

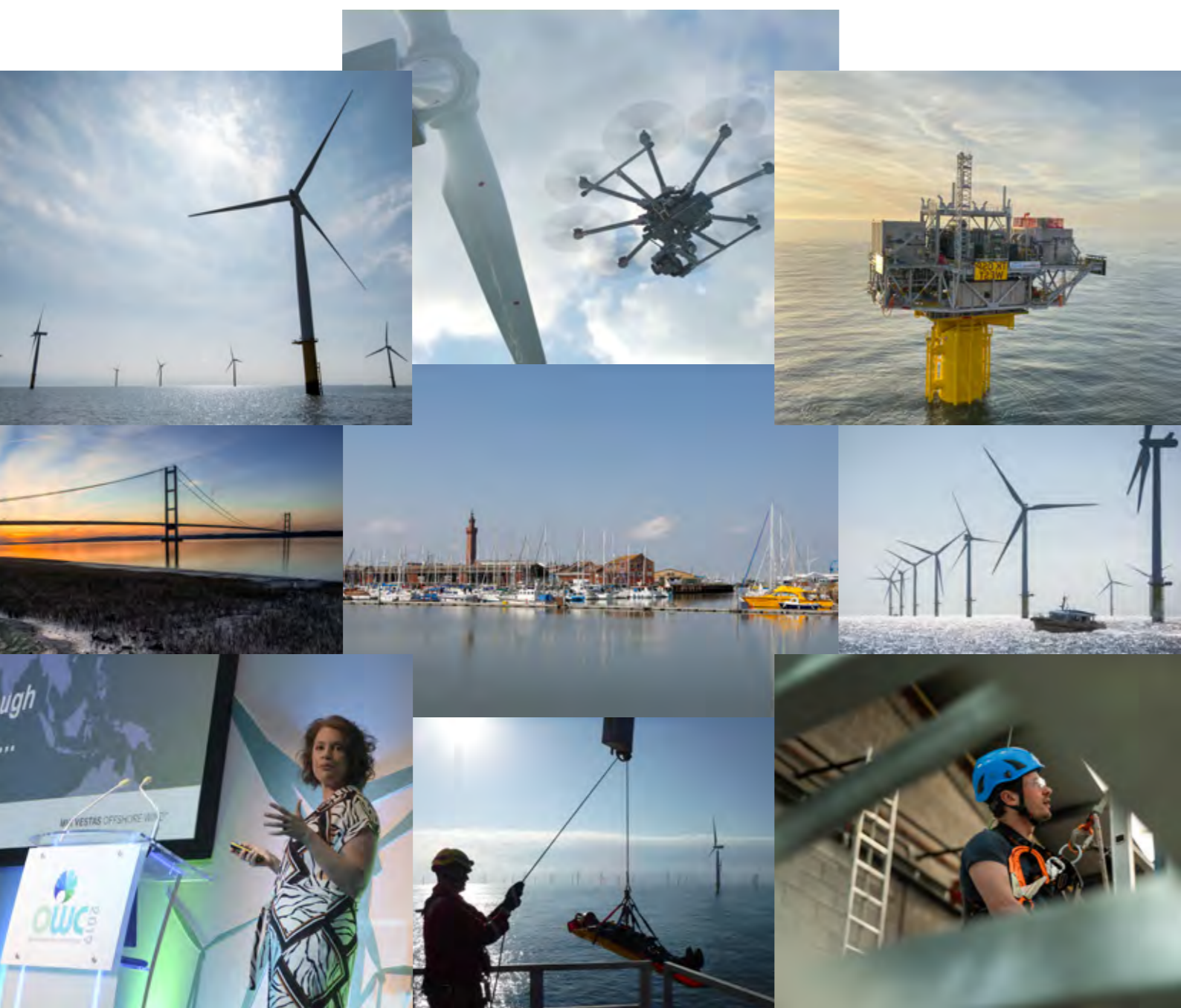
# THE HUMBER OFFSHORE WIND CLUSTER PROSPECTUS

Advancing our place with  
offshore wind growth



# THE HUMBER OFFSHORE WIND CLUSTER PROSPECTUS

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# FOREWORD

**By Emma Toulson, Ørsted,**  
Humber Offshore Wind Cluster Sponsor

This Prospectus documenting the incredible journey of the Humber Offshore Wind Cluster has been on the drawing board for some time. I am delighted that Ørsted working closely with our stakeholders from across the cluster was able to convene, to shape and agree its content.

This document is not an Ørsted product but the fruits of the wider offshore wind community. It demonstrates that we are more than the sum of our parts and indeed it sets out our collective vision for the future, and how our regional cluster can move forward to the next stage.

Working together we have identified a number of actions over the short to long term that we will progress together, building on the success we have already achieved.

Encouraging entrepreneurship, supporting new innovators and potential new entrants into the cluster and supporting companies to commercialise ideas are some of the short term actions identified as we look to build capability and strengthen knowledge in the region.

Sitting alongside actions to deliver diversity in the workforce, increase the visibility of the sector to potential employees and investors, produce an 'export offer' to international markets whose representatives visit the Humber in search of our knowledge and expertise, are a handful of the activities we have identified. Our calls to action are listed in the section entitled Building the Future on page 46 and a timeline of activities can be found on page 58.

With a strong geographical proximity to market, the offshore wind sector in the Humber region is a success story beyond any comparative measure and we are all rightly proud of how far we have come in the last 12 years.

We have established an industry that is increasing productivity each year, we have innovated, we have exported our knowledge around the world and we have transformed our region. Through the creation of 11,000 jobs nationally, the sector has brought opportunities to thousands of people and their families, alongside contributing to the national



pursuit for clean energy. But the journey is not over and there is much to consider as we move into the next chapter and the sector plays an integral and vital role in the region's ambition to be net zero by 2040. Moreover, last year the government committed to carbon neutrality by 2050 and offshore wind will need to play an increasing role in this transition.

At the same time wind generated energy will also play a significant role in the development and generation of green hydrogen, using renewable energy to power the electrolysis of water. There are already a number of projects in this space going on in the Humber including the Gigastack Renewable Hydrogen Project.

Renewable hydrogen is completely clean and it will be affordable as the cost of renewable energy falls. Green hydrogen is one of several potential low-carbon fuels that could take the place of today's fossil hydrocarbons and will play a vital role in decarbonising our energy system and our industries, especially heavy industry and transport that rely on gas.

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“The best way to predict your future is to create it.”

Abraham Lincoln

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The Humber region emits more carbon dioxide into the atmosphere than anywhere else in the UK, 30% more than the next largest industrial cluster. The opportunities created for our sector, in the generation of renewable hydrogen are enormous and it will play a pivotal role in delivering both the region and the nation's net zero ambition.

The UK currently has more offshore wind capacity than anywhere in the world with over 40 wind farms and around 2,200 turbines generating power in our waters. Last year in the UK offshore wind produced 32TWh of electricity, that is 10% of the total UK electricity generated by the offshore wind industry. To contextualise it, offshore wind generated enough electricity in 2019 to supply the needs of 8.3 million homes, around 30% of the UK total<sup>1</sup>.

The Humber is home to six operational offshore windfarms including Hornsea One - the world's largest offshore wind farm, supplying 2.5GW of clean energy to British homes and businesses. With a government commitment to deliver 40GW of offshore energy by 2030, the Humber is already playing a leading role in this national effort and with a pipeline of projects including Hornsea Two, Three and Four the ambition is to deliver at least 10GW of deployed capacity by 2030 – one third of the UK total<sup>2</sup>. Getting to 30GW represents a 200 per cent increase on 2019's installed capacity. By 2030 the Offshore Wind Sector Deal anticipates the sector's export value to be worth £2.6 billion, it is currently around £0.5 billion.

With strong market appetite for new offshore wind, this Prospectus is about the next chapter in the Humber's story and building on our successes as we strive to meet the challenges set out in the Sector Deal; increasing installation capacity to reach that 10GW target (of the government's 40GW target), developing skills to create the 27,000 jobs needed to meet the demand of the growing market by 2030 and increasing diversity in our industry to reflect modern communities. The sector has set a target of 33% of employees being women by 2030, increasing to 40% if feasible and increasing the number of black, Asian and minority ethnic workers in the sector from the current 5% to 9% in 2030, aiming for a more ambitious target if feasible.

To achieve these goals, there is much to do but we are on the right path with enormous ambition, huge talent, and public support behind us. It will be tough and there will be headwinds; global competition for the supply chain; a reduced strike price for the power output; continuing to attract the right people and businesses to the sector. This will all demand places, businesses, academia, industry, and people innovating to find solutions to these challenges and bringing new technologies and thinking to the sector. With the support of the Aura Innovation Centre, the University of Hull, the Offshore Renewable Energy Catapult's Operations and Maintenance Centre of Excellence and the plethora of global manufacturers and business in our supply chain we have that capability. It is this set of issues that our prospectus focuses on.

I am hugely grateful for the friendship and spirit of collaboration that has electrified the endeavour to bring forward this document. It is a bold set of recommendations and pledges to achieve our targets and I look forward to working with all of you as well as welcoming new players into the sector in the coming months and years.

<sup>1</sup>Humber Clean Growth White Paper, Nov 2019, p15

<sup>2</sup>The Crown Estate, Offshore Wind Operational Report 2019

<sup>3</sup>Humber Clean Growth White Paper, Nov 2019, p15

# INTRODUCTION

Clean growth is one of four challenges recognised in the Government's Industrial Strategy that will transform all of our futures. Moving to cleaner economic growth through low carbon technologies and the efficient use of resources is one of the greatest industrial opportunities of our time and the Humber is the place where the UK's capability to meet its net zero ambition is being forged; bringing forward high value job opportunities, rejuvenated urban settings, investment, world class technology development, economic growth and clean electricity powering over one million homes locally.



The Government's ambition for the UK to be net zero carbon emissions by 2050 was signed into law in June 2019 and is a strong, substantial national challenge. 2050 is 30 summers away; less than 11,000 days; in that time our task is to transform the UK economy and how we live our lives, ending our contribution to global warming. The aim is deliverable, building on the footsteps taken here in the Humber over recent years.

There are many elements to achieving net zero nationally and in the Humber region, but the generation of clean energy and the wider decarbonisation opportunity sits at the forefront and offshore wind will play a substantial and critical role to this end. The Humber Offshore Wind Cluster continues to evolve and since the publication of the Offshore Wind Sector Deal in March 2019 a huge amount of purposeful effort has been focused on unlocking the potential.

Our proposed activities and calls to action are listed at the end of every section, defined by our discussions preparing this document. Building the Future on page 48 sets out how we will do this and meet our ambitions to propel the cluster forward. The Implementation Plan on page 58 provides a timeline of activity.

It is not said often enough, but like Formula One and the automotive sector, the offshore wind sector is a brilliant UK success story. Beyond the economic metrics, offshore wind is both a contribution to the national imperative to reach our net zero commitments and a story of our regional industrial rejuvenation; the investments, the policy frameworks, the training facilities and the growing number of offshore wind arrays are the fabric of opportunities for our people and the future world ranking economic success story.

The Humber Offshore Wind Cluster is the most advanced of all the clusters, it is the Cape Canaveral of offshore wind; we are not simply powering our households, our offices and providing clean energy as we decarbonise ever greater segments of our economy; we are changing the nature by which we create power which the world wants to emulate. At the individual level, we are creating fresh pathways for our people to develop new skills with a global horizon. When realised the ambitions of the Humber Offshore Wind Cluster will have transformed the skills profile of the region, with greater diversity, driving individuals' ambition and supporting globally competitive industries.



## Charting the future

Success though needs to be constantly developed, particularly in a competitive global setting that will not reward delay. The great strides made in the Humber over recent years are commonly recognised to have been organic in nature. The achievements should serve to increase our ambition to aim higher and acknowledge that focused interventions will help to deliver the future challenges. There is much more to be done to ensure that the Humber Offshore Wind Cluster delivers the regional and national objectives. This document builds on the Offshore Wind

Sector Deal, the Humber LEP's Clean Growth Strategy and the excellent work carried out by stakeholders across the region that has informed the Humber Local Industrial Strategy.

This is also a big national challenge. The last election saw government raise the offshore wind ambition from 30GW to 40GW by 2030<sup>4</sup>. This is a welcome endorsement that provides confidence for the future and it is a challenge to embrace. To deliver this will require considerably greater contribution from regional clusters, improved links

between clusters to shape a UK offer, greater collaboration with local education institutions, much greater innovation and larger manufacturing bases, for our region to demonstrate stronger leadership in this sector, and to forge strong global links.

The Humber is already leading the way for the wider sector on several of these fronts. This prospectus charts a course for how the Humber Offshore Wind Cluster will deliver these ambitious and essential goals whilst simultaneously strengthening its position, maintaining

its competitiveness, and maximising opportunities globally. It is the fruits of the stakeholders who have generously contributed to the content of the following pages over the recent months.

Over the next pages this document details our story thus far, looking at our strengths and areas where further efforts are required in each of the five sections that are the foundations of the Offshore Wind Sector Deal. The priority activities that we have identified are listed at the end of every section.

In the final section 'Building the Future', we have created the cluster's 'shopping list', incorporating all of this information, summarising the objectives and activities, responding to the gaps stakeholders identified. A number of these actions are strategic and are long term, others are simpler and can be put into place sooner with the right level of commitment. Collectively they can strengthen the cluster and power it forward to meet the challenges set out in the Offshore Wind Sector Deal – to achieve carbon neutrality by 2050.



# WORKING TOGETHER TO SHAPE THE WAY FORWARD

Collaboration is part of the DNA of the cluster's development on the Humber. Founded on strong networks and relationships, the cluster is a community through location, but also our common interest in the future growth of the offshore wind sector. Collaboration delivers the projects that build our future success.

In developing this prospectus, the collaborative spirit has come through. The stakeholders of the Humber Offshore Wind Cluster, representatives of all major bodies and elements of the supply chain and policy community, have volunteered their time and insights to consider how to further build the strengths of the cluster and to deliver on the aspirations set out in the Offshore Wind Sector Deal and the Humber Clean Growth White Paper. This is the first time this important group of stakeholders has come together formally to set out its future approach, and points to a common desire and commitment to work to achieve the ambition.

It has been widely recognised that the region's cluster has grown not following a pre-conceived plan, but organically. It has emerged on the back of pre-existing infrastructure such as the ports, capabilities in manufacturing and proximity to the development sites. It has developed to respond to the increasing development of offshore sites and the Humber has in turn become a place with a reputation globally for capabilities in the sector; a place of knowledge; an origin of products and services; and a destination for investment. The Humber Offshore Wind Cluster aligns well to the academic and policy thinking around clusters which is defined as a "concentration of related

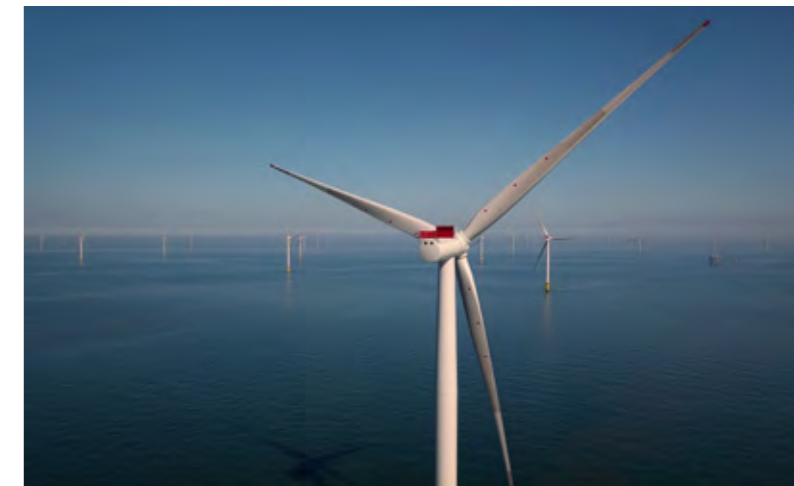
industries and services in a location". They describe a high concentration of relevant industries and actors in a location, with a high degree of collaboration<sup>5</sup>. The attributes of a cluster are set out in Figure 1.

The Humber Offshore Wind Cluster is not alone in the UK. Indeed, there are 8 identified offshore wind clusters spread across the coasts of Scotland, England, and Wales, all sharing a desire to build their communities, many with distinct propositions and at varying levels of progress. The Humber was first recognised as a cluster in 2011<sup>6</sup> as one of five Centres for Offshore Renewable Engineering locations in the UK that offered the right infrastructure for offshore wind manufacturing, access to a skilled workforce, and an experienced local supply chain and committed local leadership. As we set out in this prospectus, the cluster has evolved enormously since then and is now regarded as an established cluster, meaning that it has a critical mass of related industries with the emergence of key specialisms. The Humber Offshore Wind Cluster is the leading cluster in the UK and the challenge is to ensure that the cluster continues to drive benefits for the region and the pursuit of strategic national imperatives.

The idea for this prospectus is not new. There has been a considerable amount of planning and discussion. However, from October 2019, there has been a directed effort to push it forward. There was a dinner in October hosted by Ørsted which started to open the discussion. This was built on in January at the £12 million Aura Innovation Centre, in Hessele with over 20 senior representatives of the cluster's manufacturers, developers, policymakers, businesses, academics, trade and membership organisations and training providers. The workshop provided for a critical assessment of the features of the cluster. Participants were grouped by the five themes set out in the Sector Deal (Place, Ideas, Infrastructure, People and Business Environment) so as to bring their specific expertise and perspective to the discussion. The focus was on the relative strengths of offshore wind in the Humber and the areas for further growth; the successes to date, and how to apply the cluster's combined experience and expertise to put the Offshore Wind Sector Deal into practice. Since the workshop, stakeholders have continued to be generous with their time and involvement as we have developed this document.



Photograph reproduced courtesy of Grimsby Library Local History Collection, Lincs Inspire Ltd.



<sup>5</sup> Centre for Renewable Offshore Engineering, BIS p4

<sup>6</sup> Density Based Spatial Clustering: identifying industrial clusters in the UK' BEIS, Nov 2017 p4

## Assessing our strengths

The primary part of the discussion at the January gathering asked the groups to consider the 20 attributes of an advanced cluster (see Fig.1) and to rank the Humber's current position against each of them.

This builds upon work that was prepared for the 'Offshore Wind Place (Clusters) A Playbook', produced by the Offshore Wind Industry Council's Development Group in 2018. The playbook synthesised key academic literature from a number of sources around industrial clusters, namely the work by Professor David B. Grant of the University of Hull that identified the 20 key attributes of an Advanced Offshore Wind Cluster.

The exercise required the participants to consider and discuss different parts of the cluster from their unique perspectives. We asked them to assess the effectiveness of the different attributes – whether infrastructure, entrepreneurship,

or supply chain - based on their experience operating in the cluster, whether within the University, public administration, manufacturer, developer, port, or skills provider. The exercise revealed some consensus about what stakeholders believe the sector gets right, and also frank observations about where the industry needs to improve to deliver further success for the region.

The assessment of the cluster's performance against each of the attributes provided a basis for what focused interventions are needed to give direction to the future development of the cluster. Often these were about doing more of something rather than bold new ideas. It was more evolution than revolution.

The stakeholders' views are presented in Figure 2.

## Building on the workshop

Following the workshop stakeholders (including those present and others who have become engaged in the process), have continued to contribute to the thinking around building the cluster; promoting the Business Environment, creating a better Place and better Ideas, supporting People to gain the right skills and further enhancing the Infrastructure. These ideas run through the subsequent pages of this prospectus.

This cluster is a creature of co-operation and the formation of this document was a true testimony to that.

## Figure 1. Attributes of an advanced Offshore Wind Cluster

**Strong links with local policy** the cluster must be set within a local policy context which is supportive

**Related industry/cross-sector linkages** transferable expertise, products and services which can work between different sectors thus limiting risk for the supplier

**Entrepreneurship** the creation of scalable new business(es)

**Fully established supply chain** an integrated supply chain from end user to original suppliers

**Identified key specialisms** identified areas where there exists a strong offer around products, services, technology or expertise

**International recognition and readily exporting** having international recognition for sector delivery and where products, services and skills are exported to developing and new markets

**National recognition** having national recognition, often by national government and other geographies as 'go to' places for access to products, services and skills

**Research, development and innovation** new products, services and skills usually developed to solve problems and challenges of growing/developing industry

**Public/private sector cooperation/collaboration** open channels of communication between industry requirements for development and public sector to assist to de-risk and enable

**Brand and vision** a common brand and vision around which all stakeholders in the cluster can align

**Supporting organisations** public and private sector supporting organisations which can act to foster cluster collaboration

**Networking** business(es) and individuals within a cluster interacting with each other to exchange information, develop contacts and seed collaborations

**Finance** investment readily available to support innovation and expansion in products and services

**Physical infrastructure & ports** a concentration of relevant infrastructure which can be adapted to support the sector, including from related/previous industry

**Skilled workforce** a concentration of people within the cluster whom have relevant or transferable skills, in some cases from related/previous industry

**Growing company base** increasing concentrations of supply chain companies in the cluster

**Supportive political setting** policy or financial instruments acting to de-risk projects for developers and supply chains

**Geographical proximity to market** close to wind farm zones

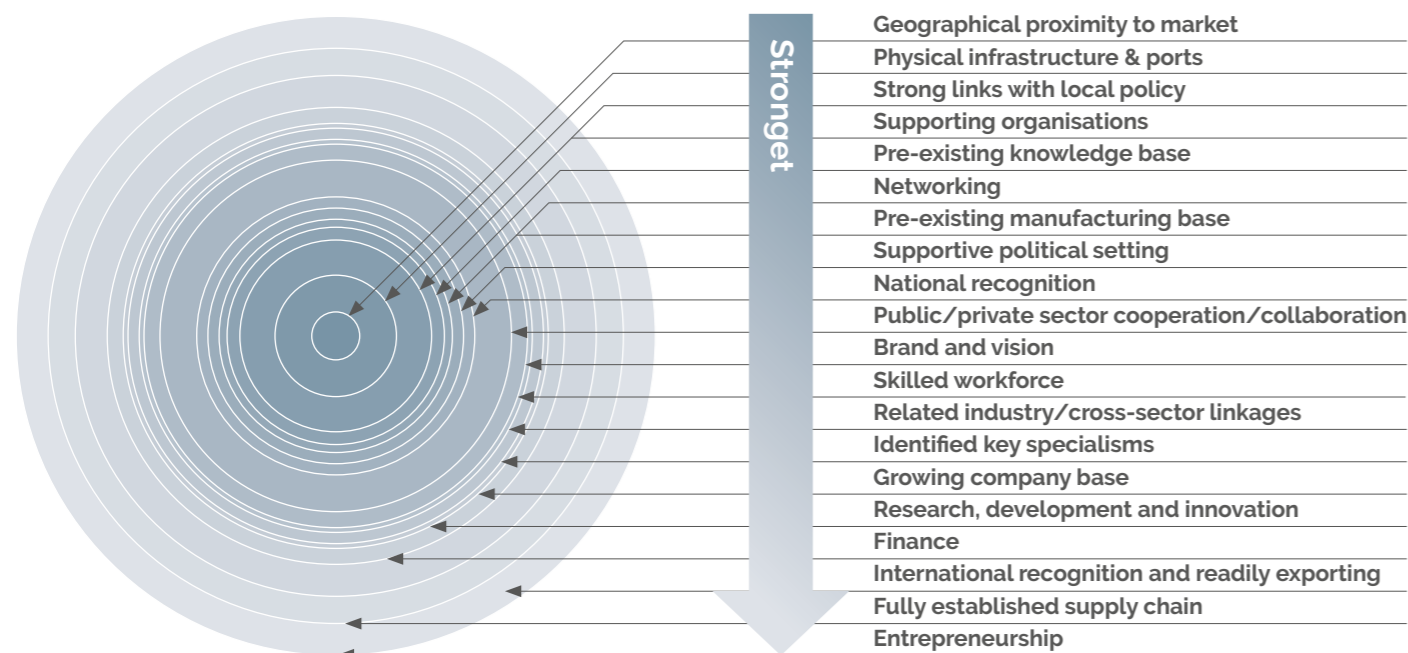
**Pre-existing manufacturing base** close to a manufacturing base which may have been originally established for a different but related industry

**Pre-existing knowledge base** close to a knowledge base which may have been originally established for a different but related industry

Attributes adapted from G Professor David B. Grant – University of Hull. "The Capability of the Humber Region, 2013" – Appendix 4: Clusters and agglomeration economies

## Figure 2. Attributes of an advanced Offshore Wind Cluster

Stakeholders assessed the cluster's attributes and believe geographical proximity to market is the strongest (centre of the circle) and identified the attributes where development is required (outside circle).





# PLACE

## Collaborating for regional growth and prosperity

The Humber region is an essential component of the UK's future facing green recovery. As a leading UK and European offshore wind cluster, the clean energy sector and a wider drive to decarbonise the whole economy will transform the region's economic fortunes.



The UK's offshore wind sector is the largest in the world and global in outlook. While it is dispersed nationally across the UK, the Humber has emerged as a key focus and is regarded as an 'Established' cluster, with more companies and organisations involved in the sector than anywhere else in the UK. Of the UK clusters the Humber Offshore Wind Cluster is the most advanced and its position will be strengthened as additional seabed rights are brought forward in future Leasing Rounds. There is enormous capacity off the north east coast with Dogger Bank, 300km from the shore offering approximately 22,000km<sup>2</sup> of development resource. Further south, in the southern North Sea region, the eastern part of The Wash region and the East Anglia region, offers a further 20,000km<sup>2</sup> of potential development resource.<sup>7</sup>

The pan-Humber Offshore Wind Cluster has shown how the complementary offers of different parts of the region can work together to bring forward a compelling proposition to economic actors: manufacturing and installation in Hull; innovation at Aura in the East Riding; operations and maintenance in Grimsby; and helicopter transport from Humberside Airport in North Lincolnshire. Current developments around the creation of green hydrogen demonstrate how the success of offshore wind can serve to stimulate the wider decarbonisation of the region's industry.<sup>8</sup>

The Humber holds considerable global reputational value as an offshore wind cluster. Each year a parade of foreign government officials and industrialists visit the Humber to learn how to develop an offshore wind cluster. The Humber Offshore Wind Cluster is building on its heritage of maritime industry, easy access to the abundant natural resources of the North Sea, pre-existing manufacturing capability and proximity to R&D assets. The local authorities, with their industry partners have created the conditions for a globally significant energy cluster.

Over the last twelve years the Humber has experienced substantial job growth, inward investment, and the deployment of world first technology. Its proximity to the largest planned offshore wind farms and those currently under construction, alongside land availability and regional port infrastructure provide a set of compelling physical conditions that give long term confidence to the industry. The Humber's attractiveness to manufacturers looking to locate at the heart of a future facing activity has been demonstrated by the Siemens Gamesa Renewable Energy blade factory in Hull. A £310 million investment creating 1,100 direct jobs and scores more across the wider supply chain in the region. The potential to bring further growth through decommissioning and repowering turbines, would further cement the Humber's position at the heart of an offshore wind circular economy.

Similarly, the Humber's operations and maintenance capabilities have also secured high value investment from offshore wind leaders Ørsted and RWE Renewables,<sup>9</sup> alongside a number of associated specialist suppliers that have transformed the area bringing new opportunities for the surrounding communities.

Underpinning these headline names are an array of wider organisations with their own networks. The four local authorities, the Local Enterprise Partnerships, the University of Hull, and the Offshore Renewable Energy Catapult, all operate alongside a series of companies and support organisations who strengthen the cluster through formal and informal ties. Team Humber Marine Alliance, the Grimsby Renewables Partnership and The Supply Chain Network provide advice to SMEs, give information about opportunities in the supply chain, organise B2B introductions and arrange international inward missions and exhibitions convening around shared agendas.

Developments to date provide a strong foundation for future growth. The Triton Knoll Wind Farm, alongside Hornsea Two and Three will trigger further opportunities for the Humber Offshore Wind Cluster. Equally, wider initiatives that are building on the successes to date will serve to provide related opportunities. The current live discussion about the potential for new Free Ports across the UK could provide substantial benefits for the region as it enhances the attractiveness of the Humber ports to foreign investors.

Whilst at the forefront of the UK offshore wind sector, the Humber's Energy Estuary is also the largest carbon emitter in the country. The ambition is to develop the Humber into a net zero carbon industrial economy by 2040 and offshore wind will play a role in that transition through the generation of renewable hydrogen. The Gigastack Renewable Hydrogen Project is already active in this space producing low-cost renewable hydrogen in bulk through the electrolysis process.

Hydrogen has traditionally been associated with high carbon emissions, but by using renewable electricity from renewable sources such as offshore wind, the process of producing renewable hydrogen by electrolysis can be completely decarbonised. Energy-intensive industries such as the Humber's oil, chemicals, and steelworks as well as the transportation and heat sectors will have the opportunity to reduce the carbon intensity of their fuels by using renewable hydrogen.

<sup>7</sup> <https://www.thecrownestate.co.uk/en-gb/what-we-do/on-the-seabed/offshore-wind-leasing-round-4/> Seabed Bidding Areas

<sup>8</sup> <https://orsted.co.uk/media/newsroom/news/2020/02/gigastack-phase-2>

<sup>9</sup> <https://renewablesnow.com/news/rwe-wraps-up-acquisition-of-innogys-renewable-energy-ops-704967/>



### Areas for further development

As an industry, the development of offshore wind in the Humber has performed excellently and has a strong future ahead. It is widely acknowledged that more needs to be done if the cluster's ambitions are to be achieved and what has to date been a largely organic path will benefit from more structure and targeted interventions in the future.

Perhaps one of the cluster's key attributes that has contributed to its success is the University of Hull. An anchor organisation in the region, it employs some 8,000 people both directly and indirectly, bringing considerable revenue to the Humber. In addition to R&D it has invested in and been a catalyst for collaboration in the sector by bringing together academia and 'green' companies, and setting up the Aura Innovation Centre to drive growth.

Cluster attributes that are considered as strong include a **supportive local policy** context with strong links to the LEPs and the four local authorities, and an array of **supportive local organisations** that encourage collaboration.

Cluster attributes that require further development include **brand and vision** and **national recognition**. Participants at the January workshop and indeed during subsequent conversations have remarked that neither of these attributes are working hard enough. In particular, the cluster is not showcasing its own

success story, explaining the distance travelled and the transformation that has been felt across the region, or celebrating the actors who have contributed to that journey. One comment spoke about the sector needing to shout louder about its achievements and the incredible progress the industry has made in a short period of time. Similarly participants at the workshop agreed **entrepreneurship** needs to be strengthened and pathways for entrepreneurs to enter the sector need better visibility and promotion to attract talent into the industry.

There is good reason to be proud of the offshore wind sector's successes and brand and vision should play well locally, drawing more people to the opportunities within the sector and the wider decarbonisation agenda. Such an approach would certainly convey the Humber's strengths, capabilities and success stories better to potential investors and could perhaps be achieved with a single organisation or point of contact providing leadership, or information (about skills, employment or the supply chain) propelling the cluster forward. One participant commented *'There is a huge amount of work being done by the separate organisations across the cluster, that work needs pulling together to present a strong brand with a clear vision so that the Humber continues to be at the centre of the UK's offshore wind sector.'*

Related to brand and vision, participants felt that **international recognition** needed to be improved in order for the cluster to capitalise on future growth opportunities globally. While considerable lessons have been learnt through international trade visits to and from the Humber where delegates have sought to explore and understand the cluster, these have not always translated into commercial benefits or future facing partnership programmes.

More generally, a number of participants believed that there was greater scope for co-operation between public and private sector bodies to discuss the strategic direction of the cluster. There was a common thread throughout the comments pointing to the private endeavours of businesses and organisations focused on their own commercial and corporate objectives. For the cluster to move forward there will need to be a greater emphasis on wider engagement to drive the wider Place agenda.

The activities set out below respond to the growth opportunities stakeholders identified to drive the cluster forward:

Timings ■ Short - 1 year ■ Medium - 2- 5 years ■ Long - > 5 years

Activity	Objective & relationship to OWSD delivery	Partners involved
With other national UK offshore wind clusters, work with and join together on national cluster initiatives.	Accessing great opportunity and profiling the Humber on a grander stage.	Aura (as a representative on Clusters Offshore Wind Sector Deal national working group) to co-ordinate national actors' regional agents, including Ørsted and RWE Renewables.
Recruit further members to join the 'Humber Offshore Wind Cluster Group' from across the cluster and have the capacity to lead the debate and design and deliver activities.  This group should plug into wider national and regional agendas such as net zero and levelling up. It should speak outwith of the region and funnel intelligence back to the cluster.	Ensure momentum is maintained particularly to ensure Leadership and Governance Coordination and Alignment for the cluster activities and advocacy. Ensure buy-in to vision and able to mobilise initiatives.	All
Enhance and deliver Place Marketing endeavours to attract inward investment into the region in the clean energy and decarbonisation sectors.	Specifically of interest to addressing the supply chain gaps set out in this prospectus, but more generally to enhance wider economic performance.	All Marketing Humber (Bondholders)





### In the spotlight:

## Aura

Aura is a powerful consortium of organisations focused on driving the innovation that will deliver a green energy future. Sitting in the heart of the Humber, it supports organisations of all sizes, helping them to build their ambitions and businesses; it acts as a catalyst for collaboration to develop and promote low-carbon innovation, building on the impetus from the offshore wind industry which is well-established in the region. It brings together university researchers, public sector bodies and businesses into one collaborative community, to move towards a greener supply chain by integrating industry engagement, enterprise support and skills development, as well as the power of R&D to meet the region's clean growth and regeneration ambitions.

In 2019, the Aura Centre for Doctoral Training was inaugurated, having won government research funding. The Centre offers 72 fully-funded PhD scholarships in offshore wind energy and the environment, to provide a home for the world's brightest minds to develop environmental and engineering solutions for the offshore wind industry. With the support of Siemens Gamesa Renewable Energy, Aura also offers an MSc Apprenticeship in Offshore Wind Energy Engineering through the University of Hull, and recently launched a CPD course in offshore wind to provide ongoing work based professional training to employees from across the industry.

With the help of a team of Innovation Managers based at the new multi-million pound Aura Innovation Centre which is part funded by the European Regional Development Fund (ERDF) and located in the heart of the Humber, SMEs have access to a cutting edge workshop, collaborative work spaces and research facilities and funding.

Aura's model supports the innovators to identify the opportunities, develop the research and test their ideas, build and demonstrate prototypes, and implement cutting edge solutions to adapt to Climate Change whether for their business, their clients or the wider cluster.

[www.aura-innovation.co.uk](http://www.aura-innovation.co.uk)

### In the spotlight:

## Humber LEP and Local Authorities

Offshore wind has been a central part of the Humber's economic development strategy over the last decade. Local authorities and the Humber LEP have been proactive in assisting the cluster to grow from the outset.

Local authority planning and economic development teams have worked closely with investors to enable large and complex projects, such as the regeneration of Alexandra Dock into Green Port Hull, to proceed in line with industry timescales. The region's unique Single Conversation approach to major developments, established by the Humber LEP, brings together local authorities and statutory agencies to work collaboratively to address barriers to development, making the Humber more responsive to time-sensitive proposals.

Programmes such as the Green Port Growth Programme and Growing the Humber, delivered by the local authorities and the LEP with funding secured from Government, have supported the region to maximise the benefits of landmark offshore wind investments. This has included local supply chain, innovation, business and skills support – helping local people and businesses to be a part of the cluster's growth.

Supported by these programmes and co-ordinated by the Humber LEP, the Humber's compelling message for offshore wind was showcased at key UK and European industry events – with local SMEs and institutions gaining new contacts and business from their attendance.

As a result of these programmes, support for the local offshore wind supply chain is now embedded in initiatives such as the Supply Chain Network and Humber Business Growth Hub, working closely with industry and local trade associations.

Demonstrating the priority given to the offshore wind sector, several prime sites were included in the Humber Enterprise Zone – the largest in the UK – in order to support the cluster's establishment in the region. Some, such as Green Port Hull, are now providing significant employment space for the renewable energy sector, while others – like the Able Marine Energy Park – will be crucial for the next phase of growth.

As well as supporting the decarbonisation of the UK's electricity supply, offshore wind in the Humber will also be a key contributor to decarbonising its established industrial

cluster – the UK's largest by emissions – by enabling the deployment of green hydrogen. The Humber LEP and CATCH are working with industry to develop a Cluster Plan that will show how the industrial cluster can achieve net zero by 2040, unlocking new investment and sustaining existing employment.

As the region looks towards new devolution and LEP arrangements for Hull & East Yorkshire and Greater Lincolnshire, collaboration across the Humber Estuary to support the further growth of the Humber Offshore Wind Cluster will continue, with the sector identified as a priority for the Humber Leadership Board.

The region's ambition, set out in the Humber Local Industrial Strategy, is to support at least 10GW of installed capacity by 2030. In doing so, it hopes to enhance the Humber's position as a world-leading centre for smart O&M and attract a new wave of manufacturing and supply chain investment.



# The Humber Offshore Wind Cluster

The Humber region is home to the UK's most coherent offshore wind cluster. The industry's close proximity to market coupled with manufacturing and installation in Hull; innovation at Aura in the East Riding; operations and maintenance in Grimsby; and helicopter transport from Humberside Airport in North Lincolnshire, have demonstrated that by working together they have created a national success story. As new areas of the North Sea-bed are unlocked for offshore wind development the potential for further growth of the Humber Offshore Wind Cluster is enormous.

**Aura Innovation Centre**  
Research, design and innovation

**CATCH Maersk Training MODAL Training**  
Training

**Other key regional partners:**

- Local Enterprise Partnerships
- Hull City Council
- East Riding Council
- Green Port Growth
- Team Humber Marine Alliance
- Grimsby Renewables Partnership
- Women into Manufacturing and Engineering
- Hull and Humber Chamber of Commerce
- Confederation of British Industry
- Department of International Trade

**Siemens Gamesa Renewable Energy**  
Blade manufacturing, assembly and installation

**ABP**  
Port/infrastructure

**University of Hull**  
Research, design, innovation and training

**Education and Training Providers inc. HOTA, HFR Solutions CIC**  
Training

**Able, ABP**  
Port/infrastructure

**Ørsted, RWE Renewables and supply chain companies**  
Owner operator

**ORE Catapult O&M Centre of Excellence**  
Research, design and innovation

**Education and Training Providers inc. Grimsby Institute**  
Training

**Rotos 360, MHI Vestas and supply chain companies**  
Operations and maintenance

## New seabed leasing areas – Round four

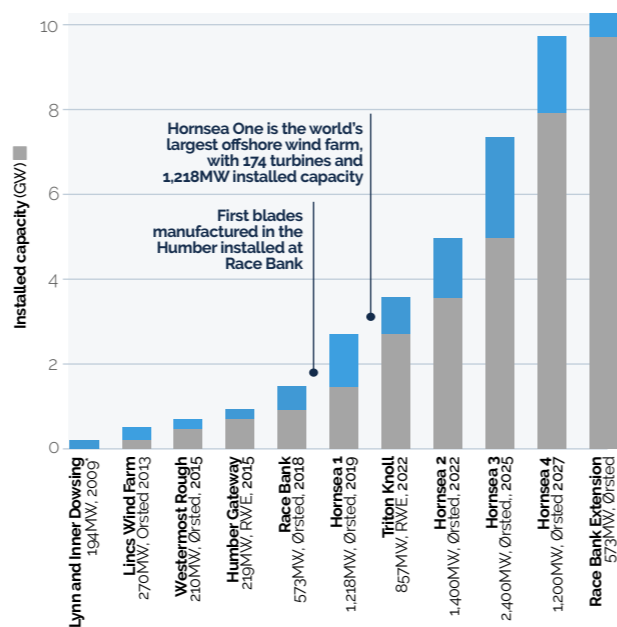
**Bidding Area 1**  
Dogger Bank  
Comprising the Dogger Bank region

**Bidding Area 2**  
Eastern Regions  
Comprising the Southern North Sea region, the eastern part of The Wash region, and the East Anglia region

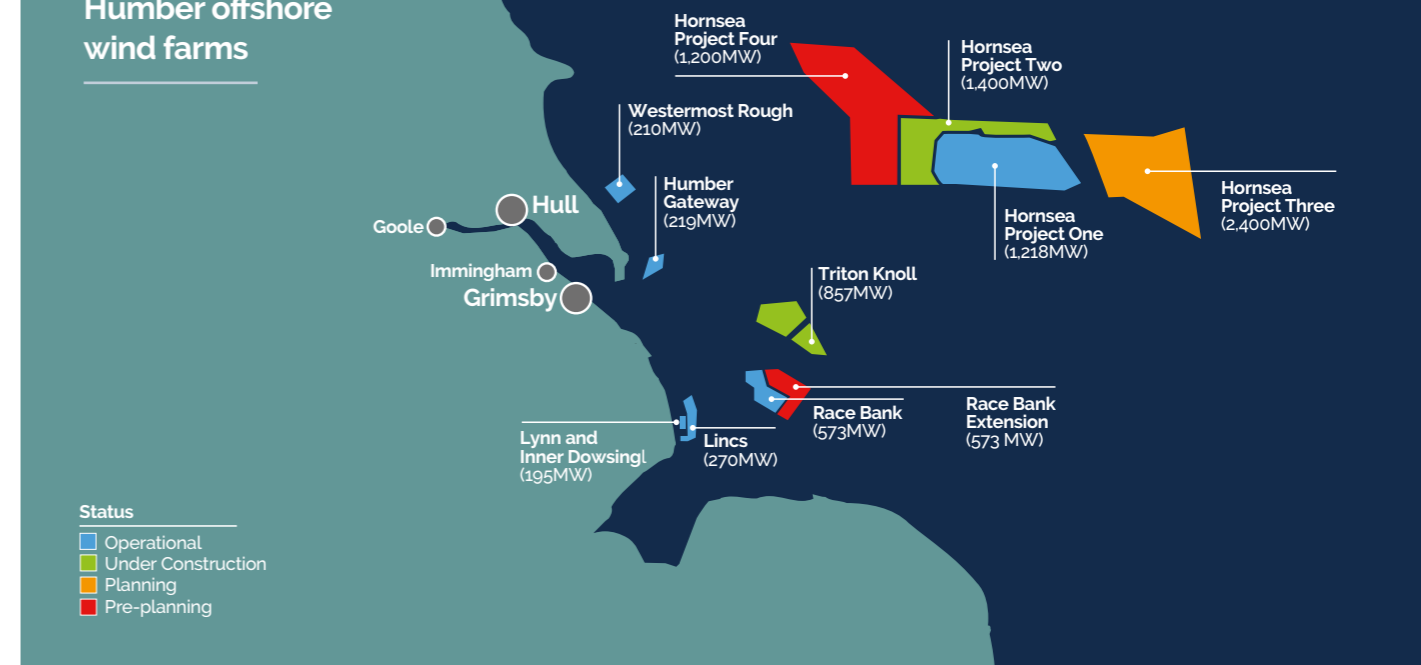
**Bidding Area 3**  
South East  
Comprising the South East region

**Bidding Area 4**  
Northern Wales & Irish Sea  
Comprising the North Wales region, The Irish Sea region, and the northern part of the Anglesey region

## Growth in offshore Wind farms' installed capacity



## Humber offshore wind farms



\*In 2016 Centrica sold Lynn and Inner Dowsing to UK Green Investment Bank Offshore Wind Fund and funds managed by BlackRock.

# BUSINESS ENVIRONMENT

**The Humber Estuary is leading the way in the production of clean energy, fighting climate change and fueling economic growth**

“

"Investment, innovation and collaboration is consolidating the Humber as a major hub for offshore wind. Ten years ago, if you wanted to see how the wind industry worked you went to Bremerhaven in Germany. Now everybody wants to come to Hull to see how it's done."

Ray Thompson, Siemens Gamesa Renewable Energy, 2018

”

With over 2,000 operational wind turbines in UK waters, the UK is leading the way on offshore wind generation. In little over 20 years the industry has catapulted itself forward making the UK the best place in the world to attract investment into the offshore wind industry. The Humber is the jewel in the crown with the largest number of businesses in the sector that will continue to keep the lights on and industry moving.

The Humber is a prized location for the offshore wind industry in the UK. That the sector has grown from a position of high unemployment, low wages, low skills, and a shortage of opportunities, brings a pride in the purpose and an ambition for greater growth in the future. Clean energy, alongside the growing impetus for decarbonisation is prompting the business community to invest and lean into the opportunities it provides.

Significant progress has been made through a strong partnership between the business community, national, regional and local government, educational partners and a range of organisations that have seen record levels of inward investment, increased demand for skills training, growing employment levels and regenerated urban centres.

There is a lot to be optimistic about. The potential for the offshore wind supply chain is vast taking account of UK and the wider global market for offshore wind. On the Humber, the future pipeline of projects, including Triton Knoll, Hornsea

Two, Three and Four, provide for further opportunities for the regional cluster and will stimulate the regional business environment. With companies operating across the construction, operations & maintenance, manufacturing and training sectors, the cluster has a strongly established supply chain able to feed into these future opportunities. The anchor investments by ABP, Siemens Gamesa Renewable Energy, Ørsted and RWE Renewables have helped to enhance the supply chain capabilities of the region and serve to attract other companies. The imperative to continue to raise the level of UK content is an important benchmark for industry to attain over the coming years, acting as a powerful invitation to a global business community to identify the opportunities and become part of the regional supply chain.

Similarly, markets in northern Europe and emerging offshore projects in East Asia and North America bring pathways to global growth where there is a compelling market for UK expertise and products. The UK's reputation is rightly

high for the achievements made to date and for the necessary expertise. A number of regional companies have succeeded in securing business in overseas markets which should only continue, contributing to the Sector Deal's target of a fivefold increase in exports to £2.6bn per annum.

The Sector Deal recognised that greater interventions were needed and the industry, in collaboration with local enterprise partnerships, councils and other relevant agencies agreed to invest up to £250m to assist with the development of the supply chain. Part of this effort was an investment of up to £100m in a new industry programme, the Offshore Wind Growth Partnership, delivered by the ORE Catapult, working with British companies looking to grow and internationalise their business in the global offshore wind market.<sup>10</sup>



<sup>10</sup> <https://owgp.org.uk/about/>

## Entrepreneurship

Stakeholders felt that there were significant opportunities for **entrepreneurship** within the cluster, however there is a general acceptance that these are not yet being fully realised. There exists huge scope to encourage start-ups in the cluster, and promote disruptive technology into the sector, drawing on the significant reservoir of local skills, talent and business support infrastructure.

It was recognised that much more needs to be done to actively promote these opportunities both locally, nationally and internationally, to capitalise on the

unique opportunity and environment that the cluster provides. To date, there is a perception that the cluster can be overlooked by entrepreneurs and a coordinated, proactive approach is needed to ensure that this changes.

The sector itself remains relatively immature, with both engineering and technological challenges providing a fertile breeding ground for the entrepreneurial mind. The sector offers the key benefits of fast technological advancement, significant revenue growth, with both large domestic and export markets available to service.

Those start-ups that have invested in the cluster to date have been able to secure multiple rounds of capital funding, providing a guide as to the viability of their risk.

Although individual programs exist, thought should be given to creating a cohesive start-up incubator organisation within the cluster to identify, develop, and support entrepreneurs, with the aim to promote and maximise the opportunities for the local economy, the cluster, and the wider sector.

## Supply chain



Participants at the workshop articulated that the cluster supply chain has elements of globally significant strengths as well as gaps and less developed areas. A number of participants pointed out that a large amount of the offshore wind farm development and ongoing support is provided by people outside of the region. This has reduced with the investment by Siemens Gamesa Renewable Energy, but it was felt there was scope for greater manufacturing of components on the Humber – suggesting towers and cabling.

It was recognised that the cluster has gone to considerable efforts to address this and there was real positivity about the potential for an Operations & Maintenance cluster based around The Port of Grimsby. There was also a lot of warm sentiment about the attention given to supporting potential suppliers, helping them to understand the opportunities at procurement gatherings and indeed the work of RenewableUK to highlight the pipeline of developments, but yet more is needed.

Participants pointed to the need for greater clarity about what the developers and the Tier 1 contractors need and when, and standards around quality. It was felt that having liaison people within organisations that are well-known within the business community would be valuable.

A number of participants in the workshop and in subsequent conversations have urged a clearer focus on the opportunities in the region and that the cluster needs to be clearer about its specific specialisms and value proposition for a national and global offshore wind sector.

The Sector Deal emphasises the importance of cross-sectoral collaboration. This also came out in various conversations where a number of people considered the business community is limited by current silos and indeed there was considerable scope to engage with wider industrial sectors.



### Areas for further development

There is a lot to be proud of when reviewing the business environment across the Humber region. Private sector investment alongside Government support has served to transform the region and has facilitated an agglomeration of suppliers into the market. At the workshop we critically assessed the attributes of the Business Environment that highlighted areas where further development is required. A good

number of the cluster attributes that underpin how we understand Business Environment were considered positively by the stakeholders who saw real value in the role of **supporting organisations, business networking** and the **pre-existing manufacturing base**.

Several participants articulated that some attributes have not reached their full potential and with focused

interventions and further development it will enable the cluster to enhance its position and stimulate further growth in the developing market. Supporting innovators in the cluster and encouraging entrepreneurs to consider fresh approaches to solutions whilst working with developers to understand their requirements are instrumental for entrepreneurship and supply chain development.



The activities set out below respond to the growth opportunities stakeholders identified to drive the cluster forward:

Timings ■ Short - 1 year ■ Medium - 2- 5 years ■ Long - > 5 years

Activity	Objective & relationship to OWSD delivery	Partners involved
Working with offshore wind developers, disseminate information regarding project timelines and requirements via events, newsletters and web portals for example.	Use this data to inform Place Marketing and inward investment endeavours.	Grimsby Renewables Partnership Team Humber Marine Alliance East Riding - Green Port
Coordinate activities between partners to make it as easy as possible for business to access support e.g. networking sessions, conferences, coordinate & PR business support offerings & make case for new business support offerings e.g. Fit4Offshore Wind, Offshore Wind Growth Partnership.	Better showcase opportunities to businesses in the region to grow and develop and the support available.	Grimsby Renewables Partnership Team Humber Marine Alliance East Riding - Green Port Local Enterprise Partnerships Aura Offshore Renewable Energy Catapult
Deliver a strong programme of events, projects, and activities, partnering with an array of bodies across the region and neighbouring areas on the various policy and technical elements of the decarbonisation agenda.	To encourage greater cross sector linkages.	All
Produce an 'Export Offer' which builds on the Humber Offshore Wind Supply Chain workstream, and which showcases their capabilities to international visitors and to fuel overseas communications.	Build a stronger story of Humber Offshore Wind Cluster companies internationalising and to better track this performance in the region.	All
Support new innovators and potential new entrants to the cluster with an engagement programme.  Encourage entrepreneurs to better understand the challenges of the offshore wind cluster and to consider fresh approaches to solutions.	Entrepreneurship Building capability and knowledge in the region Retaining talent in the region.	Aura University of Hull Offshore Renewable Energy Catapult
Produce guide to Humber Offshore Wind Supply Chain (by tiers of the industrial sector) showing companies where they fit and what is above and below them in-terms of supply. It can also be used as a marketing document outside the cluster to show company capability. (This would feed into an Export Offer).	Delivering a fully established supply chain. It is necessary to find out what there is and what is missing to target support to fill gaps.  'Identify key regional cluster specialisms' and ensure better illumination across the cluster and throughout national and international sector communities.	Grimsby Renewables Partnership Team Humber Marine Alliance East Riding - Green Port Local Enterprise Partnerships Aura

### In the spotlight:

## Siemens Gamesa Renewable Energy (SGRE) - Returning power to the Humber

Siemens Gamesa Renewable Energy's presence in the Humber dates back to 2009 when the company saw the potential to grow its wind energy business in the region. The decision to invest in the Humber was founded on their knowledge that offshore wind was going to take off and portside manufacturing was going to be critical. The availability of a large area of brownfield dock, a pool of complementary skills in the labour market and a collaborative spirit from the local authorities and politicians all played a role in attracting Siemens to the Humber.

The UK Government had also committed to a rapid increase in offshore wind deployment to meet the 2020 EU renewable energy target - that at least 15% of its energy consumption would be from renewable sources by 2020 - roughly translated as a seven-fold increase in the amount of energy coming from renewables, in a little over 10 years. Turning the clock forward 10 years to 2010 and with 95% of wind farms located down the UK's east coast the Humber was an ideal place to locate.

In 2014 SGRE announced it was opening a new 40,000 sq. m factory in Hull (with the support of Associated British Ports). After decades of decline, the opening of Siemens' new £310 million wind turbine blade factory and associated port infrastructure was hailed as the biggest investment in Hull since Victorian times. The plant was completed in December 2016 and the first blades left the Alexandra Dock bound for Race Bank in January 2017. Since then over 1,000 blades have been manufactured at SGRE's factory that has become the centerpiece of the Green Port Hull project in Alexandra Dock. Over 1,000 jobs have been created and 97% of the employees come from the local area.

SGRE's Humber-built blades have been installed on both UK and export projects and in the UK have been installed at Hornsea One, East Anglia 1, Beatrice in Scotland and Walney on the west coast. In 2019 the facility was upgraded to produce longer blades at over 81m that will be deployed on upcoming projects such as Hornsea Two, which will again become the world's largest offshore wind farm.

Change in the Humber has been transformational, and the region is now the centre of the offshore wind industry. There is a lot to be excited about with the big story still to come. The UK Government has now provided certainty on its long-term support for the growth of offshore wind capacity, to deliver 30GW by 2030 and 40GW by 2040, which requires significant installation capacity. The scale of this objective and the momentum of the sector provides huge opportunity for the cluster. Locally its priority is to extend contracts for local suppliers, increase local jobs and develop skills. The commercial opportunity to develop the cluster is huge. The region has capacity for another key manufacturer building towers or foundations and the infrastructure is ripe for development.

Attracting another manufacturer would potentially require investment in port infrastructure as well as state intervention.







### In the spotlight:

## Team Humber Marine Alliance & Grimsby Renewables Partnership

Team Humber Marine Alliance (THMA) and Grimsby Renewables Partnership (GRP) are member organisations supporting businesses either working in or seeking to work in the offshore wind sector, supporting the supply chain and drawing investment into the Humber.

THMA is a regional business network supporting over 200 member companies that collectively employ 17,000 people across the 'Blue Economy'. Set up in 1995 it encompassed a small group of like-minded marine engineering companies and has evolved and grown into the powerhouse of businesses working in the marine and offshore sectors that we see today. 75 to 80% of THMA's work is now related to offshore wind, which reflects the growth and interest in the sector.

The business network is recognised as a Regional Cluster by UK Government and with its unsurpassed knowledge of capabilities in the region, has become a driving force in the Humber's growth as an offshore wind player. Its influence extends from central government, to whom it speaks as a voice of the marine industry to world-leading manufacturers (OEM), which it attracts to the area on a regular basis through the organisation of trade visits (from Japan, China, the USA, Germany and Denmark). Its broad membership means that it will almost certainly have all of the skills required

to attract foreign investment into the Humber, connecting businesses and creating opportunities for the supply chain. THMA also arrange foreign trips for Team Humber, exporting the cluster model abroad. It is widely recognised that there is a huge and valuable skillset in the Humber, and exporting those credentials and knowledge, in management, skills, planning and design, is an area of huge potential in the future.

The Grimsby Renewables Partnership (GRP) traces its roots back to the first wind farm operated from Grimsby's docks. The founding businesses, supported by North East Lincolnshire (NEL) Council, showed the companies behind Lynn & Inner Dowsing wind farm that Grimsby was a welcoming place, with the skills and facilities necessary to solve any of the problems that arose in those early days. Since then GRP has been engaged with every wind farm operated from Grimsby and provides the voice of industry to NEL Council and the LEPS, feeding into policies for development and growth of the region. It also draws in the project teams, who are often not local, helping them feel established and connected.

GRP started as an informal networking group, where the local supply chain could connect with offshore wind developers and operators. By gathering

together and through organising events the sector has developed a stronger voice for attracting new investment and providing new opportunities in the supply chain for local business.

Run by a board of volunteers drawn from owner-operators, OEMs, Tier 1 suppliers, SMEs and the education sector, the Members play an active role in supporting events organised by other regional groups, and in particular hosting international visits coordinated by THMA. Through such collaboration, GRP extends the reach and representation of its members beyond the expected range of a small, voluntary group. GRP also support THMA at Global Offshore Wind and Wind Europe events, actively promoting the Humber in Europe and beyond.

GRP's vision is for the Humber to be recognised globally as the heart of the offshore wind industry, from research and development, through manufacturing, operations, and maintenance and de- (and re-) commissioning. The names Grimsby and the Humber should be recognised as a badge of excellence within the industry and be the first places people turn to for access to skills, innovation, and sustainability.

### In the spotlight:

## Boston Energy - Rhode Island HQ

Boston Energy is a leading provider of construction, operation and maintenance, inspection, repair, and technical training services to the renewable energy industry. Based in Beverley, the company operates onshore and offshore across the UK, Europe and now in the USA. In 2019 Boston Energy announced plans to make Rhode Island the home of its US operations, effectively exporting from the East Riding of Yorkshire, their depth of knowledge that covers the turbine and component life cycle, to support the growth of the offshore wind sector in America. Trained in the Humber, their technicians are supporting the growth of the industry in the US.

Boston Energy is recognised globally as having some of the most experienced technicians in the wind energy industry. The company has a large team of highly skilled and

experienced technicians, recruited from mechanical, electrical, and heavy industries because of their transferable technical backgrounds. They also employ ex-military veterans, who possess the transferable trade skills and the right personal attributes the industry demands.

The decision to locate their US headquarters in Providence came about when long-standing client MHI Vestas asked them to train US personnel to become pre-assembly and installation technicians for the Vineyard Wind project, off the Massachusetts coast. With over 600 km of coastline Rhode Island is well-positioned to support offshore wind energy and coupled with its maritime heritage and support from the state, the area is vying to become a centre of excellence for offshore wind in America.

The Vineyard project was due to begin operations in 2022 but has been delayed by permitting and environmental studies. In the meantime, and until the project is given the go-ahead, Boston Energy is supporting Siemens Gamesa Renewable Energy with technical advisors and commissioning teams for their extensive onshore wind project pipeline in multiple States across the US.



# INFRASTRUCTURE

## Foundations of growth

Infrastructure is the backbone of a healthy economy, it enables trade, powers businesses, connects workers to their jobs, creates opportunities for communities and protects nations from an increasingly unpredictable natural environment. The infrastructure sector across the UK also provides millions of jobs each year in design, engineering, contracting and maintenance.



The importance of infrastructure is well-demonstrated by the Humber's experience, which has been propelled into the spotlight in just 12 years to become a leader in the roll-out of offshore wind in the North Sea. Hosting the world's largest wind farm, Hornsea One and with Hornsea Two well under way, the Humber's proximity and established infrastructure makes it the gateway to more than 80% of North Sea windfarms and to more than half of Europe's offshore wind projects. The future leasing round provides significant potential for even bigger developments where the Humber can play a central role as an onshore base for construction, installation, and manufacturing, alongside operations and maintenance. Offshore wind is the UK's 4th largest infrastructure building programme with a view to generating over a third of the UK's electricity requirements by 2030.

The Humber's physical infrastructure in the ports of Hull and Grimsby have been essential to this growth and in attracting

new assembly, operations and logistics activity to nearby sites. The ports are complementary in their offer and have created an integrated estuary so that Hull is the manufacturing base for the offshore wind industry and Grimsby has become the UK's largest Operations & Maintenance Base.

The regional offshore wind proposition remains as strong today as it was in 2011 when Associated British Ports (ABP) and Siemens Gamesa Renewable Energy signed a Memorandum of Understanding to invest £310 million (£150 million and £160 million respectively), to create the world-class wind turbine blade manufacturing factory and service facility at Alexandra Dock. Siemens Gamesa was attracted to Hull, to the deliverability of the site with sufficient space to expand and attract a supply chain to the area, and the site was also close to the city centre and a big population to work in the factory.

Siemens Gamesa Renewable Energy's investment was the catalyst for the Green

Port Hull vision, which has seen further investment and development offering 500 hectares of employment land. An area of economic growth for offshore wind that includes the University of Hull and Aura, who are improving the area's skills offering. Green Port Hull has become a test-bed for new technologies in the sector, creating new jobs in mechanical and electrical engineering and in marine surveys.

The scale of the growth in the offshore wind sector has been enormous and as the sector has grown and made advances so too has the infrastructure. Growth has been literal – the blades, turbines and towers are all getting bigger, and so too are the factories, ports and vessels required to handle them.

The Humber can support the physical growth due to the availability of space around the ports. The Able Marine Energy Park (AMEP) on the South Bank of the Humber Estuary for example, is a fully consented project that will be a bespoke port facility for the renewable energy



sector, particularly offshore wind. The energy park offers 1,389 metres of new heavy duty deep water quays and 366.7 hectares (906 acres) of developable land. It has been designed specifically for the marine renewables sector providing a multi-user facility for the manufacture, storage, assembly and deployment of next generation offshore wind turbines and their associated supply chains.

But size isn't everything, many of the most important innovations in offshore wind come in software and control systems that require good-quality modern office space that is suitable for highly skilled, high-wage jobs in

computing and electronics. As the supply chain develops further, suitable business premises will need to be available for rapidly-growing SMEs, in the right locations, including more high-quality office space and co-working spaces for small tech and innovation firms, close to the cluster's Operations and Maintenance centres in Grimsby and the manufacturers in Hull.





### Areas for further development

Participants at the workshop scored infrastructure highly. **Physical infrastructure** was perceived to be a strong attribute of the cluster. However, in subsequent conversations it was recognised that there are gaps, which operate on a number of levels.

Whilst the region can accommodate large companies such as Siemens Gamesa Renewable Energy, RWE Renewables and Ørsted, the provision on the quayside is not appropriate for entrepreneurs and small start-ups who often require premises immediately or on a flexible basis for contract work. This presents a viability problem for smaller players working in the sector and there is an urgent need to overcome small-scale investment for small supply chain companies.

While the maritime facilities are critical, there are limitations particularly for deep water services and how the industry and

wider supply chain can use the Humber facilities. One stakeholder commented that many support services are being provided out of north Germany, Teesside, or the Port of Tyne, rather than from the Humber.

It was also recognised that the Humber is attracting inward investment, it has developable sites available and a mindset to make things work but the industry doesn't yet know what it needs to unlock the land potential. This also affects how the industry can adapt to requirements.

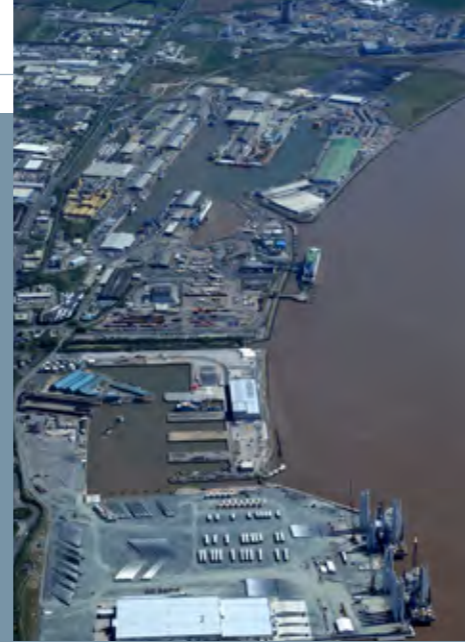
On the surface transportation infrastructure, the road network was regarded as adequate and there was a recognition that poor public transport is limited, which detracts from the otherwise strong green credentials of the sector.



The activities set out below respond to the growth opportunities stakeholders identified to drive the cluster forward:

Timings ■ Short - 1 year ■ Medium - 2- 5 years ■ Long - > 5 years

Activity	Objective & relationship to OWSD delivery	Partners involved
Continue to provide excellent planning support for new development on and around the harbour facilities.	Enhancing the infrastructure capabilities and attractiveness in the region.	Local Enterprise Partnerships (e.g. Single Conversation Forum) Local Authorities
Support future Freeport consultation activities, focused on the enhancement of the cluster's Clean Growth agenda.	Creating the right regulatory environment to support additional growth in the region in support of the net zero ambition.	Local Enterprise Partnerships Local Authorities Port Owner/Operators
Support new offshore wind farm development and associated infrastructure.	Enabling start ups and new entrants to the sector to operate.	Local Enterprise Partnerships Local Authorities Port Owner/Operators



**In the spotlight:**

**Associated British Ports**

Associated British Ports (ABP) operate four ports across the Humber, including Hull and Grimsby and has over 30 years' experience in servicing the UK's offshore energy industry. The offshore wind sector is a key focus for the group as the industry goes from strength to strength. It also has the attention of those at the top of the company, fuelled by political backing and increasing public support for net-zero. Investments totalling more than £300 million are a symbol of company's long-term commitment to grow the offshore wind industry in the region, which has become the centre of the offshore wind industry in the UK.

ABP's biggest offshore wind facility is at Green Port Hull which, jointly funded with Siemens Gamesa Renewable Energy, is a world class facility for turbine blades development, logistics and servicing. Set alongside the state-of-the-art operations and maintenance

activities taking place out of the biggest offshore wind hub of its kind in the World in the Port of Grimsby, inspires confidence that ABP is at the forefront of the renewables industry on the Humber.

The renewable energy sector will continue to be the single biggest influence on the Humber's economy for generations, creating thousands of new jobs in the supply chain and a providing a real sense of pride in the region. With the UK Government providing certainty of its long-term support for the growth of offshore wind capacity to deliver the sector's ambition of 40GW by 2030 and with the capability to expand and support the growing market, ABP is looking at next phase of development and hopes to attract further manufacturing to the region. This would certainly go a long way towards increasing UK content, driving costs down and creating highly

In Grimsby, ABP is working with ORE Catapult and developers to understand 'What's Next?'. What does Grimsby need to make sure it remains the largest offshore wind operations and maintenance port in the country? There are opportunities to grow the supply chain through the provision of employment space and with a vision to regenerate the Kasbah conservation area into an offshore wind village, ABP is keen to progress this so that companies in the supply chain can be close to the port and all of its facilities.



“No other port operator gets you closer. Our port locations offer the most cost-effective solutions for offshore wind development and operation”.

Gareth Russell, ABP



**In the spotlight:**

**RWE Renewables**

RWE Renewables is one of the world's leading renewable energy companies and second largest offshore wind developer, globally. It pioneered the growth of commercial scale offshore wind in the UK, delivering North Hoyle Offshore Wind Farm in 2004, and remains influential at the heart of today's industry.

RWE's Humber presence emerged in 2013 with the construction of Humber Gateway, a 219MW offshore wind farm capable of generating renewable electricity equal to the annual needs of around 170,000 typical UK homes. As one of the region's first major offshore projects, Humber Gateway and its operations and maintenance base at Grimsby Fish Dock helped put the region firmly on the map, and continues to support a robust local supply chain and workforce.

Success in The Crown Estate's leasing rounds has unlocked significant offshore wind potential off the north east coast, resulting in a greater RWE presence and investments in new infrastructure, local business opportunities and jobs. The latest, the 857MW Triton Knoll Offshore Wind Farm, located to the Humber in 2019, citing proximity to site, safe, deep

water channels and mature support infrastructure for its decision. Triton Knoll has since built a long-term Operations & Maintenance facility at Grimsby's Royal Dock, has contracted numerous local businesses and already recruited 80% of its growing O&M team from the local area.

Triton Knoll reflects RWE's continued commitment to the Offshore Sector Deal's focus on supporting coastal communities, and is committed to overturning the region's historic decline by maximising opportunities for jobs, contracts and apprenticeships.

Triton Knoll now partners Team Humber Marine Alliance and Grimsby Renewables Partnership, the region's LEPs, schools and colleges to deliver opportunities locally and grow a skilled, industry-wide workforce for the future. This principle applies across all of RWE's sites, including at the 1.4GW Sofia Offshore Wind Farm. With the government's longer term aspiration for 40GW of offshore wind capacity by 2030, and opportunities from Sofia, other Dogger Bank projects, Round 4 and Scotwind, the Humber Offshore Wind Cluster is well placed to compete successfully in future.



# IDEAS

## From fossil fuels to renewables; generating clean energy

Innovation sits at the heart of this relatively new sector. The development of ever larger infrastructure and technology into increasingly hazardous environments has been a hallmark of the expansion of the offshore wind sector over the recent years. Each turbine in the water is a lesson learned enabling more rapid deployment and at lower cost.

Much of the core technology has evolved from onshore wind and the experience gained from the offshore oil and gas sectors, alongside contributions from aerospace and power generation. Throughout the deployment of wind farms in UK waters, lessons have been learned to enable economies of scale, with the cost per generated GWh falling with power output increasing.

As new projects are installed in ever deeper waters, further from the coast, it is worth remembering that the first offshore wind farms were developed near to shore, in relatively shallow waters, with depths less than 30 metres where favourable logistics hubs could be located alongside wind resources, as in the Humber and at Walney, Morecombe Bay, Moray and East Anglia for example. Greater depths and distances and more sophisticated cabling have come from a better understanding and innovation in materials and substructures that will increase through the future leasing rounds conducted by the Crown Estate.

The development and acceleration of new innovation and technologies will further solve the technical challenges and continue to reduce the costs associated with offshore wind. The role of key research organisations, such as the Offshore Renewable Energy (ORE) Catapult, the Aura Innovation Centre at the University of Hull, and wider partnerships is an important part of the sector's forward path to support new methods, materials and ideas. For example, the use of autonomous technologies for subsea surveys and the application of data analytics and artificial intelligence (AI) to wind farm operations will help lower the cost of operations and maintenance. The sector and government will be working closely to explore opportunities to build on research and development (R&D) funding.

Experience of building offshore windfarms is driving innovative approaches by the large-scale developers. For example, the development of the world's first floating platform at Peterhead off the north

east coast of Scotland demonstrates new directions and possibilities. On the Humber, researchers at the University of Hull have been working with regional industrial partners Ørsted and Siemens Gamesa Renewable Energy to make offshore wind more efficient and economical, reducing waste and costs through the application of sensors to monitor the turbine blade through its lifecycle.

Innovation and the application of ideas is a primary ingredient in the sector, and the Humber Offshore Wind Cluster benefits enormously from the close presence of key assets: a research-intensive University with industry facing Aura Innovation Centre and the Offshore Renewable Energy ORE Catapult, alongside significant developers and top tier supply chain companies. With the industry continuing to pursue improvements and efficiencies, the Siemens Gamesa Renewable Energy wind turbine blade manufacturing facility forms part of a global solution. A vital part of the cost reduction comes



“The names Grimsby and the Humber should be recognised as a badge of excellence within the industry and be the first places people turn to for access to skills, innovation and sustainability”.

Katharine York, Grimsby Renewables Partnership



from the power output per unit and as turbine technology is shifting so rapidly to increase efficiency, costs will continue to decrease. When first power is generated in around 2024 Sofia, sited 195 km from the UK's North East coast, is set to deploy 14 MW Siemens Gamesa Renewable Energy state-of-the-art platforms featuring 108 metre carbon and fibreglass blades - the largest installed and operational anywhere in the world at that time.

Equally there is a host of potential additional technology solutions that can be transferred: advances in materials, manufacturing, power electronics, robotics, digitisation and AI all have potential applications to support the development of the industry both within the UK and to help shape UK export capability.

## Areas for further development

Participants at the workshop placed **research and development** in the weaker half of the list of attributes of the Humber Offshore Wind Cluster. Importantly, those seated at the Ideas table aligned with this assessment but suggested there is much more opportunity available for improvement. The role of **research and development** is much stronger and there is optimism and opportunity for the offshore wind sector where the discussion is also broadened to include the wider decarbonisation of the Humber.

A major part of the discussion centred on identifying and effectively articulating the industry's requirements;

what are the challenges the industry is facing and what are the mechanisms for engaging with them? It was felt that this was not properly being worked upon.

Related to this was the role of entrepreneurs in economic sectors, and the disruption and new thinking they can bring to solving older problems. In the offshore wind industry, pathways into the sector need more visibility and better promotion so that new talents and entrepreneurs are attracted to the industry.

The activities set out below respond to the growth opportunities stakeholders identified to drive the cluster forward:

Timings ■ Short - 1 year ■ Medium - 2- 5 years ■ Long - > 5 years

Activity	Objective & relationship to OWSD delivery	Partners involved
Support the Aura Innovation Centre, the University of Hull and the Operations and Maintenance Centre of Excellence in Grimsby to build engagement across the region to provide R&D services to companies and individuals in the region. Market the offer to businesses in the region.	Building knowledge and capabilities. Coordinate companies and individuals to access expertise and test facilities to improve Technology Readiness Level.	Aura/University of Hull Offshore Renewable Energy Catapult
Build on the Supply Chain Map to ensure the inclusion of the region's R&D and knowledge capabilities.	To ensure a complete understanding of the Humber capability for consideration across the UK and globally.	Offshore Renewable Energy Catapult University of Hull/Aura
Support companies to commercialise ideas and link up with areas of supply chain most suitable to use them.	Building capability across the region.	Local Enterprise Partnerships Supply chain companies Business Networks Aura Offshore Renewable Energy Catapult
Promote Offshore Wind Growth Partnership calls and other R&D funding to businesses.	Building capability across the region.	Local Enterprise Partnerships Business Networks Offshore Renewable Energy Catapult Aura



In the spotlight:

## Offshore Renewable Energy (ORE) Catapult



The ORE Catapult is part of the Innovate UK Catapult network and is the UK's leading technology, innovation and research centre for offshore renewable energy. With the aim of building on the UK's existing leadership and expertise in offshore wind Operations and Maintenance (O&M), the ORE Catapult has established its national Operations and Maintenance Centre of Excellence (OMCE) in Grimsby - the UK's largest offshore wind O&M port.

While engaging with and solving industry's O&M challenges, the OMCE accelerates the integration of Industry 4.0 methodologies - drawing on cross-sector experience to focus on the emerging technologies of data and digital, remote operations, advanced communications, robotics

and autonomous systems, maritime and port decarbonisation. Combined with cutting edge assets, programmes, knowledge, and support, the OMCE is helping build Grimsby and the Humber into the global centre of excellence for offshore renewable O&M innovation.

Working with key industry stakeholders, UK supply chain, academia, and government, the OMCE's mission is to ensure that UK plc capitalises on the rapidly growing domestic and international markets in offshore renewable energy O&M. The OMCE helps companies with practical innovation, R&D, test and validation and sector entry support - developing UK IP, generating long-term, high skilled jobs, and building a broader and more resilient industry in the UK.

The OMCE operates as a national funnel for ORE Catapult and partner Catapults within the cluster. It acts to channel support, projects, R&D activity, and funding into the region and connects the Humber to the broader multi-sector UK innovation landscape.

The ORE Catapult is also managing the delivery of the Offshore Wind Growth Partnership (OWGP); a long-term business transformation programme that has been established as part of the UK Offshore Wind Sector Deal and funded by the Offshore Wind Industry Council (OWIC). Over the next ten years it will promote closer collaboration across the supply chain, implement structured productivity improvement programmes and facilitate shared growth opportunities between developers and the supply chain.

In the spotlight:

## The University of Hull



The University of Hull is the leading higher education institution in the Humber. It is playing a prominent role in the development of R&D for Offshore Wind - not only for the region but also nationally and internationally. Collaboration is key to innovation and the University of Hull, along with its partner universities of Sheffield, Durham and Newcastle and industry

partners, Ørsted and Siemens Gamesa Renewable Energy, have already won funding through UK Research & Innovation (UKRI) totalling some £22 million for research - this includes £7.6 million for the Engineering and Physical Sciences Research Council (EPSRC) Prosperity Partnership, £9 million for the Supergen Offshore Renewable Energy Hub and £5.5

million for the Aura Centre for Doctoral Training. Together, these funds are enabling industry to meet its challenges and break new ground in the development of offshore wind. It also ensures that the brightest young minds, and our leaders of tomorrow, are involved at the heart of the industry in the Humber.



# PEOPLE

## 27,000 employees<sup>11</sup>; one shared purpose

The offshore wind sector has become an important employer, innovator, and driver of change in our communities over the last 12 years. Of all the regions contributing to the UK's offshore wind position, the Humber sits at the forefront with a growing highly skilled workforce in this global future facing sector.

The numbers tell the story: across the UK there are some 8GW of offshore wind electricity generation capacity, delivered by 11,000 skilled jobs. The number of skilled jobs is expected to grow to 27,000 by 2030 and 39,000 by 2050. The Humber Offshore Wind Cluster is proving to be an engine for young and older adults to train and gain skills that enable them to find a place in this critical industry of the future. Beyond the numbers, there are countless stories of people of all ages proud to be associated with this new forward-looking sector and its creation of clean energy powering homes and businesses across the country. Critically, aligned to the International Labour Organisation's 'Just Transition' principles which support the transition of people from the fossil fuel energy sector to cleaner renewables.

The sector demands highly skilled people to drive the project forward as we transition and decarbonise to net zero. These occupations will be required to support the full breadth of the wind

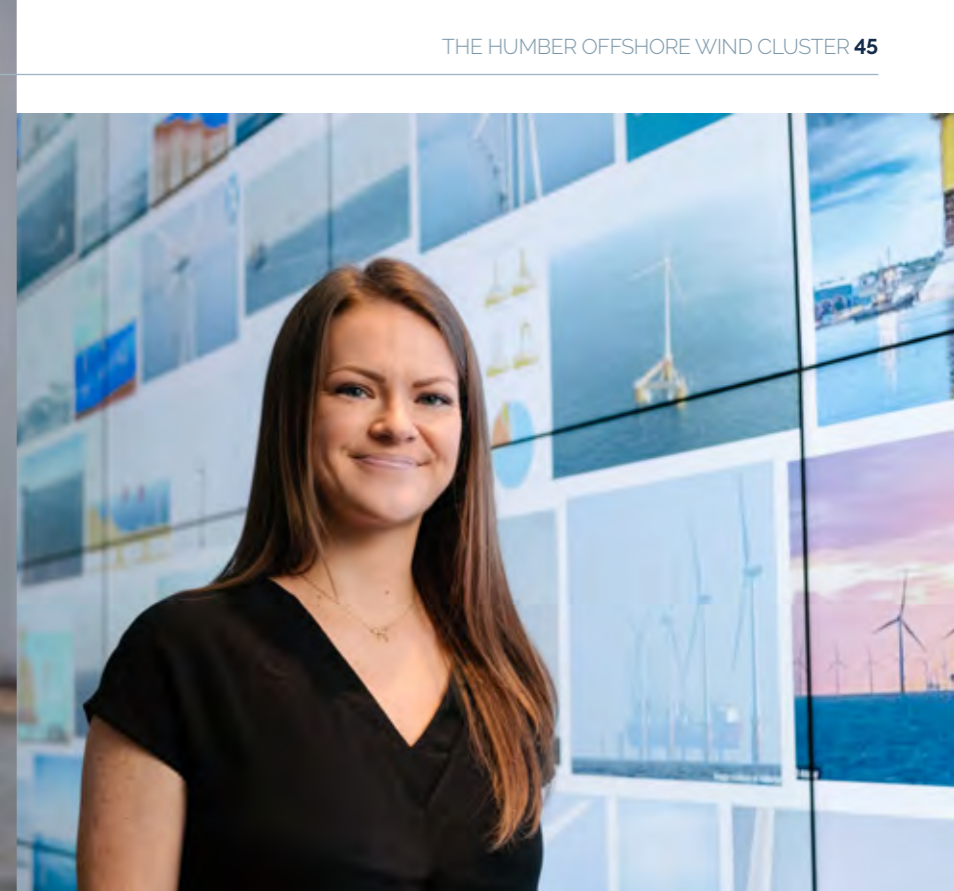
energy production and operational maintenance through its lifecycle, involving manufacturing components, project management, offshore construction, electrical engineering, business support, finance alongside a host of functions and skills. The potential for our communities will only grow as the industry looks to grow local content to meet the challenge as set out in the Offshore Wind Sector Deal; this should pull through a greater number of local firms into the supply chain, delivering British-made components and providing fresh employment and training opportunities.

The Local Government Association has recognised the role of Hull in supporting the transition to the net zero ambition, citing the projected job needs over the coming decades. They expect over 6000 green jobs to be created in the region by 2030 and 11,563 by 2050<sup>12</sup>.

The Humber has a strong track record in rising to this challenge to date and we have seen the development of training

programmes to ensure workers are able to operate safely and efficiently offshore in the challenging environments of the North Sea. The new cutting-edge safety training facility at MODAL in Immingham, supported by ATT, Ørsted and the Grimsby Institute will deliver 'Thrive', a state-of-the-art immersive health and safety training programme for all employees and contractors working on Hornsea Two.

We have seen strong performance in exposing opportunities for women in the sector through the work of WiME (Women into Manufacturing and Engineering), taking action to increase representation of women in the workforce by a third, up to 33% by 2030<sup>13</sup>. The careers services across the region has demonstrated significant capability in supporting employers and those looking for career guidance with the advice and information to help them determine their path, including the uptake of apprenticeships which has been higher than the national average.



However, to deliver on the Sector Deal's ambitious targets for growth, the region must adopt a step change to take a more strategic regional view to maximise the career opportunities and in tandem, create the enabling conditions for the businesses to grow and the sector to thrive. There are a number of organisations working in this space, playing a positive and supportive role, focused on this agenda, whether the four local authorities, the LEPs, the University, colleges and the wealth of education and training providers and businesses that rightly see the critical importance of this issue for their sustained growth.

<sup>11</sup> Offshore Wind Sector Deal, p5

<sup>12</sup> LGA: Local green jobs - accelerating a sustainable economic recovery

<sup>13</sup> Offshore Wind Sector Deal, p8

### Areas for further development

The stakeholders at the workshop scored this area in the middle of the ranking believing that much more needs to be done to grow a **skilled and diverse workforce**. Participants recognised that there are strengths to the activities that are being taken forward, noting the efforts to support more women moving into the offshore industry, innovation in safety and emergency training and driving innovation in the delivery of training. However, the

stakeholders told us that more needs to be done collectively at the regional level to meet the cluster's ambitions.

Participants recognised the close working relationships that exist between employers, education providers and recruiters, which is improving and a number of people said there is a need to share long-term perspectives to enable effective planning and to secure the necessary investment.

A number of participants cited staff being poached from similar firms across the region. It was felt that this was a symptom of limited supply into the sector where, at least, part of the solution lies in attracting young people from the region's schools and colleges into the roles, with recruitment strategies that are built around the young people businesses need to attract, rather than relying on generic recruitment fairs.

Siemens Gamesa Renewable Energy's experience of recruiting 750 people for its blade factory on the basis of attitude and practical ability, rather than qualification, was deemed to be instructive.

Participants also felt that emphasis should not solely be focused on "young people". A number of participants talked

to the impressive and relevant skills of people in the regional manufacturing, petrochemicals, oil and gas and pharmaceutical sectors and importance should also be placed on veterans for specific roles.

The diversity of the sector was an important part of the discussion. It

was recognised that significant gains have been made in attracting women and some representatives of BAME communities. However much more is needed in this regard to hit the Sector Deal ambitions, but importantly to ensure that the sector reflects the communities it serves with power.

## Humber Energy Campus



- Hull College
- Bishop Burton College
- Grimsby Institute of Further and Higher Education
- East Riding College
- Hull College Group
- North Lindsey College

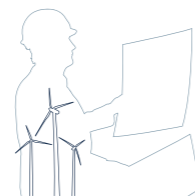


Including - CATCH - HOTA - HETA

**Liaises with businesses to inform providers of need**



**Informs investors on range of energy related learning**



**Informs students and employees of careers**



The activities set out below respond to the growth opportunities stakeholders identified to drive the cluster forward:

Timings ■ Short - 1 year ■ Medium - 2- 5 years ■ Long - > 5 years

Activity	Objective & relationship to OWSD delivery	Partners involved
Audit skills and competency from post school level and through stages of professional development, to understand level of skills in the region.  Understand Labour Market Demand forecasts coming forward in the sector and specific demand in the region.	Links with the Offshore Wind Sector Deal Skills Group and other supporting organisations working in the education and training sectors.	Local Enterprise Partnerships Local Authorities Education and Training Providers
Support national skills initiatives and key reach out events such as Skills Humber and grow presence as a cluster at such events e.g. Offshore Wind Village within them.	Build visibility in various communities in the region around the career opportunities in the cluster and critically the pathways to participate.	Local Enterprise Partnerships Local Authorities Education and Training Providers Offshore Wind Developers Supply Chain Companies
Produce compelling information materials for providers to inform and excite people into careers in the industry. Show clear career pathways and ways to access. New entrants and up-skillsers/re-skillsers.	Build visibility in various communities in the region around the career opportunities in the cluster and critically the pathways to participate.	Education and Training Providers Local Enterprise Partnerships Humber Energy Campus Aura
Support work placements throughout the cluster.	To build visibility and diversity objectives.	Companies Education and Training Providers Business Networks Aura Offshore Renewable Energy Catapult
Further support initiatives such as WiME and develop/support programmes which reach out to further diverse talent pool.	Diversity & inclusion in the workforce.	Local Enterprise Partnerships Education and Training Providers Offshore Wind Developers Supply Chain Companies



In the spotlight:

## Courtney

Courtney is an Ørsted Apprentice Wind Turbine Technician based in Grimsby, learning to operate and maintain (Ørsted's) offshore wind turbines. She is coming up the end of her second year of a three-year apprenticeship, which includes one year of classroom-based learning followed by two years working on site with Ørsted.

Courtney joined Ørsted straight from school at the age of 16 with little knowledge of the offshore wind sector. She had attended a careers fair where Ørsted had a stand and a family member had given her a leaflet about women and engineering. At the time, a career in engineering or law had been in Courtney's sights, with a view to studying A-Levels and then University. At that point, Courtney's green energy knowledge came from GCSE geography lessons. Just two years later she is helping to operate and maintain the world's most sophisticated offshore energy infrastructure.

No two days as an apprentice are ever the same and they can sometimes be very long. A day on the turbine, carrying out checks and repairing faulty equipment starts with a 07.10 sailing to the wind farm. Upon arrival at 08.45 and once kitted up Courtney will be at the top of the turbine by 10.00, for a full day work before sailing back to Grimsby at 16.30. Typically, following a debrief in the office she will leave work at 19.15. Days spent on dry land, in the office, involve training with the emergency services for example and working towards a BTEC Level 3 in Engineering.

As one of only three females following the apprenticeship, from a total of 22, Courtney is aware of the need to promote engineering careers in the offshore wind sector to her female contemporaries and has become an Ambassador for WiME, which she is very proud of. Courtney believes she is more approachable to younger girls

who see someone like them doing the job already and says that friends are certainly more open to the sector now they know what she does. One of the main barriers is getting people to understand the energy and wind sector, when the turbines are in the middle of the sea and you can't see them. However, the industry has taken enormous steps forward recently after exhibiting at careers fairs and WiME events.

For Courtney's friends who are working in part time jobs, saving money, and waiting to go to university she is set for life. Courtney has chosen a very different career path to those who stayed on at school and are progressing into higher education, and she loves it.

“

“Everything is totally new, I like the uniqueness, it is different to any job that other 18 years old girls are doing. One of the most exciting parts of my job is being on the turbine and seeing the sunsets, even in the middle of winter. It's like nothing else. It's a very special place to be”.

Courtney, Apprentice Wind Turbine Technician, Ørsted

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In the spotlight:

## Grimsby Institute

With the Humber region leading the UK in the generation of offshore wind power, the Grimsby Institute is perfectly placed to deliver the training requirements of the renewable sector and is working in partnership with Ørsted to deliver its offshore wind turbine technician apprenticeships. In September the fourth intake of offshore wind apprentices will start their course whilst the very first cohort will start full-time work at Ørsted having completed their three-year programme.

With an extensive network of regional and international stakeholders involved in renewable energy and a team dedicated to employer's needs, the Institute is able to deliver skills training and apprenticeships in all of the relevant disciplines: mechanical and electrical engineering, welding, design, project management and health and safety for example. The Institute develops bespoke programmes and is known for its very strong curriculum planning process. With very good labour market intelligence, the Institute runs its courses around the needs of the economy, engaging employers in that process to ensure the curriculum

reflects their short and long-term needs – looking at what people and the local economy need to secure good well- paid jobs. Courses are constantly being updated or replaced to reflect the needs of industry, taking into account new technologies that will become relevant in the future. Working in partnership with Ørsted, the Institute is responding to the new economic opportunities that are embedded in the town and is instrumental in upskilling the next generation.

The Institute is also collaborating with Ørsted, the training provider Active Training Team (ATT) and MODAL Training at their new cutting edge learning centre in Immingham. The new safety leadership centre of excellence provides bespoke competency development programmes in health and safety training for people working in the wind power sector and has also developed a programme for marine coordinators to support the development of this key area of work. The new Thrive training programme uses state-of-the-art marine and offshore simulators to create a scenario that examines the build up to a fatal incident during

an operation and its consequences. The technology creates a powerful immersive experience and will be used to induct all personnel working on Hornsea Two.

MODAL Training supports the development of professional competency for people working in the wind power sector using its state-of-the-art marine and offshore simulators and has also developed a programme for marine coordinators to support the development of this key area of work.

Following the growth of the offshore wind sector the Institute has seen increased demand for electrical and mechanical engineering and allied trades, but there is a gap in the awareness of jobs in the industry. It is important that young people understand the importance of STEM subjects and the type of jobs they can do with STEM subjects. People know about the most high-profile jobs such as technicians but tend not to think about the associated roles in human resources or health and safety. A strong link between industry and education is imperative in improving understanding of and visibility of the sector to deliver the right training.



**In the spotlight:****Women into Manufacturing and Engineering (WiME)**

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"Women like me considering a career change need to overcome the fear of the unknown. Whatever your qualities, characteristics and skills - you just need to believe you can do that job".

Jo McRae, Warehouse Operative, Siemens Gamesa Renewable Energy

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Women into Manufacturing and Engineering (WiME) was established in August 2016 and is a business led initiative originally started by Green Port Hull, Siemens Gamesa Renewable Energy, Airco and Jobcentre Plus, to encourage women and girls to choose a career in manufacturing and engineering. It also encourages and facilitates businesses to recruit a diverse workforce. It was founded on the recognition that in those industries there is a lack of diversity in the workforce because there is a perception that some of the jobs are not appropriate for women. Offshore wind offers a career with a purpose and the presence of some of the world's leading industries on the Humber, present significant opportunities that are not being fully embraced by women and girls.

All stakeholders in the industry; training providers, developers and large manufacturers have recognised the need to change preconceptions some women may have about manufacturing and engineering jobs and open their eyes to the wide range of fantastic careers these industries offer.

WiME has undertaken research to identify the reasons why women do not apply for positions in the sector, and identified the following:

Lack of knowledge - women and girls, parents and teachers do not know the jobs exist because they are not told about them and generally do not know how to find out about them.

Mis-understanding - women and girls generally believe they need to excel at maths and science to work in these industries.

In an attempt to reverse this trend, WiME in collaboration with locally based companies arrange Careers Fairs, in women only spaces to showcase the wide range of jobs with attractive prospects that are available to school leavers and women. The events enable girls who are considering their options after school and women of working age to find out about these career options and the exciting opportunities they offer to female candidates. Membership spans the Humber area and around 50 organisations, large and small, have attended the fairs speaking to the girls about options such as apprenticeship and to women about a career change.

WiME events are always centred around presenting women and girls with role models, which is fundamental to enabling companies like Ørsted and Siemens Gamesa Renewable Energy speak to girls telling them "I do this job and you can too". The girls go away energised having spoken to "somebody that looks like them working in offshore wind". Talking to people who look and sound like them makes a big difference. Since partnering with WiME #womenlikeme Ørsted has received more applications to their apprenticeship scheme from girls.

Interest in the sector is high, which is evidenced by the high levels of attendance at careers events. The last event was attended by around 450 schoolgirls and 80 or so members of the public; half were interested when they arrived but 85% were interested by the time they left.

In the words of Nicky, an employee at Siemens Gamesa Renewable Energy:

*"I felt welcome at the WiME event from the word go. I spoke to women just like me and their encouragement made me feel I can do this, nothing will hold me back. Any women who don't feel fulfilled in their role should definitely look into the engineering and manufacturing sector. Do it and don't look back - I never have!"*

Large efforts are being made to improve communication between recruiters and schools to break the mould of a male-dominated sector and attract more young females to the sector. Covid-19 has prevented face to face career events from going ahead so WiME will shortly be going online with plans to host live interactive events where girls can hear amazing career stories from females already working in these industries. Jess from Ørsted will be one of the first to present. The online format is designed to allow the girls to ask questions directly to the women presenting.

**In the spotlight:****HOTA - Humberside Offshore Training Association / HFR Solutions**

Contractors and employees working offshore face unique safety challenges and health and safety in the offshore wind sector is paramount. Investment and training in people are critical to the success of the renewables sector, which is why HFR Solutions and HOTA are essential components of the cluster as they deliver a range of safety training programmes and emergency response solutions.

Both organisations have utilised their extensive knowledge in their specialist areas to benefit the offshore wind sector. HOTA was originally established 33 years ago to train personnel in the offshore oil and gas industries and employs emergency response, planning and medical specialists from industry as well as all three emergency services and the military. HFR Solutions employs specialists from Humberside's Fire & Rescue Service and Humberside Police with a wealth of experience in emergency planning, incident response, rescue and medical intervention.

They have both diversified to extend their services to the offshore wind sector and in 2015 started to work in partnership, following the introduction of Renewables UK (RUK) Safety Standards. HOTA and HFR Solutions use their knowledge and experience to collaborate in the delivery of the Global Wind Organisation (GWO's) basic safety training (BST) standards and modules across the region.

They also deliver a range of added value solutions to the sector

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"It is great to witness the progress various operators have made improving safety standards, developing better emergency management procedures for managing incidents and ensuring responders hold the required competencies".

Nick Granger, Managing Director, HFR Solutions

"This is an excellent opportunity for two highly professional local companies to collaborate and offer their expertise from the maritime and offshore industries, and the fire and rescue service, to various sectors".

Karen Shepherd, Chief Executive, HOTA

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independently; with world class open water and survival pool facilities, as well as extensive medical, fire, confined space and command and control training suites, HOTA's expertise lies in the delivery of helicopter, sea and marine survival training programmes as well as a full gamut of emergency response and planning provision for all high risk industry, whereas HFR Solutions industry expertise has led to the delivery of GWO Advanced Rescue (ART) and Enhanced First Aid (EFA) utilising their unrivalled work at height infrastructure and training centre, this is complemented with bespoke offshore rescue exercises to test these skills.

As wind farms are located at increased distances from the shoreline the industry is placing a greater level of importance on remote medicine and the ability of contractors and employees to deliver advanced first aid, lifesaving competencies and sustain life at an offshore and remote location. HFR Solutions has become the first GWO training provider, based in the Humber region to deliver the new combined GWO Advanced Rescue (ART) and GWO Enhanced First Aid Refresher (EFAR) training standards to the offshore wind industry.



Both organisations provide training on and offshore so that all contractors and employees are able to respond to incidents. HFR Solutions purpose-built mobile training units are used to deliver onsite training sessions including work at height and rescue, enhanced medical and confined space courses when weather conditions and the sea state are deemed unsafe to transfer offshore.

In 2018 Ørsted approached HOTA to design and deliver a bespoke Davit Crane Familiarisation Training programme, for personnel working on the installation of Hornsea One. The Davit Crane at HOTA is identical to those offshore and staff are able to provide high quality focused training.

HOTA have also provided Ørsted with their specialist Helicopter Emergency Escape training and were asked to provide a discipline expert to assist in the review and development of their new East Coast Hub emergency response plans.



# BUILDING THE FUTURE

The future is low carbon. The Government's commitment to delivering net zero has set the UK on a path to decarbonise our power supply and increasingly the rest of the economy.



Building upon the UK Government's commitment, the Humber has committed itself to be net zero carbon by 2040 and the regional industry and stakeholder community are aligned to this agenda. As such the building blocks of capability and ambition are in place.

As we have set out in detail, the Humber has a strong track record in the production of renewable energy that puts it in pole position for the future. With strong forthcoming potential from Triton Knoll, Hornsea Two, Three and Four, Scotwind and Leasing Round 4, alongside innovation in the production and use of green and blue hydrogen, and developments in Carbon Capture Use and Storage (CCUS), the Humber Offshore Wind Cluster is at the leading edge of the UK's pursuit of net zero.

If we are to translate the aspiration and ambition for the Humber into the future, a clear programme of works will be necessary; whether that is to bring forward the necessary infrastructure; build upon the quality and breadth of the business environment; facilitate and encourage the transmission of ideas between industry and academia; or provide the right opportunities for people looking for a career in a leading clean energy sector. This prospectus has identified a number of areas where there are opportunities to transform our city and the wider region into that vibrant, leading edge of the net zero future. Seizing those opportunities requires leadership and a dedicated and co-ordinated campaign involving intervention from across the stakeholder community.

We know the Humber Offshore Wind Cluster and the wider region sit at the forefront of the UK's path to net zero, with offshore wind playing a critical component. This document is a record of conversations and that sentiment - a pride in the journey thus far and a passion for the next vital steps. Whether to support the Place agenda, Business Environment, Ideas, People or Infrastructure, there are clear needs that the chapters have focused on.

What follows is a programme of initiatives to maximise the future potential of the cluster. In producing this prospectus, the stakeholder community have given warmly of their time and ideas and the "shopping list" overleaf, sets out a series of activities and objectives in response to the opportunities identified in each chapter.



# CALLS TO ACTION:

The offshore wind sector is rooted in the Humber. Our highly skilled workforce and our growing knowledge base is defining our destiny. Our expertise and knowledge is known around the world and international delegations visit to see our infrastructure, understand our technology and learn our skills so

they can replicate our success abroad. The Humber Offshore Wind Cluster is the most advanced of the clusters in the UK, and the creation of a new low carbon industrial hub in one of the most ecologically and sensitive estuaries in the world has brought great economic and social development to our

communities. In preparing this prospectus our discussions served to highlight our collective ambition to go much further and our calls to action, based on our discussions, reviewing our attributes and identifying the gaps we need to bridge, set out how we will drive our cluster forward.

## PLACE

Timings ■ Short - 1 year ■ Medium - 2- 5 years ■ Long - > 5 years

Activity	Objective & relationship to OWSD delivery	Partners involved
With other national UK offshore wind clusters, work with and join together on national cluster initiatives.	Accessing great opportunity and profiling the Humber on a grander stage.	Aura (as a representative on Clusters Offshore Wind Sector Deal national working group) to co-ordinate national actors' regional agents, including Ørsted and RWE Renewables.
Recruit further members to join the 'Humber Offshore Wind Cluster Group' from across the cluster and have the capacity to lead the debate and design and deliver activities.  This group should plug into wider national and regional agendas such as, net zero and levelling up. It should speak outwith of the region and funnel intelligence back to the cluster.	Ensure momentum is maintained particularly to ensure Leadership and Governance Coordination and Alignment for the cluster activities and advocacy. Ensure buy-in to vision and able to mobilise initiatives.	All
Enhance and deliver Place Marketing endeavours to attract inward investment into the region in the clean energy and decarbonisation sectors.	Specifically of interest to addressing the supply chain gaps set out in this prospectus, but more generally to enhance wider economic performance.	All Marketing Humber (Bondholders)

## BUSINESS ENVIRONMENT

Timings ■ Short - 1 year ■ Medium - 2- 5 years ■ Long - > 5 years

Activity	Objective & relationship to OWSD delivery	Partners involved
Working with offshore wind developers, disseminate information regarding project timelines and requirements via events, newsletters and web portals for example.	Use this data to inform Place Marketing and inward investment endeavours.	Grimsby Renewables Partnership Team Humber Marine Alliance East Riding - Green Port
Coordinate activities between partners to make it as easy as possible for business to access support e.g. networking sessions, conferences, coordinate & PR business support offerings & make case for new business support offerings e.g. Fit4Offshore Wind, Offshore Wind Growth Partnership.	Better showcase opportunities to businesses in the region to grow and develop and the support available.	Grimsby Renewables Partnership Team Humber Marine Alliance East Riding - Green Port Local Enterprise Partnerships Aura Offshore Renewable Energy Catapult
Deliver a strong programme of events, projects, and activities, partnering with an array of bodies across the region and neighbouring areas on the various policy and technical elements of the decarbonisation agenda.	To encourage greater cross sector linkages.	All
Produce an 'Export Offer' which builds on the Humber Offshore Wind Supply Chain workstream, and which showcases their capabilities to international visitors and to fuel overseas communications.	Build a stronger story of Humber Offshore Wind Cluster companies internationalising and to better track this performance in the region.	All
Support new innovators and potential new entrants to the cluster with an engagement programme.  Encourage entrepreneurs to better understand the challenges of the offshore wind cluster and to consider fresh approaches to solutions.	Entrepreneurship Building capability and knowledge in the region Retaining talent in the region.	Aura University of Hull Offshore Renewable Energy Catapult
Produce guide to Humber Offshore Wind Supply Chain (by tiers of the industrial sector) showing companies where they fit and what is above and below them in-terms of supply. It can also be used as a marketing document outside the cluster to show company capability. (This would feed into an Export Offer).	Delivering a fully established supply chain. It is necessary to find out what there is and what is missing to target support to fill gaps.  'Identify key regional cluster specialisms' and ensure better illumination across the cluster and throughout national and international sector communities.	Grimsby Renewables Partnership Team Humber Marine Alliance East Riding - Green Port Local Enterprise Partnerships Aura

# IDEAS

Timings ■ Short - 1 year ■ Medium - 2- 5 years ■ Long - > 5 years

Activity	Objective & relationship to OWSD delivery	Partners involved
Support the Aura Innovation Centre, the University of Hull and the Operations and Maintenance Centre of Excellence in Grimsby to build engagement across the region to provide R&D services to companies and individuals in the region. Market the offer to businesses in the region.	Building knowledge and capabilities. Coordinate companies and individuals to access expertise and test facilities to improve Technology Readiness Level.	Aura/University of Hull Offshore Renewable Energy Catapult
Build on the Supply Chain Map to ensure the inclusion of the region's R&D and knowledge capabilities.	To ensure a complete understanding of the Humber capability for consideration across the UK and globally.	Offshore Renewable Energy Catapult University of Hull/Aura
Support companies to commercialise ideas and link up with areas of supply chain most suitable to use them.	Building capability across the region.	Supply chain companies Business Networks Aura Offshore Renewable Energy Catapult
Promote Offshore Wind Growth Partnership calls and other R&D funding to businesses.	Building capability across the region.	Local Enterprise Partnerships Business Networks Offshore Renewable Energy Catapult Aura

# INFRASTRUCTURE

Timings ■ Short - 1 year ■ Medium - 2- 5 years ■ Long - > 5 years

Activity	Objective & relationship to OWSD delivery	Partners involved
Continue to provide excellent planning support for new development on and around the harbour facilities.	Enhancing the infrastructure capabilities and attractiveness in the region.	Local Enterprise Partnerships (e.g. Single Conversation Forum) Local Authorities
Support future Freeport consultation activities, focused on the enhancement of the cluster's Clean Growth agenda.	Creating the right regulatory environment to support additional growth in the region in support of the net zero ambition.	Local Enterprise Partnerships Local Authorities Port Owner/Operators
Support new offshore wind farm development and associated infrastructure.	Enabling start ups and new entrants to the sector to operate.	Local Enterprise Partnerships Local Authorities Port Owner/Operators

# PEOPLE

Timings ■ Short - 1 year ■ Medium - 2- 5 years ■ Long - > 5 years

Activity	Objective & relationship to OWSD delivery	Partners involved
Audit skills and competency from post school level and through stages of professional development, to understand level of skills in the region.  Understand Labour Market Demand forecasts coming forward in the sector and specific demand in the region.	Links with the Offshore Wind Sector Deal Skills Group and other supporting organisations working in the education and training sectors.	Local Enterprise Partnerships Local Authorities Education and Training Providers
Support national skills initiatives and key reach out events such as Skills Humber and grow presence as a cluster at such events e.g. Offshore Wind Village within them.	Build visibility in various communities in the region around the career opportunities in the cluster and critically the pathways to participate.	Local Enterprise Partnerships Local Authorities Education and Training Providers Offshore Wind Developers Supply Chain Companies
Produce compelling information materials for providers to use to inform and excite people into careers in the industry. Show clear career pathways and ways to access. New entrants and up-skilled/re-skilled.	Build visibility in various communities in the region around the career opportunities in the cluster and critically the pathways to participate.	Education and Training Providers Local Enterprise Partnerships Humber Energy Campus Aura
Support work placements throughout the cluster.	To build visibility and diversity objectives.	Companies Education and Training Providers Business Networks Aura Offshore Renewable Energy Catapult
Further support initiatives such as WiME and develop/support programmes which reach out to further diverse talent pool.	Diversity & inclusion in the workforce.	Local Enterprise Partnerships Education and Training Providers Offshore Wind Developers Supply Chain Companies

# IMPLEMENTATION TIMELINE

Date	Milestone
Q3 2020	Launch Humber Offshore Wind Cluster Prospectus
Q1 2021	Establish Humber Cluster Network with key partners (two meetings per year)
Q1 2021	Establish Event Programme
Q1 2021	Representation at Skills Humber and Women into Manufacturing and Engineering Virtual Event
Q2 2021	Produce Supply Chain & Innovation Mapping
Q2 2021	Identify Humber Offshore Wind Cluster Ambassador
Q3 2021	Produce Export Offer
Q3 2021	Deliver Labour Market Demand Forecast
Q3 2021	Collate and update Humber Energy Campus Online Careers Portal
Q3 2021	One Year On Review

## ACKNOWLEDGEMENTS

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For further information or to discuss the content of this report please contact [HumberOWCsponsor@orsted.co.uk](mailto:HumberOWCsponsor@orsted.co.uk)

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