

ANNUAL REPORT 19/20





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CHAIRMAN'S INTRODUCTION



Colin Hood
Chairman,
Offshore Renewable
Energy Catapult

In a year of political change and challenge, it is with great pleasure that I am able to reflect on strong and consistent progress by the Offshore Renewable Energy Catapult in delivering an innovation, research and growth agenda absolutely in tune with the UK Government's priorities and industrial strategy.

Our continued focus on close collaboration with the industrial and academic leaders in renewable energy has driven greater levels of applied research and innovation, product development and supply chain engagement and growth, all in market sectors critical to delivering on our commitment to net zero.

Perhaps the biggest development has been our regional expansion, with our well established centres in Glasgow and the North East of England now being complemented by Centres of Excellence in the Humber and Pembrokeshire, as well as new offices in East Anglia, the South-West and Aberdeen. ORE Catapult is delivering real impact cross the UK, directly contributing to the Government's levelling up agenda.

And we have continued to develop close collaboration across the Catapult Network, with economic growth and technology development programmes leveraging the very best practise and experience from across the UK's world-leading industrial spectrum.

As we look to the future, our Board continues to exercise strong governance, assessing risks and future growth potential, and ensuring that we continue to deliver exceptional returns on the investment entrusted to us.

With an eye towards post-Covid investment and growth, we are well-advanced in developing a new portfolio of multi-million-pound projects in close alignment with the Government's ambitions for regional, low-carbon job creation, research and innovation. ORE Catapult is operating at the forefront of the green economic recovery and has strong ambition to deliver even greater economic and social benefit over the coming few years.

I am delighted to report that ORE Catapult continues to make significant progress towards delivering our core mission of accelerating the creation and growth of UK companies and innovative technologies in the offshore renewable energy sector. We are working with more and more UK businesses, across a wider spectrum of industries, bringing innovative new technologies to market and enhancing the UK's global standing as a leader in offshore renewable energy. Of the 235 small businesses that we are currently supporting, 44% are in the huge growth industries of robotics, artificial intelligence and digitalisation.

Over the past year, we have developed a major new vision, closely aligned to the UK Government's priorities around UK growth, levelling up and decarbonisation. It articulates how, with greater investment, we can enable huge leaps in innovation, collaboration and supply chain development to achieve the full economic and environmental potential of offshore renewable energy. A range of initiatives launched this year create the foundations for taking it forward.

Driving the innovation and research agendas at the heart of the renewables industries, we are directly enabling closer collaboration on delivery of the decarbonisation of our energy system, supporting the growth of R&D towards the ambitious target of 2.4% of GDP, all the while accelerating UK economic growth. The Covid-19 crisis and the resulting critical need for economic recovery have further emphasised the vital importance of this activity.

Growing Across the UK

We have expanded our national footprint and impact through the creation of regional centres of excellence that will drive both local and national economic growth and job creation. The past year has seen the establishment of a permanent office in the Humber region focusing on Operations and Maintenance. We've expanded our operations in Hayle in Cornwall, mainly supporting the growing marine energy industry in the region. And the creation of the Marine Energy Engineering



Andrew Jamieson,
Chief Executive,
Offshore Renewable
Energy Catapult

Centre of Excellence in Pembroke Dock, South West Wales, with City Deal, European and Welsh Government support, is driving economic growth from renewable energy throughout Wales. UK Government funding will support the development of new energy systems in the area, utilising hydrogen and renewables.

All of these operations are closely tied in with public sector, industrial and academic partners, enhancing each regional cluster's capabilities to make them greater than the sum of their parts.

With significant industry backing, we launched the Floating Offshore Wind Centre of Excellence to drive forward the development of next-generation offshore wind technologies. The advancement of floating wind is vital to delivering on the UK's ambitious offshore wind growth targets and could create 17,000 jobs and generate £33.6bn for the UK economy by 2050.

Delivering Next Generation Technology

Operations at our world-leading National Renewable Energy Centre in Blyth, Northumberland, have continued to go from strength to strength, culminating in the commencement of testing of the world's largest wind turbine nacelle and longest blade at our unique facilities. Deployment of GE Renewable Energy's Haliade-X turbine at Dogger Bank will create the world's largest windfarm, cementing the UK's position as a global leader in offshore wind. It also presents unparalleled opportunities for the UK's supply chain to develop new products and services for domestic and export markets, creating jobs and generating economic benefits.

Alongside the Haliade-X programme, **Stay Ashore**, our £9m, four-year research partnership with GE to develop and test next-generation technologies, entered its second year, demonstrating how we have become not only a reliable partner for testing but also a critical collaborator in delivering R&D programmes focused on industry need.

Supporting a Growing UK Supply Chain

One of the first, critical deliverables from the Offshore Wind Sector Deal to date has been the creation of the industry-funded Offshore Wind Growth Partnership (OWGP), a £100m, ten-year UK business transformation programme delivered by ORE Catapult. It promotes closer collaboration across the supply chain, implementing structured productivity improvement programmes and facilitating shared growth opportunities between developers and the supply chain.

In its first year, the OWGP has been able to announce the success of its first funding call, with seven UK companies from industries including oil and gas, manufacturing and robotics securing £364,000 in grant funding, with £156,000 leveraged in match funding contributions from successful companies, securing UK offshore wind supply chain projects worth £520,000. It also announced a high-value business support programme, Sharing in Growth, and published the first in a series of in-depth analyses of the offshore wind supply chain, making recommendations to overcome barriers to growth.

Enabling Commercialisation of Technology Innovation

Supporting the growth of innovative UK businesses is at the core of ORE Catapult's purpose. I am pleased to be able to report that we directly supported 235 UK SMEs during the year, and have now helped more than 800 with technical innovation and business growth support, through collaborative R&D projects (*65 projects completed in FY19-20*), industry-led innovation challenges (*11 launched this year*), access to our unique test assets in Blyth and Levenmouth, and a range of programmes aimed at accelerating supply chain development.

A further element of our support to SMEs is a series of collaborative business growth and development programmes. This year our technology accelerator programme, the Launch Academy, got underway at national and regional levels, channelling high-value business and technical support to innovative UK companies,



enabling them to bring new technologies and services to the offshore wind market. In its first year, it has supported 17 businesses and has plans to expand further both nationally and regionally.

Partnerships Enabling Innovation

Our close partnerships with the industry's largest companies are also critical to this economic activity. Our £1.5m partnership with offshore wind farm operator Vattenfall gives innovators in the supply chain the opportunity to test and demonstrate technologies in real-world conditions at the pioneering £300 million European Offshore Wind Deployment Centre off the coast of Aberdeen. Most of these companies have previously tested their technologies at either our Blyth facilities or on our Levenmouth Demonstration Turbine.

GE and Siemens Gamesa committed to significant investment in our Academic Research Hub collaborations with the Universities of Bristol, Strathclyde, Manchester and Sheffield. Twenty-nine researchers are now active across the blades, electrical infrastructures and powertrains research hubs, leading a significant research programme that directly responds to industry needs.

We firmly believe that the Government's target of 2.4% of GDP be invested in R&D is achievable, driven by such collaborations; and we continue to grow our own research activity, with a 9% year-on-year increase in competitively won research projects, and 156 active research projects on-going during the year.

Enabling the Future Energy System

ORE Catapult is at the heart of the development of the UK's new energy system, supporting the evolution from a highly centralised energy economy to a considerably more diverse, low-carbon one. Our activity in this exciting and rapidly growing space includes extensive work on the integration of offshore wind into the future energy system, including the development of green hydrogen and its application into our future energy mix, and enabling new technologies

on the grid through the continued investment in and expansion of our world-leading test, demonstration and certification facilities.

Supporting Exports

The global market for offshore renewables is growing quickly, creating both opportunity and competition for UK businesses. The TUS-ORE Catapult Research Centre (TORC) entered its delivery phase, identifying commercial opportunities in China for UK companies and introducing dozens of UK SME technology developers to the Chinese market, while also developing a research programme with Chinese Research Councils and UK universities. Exploring opportunities elsewhere in the Far East and the USA, we continued to drive the global competitiveness and leadership of the UK.

Leading Marine Energy Growth

In marine energy, the EU awarded the largest ever Interreg grant to a project led by ORE Catapult to advance the reliability and lower the cost of tidal stream energy in the Channel region. The €46m TIGER project will see leading UK and French developers collaborate to accelerate tidal stream adoption in the region by addressing installation, maintenance and grid connection challenges.

A Part of the Catapult Network

At ORE Catapult, we are proud to be a part of the wider Catapult Network and work closely with a number of the other Catapults on complementary programmes that leverages world-leading, in-depth expertise across multiple sectors to drive UK advantage. In 2019/20, we launched the Wind Digital Innovations Forum, a joint initiative with the Digital Catapult, bringing together industry, academia and small innovators to drive forward the sector's digital transformation. Building on ORE Catapult's existing expertise and portfolio in this field, it will focus on cybersecurity, data maturity, data integration and digital supply chain engagement in the offshore renewable industries.

We are also working in collaboration with many other colleagues across the Catapult Network on a host of collaborative programmes, including High Value Manufacturing, Energy Systems, Satellite Applications, Connected Places and Compound Semiconductor Applications.

Remaining at the Heart of the UK's Green Growth

As we look to the immediate future, the economic growth agenda has never been more important. We strongly support UK and regional Governments' plans to drive this growth through sustainable, low carbon investment, innovation and expansion and our own strong progress in these areas positions us well to play a key role in regeneration and delivery of the UK's net zero commitments.

ORE Catapult is working with industry and academia to identify, develop, prove and de-risk promising new technologies and bring them to market. We help reduce the cost of offshore renewable energy, supporting the growth of the industry, creating UK benefit and enabling offshore renewables to become the UK economy's largest driver of clean growth.

VISION:

To be the world's leading offshore renewables technology centre.

MISSION:

To play a key role in delivering the UK's largest clean growth opportunity, through accelerating the creation and growth of UK companies in the offshore renewable energy sector.

We will use our unique facilities and research and engineering capabilities to bring together industry and academia, driving innovation in renewable energy.

STRATEGIC OBJECTIVES

We use our unique facilities, research and engineering capabilities to bring together industry and academia, driving innovation in renewable energy. To deliver our strategy, we have developed four core strategic objectives: Operational Performance, Accelerated Technology Development, New Frontier and UK Growth Platforms.

Operational Performance

We will enable the UK to become internationally recognised as a centre of excellence for operating offshore renewable plant, and for UK innovators and solution providers to develop products and services that will build and maintain a UK based supply chain, boosting productivity of UK businesses and creating an exportable commodity.

Accelerated Technology Development

We will be internationally recognised as the go-to testing and validation centre for the industry's original equipment manufacturers (OEMs), and in doing so act as the access point to UK-based high-value supply chains, and help develop and validate new innovations ready for the market.

New Frontiers

We will identify and accelerate promising technologies towards commercialisation, seed the next generation of high growth businesses, and help them access the UK's indigenous market and export opportunities.

UK Growth Platforms

We will develop cross-cutting support platforms essential for ensuring economic impact from the other three strategic objectives

At ORE Catapult, we know that the way we deliver is just as important as what we deliver. Our four core values set out the types of behaviour we expect of our employees and set the tone for the culture of our organisation. We want our staff to embody the values of Innovation, Excellence, Integrity and Collaboration.

VALUES

Innovation

We Seek out new ideas and ways of working and embrace positive change whilst recognising our limitations, accepting challenge and challenging assumptions.

Excellence

We consistently take personal responsibility for delivering successful outcomes, demonstrating resilience and determination to overcome barriers and continually looking for ways to improve.

Integrity

Value, recognise and reward every individual's time, commitment, diverse and constructive contribution, treating everyone with equal dignity and respect.

Collaboration

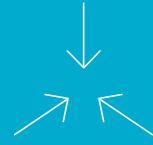
Wholeheartedly commit to building enduring, positive working relationships, recognising and supporting the needs of others and working openly and honestly towards mutual success



SMEs supported

235

803
SINCE 2013



International projects

63

114
SINCE 2013



Active R&D projects

156

328
SINCE 2013



Value of test facilities

1/4 bn



OUR IMPACT IN 2019/2020



Academic collaborations

264

556
SINCE 2013



Companies supported with product development

44

188
SINCE 2013



Year-on-Year uplift in total revenue

36%



Year-on-Year uplift in competitive R&D

9%



Industry collaborations

154

802
SINCE 2013



Are more than

7x

more likely to have received a grant



Received over

12x

more money in total private investment fundraising

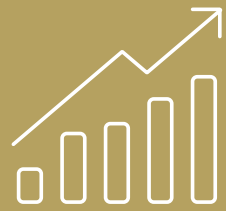


Are over

4x

more likely to be classified as high growth*

When compared with other companies in the offshore renewable energy industry, companies who have been supported by ORE Catapult:



Received over

16x

more money in total grant funding

Are more than

4x

more likely to have received private investment in a fundraising

Analysis compares experience of 160 UK-registered companies who have partnered with ORE Catapult since 2013 against a control group of 1302 UK-registered companies operating in or interested in offshore renewable energy who have not partnered with ORE Catapult.

* Beahurst definition of High Growth. Data gathered from Companies House and Beahurst

The UK's position as the world leader in offshore wind is underpinned by a thriving domestic Operations & Maintenance (O&M) supply chain, and improvements in this sphere are key to improving performance. Our team is spearheading the application of cutting-edge technologies like robotics, data and artificial intelligence to offshore wind O&M, leveraging the UK's world-leading Industry 4.0 sector to reduce time at sea, and expanding opportunities for the UK supply chain domestically and in the export market.

CASE STUDIES

O&M CENTRE OF EXCELLENCE

O&M activities make up almost a quarter of the lifetime costs of an offshore wind farm and provide a huge opportunity for cost reduction through innovation of products and services.

Located in the Port of Grimsby, ORE Catapult's Operations & Maintenance Centre of Excellence (OMCE) is building on the Humber region's energy heritage and extensive experience of servicing offshore wind farms and ORE Catapult's strong track record in O&M with a portfolio of over 70 projects exceeding £40m over the last 7 years. It is a national hub for enhancing the UK's world leading position in offshore wind operational performance. It is a catalyst for innovation, technology, cross-sector collaboration and best practice to enhance safety, reduce cost and support the growth of UK O&M.

By bringing together offshore wind owners, operators, supply chain, industry leaders, regulators and academia, the O&M Centre of Excellence works with UK industry to drive solution-focused innovation and improvements in O&M.



"The Humber, with its energy heritage, location, and extensive experience of servicing offshore wind farms, has quickly established itself as the UK's centre of excellence in operating and maintaining the existing UK offshore wind fleet."

Chris Hill
Operational Performance Director for ORE
Catapult

NEXT GENERATION OPERATIONS AND CONTROL

The emergence of big data and digitalisation as a transformer of the global economy has been one of the key industrial trends of recent years. In 2018, the Government's Industrial Strategy identified artificial intelligence and data as one of its four Grand Challenges, providing clear evidence of the technology's emerging importance and highlighting its transformational potential. For the offshore wind, wave and tidal energy sectors, the technology provides endless opportunities for innovation. From reducing turbine downtime through predictive maintenance, to improving health and safety through better weather and wave height forecasting, the industry is still scratching the surface of the potential benefits.

Our Data & Digitalisation team is working with owner/operators and service providers to drive the adoption of cutting-edge technologies that can add value across the whole wind farm lifecycle – helping the industry embrace a more efficient, effective, data-driven future.

In October 2019, ORE Catapult ran its inaugural Hackathon in collaboration with ScottishPower Renewables and National Grid ESO. Our Hackathon teams were asked to develop ways of producing PA signals during curtailment periods using commonly available wind turbine data. Around 50 participants over 18 teams gathered in the Glasgow Science Centre to tackle the challenge over the two-day event. An expert judging panel was brought together with representatives from ORE Catapult, ScottishPower Renewables, National Grid ESO and an independent judge with expertise in the area to crown the team of PhD students from the University College London Energy Institute the winner with their machine learning algorithm.

POD (Platform For Operational Data)

Our Platform for Operational Data enables users to access and request data sets collected by the Catapult from our 7MW Levenmouth Demonstration Turbine and third party data.

Better access to quality data leads to better analysis and insight and thus better decision-making – this, in turn, leads to reduced risk for investors and greater return on investment. We aim to support innovative research projects and product development through data provision to academics, researchers, and the wider community pursuing growth opportunities in renewables.

Wind Digital Innovations Forum

The wind industry is an abundant producer of big data and sits on the cusp of its own digital revolution.

Spearheading this drive, ORE Catapult launched the Wind Digital Innovation Forum, working with the Digital Catapult.

The Forum's overarching aim is to improve performance and enable better decision-making. Participants have the opportunity to influence its policy and participate in projects at the cutting edge of the UK's digital and energy sectors. Priority areas for the Forum's work in its first year will be to develop a digital transformation roadmap and cybersecurity standards for the UK wind industry, as well as launching real-world data integration studies and a Disruptive Digital Technology Taskforce to incubate market entrants.



Benchmarking

In offshore oil and gas, benchmarking performance against the competition is common practice but it has been less prevalent in the highly competitive and cost sensitive development of offshore wind. Our flagship data projects were developed to help wind farm owner/ operators identify strategic issues – for example, which components fail most, or why some turbines underperform – so that they can implement optimal solutions, set targets, and make informed investment decisions.

With our ventures for both Offshore (SPARTA) and Onshore (WEBS) benchmarking, we can provide industry with anonymised benchmarking to help strengthen their strategy, improve performance, reduce costs and manage risks.

3.2M

Benchmarks

8.8GW

Installed capacity benchmarked

Across 101 windfarms

28

Turbine models

Across 5 countries

>22

Owners

73,000

Turbine months reported

Spanning 12 operational years

INSPECTION, MAINTENANCE AND REPAIR (IMR)

The UK leads the world in offshore wind, having more installed capacity in its waters than any other country. With this huge market potential apparent, we are witnessing a drive for continual improvements in associated products, services and processes – including robotics.

ORE Catapult believes that the offshore wind sector has the potential to cut its inspection costs by almost 40 per cent by integrating robotics and automated systems into its operations. Our Levenmouth Demonstration Turbine in Fife is the test-bed for both SMEs and academic developers working in this area, hosting demonstrations of crawling, climbing, aerial and sub-sea robots. An example of one such project is the Multi-Platform Inspection, Maintenance and Repair in Extreme Environments (MIMRee)

MiMRee

Inspecting the blades of an offshore wind turbine can be a difficult task. Restrictive weather windows and extreme conditions at sea combine to create a challenging working environment, while lost revenue from turbine downtime and the cost of vessels and technicians make increasing the efficiency of inspections a top priority for the industry.

The £4.2m Multi-Platform Inspection, Maintenance and Repair in Extreme Environments (MIMRee) project is an ambitious cross-sector programme combining expertise in robotics, artificial intelligence, marine and aerial engineering, nanobiotechnology and space mission planning to prove that offshore wind maintenance missions can be conducted by unmanned robots. The Catapult is providing invaluable industry insight, engineering expertise, and world-leading representative testing and validation facilities to prove the MIMRee technologies.



O&M DECARBONISATION

Offshore wind farm developers are working hard to plan for the reduction and elimination of carbon emissions from their operations, particularly around maritime logistics associated with the transit of personnel, parts and tools to and from their operational wind farms.

This ambition among developers is also sending clear market signals to the offshore wind supply chain, with turbine Original Equipment Manufacturers (OEMs) suppliers such as Siemens Gamesa known to be planning for a reduction in their maritime emissions in order to satisfy customer expectations. In turn, vessel operators, ship-yards and designers are at various stages of designing and building vessels to satisfy the ever growing demand.

There is huge potential for UK companies to seize large market share within this nascent industry in a way that has not proven possible as yet in the turbine generator / tower manufacture elements of offshore wind.

UK companies have the capability to supply not only the UK offshore wind industry with clean maritime solutions, but to export goods and services globally to the offshore wind industry and the broader maritime industry.

The ORE Catapult is working closely with innovative and committed UK companies who are seeking to provide clean maritime products and services into the offshore wind industry. Our role is to support these UK companies to rapidly develop and demonstrate and commercialise their innovations.

FIT4OFFSHORE

ORE Catapult's Fit 4 Offshore Renewables (F4OR) programme has been developed with input from the offshore renewable energy industry, following the successful delivery of a similar programme by the High Value Manufacturing Catapult for the nuclear industry and is delivered in collaboration with them.

F4OR is a unique service to help the UK supply chain get ready to bid for work in the offshore renewable energy sector. We work with capable, competent and competitive UK supply chain companies to support their entry and growth in the offshore renewable energy industry. The objective of the programme is to support the development of an increasingly competent, capable and competitive UK offshore renewable energy supply chain – maximising opportunity for the UK supply chain, both domestically and globally.

The F4OR program is supported by an Offshore Wind Industry Advisory Group (IAG), made up of the leading developers and OEM's and others from across the supply chain. The Advisory Group provides the interface between the F4OR program and the industry, validating the F4OR brand and being a conduit of sector requirements for the local supply chain. Members of the group are drawn from Vattenfall, Ørsted, Innogy, Scottish Power Renewables, Equinor, Siemens Gamesa Renewable Energy, MHI Vestas, GE, JDR Cables, Tekmar Cable Protection Systems and Lloyds Register. Following the successful Scottish pilot, the F4OR program has had localised support from LEPs in England and two smaller regional programs, supported by the New Anglia LEP and the North East LEP have been launched.

F4OR
Fit For Offshore
Renewables



FLOATING OFFSHORE WIND CENTRE OF EXCELLENCE

ORE Catapult has established a Floating Offshore Wind Centre of Excellence (FOW-CoE) to work with Industry and drive the development and commercial viability of floating offshore wind in the UK and beyond.

The key objectives are:

- Develop internationally recognised competence in the UK
- Reduce the development cycle times for establishing floating offshore windfarms
- Ensure the readiness of the system-wide supply chain in the UK
- Drive down costs and accelerate commercial development of FOW through provision of technical expertise
- De-risk and encourage innovation projects by working with the market leaders in FOW
- Engage with the oil and gas sector to realise synergies
- Work with offshore technology industries in the UK and beyond to cross pollenate innovation.
- Set the standards for FOW globally – seeking agreements and opportunities with other countries seeking to develop this technology, such as Japan, Norway, Spain, USA & France

The FOW-CoE is unique in bringing together relevant key organisations from industry, academia, the supply chain, government, and other influential stakeholders such as the offshore wind clusters. Members include SSE Renewables, ScottishPower Renewables, Equinor, EDF Renewables, EDP Renewables, ESB, Mainstream Renewable Power, Total, Shell, Copenhagen Infrastructure Partners (CiP) and Offshore Wind Power Ltd (OWPL). Leading academic partners include the Universities of Strathclyde, Aberdeen, Exeter, Portsmouth and Bangor. Other key stakeholders are devolved governments, LEPs (e.g. Cornwall & Isles of Scilly) and offshore wind clusters (e.g. DeepWind Cluster in North East Scotland and the Celtic Sea Cluster in the south west), Sir Ian Wood's initiative Opportunity North East (ONE), the Oil & Gas Authority and SubseaUK.

By ORE Catapult bringing together these actors in such a collaborative manner the FOW-CoE is able to deliver and coordinate a range of world-leading activities.

"We recognise the vital role that floating offshore wind will play in our future energy system as we continue our transition to a net zero economy and we strongly support this innovative technology."

Paul Wheelhouse
Scottish Government Energy Minister

ENERGY TRANSITION ALLIANCE

The recently launched Energy Transition Alliance (ETA) is an ambitious collaboration between the Offshore Renewable Energy (ORE) Catapult and the Oil and Gas Technology Centre (OGTC). Together with industry this program aims to deliver key technologies to enable the energy sector to transition to a net zero future whilst retaining UK energy security and maximizing UK economic benefit.

To facilitate the transition to net zero the ORE Catapult and OGTC will jointly lead this program to:

- Collaborate with the Oil and Gas sector to decarbonise, de-risk and promote cleaner energy production. This will ensure the UK continues to meet its demand for fossil fuels in 2050 with net zero operational emissions.
- Develop a program aimed at driving significant reductions in the cost of large-scale hydrogen production.
- Deliver a programme of technology development focussed on making meaningful reductions in the cost of CCUS technology – aligned with the Energy Innovation Needs Assessment published by BEIS in October 2019.
- Work with multiple Catapults including The High Value Manufacturing Catapult and the Energy Systems Catapult to decarbonise energy production.
- Digitise and Automate O&M aspects of Offshore energy production This should lead to a lowering of renewable LCOE while creating high value, data driven UK jobs.
- Encourage more areas of offshore wind production. Seizing and incorporating floating wind opportunities could see the UK lead Europe in terms of innovation, R&D and export potential.



The Oil and Gas industry provides hundreds of thousands of jobs and sustains a major supply chain in the UK, one of the key factors in transitioning from an O&G reliant economy to a renewable future will be the shift of jobs and supply chain capability to the green sector. The need to transition jobs is exacerbated by the Covid induced recession, with significant opportunities to build a green recovery. The UK based oil and gas supply chain has been supplying and servicing offshore structures, including large scale floating structures for more than 40 years and could lead the floating wind sector in the UK with huge export potential.

REPORTS

- [Operations and Maintenance Modelling of Floating Hybrid Systems - Dr Anthony Gray](#)

Operations and Maintenance (O&M) accounts for a significant portion of the overall lifetime cost of an offshore renewable energy development. O&M simulation tools can help to identify critical components in the design, estimate operational expenditure to improve cost of energy calculations, and help to optimise logistical strategies. To date, most O&M simulation tools have focussed on offshore renewable energy projects with one type of device. Complexity is increased if a device is a hybrid of different electricity generating systems. This paper explores the methodology of taking an existing O&M tool centred on wave energy devices and modifying it to model a farm of floating wind-wave hybrid devices. Initial results are discussed, including quantifying the impact that the 'harbour effect' has on O&M, whereby the significant wave height behind the platform is reduced, allowing increased accessibility. The O&M tool produced as a part of this work will be made publicly available under the Ocean Energy Scale Up Alliance.

OWIH Deep Dives

- [Future Offshore Wind Energy Integration: Outlook & Analysis](#)
An outlook and analysis of future energy integration. The aim of this report is to provide an outlook of the impact the expansion of offshore wind generation will have on Great Britain's current grid network.
- [Operations & Maintenance: Cost Drivers](#)
A quantitative analysis of the cost reduction potential of 19 innovative offshore wind products and services. This report provides a quantitative analysis of the cost reduction potential of 19 innovative products and services that could or are expected to improve offshore wind farm operations and maintenance (O&M) over a project lifecycle.
- [Data and Digitalisation: Cross Sector Lessons for Offshore Wind](#)
Qualitative industrial research carried out on the topics of data integration, Artificial Intelligence (AI) and cyber security. The research involves a combination of surveys, a literature review and roundtable discussions with specialists from a range of diverse sectors and industries. The goal of the research is to identify lessons and good practice from other, more mature, industries and map these to the offshore wind sector.



BLADEBUG

Earlier this year, UK-based BladeBUG completed trials for its novel inspect-and-repair robot at our National Renewable Energy Centre. The robot was put through its paces as it walked on blade surfaces, proving the stability of its vacuum adhesion technology and its dexterity in adapting to the varying curves of the blades. This game-changing technology is set to revolutionise blade maintenance of offshore wind turbines, reducing manual working and ensuring a safer, more cost-effective and efficient way of working.

In addition to testing the robot, the ORE Catapult team provided its knowledge, expertise and connections to help write the code that enables the robot to walk as well as improving other capabilities including its safe and reliable deployment and retrieval, enabling technicians to operate the BladeBUG robot remotely on wind turbine blades.

CTV CHALLENGE

In direct response to the global COVID-19 pandemic, ORE Catapult's Operations & Maintenance Centre of Excellence established the Offshore Wind Operational Contingency Planning Group. The Group provides a single point of liaison between UK Government, regulators, the offshore wind industry and its supply chain.

For this reason, ORE Catapult's Operational Contingency Planning Group, alongside the Knowledge Transfer Network, G+ offshore wind health and safety group, and the Workboat Association, responded quickly to the unprecedented challenges facing the industry. As a result, the organisations worked together to set an Innovation Challenge seeking a rapid solution to increase physical separation during small vessel transit for offshore wind turbine technicians. The challenge sought a cross-sector screening solution to divide crew safely and enable transit personnel numbers to be increased. A substantial number of applications were submitted before being shortlisted with the top solutions being pitched to the challenge setters. The top five finalists will now demonstrate their initiatives.



ECHOBOLT

As part of an Innovate UK-funded project, ORE Catapult has partnered with EchoBolt, the leading provider of fastener inspection services in the wind energy sector. It has developed an inspection system that uses ultrasonics to test the tension on the bolts as well as predicting where faults are likely to appear – making scheduled maintenance procedures much more accurate and cost efficient. EchoBolt's technology promises to reduce the costs associated with offshore wind farm bolted connections by a staggering 80%, which results in an estimated saving of £250m/year for the European wind industry.

ORE Catapult has supported EchoBolt in securing Innovate UK funding to expand the capabilities of its technology as well as providing access to our 7MW Levenmouth Demonstration Turbine for further testing in simulated real-world conditions. EchoBolt has also taken advantage of our partnership with GE Renewable Energy and has secured a further testing and validation project on GE's operational turbines later this year.

We combine the world's largest and most technically capable open-access test facilities in blades, powertrains, electrical and marine testing with unparalleled engineering knowledge and research expertise, and a sector-leading programme of research projects in robotics, autonomous systems, data and digitalisation, and artificial intelligence.

We deliver multi-million-pound testing and research projects with leading equipment manufacturers and are at the forefront of supporting the development of the industry's largest and most advanced technologies, including the world's largest wind turbine and longest blade.

In September 2019 spectacular gains in reducing the cost of electricity from Offshore Wind were announced following the latest CfD auction. Shortly afterwards, in October, SSE & Equinor announced that GE had been selected as the preferred technology supplier for the UK's largest offshore wind project, Dogger Bank, using their new Haliade-X turbine, thus highlighting the vitally important role of the Catapult in bringing this technology to market within a compressed timeframe. Haliade-X not only contributes to making offshore wind more affordable but helps drive the global growth of offshore wind, generating substantial economic and environmental benefits.

CASE STUDIES

EGRID

Part-funded by ERDF, the project to install one of the world's most advanced Grid Emulation Systems in Blyth has been completed and eGrid is now operational.

The 18MVA eGrid system enables the testing of grid fault conditions that powertrains are required to cope with in order to pass compliance tests, allowing the Catapult to test all relevant parameters of next-generation wind turbine systems.

A major milestone in the installation of the eGrid system was its commissioning, which was achieved through partnering with GE Renewable Energy using their Haliade 150-6MW direct drive turbine – the first of GE's offshore wind turbines to be tested in the UK. The turbine underwent highly advanced test programmes that accurately replicated real-world operational conditions to further enhance performance and reliability.



The eGrid project also delivered hundreds of hours of UK SME engagement in product and service development, with 70 businesses benefitting from specialised workshops, training courses and innovation advisory and research cooperation services in the areas of electrical infrastructure and grid integration technology. It has succeeded in helping enterprises bring 33 products and processes to market and enabled more innovation in, and adoption of, low carbon technologies.

In March, National Grid launched a proposed change to the UK Grid Code, which would for the first time allow results from a test bench to demonstrate compliance with the code. We have been invited by National Grid to sit on the Working Group which is testament to the technical capability of our team.



LM 107M BLADE TEST

The world's longest offshore wind turbine blade, the 107 metre LM Wind Power blade, is being tested at ORE Catapult's world-leading blade-test facility and is the driving force behind GE Renewable Energy's Haliade-X turbine.

The blade is undergoing a full range of advanced certification testing procedures, to verify its ability to withstand peak wind conditions and simulating its readiness for years of operation at sea. This keeps GE Renewable Energy on track to commercialise the technology in 2021.

The production of the LM 107.0 P blade, as the first wind turbine blade to surpass 100 meters in length, represents a milestone for the entire wind industry.

100m+

The production of the LM 107.0 P blade represents a milestone for the entire wind industry, as the first wind turbine blade to surpass 100 meters in length.

GE RENEWABLES TESTING, RESEARCH AND DEVELOPMENT PROGRAMME

The UK is at the forefront of offshore wind deployment, which should enable it to take the lead in technological innovations in the field of robotics, autonomous systems, new materials and manufacturing, and data and digitalisation.

This, along with ORE Catapult's unique combination of world-leading test facilities, was key in attracting GE Renewable Energy to the UK and selecting ORE Catapult to be its partner in accelerating to market the largest wind turbine and longest blade in the world through an advanced, representative testing and validation programme.

The Catapult has continued to develop its capability for the representative testing of 10MW-plus platforms with the installation of the world's most powerful grid emulation system and hardware in the loop system testing, giving the Catapult one of the most sophisticated powertrain testing platforms in the world: the perfect platform for bringing future energy systems to commercialisation. Our agreement with GE was further strengthened with the announcement of the four-year Stay Ashore! research and development programme. The £9m initiative will aim to improve reliability, reduce unplanned maintenance and lower operating costs for next-generation turbines, while minimising human intervention, offering the UK supply chain an unparalleled opportunity to develop new products and services to support these next-generation technologies.

AXYS TECHNOLOGIES

Our industry-leading meteorological mast forms part of the UK's floating lidar expertise, supporting the acceleration of a versatile and cost-effective technology for the offshore wind industry.

AXYS Technologies entered the third and final stage of the Carbon Trust's Floating Lidar Roadmap, using ORE Catapult's met mast to demonstrate the viability of the Canadian firm's technology in the UK and accelerate its commercial acceptance. Catapult's offshore met mast, which is 3 nautical miles offshore stands in approximately 40 meters of water, and measures wind at five levels over one hundred meters above sea level. As a result, windfarm developers can understand how Floating Lidar Systems compare to the more traditional methods of wind measurement, and how they perform in various sea states and wind conditions typically seen in the North Sea. ORE Catapult's role in the Carbon Trust Floating Lidar Roadmap is helping companies demonstrate to industry the advantage of Floating Lidar Systems to assess offshore wind site viability, without having the full investment of a fixed bottom met mast.



Made up of an internal composite structure and high-tech textiles, as opposed to the prevailing fibreglass, ACT's blades are 24 per cent lighter. A lower weight means blades can be made 10 per cent longer than the standard 55 metre blade around today: producing nine per cent more energy and reducing the cost of energy by 6.7 per cent

ACT BLADE

ACT Blade, a spin-off company from UK yacht-sail developer SMAR Azure, successfully completed the first of two tests of its novel lightweight blade for wind farms at ORE Catapult's National Renewable Energy Centre in Blyth.

These tests will pave the way for its first operational deployment later. Made up of an internal composite structure and high-tech textiles, as opposed to the prevailing fibreglass, ACT's blades are 24 per cent lighter. A lower weight means blades can be made 10 per cent longer than the standard 55 metre blade around today: producing nine per cent more energy and reducing the cost of energy by 6.7 per cent.

Over three weeks, a full-length blade (13m) withstood the world's toughest simulation of offshore wind conditions, aimed at testing its structural integrity and durability to the limit. The test results showed that the blade could withstand extreme loads and every type of direction and twist, going beyond those predicted for an in-service turbine. Post-test inspections show it to have held its shape with no damage. The test data—including optically measured strain and deflection results from within the blade textile—are now being analysed to gain a fuller understanding of the blade's behaviour.



EGRID

Part-funded by ERDF, the project to install one of the world's most advanced Grid Emulation Systems in Blyth has been completed and eGrid is now operational.

Before connecting to the grid, wind turbines must prove that they comply with strict grid codes, which generally requires a full-scale prototype to be erected to allow for a series of tests to be run. This is a timely and costly endeavour.

This is where eGrid comes in. The 18MVA system allows our clients to simultaneously test mechanical and electrical systems, in order to evaluate electrical performance, gain critical performance data and achieve grid-compliant assurance. By using the Catapult's assets, the system provides a platform for electrical power quality research and testing in a controlled environment.



We are constantly looking for new ideas that push the boundaries of offshore wind technology innovation. By nurturing the next generation of high-growth businesses and partnering with leading universities to carry out cutting-edge research, we take the most promising new technologies through to the market faster and help reinforce the UK's reputation as a world-leading innovator on the global stage.

CASE STUDIES

WHOLE ENERGY SYSTEMS

With the rapid growth and cost-reduction in offshore wind, and with industry and Government setting their sights on 40GW and beyond, one of the greatest challenges to its continued development is the challenge of balancing power flows on electricity networks designed for a more centralised generation model.

We have partnered with the Energy Systems Catapult, academics, utility companies and others to explore the ways that energy systems can become more flexible and so use more offshore renewables.

Future 'smart' energy systems will integrate energy flows between the electricity and gas networks, and transport fuel supply chains, featuring new and improved technologies for understanding systems-level behaviour, energy storage (e.g. large lithium-ion batteries), automation of distribution networks, use of



hydrogen, and peer-to-peer energy trading, among others.

This is where the £4m Milford Haven Energy Kingdom (MH:EK) project comes in. MH:EK aims to accelerate the transition to an integrated hydrogen and renewable energy system by creating diverse, local, community-based markets that integrate with, and benefit from, the cluster of major energy infrastructure along the Milford Haven Waterway. The project will build hydrogen-ready features and technologies such as fuel cell RASA cars; hybrid heat pumps and hydrogen-ready boilers for heating into the Port's housing, commercial and renewables projects and will allow local people to test real-world hydrogen vehicles and home heating equipment. ORE Catapult, alongside a consortium of partners, is spearheading this transition to hybrid hydrogen and renewable energy production.

OFFSHORE WIND INNOVATION HUB

The Offshore Wind Innovation Hub (OWIH) is the UK's primary coordinator of innovation in the sector, focusing on offshore wind energy cost reduction and maximising UK economic impact.

Funded by the Department for Business, Energy and Industrial Strategy (BEIS) and delivered jointly by ORE Catapult and the Knowledge Transfer Network (KTN), the Hub presents UK offshore wind innovation priorities, supply chain growth opportunities and a comprehensive view of the funding landscape.

For the first time, the Offshore Wind Innovation Hub (OWIH) is considering Health & Safety (H&S) criteria as it assesses and prioritises the technology innovation needs of the offshore wind sector.

Health & Safety is becoming an increasing focal point for the industry in its drive to minimise the time people have to spend offshore, which will enhance safety and reduce the operating costs for offshore wind farms and potential onward cost to consumers.

The Hub's series of technology innovation roadmaps are advanced prioritisation tools that identify the innovation needs of the offshore wind sector by setting a series of industry technology challenges and calling for solutions. These innovation needs will also now be scored against their contribution to improving industry H&S.

The new scoring criteria, introduced by the OWIH's industry advisory group and verified by G+, the global offshore wind Health & Safety organisation, will help to better evaluate the sector's progress against its Sector Deal commitments as well as provide analysis on Health & Safety trends.

The OWIH's activities are overseen by a Technical Advisory Group (TAG) membership of which includes:

- Owner / operators: Ørsted, Scottish Power Renewables & Equinor
- WTG OEMs: SGRE, MHI Vestas & GE
- Service providers: CWind
- Tier 2 supply chain: JDR Cables, ABB, Atkins, DEMA and Subsea7
- Universities: Plymouth, Strathclyde and Durham

TIGER

The Tidal Stream Industry Energiser Project, known as TIGER, is an ambitious €46.8m project, of which €28m (69%) comes from the European Regional Development Fund via the Interreg France (Channel) England Programme. This is the largest ever Interreg project and will prove to be game-changing for the European tidal stream energy sector.

The total theoretical tidal energy capacity in the Channel region is nearly 4GW, which is enough to power up to three million homes. The TIGER project aims to drive the growth of tidal stream energy by installing up to 8MW of new tidal capacity at sites in and around the Channel region, thus driving innovation and the development of new products and services. TIGER will make a stronger, more cost-effective case to utilise this tidal energy capacity and justify the need for tidal stream to become part of the energy mix in the UK and France. The project will do so by harnessing economies of scale via volume manufacturing and multi-device deployment.

Proving that tidal energy generation will can be cost-effective on a large scale could open the door for it to become the renewable energy source of choice in coastal locations, helping the growth of clean energy generation.

TIGER brings together multiple partners across the UK and French offshore renewable energy supply chain to work towards validating the commercialisation of marine energy technology. This validation will help to ensure that sustainable and affordable energy plays a key role in our future energy mix as we work towards achieving net-zero by 2050 and beyond.

Led by ORE Catapult, TIGER comprises of 18 partners including turbine developers, ocean energy demonstration sites, research organisations as well as local and regional authorities. ORE Catapult will have the primary role of project management and cost reduction analysis, coordinating the collection of this cost reduction data from the project and leading on the evaluation and presentation of the results.



Interreg VA France (Channel) England Programme

The Interreg VA France (Channel) England Programme is an EU programme that funds projects that benefit the Channel area in the south of the UK and north of France, using European Regional Development Fund (ERDF) funding.

The programme awards funding to projects whose partners work together for solutions to shared challenges in the Channel area.

www.channelmanche.com

INTERREG VA France (Channel) England Joint Secretariat / Secrétariat Conjoint INTERREG VA France (Manche) Angleterre



R2S

Aberdeen-based JF AIS as part of James Fisher and Sons PLC, brings its powerful digital twin solution named R2S to the offshore wind industry, presenting asset data in a real-world context to save time and money, improve safety and enhance collaboration.

R2S produces virtual walk-throughs of offshore assets embedded with data, enabling personnel to remotely visit sites and easily access technical and operational data – saving time and cost, improving safety, and enhancing collaboration. JF AIS has completed a critical research project with ORE Catapult to transfer digital twin technology into the offshore wind sector using its R2S technology. As part of the pilot project, the R2S technology was used to recreate a data-rich digital twin of our Levenmouth Demonstration Turbine to prove the unique solution enables technicians and interdisciplinary teams to view the turbine's inner workings and all pieces of equipment anywhere, at any time.

CLUE

The Concepts, Planning, Demonstration and Replication of Local User-friendly Energy Communities (CLUE) project aims to investigate how we better serve the energy needs of our local communities and combine different energy sources with local demand more effectively.

CLUE is a world-first series of demonstrations tackling the integrated energy system challenge for heat, power and transport. Our turbine will be used to show how energy produced from offshore wind can be distributed through a web-of-cells network architecture that offers the potential for local communities to trade energy with one another, and lead to greater generation and demand balancing at a regional and national level. The project acts as a stepping-stone to highlight the potential of integrating hydrogen as part of our renewable energy mix on a larger scale for future/follow-on projects.



As strategic initiatives designed to supercharge our outreach and impact, the Catapult's Growth Platforms take us from the local to the international level. We help link the firms with the highest potential to the biggest opportunities both nationally and in the global offshore wind marketplace. Here are just a few examples of the Catapult's work delivering economic impact for UK firms by helping them win more business at home and abroad.

CASE STUDIES

LAUNCH ACADEMY

In October 2019, ORE Catapult launched a new industry-backed national technology accelerator programme, the Launch Academy, which is designed to help SMEs commercialise new technologies for the offshore wind supply chain.

Launch Academy will focus on near-market solutions and is backed by a mix of SME support specialists and some of the world's biggest renewable energy companies, including Siemens Gamesa and Red Rock Power. Launch Academy is a bespoke, nine-month programme that will culminate in participants pitching their product or service to the strategic partners and the Catapult's network of investors with the aim of securing finance and a route to market for their products

Ten innovators won out against fierce competition to secure a place in the first intake of the Launch Academy.



The **Cleantech Offshore Renewables Accelerator** is the Launch Academy programme specifically for the North East of England. The programme has been established to accelerate early-stage SME cleantech solutions from across the region, in order to enhance the North East's offshore wind supply chain and drive cost reduction through innovation.

The programme will take six companies through nine core modules, offering funding, legal, IP, accountancy and investor readiness support, as well as modules delivered by ORE Catapult such as technology assessment, supply chain readiness and business case review.



MARINE ENERGY ENGINEERING CENTRE OF EXCELLENCE (MEECE)

With 600 miles of coastline, Wales has abundant natural resources from which to harness low carbon, clean wind, wave and tidal energy.

The Welsh Government has set ambitious renewable energy and decarbonisation targets, including an aspiration to generate 70% of its electricity consumption from renewables by 2030, which would put it at the heart of the UK offshore renewable energy success story. Building on over three and a half years of working closely with the Welsh Government to support the development of marine energy technologies, ORE Catapult has established the Marine Energy Engineering Centre of Excellence (MEECE) in Pembroke Dock, South West Wales, funded by the European Regional Development Fund (ERDF) and in partnership with the Welsh Government and leading Welsh Universities.

The primary focus of the Centre is providing expert knowledge for the marine energy industry, supporting Welsh SMEs to develop new products and services, create new jobs and reduce the cost of marine energy, by carrying out collaborative marine energy research, development and demonstration (RD&D) projects.



RESEARCH HUBS

Our Research Hubs aim to build a stronger, complementary offering of applied academic research, innovation, demonstration and representative testing to the offshore renewables sector. The activities of the Hubs combine academic and industry skills and resources to better respond to industry's needs.

Wind Blade Research Hub

The Wind Blades Research Hub (WBRH) is a £2.3million, five-year research partnership between the Offshore Renewable Energy Catapult and the University of Bristol that aims to help unlock larger, more powerful wind turbines than ever before. It has a particular focus on understanding key uncertainty for next generation turbines such as blade loading in very long (125m+) turbine blades, new more resilient materials and aero-elastic properties.

Electrical Infrastructure Research Hub

The Catapult has partnered with the Universities of Strathclyde and Manchester to form the Electrical Infrastructure Research Hub. The Hub will accelerate research and development activities, tackling the challenge of making the UK's electrical infrastructure systems future-proof to meet the needs of the growing offshore wind, wave and tidal industries. With a five-year investment of around £700k from ORE Catapult, and £2.4m match funding from its university partners, the Hub will address a selection of key research topics and themes.

Powertrain Research Hub

With the University of Sheffield on board as the Hub's academic partner, the Powertrain Research Hub will support the development of future technologies for larger turbines. The University is world-renowned for its expertise in electrical machines, power electronics, controls and energy conversion and storage, and will contribute a minimum of £1.7m over five years. This complements £700k funding from the Catapult, with the collective contributions supporting 12 PhDs, a number of Postdoctoral Research Associates, and access to a comprehensive range of world-leading powertrain testing facilities. The reach and impact of the Hub is further enhanced by direct investment of £500k from GE Renewable Energy, complementary to their £9m collaborative research programme with ORE Catapult, Stay Ashore.

29

PhD students supported



THE OFFSHORE WIND GROWTH PARTNERSHIP (OWGP)

The Offshore Wind Growth Partnership (OWGP) is a key feature of the 2019 Offshore Wind Sector Deal between industry and Government, which will see at least 40 gigawatts of offshore wind installed by 2030, generating a third of the UK's electricity (up from approximately 10GW currently). It will also see UK content in our offshore wind farms increase from 48% currently to 60% by 2030.

The OWGP is funded by the offshore wind industry to the tune of £100m over 10 years and is being delivered by ORE Catapult, providing support to supply chain companies to enable them to grow and increase their competitiveness. Support includes access to direct funding and a range of services such as expert advice on manufacturing and commercialisation as well as funding for innovation. This will:

- Help UK companies currently in the UK offshore wind supply chain
- Enhance the ability of UK companies to export products and services around the world
- Enable companies from other sectors to enter the offshore wind supply chain
- Inspire companies to develop the next generation of innovative products and services to meet specific industry requirements



"The offshore wind industry is offering multi-million pound opportunities to hundreds of innovative companies throughout the UK in the years ahead – including new entrants to the market as well as firms already working in this area.

"The Offshore Wind Growth Partnership will provide practical help for UK companies so they can compete successfully for contracts in this thriving global market. The UK's global pre-eminence in offshore wind means we are uniquely placed to sell our innovative products and services worldwide"

Benj Sykes
Industry Chair of the OWIC and Ørsted UK
Country Manager for Offshore

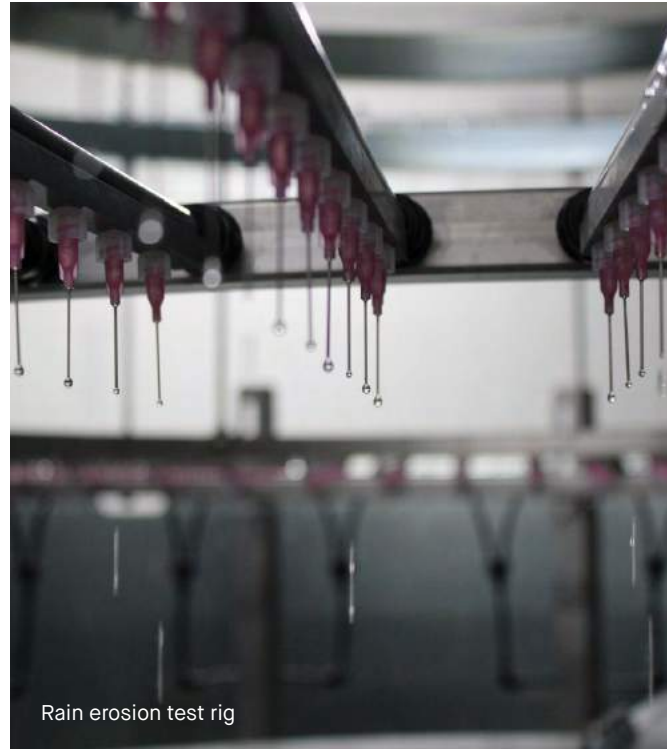
REPORTS

- [Realising the Sector Deal Opportunity - Miriam Noonan, Analysis and Insights Manager, ORE Catapult](#)

In March 2019, The UK Government and Offshore Wind Industry agreed a transformative sector deal, securing offshore wind's position at the heart of the future UK energy mix as a large-scale, low-carbon form of electricity. Miriam Noonan sets the context of the current and future outlook for UK offshore wind, introducing the main aspects of the Sector Deal and outlining the topics to be addressed in the remainder of this series. Covering the offshore wind industry's cost reduction trend, the UK's project pipeline, and looking forward to 2030 and enabling the Sector Deal's ambitions, this is essential reading for anyone involved in renewable energy in the UK.

- [Benefits of floating offshore wind to wales and the south west - Miriam Noonan, Analysis and Insights Manager, ORE Catapult](#)

This report investigates how the industries surrounding the Celtic Sea can maximise local content. Under the UK's Industrial Strategy and Clean Growth Strategy, there is an increasing need to demonstrate that public funding of energy generation is giving value to UK taxpayers and energy consumers. Currently the UK supply chain for fixed bottom offshore wind is achieving 48% of the lifetime value of projects.



Rain erosion test rig

WIND BLADE RESEARCH HUB

[Lifetime prediction of leading-edge protection systems.](#)

This Wind Blade Research Hub project aims to develop a methodology that can predict a leading-edge protection system's in-situ lifetime from rain erosion test (RET) results.

Blade leading edge erosion is a problem both on and offshore, but the erosion seems to be accelerated offshore due to harsher environmental conditions. Erosion affects the aerodynamic performance of the blade, which leads to reduced turbine efficiency, reliability and availability, as well as increased operations and maintenance activity with repairs in situ being difficult and expensive.

Better understanding of the fundamental physics of erosion, and how it can be mitigated, will lead to greater efficiency and reduced costs, as well as assist in the development of protective coatings and materials.

ELECTRICAL INFRASTRUCTURE RESEARCH HUB

[Evaluation of Co-located Wind And Battery Storage Projects In The Light Of A Battery Sizing Algorithm For Maximum Return Of Investment.](#)

Given the increasing integration of offshore wind power into the UK electricity grid, and the associated implications on the grid reliability and stability, the incorporation of battery energy storage systems (BESS) with renewable energy sources has been a hot topic for the industry.

This research project looks to create a more robust business case for BESS by informing the industry of the economic benefits and challenges for the co-location of offshore wind farms and BESS in the UK. The research simulates the operation of an offshore wind farm in conjunction with BESS under different scenarios, where the primary role of BESS is to provide enhanced frequency response or dynamic firm frequency response driven by frequency deviations from the nominal 50Hz. In addition, the research can help the offshore wind industry make suitable operational strategies for offshore wind farms in conjunction with BESS and determine the best size of BESS for the maximum return on investment.

BOMBORA

[Aberdeen-based JF AIS as part of James Fisher and Sons PLC, brings its powerful digital twin solution named R2S to the offshore wind industry, presenting asset data in a real-world context to save time and money, improve safety and enhance collaboration.](#)

Bombora is a leading wave energy technology developer and will soon deploy its first 1.5MW device, named mWave™, off the coast of Pembrokeshire. The current design focuses on nearshore, shallow water locations; however, the lion's share of the global wave energy resource is located in deeper offshore sites.

As a result, Bombora has teamed up with ORE Catapult as part of the Marine Energy Engineering Centre of Excellence (MEECE) to identify a techno-economic solution that is viable for such sites.

This feasibility study is investigating the optimum approach to mounting mWave™ on a floating platform to ensure sufficient energy production and be built cost-effectively. The MEECE project team is leading on the numerical modelling work to build the floating platform and determine energy generation, which will feed into economic analysis performed by ORE Catapult's Analysis and Insights team to assess the economic viability of Floating mWave™.



ORE Catapult's Community Engagement activity is clearly and strategically focused on improving STEM education within the communities in which we operate. Through this approach, we are able to leverage our investment in targeted schemes with additional time, experience and expertise of our team, and access to our facilities.

ORE Catapult's work with local schools and businesses continued to grow in 2019/20 as we logged over 6300 hours of CSR activity across three locations, including internships, one of which resulted in the appointment of a full time position with the Catapult's marketing team.

6337

Hours of CSR activity undertaken

We continue to fund a full-time Principle Teacher – STEM at Levenmouth Academy, co-ordinating an extensive extra-curricular and additional STEM programme, as well as a number of attainment awards. With more young people pursuing STEM subjects at Levenmouth Academy, and improved take-up among disengaged pupils, the Catapult's support is having a long-lasting beneficial impact on the community immediately around our Levenmouth Demonstration Turbine.

The Catapult is also a Gold Level supporter of Newcastle College, providing engineering skills through hands-on learning by hosting a number of students for education days delivered at ORE Catapult's Blyth site. Catapult has supported a number of the College's STEM and career events, and acts as an industrial advisor on renewable energy engineering course delivery. We continue to proactively support the Blyth STEM Hub, sitting on the Hub's strategy group. The Hub has delivered major engagement for hundreds of young learners from local primary and secondary schools, supported teachers through CPD sessions in areas such as coding, and delivered a Teacher Externship programme for 18 teachers to visit local businesses – including ORE Catapult – and learn more about the industries and career opportunities in the region.

We continue to provide an Enterprise Advisor to Duke's Secondary School, supporting the school's career programmes against the Gatsby Benchmarks. The initiative, run by the North East Local Enterprise Partnership (LEP), is focused on providing encounters with employers and experiences of workplaces. The scheme has delivered engagements with ORE Catapult and other local firms, such as Osbit, HT-Media, AkzoNobel and Bernicia Group. The school is also supported by ORE Catapult on its Career Ready programme for students close to leaving education and considering careers.

Our 25 STEM Ambassadors in Scotland hosted and supported over 60 events and activities, reaching over 5,000 students, parents and teachers in 2019/20. This included delivering

STEM lessons on engineering, renewable and sustainable development to the STEM clubs at Craigton, Saracen and St Teresa's Primary schools in Glasgow; supporting the delivery of STEM projects such as Primary Engineer in person and virtually via online presentations through the Engineering Leaders Awards; hosting stands at careers fairs to talk about ORE Catapult and offshore renewable energy, including supporting "Scotland's Biggest Parents Evening" with the DYW at the Glasgow Science Centre, and volunteering as judges for regional and national finals of STEM competitions including Primary Engineer, SubseaUK STEM Challenge and Creating Engineers.

We visited schools, colleges and universities from Greater Glasgow, Lanarkshire, East Lothian, Fife, Dundee and even as far as Lossiemouth, as we helped celebrate the 100th anniversary of the Women's Engineering Society in 2019.

We also hosted four work experience students for one-week placements in our Glasgow office where they were introduced to the diversity of roles and opportunities within renewable energy through STEM subjects. Our Glasgow STEM Club, run by mechanical engineer, Lorna Bennet, was shortlisted for the Contribution to Skills Award at the Scottish Green Energy Awards on 6 December, showcasing the dedication and support for STEM delivered by ORE Catapult.

As we expand our geographic footprint across the UK, we have also supported STEM events with ambassadors in Humber and Wales, attending the Vex Robotics competition final in Telford and the Women Into Manufacturing & Engineering Event, to celebrate International Women's day, in Scunthorpe.

ORE Catapult is committed to providing a safe and healthy working environment for its employees, customers and stakeholders. Our Safety, Health, Environment and Quality (SHEQ) processes are critical to the way we work.

Our culture based safety programme, 'Each and Everyone,' and our safety work code, **Think Safe, Talk Safe, Act Safe**, enables each and every one of our employees to make a contribution to a safer workplace. A critical component of this programme is conducting regular TalkSafe discussions about the safety of the tasks we do, understand the risks involved and how we could complete tasks more safely.

To have a culture where each & everyone always thinks, talks and acts safely

Each&Everyone vision

each&everyone
Think safe • Talk safe • Act safe

FY19-20 SHEQ HIGHLIGHTS

- Implementation of a new and more robust document control platform
- Transitioned from OHSAS 18001 and achieved certification to the new ISO Health & Safety standard, ISO 45001.
- Transitioned from ISO 17025:2005 to the 2017 edition of the standard (General requirements for the competence of testing and calibration laboratories) accreditation.
- Successfully retained certification of the Quality, and Environmental Management System standards (ISO 9001 and ISO 14001).
- Mental Health awareness increased across the business and supported by a team of trained Mental Health First Aiders.
- Further Health & Wellbeing arrangements introduced including providing voluntary health checks for all employees.
- Successful development and implementation of measures to safely operate our testing facilities and meet customer requirements during the COVID-19 pandemic

LOOKING AHEAD TO FY20-21

Although the Catapult has a mature and embedded process for Health and Safety, Environment and Quality, we are always striving for continuous improvement and have developed a key set of objectives for the next year. These include:

- Continued diligence and development of all necessary measures to ensure the health & safety of all of our employees, contractors and customers when operating on any of our sites during the COVID-19 pandemic
- Continue to drive and further embed our culture-based safety, ensuring a consistent approach to SHEQ across all of our regional sites and ensure that the changing workforce receive the appropriate H&S training
- Maintain our ISO certifications and UKAS accreditation
- Drive improvements in organisational competence around hazard identification and risk assessment



With the emergence of broad consensus that we are facing a climate and environment emergency, the imperative to develop the capacity, efficiency and integration of renewable energy has never been greater.

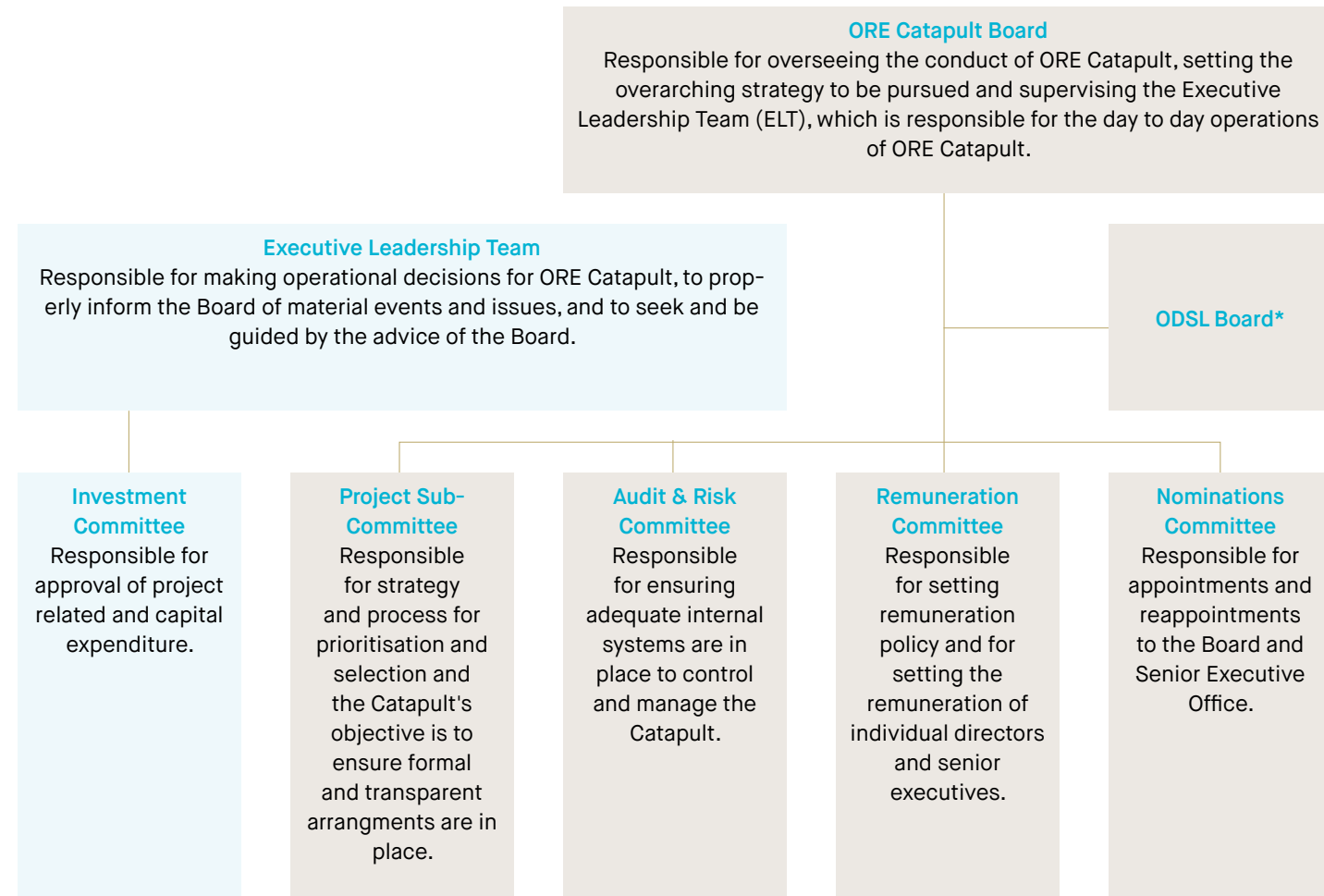
Offshore renewables are undergoing unprecedented growth, delivering more and more of our energy needs at lower cost. Huge economic benefit will flow from reduction in the price of electricity for consumers; but if we are to reap the full benefit of the green energy revolution for the UK economy, it is vital ORE Catapult continues to work with the offshore renewables sector to drive innovation forward, giving UK businesses and regions the competitive edge in meeting industry demands.

ORE Catapult operates at the centre of the offshore wind, wave and tidal industries in the UK, providing world-leading test and demonstration assets and leveraging our relationships with Owner Operators (OOs) and Original Equipment Manufacturers (OEMs) to connect them to UK supply chain companies, innovative technology developers, research organisations and academia. The developments and achievements seen across our facilities and programmes over the past 2 years confirm the unique capacity of ORE Catapult to accelerate development and deployment of the new technology required to realise green energy ambitions, our singular position as an independent, trusted broker of opportunities for innovators, and our ability to advise both government and industry strategy.

ORE Catapult has a proven track record in innovation, demonstration projects, world-leading facilities for renewables commercialisation and supply chain development. We are well-placed to be the key delivery partner for the government in an expanded innovation programme to exploit the enormous potential of offshore renewables for decarbonisation, economic growth and regional development.

One of the biggest opportunities around offshore renewables is its potential to benefit regional economies across the UK. In close partnership with local enterprise partnerships, authorities and Government agencies, the Catapult is working to nurture clusters of industry in areas like Grimsby, Aberdeen, the Humber, Pembroke, and the North-East, helping distribute investment out of London and into communities that have struggled to attract jobs following the decline of fishing and heavy industry.

And as the UK responds to the impacts of COVID-19 with an extensive green economic recovery programme, ORE Catapult is proactively developing a portfolio of multi-million pound initiatives in close alignment with the Government's ambitions for regional, low-carbon job creation, research and innovation.



ORE CATAPULT BOARD OF DIRECTORS



Colin Hood
Chair

Date of Appointment

31-March-2014

Committee Membership

N

Colin has over 35 years of experience in the Energy sector. At SSE, he joined the board as Power Systems Director and later became Chief Operating Officer. Prior to this, he was Director of Distribution for Southern Electric, having joined the industry with the North of Scotland Hydro Electric Board in 1977.



Professor Sir Jim McDonald
Non-Executive Director

Date of Appointment

31-March-2014

Committee Membership

N

Jim is the Principal and Vice-Chancellor of the University of Strathclyde, Chairman of both the Scottish Research Partnership in Engineering and the Scottish Energy Technology Partnership, and co-Chair with the First Minister of the Energy Advisory Board in Scotland.

- A Audit & Risk
- N Nominations
- R Remuneration
- P Projects



Professor Dame Anne Glover CBE FRSE
Non-Executive Director

Date of Appointment

01-April-2016

Committee Membership



Anne has a BSc in Biochemistry from Edinburgh and a PhD in Molecular Microbiology from Cambridge. She has pursued a career in scientific research at Aberdeen University.

In 2008 she was made a Woman of Outstanding Achievement in Science, Engineering and Technology (SET) and has worked hard to raise the profile of women in SET.

Anne was the first Chief Scientific Adviser to the President of the European Commission (2012-2015). Prior to that, she was the first Chief Scientific Adviser for Scotland (2006-2011)

In February 2018 she was appointed Special Adviser to the Principal, University of Strathclyde.



Fred Hallsworth B.Acc, C.A
Non-Executive Director

Date of Appointment

20-March-2015

Committee Membership



Fred had a 30-year career with Andersen, and latterly Deloitte, providing corporate finance and corporate governance services to public and private technology companies in Scotland and Cambridge. For the last 11 years he has worked as an Independent Non-Executive Chairman or Director. Fred is a lay member of the University of Strathclyde's Enterprise and Investment Committee advising spinouts.



Julia Brown DBE, The Baroness Brown of Cambridge
Non-Executive Director

Date of Appointment

20-March-2015

Committee Membership



Baroness Brown is an engineer. An academic career at Cambridge University led to senior business and engineering roles at Rolls-Royce plc. She was Vice-Chancellor of Aston University from 2006 – 2016.

She serves as: Deputy Chair of the Committee on Climate Change and Chair of the Adaptation Sub-Committee of the Committee on Climate Change; Chair of the Carbon Trust, and a Board member of Innovate UK.



Hugh McNeal
Non-Executive Director

Date of Appointment

01-July-2016

Committee Membership



Hugh became Chief Executive of RenewableUK in April 2016. Before this, he was Director of Change at the Department of Energy & Climate Change (DECC), improving the Department's efficiency and delivering financial savings. Other roles in the Civil Service included Chief Executive, Office for Renewable Energy Deployment at DECC, and Deputy Director of Low Carbon Business at the Department for Business, Innovation & Skills.



Huub Den Rooijen
Non-Executive Director

Date of Appointment

01-July-2018

Committee Membership



Huub den Rooijen is the Director of Energy, Minerals and Infrastructure at The Crown Estate. He leads the team responsible for managing the seabed around England, Wales and Northern Ireland. This includes rights to minerals and aggregates, cables, pipelines, carbon capture and storage, and offshore renewable energy.

Huub has over 30 years of experience in the energy sector, predominantly working with Shell where he was jointly responsible for creating its wind energy business in 1997 and managed its first offshore wind projects, including the first offshore turbines in the UK at Blyth in 2000.



Ronnie Bonnar
Non-Executive Director

Date of Appointment

01-January-2019

Committee Membership



Ronnie Bonnar started his career in the offshore oil and gas sector, working initially in the fabrication yards in the North of Scotland, followed by a number of assignments overseas. In 2005 he took on the role as Project Manager on the Beatrice Demonstrator Project and subsequently, in 2008, became co-founder and Operations Director of SeaEnergy Renewables Ltd. Following the acquisition of SeaEnergy Renewables in June 2011 by Repsol, he took up the role of General Manager responsible for all renewables activities in the UK, which included the development of three major offshore wind farms, Beatrice, Inch Cape and the Moray Firth projects.



Alex Smith
Non-Executive Director

Date of Appointment

30-January-2020

Committee Membership



Alex is currently Group Financial Controller, Risk and Insurance Manager of Forth Ports Limited, a large privately-owned UK ports group. She qualified as a Chartered Accountant and worked in a variety of roles within PricewaterhouseCoopers, including assurance, listing and transaction services serving a wide range of industry sectors. Prior to joining Forth Ports, she was seconded to the Scottish Government's Energy Directorate to support the team which created the Renewable Energy Investment Fund. Outside of work, Alex is an active member of the Institute of Chartered Accountants of Scotland Business Policy Panel and is a non-executive director for a number of local charities.



Andrew Jamieson
Chief Executive

Date of Appointment

31-March-2014

Committee Membership



Andrew spent 24 years with ScottishPower, where he held key roles in engineering, marketing and financial planning. In 2004, he moved to ScottishPower Renewables where he was responsible for energy policy and regulation. He is a former Chairman of both RenewableUK and Scottish Renewables, sits on the Scottish Government's Energy Advisory Board and has chaired a number of UK and Scottish working groups into the development of marine and offshore wind energy.



Andrew Walls
Finance Director

Date of Resignation

01-November-2019

Committee Membership

Andrew trained with the global firm PricewaterhouseCoopers, working with both private and public sectors delivering audit, financial diligence and consultancy assignments for the firm in the UK and abroad. He then joined the London and Edinburgh-based investment bank Quayle Munro Holdings PLC, initially focusing on infrastructure projects through the private finance initiative before joining their Executive team as Finance Director and Company Secretary. He is also a Trustee and newly appointed Audit Committee Chairman of Scotland's largest independent charity grant funder, the Glasgow-based Robertson Trust.



Steven Beattie
General Counsel, Company Secretary

Date of Appointment

01-November-2019

Committee Membership

Steven has advised on major infrastructure projects since 2008, initially as part of the Tier 1 ranked projects team at international law firm DLA Piper, where he advised on all aspects of PPP and other complex infrastructure projects, acting on behalf of sponsors, contractors, authorities and lenders. Steven then spent 7 years with the PPP investment arm of the Royal BAM Group, leading legal/commercial negotiations on national and international infrastructure projects within the BAM portfolio. Since joining ORE Catapult in early 2019, Steven has been responsible for shaping legal and commercial strategy and the delivery of legal services across the business.

Adrienne Airlie served on the board as a Director from 1 November 2019 until she sadly passed away on 5 December 2019.



ROLE OF THE BOARD

The Board has the primary responsibility of overseeing the conduct of ORE Catapult, setting the overarching strategy to be pursued and supervising the Executive Management Team (EMT), which is responsible for day-to-day operations.

Role of the Executive Management Team

The EMT's primary responsibility is to make operational decisions for ORE Catapult, to properly inform the Board of material events and issues, and to seek and be guided by the advice of the Board.

Board Composition, Roles and Responsibilities

Steven Beattie, General Counsel was appointed to the Board in November 2019 acting as Director and Company Secretary succeeding Andrew Walls, Finance Director who had served on the ORE Catapult Board since March 2015. One new Non-Executive Director was appointed in FY19-20. Alex Smith, Group Financial Controller, Risk and Insurance Manager of Forth Ports Limited joined the board on the 30 January 2020. ORE Catapult's Non-Executive Directors have a broad range of skills and insight from a variety of backgrounds to ensure there is a balanced view at Board Meetings.

REPORT FROM THE BOARD

During the year, the Chairman, supported by the Finance Director and Company Secretary, maintained a rolling 12-month agenda for Board and Sub-Committee Meetings. Standing items for discussion at each meeting are: Health & Safety, Financial Reporting against budget and revenue targets, Risk Management, a CEO Report on operational activity and updates from each of the Board Sub Committees.

The Board has a number of sub-committees to assist in discharging its responsibilities. The principal committees are the Nominations Committee, Remuneration Committee, Audit & Risk Committee and Projects Committee. The Board may also set up issue specific Committees when the need arises. The responsibilities of these Committees are set out in individual Terms of Reference which are available on ORE Catapult website. The Company Secretary is the Secretary to the Board Committees and ensures that the Committees adhere to the specific rules applicable to the Catapult under the Innovate UK Grant Funding Agreement ("GFA"), Corporate Governance standards; applying the provisions and principles of the Combined Corporate Code and Board Effectiveness Rules as well as maintaining compliance with the Articles of Association of the Company. Andrew Walls resigned as Company Secretary in November 2019 and was replaced by Steven Beattie, General Counsel.

NOMINATIONS COMMITTEE

The Nominations Committee is responsible for appointments and re-appointments to the board and to senior executive office. The Catapult's objective is to ensure a formal, rigorous and transparent procedure for the appointment of new directors to the board. ORE Catapult operates retirement by rotation provisions with Directors subject to a maximum of 2 x three-year terms. The Nominations Committee annually reviews Board composition and expertise with these provisions in mind. This year, Steven Beattie, General Counsel was appointed to the Board in November 2019 acting as Director and Company Secretary succeeding Andrew Walls, Finance Director who had served on the ORE Catapult Board since March 2015. The Nominations Committee commenced an external recruitment process for new a Non-Executive Director and Alex Smith was appointed in January 2020.

AUDIT & RISK COMMITTEE

The Audit & Risk Committee is responsible for ensuring adequate internal systems are in place to control and manage the Catapult. The Committee receives regular reports on the Company's finances, risk management arrangements alongside updates to key governance policies. In the past year the Audit & Risk Committee has overseen the annual statutory accounts and auditing process for recommendation to the Board for approval. The Committee has continued to take an interest in the risk management arrangements of the Catapult and was instrumental in the development of a new risk appetite model for approval at the Board. This has been a key area of development for ORE Catapult and the start of an increasing focus on risk-based decision making.

PROJECTS SUB COMMITTEE

The Project Sub-Committee is responsible for strategy and process for project prioritisation and selection and the Catapult's objective is to ensure formal and transparent arrangements are in place. Accordingly, the Board has established the terms of reference, including the delegation of authority documentation, for the Project Sub-Committee. In FY19-20, the Committee continued to review the delivery of ORE Catapult's project portfolio and the health of its pipeline activity. It also considered projects requiring Board approval.

REMUNERATION COMMITTEE

The Remuneration Committee is responsible for establishing remuneration policy and for agreeing the remuneration of individual directors and senior executives. The Executive Directors play no part in decisions on their own remuneration. The Remuneration Committee ensures that there is a formal and transparent procedure for developing policy on executive remuneration and for fixing the remuneration packages of individual directors. The Remuneration Committee uses independent evidence of total compensation for executive and management roles, both in similar types of organisation and across the energy sector, to benchmark remuneration packages, ensuring they are appropriate and sufficient to attract, retain and motivate people of the quality required to lead the Catapult. In FY19-20, the committee reviewed the objectives and targets of the Executive Team and approved the bonus provision for all staff, in line with current policy. The Committee also reviewed output from the Employee Opinion Survey to understand staff attitudes towards the company and the delivery of its services. The Remuneration Committee is responsible for setting remuneration policy and for setting the remuneration of individual directors and senior executives. The Committee also reviewed ORE Catapult's Gender Pay Report.

GENDER PAY REPORTING

Chair: Andrew Jamieson CEO



What is Gender Pay Reporting?

The gender pay gap shows the difference in the average pay between all men and women in a workforce expressed as a proportion of men's earnings. Having a gender pay gap is not unlawful or discriminatory of itself. Due to the nature of the work undertaken, there may be several reasons why organisations attract more men than women into the organisation. ORE Catapult has ca. 210 employees and although we are not obliged by law to publish Gender Pay Reporting, we have chosen to do so, recognising our commitment to transparency. Gender pay gap reporting is a different calculation to equal pay. Equal pay deals with the pay differences between men and women who carry out the same jobs, similar jobs or work of equal value. It is unlawful to pay people unequally because they are a man or a woman.

Our Results

Comparison of mean pay in Offshore Renewable Energy Catapult shows a gap in favour of men of 25%, a small improvement of 1% on FY18/19. Comparison of median pay in Offshore Renewable Energy Catapult shows a gap in favour of men of 17%, a small improvement of 2% since FY18/19. The mean bonus pay gap is 41% (FY18/19: 42%) and the median is 17% in favour of men (FY18/19: 17%).

What our results tell us

The Catapult's gender pay gap is gradually shortening year on year. At 17%, our median pay gap is marginally below the national average of 17.3%. To give context, at the end of March the Catapult employed ca. 125 individuals in senior roles in the areas of research, engineering and technical competence. By gender, these roles are predominantly male having been historically drawn from a majority male talent pool. Our results indicate that the majority of women we employ are in lower-paid jobs within the organisation.

Eradicating the gender pay gap – action we are taking

The Catapult recognises the offshore wind sector commitment to a higher participation by women (33% by 2030) in the industry and commits to seeking to achieve this target within our own organisation. Our overall approach to decreasing the industry gender pay gap includes both an external and internal approach.

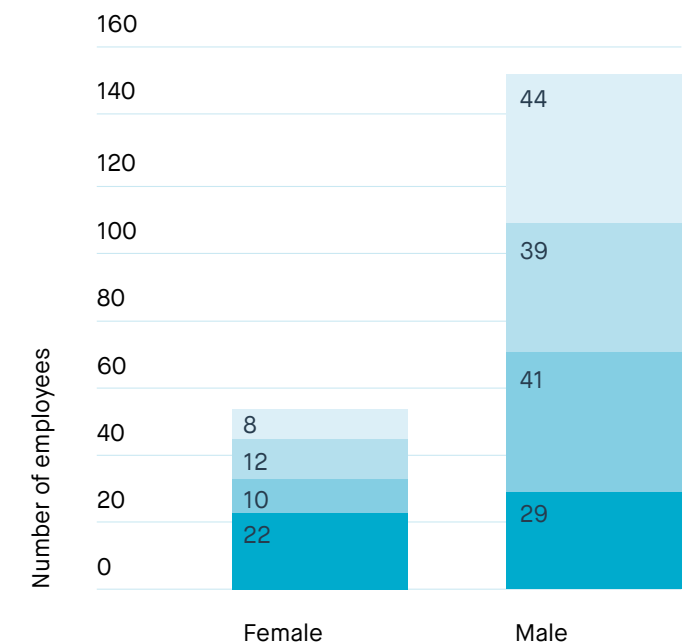
Externally, we support action looking to address the under representation of women within STEM roles, which are typically higher paid. To do this we support and promote several initiatives including encouraging our employees to volunteer as STEM Ambassadors and supporting our employees to support schools, career fairs and work experience opportunities. We currently have 29 STEM Ambassadors and recorded over 600 hours STEM activity up to the end of March.

Complementing our external engagement, we continue to undertake internal action too. Examples include unconscious bias training for

our employees, carrying out annual equalisation reviews, ensuring the continued review of gender pay during recruitment and securing equal numbers of males and females in our salaried placement and intern programmes. In addition to the approaches already outlined, this year we plan to capture the lessons we can learn from the flexible working approaches we adopted during COVID 19, looking to introduce these in the longer term, and to conduct a review of our remuneration strategy.

Gender Distribution across pay quartiles

- Q1 Hourly rate - £10.26 - £20.51
- Q2 Hourly rate - £20.54 - £25.00
- Q3 Hourly rate - £25.11 - £32.53
- Q4 Hourly rate - £32.74 - £156.69





At ORE Catapult we recognise the importance of providing an inclusive workplace for all our people to feel safe and supported at work, no matter what their individual characteristics. We encourage everyone to bring their whole selves to work to enable a work environment that is supportive and collaborative and where integrity is valued. As well as benefiting employees, we believe this approach also creates the conditions for the diversity of thought and innovation that allow us to perform at our best for everyone. Demonstrating resilience and determination to overcoming barriers, we will strive to achieve excellence.

We recognise that at ORE Catapult we are on a learning journey, exploring and growing in our understanding of equality, diversity and inclusion.

Over the next year we will renew our effort on gathering knowledge, working with organisations with relevant expertise to assess where we are at as an organisation, and use this to inform and develop our future strategy and approach. We will be working on creating a more inclusive environment and pursuing outreach measures for those who are currently under-represented in our organisation, including Black and minority ethnic communities, disabled people, women and those from the LGBTQ+ community.

We believe that by creating such an environment we can attract the very best talent, regardless of background, to work at ORE Catapult. We will seek feedback from our current employees and ensure our inclusion efforts are well informed by their lived experience.



RISK MANAGEMENT PROCESS

ORE Catapult manages a portfolio of risks that represent both internal and external challenges to the business. Risks are proactively identified, assessed and reported to the Executive Management Team and Board. Mitigations are progressed to reduce the impact of the risk should it materialise and the likelihood of occurrence. All risks are identified and categorised against risk categories that reflect the nature and scope of the Catapult's activities.

A review of risk appetite was undertaken in FY18-19 to understand our attitude towards risk as an organisation and for each type of risk we encounter. This exercise was conducted with the Executive Team and considered by the Audit & Risk Committee prior to approval at the Board in January 2019. Steps are now being taken to roll out risk appetite across the organisation to ensure it is embedded into our risk management processes and decision making. This work will continue into FY19-20.

KEY RISK THEMES

ORE Catapult has considered a number of strategic and operational risks, including:

Health & Safety - The safety of our staff is paramount in ORE Catapult. If the right controls and protections are not in place, the consequences could be catastrophic for our staff and visitors.

Mitigation: The Catapult has a comprehensive set of policies and controls in place to manage the safe operation of our activities. Our cultural behaviour programme, 'Each and Everyone' continues to drive our commitment to Think Safe, Talk Safe, Act Safe across the organisation. Regular reporting of incidents and near misses ensures transparency in our culture and allows us to learn and implement actions to further reduce the potential of injury to our staff.

Innovation and CR&D Funding – The availability of publicly available funding for research and innovation work is vital to ensuring the Catapult can collaborate with UK businesses and deliver impact to the sector.

Mitigation: ORE Catapult has a strong track record of accessing and winning publicly available funds. It has developed strategic relationships with BEIS and across Europe to ensure visibility of forthcoming opportunities.

The Catapult's Key Performance Indicators (KPIs) are set out in ORE Catapult's Grant Funding Agreement with Innovate UK and monitored by the Executive Management Team. In addition, Innovate UK conduct a quarterly review of ORE Catapult's performance including progress against KPIs.

		Q4 / FY-end			
KPI		Target	Actual	Variance	
1	Number of businesses the Catapult has partnered with or been sub-contracted by, year to date	60	94	34	
2	£s invested by UK businesses as match funding to CR&D projects with the Catapult, split between UK large and SMEs (£000s) – cumulative	Large	1,200	1504	304
		SMEs	700	2902	2202
3	Progression from concept to commercialisation (Number of projects completed, see notes)	20	35	15	
4	% of commercial income target for year achieved, year to date	100%	154%	-54%	
5	Number of active projects with a UK business (split between UK large and SMEs)	Total	75	113	38
		Large	50	73	23
		SMEs	35	54	19
6	% of CR&D income target for year achieved, year to date	5%	100%	95%	
7	Number of collaborative 'R&D focussed' (i.e. not HR, Finance, etc.) projects completed year to date	50	65	15	
8	% of projects in current project portfolio that involve both academic and industrial partners	31%	29%	-2%	

ORE Catapult's statement of comprehensive income for FY19–20 is highlighted below.

Turnover	£'000	£'000	£'000
Innovate UK core revenue grant funding	13,254	11,997	11,770
Other income including CR&D and commercial	14,701	10,819	7,323
	27,955	22,816	19,093

Capital funding

Innovate UK capital grant funding	2,600	2,881	3,709
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Capital funding

Fixed assets	67,796	70,818	70,922
Investments	14	14	14
Net current assets	7,331	5,052	2,371
Creditors amounts falling due > 1 year	58,481	62,034	57,037
Provisions for liabilities	5,997	6,014	9,514
Net assets	10,663	7,836	6,756
Capital and reserves	10,663	7,836	6,756

The financial information in this review is extracted from the consolidated financial statements and accounting records of the Offshore Renewable Energy Catapult.

Offshore Renewable Energy Catapult is limited by guarantee and registered in England and Wales under company number 04659351 with registered office at Offshore House, Albert Street, Blyth, Northumberland, NE24 1LZ.

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Engage with us

