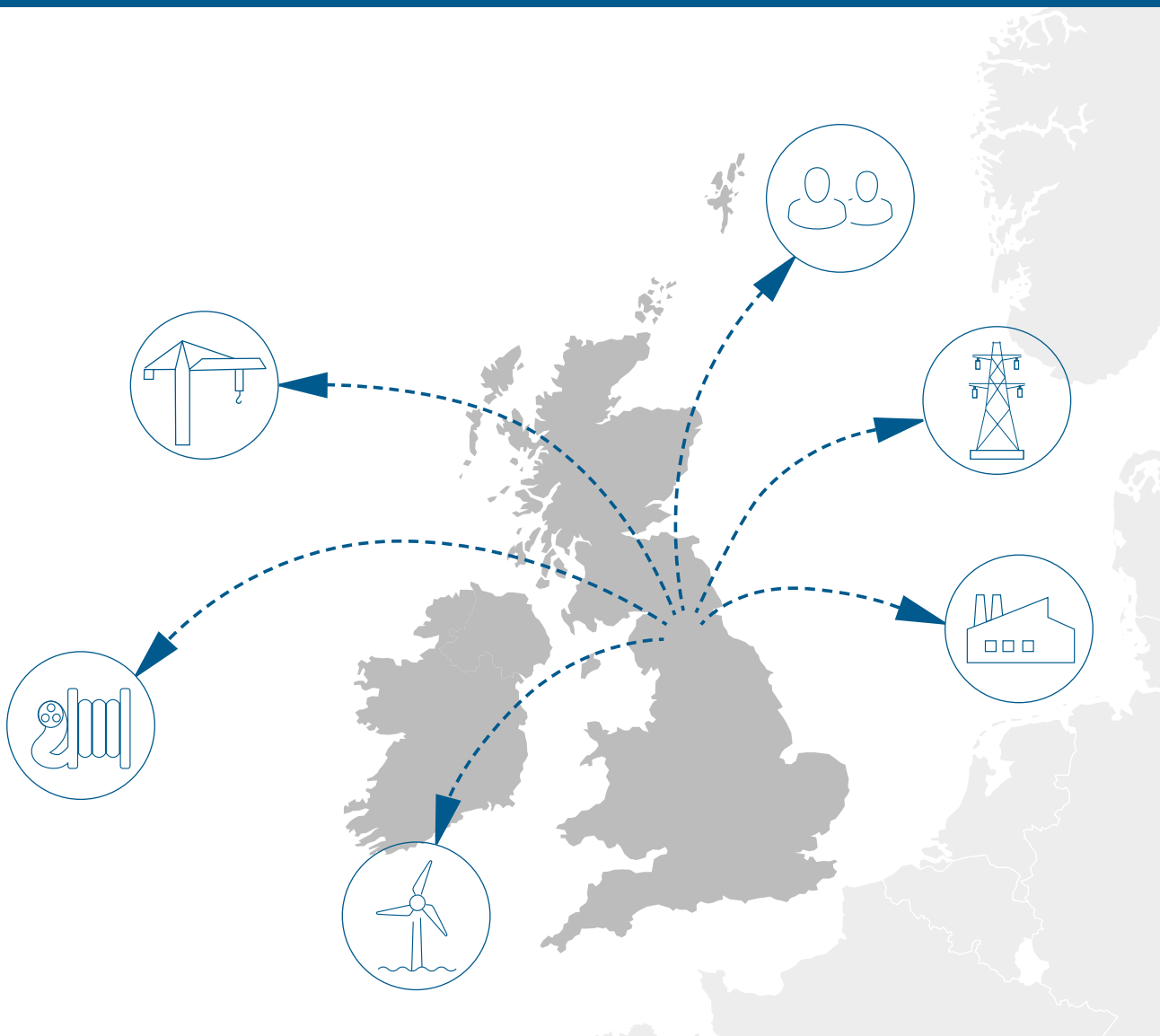


MAXIMISING OFFSHORE WIND EXPORTS



Introduction to **DONG Energy**

DONG Energy is the global leader in the development, construction and operation of offshore wind farms. The UK is our largest market and we currently have eight operational offshore wind farms and a further four under construction.

As well as being the market leader in offshore wind power, we produce oil and gas, and sell flexible solutions to our gas and electricity commercial and

industrial customers. We are also investing in new technologies, which convert household waste into energy.

Offshore wind has created significant value for the UK economy both locally and nationally and, as a company, we have already invested £5 billion in the UK in offshore wind alone. We plan to invest another £6 billion by 2020. With this investment, we are not only playing a leading role in the crucial transition to low-carbon energy, but are also helping to build a thriving UK offshore wind supply chain.

UK Expertise: **Going Global**

The growth of manufacturing is a key priority for the new Government as it seeks to rebalance the economy and maximise growth across the country.

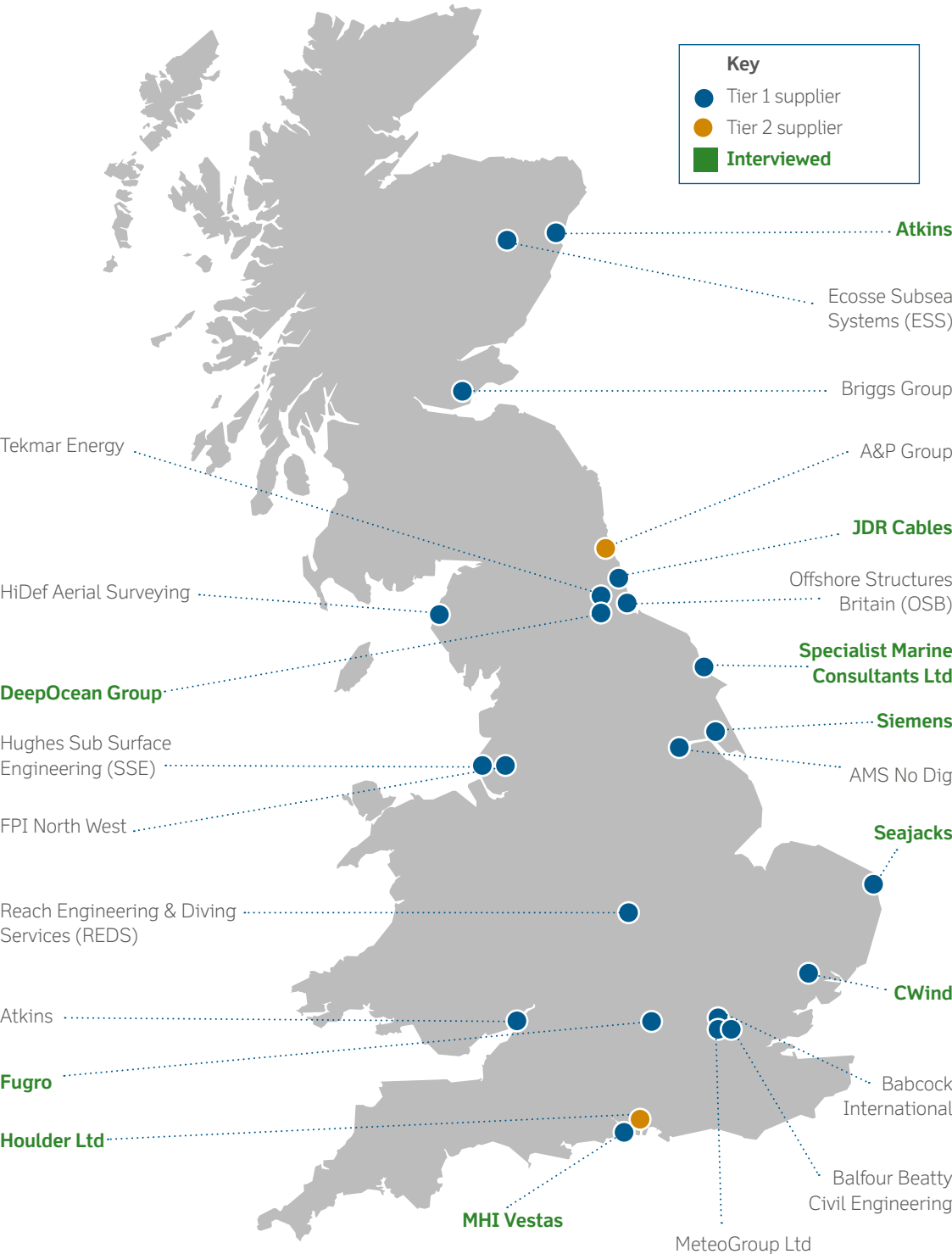
Increasing exports are a priority for the Government's new industrial strategy and will be key to ensuring the continued growth of UK companies. The offshore wind sector has an important role to play in the new industrial strategy as it brings much needed economic growth to coastal areas. It also has a diverse and rich supply chain across the UK, which is starting to export.

Government policy and financial support has enabled the offshore wind sector and the UK supply chain to grow. Our pipeline of projects, in the UK and overseas, has allowed us to buy in bulk, giving certainty to our UK suppliers to enable them to invest in new facilities and technology. International players like Siemens and MHI Vestas have started to invest in new UK facilities in Hull, the Isle of Wight and Belfast, allowing them to service the large UK market and also to export to Northern Europe.

Our suppliers are based around the country

The map below shows the location of the headquarters or main UK facility of some of our tier 1 (direct suppliers) and tier 2 (suppliers to our direct suppliers).

We interviewed the companies in green to get their views on export markets.



Why is the UK well placed for offshore wind exports?

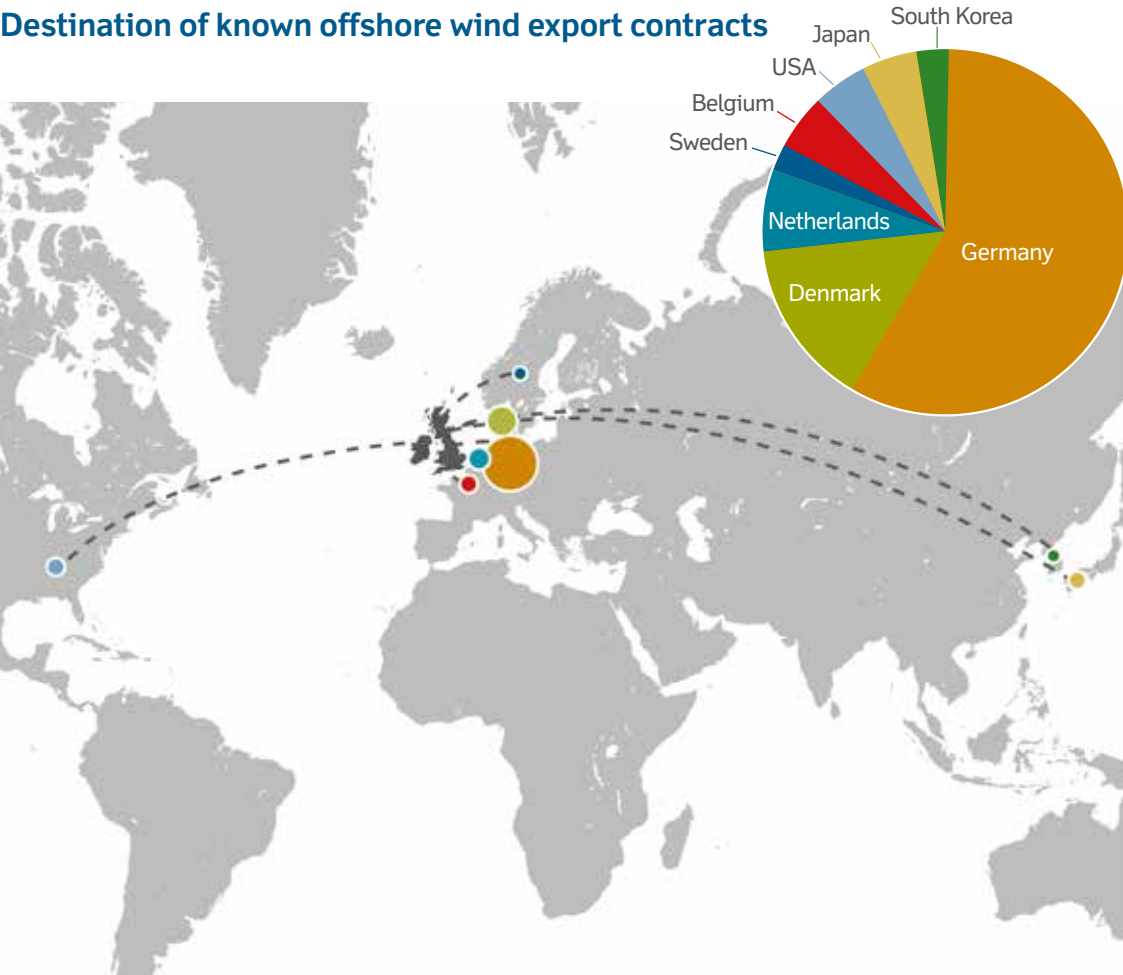
Due to the commitment of the UK Government, the UK is a world leader in offshore wind. The world's largest offshore wind farms are being built here in the UK and we have had to develop unique skills and technology that can be taken to countries around the world seeking to exploit their wind energy resources.

DONG Energy is putting in the world's largest wind turbines at Burbo Bank Extension in Liverpool. Each blade is the length of nine double-decker buses. We are building wind farms as large as a new gas power station up to 120 km out into the North Sea.

From oil and gas to offshore wind

The UK's long history of oil and gas exploration in the North Sea has left us with a wealth of specialist companies and staff that have turned their attention to the growing offshore wind market both here in the UK and abroad. For example, the UK is home to world leading geologists that use advanced laboratory tests on soil samples taken when surveying the sea bed to determine its structure. A number of specialist engineering companies with years of experience operating in the North Sea are now increasingly turning to the offshore wind sector to make up falling activity in the oil and gas sector.

Destination of known offshore wind export contracts



*Source: GROW database 2011-current.

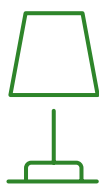
Growing New Markets

United States of America

With 80% of US electricity demand located in coastal states, and the potential to develop offshore wind projects that could supply double the electricity of current US demand, there is huge capacity for growth in the US offshore wind industry. In 2015, the Department of the Interior granted 11 commercial leases for offshore wind projects totalling 14.6 GW of capacity and, by 2030, the federal government has projected that there will be 22 GW of offshore wind across the nation.

"This year, Massachusetts passed an energy bill that commits utilities to buying 1.6 GW of electricity from offshore wind farms by July 2027."

Electricity demand



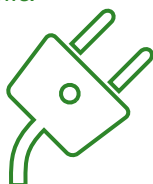
80% of US electricity demand is located in coastal states

80%

In New England, there is a particular need for offshore wind, as gas pipelines are unable to keep pace with the rapid expansion in gas power, resulting in high electricity prices, especially in winter. This year, the Massachusetts legislature has shown clear leadership in the US, having passed an energy bill that commits utilities to buy electricity from 1.6 GW of offshore wind farms by July 2027. DONG Energy is already established in Massachusetts, having identified it as the best entry point for the US market, when it acquired the rights for a potential 1 GW development off the state's east coast in April 2015. This was followed up with further investment in another potential 1GW site off the coast of New Jersey in November 2015.

"The rapidly expanding U.S offshore wind market offers significant long-term opportunities. There are big advantages to being first movers."

Projected power



By 2030, the federal government has projected that there will be 22 GW of offshore wind across the nation

22GW by 2030

For UK supply chain companies deciding whether to follow DONG Energy into the US offshore wind market, it should be recognised that few local suppliers of suitable experience exist today.

This gap in the market represents an opportunity to UK suppliers who are among the world's most experienced and skilled. However, there remains a strong drive for local content around US offshore wind which could present challenges to UK exporters. The Jones Act requires that cargo shipped between US ports be on a US flagged vessel. While this prevents UK vessels from operating in the market, it also presents an opportunity for suppliers willing to invest in the US, as there are currently few US flagged vessels able to deliver the services required of the offshore wind industry. UK companies wanting to enter the US may need to partner with US suppliers or invest in new facilities there. However, the US may still require specialist services and components manufactured in the UK, and the costs of shipping are not prohibitive for lighter components.

The rapidly expanding US offshore wind market offers significant long-term opportunities. There are big advantages to being first movers.

Taiwan

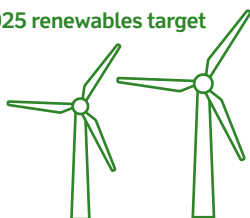
Taiwan's new government, the Democratic Progressive Party (DPP), is taking Taiwan in a new energy direction, headlined by a nuclear phase out and a strong renewables target of 23GW by 2025. 3GW of this 2025 renewables target is allocated for offshore wind power, compared to 5GW of offshore wind currently installed in the UK today. Taiwan has good wind resources and a water depth and geology that is suitable for offshore wind. While natural hazards like typhoons and earthquakes pose a risk, it is possible to design against them. DONG Energy has opened up an office in Taipei to further explore the potential for offshore wind in Taiwan and the Asia Pacific region.

Few existing players in the Taiwanese market have offshore wind experience and overseas suppliers and developers are being encouraged to help kick-start the industry. While there is no local content legislation in Taiwan, the Government has made it clear that it expects its support of offshore wind to result in the development of a local offshore wind industry. This could pose a challenge to UK suppliers, but it also means that attempts to use local Taiwanese sub-suppliers, or establish production facilities in Taiwan, will be rewarded by continued political support. In addition, suppliers should not view Taiwan in isolation. It is merely the fastest moving market in a region that includes China, Japan and South Korea. All of these countries are committed to offshore wind in the coming years.

Challenges certainly exist, such as a strong fishing lobby with legal protection of rights that require engagements at a very early stage. Resolving such challenges will require local cooperation and partnerships throughout the offshore wind lifecycle. For suppliers willing to invest, Taiwan has every possibility of providing access to a large home market from which neighbouring markets can also be covered.

"Suppliers should not view Taiwan in isolation. It is merely the fastest moving market in a region that includes China, Japan and South Korea. All of these countries are committed to offshore wind in the coming years."

2025 renewables target



3 GW by 2025

Taiwan's new energy direction is a renewables target of 23 GW by 2025. 3 GW of this 2025 renewables target is allocated for offshore wind power.

What do our suppliers need to grow?

DONG Energy interviewed ten supply chain companies in the UK offshore wind industry, with a particular focus on exports and industrial strategy.

We spoke to both advanced manufacturers and specialist offshore wind service providers, from smaller entirely UK based firms through to large international companies with UK facilities.

Many of the companies we spoke to have grown with us, showing rapid growth in the UK as a direct result of working on a number of DONG Energy UK projects. They have then entered other markets, supporting us and other developers on projects in Northern Europe.

”We spoke to both advanced manufacturers and specialist offshore wind service providers”

”Many companies have grown as a result of working on a number of DONG Energy UK projects”

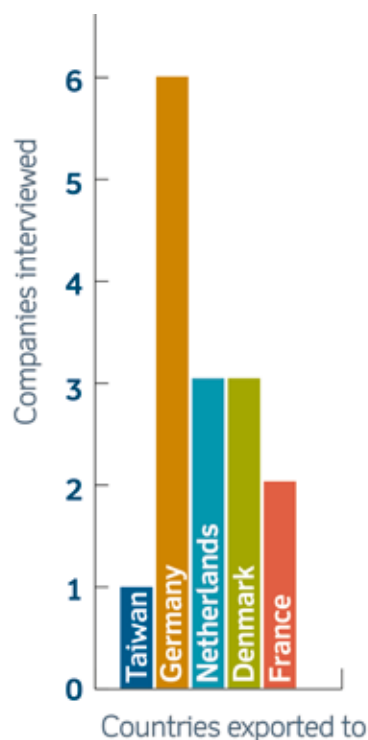
Exporting outside the UK

The results show that 70% of those interviewed are currently exporting.



Europe remains the main market

80% of these exports are to the EU.



What do our suppliers need?

Looking outwards towards new markets, the majority of these companies cited the US and Asia Pacific – notably China and Taiwan – as potential targets for future exports.

What are the barriers?

- Difficulties around the security of **Intellectual Property (IP)** in the Asia Pacific region. As a result, many companies have expressed priority in expanding and delivering more from markets in which they are already established.
- Concerns over **protectionist local content** regulations in the US such as the Jones Act. This may present an issue for companies that don't have an office or a manufacturing facility in the US or the Asia Pacific. The development of permanent facilities and business registration might be too expensive in the short term.
- The **weak pound** was viewed with mixed emotions, with 40% of those interviewed seeing it as a temporary help, but one which by no means makes up for the uncertainty surrounding Brexit and the single market.
- Almost all of the companies said they were highly concerned about the **impact of Brexit**, given that they work in a Northern European market and that uncertainty was making it hard to do business and look ahead.

"The weak pound was viewed with mixed emotions, with 40% of those interviewed seeing it as a temporary help, but one which by no means makes up for the uncertainty surrounding Brexit and the single market."

What can the UK Government do?

- 50% of those interviewed highlighted the important role of both the **Department for International Trade (DIT)** and **UK Export Finance (UKEF)** in helping them to export.
- A clear **long-term energy policy** with regular Government support to enable them to plan and scale up operations in the UK and invest further in offshore wind clusters.
- A number of companies flagged the need for greater Government assistance with **access to finance** to enable them to scale up in the UK and create a solid base for export.
- Remaining in the single market to **avoid trade tariffs** was a top priority, especially as contracts are entered into several years in advance. More needs to be done in terms of agreeing acceptable sharing of risk of possible future trade tariffs along the supply chain.
- **Maintaining freedom of movement** across Europe is also key, given the small pool of specialist skills in many areas in the offshore wind sector and the shortage of available shop floor workers in manufacturing.



New opportunities in Taiwan?

With its ambitious 2025 renewables target and its densely populated cities, forests and mountains, Taiwan is looking offshore.

UK Exporting Case Studies

Seajacks

Seajacks owns and operates five of the world's most advanced harsh environment self-propelled jack-up vessels. Operating in both the renewable and hydrocarbon sectors, they are a UK company headquartered in Great Yarmouth. They have supported DONG Energy during the installation of turbines for Walney Offshore Wind Farms 1 and 2, and have been contracted for Walney Extension.



Q: Which markets are you currently exporting to from your UK facilities/business?

A: Germany is our biggest export market for offshore wind. Vessels go all over the world for oil and gas projects.

Q: What is the estimated percentage of your income from exports?

A: In the wind sector, exports account for an estimated 50% of our income. Seajacks were the first offshore wind company in Germany when we worked on the Meerwind project, but now the market is changing and our new competitors in Germany are based in Europe.

Q: Which new markets are you considering exporting to in the future?

A: We are interested in developing a presence in all new offshore wind markets including Asia and the US.

Q: What barriers do you see to further exports?

A: The main barriers are associated with governments that are focused on contracting local/domestic companies for the installation of offshore wind farms.

Q: What could Government do for Seajacks to facilitate growth and further exports?

A: More trade missions and reciprocal trade agreements. Our Commercial Director has been on DTI trade missions into Asia and was very impressed. The UK is the easiest market to enter – we need more give and take.

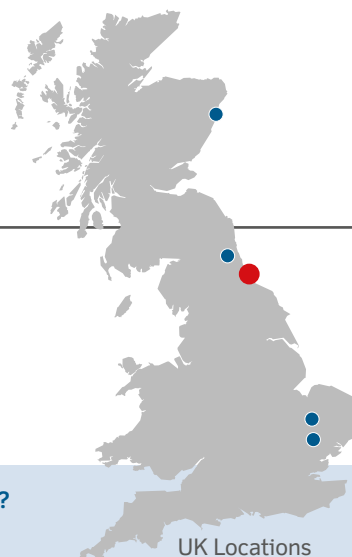
Q: What do you need from Brexit negotiations?

A: We need to ensure that the European offshore wind market continues to operate as a single market, without any additional bureaucracy or tariffs being imposed between the individual nations.



JDR Cables

JDR is a leading designer, engineer and manufacturer of subsea technology for the offshore wind industry. Headquartered in the UK, with its primary manufacturing facility in Hartlepool, JDR has worked with DONG Energy supplying subsea power cables and accessories to both our Gunfleet Sands and Race Bank projects.



Q: Which markets are you currently exporting to from your UK facilities/business?

A: We export globally to the oil and gas industry, including to the US, Norway, India, UAE, China, and Angola. We also export to Europe in the Renewable Energy Industry (mainly Germany), as Europe still represents 90-95% of the world's offshore renewables market.

Q: What is the estimated percentage of your income from exports?

A: At present, roughly 70% of our income comes from exports, and approximately 40% of this is for renewable contracts.

Q: Is the weak pound a help or a hindrance as it makes components more expensive?

A: It should help as our competitors trade mainly in Euros.

Q: Which new markets are you considering exporting to in the future? Do you currently find there are trade barriers to supplying to the US and China from the UK?

A: Our export strategy is linked to new markets for JDR (oil and gas in Brazil, offshore wind in the US and China), target projects (India and China) and areas we currently operate (for example, other European offshore wind countries such as France, Denmark etc.).

Q: Will your UK facility support the US markets?

A: Our current manufacturing strategy is to utilise our Hartlepool facility to its full potential – all of our inter-array cables for offshore wind come from here and shipping costs to the US are competitive. Asia and China have enormous potential, and we are looking at these, but as a European manufacturer we are aware that we would experience high levels of local competition in these locations and there are some concerns over Intellectual Property.

Q: What could Government do for JDR Cables to facilitate growth and further exports? Is there anything else you'd like to see in the new industrial strategy?

A: Avoid trade tariffs on UK imports, and look into how the supply chain as a whole could share the risk of tariffs. We're also looking at expanding our industrial base, which will need funding, and would welcome Government support. We also work very closely with UKEF who have helped to guarantee our export business, and issue commercial bonds to our overseas buyers. Their work has been important and they need to continue to give assistance to British manufacturers.

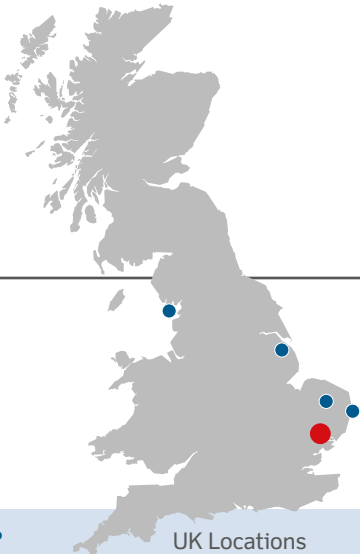
Q: What do you need from Brexit negotiations?

A: Need to clarify issues around the movement of people as we employ a lot of Eastern Europeans, especially on our shop floor – at the moment there is lots of uncertainty around whether they will be allowed to remain in the UK.



CWind

CWind have six years' experience integrating services, manpower and vessels to the offshore wind industry. Their first project was Gunfleet Sands in 2009, and they have worked on every DONG Energy UK project since, as well as working on Gode Wind and Borkum Riffgrund in Germany. CWind is headquartered in Colchester, and has offices and vessels in Grimsby, as well as three training locations in Lowestoft, Norwich and Barrow. CWind also has an operational base in Bremen, Germany.



Q:	Which markets are you currently exporting to from your UK facilities/business?
A:	Offshore renewables to Germany, Denmark, the Netherlands and Taiwan. However, CWind sees the UK offshore renewables market as part of an overall North West European/North Sea offshore renewables market given the number of companies working in more than one country in the supply chain.
Q:	What is the estimated percentage of your income from exports?
A:	For the 12 months leading up to September 2016, exports made up approximately 40% of our annual turnover.
Q:	Is the weak pound a help or a hindrance as it makes components more expensive?
A:	It's a constantly changing situation, but the most important thing is stability – then you can hedge for security. Despite the weak pound, local content is still important and we can deliver that. Operationally we set up a local base to work from. This makes our delivery more flexible as well as cost effective.
Q:	Which new markets are you considering exporting to in the future?
A:	Global Marine Systems (who have a 60% ownership in CWind) has a base in China, so there is potential to work there as well as elsewhere in the Far East and North America, but the priority for the moment lies in expanding and delivering more in already established markets where we are already present in Europe.
Q:	What barriers do you see to further exports?
A:	The US would need to be a joint venture with a local manufacturing partner with CWind offering its service expertise. Foreign markets appreciate and see the benefit of CWind's in depth operational expertise. Commercially this needs to work for CWind.
Q:	What could Government do for CWind to facilitate growth and further exports? Is there anything else you'd like to see in the new industrial strategy?
A:	Ensure regulations are consistent with and are kept up to date or ahead of European regulations. There needs to be growth and strength in depth in the UK domestic supply chains to capture the export opportunity. Furthermore, there needs to be a more regular flow of UK projects through consistent auctions, with corresponding long-term agreements with companies such as CWind in the supply chain that will help to build that strength in depth.
Q:	What do you need from Brexit negotiations?
A:	We need stability and to be able to be part of a North West European offshore renewables market.



Specialist Marine Consultants Ltd

SMC Ltd provide a variety of specialist services to the offshore wind sector including marine coordination, vessel inspections and marine consultancy. SMC's headquarters are in Filey, North Yorkshire, and they are currently working on DONG Energy's Race Bank Project (coordinating the load out of foundations from Germany and Poland) and Burbo Bank Extension (client rep for wind turbine installation).



Q: Which markets are you currently exporting to from your UK facilities/business?

A: Germany, France, Holland, the US and Brazil.

Q: What is the estimated percentage of your income from exports?

A: Our income this year from offshore wind is approximately 80%, of which roughly 65% comes from Germany, 25% from Holland and 20% from the UK.

Q: Is the weak pound a help or a hindrance as it makes components more expensive?

A: We had to bid in Euros, so there was some loss, but we did not have to exchange straightaway. If levels remain as they currently are, it could work quite well.

Q: Which new markets are you considering exporting to in the future?

A: We are considering both the US and Asia, but in the near-term our prime growth market is the UK (with huge potential in the large Round 3 sites). We also see potential in Germany and Holland. The US is 3-4 years away and we are currently focusing primarily on oil and gas in the Taiwan/Asia region.

Q: What barriers do you see to further exports?

A: The major challenges in the US are:

1. The Jones Act.
2. Worker's compensation scheme.
3. Difficult to secure contracts, as we need the right insurance and must have a US office.
4. Framework agreements, as these can be disadvantageous for smaller companies. If you miss a contract, you have to wait between 3-5 years before you can tender again.

Q: What could Government do for Specialist Marine Consultants to facilitate growth and further exports? Is there anything else you'd like to see in the new industrial strategy?

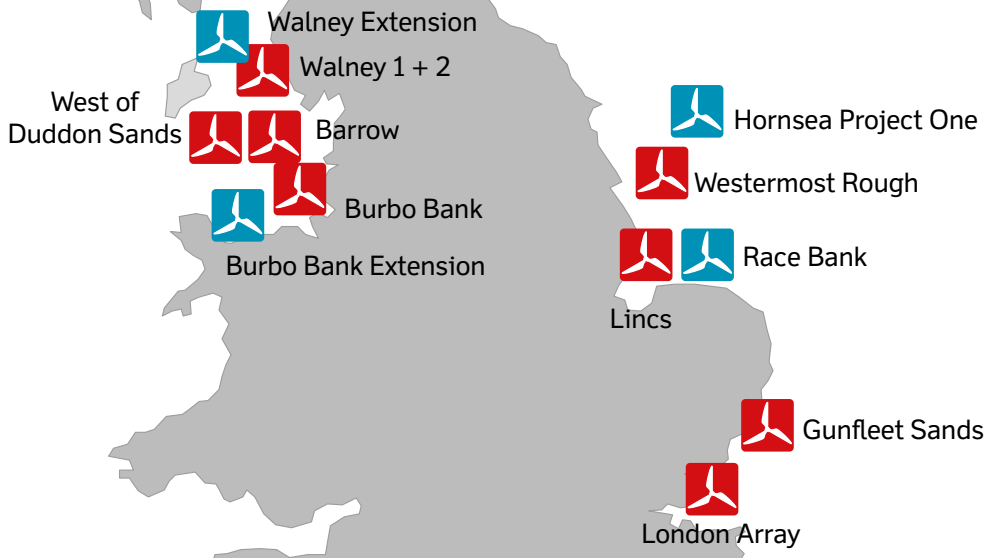
A: Better assistance for smaller businesses. The Government could help with insurance guarantee for UK companies. Growth could be maintaining existing positions. If small companies want to access larger foreign contracts, we could start to see more mergers and acquisitions.


Q: What do you need from Brexit negotiations?

A: A similar platform to what we have today. We are, however, open minded and it could enable us to negotiate our own deals with the US. We need early visibility on the Brexit strategy.










DONG Energy wind power under construction



DONG Energy wind power in operation



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