 2 active companies did not provide workforce data

⁺Based on 16 respondents as 18 aspiring companies did not provide workforce data



The below map shows the location of active companies displayed by the number of employees working on site in each county.



2 active companies did not provide workforce data, affecting 6 sites. This means that there is more capacity in the following counties:

Aberdeen

Dundee

Edinburgh

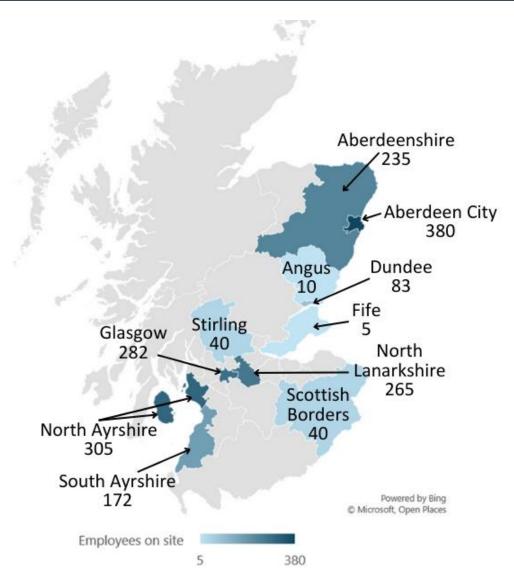
Glasgow

Moray

ii. Map of available workforce

The below map shows the location of aspiring companies displayed by the number of employees working on site in each county.





18 aspiring companies did not provide workforce data affecting 37 sites. This means that there is more capacity in the following counties:

Aberdeen City Falkirk Shetland
Aberdeenshire Fife South Ayrshire
Angus Glasgow South Lanarkshire

Dumfries and Galloway North Ayrshire Stirling

Dundee North Lanarkshire West Lothian

Edinburgh Scottish Borders

e. Capabilities

i. Currently active

Below are the companies who are currently active in the offshore wind sector, broken down by how many of them offer each product/service. This is limited to the 39 within Scotland. We have condensed these into broader categories for ease of display, but a detailed list can be found in the appendix.



Broad capability category	Number of active companies
Access/Inspection	9
Consultancy (including engineering, environmental, recruitment)	8
Cables (design/install/supply)	2
Operations & Maintenance (including coatings, repairs)	6
Manufacturing/Fabrication (including structures/components, assembly)	3
Digital (including IT/data solutions/cybersecurity)	2
Engineering services and supplies (including electrical, civil)	4
Logistics (including Installation, vessels, vessel components, transport,	
heavy lift)	5
Personnel services (including staff provision, medical services, training,	
PPE/supplies, accommodation)	2
Facilities (including management, security, cleaning)	2
Site investigation/preparation (including on and offshore, UXO, groundworks)	1
Surveying (including environmental, geotechnical)	3
Total	47

ii. Capabilities available to offshore wind

Companies who haven't yet worked in offshore wind but are looking to enter the sector. 1,817+ professionals are available to support the offshore wind industry in the following areas, broken down by the number of companies offering each product/service.

We have condensed these into broader categories for ease of display, but a detailed list can be found in the appendix.

Broad capability category	Number of aspiring companies
Access/Inspection	1
Consultancy (including engineering, environmental, recruitment)	1
Operations & Maintenance (including coatings, repairs)	3
Manufacturing/Fabrication (including structures/components, assembly)	13
Digital (including IT/data solutions/cybersecurity)	1
Engineering services and supplies (including electrical, civil)	6
Logistics (including Installation, vessels, vessel components, transport, heavy lift)	5
Personnel services (including staff provision, medical services, training,	
PPE/supplies, accommodation)	4
Facilities (including management, security, cleaning)	2
Site investigation/preparation (including on and offshore, UXO,	
groundworks)	1
Total	37

f. Current contracts

i. Scotland supplying the world



The Scottish businesses who responded to the survey currently have contracts supplying projects around the world, either directly to the developers or to their partners. Below are some* of the projects currently being supported by the Scottish supply chain:

*not all participants shared contract information. Some projects are supplied by more than one respondent



Outside Scotland

Dogger Bank offshore wind farm, England
East Anglia offshore wind farms, England
Arklow Bank Wind Park, Rep. of Ireland
Provence Grand Large (PGL) floating wind farm, France
Saint-Brieuc offshore wind farm, France
Baltic Eagle offshore wind farm, Germany
Ostwind, Germany
Hollandse Kust Zuid (HKZ) Offshore Wind Farm, Netherlands
Thor offshore wind farm, Netherlands
Coastal Virginia Offshore Wind, USA
Revolution Wind and Sunrise Wind, USA
South Fork Wind Farm, USA

Scotland

Beatrice offshore wind farm, Scotland Inch Cape Offshore Wind Farm, Scotland Levenmouth Demonstration Turbine, Scotland

Moray West offshore wind farm, Scotland Moray East offshore wind farm, Scotland Neart na Gaoithe (NnG) offshore wind farm, Scotland

Seagreen Offshore Wind Farm, Scotland
Ports for Morgan, Mona, Broadshore,
Bellrock, and Stromar projects
Various other port developments
Ports have not been plotted as they were not specified







This map is interactive. <u>Click here</u> to see the map in more detail and zoom in on each point of interest.

ii. Sites in Scotland

Respondents which are not headquartered in Scotland but have a site in Scotland are supplying the following wind farms in Scotland and beyond:

Scotland:

Alyth Sub-station, Scotland
Equinor Hywind, Scotland
Kinkardine Offshore Wind Farm, Scotland
Moray West, Scotland
Morven, Scotland
NNG, Scotland
Ossian, Scotland
Seagreen, Scotland

Rest of World:

Dogger Bank offshore wind farm, England
Dieppe Le Tréport, France
EFGL, France
Baltic Eagle Offshore Wind Farm, Germany
Wikinger, Germany
Windfloat Atlantic, Portugal
Chang Fang offshore wind farm, Taiwan
Xidao offshore wind farm, Taiwan
Yunlin offshore wind farm, Taiwan
Zhong Neng offshore wind farm, Taiwan
Vineyard Wind, USA







This map is interactive. <u>Click here</u> to see the map in more detail and zoom in on each point of interest.

Again, with broad support to build a strong local offshore wind supply chain in Scotland with local businesses and communities benefitting from the huge offshore wind potential, we are keen to see this list grow over the coming years. Particularly for supply to upcoming Scottish wind projects, but equally abroad as we hope to support members accessing export opportunities and taking Scottish offshore wind excellence globally.

4. Database supplement

We also pulled data from our Forth & Tay Offshore cluster membership database, to help supplement the survey data gathered and provide a more complete picture of the Scottish offshore wind landscape.

At the time of producing this report, our database features 442 live records, with 422 being based here in Scotland. Below you can see them first plotted by location and then broken down by region and the capabilities offered to the offshore wind sector.

a) Locations



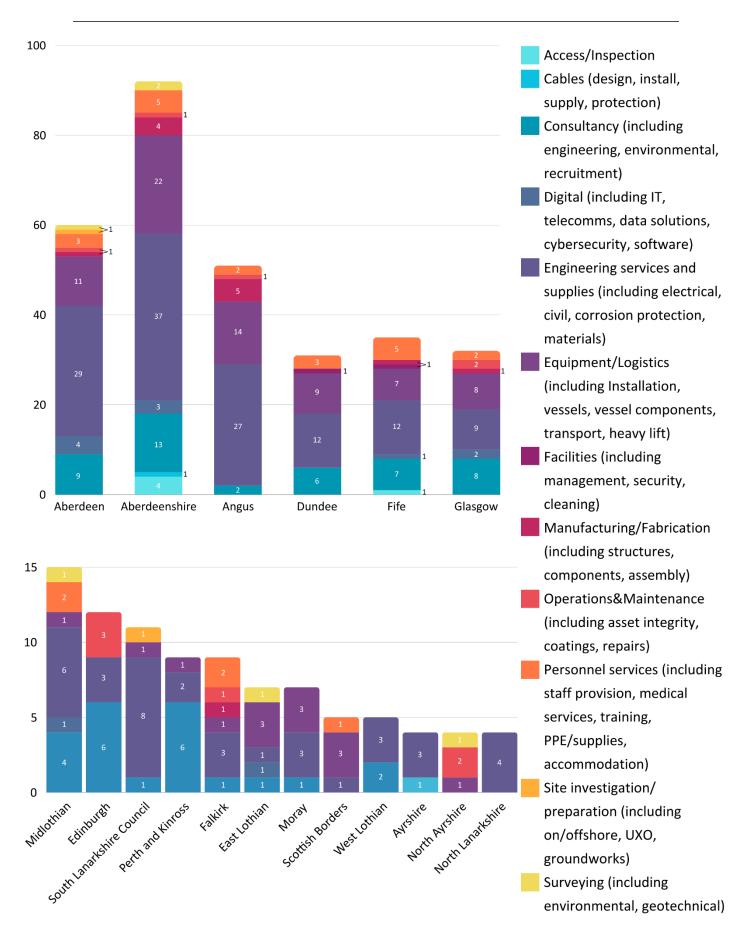


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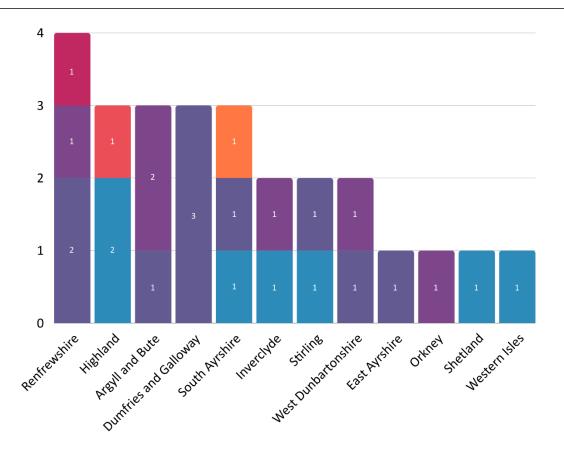
b) Capabilities per region:

Here we have grouped the capabilities covered in our database into very broad categories in order to display them in a more condensed way, and split them by local council. Local councils are grouped by order of total capabilities to produce the best display. You can see what capabilities are on offer more specifically in our <u>supply chain directory</u>, which can be filtered.









5. Recommendations and next steps

Support companies looking to enter

With 43% of respondents expressing interest in entering the offshore wind sector, it's crucial to provide targeted resources, guidance, and training to facilitate their entry. At Forth & Tay we help companies find the support they need and keep them up to date with market intelligence, available funding and support programmes.

Promoting the use of Scottish suppliers

Using local suppliers is beneficial to the developer of offshore wind farms, and it is a requirement for the construction of ScotWind projects. We would encourage developers and project teams to engage with local clusters to expand their supply chains. The Forth & Tay supplier database displays all of our members and can be filtered by capability, and we can also make direct connections to companies when a particular new supplier type is sought. We also organise events to allow project teams to meet a broad range of suppliers and build up their use of local content. We intend to engage with the project teams of offshore windfarms in the pipeline to support them in this regard.

We will continue to promote upcoming opportunities to our members so that they are aware of what's coming to market and how they can engage, as well as useful resources and support organisations so that companies are well prepared for opportunities that arise, here in Scotland and beyond.

Repeat survey to broaden data

This survey is something that can be repeated annually, in order to reach more companies and build up a broader, more accurate picture of the sector. This would also allow for the collection of updated data from the supply chain to track growth, employment trends, and economic impact.



The survey could be extended to conduct a more in-depth analysis of workforce capabilities and gaps to identify specific training needs and opportunities for upskilling, allowing for targeted investment in education and workforce development programs.

6. Summary

We are amassing a wealth of expertise in offshore wind across the full spectrum of the supply chain, both here in Scotland and across the UK. Not only do we have many companies already engaged, delivering both financial and employment benefits to the local communities, but we also have a diverse range of companies who can bring their experience from related sectors to support the upcoming growth in offshore wind farms around Scotland's coast. This report underlines too that we still have a significant capacity to extract from the companies keen to diversify their business into offshore wind, and it remains the responsibility of our offshore wind clusters to help accelerate that outcome.



7. Appendix

Appendix 1: detailed capabilities of survey participants looking to diversify into offshore wind

Below are the detailed capabilities of companies who haven't yet worked in offshore wind but are looking to enter the sector. Areas they can support, in more detail specific to their businesses:

- Metal/Structural
 - Steel Stockholding and processing
 - Steelwork fabrications
 - Medium/Large Machining
 - Inconel Overlay Welding
 - Secondary Structural Steel (inc. railings, ladders, walkways etc)
 - o Heavy fabrication, pressure pipework, structural fabrications
 - o Full turnkey site for design, fabrication, machine and assembly
 - Sub-contract CNC machining (turning, milling, gun drilling, spark erosion, wire erosion, honing, CMM inspection)
 - Sub-contract Machining, Welding & Assembly
 - o Sub Contract Metal Manufacturer, Laser Cutting, Folding, Punching, Fabrication, Machining, Powder Coating & Assembly
 - On site Machining, hot tapping
- Survey/Inspection
 - o Full scope statutory inspections
 - o offshore statutory inspections, repair & maintenance
 - Walkdown and quality inspections
 - o Survey equipment rental, Hydrographic survey, Environmental Monitoring, NDT and Inspection, Geophysical survey

Logistics

- o integrated logistics solutions
- Shipping, Import, Export, Storage, Cargo Handling
- Wind farm support vessels
- o Heavy lifting, Installation crews, Heavy transport, Wind turbine preassembly, maintenance, major components and dismantling services
- storage and warehousing
- Floating offshore wind substructure assembly, fabrication, engineering, quayside services, port services, cable storage, decommissioning
- o Quayside, secure storage, cargo handling, yard space
- autonomous survey vessels, Unmanned surface vessels, specialised boats, autonomous marine vehicles, Daughter Craft, lifting and mooring, Temporary buoyancy for mobilising structures, Subsea Buoyancy, Lift Bags
- Digital/Data
 - Data capture for automation and insights
- Electrical system design, specification, witness testing
- Manufacturing
 - Cooling coils for nacelles
 - Pin pile manufacturing
 - electrical, connectors and sockets up to 33kv
 - o PPE/workwear



- Installation
 - o Installation of jacket foundations
 - o wind turbine component pre-assembly and installation
- Maintenance
 - Metallic component restoration/circular economy
 - Offshore services and maintenance (including rope access)
- Marine
 - o Co-location of aquaculture with wind farms
 - Installation & UXO noise mitigation
- Supply of products/services:
 - o Commercial Cleaning and a packaging
 - o rental solutions of PPE & equipment
 - saturation diving systems, oceanographic equipment, Diving and life support,
 Buoyancy and water weights, Commercial Diving Equipment
 - o Monopiles, Jackets
 - Cable lay
 - o Security and manned guarding
- Training
 - GWO (Global Wind Organisation)
 - o TICCCS (Turbine Inspection, Competency, Compliance & Certification Scheme)
- Testing
 - o testing solutions, diagnostic systems
 - Load testing, crane testing and verification
 - NDT

Appendix II: the survey findings at a glance

Mapping Offshore Wind Capabilities in Scotland

Location and status

From 80 responses..

companies with a Scottish base companies with a Scottish site total sites in Scotland

companies currently active in offshore wind
companies looking to enter the sector
companies previously active in offshore wind





Mapping Offshore Wind Capabilities in Scotland

Current contracts

From 80 responses..

£51,620,450

total value of active contracts*

£2,316,339

average contract value*

28 companies with a current contract

60

contracts active



*Not all respondents disclosed financial data. Figures are based on the data available.

Mapping Offshore Wind Capabilities in Scotland

Employment

From 80 responses..

Currently active

477

people working on offshore wind projects

3,756

people working on site in Scotland

Potential to support

1,817

employed on site in Scotland, looking to engage in the sector





Mapping Offshore Wind Capabilities in Scotland

What capabilities does Scotland have?

