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Offshore Renewable Energy

CIRCUIT

ISSUE 15 // SPRING 2019

UNIVERSITY CHALLENGE

OUR ACADEMIC COLLABORATIONS IN FOCUS

FEATURES

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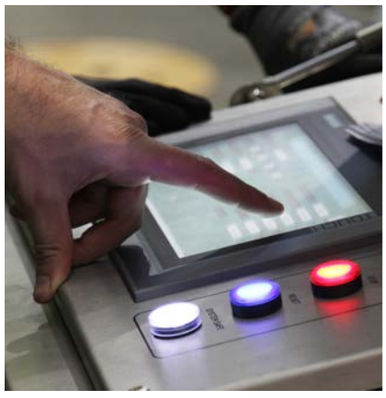

FULLY-FUNDED INDUSTRIAL PHD STUDENTSHIP OPPORTUNITY

Sponsored by Siemens Gamesa Renewable Energy and ORE Catapult, one PhD student is being offered the chance to work with leading renewables researchers through the Electrical Infrastructure Research Hub.

You'll investigate new DC collection systems for wind farms and new drivetrain technologies, with access to the University of Strathclyde's state-of-the-art research facilities.

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WELCOME

GUEST FOREWORD

Professor Deborah Greaves OBE

Head of the School of Engineering and of Computing, Electronics and Mathematics and Director of the COAST Laboratory at the University of Plymouth and Supergen ORE Hub Lead

Innovative research has long been at the heart of the incredible growth of the UK's offshore renewable energy sector. The development of new products and services used in the installation, operations and maintenance of renewable energy assets is underpinned by world-leading academic research. With active programmes in areas as diverse as materials and composites, electrical and mechanical engineering, robotics and artificial intelligence, the UK's leading Universities contribute to that progress.

The UK has set ambitious targets for a reduction in harmful carbon emissions, and so it is absolutely vital that it continues to develop low carbon energy sources to deliver on these targets. With the offshore wind sector set to install at least 30GW capacity by 2030, and our wave and tidal industries moving towards full-scale commercialisation, the size of the economic, social and environmental prize for the UK has never been greater. To realise this potential, there must be a step change in industrial/academic research collaborations. We need to meet the industry needs of today, but also futureproof the technologies of tomorrow and leverage the vital public and private finance that enables those research activities.

ORE Catapult's Research Hubs are crucial powerhouses for that industrial/academic collaboration. Combining existing academic strengths with extensive industry knowledge, access, and world-leading test and demonstration facilities, they are able to support the journey from early-stage academic research to the commercialisation of products and services for the sector.

We're excited to be strengthening our alliance through the new Supergen ORE Hub - creating partnerships that connect the UK's academic research strengths with the real innovation needs of the sector. At the heart of that cooperation is an improved research landscape to identify and share synergistic research more effectively across offshore wind, wave and tidal renewable energy innovation, ensuring a more joined-up approach for an effective response to the UK's industrial strategy challenges, creating UK economic benefit and jobs and enhancing our reputation for academic excellence.

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Department for Business, Energy & Industrial Strategy

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energy technologies institute

Image
Paul McKeever

INNOVATIVE RESEARCH, REAL-WORLD IMPACT

Our team explains how the Catapult's unique academic engagement plan fosters innovation.

The UK has a long and illustrious history as a research nation. Data compiled in 2017 showed that despite having less than 1% of the world's population, we produce over 6% of academic articles and over 15% of its most highly-cited research. And with four of the world's top 50 universities among its total of 160 centres of learning, Britain remains a world-leader in the field of academic research.

All of this prime research real estate provides fertile ground for the Catapult's academic engagement programme. Working in partnership with academia is key to our mission of lowering costs and fostering new technology development in our sector.

Moreover, the launch of the Offshore Wind Sector Deal has brought into sharp focus the need for continued research and innovation. To deliver on its commitment of up to 30GW of offshore wind capacity by 2030, turning academic research into industrial innovation will take on crucial importance.

Increasing academic investment is one of the five key pillars of the Government's Industrial Strategy, and it is research that will drive the four Grand Challenges that aim to put the UK at the forefront of the industries of the future. Academic innovation will also underpin increased UK content in offshore wind farms, as the industry moves towards its target of 60%.

Building links between high-growth-potential local supply chain businesses, and the university partners that can provide the expertise and testing facilities to support the development of their technologies, will be vital.

The Catapult plays a central role in that transfer of ideas into tangible, real-world cost reduction. Its Research Hubs are designed to create researcher communities, offering businesses access to both the Catapult and university research networks – creating an attractive, holistic solution for the many companies and organisations who want to engage.

"The Research Hubs are central to our academic engagement," says Paul McKeever, the Catapult's Head of Strategic Research. "They focus on key areas with selected Universities, as opposed to a more fragmented project-based approach."

Image
The launch of the Offshore Wind Sector Deal has brought the importance of academic research into sharp focus.

> **"To deliver on the Sector Deal's commitment, turning academic research into industrial innovation will take on crucial importance."**

"We have five key research areas," says McKeever, "and in our strongest three we have established Research Hubs: Wind Turbine Blades, Powertrains, and Electrical Infrastructures."

The Research Hubs follow a "hub-and-spokes" model that drives the greatest impact for their investment and provides alignment with the Catapult's key research areas. "The principle behind this model is to identify a lead academic partner that we can form a close working relationship with," says Derek Craig, the Catapult's Academic Engagement Manager. "We design a research programme together to utilise our collective expertise, and then we use the spokes to bring in the extra industrial or academic resource needed."

"The flexible, industry-facing nature of our research hubs also enables a researcher to focus on an urgent issue for six months," says McKeever, "and that allows us to solve problems for industry quicker."

The Catapult also engages with specialist centres, like the University of Hull's Aura, that offer a healthy pipeline of PhDs and researchers. These provide the catalyst for continued collaboration, complementing the Catapult's core research and development programme.

The mission of the Hubs is simple: to help achieve the main objectives of the Catapult's research programme. But it's clear that industry will benefit most from the continued transition of academic research into tangible products and services that bring offshore renewable energy costs down. As the UK's offshore renewables sector continues its upward trajectory, the Catapult's research and academic engagement strategy will evolve to meet the challenges that lie ahead, whilst keeping the academic institution collaborations at its heart.

CASE STUDY: Project Aura

Partnering in Aura and its related collaborations, such as the £7.6m Prosperity Partnership and the Aura CDT, allows the Catapult to engage with the universities of Durham, Hull and Sheffield on key areas related to offshore wind operations and maintenance. These activities also attract significant investment from both Siemens Gamesa Renewable Energy and Ørsted and provide a healthy pipeline of PhDs and researchers. The result is a catalyst for continued collaboration whilst complementing the Catapult's core research and development programme. AURA tackles the triple challenge of: industry engagement and enterprise; research, development and innovation; and talent pipeline development.

Image
ORE Catapult's 15MW Powertrain test facility

POWER MOVE: UNIVERSITY OF SHEFFIELD JOINS NEW POWERTRAIN RESEARCH HUB

ORE Catapult's third Research Hub will focus on the development of next generation turbines, improving their operations, reliability and performance.

The University of Sheffield is world-renowned for its expertise in the fields of electrical machines, power electronics, controls and energy conversion and storage and will contribute a minimum of £1.7m over five years to Hub operations. This complements £700,000 funding from the Catapult, with collective contributions supporting 12 PhDs, a number of Postdoctoral Research Associates and access to the University's extensive testing facilities in addition to ORE Catapult's 1, 3 and 15MW test assets at its National Renewable Energy Centre in Blyth. GE Renewable Energy will also contribute £500,000 over a four year programme supporting a number of research projects.

The Powertrain Research Hub (PTRH) will support the development of future technologies for larger turbines and research solutions for improving turbine reliability and availability.

The Hub's key objectives are:

- Reliability improvement and advanced test methodologies.
- Advanced health condition monitoring and prognostic technologies.
- Development of next generation powertrain components for larger wind turbines.

Research will focus on minimising human interventions throughout the life of the wind turbine, an area of research that has attracted the support of GE Renewable Energy as it fits well with the OEM's recently announced 'Stay Ashore!' research collaboration with the Catapult, aimed at minimising the time people have to spend offshore.

The Catapult already has a strong track record in powertrain testing, research and development and recently signed a five-year collaboration agreement with GE Renewable Energy to advance next generation turbine technologies, including the Halyad-X 12 MW, the most powerful wind turbine in the world to date.

Paul McKeever, ORE Catapult's Head of Strategic Research, said: "With industry moving towards larger wind turbines, we have an opportunity to significantly contribute to reducing the cost of turbine technology. It is essential to maximise this opportunity by tackling the challenge of improving powertrain component reliability and availability.

"By developing the next generation of powertrain components, and improving their lifespan, we can significantly reduce the related operations and maintenance costs and subsequently minimise the number of human interventions for potentially dangerous turbine repair work at sea."

Scientific Director Professor David Stone from the University of Sheffield said: ""The University of Sheffield sees working with ORE Catapult as a fantastic opportunity to apply its cutting-edge research ideas to support the rapidly expanding field of green energy generation solutions. The synergies brought about by the Powertrain Research Hub will not only bring benefits for the University and the offshore wind industrial sector, but consumers as a whole through higher reliability, lower cost electricity generation."

Image
Materials research

ACADEMIC ALLIANCE: NEW FUNDING BRINGING LATEST RESEARCH TO SCOTTISH SMES

The Catapult is supporting a unique academic alliance that links researchers with Scottish SMEs.

Scotland's Energy Technology Partnership (ETP) is an alliance of thirteen independent universities that conduct world-leading research in the renewable energy sector. ORE Catapult is helping to connect ETP academics and researchers with innovative SMEs working in Scotland to accelerate the development of new technologies for offshore wind.

By applying for funding under the ETP's Knowledge Exchange Network (KEN), businesses can leverage the latest academic expertise on new technology development. KEN projects focus particularly on early Technology Readiness Level (TRL) stage development and equip businesses to conduct their own feasibility studies, modelling and validation.

The programme enables academic research to have real industrial impact by linking early stage academic research with SMEs who can take the research forward towards technology development and commercialisation. It allows SMEs to access vital skills that may not be present in-house and also provides them with an ETP report, in other words 'a stamp of approval' for the next stage of development, be that further grant funding or starting the commercialisation journey. Up to £10,000 in funding is available per business to pay for ETP support. Application is a simple two-step process with a one-week turnaround.

ORE Catapult's Alex Louden can provide detailed guidance on making the application process.

Contact alex.louden@ore.catapult.org.uk for more information or to submit an application

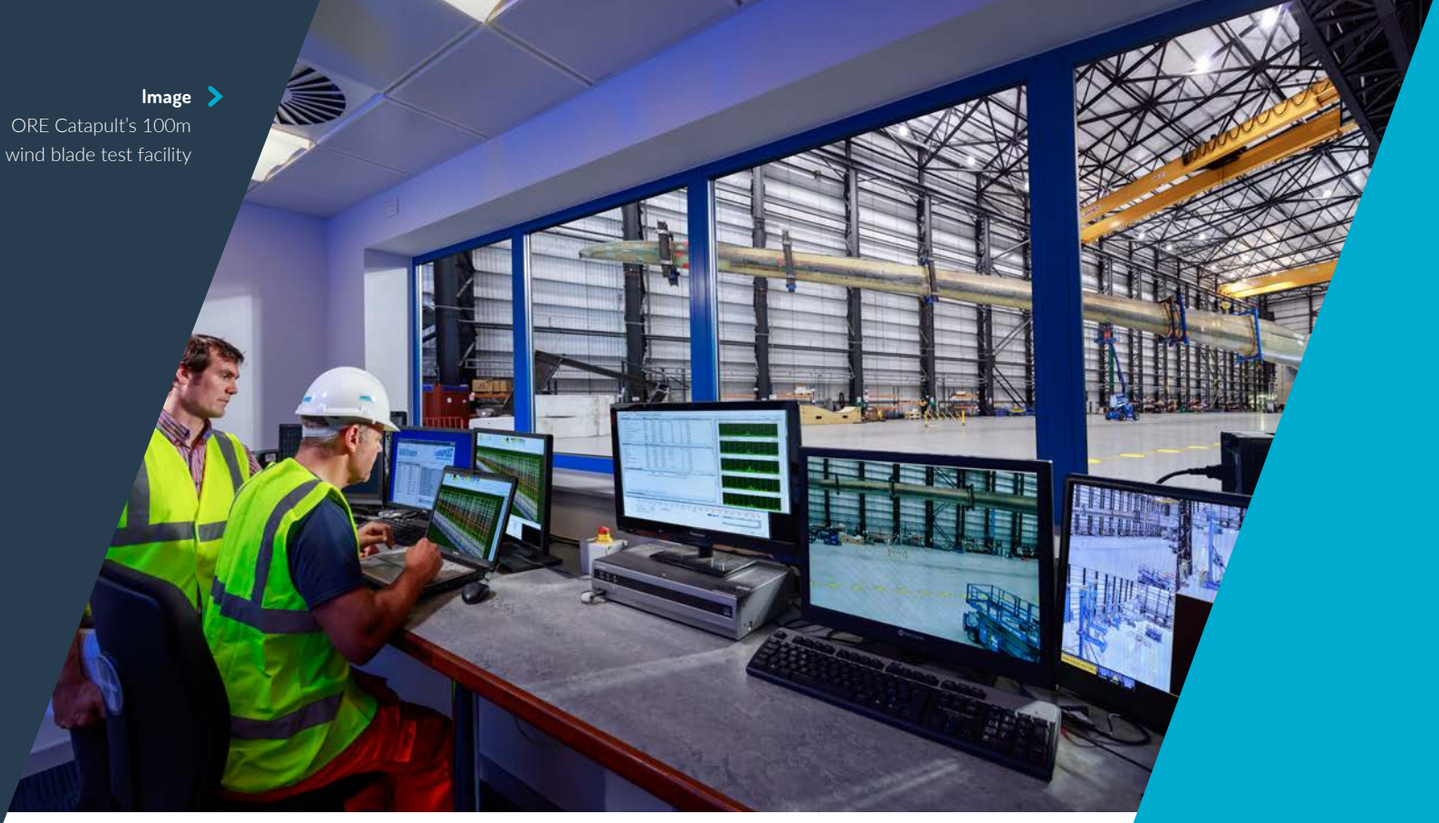

Image
ORE Catapult's 100m wind blade test facility

FIRST IN LINE: FLAGSHIP RESEARCH HUB DELIVERS REAL INDUSTRY IMPACT

Eighteen months into its five-year research programme and the Wind Blade Research Hub is attracting industrial interest and achieving real impact through its research workstreams.

The Wind Blade Research Hub (WBRH) marked the first major strategic academic collaboration between the Offshore Renewable Energy (ORE) Catapult and a UK university, in this case the University of Bristol, world-renowned for its materials and composite expertise. The WBRH was established to investigate innovations in the design, materials and manufacture of wind turbine blades and kicked off in June 2017, marking the birth of the Research Hub initiative. The success of the trailblazing prototype academic collaboration provided the blueprint for a further two Hubs in Electrical Infrastructure and Powertrains.

Notwithstanding the challenges experienced by first-of-a-kind initiatives such as these, the WBRH is starting to deliver real industry impact by enabling academic research programmes through its PhD and EngD projects, established through the University of Bristol's Advanced Composites Collaboration for Innovation and Science Centre for Doctoral Training (ACCIS CDT) and its Industrial Doctorate Centre, that can help solve technology challenges experienced by the offshore wind industry.

The work of the WBRH is focused around the three overarching technical objectives of improving blade design, manufacturing and integrity, with each research project designed to address at least one objective and informed by the technology challenges identified in the Offshore Wind Innovation Hub's roadmap for rotor innovation. One EngD and two PhDs are currently underway, with a third PhD and another EngD due to start in the autumn. Current research areas include modelling the impact of rain erosion on a blade and designing new protection methodologies; understanding the leading-edge protection performance of nano-silicates; and developing new aero-servo-elastic design tools for next generation wind turbines.

One particular strength of the WBRH has been its work in the area of blade leading-edge erosion. The Catapult already has a strong research agenda in materials, erosion and leading-edge protection systems, led by Materials Research Engineer Dr Kirsten Dyer. This has attracted the attention of Vestas Wind Systems, who already enjoy a close collaboration on onshore wind with their key university partner on composites, the University of Bristol. Through the WBRH, Vestas are now working with EngD student Robbie Herring on the simulation and quantification of a rain erosion model, using material provided by Vestas and ORE Catapult's rain erosion test rig. Vestas and Bristol have now extended their framework collaboration agreement to allow for the WBRH to join their future collaborations in areas

Image
ORE Catapult's Rain Erosion Test Rig

> "Research Hubs allow us to expand the scope of the work we undertake, and we offer benefits to universities in expanding their reach."

of mutual interest. The outputs from the WBRH academic projects are now being showcased across Europe, through academic and industrial conferences, journal papers, features and articles. And future research projects are in development, such as University of Bristol lecturer Dr Terence Macquart working with ORE Catapult's Blades Research Engineer Dr Peter Greaves on aeroelastic tailoring, attracting additional funding from the Supergen Wind Hub, and Peter working with LM Wind Power investigating methodologies for next generation blade testing.

Derek Craig, ORE Catapult's Academic Engagement Plan Manager, believes that the success of the Research Hub model is seen as a powerhouse of an industrial and academic collaboration by the wider academic community. "The different Catapults all approach their engagement with academia in slightly different ways. At ORE Catapult, we've taken a strategic, focused view to form an intimate relationship with one university, but then use the research outputs to attract further investment from industrial partners and other universities.

"The universities benefit from a close relationship with us because it gives them more exposure to the Catapult's wider research programme and wider industrial network. The Catapult acts as convener and facilitator bringing industry and academia together and, because of our industrial reach, we are able to link early academic research to industrial partners that can accelerate technology up the readiness scale quickly. The Research Hubs model is designed to attract not only big industry and academic partners but is also about introducing university researchers to SMEs to help them to further develop the technologies."

By combining its in-house researchers with university researchers, the Hub model allows the Catapult to expand its existing research agenda, accessing a larger pool of academic expertise and facilities to carry out research on technologies at a lower readiness level than it normally would.

"Research Hubs allow us to expand the scope of the work we undertake," adds Craig, "and we offer synergistic benefits back to the universities in expanding their industrial reach."

"The first tangible product output from the WBRH is expected towards the end of this year and will be a 20MW model of a next generation turbine enabling demonstration of aeroelasticity blade challenges. This will showcase to industry the strength of our next generation blade research capabilities and that the WBRH is the go-to expert for industry players looking to upscale turbine technologies."

Case Study: Rain Erosion Lifetime Model Development

Second Year EngD student **Robbie Herring**'s project aims to develop a rain erosion lifetime prediction model to predict in-service coating erosion behaviour, and it has attracted the interest of Vestas Wind Systems. Robbie is using real-world offshore and environmental data to build the model and then validate it using conditions mirrored on ORE Catapult's rain erosion test rig. This model will also be extended to cover wind turbine operational conditions, including blade bending and creep. This will create a comprehensive model fully representative of a leading-edge protection system, including layers, layer adhesion and defects to be used for the modelling of leading-edge repair scenarios to explore the development of improved repair methods. The National Composites Centre (NCC), part of the HVM Catapult, also collaborated on this project during its first year and the NCC and the WBRH are now working together to identify new opportunities for further PhD and EngD projects.

Image
University of Manchester's electrical testing facilities

GRID PRO QUO: THE HUB DEVELOPING FUTURE ENERGY STORAGE AND HARDWARE SOLUTIONS

Following the example set by the Wind Blade Research Hub, the Catapult's second Research Hub brings together expertise at the Universities of Strathclyde and Manchester and specialises in Electrical Infrastructure.

By bringing together industry and academia, it aims to translate academic research into the products and services that will future-proof the next generation of electrical infrastructure systems to meet the needs of the growing offshore wind, wave and tidal energy industries.

A five-year investment of around £700k from the Catapult, matched by £2.4m from its university partners, will see a tailored programme of research around themes including component reliability, system and subsystem optimisation, and smart energy and storage.

"The Electrical Infrastructure Research Hub is based on a slightly different model to the Wind Blade Research Hub," says Derek Craig, the Catapult's Academic Engagement Plan Manager. "With both the Universities of Strathclyde and Manchester on board, our dual partner approach brings wider opportunities for collaboration in terms of the facilities and the infrastructure projects they have. We also anticipate expanding the Hub later in 2019 through collaborative projects with academia and industry."

"The teams at Strathclyde and Manchester have exceptional research capabilities in the field of energy systems and future electrical systems," says Craig. "It's a perfect partnership that gives us really strong foundations on which to build and achieve our research goals."

Having two universities collaborating with the Hub has been crucial in attracting industrial interest, and has allowed the Catapult to work more closely to attract other strategic opportunities. "Showcasing the strengths of the partnership between the Catapult and academia makes working with us a more attractive prospect for industrial partners," says Craig.

Nine months on from the Hub's launch in summer 2018, the first shoots are beginning to emerge from the research being carried out. Three PhD projects are now underway in the fields of co-optimisation of cable utilisation and energy storage, and High Voltage Direct Current (HVDC) converter control and reliability, while a fourth, joint-funded by industry giant Siemens Gamesa, will begin investigating new DC collection systems later in 2019.

Image
Dynamic Cable Test Rig

> "Showcasing the strengths of our partnership makes working with us a more attractive prospect"

"Storage and smart energy systems are central to the work we're already engaged in with The Engineering and Physical Sciences Research Council (ESPRC) and University of Strathclyde," says Craig, "and it builds upon previous research by the University. This collaboration with the Hub will release further outputs from an already-successful project, helping generate further impact.

"Another objective for the Hub is reducing the impact of cable failures, and we have had a lot of interest in developing projects around cables. Innovation in cables is a real area of strength for the Catapult, and it is giving us the opportunity to bring in our Testing & Validation team in Blyth, who have a phenomenal track record in electrical infrastructure testing and development."

The Catapult Team's wider technical collaborations with both Strathclyde and Manchester have helped shape the initial success of the Hub. "With this being the second Research Hub, the model was already established and the lessons from the Wind Blade Research Hub had been learned and implemented. Our first projects and PhDs were able to hit the ground running upon the inception of the Hub."

But it's what comes next that will be most exciting. "Attracting Siemens Gamesa as a PhD co-sponsor is a big success that has come early on in the Hub's tenure," says Craig, "but long-term we see that success as being a varied portfolio of PhDs and a pipeline of collaborative projects with further academic and industrial partners. Our aim is to generate the products and services that will support the industry for years to come by capitalising on important, grassroots research at its inception."

A number of the students involved in the Electrical Infrastructure Research Hub as PhDs will progress through the Wind and Marine Energy Systems Centre for Doctoral Training, recently renewed until 2028, that is chaired by the Catapult's CEO, Andrew Jamieson. The centre aims to train future research leaders for the sector, and has worked closely with major players like Scottish Power, Siemens and SSE.

What's certain is that the Catapult and Hubs will continue broadening their capabilities to provide the strongest-possible offering to industry, with deep pools of resource, expertise and infrastructure available to pursue the electrical infrastructure solutions of the future.

"By being more responsive to the industry's demand, we can offer a more flexible response to the big-hitters and their research requirements, allowing us to solve problems and build the future-proof energy systems needed to facilitate the growth of low-carbon generation sources."

Case Study: Dynamic Cable Test Rig

A research engineer at the Industrial Doctorate Centre of Offshore Renewable Energy (IDCORE), David Young is currently working with the Catapult to complete a doctoral thesis on predicting dynamic subsea cable failures. The compelling outcomes of David's research led to the Catapult commissioning north-east engineering specialist Osbit Ltd with the design, development and delivery of its new Dynamic Cable Test Rig. "This project showcases just how fruitful the relationship can be between the Catapult and its academic partners," says the Catapult's Derek Craig. "It's a perfect example of research being translated into industry application and it has helped us attract projects and PhDs to the Electrical Infrastructure Research Hub, as well as providing a boost to the local supply chain."

PHD SNAPSHOTS

Ongoing projects from our Research Hub network

Study of grid interactions of Voltage Source Converters controlled as a Virtual Synchronous Machine

Power converter penetration in the UK power system has created new challenges in grid operation, control and stabilisation. To circumvent this, researchers have suggested a new converter controller known as a Virtual Synchronous Machine (VSM) permitting 100% integration of converter-based generation. As offshore wind farms are interfaced through an High Voltage Direct Current (HVDC) link, they are key candidates for this type of control mechanism. The VSM concept has been proven and tested only in small-scale demonstrators. This project aims to further investigate VSM aspects required for large-scale demonstration by focusing on interactions between VSM and other power system components that may lead to new types of dynamic phenomena in power systems

Ahmed Abdelrahim, 1st Year PhD, EIRH

Understanding of leading-edge protection performance using nano-silicates for modification

As a First Year Centre for Doctoral Training (CDT) student, Imad undertook an initial six-month project with the WBRH, which has inspired him to subsequently follow this line of research for his PhD studies. The project seeks to identify the effects of coating systems for protection of wind turbine blades from leading edge erosion (LEE). LEE is the leading cause of blade damage and results in significant blade repair costs and operational downtime. Current solutions for this issue are not fully optimised and are prematurely failing in their lifecycle at a significant cost to the wind industry.

Imad Ouachan, 1st Year PhD Student, WBRH

Optimising the utilisation of subsea cables in GW scale offshore wind farm collector networks using energy storage

Offshore collector networks contribute a significant cost to the capital expenditure (CAPEX) of an offshore wind farm. This project investigates the benefits of adopting energy storage systems (ESS) as an additional variable in the cable layout optimisation design phase. Through utilisation of ESS, improved cable layouts can be found using lower-rated cables, which would in turn reduce the CAPEX of the electrical infrastructure. "I was attracted to this PhD as I have a big interest in the increasing role energy storage is playing in the integration of renewables to the grid", said Peter Taylor. "I believe that the strength of this project lies in the combination of benefits in reducing CAPEX - de-rating array cables – and operational expenditure (OPEX) - reducing mechanical fatigue loading through extended generator torque provision. Finally, potentially being able to put this work to the test at ORE Catapult's world-class facilities in Blyth is a huge opportunity not available to all of the PhD projects proposed."

Peter Taylor, 1st Year PhD, EIRH

Design, optimisation and comparison of 10MW wind turbines performance

Despite the increasing reliance on numerical methods for wind turbine design, detailed aero-servo-elastic optimisations remain the capability of a limited few. Consequently, few studies attempting to reproduce and verify the design solutions proposed in the literature have been undertaken. Since discrepancies are common between even the simplest aerodynamic wind turbine codes, independent design studies are needed before a consensus on 10MW wind turbine designs can be reached. This investigation relies on the University of Bristol's software ATOM, to replicate, verify and optimise the design of 10MW wind turbine models available in the literature. Prior to joining the WBRH, Terence was a Post Doctoral Researcher working on Supergen Wind projects.

Terence Macquart, Lecturer, WBRH

Reliability evaluation of offshore electrical systems

Offshore wind will form a large part of the UK's future electrical energy supply. Information on offshore electrical infrastructure in wind farms is scarce and, in some cases, non-existent (such as for future VSC HVDC links). This project will address the need to collate existing research data from a variety of sources (onshore systems, oil and gas etc) and build a meaningful reliability model for future large offshore wind farm systems. This will then be used to run 'what if' strategies on maintenance operations and to embed new and emerging technologies such as robotic inspection.

Arsim Ahmedi, 1st Year PhD, EIRH

Image
Work is ongoing into leading edge protection at the Wind Blade Research Hub.

Image
Optimising subsea cables is a priority for the Electrical Infrastructure Research Hub.

Aero-servo-elastic design tools for next generation wind turbines

The project focuses on the significant design challenges of upscaling wind turbines via larger turbine diameters and seeks to achieve this through the development and validation of two features of the ATOM code developed by the University of Bristol, enabling accurate and efficient modelling of next-generation turbine blades.

"My PhD project attracted me because, in being multi-disciplinary design, it allows me to learn about the many facets of wind energy systems and how they integrate together in the most optimal way. In addition, the focus on aeroelastic tailored blade designs is exciting and at the forefront of blade technology."

Samuel Scott, 2nd Year PhD Student, WBRH

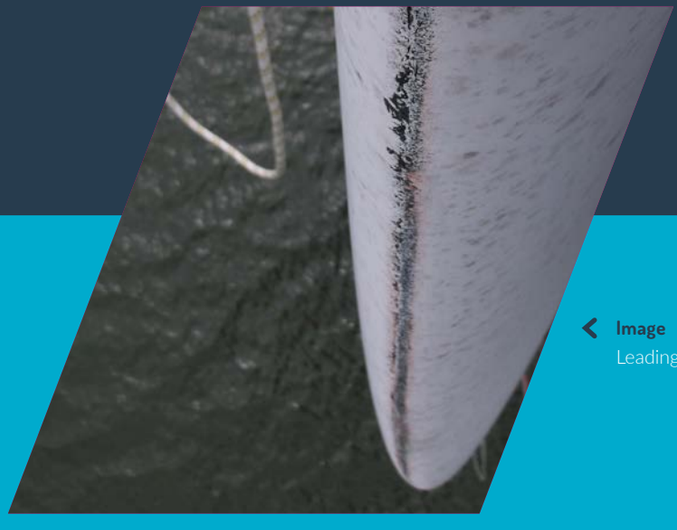

Image
Leading edge erosion

NEWS ROUNDUP

Latest news and developments

Image
Wood Galion lidar test

Offshore Wind Becomes First Renewable Technology to Agree Sector Deal

The offshore wind industry has secured a Sector Deal with Government, paving the way for the industry's rapid growth. The agreement will help to create tens of thousands of highly-skilled jobs across the UK and attract billions of pounds in investment.

This first Sector Deal for a renewable energy technology puts offshore wind at the centre of the nation's clean, affordable and reliable energy system, almost quadrupling our capacity from 7.9GW now to at least 30GW by 2030, generating one-third of the UK's electricity.

"By 2030 a third of our electricity will come from offshore wind, generating thousands of high-quality jobs across the UK, a strong UK supply chain and a fivefold increase in exports," said Energy and Clean Growth Minister Claire Perry. "This is our modern Industrial Strategy in action."

Battery Innovation Boost for North-East Firm

An innovative north-east energy firm has received a boost from a new support programme designed to develop grid-related technology.

Newcastle-based Connected Energy received specialist input from grid gurus Narec Distributed Energy to develop its E-STOR battery system. That support came as part of the Grid Connection Support Series, a Catapult programme that helps businesses grow and innovate across grid-related products and services.

Part-funded by the European Regional Development Fund (ERDF), the free-to-access Grid Connection Support Series will run until 2020, providing masterclasses, innovation challenges and direct business support to better prepare the UK supply chain for future grid connection challenges.

"Help from the Grid Connection Support Series was invaluable," said Connected Energy's William Hair. "It has allowed us to access world-leading knowledge... which ensures our products comply with all of the latest regulations as the UK electricity grid transitions from G59 to G99."

Newcastle College Launches iHR Offshore Wind Training Facility

The world's most advanced Immersive Hybrid Reality (iHR) offshore wind training facility has been installed at Newcastle College's Energy Academy to help train future engineers and technicians.

The immersive system replicates working conditions experienced on offshore wind farms and allows users to virtually find and diagnose faults, helping to develop the vital skills needed to work in the wind industry. The innovative technology will allow Newcastle College to support the region's growing energy sector as part of the UK's aim to create 27,000 skilled jobs in the industry by 2030.

The system was one of the highlights of the Innovation Trail at 2018's Great Exhibition of the North. Future engineers at the Energy Academy will start training with the new system immediately, giving a unique edge to their future employability in the sector.

Image
Newcastle College's new iHR system in action

CDT Success for the Offshore Renewables Sector

The offshore renewables sector has received a welcome training boost through the latest funding round of the UKRI EPSRC Centres for Doctoral Training (CDTs). The recent announcement of £446 million of investment in 75 new and continuing CDTs will enable the training and upskilling of the next generation of doctoral level students to support research and innovation across the engineering and physical sciences landscape. ORE Catapult plays an integral role in the continuing support for PhD training through its academic engagement and research programmes.

Within the offshore renewable energy sector, significant funding has been provided to support four new CDTs:

- Northumbria University - EPSRC CDT in Renewable Energy Northeast Universities (ReNU)
- University of Edinburgh – EPSRC Industrial CDT in Offshore Renewable Energy (IDCORE)
- University of Hull – EPSRC CDT in Offshore Wind Energy and the Environment
- University of Strathclyde – EPSRC CDT in Wind and Marine Energy Systems and Structures

Each centre is a collaboration between multiple universities and industrial partners to shape a training and skills programme to equip the students to make their mark on the industrial landscape. The Catapult is a partner of all four centres and looks forward to playing an active role through supporting, mentoring and facilitating the development of future engineers. More information can be found on the EPSRC website.

Image
An offshore wind farm

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