

CIRCUIT

ISSUE 13 // SUMMER 2018

MEET THE GAME CHANGERS

FEATURES

// **Sector Growth**

Catapult and GE spearheading R&D

// **Changing the renewables game plan**

Meet some of the UK's leading innovators

// **SME Portal**

A one stop information shop

BACKING THE GAME CHANGERS

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Offshore Renewable Energy

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ROVCO
SUBSEA

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ASV unmanned
marine systems

INTEGRITY

Sensor-Works

Span
innovative access solutions

PSL

GreenSpur

hydrasun

LIMPET
TECHNOLOGY

WELCOME



GUEST FOREWORD

Jonathan Cole

Managing Director Offshore Wind, ScottishPower Renewables

For those, like me, who have been involved for many years in growing and developing the UK's offshore wind industry, the last few months have been a remarkable period in the sector's development. We continue to lead the world in terms of installed capacity, and through concerted efforts across the industry, costs have been reducing rapidly. Not many would have thought, even as little as two years ago, that we'd witness strike prices as low as £57.50/MWh being achieved.

Building on these successes, the proposed Sector Deal will firmly cement offshore wind's place in the UK's future energy mix and Industrial Strategy. We can deliver 30GW of offshore wind by 2030, stimulating £48bn in UK infrastructure investment. In this period, we will also support 27,000 skilled jobs, reduce electricity costs to consumers by £2.4 billion, and seek to drive a five-fold increase in exports.

At the heart of the Sector Deal is a focus on a strong UK supply chain, creating economic value and highly-skilled jobs, often in regions of the UK where investment and economic regeneration is needed most. The UK is famed for its entrepreneurial spirit and technological lead in emerging sectors such as robotics, autonomous systems and big data, and these innovations can be applied to offshore wind to help solve some of the sector's key technological challenges.

ScottishPower Renewables will always support innovative companies and help them develop the products and services that will support growth in the renewables sector. We fully endorse ORE Catapult's mission to support high-growth SMEs to drive the UK economy and are therefore pleased to partner, along with investment group Green Angel Syndicate, in ORE Catapult's Offshore Wind Innovation Competition. The initiative brings together, for the first time, the three most important elements companies need to commercialise their products: the market (a customer); a technology proving ground (testing facilities); and finance (investment).

A strong offshore wind sector is vital for the UK to achieve its clean growth ambitions, and it is also well on course to becoming a truly global success story for UK industry.

CONTENTS

- 4**
Growing industry momentum
Creating economic opportunities for the UK supply chain
- 6**
Offshore renewable energy's game changers
Leading UK innovators being showcased at Global Offshore Wind
- 9**
SME-DOM of information
Helping companies break into offshore renewables
- 10**
Offshore Wind Innovation Competition
Linking innovators to the three pillars of successful commercialisation
- 12**
Project snapshots
Latest collaborative research projects
- 14**
News round up
Latest news and developments

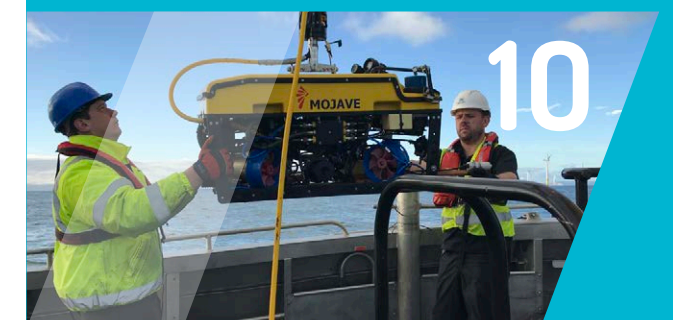


Image >
ORE Catapult's own drone
team prepare for take-off



INDUSTRY MOMENTUM PRESENTS HUGE ECONOMIC OPPORTUNITIES FOR UK'S SUPPLY CHAIN

Last year, we were on the cusp of a renewables revolution. This year, we find ourselves right in the middle of one following two major developments that will have wide-reaching implications for how the UK will generate and deliver power in the months and years ahead.

These announcements, made in quick succession, have delivered the biggest vote of confidence yet in the country's renewables credentials – and in the process provided us the clearest view so far of how the clean growth revolution will pan out in the UK.

GE Renewable Energy's five-year agreement to test two of the most important developments in its wind portfolio at our National Renewable Energy Centre in Blyth, Northumberland, is a tremendous boost to the country's reputation as a hotbed for development in the industry. It not only validates our capability to test technology, but it helps the UK supply chain grow, further demonstrating the UK's potential as a global leader in an incredibly competitive environment.

That news came hot on the heels of an announcement by the offshore wind sector that it was committed to working with the

UK Government on a Sector Deal that could generate £48 billion in new investments in the country's infrastructure – and boost the nation's offshore wind capacity to 30GW by 2030.

And all of this follows the UK Government's announcement last year, in its Industrial Strategy, that it is to champion innovation in clean energy as one of the country's four main economic drivers.

Momentum isn't just building, it's gathering serious pace.

Of course, there will be some immediate impact from these developments, but it is only when we look to the horizon that we begin to realise the true effect they will have on the UK.

And we look to that horizon from a position of strength.



Image ^
GE's 150-6MW Haliade offshore wind
turbine nacelle has arrived at ORE
Catapult Blyth for testing

// Already, we have the largest installed capacity of offshore wind in the world and that is set to continue

Already, we have the largest installed capacity of offshore wind in the world and that is set to continue. With offshore wind already competitive with other forms of energy generation, the move to larger turbines – such as the GE Renewable Energy Haliade-X 12MW turbine – will see the cost per MW drop even further.

Perhaps the most exciting element of the clean energy revolution is the tech that will sit alongside it. ORE Catapult has been working with a network of highly responsive SMEs and start-up companies across the UK (see page 6), who are capturing the imagination by driving forward the development of robotics, Artificial Intelligence (AI) and digital twinning technologies. These solutions, which can be applied to every stage in a turbine's lifecycle, are already attracting global attention, not least for their ingenuity.

From moving us away from expensive rare-earth

magnets to cheap, abundantly available ferrite solutions, to fully automated drones with their own self-navigating motherships, we are seeing innovation on a scale never seen before in the energy sector.

The results are tangible. Already, we've seen job growth from this work, but GE's announcement and the commitment on the Sector Deal propels the jobs potential for this country onto another level – that's not to mention the possibilities associated with exporting technology and skills to other nations now catching up with the clean energy revolution.

Industry analysis suggests reaching 30GW by 2030 will see the industry support 27,000 well paid, highly-skilled jobs – double the existing workforce. Aberdeen, Liverpool, Hull, Isle of Wight, Barrow, East Anglia and the North East of England have already felt the benefit of the growing renewables sector – and we see that benefit spreading even further.

There are, without question, challenges we still have to overcome if we are to achieve these goals but it's worth remembering that the cost of electricity produced from offshore wind halved between 2015 and 2017. At this rate, overcoming these challenges isn't just a possibility – it's absolutely within our grasp.



Image ^
ASV Global's C-Worker
7 autonomous vehicle

OFFSHORE RENEWABLE ENERGY'S GAME CHANGERS

As a key strategic partner at this year's Global Offshore Wind conference, we've invited some of our SME partners to join us at a showcase pavilion – visit all the companies featured here at Stand 20 in Manchester.

Octue

The world's energy and industrial infrastructure is changing. The proliferation of digital twinning – creating dynamic software models of physical structures – is ushering in a new era in which sensor data and artificial intelligence are allowing engineers and technicians to better predict how their assets respond to real-world conditions.

The Cambridge-based SME Octue Ltd specialises in building wind farm digital twins, helping owner/operators improve control strategies. That provides a competitive advantage by increasing the structural lifetime of the wind farm's components: blades, for example, benefit from reduced loads and undergo less stress over their lifespan.

The Catapult collaborated with Octue on the Innovate UK-funded Simulation to enable Asset Life Extension of wind turbines (SALE) project,

which aimed to demonstrate the ability of the company's flow characterisation methodology and simulation tool. We provided SCADA data and parameters for the 7MW Levenmouth Demonstration Turbine, and a high-resolution set of concurrent Lidar data for the site. The Catapult also facilitated talks with wind farm operators to help Octue understand industry requirements for farm-level turbine control.

The collaboration enabled Octue to validate its software tool – which, through lower maintenance, reduced failures, and increased production, could reduce the levelised cost of energy (LCoE) by 2.4% when applied across a whole wind farm. "Collaborating with the Catapult provided a sounding board for ideas as well as high-calibre test facilities," said Tom Clark, the company's Technical Director. "The support has been nothing short of transformational for Octue."

// Catapult support has been nothing short of transformational for Octue

Limpet

Keeping the blades of an offshore wind farm turning requires regular visits from maintenance technicians. But getting onto and off the turbines from a boat is among the most stressful and dangerous parts of the job and, when waves are higher than 1.5 metres, transfers are considered too risky. Failed transfers and lost energy production are hugely expensive for operators, and this problem is set to become worse as the industry pushes into sites that are further from shore.

The Edinburgh-based SME Limpet Technology is developing a game-changing offshore personnel transfer system aimed at alleviating this problem. This dynamic hoist and fall arrest system uses in-built lasers to track the vessel's deck, adjusting the height of the hoist in real time. This compensates for the motion of the vessel and allows the technician to clip in and transfer onto the turbine more easily. The system aims to increase access to far offshore turbines from 50% of the year to 80%.

Trials at the 7MW Levenmouth Demonstration Turbine have been invaluable to Limpet's research and development programme – so much so that the company has moved its manufacturing base to be closer to the turbine, creating skilled jobs where they are most needed, and the system is now being installed and tested on a real-world wind farm.

Modus

The cost of surveying the seabed and inspecting subsea cables and foundations represents a major challenge for the offshore wind industry. Inspections and surveys using vessels, technicians and divers are expensive and potentially dangerous, creating a significant market opportunity for disruptive solutions that are cheaper and less risky.

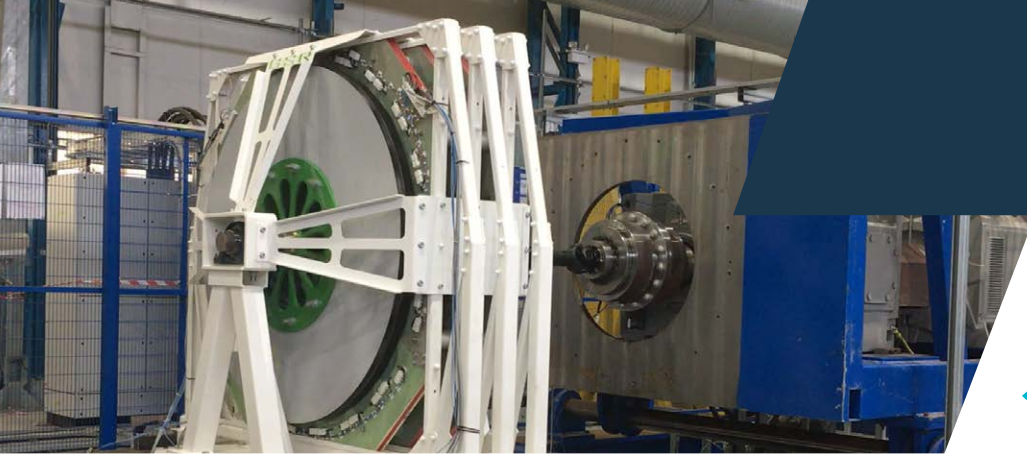
Subsea specialist Modus Seabed Intervention, in partnership with Osbit Ltd, is developing an innovative approach to enable autonomous underwater vehicles (AUVs) to remain at offshore

wind farm sites without a support vessel, in a move that could shave £1.1billion from the operating cost of Europe's offshore wind farms.

The Darlington-based firm is trialling a novel AUV docking station. The design will enable vehicle re-charging, as well as the upload of acquired data and download of mission commands.

"Part of our vision is to see AUVs becoming field-resident," says Modus' Jake Tompkins, "offering significant cost savings and quality benefits to the markets and our customers."

The use of AUVs to survey and inspect subsea infrastructure is a relatively new cost-efficiency measure in offshore wind, and replacing support vessels with the AUV docking station could further reduce expenditure. In addition to the estimated £1.1billion saving across the current 11GW offshore wind fleet over the next 25 years, the scheme will



◀ Image
GreenSpur's 75kW prototype generator under test at ORE Catapult

significantly reduce the need for staff to work in hazardous environments.

The Catapult is working with Modus as part of the Autonomous Vehicle for the Inspection of offshore wind farm Subsea Infrastructure (AVISIoN) project, which will enable further development, testing and demonstrations of Modus' existing Hybrid AUV capability, and docking station.

Testing will take place at our National Renewable Energy Centre. The first phase will use our saltwater testing docks and our National Offshore Anemometry Hub.

Offshore wind farm developers innogy, EDF Energy and E.ON are also supporting the project, with innogy agreeing to carry out commercial trials at the Gwynt y Môr offshore wind farm.

Rovco

Together with its pioneering 3D visualisation technology, Bristol-based SME Rovco's cutting-edge subsea robotic systems provide offshore wind owner/operators with a clearer picture of their assets. By creating real-time 3D mapping and stereo images of the seabed and structures underwater, it helps technicians quickly identify issues and instruct repairs, and facilitates more accurate predictions of lifespan and risk. Above all, it could lower the cost of subsea inspections by 80%, helping to put offshore wind among the cheapest low-carbon energy sources.

Support from the Catapult helped Rovco secure Innovate UK funding and private investment from London's Green Angel Syndicate to develop its one-of-a-kind artificial intelligence-driven software. The system is undergoing testing and validation at the Catapult's National Renewable Energy Centre in Blyth in a 12-month research project, Advancing Underwater Vision for 3D (AUV3D).

Our unique dry dock testing facility features a replica seabed, allowing technology developers to carry out trials in a controlled subsea environment. And our experienced marine engineers and technicians have the capabilities to replicate the conditions and structures found on an operational offshore wind farm site, boosting bankability and investor confidence in innovative solutions that perform well.

With an estimated export revenue of £20m per year, Rovco's 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 the remotely-operated-vehicle and subsea equipment sectors.

ASV Global

Around 96% of marine casualties stem from human error. Alongside unmanned marine systems specialists ASV Global and an industry advisory group that includes Ørsted and BAE Systems, the Catapult is part of the Windfarm Autonomous Surface support vessels Project (WASP). The project is studying the utility of autonomous surface vessels in offshore wind, with the potential to make a step-change reduction in LCoE costs over manned vessels and significant increases in safety and performance.

GreenSpur

Today's generation of multi-megawatt wind turbines are increasingly using direct drive generators to produce electricity. However, these generators use large volumes of rare earth magnets, which are scarce, expensive and sourced almost exclusively from China. GreenSpur Renewables was established to develop and commercialise a new direct drive generator that exclusively uses ferrite – an abundant material around forty times cheaper than rare earth – as an alternative. GreenSpur's concept removes the price and supply risks of using rare earth magnets, and presents enormous opportunities for UK-based manufacturing and its associated supply chain.

After helping the company secure Innovate UK funding to scale up its pioneering generator, the Catapult worked with the Essex-based SME to successfully test its 75kW prototype generator at the National Renewable Energy Centre in 2017. If scaled up to the 2-3GW level, the technology could lead to the creation of over 3,000 new jobs in the UK. This is a revolutionary UK technology with the potential to have a global impact.

RAB Microfluidics

With its "lab-on-a-chip" technology, RAB Microfluidics' sophisticated sensor delivers oil analysis continuously and in real-time: a method 1000x faster than the current approach, which involves sending samples to a laboratory. We helped the Aberdeen-based firm win Innovate UK funding to set up a project that will validate and demonstrate their oil condition monitoring system, which could slash maintenance costs and technician inspection times.

CLOWT/Levenmouth

Supply chain and sensor technology companies stand to benefit significantly from the offshore wind industry's rapid growth, but accessing operational turbines to test novel systems is one of the biggest technology innovation barriers.

Our 7MW demonstration turbine in Levenmouth, Fife, enabled the Scottish Government-supported Clone of the Levenmouth Offshore Wind Turbine (CLOWT). A raft of promising technology companies were given a rare chance to demonstrate their technology and solutions in a realistic offshore wind environment, a rare opportunity that the Catapult is uniquely placed to offer.

The programme helped Livingston-based start-up Sensor-Works commercialise its low-energy Bluetooth "internet of things" transmitter that makes vital condition monitoring data accessible via the cloud.

We also helped Aberdeen's Hydrasun validate its globally-patented, intelligent condition monitoring system – originally developed for the oil and gas sector and later applied to wind turbines – as it aims to build its renewables portfolio. Similarly, Aberdeen-based Integryt was able to test and validate a remote wireless acoustic condition monitoring unit that utilises an array of microphones to record the sound of a turbine, along with separate video recording, to determine any changes to operating conditions and flag potential faults.

Temporary work access specialist Span Access Solutions is working with the Catapult to undertake a rope-access inspection of the Levenmouth turbine's blades, helping the local firm's transition into the renewables sector. The project will help Span Access to grow and diversify, as well as provide the Catapult with a benchmark for UAV inspection trials at Levenmouth. In addition, Span Access Solutions is leading an Innovate UK-backed project looking at innovative ways of accessing blades for repairs and maintenance activity.

Also driving improvements in safety is St Andrews SME Photosynergy, a spin-out of the town's historic university – its unique, side-emitting fibre optic lighting system, LIGHTPATH, offers engineers a reliable, low-energy source of local bright light that highlights emergency exit routes when power supplies fail.



ANDREW MACDONALD, SENIOR INNOVATION MANAGER

SME-DOM OF INFORMATION THE PORTAL HELPING COMPANIES BREAK INTO OFFSHORE RENEWABLES

Helping businesses take their solutions from concept to commercial viability is at the heart of the Catapult network's mission. Laboratory testing and technology development is key to de-risking an idea – but if a company is moving into offshore renewables for the first time, there can be significant barriers to overcome before becoming established in the sector.

In the UK, there is no single repository for the kind of inside information that could make or break an SME's journey toward success. So the Catapult is developing an SME Portal: a "one-stop-shop" for market overviews, insight, and introductory information.

"It's important to know the dynamics and drivers of the industry," says Andrew Macdonald, the Catapult's Senior Innovation Manager. "The SME Portal will act as the first port of call when we engage with innovative companies looking to break into offshore renewable energy."

The portal will enable SMEs to better prepare a business case and understand the growth that they can expect in the market. "Companies will have access to market reports detailing the size of the prize," says Macdonald, "and information on commercialising into offshore wind will help technology developers to understand what end-users will look for before adopting a technology, and what steps they can take to mitigate risks. Information on the handling of IP will also be useful for start-ups with less experience in technology development."

Funding is, of course, all-important for SMEs looking to innovate. "The report focusing on funding and finance will help innovators to understand what options are available and which of those might be best suited for them," says Macdonald.

The portal will also act as a launchpad into engaging with the Catapult. "It'll have information on the current Innovation Challenges and Competitions all in one place, as well as points of contact for further advice, support and collaboration. Companies will be able to move further along our SME engagement process, which includes in-depth assessment of the company and the technologies, services and processes that the business is looking to develop and commercialise."



PITCH CONTROL: CONNECTING INNOVATORS, INVESTORS AND CUSTOMERS

With the UK aiming to increase its installed offshore wind capacity to 30GW by 2030, the prize has never been greater for high-growth potential companies with innovative solutions to common industry problems.

But for an early-stage company – or even an established player moving into renewables – accessing the funding necessary to develop a product or commercialise it in the sector can be challenging. The path that leads an innovator to funding, willing customer, and commercial success is notoriously fraught with difficulty; dead ends and dropouts along the way are common.

A new competition launched by the Catapult earlier this year has the aim of making that tough transition easier. And for the first time ever, it puts tangible connections with potential clients and investors within reach for the high-growth potential SMEs with the most promising technologies.

The Offshore Wind Innovation Competition issued a call for solutions to specific industry innovation challenges identified by wind farm owner/operator ScottishPower Renewables.

Successful entrants will have the chance to access the Catapult's world-leading market knowledge and test and validation facilities to de-risk their technology, as well as pitch their ideas to investment group Green Angel Syndicate and ScottishPower Renewables at an event later in 2018.

Open to SMEs aiming for a share of the offshore renewables market, ORE Catapult's Commercialisation Manager Andrew Tipping – whose idea brought the competition from concept to reality – says the new programme delivers a significant advantage to UK businesses.

"Driving UK economic growth through support for high-growth potential SMEs is at the heart of the Catapult network's mission," says Tipping.

"Our competition seeks to match innovative technology developers with the three most

// Driving UK economic growth through support for high-growth potential SMEs is at the heart of the Catapult network's mission

important elements they need to commercialise their products. First of all, the market: an offshore wind owner/operator seeking solutions. Secondly, it offers a technology proving ground in the Catapult's testing and validation facilities. And third, access to finance: the private investors who provide the essential capital to make it all happen.

"Innovation challenges have always been a key part of the Catapult's offer, but never before has this proven method for accelerating technology development been backed up by private investment."

Alongside Tipping, the Catapult's Research and Disruptive Innovation team liaised closely with industry giant ScottishPower Renewables to understand their most pressing pain points and innovation needs. "By working with the sector's biggest players," he says, "we demonstrate a ready market for new products.

"By rigorously assessing the competition entries, we can then identify the firms developing technologies with the highest growth potential to fill those gaps, and work with them to test, validate, and de-risk their solutions."

Investment is the final piece of the puzzle. "The Catapult's backing adds clout to smaller firms, making them more bankable and an attractive proposition for investors," says Tipping.

This unique approach is "original and highly constructive," says Green Angel Syndicate co-founder and director Nick Lyth, a ten-year sustainability veteran who played a key part in building up the International Resources and Recycling Institute.

A successful trial programme saw Bristol-based Rovco carry out testing and validation of their innovative 3D visual subsea surveying systems, which could cut inspection costs on offshore wind farms by 80%, at the Catapult's National Renewable Energy Centre in



Blyth. The Catapult also linked the firm with Green Angel Syndicate, who offered an initial investment of £160,000. Rovco has tripled in size since it launched less than two years ago and estimates its export revenue at £20m per year before 2025 – numbers that demonstrate the potential benefit for the UK supply chain, as well as individual companies.

The challenges range from developing a fault detection system for subsea cables, to a cost-effective subsea survey methodology. Jacket foundations to pin pile connections, and low-cost wind measurement methods, are also among the solutions being sought.

"The vision to link innovation with enterprise and investment... is the most practical possible intervention to accelerate the development required to meet the industry's technology needs," says Lyth.

"It is a real example of best practice in the sector."

PROJECT SNAPSHOTS

Latest collaborative research projects



BASE

The Innovate UK - funded BASE project will develop a novel and innovative blade access system and integrated habitat working environment, designed to significantly reduce the turbine downtime associated with traditional suspended platforms.

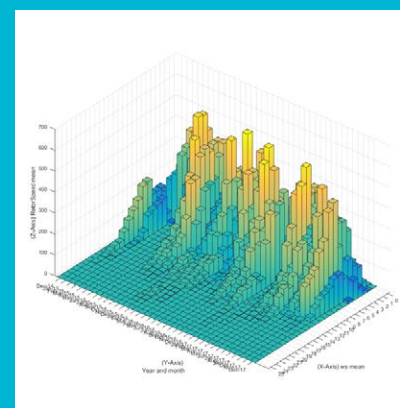
This will be achieved through application of Span Access TechniSpan technology for application to blade maintenance. A prototype access system (BASE unit) will be specified, designed, manufactured and fully demonstrated at ORE Catapult's 7MW Levenmouth Demonstration Turbine. By significantly reducing the associated turbine downtime, the BASE approach will increase the cost benefit of using working platforms and habitat systems for performing blade repairs and upgrades.



RiaSoR 2

The Reliability in a Sea of Risk (RiaSoR) 1 project established industry best practice in reliability testing for wave and tidal devices through improved load measurements and verification.

For the OCEANERA - NET phase 2 project RiaSoR 2, the chosen components for monitoring are equipped with several sensors to collect the required data, which will then be fed into the reliability process to reduce uncertainties. The key objective of the RiaSoR 2 project is to offer a comprehensive suite of testing methodologies to wave and tidal developers that will enable a systematic approach to achieve optimal reliability and performance, while minimising cost and time-to-market.



DATAPOD

The Datapod project has been established to disseminate research-grade data from demonstration assets in Scotland, starting with ORE Catapult's 7MW Levenmouth Demonstration Turbine.

Intended for academia and technology developers, the project will build a platform for data access, including a website for user interface and a database repository. ORE Catapult has been awarded funding from the Scottish Government and is now working to develop the project's website.



EROSCONS

The Innovate UK - funded Erosion Sensors for continuous monitoring of coatings (EROSCONS) project will develop sensing capability for coatings used to resist erosion on wind turbine blades.

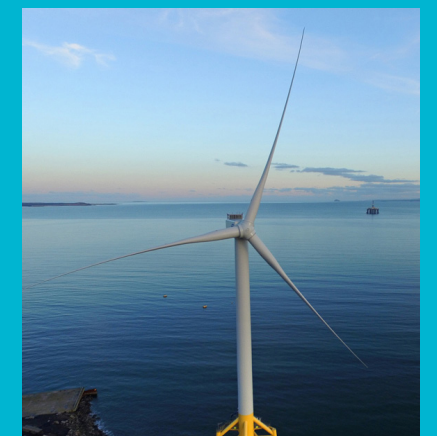
The technology will provide both a continuous measurement technique in rain erosion testing and a correlation technique between testing and erosion on blades, contributing to the improvement of accelerated rain erosion test methods for turbine blades and facilitate the development of improved erosion-resistant coatings in the longer term. ORE Catapult will conduct the sensor testing primarily using a rain erosion test rig at the Energy Technology Centre, before transferring the technology to their own rain erosion test rig in Blyth, as well as carry out an analysis for the results.



MONITOR

MONITOR is a project being led by Swansea University and funded through the INTERREG Atlantic Area programme.

The project is developing novel reliability models for tidal turbines, particularly floating tidal devices, and an emphasis on the wave-loading of blades and support structures, including the use of Variation Mode and Effect Analysis (VMEA). Two turbines will be fully-instrumented with sensor packages and the data collected will be used to inform, verify and validate the VMEA models that can be applied to a wide range of tidal turbine designs. ORE Catapult will deliver work packages building on previous projects related to tidal turbine reliability and synthesising a generic VMEA model, suitable for a wide range of tidal turbine types.



ODB

The Demowind - funded Offshore Demonstration Blade (ODB) project has been established to reduce the cost of energy of offshore wind by demonstrating a set of blade technologies aimed at increasing the rotor energy performance and reducing its O&M costs.

Most recently, ORE Catapult has successfully tested a nickel-based leading-edge erosion protection solution, developed by UK-based Doncasters Bramah, using its Rain Erosion Test Rig. ODB's successful technologies will be demonstrated on ORE Catapult's 7MW Levenmouth Demonstration Turbine. ODB is being delivered in collaboration with Aerox, Bladerna, CENER, CEU, DIS, DTU, Siemens Gamesa, and TNO.

NEWS ROUNDUP

Latest news and developments

GE Renewable Energy and ORE Catapult team up to test 12MW Haliade-X

GE Renewable Energy and the Catapult have signed a five-year research and development agreement to test and develop next generation offshore wind technologies.

GE's recently announced Haliade-X 12 MW offshore wind turbine and existing Haliade 150-6MW will undergo advanced test and demonstration programs that accurately replicate real-world operational conditions to enhance performance and reliability. Testing will take place at the Catapult's 15MW power train test facility in Blyth, Northumberland. Research and development activities will include cooling technologies, converters, loading conditions across mechanical and electrical components, grid testing and design validation.

"This collaboration is great news and highlights our world-class research and testing facilities," said Energy & Clean Growth Minister Claire Perry. "Through our Industrial Strategy, we are making the UK a global leader in renewables, including offshore wind, with more support available than any other country in the world. With 22% of all investment in European wind projects coming to the UK, the offshore wind industry is exceptionally well placed to boost supplies of home grown clean energy whilst growing new jobs and opportunities."

Triple test boost for wave and tidal thanks to Catapult report

The UK's marine energy industries can meet the requirements of the Government's new "triple test," according to the Catapult's Tidal Stream and Wave Energy Cost Reduction and Industrial Benefit report.

Published in early May, the report presents an evidence-based assessment of the UK's wave and tidal sectors and their readiness to meet Government targets on carbon reduction, cost reduction, and GVA and jobs supported. The report found that the tidal stream industry could generate a net cumulative benefit to the UK of £1.4bn and support 4,000 jobs by 2030. It also forecasts that the levelised cost of tidal energy will fall to under £90 per MWh within 1GW deployment.

With wave technology lagging 10 years behind tidal stream, the report also projects that wave energy could support over 8,000 jobs and contribute £4bn to the economy by 2040.

Blade stunner: 88.4m LM Wind Power rotor arrives in Blyth for tests

One of the world's longest offshore wind turbine blades has arrived at the Catapult's testing facilities in Blyth.

The 88.4-metre LM Wind Power blade will be put through its paces at our world-leading 100m blade test facility over the coming months. The rotor has been developed as part of XL-Blade, an EU Demowind-funded project that aims to reduce the cost of offshore wind by designing, validating and deploying the world's largest offshore wind turbine blade.

From ship to offshore: Nottingham SME proves tech on world's most powerful drive train platform

A Nottingham-based company has become the first to demonstrate a new technology on the world's newest and most powerful drive train testing platform.

GyroMetric Systems Ltd, a spin-out from the city's Trent University, partnered with the Catapult to develop and prove an innovative drive shaft condition monitoring system. Already an established presence in the maritime sector, GyroMetric saw an opportunity to transfer their system and use it to enhance the efficiency of offshore wind turbine drivetrains.

The system has been put through its paces on our 15MW drive train test facility at the National Renewable Energy Centre in Blyth. Since testing started, GyroMetric has also secured a significant investment, helping the company to further grow and develop its technology.

Image >

ORE Catapult's 15MW drive train test facility



< Image

GE's 12MW Haliade-X nacelle



ORE Catapult



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