



HM Government

Industrial Strategy

Offshore Wind Sector Deal



Foreword

The offshore wind sector is a UK success story; we have the largest installed capacity of offshore wind in the world and costs have fallen faster than anyone could have envisaged 10 years ago. Offshore wind's share of annual UK generation increased from 0.8 per cent in 2010 to 6.2 per cent in 2017, and is expected to reach around 10 per cent by 2020.

In partnership with government, the offshore wind sector has flourished, demonstrating it can deliver ever larger projects to predictable timescales, at ever lower costs while creating skilled, fulfilling, well-paid jobs in communities around the country. There are more than 430,000 jobs in low carbon businesses and their supply chains, employing people in locations right across the country and 7,200 are directly employed in offshore wind.

This Sector Deal marks a significant deepening of the partnership between the government and the sector, reinforcing the aims of the government's Industrial Strategy to build a Britain fit for the future. To meet these aims, we are ensuring we position the UK at the forefront of emerging opportunities by taking on Grand Challenges - four areas where, building on our existing strengths, we can capitalise on the technological and demographic transformations that will shape the world in the years ahead. Clean Growth is one of these, where we are maximising the advantages for UK industry from the global shift to clean growth.

This Deal is a key milestone in furthering these ambitions.

The Deal will drive the transformation of offshore wind generation, making it an integral part of a low-cost, low-carbon, flexible grid system and boost the productivity and competitiveness of the UK supply chain. This focus on building the capability of our supply chain will allow companies to play a greater role in the UK's global leadership in offshore wind generation while enhancing their competitiveness internationally. These ambitions will be realised through an industry investment into the Offshore Wind Growth Partnership of up to £250m, supporting better, high-paying jobs right across the UK.

Taken with the significant commitment from the government in 2018 to run regular Contracts for Difference auctions (our mechanism for supporting low carbon generation), using up to £557m for future Contracts for Difference, this Deal has the potential to further build on the UK's position as a world leader by providing long-term certainty to business.

Subject to costs coming down, this commitment could see offshore wind contributing up to 30GW of generating capacity by 2030. In return, we expect the sector to continue cutting costs committing to lower their impact on bill payers while investing in and driving growth in the UK's manufacturing base.

Countries around the world have seen what the UK has achieved and are seeking to learn from our example. The technology is now being adopted globally, creating new export market opportunities and accelerating the shift to clean growth.

The government recently set out a renewed approach to the energy sector as we enter a new era for low-carbon power. We are moving towards the end of the energy trilemma, where we can decarbonise and ensure energy security whilst still bearing down on costs to consumers. Just 10 years ago, few people would have imagined that power from offshore wind could be a low-cost form of electricity. That is the reality today. Building on the 30GW of deployment which could be delivered through this Deal by 2030, we are working in partnership towards a future where green power is the cheapest power, with the potential to be delivered without public subsidy. This promises the creation of a low-carbon, secure energy system which is not just affordable but a key driver of our modern Industrial Strategy.

In the last 20 years, we have seen offshore wind grow from a nascent sector to the industrial powerhouse we see today. The Sector Deal will take it through to maturity and beyond and will keep the UK at the forefront of this vibrant 21st century industry.



Rt Hon Greg Clark MP

Secretary of State for Business,
Energy and Industrial Strategy



Benj Sykes

Offshore Wind Industry
Council Chair



Baroness Brown of Cambridge
Offshore Wind Sector Champion

Executive Summary

The Offshore Wind Sector Deal builds on the United Kingdom's global leadership in offshore wind, maximising the advantages for UK industry from the global shift to clean growth.

This Sector Deal builds on the UK's global leadership position in offshore wind and seeks to maximise the advantages for UK industry from the global shift to clean growth, consistent with the Clean Growth Grand Challenge.

It will do this by:

- 1.** Providing forward visibility of future Contracts for Difference rounds with support of up to £557m, with the next allocation round planned to open by May 2019, with subsequent auctions around two years thereafter.
- 2.** The sector committing to increase UK content to 60 per cent by 2030, including increases in the capital expenditure phase.
- 3.** Increasing the representation of women in the offshore wind workforce to at least a third by 2030.
- 4.** Setting an ambition of increasing exports fivefold to £2.6bn by 2030.
- 5.** The sector will invest up to £250m in building a stronger UK supply chain, establishing the Offshore Wind Growth Partnership (OWGP) to support productivity and increase competitiveness.

With the largest installed offshore wind capacity in the world and the prices consumers pay for the energy the sector generates falling significantly (between the 2015 and 2017 Contracts for Difference auctions, support costs fell 50 per cent), a trend that is expected to continue.

Over the next decade, there will be a huge expansion of offshore wind around the world with some estimates envisaging a 17 per cent annual growth from 22GW to 154GW in total installed capacity by 2030¹. In the UK, this could see offshore wind contributing up to 30GW of generating capacity. The domestic opportunities are significant too. Building up to 30GW of offshore wind by 2030 could account for over £40bn of infrastructure spending in the next decade².

This Deal is built on the foundations of the Industrial Strategy - Ideas, People, Infrastructure, Business Environment and Places.



Siemens Gamesa's first blade from facility in Green Port Hull
Source: Siemens Gamesa

Ideas

The Industrial Strategy sets out how the UK will become the world's most innovative economy. We are increasing public Research and Development (R&D) spending by £7bn by 2022, the largest increase on record. Our ambition is to increase total R&D investment to 2.4 per cent of GDP by 2027 and 3 per cent in the long term.

Deployment of innovative technology has been integral to the success of offshore wind in the UK, with notable advances in turbine development leading to significant cost reduction; with turbines now five times larger than when first deployed³. From 2010 to 2016, wind turbine power ratings have grown by 60 per cent, with projects now being deployed over 100km from the shore and in waters over 50m deep.

The development of new technologies, and the innovative application of existing ones can all further reduce the costs of offshore wind. For example, the use of autonomous technologies for subsea surveys and the application of data analytics and AI to wind farm operations will help lower the cost of electricity to consumers. The sector and government will work closely to explore opportunities to build on R&D funding.

To support the cost-effective deployment of offshore wind, the sector will establish a System Management and Optimisation Task Group which will explore innovative solutions to support grid integration. This will include managing variability of demand and supply, and the potential for generation and storage of hydrogen for other key applications in a decarbonised energy system.

People

Deploying up to 30GW of installed capacity by 2030 could support 27,000, including in manufacturing, jobs⁴ according to the sector's estimates. This will reinforce the aspiration of the Industrial Strategy to generate good work and greater earning power across the country.

The sector is also taking action to increase the representation of women in the workforce to a third by 2030, (up from 16 per cent in 2018) and with a desire to reach a more stretching ambition of 40 per cent. The sector will also set a baseline and target (by the end of 2019) for increasing BAME representation across the sector.

The sector will work with the government, existing institutions,

universities and industry programmes to develop curricula, increase job mobility across and between energy sectors, increase apprenticeship opportunities and coordinate local efforts to prepare for the introduction of T levels (and equivalent higher-level technical levels in the devolved administrations).

Infrastructure

The Industrial Strategy commits to upgrading the UK's infrastructure and we are committed to maintaining and enhancing our position as the anchor market for offshore wind. To achieve this, the government is providing more long-term visibility than any other market in the world through regular Contracts for Difference auctions.

Since 2010, the UK has attracted 48 per cent of new investments, making

East Anglia 1 Offshore Windfarm
Scottish Power Renewables



it the biggest offshore wind market over the last nine years, deploying a turbine a day in 2017. The growth of offshore wind in the UK is underpinned by sophisticated infrastructure capability - from highly capable supply chain companies to design, planning and construction experts.

The government will work collaboratively with the sector and wider stakeholders to ensure that up to 30GW of offshore wind can be delivered by 2030, delivering 1-2GW of new offshore wind per year, in a sustainable and timely way. This will address strategic deployment issues including aviation and radar, onshore and offshore transmission, cumulative environmental impacts (both in the marine and onshore areas) and impacts on other users of the sea space, such as navigation and fishing.

The Crown Estate and Crown Estate Scotland will undertake new seabed leasing in 2019, ensuring a sustainable pipeline of new projects for the late 2020s and early 2030s. This will also provide an opportunity to bring in companies who are new to the UK market, adding to competition, innovation and new sources of investment.

Business Environment

We want the UK to be the best place in the world to start and grow a business and attract international investors. The UK's long-term policy framework has driven the growth in offshore wind and encouraged investment.

In response to a commitment of up to 30GW of offshore wind by 2030, the sector has set a target of 60 per cent lifetime UK content in domestic projects, (up from the current 50 per cent) and targeting increasing UK content in the capital expenditure phase. The expertise of UK companies is globally recognised, winning contracts in northern European projects and emerging offshore wind markets such as Taiwan. Deploying up to 30GW offshore wind by 2030 and a growing global market offers unique opportunities for the UK supply chain, with the sector targeting a fivefold increase in exports to £2.6bn per annum⁵.

As the offshore wind global market expands, the long-term challenge facing the sector and supply chain is to remain competitive. In response to this challenge the sector will invest up to £250m across the UK, establishing the Offshore Wind Growth Partnership (OWGP), to deliver increased productivity and competitiveness.

The sector commissioned Martin Whitmarsh, former McLaren Group CEO and Formula One Team Principal, to conduct an independent review into the UK supply chain and its conclusions were published in February 2019⁶. Its conclusions served to confirm the direction being taken by the sector and the government in developing the Sector Deal.

Places

The Industrial Strategy set out our goal of helping our communities prosper and thrive across the UK. This is a truly UK-wide sector, with opportunities to create growth and economic benefits, particularly in coastal areas adapting to economic change.

Regional clusters are already emerging, generally located close to windfarms or areas with a strong, pre-existing manufacturing base, oil and gas or R&D presence, such as the Humber and East Anglia.

Linking the clusters with educational institutions, centres for innovation, manufacturing bases, can provide the conditions for local incubation of innovation, drive competitiveness, increase economies of scale and productivity. The Deal proposes capitalising on naturally existing clusters and providing sector leadership to create more opportunities for investment and growth in local economies. These will also link with Local Industrial Strategies in England, and City and Growth Deals across the UK.



Offshore Wind Sector Deal

Key commitments



Ideas

To be the world's most innovative economy.

Sector action to support offshore wind

Industry will establish a System Management and Optimisation Task Group (SMOTG) to deliver innovative solutions to system integration.

- ▶ To support the transformation of the power grid, the SMOTG, led by the Sector Champion, will work with industry stakeholders, National Grid, and the Energy Systems Catapult to identify opportunities to strengthen offshore wind's role in delivering innovative solutions to system integration. A roadmap will be published to identify opportunities to collaborate on pioneering technologies for system integration, such as co-located storage and wind to hydrogen.

The sector will continue to co-fund investment in UK-based Research, Development and Demonstration (RD&D) activities.

- ▶ Working collaboratively with UK universities and research institutions to help increase the productivity and competitiveness of the UK supply chain, and support export opportunities.

This includes next generation technologies with significant export opportunities. The sector will work in partnership with government to ensure innovation activity also considers how to ensure the UK's radar capabilities and requirements are not impacted adversely.

Drive innovation in the UK supply chain to increase competitiveness and development of UK Intellectual Property (IP).

- ▶ The sector and the government will expand co-operation across the Catapult network and, working closely with UK Research and Innovation, explore opportunities to build on R&D funding within existing schemes in order to help drive increased investment into sectoral R&D and its commercialisation. This will underpin the sector's future innovation and competitiveness and accelerate the commercialisation and development of UK intellectual property.



Government action to support offshore wind

Government will continue to fund collaborative RD&D to increase UK competitiveness and further reduce costs.

- ▶ Innovation activity to include a focus on increasing the UK competitiveness of goods and services, including digital and robotic technologies for surveying and operations and maintenance, and next generation technologies contributing to cost reduction.

Government & research institutions will work with the System Management and Optimisation Task Group (SMOTG) on offshore wind system integration.

- ▶ Led by the Sector Champion, the SMOTG will identify opportunities to strengthen offshore wind's role in delivering innovative solutions to system integration via existing government programmes.

People

To generate good jobs and greater earning power for all.

Sector action to support offshore wind

Develop a skills training needs analysis and an accreditation framework to broaden the UK offshore wind skills base.

- ▶ The sector will establish an Investment in Talent Group, supported by a skills professional, who will identify skills needs across the sector, and develop curricula and accreditation to deepen the skills base. This includes developing an Offshore Energy Passport (recognised outside the UK) to accredit offshore workers and facilitate job-mobility between offshore renewable and extractive industries. It will also develop a mechanism to more easily facilitate the transfer of former military personnel with appropriate skills into the industry.

Introduce a workforce and skills model to track and report workforce data.

- ▶ The sector has completed a skills gap analysis using a model developed by the National Skills Academy for Rail (NSAR). The sector will continue to track and report on workforce data using the NSAR model, or a similar

model to establish measures to encourage diversity, inclusion, and equitable access to opportunity throughout the industry and agree clear targets and metrics.

Increase diversity in the workforce with an ambition of 40 per cent women employed in the sector by 2030. Set new target for BAME representation by end of 2019.

- ▶ The sector is committed to becoming more diverse and inclusive and will take action to raise the number of women in the workforce to a third by 2030 (up from 16 per cent in 2018), but with a desire to reach a more stretching ambition of 40 per cent if feasible (including those undertaking training and university degrees). The sector also commits to calculating a baseline figure for BAME representation and to set an equally stretching target for this by the end of 2019.

The sector will continue to collaborate to ensure the highest health and safety standards during development, construction, operation, and decommissioning.

Sector action to support offshore wind

Build early-stage skills and knowledge accessibility.

- ▶ The sector will continue to work with education institutions for post 16 year-olds to support development of Institutes of Technology to develop a sector-wide standardised curriculum. This will facilitate skills transfer within the offshore wind industry and strengthen links between employers and providers of higher-level technical training (particularly at Levels 4 and 5), providing work experience to deliver a skilled and diverse workforce to support Regional Clusters.
- ▶ Working with government, the sector will address identified skills gaps by coordinating local efforts to prepare for the introduction of T levels and equivalent higher-level technical levels in the devolved administrations, including informing and signposting opportunities, supporting the work of local communication activity and working with key partners to encourage high quality work placements. The sector will work with government to increase the provision of work placements, ahead of and during the phased roll out of T levels in specific related routes such as digital, construction, and engineering & manufacturing.

Collaborations with universities will be expanded to support research and cultivate a highly skilled Research Development & Demonstration (RD&D) workforce.

Review apprenticeship standards and increase apprenticeships with a target to be set by end of 2019.

- ▶ The sector has completed an audit of the current range of over 60 apprenticeship standards and frameworks available and will focus on reviewing the standards periodically. The sector will work with The Institute for Apprenticeships & Technical Education to develop new standards, where necessary.
- ▶ The sector will work with the government to set targets to increase the number of apprentices in the sector. Targets will be published by the end of 2019. The sector will work with the devolved administrations, where other apprenticeships approaches exist on targets and standards to ensure that skillsets across the industry are consistent.



Source: Hornsea One Offshore Windfarm © Saipem SpA

Government action to support offshore wind

Government and devolved administrations will participate in a new sector led Investment in Talent Group.

- ▶ The Investment in Talent Group will ensure that sector action is aligned and complements the government's skills agenda. The group will also collaborate with other sectors such as oil and gas, nuclear and automotive.

Infrastructure

A major upgrade to the UK's infrastructure.

Sector action to support offshore wind

The sector will deliver cumulative infrastructure investment of over £40bn to 2030 (based on the sector's estimates) to deliver a low-cost, clean energy system.

Collaborate to deliver an efficient, secure and integrated energy system.

Through the investment certainty provided by the CfD mechanism, the sector will continue to reduce costs to consumers so projects commissioning in 2030 will cost consumers less as we move towards a subsidy free world.

Government action to support offshore wind

Government will provide long term certainty to underpin investment.

- ▶ The government will make up to £557m available for future Contracts for Difference. The next Contracts for Difference allocation round is planned to open by May 2019. It is intended

that subsequent Contracts for Difference auctions will then take place every two years. A pathway to up to 30GW by 2030 provides a level of certainty unmatched by any other European government and means the UK will remain the anchor market for offshore wind.

Government action to support offshore wind

The government will work collaboratively with the sector and wider stakeholders to address strategic deployment issues including aviation and radar, onshore and offshore transmission, cumulative environmental impacts both in the marine and onshore areas and impacts on other users of sea space such as navigation and fishing.

- ▶ This is to ensure that up to 30GW of offshore wind can be delivered by 2030 in a sustainable and timely way so that:
 - offshore transmission is delivered in a way which is efficient, attractive to investors and provides value for consumers;
 - impacts on other users of the sea space and impacts of transmission infrastructure (onshore and offshore) are acceptable;
 - the UK is able to meet its national security obligations, and that its radars can operate effectively as the offshore wind sector expands in the coming years. This will include working in partnership with the sector on innovation activity and development of a technical solution.

In support of this commitment The Crown Estate will establish a strategic enabling actions programme with the aim of increasing the available knowledge and evidence to support sustainable and coordinated expansion of offshore wind.

- ▶ In parallel with new leasing, The Crown Estate will work partnership with government, and in collaboration with the devolved administrations, regulators, developers, operators, Statutory Nature Conservation Bodies (SNCB), and Non-Governmental Organisations to define and deliver the programme. Government, regulators and SNCBs will ensure the lessons from this and previous work are fed back into future decision-making enabling more informed policy making.

The Crown Estate and Crown Estate Scotland will undertake new seabed leasing in 2019, ensuring a sustainable pipeline of new projects to be developed in the 2020s and 2030s.

Business Environment

The best place to start and grow a business.

Sector action to support offshore wind

Build more productive, competitive and export-orientated supply chains.

- ▶ A supply chain review led by independent expert Martin Whitmarsh, former McLaren Group CEO and Formula One Team Principal, has examined opportunities and barriers to growth across the supply chain. Clear deliverables developed from the review will be implemented as part of the Sector Deal.

The sector will establish and fund a new Offshore Wind Growth Partnership (OWGP), targeted at raising productivity and increasing competitiveness. Over the next 10 years the sector will be contributing up to £250m into delivering a stronger, more competitive UK supply chain on the way to delivering 30GW of generating capacity around the UK.

- ▶ Learning lessons from the aerospace and automotive sectors, the OWGP will implement structured productivity improvement programmes and work with the developers to increase growth

opportunities for the supply chain and provide longer-term visibility of opportunities in UK and global markets.

The sector will have a target of achieving total lifetime UK content of 60 per cent for projects commissioning from 2030 onwards including increasing levels of UK content in the capital expenditure phase. A roadmap of how this could be achieved will be developed.

Measuring and reporting UK content.

- ▶ The sector will update its UK content methodology and commits to a longer-term move towards increased transparency. As part of the update, the sector will develop a more holistic approach by reporting UK content and UK exports.

Increasing UK exports.

- ▶ The sector will have a target of increasing exports fivefold to £2.6bn per annum by 2030. Project developers will work collaboratively to help facilitate and promote this export drive by encouraging their UK supply chains to bid for contracts in their worldwide project portfolios.

Sector action to support offshore wind

Improving access for SMEs.

- ▶ Martin Whitmarsh has carried out an independent supply chain review on behalf of the industry. The sector will take account of the recommendations specifically in relation to the barriers to entry for SMEs.

Information sharing with supply chain.

- ▶ The sector commits to providing pipeline visibility to supply chain companies at the earliest opportunity and sharing this information as widely as possible. This will help the supply chain to plan and, if necessary, invest in either new capacity or capability.

Offshore wind sector commitment on payment practices.

- ▶ The sector's Industry Council member companies are committed to report on their payment practices and performance. The Industry Council will benchmark the payment performance of the sector to drive cultural change within the industry on this issue to support the financial health of suppliers, including SME's, and encourage good practice at all tiers of the supply chain.

Source: Ormonde Offshore Windfarm, Vattenfall



Government action to support offshore wind

Maintain key policies and programmes that support export-led growth.

- ▶ As the global market develops, the government will commit to continuing their export support programme for the offshore wind sector. This will include targeted programmes to help growing firms access international markets, trade and foreign direct investment promotion, supporting supplier competitiveness and productivity, and working with developers and suppliers to access new markets.

Maintain key programmes that support inward investment led growth.

- ▶ Continued support from the government to work collaboratively with the sector to encourage inward investment opportunities, based on projected future project pipeline.

Developing frameworks to support future technology.

- ▶ The government will work with the sector and other stakeholders to consider the best way to bring forward new technologies such as floating offshore wind and hybrid projects, consistent with the principles of competition, maximising value for the UK economy and value for consumers.

Places

To have prosperous places throughout the UK.

Sector action to support offshore wind

Coordinate to maximise impact.

- ▶ The sector will bolster Regional Clusters by working with local, regional, and devolved government and economic development agencies to identify areas of comparative advantage and define the specific infrastructure and investments required to support increased earning power in local communities. This will help align cluster support activities across the

sector and identify synergies. This approach will help support the clean growth transition by increasing job mobility between offshore renewable and extractive industries.

The sector will continue to invest in projects that will benefit local communities in the regions in which they operate, for example through community benefit funds.

Government action to support offshore wind

Bolster Regional Clusters.

- ▶ Established government programmes will deliver significant investments that benefit the industry across the UK. The £115m Strength in Places Fund will support areas to build on their science and innovation strengths and develop stronger local networks, as a competitive fund for

collaborative bids. Local Enterprise Partnerships may also build on the example set by the Humber Local Enterprise Partnership to maximise opportunities in the offshore wind sector by investing in specialist skills and business support, which it has done successfully through its Growth Deal and the Hull and Humber City Deal.

Ideas

The growth of the offshore wind sector in the UK over the past two decades—and the cost reductions we have seen—has been driven by constant innovation.

Cost reduction and efficiency has been underpinned by the practical application of Research and Development and learning by doing. This Sector Deal will ensure that ongoing innovation will continue to act as a catalyst to growth of the sector.

Offshore wind is a UK innovation success story

Offshore wind will play a key role in addressing the Grand Challenges set out in our modern Industrial Strategy in delivering the UK's leading role in the global shift to Clean Growth. The increasing deployment of offshore wind over the coming decade will create a range of challenges for the sector. Challenges such as the ability to integrate larger volumes of offshore wind generation into the grid whilst minimising increases in the cost of operating the energy system; generating electricity in a more flexible, responsive manner; and more efficient operations and maintenance.

Rapid advances in manufacturing techniques means that there are opportunities for innovation within the supply chain to continue to drive down costs.

New products and services built on UK expertise in areas such as autonomous vessels, drones, artificial intelligence, data and digitalisation have the potential to transform the sector and strengthen the UK's export proposition.

Investment in research and development to increase productivity and competitiveness

The UK has a longstanding record in supporting collaborative R&D and innovation across the UK economy, capitalising on its strong academic and engineering base. The creation of the UK Offshore Renewable Energy (ORE) Catapult in 2013 brought together leading UK research and testing facilities and expertise in offshore renewable energy to support the development of world leading skills, knowledge and expertise in the offshore sector. In 2018, the government announced a further £73.5m, five-year funding plan for the ORE Catapult. The sector and the government will expand the co-operation across the Catapult network and, working closely with UK Research and Innovation, explore opportunities to build on R&D funding within existing schemes such as the Industrial Strategy Challenge Fund and learn from other sectors.

This Deal builds on the established 'Offshore Wind Innovation Hub', a collaboration between InnovateUK and the ORE Catapult which has jointly agreed innovation priorities around four key areas:

- ▶ Turbines;
- ▶ Sub-structures (including floating);
- ▶ Electrical infrastructure; and
- ▶ Operations and maintenance and wind farm lifecycle.

As the scale of offshore wind deployment increases, innovative technologies and processes will be able to assist in addressing the cumulative impacts, such as environmental and radar, of more offshore wind deployment.

Delivering an efficient and secure energy system through an integrated approach to decarbonising power

The energy system of the future will need to be clean, smart, reliable and demonstrably fair to consumers and producers. The Deal will focus on delivering an effective, low-cost integration of offshore wind into the energy system.

The sector will establish the System Management and Optimisation Task Group, led by the Sector Champion, Baroness Brown of Cambridge, which will work with National Grid, the Energy Systems

Catapult and research bodies such as the Faraday Institution to identify opportunities to strengthen offshore wind's role in delivering innovative solutions to system integration, including managing variability.

As a first step, a roadmap will be developed which identifies opportunities to collaborate on pioneering technologies and methods and how it can support energy-intensive industrial processes, the role of hydrogen in the energy system and other smart grid solutions, and how they could be enabled through policy and sector action.

Bringing innovation to market and developing new technology

Innovations such as floating foundations could make it feasible to deploy offshore wind in deeper waters around the world which are currently inaccessible to fixed bottom foundations. As the electricity system evolves, hybrid projects linking offshore wind with large scale storage or hydrogen or interconnection may develop into efficient and cost-effective solutions to help the UK decarbonise. The government will work with the sector and interested stakeholders to consider the best way to incentivise new technologies consistent with the principles of competition, maximising economic value for the UK and ensuring value for consumers.

Rovco Case Study



Subsea survey and inspections are a necessary part of operations and maintenance but current methods of analysing thousands of hours of video are time-consuming and expensive. Bristol-based SME Rovco delivers cutting-edge subsea survey services through a pioneering underwater live 3D vision technology which provides operators with a clearer and immediate picture of

their subsea assets. The system creates real-time 3D reconstructions of the seabed and underwater structures. This helps quickly identify issues and facilitates more accurate predictions of asset lifespan and integrity. This could lower the cost of subsea inspections by 80 per cent. Support from the Offshore Renewable Energy Catapult helped Rovco secure Innovate UK funding and private investment. With an estimated export revenue of £20m per year, Rovco's subsea robotics expertise has put the firm in line to become the market leader in subsea surveying. The company plans to create around 70 highly-skilled jobs in manufacturing and operations, and its expansion will bring UK supply chain benefit in oil & gas as well as offshore wind.

People

In partnership with the government, offshore wind has grown into a maturing sector, supporting around 7,200⁷ jobs in communities around the country. The challenge the sector now faces is a positive one.

The sector will require a new influx of highly skilled workers by 2030, covering a broad range of disciplines and in communities right across the country.

The sector estimates that offshore wind could support 27,000 jobs across the UK by 2030⁸, covering all aspects of a wind farm; project management, construction and operations and maintenance. With the industry committed to sourcing 60 per cent total lifetime UK content and increasing UK content in the capital expenditure phase, there will also be a need for highly skilled workers in manufacturing areas throughout the supply chain.

To deliver change of this scale will require cooperation and coordination between industry, government and educational institutions, specifically at a regional level as those communities benefitting from this expansion will have the knowledge and resources to deliver the new young, skilled recruits of the future, capable of exporting these skills and experience to global markets.

In this Deal, the sector commits to supporting the development of skills at all levels of the supply chain, from small enterprises to multinationals.

The sector will establish an Offshore Wind Investment In Talent Group, supported by a skills professional, who will identify skills needs across the sector, and develop curricula and accreditation to deepen the skills base. It will work closely with Regional Clusters and with Local Industrial Strategies in England, and where skills policy has been devolved, with the appropriate bodies and the devolved administrations, to ensure that industry action is aligned and complements these skills agendas. This includes developing an Offshore Energy Passport (recognised outside the UK) to facilitate job mobility between different sectors. It will also develop a mechanism to more easily facilitate the transfer of former military personnel with appropriate skills into the sector.

Building early stage skills

The sector understands that it is critical to deliver the highly skilled and diverse workforce into the 2020's and will require work with education institutions for post 16 year-olds. It will support development of Institutes of Technology, and the appropriate institutions in the

devolved administrations, to develop a sector-wide standardised curriculum to facilitate skills transfer within the industry and strengthen links between employers and providers of higher-level technical training and providing work experience to deliver a skilled and diverse workforce.

Working with the government, the sector will address identified skills gaps from the work of the Offshore Wind Investment In Talent Group by coordinating local efforts to prepare for the introduction of T levels and equivalent higher-level technical levels in the devolved administrations, including: informing and signposting opportunities, supporting the work of local communication activity and working with key partners to encourage high quality work placements. The sector will work with the government to increase the provision of work placements, ahead of and during the phased roll out of T levels and equivalent higher level technical levels in the devolved administrations in specific related routes such as digital, construction, and engineering and manufacturing.

The sector has completed a review of the current range of over 60 Apprenticeship standards and frameworks currently applicable to the industry and will focus on reviewing the standards periodically to ensure they remain up to date and relevant.

The sector will work with the Institute for Apprenticeships to develop new standards where necessary and will set targets to increase the number of apprentices in the sector and these will be published in November 2019.

Collaborations with universities will be expanded to support research and cultivate a highly skilled Research, Development & Demonstration workforce.

Promoting diversity

The sector recognises that it needs to tap into the largest pool of talent possible and better reflect modern society by having a diverse and inclusive workforce. Currently, only 16 per cent of workers are women, with an average workforce age of 38, meaning the challenge is significant. The sector has set itself a minimum target of employing 33 per cent women across the sector by 2030 and raising this figure to 40 per cent if feasible—including those undertaking training and university degrees. The sector will also calculate a baseline figure for BAME representation in the industry and look to set an equally stretching target for this by November 2019.

The sector will commit to local initiatives for including people with diverse backgrounds, perspectives and needs, which include age, ethnicity, education and other abilities, including assessing if any systemic issues prevent potential recruits from joining the sector and if so, how these should be tackled.

The government is encouraging more students into STEM education, and training, at all stages from primary school to higher education by funding programmes in schools and colleges to increase the take-up of maths (such as the Advanced Maths Premium), computing and physics; and to support better teaching of maths, science and computing in schools. Supported by a new £84m programme to improve computing teaching, whilst seeking to address the gender imbalance in STEM subjects, and in particular, improving girls' take-up of maths, computing and physics.

Health and Safety Initiatives

The marine environment can be a hazardous working environment. The sector is proud of its commitment to the continuous improvement of health, safety, and wellbeing, setting up the G+ global group to drive good

practice. Through industry collaboration there has been a reduction in incident rates, with the G+ group reporting fewer high potential incidents in 2017 even though its members worked five million more hours than in 2016.

Over the next decade, the increase in deployment means the sector will expand, bringing in new companies and workers who may have little or no experience of the marine environment and new areas of activity, such as repowering and decommissioning, will also develop. The sector will continue to collaborate to deliver a strong, sustainable and continually improving culture, promoting and maintaining the highest possible standards of health and safety through the life cycle of projects both in the UK and around the world.

Lorna Bennet at ORE Catapult's Levenmouth Demonstration Turbine



Lorna Bennet is a Mechanical Engineer at the Offshore Renewable Energy Catapult, running the STEM engagement and intern programme. She's passionate about encouraging more young women to take up a career in engineering. Lorna was a finalist in the 2018 Institution of Engineering & Technology's Young Woman Engineer of the Year Awards.

Infrastructure

Clean, affordable energy is essential for economic prosperity.

Renewable electricity, is now a significant, core part of the UK's electricity mix providing over a third of annual generation. It's less than 20 years since the UK's first offshore windfarm became operational. By 2020, offshore wind will provide around 10 per cent of the UK's annual electricity generation and by 2023 we expect around 14GW of installed capacity.

Working together, the government and the sector will accelerate investment which could support a credible and achievable pathway to up to 30GW by 2030, generating clean electricity helping to decarbonise the economy and contributing to global efforts to tackle climate change. This will mean the UK remains the core market for offshore wind in the 2020s and this ambition will be the foundation for delivering the other commitments in this Sector Deal.

Offshore windfarms can require billions of pounds in up-front capital investment years before investors realise a financial return. The government will continue to provide a long-term framework to underpin that investment based on the principles of competitive allocation of support, continued cost reductions and value for consumers. The government has committed up to £557m available future Contracts for Difference. The next Contract for Difference allocation round is planned to open by May 2019.

It is intended that subsequent Contracts for Difference auctions will then take place around every two years. Depending upon prices achieved, this offers a credible and achievable pathway to 30GW by 2030. This is a level of certainty and ambition unmatched by any other European country and means the UK will remain the anchor market for offshore wind in the next decade.

Reducing costs to consumers

The costs of offshore wind have fallen faster than anyone could have envisaged, which has brought benefits to consumers. This has been driven by competitive allocation of support and underpinned by long-term policy certainty, which enabled the sector to invest in technological innovation, and benefit from learning by doing and reductions in the cost of capital due to the risk profile of this technology coming down. The sector and finance community expect costs to continue to fall. Over the period to 2030, the sector will continue to focus on reducing both the levelised cost of offshore wind and system costs, as low-carbon technologies move towards a subsidy free world.

Delivering up to 30GW in a sustainable way

The government will work collaboratively with the sector and wider stakeholders to address strategic deployment issues including aviation and radar, onshore and offshore transmission, cumulative environmental impacts both in the marine and onshore areas and impacts on other users of the sea space such as navigation, fishing and dredging.

Our European neighbours will also be deploying more offshore wind in shared sea spaces such as the North Sea. This continued pace of deployment drives the need to better understand the cumulative impacts, both in the ecological and socio-economic arenas: including birds, marine mammals, navigation and fisheries, and coastal and onshore communities affected by associated infrastructure, such as onshore cabling.

This is to ensure that deployment out to 2030 can be delivered in a sustainable and timely way, that impacts on other users of the sea space are acceptable, that impacts of transmission infrastructure onshore and offshore are acceptable, that future needs of the UK's radar capabilities are taken into account and that offshore transmission is delivered in a way which is efficient, attractive to investors and provides value for consumers.

In support of the government's policy and this Deal, The Crown Estate will establish a strategic enabling actions programme (in parallel with new leasing). In partnership with the government and in collaboration with the devolved administrations, regulators, developers, operators,

Statutory Nature Conservation Bodies (SNCBs), and non-governmental organisations, the programme's aim will be to increase the evidence base and understanding of offshore wind deployment, both in the marine area and where there are associated onshore impacts, to support sustainable and co-ordinated expansion of offshore wind. Core funding will be provided by The Crown Estate with additional contributions sought for specific projects and activities from the sector and key stakeholders. Government, regulators and SNCBs will ensure the lessons from this, and previous, work are fed back into future decision-making enabling more informed policy making.

Beyond 2030

Offshore wind projects take a long time to develop—typically 10 years from original concept to generating electricity—so it is imperative to prepare now for the longer term. The Crown Estate and Crown Estate Scotland will undertake new seabed leasing in 2019 ensuring a sustainable pipeline of new projects which can be built in the late 2020s and into the 2030s. This will also provide an opportunity for companies who are new to the UK market, adding to competition, innovation and new sources of investment.

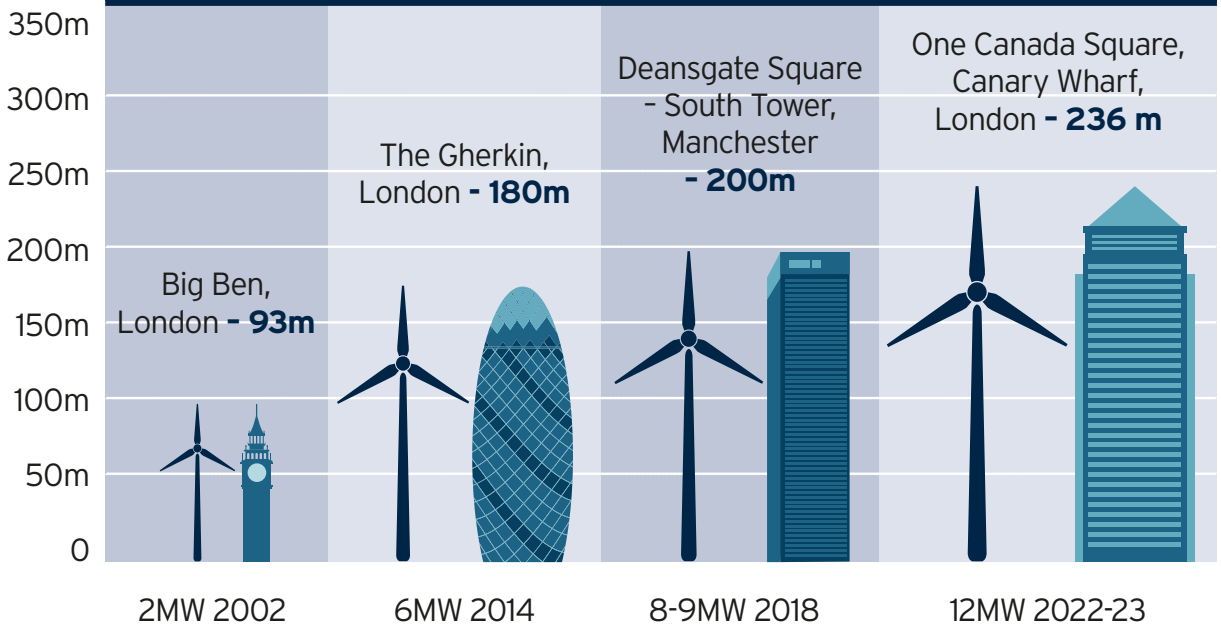
By the late 2020s, the sector will be addressing issues such as life extensions, repowering and decommissioning as the earliest operational projects reach the end of their operating lifetime. The government will work with the sector as this develops, to ensure that the UK maximises the economic value of such work and provides value to consumers.

Beatrice operations base in Lower Pulteneytown, Wick



First developed by renowned Scottish civil engineer Thomas Telford in 1807, these buildings have a long history of supporting marine work. SSE has restored these historic buildings as part of their £20m investment into Wick, to bring them back into use as the operations and maintenance base for the Beatrice project. This base, for Scotland's largest offshore windfarm, will be home to 90 workers through the 25 year lifetime of the project.

Comparison of offshore wind turbine size over time



Business Environment

Offshore wind is now growing globally. The UK has built a successful supply chain, with expertise across the entire value chain.

The UK has significant opportunity to increase our competitiveness, and develop the technologies and expertise to increase UK value at home and drive forward an export-led supply chain.

The UK's growing offshore wind supply chain has already delivered a number of notable successes, including blade and cable manufacturing facilities, which have helped deliver British-made components to our most recent UK projects. This has helped us achieve almost 50 per cent UK content in these projects⁹. This Sector Deal provides an opportunity to further build on these successes and supply, at scale, emerging offshore wind markets globally.

Supply chain opportunity

Over the next decade there will be a huge expansion of offshore wind around the world with some estimates envisaging a 17 per cent annual growth from 22GW to 154GW in total installed capacity by 2030¹⁰.

The UK market will be the largest in Europe, and this anchor home market is an opportunity for the sector to build on its competitiveness, increase productivity and by harnessing new technology, develop the new and innovative products and services that will be needed. In doing so, the sector can deliver on its target of

achieving 60 per cent UK lifetime content, with increasing levels of value in the capital expenditure phase, and increasing exports five-fold by 2030 to £2.6bn per annum¹¹.

As well as the greater export opportunities, UK companies will be increasingly exposed to competition from the growing global supply chain with customers in all markets putting pressure on costs and requiring continuous improvement in goods and services.

Supply chain competitiveness and productivity improvement

To address these challenges, the sector has developed a new programme—the Offshore Wind Growth Partnership (OWGP), based on successful initiatives in other sectors¹². Through the OWGP, the sector will be contributing up to £250m to support productivity and increasing competitiveness.

This initiative will work with businesses and SMEs to address the UK productivity gap, increase business competitiveness, promote greater collaboration across and down the supply chain, support greater supply chain innovation, and help increase supply chain capacity through attracting new entrants and growing existing capacity. This initiative will



Source: Racebank Offshore Windfarm

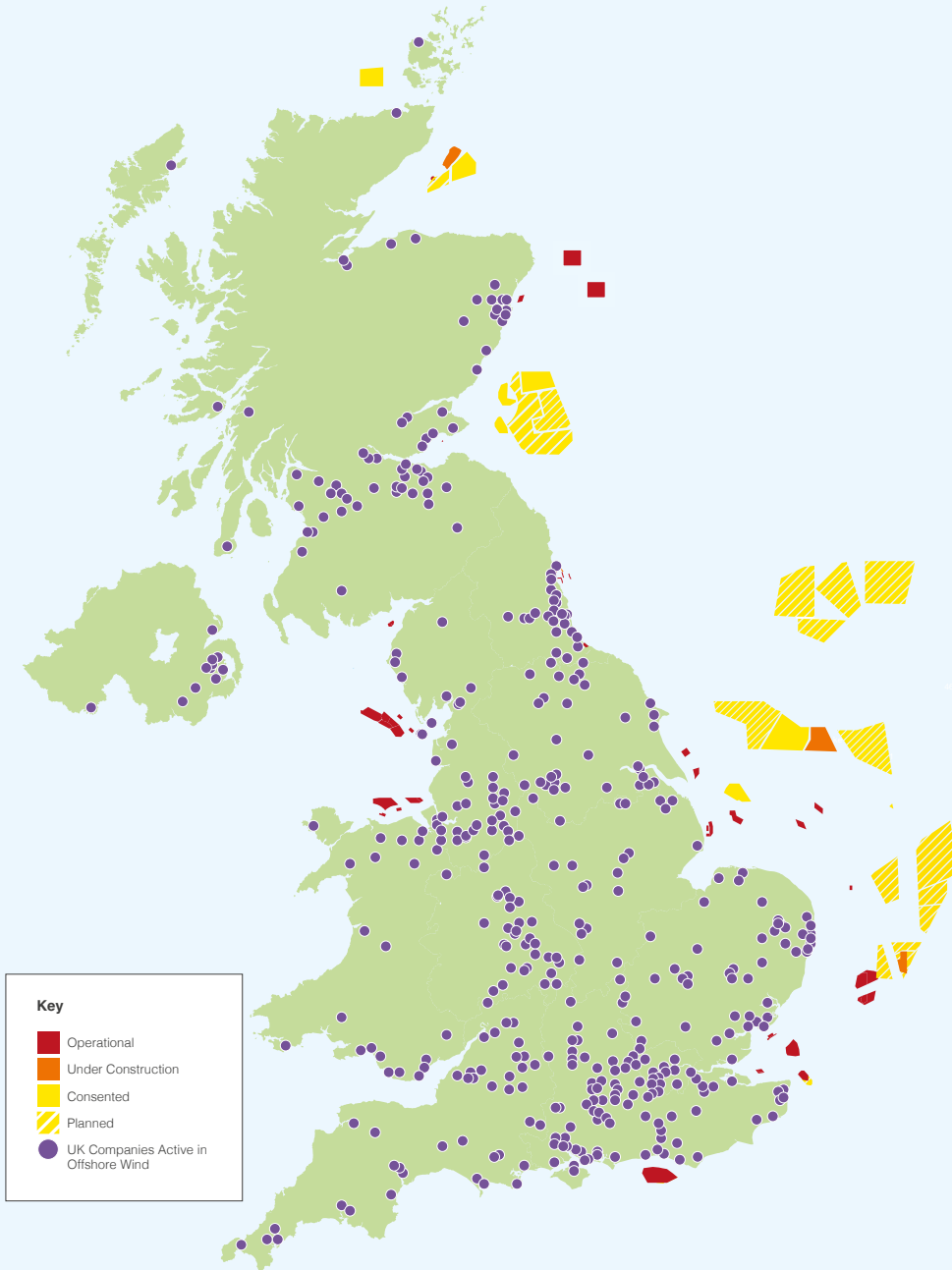
also drive innovation in the supply chain, develop new technology and UK intellectual property. If achieved this would support an increasingly globally competitive supply chain. This programme will coordinate closely with the work the sector is doing through Regional Clusters and on increasing skills provision through the Offshore Wind Investment In Talent Group.

To inform the new programme, an independent expert, Martin Whitmarsh¹³, the former McLaren Group CEO and Formula One Team Principal has examined the opportunities and barriers to business growth, taking advantage of best practice from leading industries across the UK to develop a globally competitive UK-based supply chain. The report was published on 1 February

2019 and confirmed the direction being taken by the sector and the government in developing the Deal. The sector and government will consider the recommendations when developing the programme of work for the OWGP, specifically on removing barriers to SME's entering the market, including examining how to streamline and reduce costs through the procurement process.

The OWGP programme will establish criteria by which companies, can bid for support. It will work with companies and their potential customers, to develop a tailored business improvement plan.

Locations of UK Supply Chain Companies



Source: Renewable UK

CS Wind



Campbeltown based CS Wind has invested in a facility to produce large offshore wind towers and recently completed a process improvement project to expand capacity and improve production efficiency. CS Wind supplied the first ever offshore towers manufactured in the UK to Walney Extension, followed by Hornsea One and Beatrice offshore wind farms.

OWGP activities will initially focus on: helping supply chain companies with strategy and leadership, project management, people excellence, process excellence, health and safety culture, and quality management. It will also work with the developers to provide greater long-term visibility of project pipelines which will help supply chain companies to plan and, if necessary, to invest in new capability or capacity.

The government will lead initiatives to target and support inward investment. This work will require greater collaboration with the sector to understand future capacity requirements and technology needs to enable them to develop inward investment strategies and targets.

The OWGP programme has four distinct strands:

- ▶ Project led for growth—enhanced engagement and support between developers to increase competitiveness in the supply chain, build capacity and sharing of information on future opportunities.

- ▶ Business competitiveness—an intensive structured business improvement programme. Participation in the programme will vary depending on the level of improvements identified for each company.
- ▶ Building new capacity—considering the recommendations from the supply chain review, and an analysis of achieving 60 per cent lifetime UK content, identify supply chain gaps to grow existing capacity and identify new entrants.
- ▶ Supply chain innovation—developing new innovations and UK intellectual property in areas such as robotics, advanced manufacturing, new materials and automation, in conjunction with the Catapult Network and innovation programmes.

This Deal will contribute to the sector's ambition of an increased target of 60 per cent lifetime UK content by 2030, while driving up the levels of UK content in the capital expenditure phase.

Seizing export opportunities

The rapidly expanding global offshore wind market presents a huge export opportunity. The Deal provides a strong platform to increase the number of globally competitive UK supply chain companies.

The government will continue its export support programmes to help firms access international markets, including:

- ▶ working with UK and European developers to access new markets.
- ▶ supporting supplier competitiveness and productivity; and
- ▶ trade and foreign direct investment promotion;

This will complement their existing High Value Campaigns (HVC) programme which targets specific growth markets in offshore wind.

Government will also continue its trade support programme to identify future inward investment opportunities, based on the sectors analysis of the capacity gaps to achieve 60 per cent UK lifetime content.

The OWGP will support this work by collaboratively working with government to identify market opportunities and how to promote export opportunities to the supply chain and by increasing information sharing on future technology trends i.e. larger turbines or components to allow government to better inform the supply chain to respond to these changes and identify future investment opportunities.

This supportive business environment aligned with sector collaboration will allow UK businesses to capture not only an even greater proportion of the UK market, but also the global export markets. This will allow the sector to deliver a fivefold increase in exports to around £2.6bn per annum.

Hutchinson Engineering Ltd



Widnes based SME Hutchinson Engineering Ltd successfully diversified their business into offshore wind. As a market leader in the fabrication and commissioning of mobile telecommunication masts, they pursued a detailed strategy to transfer their capability into the offshore wind secondary steel market. They have delivered secondary steel to Dudgeon, Burbo Bank Extension and Walney Extension offshore wind farms

Pacific Orca Vessel and jacket
© Beatrice Offshore Wind Ltd, photo Noel Cummins



Places

Offshore wind is a new and growing sector that has already brought a positive transformation to many communities around our coast that are adapting to industrial change.

Due to the investment in the past decade and the number of jobs supported by offshore wind in these areas, we are seeing a renewed confidence and pride that comes from cities and towns realising their potential, shaping their own economic future and benefiting from greater prosperity and life prospects.

With eight large offshore wind projects currently under construction and many more to follow, many communities are ideally located to take full advantage of the opportunities and investment.

We are already seeing an emergence of regional clusters that are generally located close to the wind farms or with a strong, pre-existing manufacturing or R&D base. Scotland is an example of this where the first three large wind farms (Beatrice, Moray East and Nearth Na Gaoithe) will be commissioning in the next few years. This will extend economic activity, wage levels and productivity benefits of offshore wind to Scottish coastal communities such as Wick and Fraserburgh, delivering the Industrial Strategy aim to have prosperous communities throughout the UK.

Places such as Great Yarmouth and Lowestoft in East Anglia, Mostyn in North Wales, Grimsby and Barrow-in-Furness are now hubs of activity for construction and operations and maintenance that support the growing number of offshore windfarms off the coast. Building on the strengths of the oil and gas and fishing industries, companies have seized the opportunities presented by this sector. Manufacturing clusters are also emerging in many places, such as Hull and the Humber, the north east of England and the Solent as companies with specialist capabilities in offshore working expand their work into renewables. In Scotland, regional clusters are developing around Moray Firth, and Forth and Tay.

As the sector grows, so will the demand for the components that are required to build, operate and maintain a windfarm, and for the highly skilled workforce to support it. By linking regional clusters with educational institutions, supply chain companies and centres for innovation we can drive competitiveness, economies of scale and productivity.

The Deal proposes capitalising on naturally existing clusters and providing sector leadership to create more opportunities for investment and growth in local economies.

To maximise this impact and bolster regional clusters, the sector will coordinate its approach by working with local and regional agencies, devolved administrations and economic development agencies to identify areas of comparative advantage and

define the specific infrastructure and investments required to support increased earning power in local communities. This will help align cluster support activities across the sector and identify synergies to enable individuals and companies to grow and fulfil their potential.



Industrial Strategy Offshore Wind

The sector will work with the expertise of Local Enterprise Partnerships and regional Enterprise Agencies (including aligning to any existing or future Local Industrial Strategies) in England, and the corresponding bodies in the devolved administrations to help deliver regional clusters, closely linking with SMEs, larger industry and leading universities and to work closely with UK Research & Innovation. All this will help to drive forward applied research, testing and product development.

Project Aura is a consortium led by the University of Hull which won a £5.5 million funding for the Aura Centre for Doctoral Training (CDT)¹⁴, aimed at boosting offshore wind skills and investment in the Humber. This is an example of how a region can harness the industry, local enterprises, innovation providers and skills agencies, bringing the public and private sector together to promote regeneration and grow capability in the region.



By working through established government programmes, the sector can deliver significant investments that benefit the sector across the UK. The £115m Strength in Places Fund will support areas to build on their science and innovation strengths and develop stronger local networks, as a competitive fund for collaborative bids. Local Enterprise Partnerships may also build on the example set by the Humber Local Enterprise Partnership to maximise opportunities in the offshore wind sector by investing in specialist skills and business support, which it has done successfully through

its Growth Deal, the Hull and Humber City Deal and the Greater Grimsby Stage 1 Town Deal. Similarly, the Local Enterprise Partnership for Norfolk and Suffolk has outlined its vision to build on an offshore wind cluster.

The sector recognises the importance of support from local communities and will continue to invest in projects that will benefit local communities in the regions in which they operate. Each offshore wind farm operates a community benefit fund that provides grants to support local projects such as community facilities, activities and recreation.

Project Aura

Aura brings together multidisciplinary excellence, knowledge and innovation for the offshore wind industry. Established in 2016 it is a coalition of public and private sector partners, collaborating to sustain the region and the UK as a global leader in offshore wind.

Led by the University of Hull, Aura brings together Humber Local Enterprise Partnership with manufacturers (Siemens Gamesa), developers (Ørsted), the wider supply chain, academia (Universities of Hull, Sheffield and Durham), innovation institutions (ORE Catapult) and training provider CATCH.

Aura focuses on three fundamentals to develop the cluster:

- ▶ Business support - access to business facilities, advisors and industry, particularly developers and Tier 1 suppliers and links into National business support programmes;
- ▶ Talent Pipeline - regional skills analysis, local skills development bodies and higher education institutions to identify opportunities and training gaps;
- ▶ Research & Development - SME's have access to equipment, expertise and advice and access to funding and support services.

Implementation plan

Key deal activities

Date	Milestone
Mar 2018	'A Sea of Opportunity' - Offshore Wind Industry Council proposal to the government for a Sector Deal
Jul 2018	The government announces regular series of Allocation Rounds
Nov 2018	Whitmarsh Review roadshows across UK
Feb 2019	Publication of the Whitmarsh Review
Mar 2019	Offshore Wind Sector Deal launched
May 2019	Offshore Wind Growth Partnership launched
May 2019	System Management and Optimisation Task Force established
May 2019	Offshore Wind Investment In Talent Group co-opted
Nov 2020	First Annual Review of Sector Deal at Offshore Wind Week

Governance

Oversight of the implementation of the Sector Deal will be led by a Delivery Group, which will review progress against objectives at quarterly meetings.

The governance for the Sector Deal will build on the existing government-industry body, the Offshore Wind Industry Council (OWIC), which meets twice a year. It will set the strategic direction for the sector and will also be accountable for the delivery of the Deal, including the review and approval of the work programme and budget.

All Council member companies will sign and fulfil the requirements of a new Industry Charter, a summary of which will be published. This will include a commitment to engaging in and providing financial support to the Offshore Wind Growth Partnership programme through the agreed funding mechanism, as well as funding and resourcing of all other commitments of the Deal, through an annually agreed Council work programme and budget.

The delivery of the Deal outcomes will be overseen by a Delivery Group, led by a representative of OWIC.

The Delivery Team will be supported by a small Project Management Office funded by the Council and hosted at cost by RenewableUK.

Once the Deal enters the implementation phase, representatives of the Council will report on progress annually to BEIS ministers responsible for the Deal. The Council is responsible for reporting to the government on delivery at regular intervals.

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