



Wave & Tidal Energy

NETWORK

COMMUNICATION HUB FOR THE WAVE & TIDAL ENERGY INDUSTRY

North Wales

Oils & Lubrication

INDUSTRY UPDATES

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sustainability
WRITTEN IN OUR
STATUTE

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Llywodraeth Cymru
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Just Ask Wales

Welsh Assembled

In our last edition we brought our readers' attention to the advances made in particular areas of the UK. We therefore ran a feature on Wales and focused on Pembrokeshire and Haven Enterprise Zone.

NORTH WALES

We now turn our attention to North Wales where again we find companies and organisations working together and passionately believing in the future of wave and tidal energy.

The Welsh Government continue to sponsor the second in a series of four in a long term focus on the industry in Wales.

OILS & LUBRICANTS

Our Oils & Lubricants focus feature Klüber Lubrication, a global leader in the industry emphasises the need for working together to achieve great benefits for all.

They comment *"By working in close collaboration with leading OEMs the company continues to push the limits of efficiency and performance helping to achieve the best operational practices that combine economic savings with environmental benefits."*

EDITORIAL CONTRIBUTIONS

Please feel free to contribute to the next edition. The next edition will be our Summer issue as the feedback we have received from the industry in general points towards a quarterly publication.

Your contributions will be vital to this success so please do not hesitate to get in touch.

FEATURES – CONTINUE GETTING INVOLVED

As the magazine grows so will the individual features on all sorts of areas within the industry.

These features emanate from our discussions with leading experts during our visits to conferences and events, as well as our editorial team bringing up subject areas when looking at the industry as a whole.

Please feel free to contact us if there is any subject area which you think may be of interest to our readership and we will do the rest – there is never any charge for genuine editorial.

You will find our 'Forthcoming Features' tab on our website in the magazine section.

MAGAZINE AND WEBSITE INTERACTION – QR CODES

As with our sister publication, Wind Energy Network, we have pink and green flashes indicating more information online.

QR codes have been substituted in the printed version which means that you can scan the code with your smart phone and it will direct you to more information from the featured company or organisation, so that you can learn much more in all sorts of formats.

These have already become very popular as it links the printed magazine in a very interactive way – a great marketing tool for our decision making readership to find out about products and services following the reading of an interesting article.



Duncan McGilvray - Editor
Wave & Tidal Energy Network

[Click to view more info](#)

Bridging the Gap

OUR COVER IMAGE IS THE FAMOUS AND IS VERY APT, DENOTING NOT ONLY OUR FOCUSED AREA OF THE NORTH OF WALES, BUT IT ALSO SYMBOLISES A JOINING TOGETHER OF AN AREA IN ACHIEVING COMMON GOALS.

The North Wales feature, the second in our continued Wales spotlight contains more than 30 pages and includes a varied mix of companies and organisations. There is also a section introduced by Dr Michael Roberts of SEACAMS (Sustainable Expansion of the Applied Coastal and Marine Sectors), whom we interviewed recently, which brings together a number of articles introducing organisations that combine to form a very close working relationship within business and academia.

OILS & LUBRICANTS

You will find a very informative article within this edition on Oils & Lubricants by Klüber Lubrication, a global specialist and regular contributor to the magazine.

FOUNDING PARTNERS

Now into our 6th edition we again welcome their continued support of our 'Founding Partners'.

Their professional and valued feedback is extremely helpful to our team and we would like to again to thank them for their support, advice, ideas and time – it is much appreciated.

Duncan McGilvray - Editor
Wave & Tidal Energy Network

OUR FOUNDING PARTNERS:



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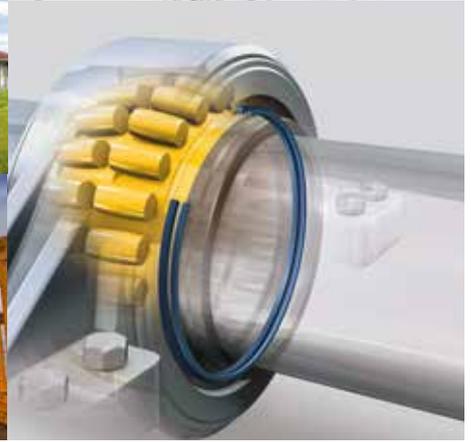
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MAKING WA

It is true to form that each time I am asked to report and interview clients for the purposes of this publication, I must admit to a feeling of anticipation and a slight quiver of excitement from within, as I literally embark on another voyage of discovery. Without becoming too euphemistic and allowing my journalistic juices to overflow, I in short, feel privileged to be invited into worlds of such specialism and intrigue! Have I whetted your appetite yet? Well, good. I will cut to the chase...

TRULY MADLY DEEPLY...

I introduce to you Seiche who have been one of our Founding Partners for this publication since its inception and catch up with Phil Johnston, Business Development Manager for these experts in underwater acoustics. Long established as market leaders in the design and manufacture of cutting edge hydrophone systems, Seiche also offer an extensive suite of services for sound measurement and propagation modelling.

AND NOW FOR SOME STATS...

With an impressive 18 years' experience and over 130,000 days of deployment in 7 continents Seiche' have gained their world-leader status within passive acoustic monitoring (PAM). Such success has led to Seiche being ranked in the Sunday Times Hiscox Tech Track 100 (August 2015) as one of the 100 fastest growing technology companies in the UK, and number 1 in the marine sector.

All the while pioneering a range of marine acoustic solutions: Novel methods for sound measurements in challenging environments, such as through the use of drift buoys and unmanned surface vehicles USVs. State-of-the-art low noise digital array, just 20mm in diameter. And remote PAM monitoring which uses satellite technology to transmit signals direct from a vessel anywhere in the world to dedicated monitoring stations within UK and US whereupon highly trained specialists listen to the live audio feed and view the computer screen at source 24 hours a day 7 days a week in real time.



Phil Johnston

DUTY OF CARE

Adhering to environmental impact assessment (EIA) at the various stages of a project is paramount, hence collation of accurate 'research and modelling' of the marine environment allows the client to follow the most appropriate mitigation for their continued operations.

ANOTHER FIRST!

This leads rather seamlessly onto one of the company's most recent major projects which saw on 16th December 2015 the installation of an advanced acoustic monitoring system on the Delta Stream tidal stream generator— off the coast of Pembrokeshire, Ramsey Sound. The involvement on the TEL (Tidal Energy Limited) is in collaboration with SMRU (St Andrews University). Seiche's solution comprises of four listening pods each containing three hydrophone sensors, specially designed for turbulent conditions. Sound is then transmitted to shore via an optic fibre link. Live monitoring provides real-time mitigation and valuable evidence on the collision risk between marine mammals and the device.

IMPORTANCE OF RESEARCH & DEVELOPMENT

Phil goes on to say that the company has an inbuilt ethos of the importance of R&D and have forged excellent collaborative relationships with Universities such as Bath and St Andrews and Plymouth University stretching the boundaries of innovation, providing feasibility studies and intellectual packages.

As an eminent expert within it's field the company also runs a highly successful training arm offering a suite of courses from Advanced Underwater Acoustics to Marine Mammal Monitoring – accredited by the government regulators, JNCC (Joint Nature Conservation Committee).

WAVES



DELIGHTED TO ANNOUNCE...

There seems to be no end to this innovative company's scope and capabilities as Phil reveals to me that the company has just recently entered into a partnership with the Norwegian company, Lofitech, for the supply of Acoustic Deterrent Devices or ADD for mitigation of marine mammals during renewables developments.

Phil goes on to say *"There is a vital need for effective mitigation of marine mammals in the offshore renewables industry and the highly-regarded Lofitech ADD is a great addition to our portfolio here, alongside quality passive acoustic monitoring and services for sound measurement and modelling"*

THE FUTURE

Recent expansion into new premises with their collaborative partners Ashridge Engineering (Okehampton) who manufacture sensors and leak detectors for the water and electricity industries has further diversified Seiche's extensive portfolio.

IN A NUTSHELL

As is the case in most of my narratives, I could continue ad infinitum, however this will be a pleasure postponed as we will catch up with Seiche in future issues to follow their journey and successes!

FACTOID

Definition of Seiche is a standing oscillating wave in body of water - from a massive lake to a small coffee cup!

FINAL FACTOID

Seiche is French for Cuttlefish!



Interview by
Fliss Chaffer
Wave & Tidal Energy Network

Seiche Ltd
Founding Partner

[Click to view more info](#)

Successful deployment of OpenHydro tidal turbine on EDF's Paimpol-Bréhat site

James Ives, OpenHydro Chief Executive, said: *"The first of two OpenHydro tidal turbines on EDF's Paimpol-Bréhat site has been successfully deployed. After a series of successful tests evaluating mechanical and electrical performance the 16-metre diameter turbine was towed out to sea on Wednesday 20th January and deployed by the OpenHydro barge."*

WORLD'S FIRST GRID CONNECTED TURBINE ARRAYS

"When both Open-Centre Turbines are connected to the grid, before summer 2016, the project will be among the world's first grid connected turbine arrays."

ESSENTIAL STEP IN COMMERCIAL PROGRESS

"The Paimpol-Bréhat development is an essential step in progressing towards commercial scale arrays. It will allow EDF and OpenHydro to benefit from invaluable experience and help prepare for the Normandie Hydro project, which will see seven tidal turbines in the Raz Blanchard by 2018."

OPENHYDRO

OpenHydro is a DCNS company specialising in the design, manufacture and installation of marine turbines generating renewable energy from tidal streams. The company's vision is to deploy turbine arrays under the surface of the oceans to produce energy silently, invisibly and with no impact on the environment.

DCNS

DCNS is a world leader in naval defence and an innovative player in energy. The Group's success as an advanced technology company with global reach is built on meeting customer needs by deploying exceptional know-how, unique industrial resources and an ability to develop innovative strategic partnerships.

The group designs and builds submarines and surface combatants, develops associated systems and infrastructure and offers a full range of services to naval bases and shipyards

OpenHydro



Completion of subsea cable deployment at MeyGen

James Fisher successfully completed the initial phase of work as principle contractor at MeyGen the world's largest commercial tidal energy array.

safely and in line with the programme is a commendable achievement by our onshore and offshore teams, aided by great performance from the vessel.



PENTLAND FIRTH, SCOTLAND

The company recently announced the successful deployment of the subsea export cables, as part of the initial construction phase (Phase 1A), in support of MeyGen Limited's (MeyGen) ground-breaking 398MW tidal array at Pentland Firth, Scotland.

Utilising specialist in-house expertise from a number of group companies, the integrated solution delivered significant cost benefits and operational efficiencies to MeyGen, through the combination of innovative products and services exclusive to James Fisher.

CHALLENGING TIDAL ENVIRONMENT

Tim Cornelius, CEO of the Atlantis Group – majority owner of MeyGen, said: *"This is an excellent result for the project. By its very nature the offshore site is a challenging tidal environment and to complete the installation campaign*

"After all the planning it is very rewarding to see the offshore infrastructure taking shape for this trail-blazing project."

Principle contractor James Fisher Marine Services (JFMS) acted as the project interface for the installation of four subsea cables at the MeyGen tidal energy project with Mojo Maritime (Mojo), marine management specialists acting as the project lead that co-ordinated all offshore activities during operations.

INNOVATIVE MARINE PROJECT PLANNING SYSTEM

Mojo was able to apply its innovative marine project planning system, Mermaid (which precisely simulates marine operations against historical tidal data), to accurately optimise critical project operations and significantly reduce costs. A short neap window was identified and in order to achieve it, the vessel would have to lay one cable every 12 hours. While

ambitious, this schedule was achieved and the offshore operation took just 2.5 days.

DP VESSEL

Mobilisation was very compressed and required extensive input from all involved to mobilise an entire cable spread in 4 days. The Siem Daya 1 DP vessel was carefully selected on its capabilities, as Mojo understood that securely positioning the vessel within the extreme tidal conditions would be a critical factor in achieving success.

RELENTLESS TEAM EFFORT

Commenting on the project's overall success, Richard Parkinson Managing Director at Mojo said: *"Attention to detail and the safety of all personnel was paramount throughout every aspect of this project. Installing 11km of cable in tidal speeds of up to 6 knots posed significant challenges in planning and delivery and we knew we had a demanding schedule.*

"It is a credit to the relentless effort of the team that we were able to achieve a safe and highly optimised cable pull and lay program."

INTEGRATED APPROACH

Demonstrating the streamlined service delivery from James Fisher, further group company involvement included; James Fisher Subsea heading up the diving services and mobilisation of a full dive spread, James Fisher Offshore supplying marine equipment and Fendercare Marine providing mooring systems.

Highlighting this integrated approach, JFMS Managing Director Richard Burmeister explained: *"I'm proud of our significant success at this project milestone. JFMS is all about delivering our extensive inhouse group capability through one contractual interface. This was a perfect example of how we aim to reduce our customer's supply chain by bringing together a streamlined solution, enabling improved cost-effectiveness and efficiency."*

James Fisher Marine Services (JFMS)

CABLE DEPLOYMENT

MeyGen tidal energy project

In September 2015 four subsea power cables were laid from the Ness of Quoy, in northern Scotland, out into the extreme tidal flows of the Pentland Firth. The cables had to be accurately laid in order to make best use of the shielding provided by the natural crags and gullies in the seabed.

Spring tides generate 10 knots of flow and therefore this shielding is vital to the longevity of the power cables. The cables are part of the MeyGen tidal energy project, the UK's flagship marine energy project, with plans to install 398MW of tidal energy.

PROJECT DETAIL

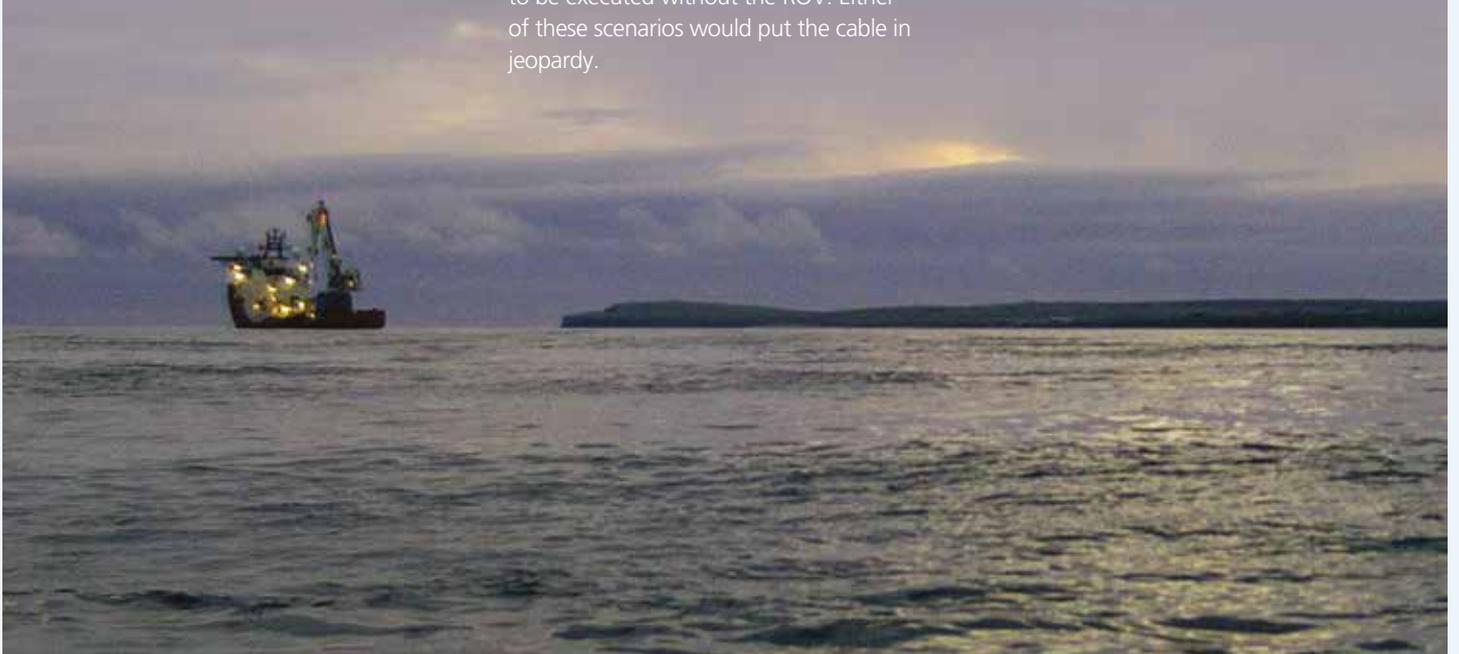
The team were using the Siem Daya, a DP 2 construction vessel, as the platform for the works. The vessel was selected for its excellent dynamic positioning performance but even with this capability it was vital that the cable laying was synchronised with the tidal cycle. The ebb flow is weaker than the flood and so all cable laying was to be carried out during the ebb.

The vessel was set up to deploy the cable over the starboard side, allowing the vessel to crab along the cable route with its bow headed into the flow. The plan required the lay to start at the end of the flood tide in order to use the slack tide at the end of the ebb to deploy the ROV and spot the lay of the cable termination. If the operation were to become out of sync with the tidal cycle there was a risk that the vessel would either be caught mid channel with its stern into the flow, or the final lay down would have to be executed without the ROV. Either of these scenarios would put the cable in jeopardy.

MITIGATING RISK

In order to mitigate this risk the team deployed a met-ocean data buoy, specially designed for tidal environments, into the channel. The buoy was fitted with a Teledyne ADCP and a UHF radio link which enables it to stream live tidal flow data over 15km. The system is called DataFish. During the operation the on-board camera took some fantastic photos that provided a unique record for this ground-breaking project.

North Sea Systems



Atlantis Resources Joins Ocean Energy Europe Board of Directors

Tim Cornelius, CEO of Global tidal developer Atlantis Resources has taken a seat on the Board of Directors of Ocean Energy Europe – the industry group for ocean renewable energy – by becoming a Lead Sponsor of the organisation.

The move reflects Atlantis' position as a leading developer of commercial tidal power projects and underpins its commitment to driving the market for ocean renewable energy.

ACQUISITION

Following its acquisition of pioneering tidal company Marine Current Turbines early in 2015, Atlantis Resources now owns one of the largest and most diverse

portfolios in the business, with a project pipeline of 600MW. This portfolio includes the 398MW MeyGen project, the world's largest planned tidal stream array which is currently under construction in the Pentland Firth, Scotland.

VISION

Rémi Gruet, CEO of Ocean Energy Europe, said: *"Atlantis Resources has a strong vision for the future of the ocean energy industry and we are very pleased to have them join the Ocean Energy Europe Board of Directors.*

"We look forward to drawing on their strong experience as both a leading technology developer and a project developer to help build a fully commercial ocean energy industry, capable of meeting 10% of Europe's electricity demand by 2050."

HONOURED

Tim Cornelius, CEO of Atlantis Resources, commented: *"I am hugely honoured to be joining the Ocean Energy Europe board. As a longstanding member of this organisation, we fully endorse all the work it does to promote tidal power on a global platform. I look forward to sharing my experience and contributing to the development of the marine energy industry in Europe and beyond."*

BOARD OF DIRECTORS

Atlantis joins an impressive line-up of lead sponsors on the Ocean Energy Europe Board of Directors which includes senior representatives from: Alstom, EDF, Engie, Scottish Power Renewables, Siemens, DP Energy, DCNS, West Normandy Marine Energy, and Scottish Development International.

Atlantis Resources



Full-scale tidal stream turbine deployment

Tidal Energy Ltd (TEL), will shortly deploy its full-scale tidal stream turbine – DeltaStream™ – at Wales’ first consented tidal energy test site at Ramsey Sound in Pembrokeshire.

With a ground-breaking environmental monitoring regime, the DeltaStream project is one of the first to receive a precautionary ‘deploy and monitor’ environmental consent in a designated Marine Special Area of Conservation, having incorporated a number of design features to minimise, monitor and control any potential impact on the surrounding environment.

UNIQUE MARINE MAMMAL MONITORING PACKAGE

A unique and extensive marine mammal monitoring package has been developed by TEL incorporating a number of scientific technologies. These instruments and sensors including hydrophones, acoustic sonar, acoustic tracking, strain gauges and accelerometers have been integrated with standard industrial components for turbine control, operation and power generation.

In collaboration with Applied Renewable Research Ltd and SMRU Consulting, a highly integrated hardware and software solution was designed and implemented in order to handle the unprecedented scale of real-time data management in this field.

The information gained from the system with regards to behaviour analysis of different species and their interaction with the turbine will help open the window further on an as yet, little understood underwater habitat.

This complex suite of environmental monitoring subsystems will provide a robust and scalable marine mammal monitoring programme and can be tailored for any marine energy converter project.

GAINED EXPERIENCE AND KNOWLEDGE

The experience gained from this implementation will provide valuable experience and data for all stakeholders within the marine energy community and will revolutionise the way that tidal energy devices operate.

The learnings gained from the ‘deploy and monitor’ approach used for DeltaStream, will provide a better understanding of how mammals interact with these devices. This research and development is of global importance and will enable regulators, consultees and developers appreciate marine mammal behaviour in the vicinity of a tidal energy converter and ultimately leading to evidence-based risk assessments for long term environmental impact assessment.

INDUSTRY BENEFITS

Chris Williams, Development Director at TEL said, *“We are on the brink of delivering this ground-breaking data and are very excited about how the findings will benefit the industry as a whole. Having developed and integrated these systems, we are in a fantastic position to be able to provide the essential research to ensure the integrity of marine mammal species in the vicinity of marine renewable energy projects.”*

Tidal Energy Ltd



DeltaStream™ Tidal Turbine at Pembroke Dock. Courtesy of Tidal Energy Ltd

ORKNEY BUSINESS WINS PRESTIGIOUS AWARD



At the fourteenth Scottish Green Energy Awards held in Glasgow recently saw Leask Marine collect the top award for the Best Supplier to the Scottish Renewable energy Industry.

Organised by Scottish Renewables, the event is the most important of its kind which recognises the wealth of talent which exists in this industry especially in Scotland. The awards are highly competitive and showcase the depth and breadth of the industry that is still world-leading.

CELEBRATING RENEWABLE ENERGY'S FINEST

Over 1200 people from across the globe attended the glittering ceremony to celebrate energy's finest which was hosted by Fred

MacAulay and featured special guest the First Minister of Scotland, Nicola Sturgeon.

Douglas Leask commented: *"We are delighted to receive the prestigious award of Best Supplier at the Scottish Renewable Green Energy Awards tonight in Edinburgh alongside Green Marine. Many thanks to the Leask Marine team for their continued dedication and hard work as this award is a testament to the entire team."*

EXPERIENCE AND EXPERTISE

The award was presented in recognition that since it was established in 1985, Leask Marine Limited has consistently grown to become arguably one of the worlds most experienced marine energy supply chain business.

The company's skilled team of more than 45 people and seven multi-purpose vessels, three of which are designed specifically to support marine energy operations, putting the business in pole position to deliver at every phase of a projects lifecycle, from conception, design, engineering, reliability & survivability studies, testing, economic modelling, installation, operations & maintenance through to environmental decommissioning.

BUSINESS GROWTH

To support the ever-increasing demands on the business the company have moved into new extended office premises in the old Currie Brothers yard on Crowness Road, Hatston Industrial Estate in Kirkwall.

Leask Marine Limited



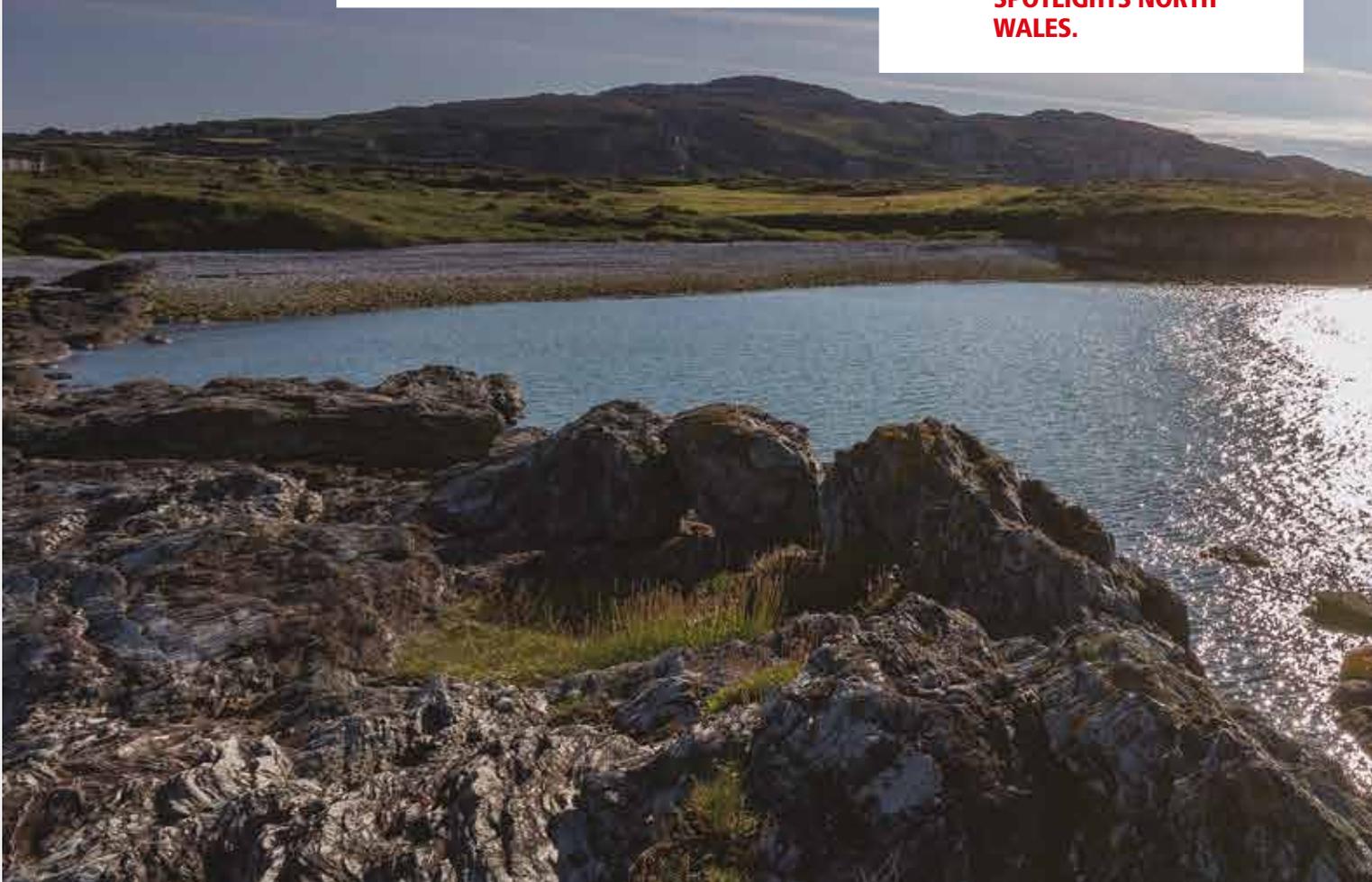
Wales

Continuing to lead the way in wave & tidal technology



WE CONTINUE OUR FOCUS ON WALES AND ITS FAR-SIGHTED ENERGY REQUIREMENTS CONCENTRATING ON SELF-SUFFICIENCY AND GREEN ENERGY.

THIS EDITION SPOTLIGHTS NORTH WALES.





NORTH WALES

**THE SMALLEST,
THE LARGEST &
THE HIGHEST!**

North Wales is a geographical area of Wales that takes in the Snowdonia National Park as well as the local authorities of Gwynedd, Anglesey, Wrexham, Flintshire, Conwy and Denbighshire.

The region is surrounded by beautiful scenery and is an area steeped in history which can also boast its own distinct regional identity, an identity which has spread across the world! In 1865, nearly 200 colonists left North Wales and setup camp in Patagonia in Argentina. To this day the community is still going strong with many Welsh speaking descendants still living in the area.

North Wales is also home to the smallest house in Britain (which is 10ft deep, 6ft wide & 10ft high and once housed a 6' 3" fisherman) and the highest aqueduct in the UK. Thomas Telford's 'Pontcysyllte Aqueduct' near Wrexham opened for traffic in 1805 and quite remarkably is still completely functional! It's 128 feet high (three and a half double decker buses) and as well as being a marvel of engineering, is now a World Heritage site. Quite amazing for a metal tub of water suspended in the air!

Bala Lake is the largest natural lake in Wales being 4 miles long and 1 mile wide and is home to an endangered white fish called the Gwyniad. Found nowhere else on the planet it came to be in Wales when its ancestors were trapped in the waters there at the end of the last Ice Age.

COMMUNICATIONS

Anglesey is only three and a half hours by train to London and less than a two hour drive to Manchester and Liverpool. The A55 expressway across Anglesey and north Wales ensures easy and quick access into the UK motorway network.

Anglesey Airport offers flights (Mon-Fri) to Cardiff - in just 40 minutes. Anglesey is less than a two hour drive to Manchester International and Liverpool airports.

The Port of Holyhead is the international gateway to Ireland for both freight and passengers (90 minutes on the fast ferry). The port is operated by Stena Line Ports Ltd and is a 24-hour, deep water, lock-free port, centrally located on the Irish Sea coast within easy reach of several major areas both in the UK & Ireland. The port provides potential for the growth of the cruise sector, and is already capitalising on the Irish Sea cruise market.

FANTASTIC TIDAL RANGE

In terms of wave and tidal resource, the coast of North Wales benefits from very strong tidal currents flowing around the coast of Anglesey and Colwyn Bay, further east along the coast has got a fantastic tidal range. It is one of several zones around the United Kingdom which have been leased out by The Crown Estate to encourage and accelerate the sector. Each of the zones were identified because they offer appropriate wave and tidal energy potential and access to necessary infrastructure, including ports and electricity grid.

A STRONG FOCUS ON BUSINESS

The North Wales local economy has a strong focus on manufacturing and in the North West harbours an important low carbon energy cluster with a growing reputation for attracting major brand investments in biomass, wave, wind and nuclear related industries.

Anglesey Enterprise Zone is in close proximity to both Snowdonia Enterprise Zone who provide complementary opportunities for energy related businesses and Deeside Enterprise Zone who focus on advanced materials and manufacturing.

Anglesey Enterprise Zone concentrates on the growth of the low carbon energy sector. Wales is committed to a low carbon energy future and has over 40,000 people employed in the sector contributing more than £3.2 billion to the economy annually.

COME TO NORTH WALES

All in all, the North Wales region has become an area of significant interest for several Wave and Tidal developers and associated supply chain activities.

Backed up by focused business support and other initiatives from Welsh Government, such as the Enterprise Zones, there has never been a better time to come to North Wales and see what it has to offer.

Welsh Assembly Government

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ABOVE AND BELOW



Among a variety of tasks the company is considering any potential effects of the tidal lagoon on fish ecology, marine benthic ecology and plankton dynamics and designing surveys that will assess seafloor habitats and species within the Severn Estuary and Bristol Channel. The company are also working to develop models that predict the effects of habitat changes on marine and migratory fish species.

A combination of expertise, experience and equipment together with offices in Flintshire and Cardiff has recently resulted in APEM Ltd supporting some of the most ambitious marine energy projects in the world, above as well as beneath the waves. As specialists in marine ecology and aerial surveys with a track record for innovation, APEM is working closely with Tidal Lagoon Power (TLP) on proposed projects in Swansea Bay and the Severn Estuary near Cardiff.

ABOVE...

Despite spending thousands of hours working on marine power projects, staff at APEM's Flintshire office are more likely to be buckling up in a twin-engine aircraft than climbing aboard a boat. They are based at Hawarden airport, home to the company's fleet of four survey aircraft and state-of-the-art, ultra-high resolution camera systems.

From here the company has flown over 500 aerial surveys searching for birds and marine mammals over huge expanses of sea on behalf of offshore windfarms in Wales, Scotland, England and Germany.

AERIAL SURVEYS

TLP's plans for a tidal lagoon in Swansea Bay saw it draft in APEM's aerial survey team to map the bay's intertidal habitats from the air. The surveys were flown at low water on a spring tide in order to achieve the required coverage.

...AND BELOW

Meanwhile, beneath the waves the company has also been closely involved with early stage work on TLP's proposed tidal lagoon in the Severn Estuary. Its expertise in marine benthic ecology and fisheries has seen it contribute to the scoping of potential effects on sensitive ecological receptors for the environmental impact assessment (EIA) and undertake consultation with statutory stakeholders.

PROVIDING NECESSARY EVIDENCE

This work will provide the robust evidence necessary for the EIA and inform mitigation measures to minimise effects on the environment.

Dr Rafael Perez, Principal Marine Consultant, said: *"The focus in Wales on marine renewable energy, plus the far sighted efforts of Tidal Lagoon Power, dovetail perfectly with APEM's expertise in marine ecology and aerial surveys."*

APEM Ltd

[Click to view more info](#)



North Wales fishermen eager to seize the tidal opportunity

Commercial fishermen in North Wales could tap into contracts worth more than £6 million if tidal energy projects off the coast of Anglesey go ahead as proposed.



Significant momentum is building in the region's tidal energy sector, with the creation of the West Anglesey Tidal Demonstration Zone in July 2014 and the permission granted to Swedish-based company Minesto for the Holyhead Deep project, a commercial-scale tidal stream project off Holy Island. Positive moves are also being made with regard to re-starting the Anglesey Skerries demonstration project, which stalled in 2013.

MARINE SERVICES STUDY

It is hoped that this growth in the tidal sector will bring opportunities for the local economy and with this in mind, Menter Môn, the third-party manager for the Anglesey Tidal Demonstration Zone, commissioned MarineSpace and Aquatera to carry out a study into the marine services required for the development of tidal projects and the potential for Anglesey's commercial fishing community to diversify into providing some of these services.

CONSULTATION

Joseph Kidd, from MarineSpace, explains: *"We consulted widely with the tidal industry, local fishermen and other key stakeholders including R-UK and The Crown Estate, with a view to identifying realistic short-term services that could*

be delivered locally. This could involve supporting the consenting process as early as next spring.

"We were confident before the study that there were definite areas where fishermen could get involved but we were pleased that we were able to identify even more during the course of the study. And if all goes as planned, it could all add up to significant benefit for the Anglesey's economy"

STUDY FINDINGS

Key findings from the study included...

- Potential for significant growth in the emerging tidal energy industry around Anglesey over the next 10 years, with up to 200MW of generation expected to be deployed – this could represent a significant opportunity for fishing vessel operators to diversify and provide a range of services in the development, construction and operation of projects
- Services that could realistically be carried out by the vessels typical of the Anglesey fleet include physical, environmental and metocean surveys, deployment of monitoring equipment, ROVs, buoys etc, guard vessel duties and crew transfer services

- The total value of the contracts for these activities associated with the West Anglesey Demonstration Zone could be as much as £3.5m over the next 10 years if everything develops as planned, with up to £400k over the next three years during the development phase, up to £1.4m during the construction phase and up to £300k per year during the 25-year operational lifetime of the project

SUPPLY CHAIN OBJECTIVE

Dafydd Gruffydd, from Menter Môn, says: *"One of our objectives is to ensure that the local supply chain is fully aware of developments and able to respond to the opportunity. The study identified work to the value of £3.5 million which could be delivered by fishermen utilising their skills, marine experience and vessels at their disposal. Activity associated with the Anglesey Skerries and Deep Green projects could potentially represent a further £3M over the next 10 years."*

WORKSHOP

Engagement with the fisheries community included a workshop where Green Marine from Orkney were invited along, representing a perfect example of how a commercial fishing company has successfully diversified and now exclusively provides marine services to the marine energy industry throughout the UK.

"Fishermen in Orkney have fully embraced the opportunity and our local fishermen benefitted from hearing about their experience," says Dafydd.

WORKING TOGETHER

Menter Môn will now work with Welsh Government and the Gwynedd and Anglesey Fisheries Local Action Group, which funded the research, to identify additional support for the local fishing industry in order to help secure some of the opportunities identified in the study for the local community.

MarineSpace

[Click to view more info](#)



ONE-STOP-SHOP FOR TURBINE SAFETY TRAINING, OFFSHORE INSPECTION AND MAINTENANCE

Safety Technology Ltd was founded in 2002 as a safety equipment supplier for work at heights. The company originally worked closely with the Utilities and Telecom Industries supplying high quality fall arrest safety equipment and training, so was in the perfect position to diversify into an exciting new growth sector.

After a huge surge in Wind Energy in the UK, Safety Technology was quick to recognise the need for skilled workers in the sector and began to develop a range of safety courses not just for the wind industry but also for wave and tidal.

ACCREDITATION

In 2009 the company gained Renewable UK accreditation and by 2010 was training individuals worldwide from a number of industry leaders including...

- DONG Energy
- Alstom
- Nordex
- Vestas
- RWE Npower
- Gamesa

INDUSTRY SPECIFIC ONE-STOP-SHOP

It soon became apparent to Safety Technology that the industry was crying out for a one-stop-shop for turbine safety training in the UK. In order to offer this, they identified the need to collaborate with other industry area specialists, subsequently forming collaborations with institutions such as South Tyneside College, Letterkenny Institute and Grand Rapids CC, Michigan.

MARKET LEADING POSITION

This has enabled the company to stay in a market leading position and as recognition of this, in 2013 Safety Technology Ltd gained GWO approval for Working at Height, First Aid, Fire Awareness and Manual Handling training and can offer combined GWO and Renewable UK accredited courses from its locations throughout the UK, Europe and the USA.

GREEN ENERGY AWARD WINNER

Also in 2013, Safety Technology Ltd was announced as the winner of the 2013 Wales Green Energy Award for its valuable contribution to Skills and Training.

In 2015 the company reached an agreement with Iowa Lakes CC (the leading USA Wind Energy Training Centre) to provide the full GWO onshore programme.

COST REDUCTION - UNIQUE SOLUTION

The company recognised the importance of maintenance and reduction of downtime which would result in loss of generation and revenue. In response to this efficiency drive Safety Technology has set up an Alliance with two Welsh companies, Offshore Turbine Services and WTG Offshore to offer a unique solution for offshore turbine inspection, maintenance and repair, blade inspection and repair and gearbox inspection all in one package.

A fully equipped controlled environment pod for blade composite repairs and equipment inspection and maintenance has been fitted to an OTS 18.5m composite hulled catamaran. This enables all the activities to be carried out on the offshore windfarm with technicians servicing 2 turbines simultaneously from the service vessel and achieving substantial savings.

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Frank Fortune: Wave and Tidal Development Director, Renewable Energy
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royalhaskoningdhv.com



EXTENSIVE RANGE OF PRODUCTS AND SERVICES

The company offers an extensive range of onshore and offshore safety courses, high quality safety equipment and health & safety consultancy delivered from a host of locations...

- South Wales
- North Wales
- South Shields
- Grimsby
- USA (Michigan and Iowa)

Striving to continuously develop its services to meet the demands of the energy sectors, it takes enormous pride in its well-earned industry wide reputation of flexibility and innovation, to provide customers with the best service possible in the industry.

WIND INDUSTRY SPECIFIC STOCK

As the only company in the UK to supply, inspect and maintain and train on both CRESTO and Skylotec products. The company stocks a full range of products, including its own range Sirocco by STL, designed and manufactured to meet the unique demands of working in the wind energy sector.

FULL AFTERSALES SERVICE

Also, as the only UK certified representatives for CRESTO RESQ the company is able to provide full inspection, maintenance and re-vacuum sealing of all of the AG, RG, MRG and RedPro devices.

The company offers inspection, maintenance and certification of PPE, Retractable, eye bolts, anchor points, lifting equipment and LOLER inspections. Additional services include; Risk Assessment Method Statement Development, COSHH Assessments, Personal Protective Equipment (PPE) Inspections, On-site Health and Safety Supervision and Site Management.

Safety Technology Ltd

[Click to view more info](#)





A FAMILY BUSINESS WITH A GLOBAL REACH

From the Middle East to West Africa, the Falkland Islands to South America and across Europe and Russia, Holyhead Towing's fleet of tugs and workboats, each sporting the company's unique 'Welsh Dragon livery', can be seen working on some of the World's most challenging marine projects. Their tug AFON CEFNI recently played a key role in the salvage operation of the stricken cruise liner Costa Concordia, assisting to pull the ship upright and acting as site support in the multi-million pound operation.

STEERING A STEADY COURSE

The Anglesey-based business is steered on a steady course by Managing Director Captain J Mark Meade and Operations Director James Burns, who between them oversee a fleet of more than sixty vessels, a far cry from the early days when Captain Meade's father John set up the company in 1966 as a subsidiary to Holyhead Boatyard with just one small coastal tug.

SUBSIDIARY COMPANY

In 2008 Holyhead Towing spawned its own subsidiary company, Turbine Transfers Ltd, which runs state-of-the-art Crew Transfer Vessels that are used primarily for offshore windfarm support.

Turbine Transfers now owns and operates one of the largest fleets of high-speed catamarans within this particular marine sector.

ENVIABLE REPUTATION

Working in an industry that's extremely competitive, dynamic and challenging is no easy feat, nevertheless Holyhead Towing has been able to establish an enviable reputation as a skilled and trusted workboat operator, particularly in specialised shallow water operations and the company's ability to adapt and pioneer unique solutions has helped to further cement this reputation.

BESPOKE VESSELS

Last year Holyhead Towing took delivery of AFON MENAI, a specially designed ultra-shallow draft tug, the latest addition to the company's catalogue of bespoke vessels, which today includes a varied mix of anchor handling tugs, multicats, survey boats, high-speed catamarans and two unique vessels that clearly highlight the company's innovative ethos.

The inimitable and impressive AFON DYFRDWY is a mammoth barge-type craft that transports wings for the A380 airliners from the Airbus factory at Broughton near Chester to the Port of Mostyn for onward shipping to Toulouse in France and the landing-craft vessel CONCORDIA BAY provides a vital service as a passenger and cargo ferry within the Falklands archipelago.

HOLYHEAD BASE

Holyhead Towing is still based in its original offices in Holyhead Boatyard, situated alongside sister company, Holyhead Marine Services, which itself offers new-build, refit and repair of aluminium, steel and GRP boats and has secured work as far afield as the Middle East and Australia.

50 YEAR ANNIVERSARY

It's no surprise therefore that Holyhead Towing Company has become one of the largest employers on Anglesey and has over 500 workers worldwide, quite an achievement as they look forward to celebrating their half century in 2016.

Holyhead Towing Company Ltd

[Click to view more info](#)





WORKFORCE EDUCATION AND SKILLS TRAINING

Grŵp Llandrillo Menai (GLLM), based in North West Wales, prides itself on offering high quality, post 16 education and training to the public, commerce and industry in an attempt to; skill, up-skill and re-skill the local workforce and meet the growing needs of a low carbon workforce.



The college offers a wide range of training programmes for the renewable energy sector with a view to fully supporting the local 'energy' economy and the Anglesey Energy Island programme.

CURRICULUM RANGE

The range and breadth of the curriculum is the result of a carefully planned strategy to respond to regional agendas and work closely with local employers. Since 2009, training programmes have been developed to encourage progression from further education to higher education and build knowledge and essential skills within young people through apprenticeships.

BESPOKE TRAINING CENTRES

To ensure high quality training takes place at the college, bespoke training centres have been developed, with the support of the industry, resulting in the Renewable Energy & Sustainability Centre for Wales (RESCW)...

- Delivering core training for the micro renewable energy industry – the first and only in Wales Hydro & Wind Turbine Training Centre (HWTTTC)
- Delivering core training for wind turbine technicians and apprentices

- The Marine & Built Environment Centre (MBEC) which includes a specialist Marine Engineering and Boatbuilding facility with a range of full and part-time courses which include RYA day skipper, sailing and water sports and yacht maintenance and commercial skippering.

Through these training centres the college delivers full and part time courses, apprenticeships and bespoke training.

MAINTAINING SUCCESS

GLLM are keen to maintain the success of apprenticeships recognised by learners winning national awards...

- Ross Kenyon of RWE Innogy – RenewableUK Apprentice of The Year 2014
- Michael Leach of Isofab Ltd/Vattenfall – RenewableUK Apprentice of The year 2015
- Grŵp Llandrillo Menai – RenewableUK Cymru Green Energy Awards 2015 for the college's 'Contribution to Skills & Training'

By continuing to develop their facilities and staff in order to improve the quality and opportunities for training in the renewable energy, the college aims to develop a highly skilled workforce to benefit the whole renewable energy sector.

Grŵp Llandrillo Menai (GLLM)

[Click to view more info](#)

Centre for Applied Marine Sciences (CAMS)
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Providing vital offshore metocean information

Knowtra is a small specialist consultancy, focusing on the analysis of offshore metocean information for a range of commercial applications. In the renewables sector, the company's project experience includes analysing tidal resource at both countrywide strategic level and local project level.

EXTENSIVE EXPERIENCE

They have extensive experience developing time domain computer simulations of the weather impact on offshore construction and operation and developing metocean design criteria.

WORKING WITH INDUSTRY

Knowtra works closely with offshore energy specialists Xodus Group. "Dr Steve Spall and his colleagues at Knowtra work across our oil & gas and renewables business. They provide a detailed understanding of the metocean environment, combined with knowledge and design of measurement equipment and outstanding modelling capability.

"Their insight into our engineering applications has helped Xodus secure and

deliver Carbon Trust research projects to develop advanced software tools that optimise marine construction and maintenance operations." says Xodus Low Carbon Technical Director James Ingram.

FOUNDER BACKGROUND

Knowtra's founder and Managing Director, Dr Steve Spall, worked at the Met Office for 9 years in a number of scientific roles. As a climate scientist, he was an author on a highly cited paper in the prestigious scientific journal Nature, Steve commented; "During my career I have studied metocean phenomena with timescales from hours to decades. At Knowtra we are applying this experience to renewables projects, where clients will be concerned with immediate weather right through to extreme conditions over centuries."

UNIQUE PERSPECTIVE FOR RENEWABLES PROJECTS

Knowtra's wider experience gives a unique perspective for renewables projects. Having worked on projects worldwide where observational data can be sparse, the company has particular expertise in

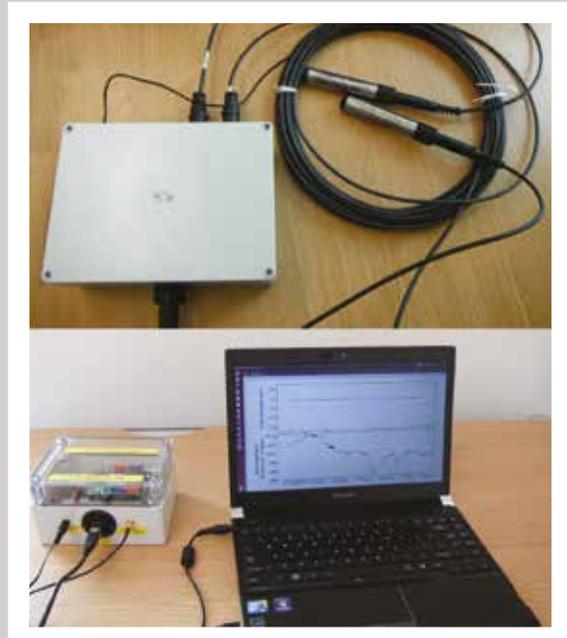
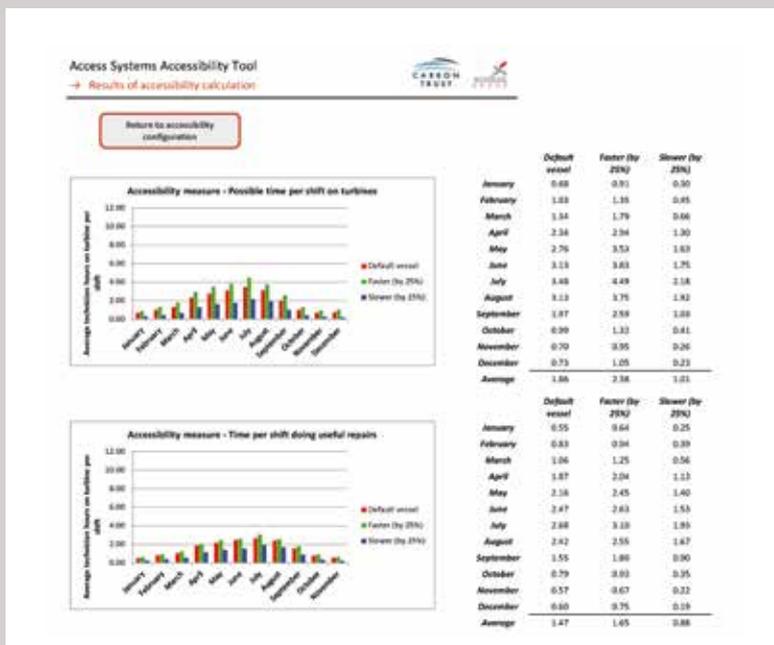
exploiting limited data. "In conducting a metocean gaps analysis on a major windfarm development, we were able to identify low cost data sources to make the metocean input to the design process more robust, while making best use of the client's budget for ocean observing." Steve added.

PHILOSOPHY OF SCIENTIFIC EXCELLENCE

In undertaking commercial projects, Knowtra maintains a philosophy of scientific excellence. "In a recent project studying waves for a major port in West Africa, we discovered several phenomena undocumented in the region. As well as this benefiting the client for safety of shipping, we are liaising with university researchers to advance understanding." says Ben Barton, Ocean Modelling Scientist at Knowtra.

"We are currently working with Bangor University to exploit state-of-the-art hydrodynamic modelling techniques for renewables projects." Ben concluded.

Knowtra Ltd





NORTH WALES PROPERTY

One of the key focuses of Enterprise Zones in North Wales is to prioritise regeneration and infrastructure improvements to key sites within those Zones.

carbon energy sector. There is an existing master plan for the development of the site and it has all the relevant infrastructure provision, including a direct link into the fibre optic spine that runs along the A55.

Parc Bryn Cegin, Bangor

Parc Bryn Cegin offers the most exciting new premier business park environment in North Wales. With Snowdonia to one side and the countryside and beaches of Anglesey and the Llyn Peninsula to the other, this is the place to feel inspired. Parc Bryn Cegin holds an ideal strategic location on the major road and rail axis of the North Wales coast. Both office and industrial buildings will be custom-designed to a high specification.

Bryn Cefni Industrial Estate, Llangefni

An existing industrial estate accommodating a mix of office and light industrial uses, Bryn Cefni is located close to the A55 and offers development land for design and build opportunities for the low carbon energy supply chain.

Gaerwen Industrial Estate

The site includes existing industrial uses with significant potential for expansion. There is spare capacity within the existing estate providing short and long-term opportunities for low carbon energy businesses.

This site benefits from being located near the recently completed A55 North Wales expressway across Anglesey, which is the main route for traffic through the island to the port of Holyhead, situated 16 miles from Gaerwen, with the city of Bangor on the mainland, located approximately six miles south of Gaerwen.

Gaerwen Industrial Estate has attracted significant occupiers including Securicor, IAT, Grampian Foods and Huws Gray.

Rhosgoch

A strategically located brownfield site, close to the proposed nuclear new build at Wylfa with potential for supply chain firms and supporting development.

Welsh Assembly Government Property

[Click to view more info](#)



Penrhos Industrial Estate

Located close to Junction 2 on the A55 on an existing industrial park in Holyhead these plots are in close proximity to key energy projects on the island offering good potential for supply chain firms. The site has the necessary infrastructure provision to bring forward development in the short-term.

Detailed consideration is currently being given towards the infrastructure investment required at these key sites to accommodate the future needs of businesses locating to and expanding within the Zones. This will include investment in a range of critical infrastructure from communications through to power, transportation and water.

ESTABLISHED KEY SITES

There are a number of key sites in North Wales which are established and ready to trade from, or are currently undergoing redevelopment to provide exciting new high quality premises.

Here are a few of the main industrial sites and business parks which are worth looking at...

Parc Cybi

Anglesey Island's premier business site is located close to the A55, the Port of Holyhead and Horizon Nuclear Power's proposed new nuclear power station at Wylfa. The park will take advantage of supply chain opportunities in the low

Port of Holyhead

The deep water port facilities at Holyhead, the surrounding premises and development plots provide a number of opportunities for businesses, including...

- Potential investment in the offshore wind Round 3 Zone
- Existing supply chain firm role in the offshore renewables market

Parc Menai Business Park

Parc Menai is a strategically located mature business park suitable for B1 business uses, situated adjacent to the junction of the A487(T) and junction 9 of the A55, approximately 3 miles west of Bangor City centre.

There is a range of properties available to rent or buy on Parc Menai in a variety of sizes capable of accommodating the needs of business. There are also several plots of development land available to facilitate a bespoke building designed to meet companies specific future requirements.



Health & Safety Equipment Supply Specialist

Established for over ten years, Ruthin based Workplace Worksafe supply specialist health and safety equipment throughout industry with a passionate focus on the renewables sector.

BUSINESS GROWTH

Expansion over the decade has seen the company, formed by Rhian Parry, move from humble beginnings in a home office to a large industrial unit fitted out to specifically meet the needs of the growing enterprise. Combining a large retail and display area with ample area for stock holding means the company are able to fulfil orders with little or no waiting time. Offering a customer driven service the unit has been equipped with the facility and experienced staff to alter, print and embroider a wide range of specialist work wear.

WIDENING MARKET

The increase in the renewables sector has benefitted the company with them being awarded large contracts to supply work wear, health and safety equipment and a wide range of consumable products to some of the largest names in the wind generation sectors. Although based in North Wales, the reliability, passion and commitment shown by the company has allowed them to generate contracts throughout the UK and Europe supplying many Blue Chip companies within the renewable energy sector.

UNDERSTANDING CLIENT NEEDS

Providing safety solutions to some of the biggest names in the industry led Rhian to understand the complexities and difficulties which these companies face on a daily basis, such as the transportation and handling of expensive and vulnerable critical components.

While many site based solutions were deemed acceptable in the handling of these components, Rhian saw the possibility of a bespoke solution to provide a totally safe, secure and reusable method of transporting and handling such components.

DELTA BAG SYSTEM

Over five years of constant development and refining has seen Workplace Worksafe able to offer the Delta Bag system; a bespoke solution to the handling of vulnerable components. Designed and developed in-house in Ruthin and manufactured within the UK to exacting standards, the company are now supplying this component specific handling solution to wind, oil and petrochemical companies around the globe.

Rigorous testing of the material and manufactured product has seen the company win plaudits from its client base for the unique solution to their handling requirements.

FUTURE OPPORTUNITIES

While critical componentry for the wind industry was the driving factor for the Delta Bag's development, other renewable sector industries along with the construction industry have shown great interest in the product.

Capable of being designed to suit specific component size and weights, the company has been asked to develop a further 20 new designs for various applications within the sector. Providing both a weatherproof, chemical resistant and structurally sound handling solution has allowed Workplace Worksafe to offer a wide ranging solution to industries critical component handling.

Workplace Worksafe Ltd

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ANGLESEY TIDAL ENERGY

A local's perspective



Imagine going on holiday and launching your sea kayak in a beautiful and calm inland sea separating Anglesey from Holy Island. You have timed it perfectly just after high water and the slowly ebbing tide pushes you gently southward towards open water a few kilometres away.

TIDAL CHANGES

You cannot relax for long and soon you are ejected from the inland sea at 5 knots into the surf. Almost as quickly the tide changes again as you are pushed northward around Holy Island, while a little further offshore paddlers are shooting southward still on the ebb. While contemplating the odd tides you marvel at the dramatic wave carvings along the coastline in the form of caves, blowholes, geos, arches and stacks.

Wave action is further evidenced at the next beach which shows signs of mass sediment transport uncovering the tree stumps of an ancient forest (and the offshore fibre optic cables to Dublin...). After lunch you head out into a monster tidal race in full flood. Those needing rescue refer to the confused and unpredictable nature of the sea. Those that don't have a great day.

IMPORTANT INDUSTRY

Tides are already an important industry on Anglesey. It is a world renowned sea kayaking paradise and the expert local kayaking schools even design and build their own boats specifically for our type of conditions.

It is a highly professional business, based on detailed local knowledge and understanding of the seas, that contributes to safe, sustainable and profitable employment in some of the most exciting waters on the planet. This is the challenge for the developing tidal energy sector on Anglesey and indeed everywhere.

JAMES INGRAM, XODUS GROUP

The author of this scenario is James Ingram who is the Low Carbon Technical Director of international offshore energy specialists Xodus Group based in their Anglesey office.

He graduated in Marine Physics at Bangor University's School of Ocean Sciences and holds a Masters Degree in Underwater Technology. Over his 25 year offshore engineering career the last 10 years have focused on renewable energy R&D and technical and commercial applied engineering.

PASSIONATE DEVOTEE

He is a founding member of the Anglesey Energy Island Marine Energy Forum and works closely with Bangor University to support tidal energy development, marine energy PhDs and the new Low Carbon focused Science Park.

He is very concerned about ocean warming and the subsequent impact on climate change. He believes that the marine energy sector could develop faster by incorporating novel applications that may include energy storage and possibly seawater hydrogen generation.

FUTURE VISION

He wonders if the recent decommissioning of the fuel hungry HSS ferry from Holyhead to Dublin could be a catalyst to encourage hydrogen fuelled ferries across the Irish Sea and other tidal ferry crossings, building on the Norwegian prototype that uses hydroelectric power to generate the hydrogen.

Xodus Group

[Click to view more info](#)





Anglesey Enterprise Zone

Anglesey has an established reputation for low carbon energy generation including nuclear, wind and biomass. Given its natural resources (wind, solar and marine), skilled workforce (especially nuclear related skills), supply chain and research and development capability, the island already attracts major interest from the low carbon energy sector.

The Energy Island Programme (EIP) part of the Enterprise Island framework is a key driver for delivering exciting opportunities for Wales' renewable energy sector. Enterprise Zone status emphasises the Welsh Government's commitment to realising the Energy Island Programme Vision.

The Enterprise Zone has a number of major strategic investment projects in the pipeline, presenting exciting supply chain opportunities for local companies and future companies locating to the area.

Enterprise Zone status will accelerate the investment required to secure the island's future as a leading location for future low carbon energy innovation, generation and demonstration.

Businesses locating to or expanding within the area will have direct access to key decision-makers within the Welsh Government and access to the Welsh Government's outstanding package of business support.

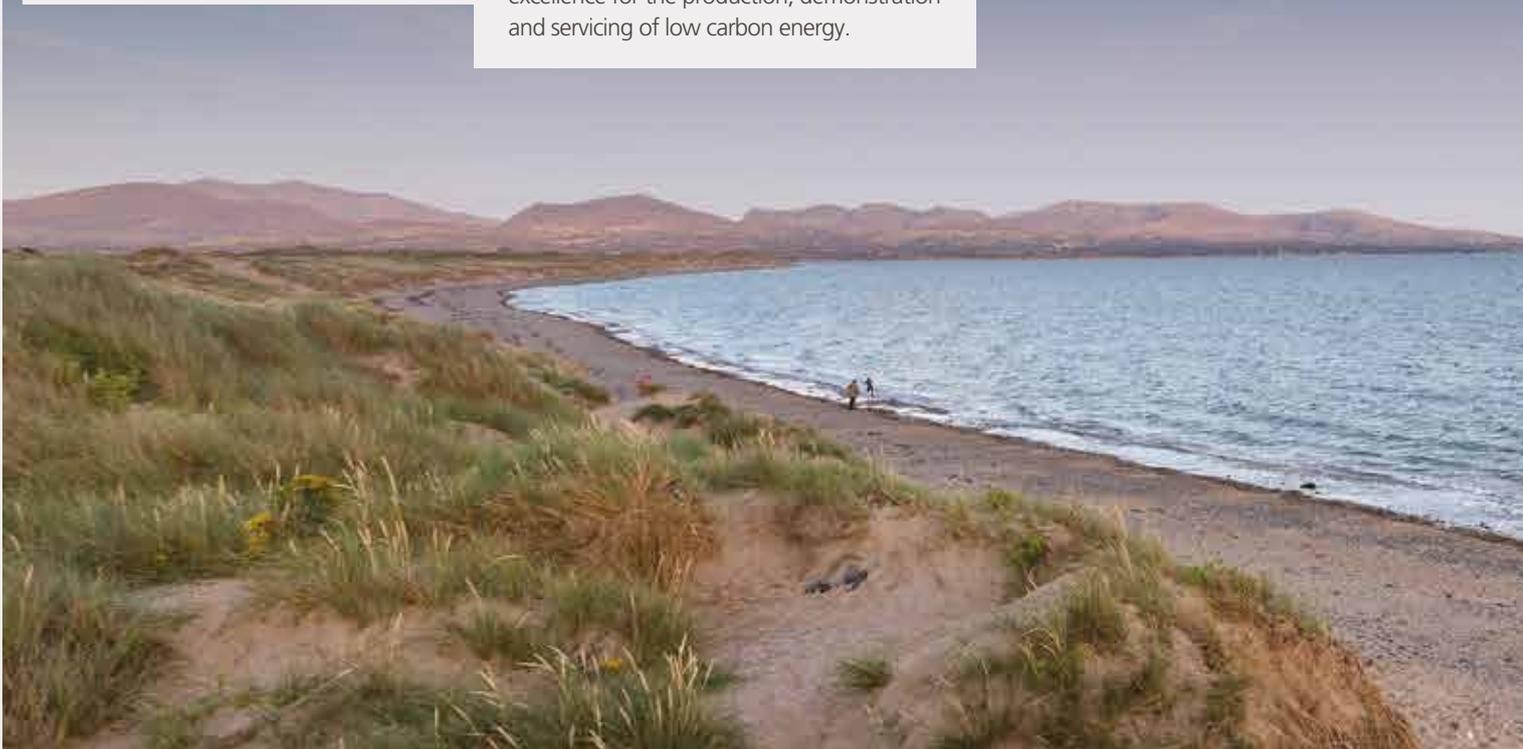
The vision for the Anglesey Enterprise Zone is to create a world-renowned centre of excellence for the production, demonstration and servicing of low carbon energy.

STRATEGIC INVESTMENT

There are a number of major strategic investment projects proposed for Anglesey, presenting exciting supply chain opportunities for local companies and future companies locating to the Enterprise Zone.

The island already includes a variety of companies across a range of sectors, such as...

- Energy (e.g. Magnox, Minesto, Orthios)
- Marine services companies (e.g. Holyhead Marine Services, Holyhead Towing, Stena and Irish Ferries)
- Manufacturing companies (e.g. Marco Cable Management, Mona Pre Cast and ALPOCO)
- Building and construction companies (e.g. Balfour Beatty, CL Jones, Huws Gray, Rehau and Jewsons)
- Food manufacturing and processing companies (e.g. PV France, Glanbia Cheese and Llechwedd Meats, Two Sisters)





EFFECTIVE COLLABORATION

Anglesey Enterprise Zone works closely with the Isle of Anglesey County Council and other key stakeholder organisations to provide the best possible conditions for businesses to succeed in the Zone.

Driven predominantly by a private-sector led Board, so support and delivery is flexible and responsive enough to meet business needs. The Board is responsible for advising the Minister for Economy, Science and Transport on the opportunities and needs for the Zone.

Each of Wales' Enterprise Zones focuses on a key target sector. The sector approach is a crucial part of the Welsh Government's continued commitment to creating jobs and sustaining growth. The area is a focal point for the future growth of the Energy and Environment sector and the Board complements a separate advisory panel for the sector across Wales.

FOCUS AND LOCATION

The North Wales local economy has a strong focus on manufacturing and in the North West harbours an important low carbon energy cluster with a growing reputation for attracting major brand investments in biomass, wave, wind and nuclear related industries.

Anglesey Enterprise Zone is in close proximity to both Snowdonia Enterprise Zone who provide complementary opportunities for energy related businesses and Deeside Enterprise Zone who focus on advanced materials and manufacturing.

Anglesey Enterprise Zone concentrates on the growth of the low carbon energy sector. Wales is committed to a low carbon energy future and has over 40,000 people employed in the sector contributing more than £3.2 billion to the economy annually.

WORD CLASS EDUCATION AND SKILLS TRAINING

Coleg Menai (the local further education college) has a new world class Energy Centre and Construction Skills Centre which complements the excellent courses offered at Bangor University including access to the broader Llandrillo-Menai skills set.

The 'Prentis Menai' scheme is proactively developing apprenticeship schemes in engineering and construction. This arms-length company of Coleg Menai, can offer companies apprentices at a 50% wage rate and take the employment risks.

Other key incentives include...

- An excellent package of Welsh Government training support will be provided to employers within Anglesey Enterprise Zone
- The area has close links with key research departments in local universities and colleges to support companies with industry led academic research

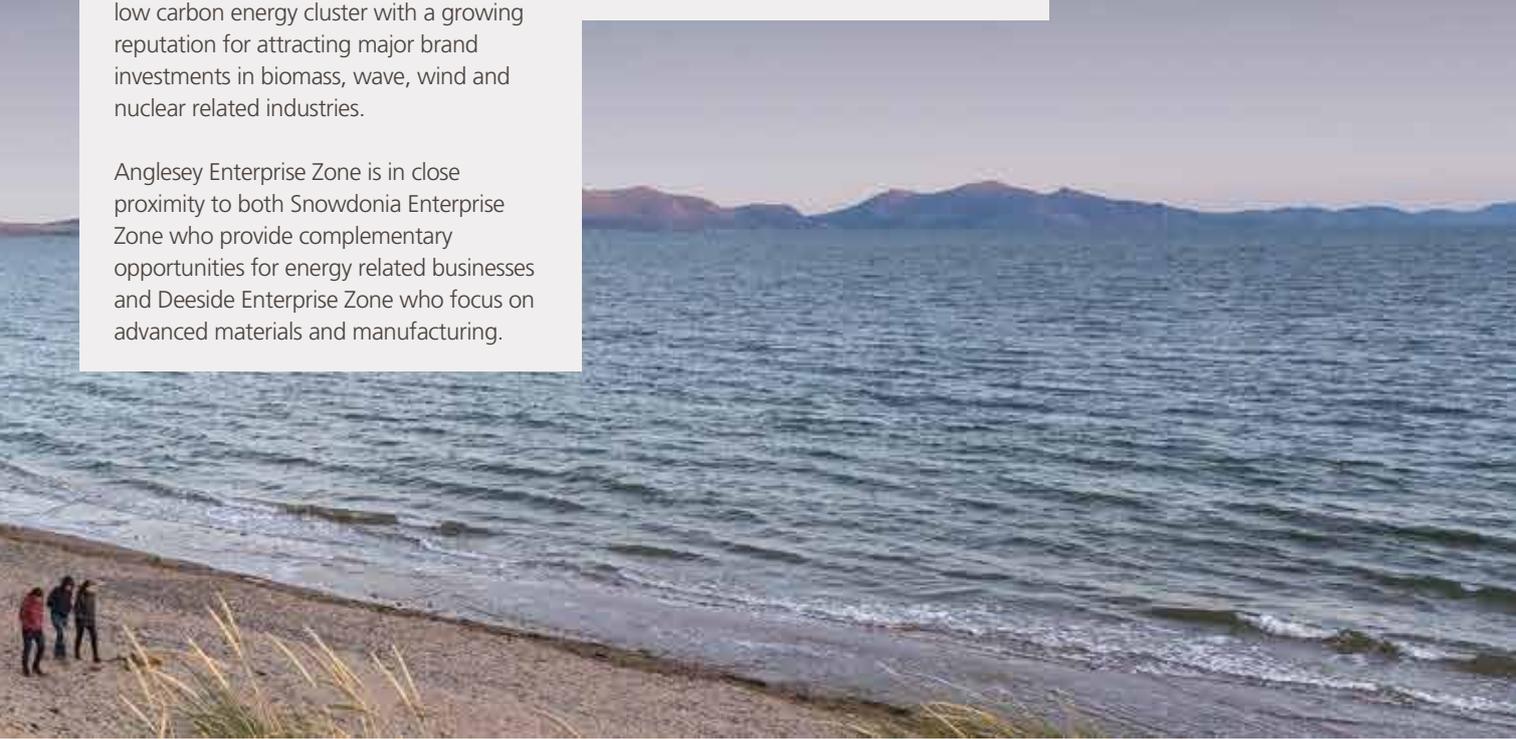
COMMITTED TO THE FUTURE OF ANGLESEY

- The focus of the Anglesey Enterprise Zone Board remains on positive job growth and ambition in the Energy Sector
- The Board continues to focus on growing infrastructure and skills to further consolidate this growth
- Anglesey has a receptive workforce offering a transferable skills base at competitive salary levels for employers locating to the island
- As an Enterprise Zone, prioritisation will be given towards programmes to develop the workforce skills in the area
- There will also be a commitment to schools, supply chain and skills pathways for technical, managerial and service sector skills and encouraging entrepreneurial attitudes

Enterprise Zones in Wales are a Welsh Government initiative.

Anglesey Enterprise Zone

[Click to view more info](#)





HOLYHEAD DEEP PROJECT

The vision of Holyhead Deep project is to be a part of the transition from fossil fuels to renewable energy, making the UK and Wales a global leader for a sustainable future.

Following an extensive project selection exercise in the waters off Wales, Minesto identified a potential site off the coast of Anglesey for a full scale Deep Green power plant array.

INSTALLATION

Minesto plans to start the installation of a 10MW marine energy array in 2017. The Welsh waters hold a potential of several 1000's of MW, which makes Wales one of the most suitable places in the world for low velocity tidal energy.

PERFECT LOCATION

The Holyhead Deep, a seabed area west of Anglesey, North Wales, was identified by Minesto in 2012 as a perfect location for a commercial Deep Green installation. The area matches all the site requirements by providing low flow tidal velocities (1.5 m/s – 2 m/s mean peak flow) at an 80-100 metre deep close to land.

The area also benefits from good port facilities in Holyhead Port, onshore grid connection possibilities at Holy Island as well as good transport links and access to installation and maintenance services. In June 2014 Minesto was awarded an Agreement for Lease (AfL) for a 10 MW installation in Holyhead Deep by The Crown Estate.

The proposed installation site is located in the southern corner of Holyhead Deep. The area has been carefully selected to maintain separation from shipping lanes and to minimise the impact on other sea users.

LOCAL ENGAGEMENT

Stakeholder engagement and environmental investigations have been ongoing since 2012 and Minesto works closely with Bangor University and research organisations in Wales. The establishment of Minesto's 10MW Deep Green array requires a large variety of competences and creates immediate local jobs in a rapidly expanding sector.

The installation is part of Minesto's commercial roll-out and a UK Headquarters will be established in North Wales.

Minesto

[Click to view more info](#)





Specialist Equipment

Established in Mostyn, North Wales, in 2012, now renamed WFE Safety, has quickly become one of Europe's leading providers of Specialist Safety Equipment.

Wind Farm Equipment Ltd (WFE) range covers both on and offshore working environments with fully integrated safety systems. With safety equipment available for both purchase and hire and can cater for all safety needs. The company designs and develops safety products under the brand 'WIN TECH'.

AFTER-SALES AND SERVICING

Expanding the company's support in developments of the offshore Industry, WFE Safety is proud to open its newly commissioned MCA Approved Lifejacket Servicing Station. Their fully qualified staff can provide servicing and re-certification for a wide range of Lifejackets, Personal Protective Equipment and non-mechanical lifting equipment. As part of the developing services offered inhouse, transit and dry suit certification and repair. The newly commissioned facility is now able to fully test and repair all types of dry seal suits.

COST EFFECTIVE HIRE OPTIONS

In many instances hiring equipment instead of purchasing is more cost efficient for ongoing and temporary working situations. Providing both long and short term hire for a wide range of safety equipment. WFE have experienced hire staff that are able to provide indepth advice on the best solutions for a client's hire needs.



For certificated equipment the hire option offers seamless equipment availability. For the long term solution this means that any on hire equipment requiring certification will be issued with replacement equipment prior to the required inspection date.

SITE ARRANGEMENTS AND BUDGETARY BENEFITS

The company will arrange for the equipment to be sent to the site of operations so it can be changed out with the equipment due for inspection.

This way the client always has the equipment required operating 365 days of the year and there is a budgetary advantage to this solution...

- No capital investment required (save on capital expenditure and claim the total cost of hire against tax)
- Built in service and inspection costs
- No man power lost time due to service and inspection

SINGLE POINT OF ACCESS

WFE Safety provide a single point of access for a huge range of specialist equipment companies allowing the option to cross hire at reasonable prices whilst also saving valuable time in procuring equipment.

The company is committed not only to research, innovate and produce the next generation of specialist equipment but also to expand both its product range and customer base.

WFE Safety

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RURAL ECONOMIC REGENERATION ON ANGLESEY

Morlais Marine Energy was established by Menter Môn following its appointment as the Manager for the West Anglesey Demonstration Zone by The Crown Estate. Menter Môn is a third sector social enterprise delivering projects across North Wales in various sectors. Menter Môn was established in 1995 to deliver EU rural development programmes.

PRIMARY AIM

Its primary aim is to facilitate rural economic regeneration on Anglesey. In order to achieve this Menter Môn recognise the importance of preserving and celebrating the island's unique and valuable resources.

GRANT FUNDING

The company has attracted in excess of £40 million of grant funding from various sources for a range of activities since it was established almost twenty years ago.

WEST ANGLESEY DEMONSTRATION ZONE

The West Anglesey Demonstration Zone is an area which has been identified by the Crown Estate as being a suitable location for the installation of marine energy devices in the short to medium term.

The Zone has a good tidal current resource and a relatively low wave regime and was primarily selected because of this excellent marine resource that is rarely found in other parts of the country.

The West Anglesey Demonstration Zone is one of several around the United Kingdom which have been leased out by The Crown Estate in a bid to encourage and accelerate technology development. The Demonstration Zone comprises of 37km² and is generally based around the promontory of Holy Island.

Menter Môn will manage and sub-let areas within the Zone for test and demonstration activities alongside some of the first array scale commercial projects. Menter Môn will also seek to add value to the Zone by undertaking consenting activities and establishing grid connection to further support subtenant projects.

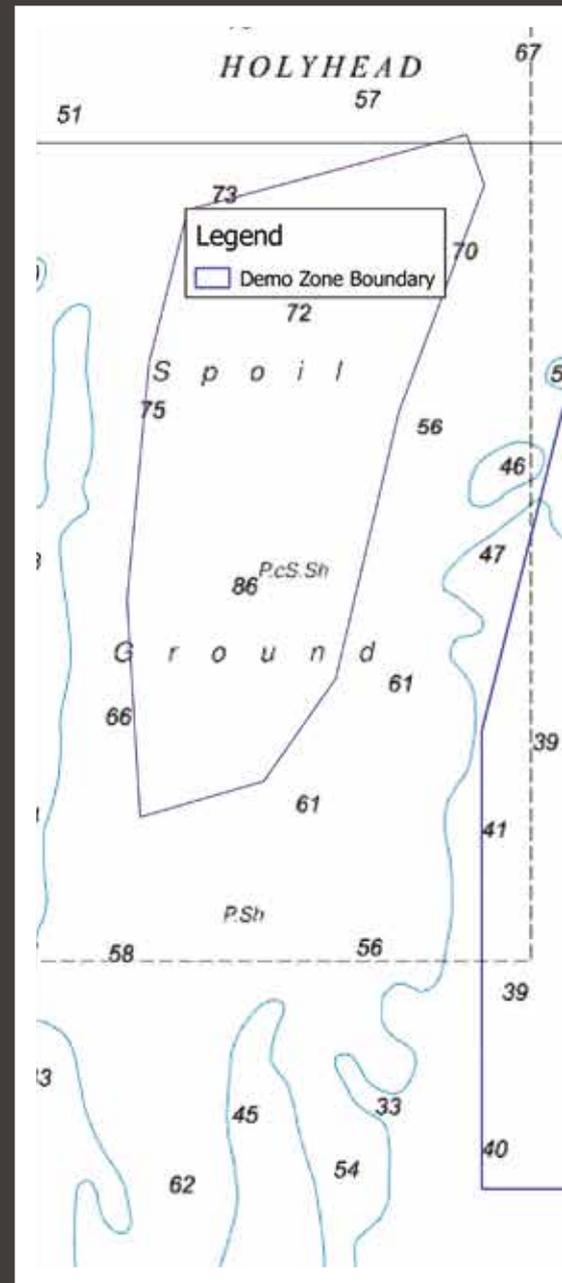
ADDING VALUE TO THE LOCAL ECONOMY

Menter Môn's primary motivation for acting as the Third Party Manager for the West Anglesey Demonstration Zone is secure maximum benefit for the economy of Anglesey and to develop the Zone to accommodate marine technology developers, as well as servicing their requirements once they have located on Anglesey.

SKILLS AND SERVICES REQUIREMENT

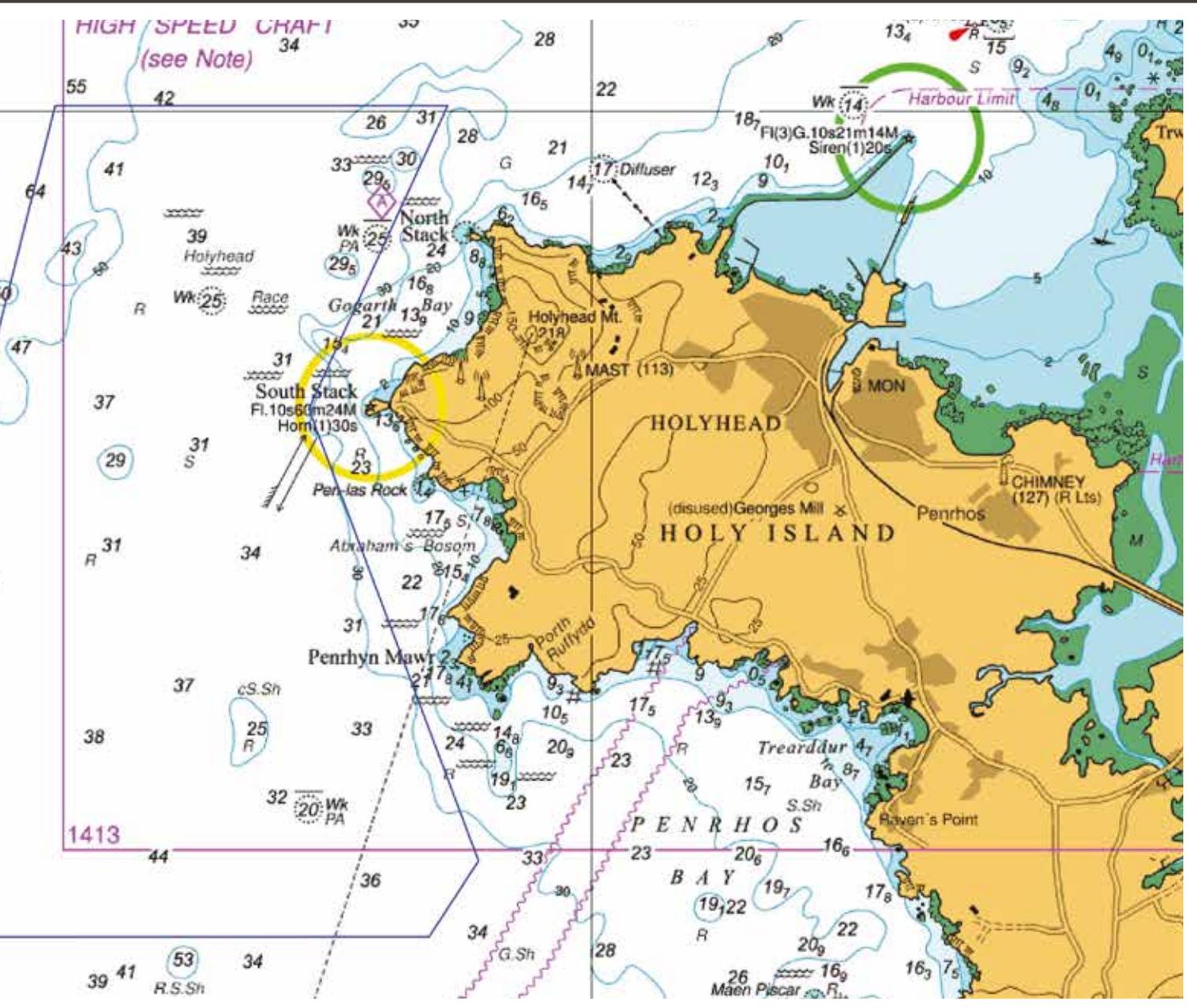
Both elements will require a wide range of skills and services which it is hoped can be sourced locally wherever possible...

- Permitting & Consenting
- Vessel Hire
- Environmental & Geotechnical Monitoring
- Maritime Operations Consultancy
- Fabrication & Final Assembly
- Underwater Substation Pod
- Cable Installation
- Installation of Telecommunications to Shore Station
- Operation & Maintenance
- Port Facilities
- Office Space
- Accommodation
- Training



PROFESSIONAL BUSINESS SUPPORT

Menter Môn has nearly 20 years' experience delivering business support in North Wales and is therefore ideally placed to identify and develop supply chains. Working closely with Anglesey Council, Menter Môn will also contribute to the wider aim of economic development on the Island offering opportunities for a highly skilled workforce that could otherwise leave the area.



CROSS SECTOR COMMUNITY ENGAGEMENT

Menter Môn's strength is its long association with the island and its well established links with local stakeholders. For Morlais to succeed it is important that it engages with all stakeholders at each stage of the process.

The key stakeholders will include the fishing industry, the maritime recreational sector, coastal landowners and the business sector.

CARING FOR THE ENVIRONMENT

In addition to the general engagement process there will also be a requirement to

undertake a detailed Environmental Impact Assessment prior to any works being undertaken in the Zone.

This will seek to identify, assess and mitigate the impacts the development could have on the marine and coastal environment.

MAJOR OPPORTUNITY FOR NORTH WALES

A feasibility study commissioned by Anglesey County Council (Feasibility Study for a Marine Energy Programme – a Marine Energy Sector Development Programme

2013) described the marine energy sector as 'a major opportunity for transformational economic growth' for North Wales and recognised the importance of 'supporting and encouraging local marine skills capability and supply chain capacity...to create positive regional impacts and benefits.'

Morlais Marine Energy

[Click to view more info](#)



NEW INDUSTRY FOR ONE OF THE OLDEST COMMERCIAL PORTS

The Port of Mostyn is one of the oldest commercial ports in the UK. Privately owned and operated it has seen many changes in its long history, the most recent with the birth of the offshore renewable energy industry.



WAREHOUSING/WORKSHOPS

The warehousing/workshops are ideal for the storage and final assembly of sensitive components and together with the office accommodation the quays, storage land provides an integrated site suitable for the manufacturing, assembly and deployment of renewable energy devices.

WIND INDUSTRY SPECIFICS

In addition to being involved in the construction phases of the windfarms, Mostyn is now home to three windfarm support bases which in total employ in the order of 120 turbine technicians and about 30 support staff.

To keep pace with the increasing number and size of CTV's additional berths have been commissioned, up to 26 CTV's operate from the port during busy periods.

SUPPORT SERVICES

Supporting service companies located at Mostyn include...

- Diving Services
- Steel Fabrication/Welding
- Safety and Training
- Hydraulic Supply service/repair
- Ship's Agency
- Turbine Technicians
- Turbine blade repairs

All in all a fair chunk of the supply chain is already there!

Port of Mostyn

[Click to view more info](#)

UK'S FIRST OFFSHORE WINDFARM

In 2003 Mostyn was chosen as the construction port for the UK's first offshore windfarm at North Hoyle off the north Wales coast. Since then a further six windfarm projects have been undertaken from the port with the latest being the 160 turbine Gwynt-y-Môr windfarm, the second largest in UK waters to date and completed in July this year.

- 180m length Ro Ro berth with a 15m wide and 225 tonne capacity linkspan
- Lock free access for ships, no beam or aircraft restrictions
- 2,800 Sq.m of Warehousing/Workshops
- Fully fitted purpose-built project office accommodation for 110 people
- Car parking for 120 vehicles
- Pontoon berths for Crew Transfer Vessels (CTV's)

INFRASTRUCTURE GROWTH

The area of the Port's infrastructure dedicated to the renewable energy sector now extends to the following...

- 55 acres of level and drained storage land adjacent to 310 metres of quay

STORAGE LAND

The storage land provides extensive space for the manoeuvring of large and heavy turbine components such as towers, nacelles, blades and transformers. The ground is well compacted and level; cranes of 1,300 tonnes capacity have been extensively operated over this area.



HOLYHEAD PORT

Holyhead is the largest town on the island of Anglesey and is perhaps known best for being a busy ferry port.

SPECIFICS

The Port of Holyhead lies in a well-protected position due east of Holyhead Mountain, shielded from the Irish Sea by the historic Breakwater which is 1.5 miles in length. The port is a 24 hour, deep water, non-tidally restricted and centrally located on the Irish Sea coast within easy reach of several major conurbations both in the UK & Ireland.

The Port of Holyhead is owned and operated by Stena Line Ports Ltd, who is the statutory Harbour Authority. The Port covers circa 1300 hectares of land and seabed and is the second busiest UK international passenger ferry port, linking the UK and Ireland via Dublin Port and is Wales' busiest port in terms of roll-on roll-off freight.

24/7

The port operates round-the-clock with up to 20 ferry movements to Ireland per day. Sheltered from the prevailing South Westerly winds the port offers high berthing reliability and is open 365 days a year. The favourable weather and tidal conditions give Holyhead Port a distinct operational advantage which potentially saves users time and money.

BUSINESS GROWTH

Performance Indicators for the year are good. Freight in 2014 grew by about 10/11% on the previous year and the port is back to the operating capacity it had experienced before the economic crash of 2009. There are a lot more ships and a lot more capacity so there is room for further growth.

Holyhead is seen as a growing freight hub for the whole of Ireland and a lot of Northern Irish hauliers coming through the Port because it has the frequency and the capacity. The connections now are so good with Dublin port you can get up to Belfast in an hour and a half.

Dublin is growing and Holyhead and Dublin are natural twin routes. Good news for Holyhead port and for the wider economy.

INVESTMENT AND FACILITIES

There has also been significant investment in logistics in Holyhead. The lorry park (opened in the spring) has become a catalyst and this will no doubt continue to grow as supermarkets have started to look at distribution hubs at the Port.

In terms of facilities available to businesses wishing to locate at the Port, operational land measures approximately 98 hectares and there is significant land available for redevelopment which is suitable for B1, B2 and B8 planning uses. An ideal base for a manufacturing facility and the flexibility to build something entirely bespoke suited to individual business needs.

COMMUNICATIONS AND CONNECTIONS

Holyhead Port has excellent communications. Road and rail connections to rest of UK and situated close to Anglesey Airport which offers regular flights to Cardiff. Holyhead Station, located within the Port, has direct links to London and Cardiff.

The A55 dual carriageway runs from the centre of Holyhead directly into the British motorway network. The major cities of Manchester and Liverpool are less than 2 hours drive away. Liverpool John Lennon Airport is 104 miles from the port and Manchester International Airport 122 miles.

Aside from the commercial and passenger traffic, Holyhead is the busiest cruise port in Wales with c12,000 passenger in 2015 and c20,000 projected in 2016 therefore the long term future looks bright.

Holyhead Port

[Click to view more info](#)



Linking academia and business

WE OPEN THIS SECTION OF THE NORTH WALES FEATURE WITH A BRIEF INTRODUCTION TO DR MICHAEL ROBERTS WHO IS THE RESEARCH & DEVELOPMENT PROJECT MANAGER FOR THE SEACAMS (SUSTAINABLE EXPANSION OF THE APPLIED COASTAL AND MARINE SECTORS) PROJECT LED BY BANGOR UNIVERSITY AND PART-FUNDED THROUGH THE WELSH EUROPEAN FUNDING OFFICE (WEFO).

Because of his close involvement with other stakeholders Michael has also provided informative articles on the following...

- Bangor University: School of Ocean Sciences (SOS)
- Marine Centre Wales (MCW)
- Centre for Applied Marine Sciences (CAMS)
- SEACAMS
- R.V. Prince Madog





BACKGROUND

Michael's background, following primary and secondary school education on Anglesey, involved Europe-wide work within the Civil Engineering sector, which stimulated an interest in travel and experiencing the commercial sector outside of Wales.

After various positions of employment throughout his teens and 20's Michael, like most young men, then made a more focused decision on a potential career path having developed a specific interest in marine science.



Michael Roberts

FURTHER EDUCATION

Following the successful completion of an Access to Higher Education course at his local further education college, Michael enrolled on

the B.Sc. Ocean Sciences undergraduate degree course at Bangor University's School of Ocean Sciences in Menai Bridge. Shortly after graduating there, Michael was offered a Ph.D. Studentship studying postglacial sea-level change in North Wales which was successfully completed in 2006.

His experiences during this time and the varied people he met led Michael to take a very active interest in developing methods for academia and industry to work together for the benefit of all.

IMPROVING COMMUNICATION

Climate change was also becoming more of an issue over recent years and Michael felt he could contribute by helping all interested parties communicate in a better way.

FOCUS

Michael's present and future focus is involvement within the Centre for Applied Marine Sciences at Bangor University based at the newly-established Marine Centre Wales building in Menai Bridge, integrating with the marine renewables sector by sharing knowledge and he feels very confident about the future of that industry.

Michael Roberts
Research & Development Project
Manager
SEACAMS

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School of Ocean Sciences

Bangor University's School of Ocean Sciences (SOS) is one of the largest university marine science research and teaching departments in Europe. The School is a multi-disciplinary department located on the shores of the Menai Strait and has a long-established tradition of excellence in both marine science research and teaching.

The School has well-resourced groups in the principal marine disciplines of biology, chemistry, geology and physics. However, its unique emphasis on multidisciplinary marine research effectively ensures ready access to expertise in all aspects of marine science.



training in Applied Marine Geoscience, Marine Biology, Physical Oceanography, Marine Environmental Protection and the recently launched MSc in Marine Renewable Energy are also available and prepare students for careers or research in these disciplines.

The School also supports approximately 50 PhD and MRes research students as well as providing support to Industry through applied

research projects conducted through its self-funding commercial unit The Centre for Applied Marine Sciences (CAMS) which resides in Marine Centre Wales (MCW).

Bangor University

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OPPORTUNITIES

The School offers students the opportunity to train in one of the most visually stunning and dynamic natural environments in the British Isles. The unique combination of research-led teaching and student support produces some of the most 'in-demand' graduates in marine science, as well as contributing to high student satisfaction, with Bangor ranked amongst the UK's top universities in the latest National Student Survey.

Teaching and research are underpinned by highly skilled staff, experienced researchers and state-of-the-art resources such as our fleet of research vessels including the ocean-going research ship the RV Prince Madog and a comprehensive range of laboratory, oceanographic and shore-based surveying equipment.

COURSES

The School of Ocean Sciences offers 15 different undergraduate degree programmes and the Advanced Masters Degree programmes offer specialised



Centre for Applied Marine Sciences

Based in Marine Centre Wales, The Centre for Applied Marine Sciences (CAMS) forms part of Bangor University's School of Ocean Sciences (SOS) and has over 40 years of experience in commercial and applied research. CAMS is an externally-funded, outward-facing centre that links end users to marine and coastal research within the School of Oceans Sciences and across the College of Natural Sciences.



CAMS is an internationally-recognised centre for applied marine sciences and has an extensive portfolio of applied research and a strong history of interaction with partners across the UK and Europe. The centre links academic research to real-world applications through projects that are defined by end user needs with results rapidly applied to specific issues. This creates opportunities to link research to impact.

CAMS contributes to the research profile of the wider university through the generation of research based income and associated publications. Research staff work to promote collaboration with external partners in industry, national and international agencies and government, acting as a platform for knowledge exchange and economic development. The Centre operates a full range of relationships with external partners including strategic programmes, collaborative research, contract research and consultancy.

CAMS expertise and facilities reflects the interdisciplinary nature of marine science, ranging from physical oceanography to ecology. Typically about 30 staff are dedicated to specific projects, in many cases working closely with academic staff from the School of Ocean Sciences and collaborating with a wide range of marine research organisations across the UK and Europe.

THE FUTURE AND OPTIMISING MRE PRODUCTION

A challenge for Wales is to optimise MRE production while ensuring the sustainability of the coastal and marine environments. The coastal zone of Wales, in which the majority of its population live and work, is of great cultural, social and economic importance but it is highly vulnerable to the impacts of climate change and human activities.

Progressive expansion of MRE and the associated economy needs to be guided by proper environmental assessment and planning, and supported by advanced research and data. The ambition of CAMS and its staff is to work with companies to provide answers to applied research questions relating to the hydrodynamic resource, optimal siting of installations, and environmental impacts of turbines and arrays. Both local and far-field environmental impacts need to be assessed on decadal time scales (the operational lifetime of many MRE installations). There is also a clear need to significantly upgrade the coastal and marine data gathering capacity in Wales together with centralising data and providing end-users with information that both stimulates and supports the ambitions of the MRE sector and CAMS is currently exploring potential ways of realising this vision.

COLLABORATIVE RESEARCH AND THE FUTURE

CAMS seeks to build on its existing record of successful research linking academia and the marine renewables sector through developing collaborative R&D projects with existing partners and companies associated with the Crown Estate Demonstration Zone initiative, together with helping support the wider MRE sector in Wales including developers associated with progressing the tidal lagoon industry. CAMS research staff include; physical oceanographers, numerical modellers, biologists and geo-scientists. Aspects of research include the development of high-resolution hydro-dynamical models to address key research questions associated with wave-current interaction, turbulence, sediment transport and water quality. CAMS staff are regularly able to utilise Bangor University's R.V. Prince Madog and its fleet of inshore survey vessels to undertake a wide range of research projects in collaboration with commercial developers in order to address wider industry needs.

Centre for Applied Marine Sciences

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Wave & Tidal Energy

NETWORK

Summer 2016 – Issue 7

Please feel free to contribute a 350 word editorial to the features planned in the next edition of Wave & Tidal Energy Network

- 1 Industry Update – News & Events
- 2 Wales Update
- 3 ROV Services
- 4 Anchoring & Moorings
- 5 Spotlight on: The Isle of Man
- 6 Research & Innovations
- 7 Cable Route Planning

Editorial deadline 15th April

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Marine Centre Wales

Marine Centre Wales (MCW) is a new centre for innovation in applied marine science that has been developed during the SEACAMS project. Situated on the shore of the Menai Strait, it is a new national resource for Wales to meet the need for integration of research, commerce, and policy in the marine sector.

INTERACTION AND COLLABORATION

It has been designed to facilitate interactions between researchers undertaking blue skies research, businesses requiring answers to specific and pressing research questions, and policy makers working on rapidly evolving legislation.

MCW is dedicated to overcoming the silo culture among practitioners and stakeholders in past decades and to fostering the development of a joined-up marine community to address cross-sectoral and technology needs.



CHALLENGES

The challenges of blue growth, sustainable marine ecosystems, and climate change demand an overarching coordination and prioritisation of research, commercial opportunities, and policy through a strategy driven by societal needs. This requires a holistic understanding of opportunities, hazards, risks, and changes in the coastal and marine environment.

MCW brings together blue skies researchers in applied marine science, SMEs working on specific commercial projects in Wales, and policy makers tasked with optimising growth and sustainability. It provides businesses with access to expertise (in data gathering and numerical modelling) and facilities (e.g. high performance computing, laboratories and research vessels).

FORUM FOR DEVELOPMENT

MCW provides a forum for the development of commercial projects that not only exploit cutting edge science but are harmonised with environmental policy at local, regional, and European levels. This provides businesses in Wales with opportunities to answer specific research and commercial questions in the short term while planning future developments within a holistic strategic framework in the long term.

Marine Centre Wales

[Click to view more info](#)





SEACAMS

The marine environment provides a wide range of socio-economic benefits and services to Wales; some 60% of the population lives or works in the coastal zone. SEACAMS aims to increase the value of such services while ensuring that the sustainability of the environmental resource is not compromised.

SEACAMS works to assist the expansion of the commercial marine sector by providing academic expertise and facilities for development of collaborative research initiatives with companies to help them deliver Blue Growth in Wales.

£25 MILLION PROJECT

It has been a £25 million project, part funded by the Welsh European Funding Office (WEFO) from 2010-2015, conceived and led by Bangor University (in the Centre for Applied Marine Science based in Marine Centre Wales in Menai Bridge), and operated in conjunction with Swansea University.

REMIT

The SEACAMS remit is to develop collaborations with companies that address research questions and provide solutions to problems that companies cannot solve alone. SEACAMS is able to draw on a broad range of academic expertise in applied marine science with state-of-the-art laboratory and field facilities, including a fleet of research vessels.

A major asset, unique in the UK university sector, is the RV Prince Madog, a 35 m vessel jointly operated by Bangor University and P&O Maritime Services, and fully furnished with instrumentation for shelf sea oceanography, seabed surveys, geophysics, marine biology, and marine chemistry.

RESEARCH COLLABORATIONS

These resources have enabled SEACAMS to undertake research collaborations with more than 200 companies across a broad spectrum of activities including energy, aggregates, water quality, aquaculture, tourism, leisure, infrastructure, and technology. The majority of projects have been interdisciplinary and the principal focus

the design and siting of turbines and for assessing the environmental impacts of engineering installations.

INVESTMENT

SEACAMS research has boosted business investment in the marine sector in Wales by £8 million, further estimated by collaborating companies to rise to £56 million by 2020.



has been on marine renewable energy with some 70% of the 120 collaborative research projects completed by SEACAMS being in this area.

This reflects the great potential of, and increasing business activity in, the Welsh sector where the continental shelf and coastal zone provides fast tidal currents, high tidal range, and large wind-driven waves. SEACAMS researchers have helped companies understand the complexities of wave-current interaction in high energy regions where knowledge of the hydrodynamic resource, the turbulence properties of the water column, and the mobility of the seabed under extreme conditions as well as information on the geology beneath the seabed are crucial to

A follow-on project entitled SEACAMS2 is currently being proposed by Bangor University and the associated project bid is under development. The intention of this potential initiative is to focus on marine renewable energy (MRE) and help companies exploit the rich tidal stream, tidal range, and wave energy resources of Wales – to help Wales become a world leader in low carbon energy.

Sustainable Expansion of the Applied Coastal and Marine Sectors (SEACAMS)

[Click to view more info](#)



R.V. Prince Madog

Many of the surveys and experiments associated with the SEACAMS project and other SOS/CAMS activities have been undertaken using Bangor University's fleet of survey vessels, including the 34m Prince Madog. This state-of-the-art, purpose built Welsh-based, shelf-sea research vessel is perfectly equipped to working in areas right across the northwest European continental shelf and is particularly suited to working in areas characterised by strong tidal currents and testing sea conditions.

The Prince Madog is a custom built multipurpose research and survey vessel and its features and capabilities include

wet and dry laboratories, A-frame with a capacity of 5 tonnes and on board accommodation for 18 persons with the ability to operate for 24 hours a day for up to 10 days at a time. The vessel is routinely used to undertake environmental surveys including ornithological studies, benthic and acoustic mapping, together with a variety of geotechnical and geophysical surveys (multibeam, side scan sonar etc).

The Prince Madog allows UK's marine scientists to study the biology, chemistry, geology and physics of our seas. The School of Ocean Sciences, Bangor University and other university departments in the UK also use the vessel as a teaching platform, training the next generation of marine scientists.

As well as being utilised for research purposes, the Prince Madog is also available for commercial hire and is often utilised by Marine Renewable Energy developers and consultancies to undertake commercial contracts. The Prince Madog is owned and operated through P&O Maritime Ocean Services (POMOS); a Joint Venture between Bangor University and P&O Maritime Services UK. Operating from Menai Bridge in North Wales the vessel is specifically designed to provide a 24 hour, year round, operating capability and can undertake a variety of tasks associated with supporting offshore operations in the renewables, oil & gas, and telecommunications sectors.

Bangor University

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A PERFECT ISLAND LOCATION FOR A SCIENCE PARK

The potential power of the tides in generating low carbon energy solutions is not lost on Anglesey. It's also one of the key reasons why the island was chosen as the location for M-SParc, Wales' first dedicated science park.





UNIQUE CLUSTER ECONOMY

The hope is that M-SParc can create the right conditions to support and grow a unique cluster economy to encourage hi-tech, low carbon industry and scientific research partnerships in North-West Wales. Its close proximity to the open test beds on The Skerries makes it ideally placed to showcase renewables and testing on site in the future.

To this end, M-SParc has already been speaking to wave and tidal businesses with the offer of links to expert help and business support.

MAJOR STEP FORWARD – FUNDING

Plans for M-SParc, located in Gaerwen, recently took a major step forward following success in securing £10million of European Regional Development Funding through the Welsh Government.

The Bangor University owned venture had also secured an agreed £10 million capital investment from the Welsh Government. This now ensures all the funding is now in place for the project.

30-YEAR VISION

M-SParc’s 30-year vision is based on creating highly skilled long-term employment opportunities for local people, developing a knowledge-sharing environment and creating an economic hub for companies in sectors such as low carbon, energy, environment and ICT.



The science park, which is an important element in Bangor University’s strategic ambition to develop science within the region, will create a bridge between such companies and the university’s extensive science research and teaching activities.

LEADING THE WAY

M-SParc’s Director, Ieuan Wyn Jones, said, *“Bangor University already has a close working relationship with the marine sector through SEACAMS, a branch of its School of Ocean Sciences and ensures the University is at the forefront of marine research and design.*

“Combined with the years of experience from technicians and academics at Bangor University we are confident M-SParc will not only serve to ignite ambition amongst businesses but also improve the already high standard of achievement and innovation in the tidal and wave sector in north Wales.”

Menai Science Park (M-SParc)

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CELEBRATING A SUCCESSFUL FIRST YEAR FOR THE FAST FLOW FACILITY

More than a year on from the official opening of their Fast Flow Facility, engineers and scientists at HR Wallingford are celebrating a successful first year, which has seen the facility in continuous use on offshore wind energy, tidal energy and research projects.

UNIQUE DESIGN

Officially opened in late 2014, the Fast Flow Facility is a 75 m long flume uniquely designed to simulate the interaction of waves, currents and sediments at large scale and in more detail than was previously possible.

Professor Richard Whitehouse leads the team at HR Wallingford responsible for the Fast Flow Facility. He said: *"It has been an incredible first year. This milestone gives us an opportunity to pause and reflect on just how successful it has been. Our goal was to develop a state-of-the art facility to help us investigate the complex interactions faced by developments in the marine environment and we have delivered on this promise."*

"I am proud to say that the Fast Flow Facility has been embraced by industry and academia alike and is now rightly regarded as a world-leading simulation facility."

CONTINUOUS USE

Over the past 12 months, the Fast Flow Facility has been in continuous use for both commercial projects and research. Commercial projects have included work for Norfolk Marine and MeyGen on offshore wind and tidal energy developments in UK waters and for Danish energy provider, DONG Energy, on an offshore wind development planned for European waters.





“The new Fast Flow Facility at HR Wallingford is tailor made for this purpose.”

PROJECT HIGHLIGHTS

- By simulating the strong tidal flows and challenging storm waves typically experienced at windfarm sites around the UK, HR Wallingford assessed the viability of Norfolk Marine’s tyre-filled nets as a remedial measure for seabed scour at offshore foundations
- Research for MeyGen and the Carbon Trust investigated the impact of combined strong tidal currents and large waves on turbine foundation stability and the stability of seabed cables
- Ongoing work for DONG Energy is informing the design of a novel suction bucket foundation and will ultimately lead to more cost effective seabed foundation solutions for the renewable energy industry
- Testing of Acoustic Doppler Current Profiler flow measuring equipment used for river hydrometry

Andreas Roulund, Lead Oceanographic Engineer at DONG Energy Wind Power, said: *“The ability to have novel designs tested by physical modelling is crucial for development of our foundations. We can observe how the seabed responds to the foundation in the extreme conditions found in the North Sea.*



Professor Whitehouse added: *“HR Wallingford has the most extensive commercial hydraulic modelling facilities in Europe and this year has been the busiest for physical modelling in our 65 year history. The Fast Flow Facility has played a pivotal role in this success and we look forward to this continuing long into the future.”*

SO WHAT IS NEXT FOR THE FAST FLOW FACILITY?

Professor Whitehouse explained *“We are in discussion with a number of commercial clients about projects, both in the marine renewable and oil and gas sectors. The Fast Flow Facility is also an important research tool. During 2016 we will be collaborating with partners on a major European research projects that will exploit the full capabilities of the facility.”*

COLLABORATION

This includes a collaboration with University College London on URBAN WAVES to investigate the resilience of coastal defences and urban environments against tsunamis. As part of the project, HR Wallingford is developing a tsunami simulator that, once installed in the Fast Flow Facility in early 2016, will be the largest tsunami simulator in Europe.

FUNDING

As part of the €10 million EU-funded HYDRALAB+ project, HR Wallingford will also work with scientists and engineers from around Europe on research that will use the Fast Flow Facility to examine the impact of climate change at the coast.

HR Wallingford

[Click to view more info](#)

[Click to view video](#)



Oceanology International focuses on cost reduction in marine renewables

Cost reduction is the constant aim of the marine renewable energy industry, and this year's 'Marine Renewables' conference session on Tuesday 15 March, the opening day of Oceanology International 2016 (OI 2016), the world's largest exhibition and conference for marine science and ocean technology (London's ExCeL, 15-17 March), will be exploring some of the steps being taken to achieve this all-important goal. It is one of ten conference streams taking place over the three days. Like all the component parts of Oceanology International the conference is free to attend.

GET INVOLVED

"Join the marine renewables session at OI 2016 and hear from industry professionals about how recent innovations in modelling, surveying and foundation design are helping the industry achieve real cost reductions," urge the co-chairs of the day-long session, Nick Murphy, Head of Operations, SeaRoc and Tony Hodgson, Global Business Development Manager – Renewable Energy, Fugro.

"We will start by exploring some of the new techniques and technologies which are expanding our knowledge in offshore surveying, in areas such as underwater acoustics, quantifying turbulence, and dealing with WWII bombs and other unexploded ordinance."

EXPERT PANEL

"After lunch we have a panel of experts who will present some of the more novel foundation systems which are being deployed to support offshore wind, tidal and wave energy projects around the world, and who will talk about a variety of projects they have been involved with, from large bore submarine drills, rock anchors and suction caissons to self-installing substations from Germany."

NEW APPLICATIONS FROM EXISTING TECHNOLOGIES

"Finally we will wrap up with a session on new applications from existing technologies, at which we will hear from

the European Space Agency on how space tech is being applied in offshore renewables (and vice versa)," they add.

"These include the latest on floating LiDAR for offshore anemometry, and a commercial power application from wave energy today; as well as the fascinating world and complexities associated with physical modelling and replicating the environmental conditions of seabed scour."

FULL CONFERENCE PROGRAMME

The full conference programme for the day (and for all conference streams, many of which will also be of interest to marine renewables specialists) is online.

EXHIBITION

"There are Canadian, French, German, Irish, Dutch and US national group stands at OI 2016, as well as a diving pavilion; and individual exhibitors come from 32 countries," explains Event Director, Jonathan Heastie of organisers Reed Exhibitions.

"Together they take up over 8,000m² of stand space making OI 2016 the largest ever held in its 47-year history. In 2014 there were 520+ exhibiting companies and total attendance over the three days of over 8,400 industry professionals."

Exhibits of particular interest to the marine renewables community include offshore drill rigs; a dynamic remotely operated survey platform; a wide range of highly relevant survey and hydrography software and data collection/processing tools; autonomous underwater vehicles and remotely operated vehicles; innovations in connector ranges; metocean devices; specialist cables; and much more, all designed to add value rather than cost for the rapidly expanding industry.

Oceanology International

COSTS

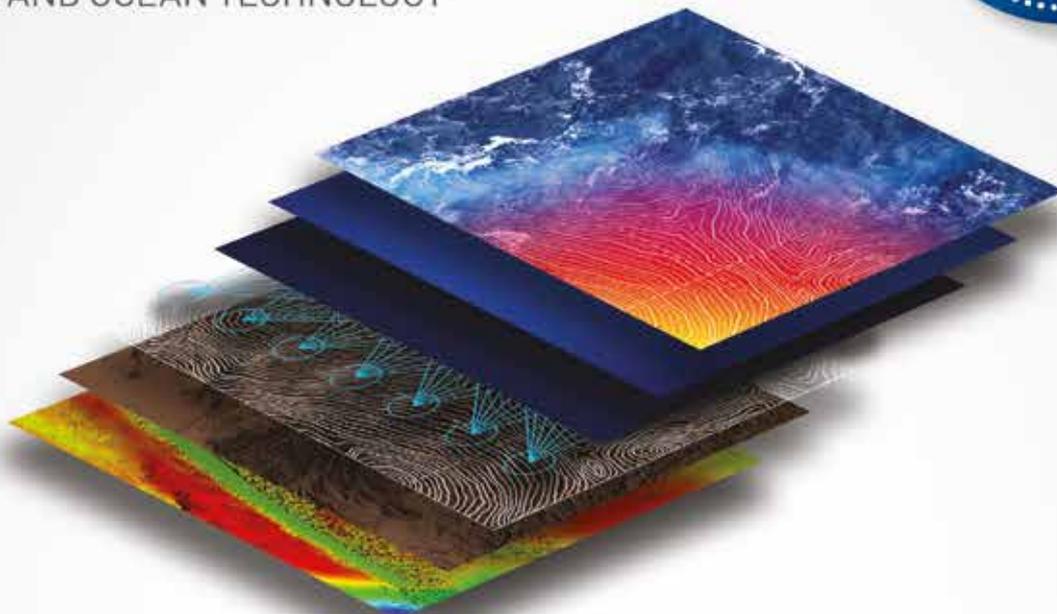


Oi oceanology international® 2016

15-17 MARCH 2016, LONDON, EXCEL

THE WORLD'S PREMIER EVENT FOR MARINE
SCIENCE AND OCEAN TECHNOLOGY

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- Coastal Engineering Consultancy

Register to attend for free at:
www.oceanologyinternational.com

Organised by:



Learned Society Patron:



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Smooth operation a

In the wave and tidal energy sector components have to withstand harsh conditions and work effectively, which is why choosing the right lubricants is crucial to ensure appropriate levels of reliability are maintained. Speciality lubricants from Klüber Lubrication help to maximise the output of equipment and critical assets whether floating or fixed with minimum maintenance intervention to reduce downtime and save costs.

The company is a trusted partner of OEM's worldwide with a portfolio of over 2,500 speciality lubricants designed to perform in the harshest offshore operating conditions and has for over 85 years continually provided greater product durability, solving the most challenging lubrication problems of modern-day equipment.

MATCHING THE RIGHT LUBRICANT WITH THE RIGHT ELASTOMER SEAL

Most wave and tidal energy systems incorporate oil lubricated bearings and gearboxes which have the capacity to leak lubricating oil should the external sealing prove inadequate. The advantage of speciality lubricants with proven and tested 'lube and seal' compatibility is therefore a major design advantage.



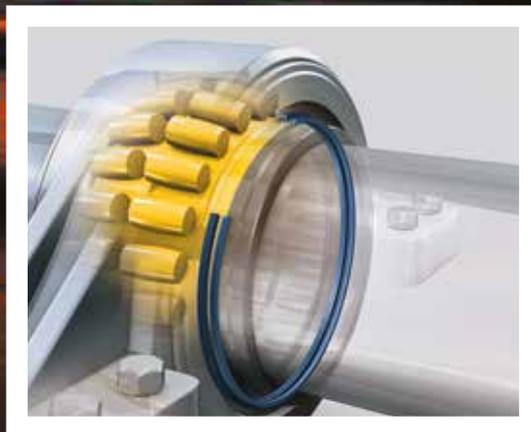
at all temperatures

Working together with Merkel Freudenberg one of the world's leading manufacturers of elastomer seals, Klüber Lubrication have successfully developed a range of biodegradable gear oils for use in bearing and enclosed gear systems.

PUSHING THE LIMITS – THE FUTURE OF SPECIALITY LUBRICANTS

Reducing the impact of mineral oil-based lubricants entering the oceans is incumbent on everyone to deliver higher levels of sustainability and work together to protect the environment we operate in.

As an independent supplier of speciality lubricants the company excels at driving improvement measures, their Klüberbio EG 2 gear oils are based on synthetic ester oil – a genuine alternative to mineral oils – which not only meet regulatory and market demands for environmental sustainability



containing more than 90% of renewable raw materials but also bear the European Eco-label, meet the US EPA's requirements for environmentally acceptable lubricant (EAL) classification and comply with OSPAR regulations.

Klüberbio EG 2 gear oils provide high scuffing load capacity to protect the gear teeth against damage even at high peak loads, so protecting the environment without compromising on performance.

CLOSE COLLABORATION

Through technology, expertise and by working in close collaboration with leading OEMs the company continues to push the limits of efficiency and performance helping to achieve the best operational practices that combine economic savings with environmental benefits.

Klüber Lubrication

[Click to view more info](#)

 = [Click to view video](#)



Invitation to... Meet the team

We want to let you know about the various events we will be attending in 2016.

It is a great opportunity to discuss ways we can help promote your company and listen to your ideas. If you would like to meet us, please get in touch as we will be attending the following events:

EVENTS LIST

- Oceanology International 2016
Excel London, 15-17th March
- OWC 2016 THMA's "Offshore Wind Connections" Annual Conference & Exhibition
Bridlington, 11-12th May
- RenewableUK Global Offshore Wind 2016
MCCC Manchester, 21-22nd June
- EWEA Annual Event 2016
Hamburg, 27-30th September

WindEnergy
NETWORK

Wave&TidalEnergy
NETWORK



Fliss - Editorial



Duncan - Editorial



Carly - Sales



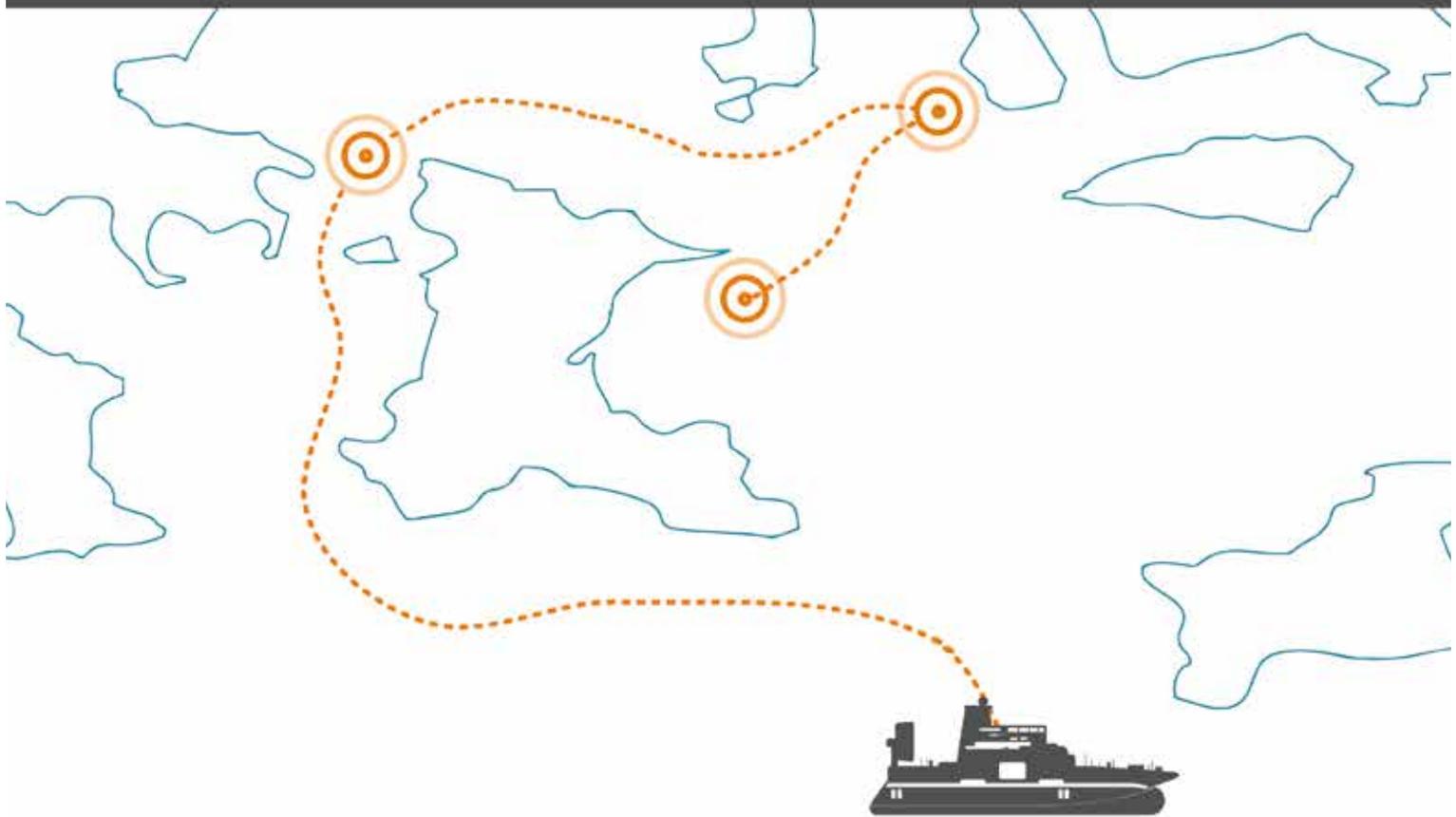
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HR Wallingford
Working with water

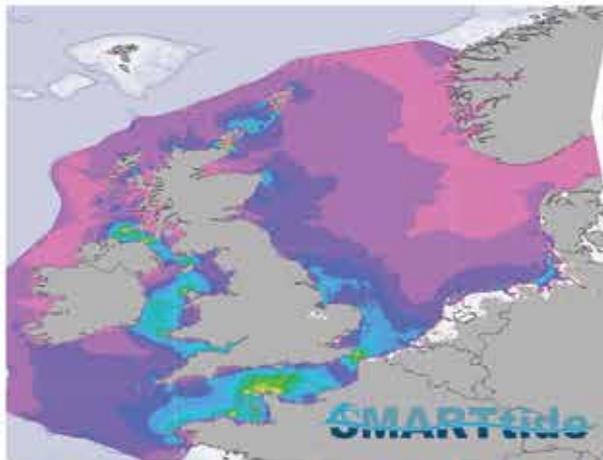
Targeted solutions

for the **renewable energy industry**

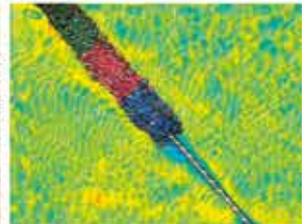
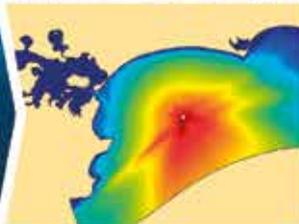
Fluid thinking, smart solutions



Fast Flow Facility



SMARTide
Voted 'Most Promising New Tool to Support Developers and OEMs' at the 6th International Tidal Energy Awards.



HR Wallingford
Working with water

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HR Wallingford carries out specialist consultancy and research in civil engineering and environmental hydraulics.

We provide the technical capability and specialist expertise to inform and support every phase of the project development cycle:

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- > environmental impact assessment (EIA)
- > underwater noise modelling
- > port selection and navigation risk assessment.

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