FLOATING WIND THE UK INDUSTRY AMBITION

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INTRODUCTION

RenewableUK and Scottish Renewables represent companies at the forefront of delivering offshore wind energy, across project and technology development and the supply chain. Our members are transforming our energy system and have worked with Government to establish the UK's global lead in offshore wind.

Following commitments in the Offshore Wind Sector Deal, we have worked with Government to establish an industry group on floating wind, bringing together key industry players, who are actively developing or contributing to the supply chain of floating wind in the UK market. We would like to thank the Offshore Renewable Energy Catapult in particular for their support in producing this document.

DELIVERING FOR THE UK

In this paper we set out our vision for the sector - the contribution we see floating wind making to our net-zero carbon target, reducing technology cost and delivering economic benefit across UK regions.

Governments and industry around the world are showing increasing interest in the development of floating wind projects. Developing domestic floating wind will unlock these new markets for UK skills, products and expertise.

- Floating wind will be necessary for the UK to meet net-zero emissions by 2050, and Scotland net-zero emissions by 2045, and will offer the most cost-effective pathway to delivering 75GW of offshore wind in UK waters.

- The UK has already established a global lead in offshore wind. Floating wind represents an opportunity to grow the market for UK skills, products and expertise.

- Floating wind will bring economic benefits to areas of the country that need it most, including Wales, Scotland and the South West of England, benefitting from the synergies with the skills and capabilities already held within the oil and gas sector and helping with the transition for those employed in this sector.

KEY ENABLERS

1. Government working with industry, as set out in the Offshore Wind Sector Deal, should **develop a competitive market framework** that promotes the development of floating wind – such as an innovation pot within the CfD auction framework.

2. Future **marine spatial planning and leasing** processes around the whole of the UK should allow for commercial floating wind sites to be made available. The ScotWind process provides an early opportunity for the development of floating wind.

3. Government and Industry should work to identify and deliver **joint investments in infrastructure** underpinning the development of floating wind and its supply chain, supporting the development of the UK Industrial Strategy.

WHY DOES THE UK NEED FLOATING WIND?

1. FLOATING WIND WILL BE VITAL TO ACHIEVING NET-ZERO

Decarbonising our energy system while growing a robust economy will be central to meeting our net-zero target. As an innovative technology, floating wind can make a significant contribution to decarbonising the UK's economy, whilst offering an opportunity for regional economic growth in areas of the UK that would not otherwise benefit from the success of offshore wind.

The commitment from the UK Government to a legally binding target of net-zero carbon emissions by 2050 will, according to the Committee on Climate Change (CCC), require a quadrupling of low-carbon electricity capacity[1]. This would entail levels of offshore wind deployment of around 75GW by 2050; significantly beyond the existing total UK pipeline of 38.5GW[2].

Constructing capacity at this level will require a geographical spread of projects in order to take account of different constraints, including the needs of other maritime sectors, environmental considerations and the need to utilise deep water sites.

Nearly three-quarters of the UK's forward pipeline of projects are in waters over 50km from shore[3]. As we ramp up ambition in the sector, we expect to push even further from shore and into areas of deeper water. Floating wind technology will be key to unlocking these potential deep water sites around the UK, as has been recognised by the Scottish Government through the geographic spread of sites identified for the forthcoming ScotWind leasing round.

Kincardine: Dock90

1. Net Zero: The UK's contribution to stopping global warming. Committee on Climate Change, May 2019
2. RenewableUK Project Intelligence
3. RenewableUK Project Intelligence

2. FLOATING WIND WILL BE COST COMPETITIVE

Floating wind is an innovative technology. Successful demonstration projects have proved concepts and allowed industry and the supply chain to better understand the distinct requirements of floating wind. Coupled with the UK's existing expertise in fixed-bottom offshore wind, this creates a strong base for cost reduction. With the right support, cost reductions can be achieved rapidly, mirroring the significant cost reductions in offshore wind over successive CfD allocation rounds.

Based on realistic levels of UK and global deployment, we expect floating wind to be cost-competitive with other energy technologies by 2030[4].

We expect this to support market-driven competition across our energy system, driving benefit to government and consumers.

Several factors will enable cost reduction. First and foremost, delivering cost reduction, alongside industrial benefits to local communities around the UK, will be contingent on having **a clear domestic pipeline of commercial scale projects.**

Industry will need to work collaboratively, capitalising on UK's existing global lead in fixed-bottom offshore wind; our decades of experience in offshore activities through the oil and gas sector; our bodies of expertise such as the Offshore Renewable Energy Catapult; and our world-leading research institutions.

CASE STUDY – WOOD

Wood is a global leader in the delivery of project, engineering and technical services in energy, industry, and the built environment. Focused markets include upstream, midstream and downstream oil and gas; power and process; environment and infrastructure; clean energy; mining; nuclear and general industrial sectors.

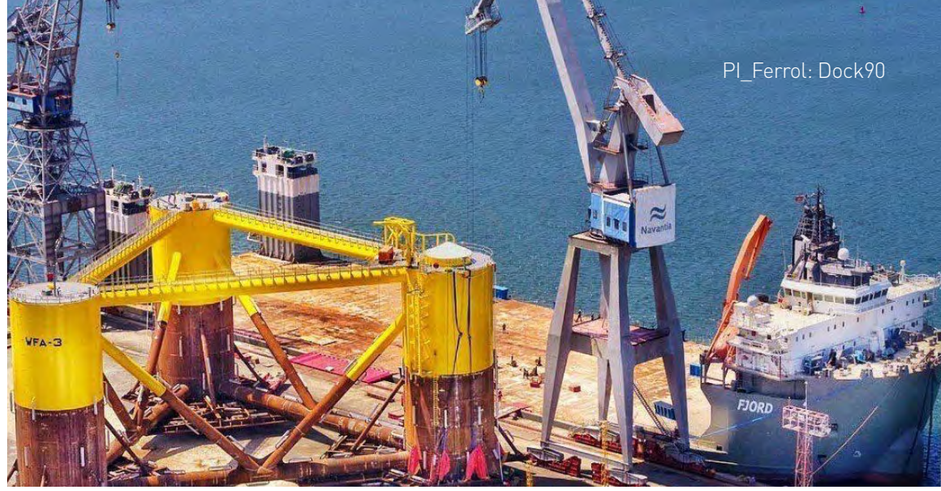
Development of the UK floating industry would allow Wood to capitalise on experience in the fixed offshore wind and offshore oil and gas sectors, and to be an early beneficiary of exports as overseas markets begin take off. This increased commercial activity for Wood could result in the expansion of their offshore wind team and additional deployment of expertise in other parts of the organisation including oil and gas offshore engineering.

EXTRACTING EXPERIENCE FROM THE OIL AND GAS SECTOR

Wood can leverage experience from the current offshore wind, marine and oil and gas sectors to deliver the following key elements in floating wind:

- Subsea cable design including:
- Survey management, data processing and interpretation
- Through-life inspection and maintenance
- Offshore cable routing and optimisation
- Cable design for optimum stability and protection
- Cable installation and repair design for deep water
- Landfall location analysis and shore crossing design
- Cable package management to the quay side
- Marine structural engineering
- Moorings and anchor design including optimised design methodology for mooring lines of floating facilities.
- Materials and corrosion protection
- Installation and operational logistics
- Dynamic modelling and wave loading. Our expertise includes vibration, pulsation, stress and noise measurement and analysis of rotating equipment, piping systems and structures.

4. Macroeconomic Benefits of Floating Offshore Wind in the UK; September 2018. Crown Estate Scotland & Offshore Renewable Energy Catapult



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In addition to a steady pipeline of projects, cost reduction will be driven by **a combination of continued technology optimisation and innovation, and a move towards large, commercial-scale projects and increasing standardisation.**

Innovation in the components used and the facilities and processes that produce them will drive costs down. Design improvements will allow whole system and whole lifecycle costs and performance to be optimised, rather than focussing purely on the cost and performance of individual components. This optimisation and innovation can be achieved through a combination of demonstration-scale projects where further de-risking can take place and commercial-scale projects.

Commercial-scale projects will be key to unlocking economies of scale by spreading significant fixed costs over larger numbers of units and megawatts. Economies of volume will improve buying power and provide signals for supply chain investment in capacity and capability. This will enable the leveraging of attractive project finance packages, reducing the cost of capital. Longer-term, once sufficient optimisation has been achieved, this will enable increasing standardisation resulting in further reductions in unit costs.

The pipeline of projects can be enabled in the near-term by existing and planned leasing. Crown Estate Scotland's upcoming ScotWind leasing round will make leases available across multiple zones, including sites suitable for development of commercial-scale floating offshore wind projects.

Off the South West of England and off the coast of Wales (Celtic Sea), there are existing suitable, leased sites for further technology and supply chain demonstration projects. These sites benefit local supply chain development and UK content, with dialogue underway with The Crown Estate for additional pre-commercial sites. Longer-term, there is a significant opportunity to make commercial-scale sites available around the whole of the UK.

Continuous, predictable deployment is critical to cost reduction, for enabling both supply chain investment and further learning. Support for the near-term deployment opportunities outlined above, in the region of 1–2GW in the period up to 2030, is therefore crucial. This will enable the current levels of cost reduction to continue and ensure the longer-term pipeline of UK projects can achieve significant reduction in support requirements; similar to those achieved in CfD allocation round auctions for fixed-bottom.

WHY SHOULD THE UK BE AN EARLY MOVER?

3. FLOATING WIND SUPPORTS THE UK'S REGIONAL GROWTH

The UK already has a well-established and relatively mature offshore wind market, including a known pipeline of projects in the short to medium term. Our offshore wind supply chain continues to grow, gaining ever larger shares of the domestic and export markets.

The UK is also home to many world-leading oil and gas companies who routinely provide goods and services around the world, exporting £12bn of goods and services in 2016[5].

Floating wind therefore represents an industrial opportunity, even in the short-term, for our domestic offshore market and supply chain. Government backing for floating wind would also enable the UK to capture a growing export market, as well as unlocking the full extent of UK offshore wind resource potential.

With the right scale of deployment and a pipeline of projects, the floating wind industry's ambition is to create a successful, dynamic indigenous supply chain across the UK. This will build on existing UK strengths and focus on areas with high export opportunities, as outlined in the table below.

Area	UK strength	Exports	Investment Required	Lifetime Value
Development	Strong UK expertise for both OSW (reported 75% for UK OSW)[6] and O&G	Highly exportable skills and common needs across international projects	Nil - Low	**2%**
Balance of Plant design	Strong UK expertise in design and management, e.g. foundations, array cables, substations for both OSW and O&G	Highly exportable skills and common needs across international projects	Nil - Low	**3%**
Balance of Plant fabrication	Majority of fabrication currently overseas	Limited export	High	**23%**
Balance of Plant assembly	Strong UK expertise in final assembly of structures (e.g. foundations, turbines) - using existing port facilities as well as upgrades needed in others	Highly exportable skills and common needs across international projects	Medium	**5%**
Turbine supply	Blade and tower manufacture	Limited export	Low	**18%**
Installation	Strong UK expertise in installation using conventional vessels (e.g. tugs, anchor handlers) for O&G and other marine activities	Highly exportable skills and common needs across international projects	Low	**5%**
O&M	Strong UK expertise in O&M for OSW (reported 73% for UK OSW) and O&G	Highly exportable skills and common needs across international projects	Low	**42%**
Decommissioning	Strong UK expertise in decommissioning for O&G though final stripping / scrapping often done overseas	Highly exportable skills and common needs across international projects	Low	**2%**

5. O&G UK Economic Report 2018
6. Table 1 – Data from Offshore Wind Industry Investment in the UK 2017: Report on Offshore Wind UK Content. RenewableUK

The floating wind sector seeks to build on existing supply chain clusters, drawing on centres of activity in the Solent and Humber for turbine technology; oil and gas capability in the Forth and Tay and Moray; and offshore wind service centres in cities around the UK. The industry also has the capability to trigger new clusters in areas such as the South West, Wales and Scotland.

The existing UK supply chain is well-positioned to take advantage of opportunities presented by the development of floating wind. There is considerable overlap between existing activity from fixed-bottom offshore wind and the oil and gas sector – across ports and harbours, assembly, manufacturing and fabrication facilities as well as more specialist outlets.

The level of supply chain activity will depend on joint working across industry and government and we currently envisage a natural evolution of growth in UK content and export value from floating wind.

1. PORT OF NIGG
2. HUNTERSTON PARC
3. FIRST SUBSEA, LANCASTER
4. MILFORD HAVEN PORT AUTHORITY

DELIVERING >50% UK CONTENT

In the near term, the UK supply chain proposition will leverage the areas where domestic companies are already competitive and successfully exporting; these include offshore wind, oil and gas and other marine industries. Project development, balance of plant and component design, project management, installation and O&M; together accounting for over 50% of lifetime project expenditure. Limited additional investment would be required to achieve this in these sectors.

The UK currently has a limited number of ports capable of fabricating smaller components (e.g. steel tubulars), quayside assembly of substructures, turbine/substructure assembly and launch. Targeted investment can increase the number of locations with this capacity, with upgrades focusing on developing facilities suitable for multiple uses (e.g. floating wind, offshore wind, oil and gas, decommissioning). This will allow UK companies to compete for contracts in supply chain sectors accounting for 60% of lifetime project expenditure.

In the longer term, enhancing the UK offering in quayside assembly keeps the option open for more significant investments in fabrication facilities for large steel sections, advanced welding and robotic manufacturing. This would enhance the ability of UK companies to win a share of business in supply chain areas accounting for 80% of lifetime project expenditure.

In addition to these floating wind specific target areas, UK-based companies and operations will continue to supply turbine blades and towers as is already the case for fixed-bottom offshore wind.

CASE STUDY - GLOBAL ENERGY GROUP

Global Energy Group (GEG) has invested £90 million of private capital into the Port of Nigg in order to capture the benefits of multiple offshore markets – including offshore wind but also oil and gas. GEG provides construction, fabrication, inspection, maintenance, logistics and decommissioning solutions to a range of energy industry customers.

With a background in oil and gas, GEG has now been involved in a number of renewable energy projects. These include fabrication of monopile foundations for the Scroby Sands offshore windfarm, wind turbine assembly for the Beatrice offshore demonstrator and the suction anchor buckets for the Hywind Scotland project. More recently, the Port of Nigg has completed the Staging/Marshalling work for the construction of the 588MW Beatrice Offshore Wind Farm.

GEG has facilities in North East Scotland, including the Port of Nigg. Nigg has a 332,000m2 construction yard with 36,000m2 of covered fabrication space and 900 metres of heavy load-bearing quayside (another 250 metres by August 2020).

GEG has grown its renewables revenue in the last year to 25% of total Group turnover and transitioned a significant part of the workforce from oil and gas trades into offshore renewables work (nearly 100 people so far). This includes fabrication, logistics/shipping and inspection/remediation.

CASE STUDY - HUNTERSTON PARC

Hunterston PARC has been identified as a national piece of infrastructure for offshore wind (National Renewables Infrastructure Plan). The PARC has 120 hectares of land with suitable infrastructure available for manufacturing activities, a drydock of 230 x 150 metres, quayside water depth of 22 metres, and an extensive, sheltered marine area for storage and erection activity in water over 60 metres deep.

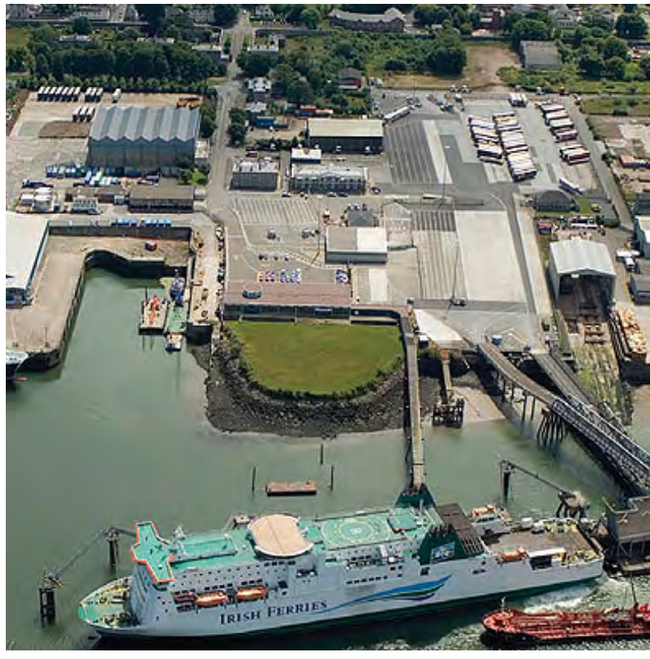
It has its own rail terminals and is located close to Glasgow. With a clear line of sight to a pipeline of floating wind projects, the owners have the willingness and financial strength to turn plans for a hub of floating wind activity into reality, including the refurbishment of the drydock and construction of a heavyweight logistics jetty.

CASE STUDY - MILFORD HAVEN PORT AUTHORITY (MHPA)

The Port of Milford Haven is the UK's largest energy port, and the largest port in Wales.

The port is situated in close proximity to deep water, with strong offshore wind resource, extensive high-skill supply chain and transmission grade infrastructure able to accommodate GWs of capacity. The port and its supply chain evolved around the oil and gas sector originally comprising of 5 active refineries and now comprising one operational refinery, two terminals, the 2.2GW CCGT power station and two LNG terminals.

The majority of employment and economic benefit revolves around Valero, one of the largest refineries in Western Europe. Whilst significant investment is taking place in Valero, if this refinery were to close, it would have a significant impact on other businesses and overall economic activity of Wales.



The Port of Milford Haven is actively diversifying its interests and has a keen focus on marine renewables. Floating wind is a key line being pursued and MHPA has worked with different floating wind technology developers to ensure the port is made suitable for deploying large floating wind arrays. The necessary upgrades could be completed by 2022/23 and, depending on the size of pipeline expected, investment of £50-80m would be required. The majority of the funding could be made available via the Swansea Bay City Deal.

The port could act as a one-stop-shop for fabrication, assembly and O&M, bringing in near-by facilities to support the space needs for large commercial-scale floating wind projects when required. The close proximity to Port Talbot for steel and Swansea's turbine handling experience add to the attractiveness of Pembrokeshire as part of the Swansea Bay Region to the floating wind sector. Bristol or Belfast could also take a share of the activity. This could offer significant economic opportunities for a number of businesses and towns under a single development.

CASE STUDY - FIRST SUBSEA

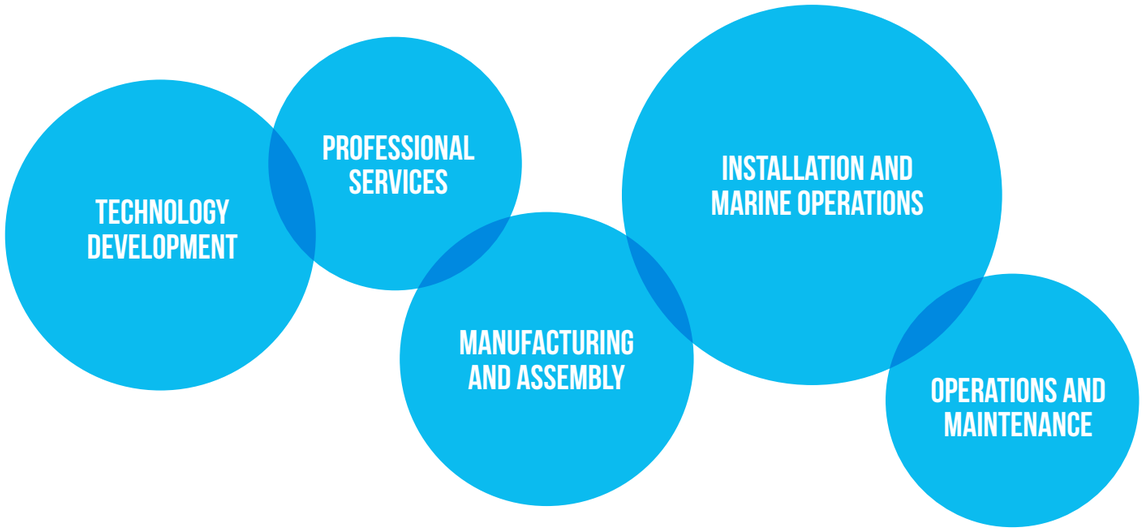
Lancaster based, First Subsea is supplying Platform Mooring Connectors (PMCs) to Windplus SA for the 25MW WindFloat Atlantic Project, off northern Portugal. The PMCs will be used to connect wind turbine generator platforms to mooring lines at a water depth of 85 – 100 m.

The WindFloat Atlantic Project comprises three WindFloat 8.3MW Wind Turbine Generator platforms that will be installed 20km off the coast from Viana do Castelo. Each platform's mooring system is made up of three catenary mooring lines, connected to drag embedded anchors. First Subsea will supply nine PMCs, each with a minimum breaking load of 5500 kilonewtons (560 metric tons).

The PMC will allow the mooring lines to be pre-laid on the seabed, prior to the arrival of the Wind Turbine Generator platforms. With the platforms in position, the end of the mooring line will be picked up from the seabed and pulled into the PMC located on the platform's hull structure. Once in place, the connector is automatically engaged and ready for service.

The technology underlying floating wind, and a number of processes around assembling, installing, operating and maintaining floating wind sites differs from fixed-bottom offshore wind. It is in these areas (detailed further below) where we forecast the sector delivering specialist jobs specific to the field.

Primarily employment opportunities are expected to be delivered in:



4. FLOATING WIND CREATES JOBS AND SUPPORTS THE TRANSITION OF WORKERS

The UK is a leader in offshore wind and, for decades, we have been at the forefront of the oil and gas industry. We therefore have a strong competitive advantage in these industries, backed up by years of skills and expertise.

Floating wind provides an opportunity to continue to bring highly skilled jobs to parts of Scotland, Wales and the South West of England. These areas suffer from low productivity and, due to seabed geography, will see limited benefit from fixed-bottom offshore wind. The opportunity for jobs linked to the development and maintenance of floating wind is particularly pertinent in communities which currently rely heavily on the oil and gas industry.

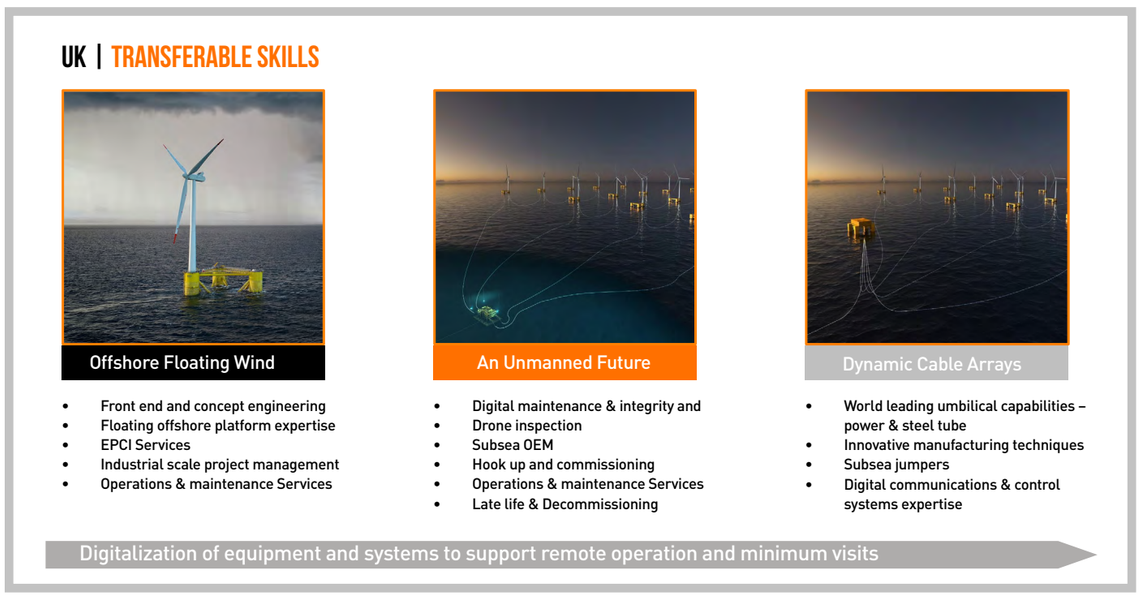


Figure 1 - Aker Solutions

Floating wind provides tangible opportunities to support oil and gas diversification; transferring the knowledge and expertise of highly skilled workers from regions around the UK into new energy projects. As the UK and other economies address their Paris Agreement commitments and start to move towards net-zero, we can expect to see wider changes in how we source future energy. In the UK, oil and gas is a major employer and UK based oil and gas companies are active around the globe, so it is important to consider the role floating wind can play in supporting this energy transition.

There are three key potential opportunities in floating wind for the UK oil and gas sector:

1. Supply Chain diversification and growth

Many companies in the oil and gas supply chain with expertise in areas like trenching, subsea vehicles and shipping have diversified successfully into fixed offshore wind. A floating wind market could offer opportunities to parts of the oil and gas supply chain like anchor handling, tugs, mooring systems, heavy lift vessels and cabling. The UK has a significant supply chain in these areas working in UK fields and across the globe, and could easily diversify into floating wind site construction, operation and maintenance.

2. International know-how

Thanks to early stage development of oil and gas fields on the UK Continental Shelf, the UK gained valuable expertise in developing oil and gas offshore in harsh environments. This expertise is now highly valued and exported across the globe. From project and technology developers to suppliers and environmental consultancies, there is already an emerging and diverse body of professionals working to deliver floating wind projects around the UK and internationally. Floating wind can open up offshore wind to many new markets, and, as costs fall, it is expected that floating wind will grow rapidly in markets such as SE Asia, South America and the West Coast of North America.

3. Wider Energy Integration

The energy transition is giving rise to new concepts in the oil and gas industry, such as the integration of renewables with oil and gas assets, or the reuse of oil and gas infrastructure by floating wind. The Oil and Gas Authority is currently working with The Crown Estate and BEIS to make an assessment of future scenarios, including:

- **Platform electrification:** Connection of offshore oil and gas platforms to an alternative power source (from shore, an offshore wind farm, or offshore grid) to reduce both costs and emissions and extend field lives when compared to platform-based generation.
- **Gas to wire:** The use of gas produced from offshore fields to generate electricity offshore and transmitting that to the shore through sharing infrastructure with windfarms. Expected synergies would improve the economics of both renewables and gas projects, enabling further offshore developments.
- **Carbon capture and storage:** re-use of offshore oil and gas infrastructure, and spent fields, to transport and store carbon dioxide, improving the economics of the projects.
- **Hydrogen:** enabling production of hydrogen (e.g. via water electrolysis using wind power) for power and domestic heating, by repurposing offshore oil and gas platforms, and using pipelines for storage and transportation to shore.
- **North Sea power hubs:** large-scale electricity and hydrogen production from wind, also combined with carbon and energy storage solutions. This would benefit from cross sector synergies, and potential North Sea cross-border economies of scale.

As the UK moves towards a net-zero future, our energy infrastructure and business models will evolve. The UK's oil and gas supply chain covers the whole product life cycle – from extraction to the supply of consumers. Energy companies that are currently focused on fossil fuel extraction could, over time, make use of their existing infrastructure to supply synthetic gas, hydrogen or electricity to consumers, replacing one fuel with another as part of a successful energy transition. With the growth of floating wind, the UK can show leadership in such an energy transition, and through this help enable a global market in which we are the leading expert.

5. FLOATING WIND IS A GLOBAL EXPORT OPPORTUNITY

The global opportunity for floating wind is large, at least twice the size of the fixed offshore wind market[7], with emerging markets in Japan, USA, China, Taiwan, Korea, Norway, Spain and Portugal. Whichever country wins the race to build out commercial scale projects will have a winning lead in this export market. A growing UK domestic market will be crucial to a successful export sector and the ScotWind process provides an initial opportunity for the development of domestic sites.

The countries which are the targets of UK exports also have a drive to maximise levels of local content in domestic projects. It will not necessarily be simple to get UK products and services into these markets. We therefore expect it will be necessary for UK companies to be able to display a clear advantage of importing UK content over local competitors to win contracts. This may be through lower prices, higher quality (or both), or providing goods and services not available locally.

A UK domestic market is necessary for UK companies to develop world-leading capabilities and a track record in successful delivery in floating wind. This will support significant steps in cost reduction, without which it will be extremely difficult to penetrate overseas markets, which are seeking to promote their own local companies.

The total global market for offshore wind is set to grow to between 4GW and 13GW installed by 2030, representing markets of between £3bn and £9bn annually[8]. The increasing global drive for reduced carbon emissions and rapid cost reductions mean offshore wind is expected to grow exponentially. IRENA's most recent forecast included 1,000GW of offshore wind installed by 2050, with installation rates of 45GW per year[9].

With floating wind taking an increasing share of this capacity (forecast up to 150GW in IRENA's figures), floating wind will provide a sustainable global market in excess of £10bn per year. Off the back of this, with the appropriate supportive actions, we believe the UK can deliver annual UK export value of at least £230m by 2031 and £550m by 2050[10]. This equates to 9% of the £2.6 billion exports for offshore wind in total set out in the Sector Deal, demonstrating that the industry is pursuing a realistic level of ambition.

Kincardine: Dock90

7. Carbon Trust Floating Offshore Wind: Market and Technology Review from 2015
8. Macroeconomic Benefits of Floating Offshore Wind in the UK; September 2018. Crown Estate Scotland & Offshore Renewable Energy Catapult
9. IRENA Current Status and Outlook for Offshore Wind, July 2019, presented at AIIB, Luxembourg
10. Macroeconomic Benefits of Floating Offshore Wind in the UK; September 2018. Crown Estate Scotland & Offshore Renewable Energy Catapult

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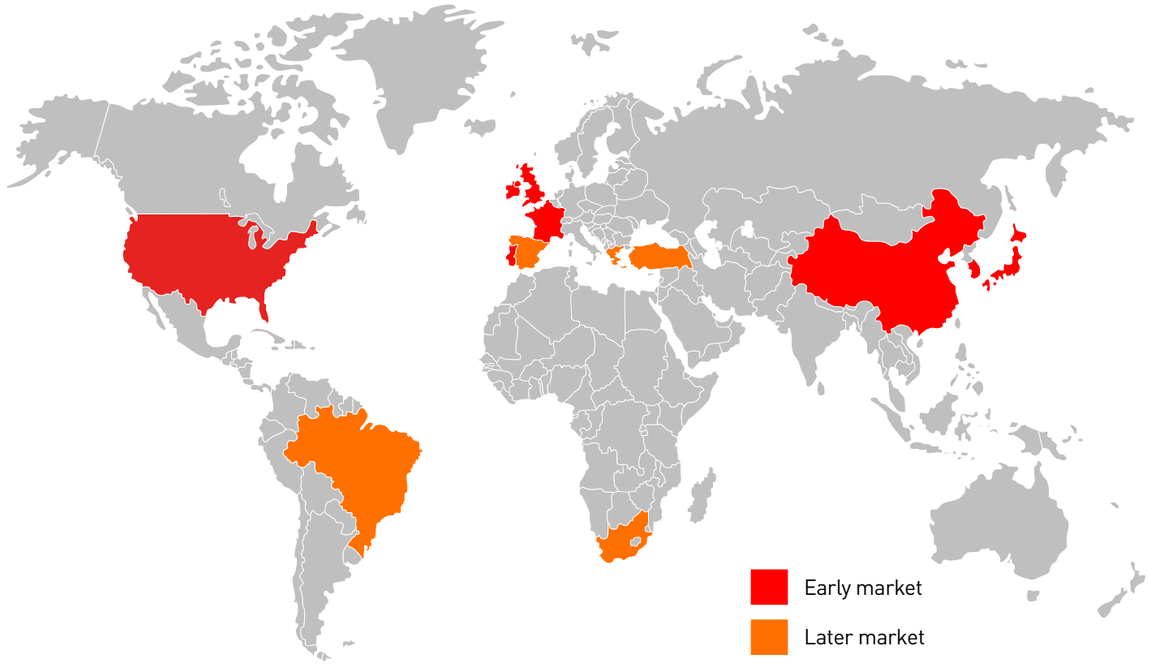
Potential Global Export Hotspots



UK companies and UK-based operations are already supplying international projects, with the Portuguese WindFloat Atlantic 2 project being supplied 66kV dynamic array cables (a world first for offshore wind) by JDR Cables in Hartlepool and turbine blades from Mitsubishi Vestas Offshore Wind facility on the Isle of Wight.

We anticipate that further export success will build on exporting service industries and leveraging the competitive advantage of the unique capabilities and experience spanning a variety of offshore focussed sectors generated by UK centres of excellence. This could include project design and development, engineering, logistics, and marine operations and may even encompass exporting smaller, modular components to overseas markets.

CASE STUDY – ATKINS

Atkins is a global multidiscipline engineering consultancy with over 45 years offshore engineering experience in both the hydrocarbon and renewable energy industries.

Atkins has over 17 years experience in offshore wind and 10 years of floating wind. This is built on decades of experience in the design and analysis of deep water floating oil and gas platforms. Their portfolio of oil and gas design projects includes 75% of the world's deep water Tension Leg Platforms as well as Spars and semisubmersibles (types of floating platform). They have developed an industry-leading track record for the design of fixed-bottom offshore wind solutions and global floating wind developments.

When floating wind develops globally, Atkins would be in a strong position to provide professional services and project management support, which would offer export potential from various regions of the UK. Given a sufficient volume of work, growth of Atkins navel architecture and structural design hubs in the UK would also be required to meet global development of these markets.

Having a domestic, commercial floating wind market would allow Atkins to further build their reputation in commercial scale projects in a similar way to fixed-bottom offshore wind, which puts Atkins in a highly favourable position globally having a depth of experience in their home market.

CASE STUDY - PRINCIPLE POWER

Principle Power is the developer of the WindFloat floating wind platform and is actively supporting the development of floating wind across the UK from Cornwall and Wales in the South West to Scotland in the North.

Floating wind platforms like the WindFloat that rely upon common services, technology and components from the 'fixed' offshore sector will enable the UK to expand beyond the current constraints of 60m water depth. They will also ensure a long-term market for products such as blades produced in Hull and the Isle of Wight, and towers produced in Campbelltown. Both the WindFloat Atlantic and Kincardine projects utilise the Vestas V164 wind turbine as used across the UK's fixed bottom offshore industry.

WindFloat Atlantic in Portugal is utilising key technology developed by the UK Oil and Gas sector, examples include the 66KV floating inter-array cables developed by JDR Cables in Hartlepool and the Ball-connector technology developed by First Subsea in Lancaster.

By returning the WindFloat to quayside for major component repair, Principle Power is able to undertake these activities in a controlled environment utilising expertise from areas such as the onshore wind market. By removing the need for expensive offshore construction vessels, floating wind returns a significant amount of economic activity to ports and the supporting supply chain. For the Kincardine project Windhoist from Irvine, who provides heavy lift services to the onshore wind market, supported the commissioning of the Vestas Turbine from the Dundee quayside.

Removing the need for large construction vessels, WindFloat relies upon standard tugs of 75 ton, the type found commonly across the UK. This approach means that there is greater competition in the market, with a greater number of vessels owned and operated by UK companies.

6. WHAT IS NEEDED TO ENABLE FLOATING WIND?

The success of the floating wind sector will depend upon industry and government working together to create the right environment for growth. **Beneath that we have identified three key policy enablers for the development of the sector:**

1. **Government working with industry, as set out in the Offshore Wind Sector Deal, should develop a competitive market framework that promotes the development of floating wind – such as an innovation pot within the CfD auction framework.**

2. **Future marine spatial planning and leasing processes around the whole of the UK should allow for commercial floating wind sites to be made available.**

3. **Government and Industry should work to identify and deliver joint investments in infrastructure underpinning the development of floating wind and its supply chain, supporting the development of the UK Industrial Strategy.**

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