

High Potential Opportunity

Marine Autonomy

Exploit the emerging opportunity to design, test, validate and manufacture marine autonomous systems in the UK's largest maritime cluster; meeting growing demand across unique early adopter sectors including Offshore Renewable Energy, Defence, Aquaculture and Shipping.

The South West of England



Department for
International Trade



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1

Executive Summary

The Opportunity

Exploit the emerging opportunity to meet growing national and international demand in the applications of maritime autonomous systems across a variety of high growth industries.

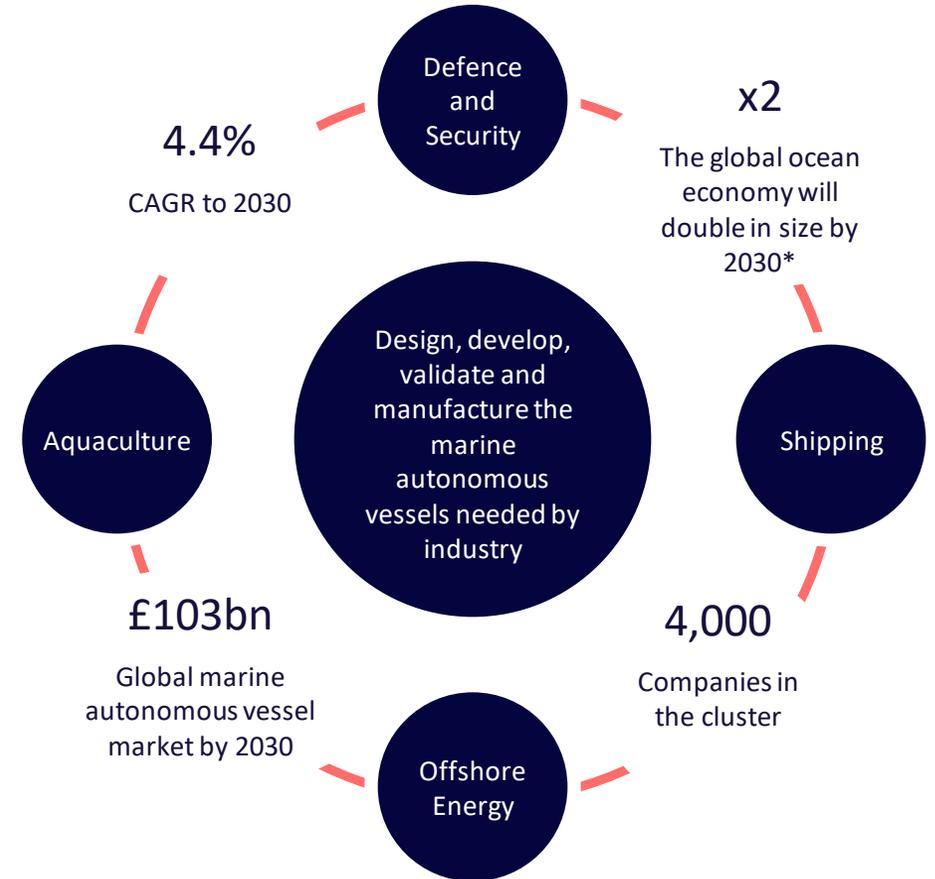
Marine Autonomy is a truly disruptive technology that will replace traditional ship-based alternatives for equipment inspection and other marine monitoring operations. Projected demand for Marine Autonomy is predicted to skyrocket to become a **£103bn market by 2030** with conceivable applications in almost all marine environments.

For the UK, high growth opportunities lie across:

- › **Defence & Security**
- › **Offshore Renewable Energy**
- › **Shipping**
- › **Aquaculture**

The UK is one of the world's leading maritime nations. Its status is built upon a remarkable historical foundation, geography, and a large and vibrant economy. The maritime industries employ 111,000 people in 6,800 companies, **contributing £13bn to the UK economy.**

The South West of England presents a unique investment offer in its ability to test, develop and manufacture target technologies. The region offers a wide range of uncongested testing conditions, ample physical space for investment and a committed maritime cluster which can support your company's autonomous projects.





1

Executive Summary

The Location

Which you can access through the unique capabilities of the UK's largest maritime cluster

The South West of England presents a key opportunity to benefit from this cluster and provide solutions across growing industries.

Tap into one of the world's most prominent marine autonomy clusters: Benefit from a well established supply chain, ranging from data analytics to shipbuilding facilities.
maritimeuksw.org

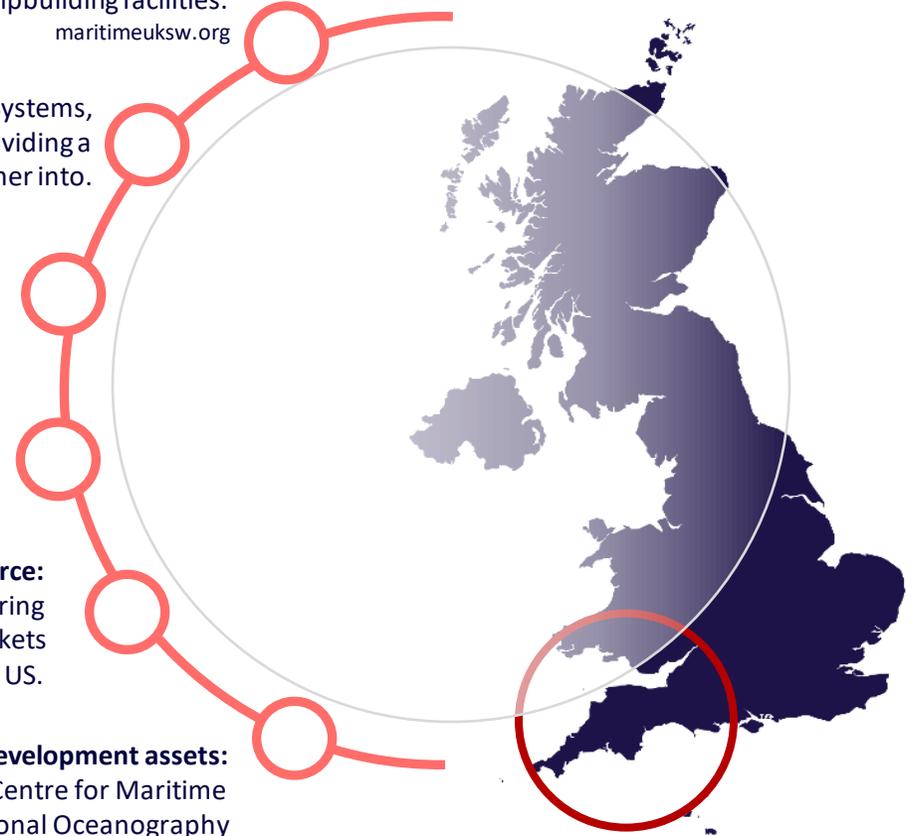
Collaborations to help your business prosper: UK platform (vessel) producers including, BAE Systems, Autonaut Ltd., M-Subs and ATLAS ELEKTRONIK UK are based within the South West, providing a market to partner into.

Affordable cost base for your business: Exploit the Industry specific industrial space available from only £6.50 per sq. ft.

Take advantage of customers and partners on your doorstep: The region includes customers such as the Royal Navy, with a strong presence along the south coast.

Benefit from highly competitive salaries and a skilled workforce: Direct access to a core of highly-skilled marine technology, AI science and engineering students and professionals, where salaries are more competitive than in other key markets such as the Netherlands, Germany, and the US.

Testing and development assets: Trial and validate your technologies at facilities such as; Smart Sound and the Thales UK Centre for Maritime Autonomy in Plymouth, the ATLAS ELEKTRONIK UK Portland Test Facility, and the nearby National Oceanography Centre in Southampton.





2

Design, develop and validate your autonomous marine system

The opportunity

From lab to launch – use the unique capabilities in the South West to design, develop, validate and deploy your technology.

The South West R&D capability has established the region at the forefront of maritime autonomy, through its academic centres of excellence and in-water trials.

Investors can plug into the Maritime UK South West cluster, which facilitates access to specialist support for innovative businesses and 21 leading research institutions allowing you to **take advantage of this multi billion pound opportunity.**

Design

Access leading industrial and academic partners experienced in collaborating in the design and delivery of innovative marine autonomy solutions, including:

- › surface, subsurface and air capabilities
- › advanced manufacturing
- › applying Digital Twins to platforms and the environment
- › smart ports
- › communications
- › cyber security

Develop

The South West of England’s established facilities can enable companies to benefit from:

- › rapid development and testing of marine autonomous systems
- › ready access to research
- › reduced time to market through manufacturing and at-sea facilities
- › enhanced infrastructure, including a marine focused 5G testbed
- › opportunity to test components, concepts or full-scale devices at the award-winning FaBTest facility

Validate

Tap into the UK’s world-leading regulation development and safe marine autonomy innovation:

- › new ideas actively supported by the UK’s MAS Regulatory Working Group (MAS RWG), which includes the Maritime and Coastguard Agency (MCA) and UK Hydrographic Office (UKHO)
- › validate marine autonomous systems, with an opportunity to balance at-sea and Digital Twin virtual tests at Smart Sound Plymouth

Design, develop and validate systems

Manufacture and commercialise

Across...

Offshore Energy

Defence and Security

Aquaculture

Shipping



Manufacture and commercialise your autonomous marine vessel

Around 25% of all marine manufacturing jobs in the UK are based in the South West. Maritime UK South West is a leading developer of technologies, systems, processes and skills in design, manufacture and repair for marine manufacturing.

Plug into a well-developed supply chain for the manufacturing of autonomous vessels

The South West is home to key players such as BAE Systems, ATLAS ELEKTRONIK UK, Babcock Pendennis, AMP Falmouth, the RNLI All-weather Lifeboat Centre, Msubs and Sunseeker.

Collaborate with leading research organisations in the South West to innovate and commercialise autonomous marine vessels

The Additive Layer Manufacturing Centre works on all stages of the manufacturing process, including powder morphology, material flow and sintering characteristics, as well as optimisation of the design and structural properties.

www.maritimeuksw.org

The South West has a wealth of experience and expertise in high value marine manufacturing, with complementary strengths in aerospace, nuclear, renewables, defence and automotive. World renowned marine and maritime organisations set industry standards for design, research, manufacturing and testing and are well placed to develop the regional and wider UK economy, through enhanced trade, productivity and brand value.



The UK's expertise in maritime systems, equipment, design, manufacturing, engineering and naval architecture is recognised throughout the world

Through companies such as BAE Systems, Babcock, Thales, BMT, Ultra, AEUK and manufacturers Tods Defence and Norco Composites & GRP.

Source: Maritime SWUK, Design, Engineering And Manufacturing, 2020 Wavehill; The South Coast Marine Cluster: Marine Inward Investment Evidence Study, June 2017. Photo MSWUK, 2021.

Design, develop and validate systems

Manufacture and commercialise

Across...

Offshore Energy

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Exploit the UK's fastest growing Offshore Renewable Energy sector

The UK Government is committed to having over 40GW of offshore wind farms installed by 2030 as part of the UK's net zero emission strategy, with a potential of up to 80GW by 2050, providing unrivalled opportunities for autonomous vessels.

There is a need for Uncrewed Service Vessel (USVs) to monitor offshore wind farms. Research indicates that USVs will operate seamlessly together and amongst crewed vessels by 2025-2030.

Demand lies in:

- › **Inspection, Maintenance and Surveillance** – ensuring offshore assets are operating efficiently above and below the waterline
- › **Geophysical and Geotechnical Surveys** - geophysical and environmental monitoring to comply with licence requirements
- › **Security operations** – asset protection, liaising and assisting during emergencies
- › **Cargo delivery** - transfer of spare parts and consumables to turbines, offshore substations (OSS) or Service Operations Vessels (SOVs)
- › **Crew Transfer** - transfer of personnel to wind turbines and onshore/offshore substations to perform maintenance tasks
- › **Seabed characterisation** – through world leading hydrography, marine geospatial data processing and video, build a real picture of the seabed and water column



The South West
 The only region with all renewable energy resources (wave, wind, Tidal and solar) close to its major ports and centres of population

In the South West, collaboration between local enterprises, universities, Celtic Sea Power and Offshore Renewable Energy Catapult are accelerating floating offshore wind (FLOW) deployment in the Celtic Sea.

FLOW development projects are already underway in the Celtic Sea including Simply Blue Energy working with TOTAL and SHELL and the development of the Wave Hub site by Swedish FLOW developer Hexicon.

Design, develop and validate systems

Manufacture and commercialise

Across ...

Offshore Energy

Defence and Security

Aquaculture

Shipping



Design, develop and commercialise software and systems that will revolutionise the Defence & Security sector

The region is home to the Defence Innovation Centre in Dorset and Her Majesty’s Naval Base (HMNB) Devonport. HMNB bases Britain’s amphibious ships, survey vessels and half her frigates, plus the training hub of the front-line Fleet, FOST, and the Royal Navy’s Amphibious Centre of Excellence at RM Tamar and Portland Harbour, home to the Royal Fleet Auxiliary. The South West is also close to HMNB Portsmouth.

Develop your marine autonomous solutions for the Ministry of Defence (MOD) in the South West:



Design, develop and validate systems

Manufacture and commercialise

Across...

Offshore Energy

Defence and Security

Aquaculture

Shipping

The Royal Navy is pursuing marine autonomous systems to protect the world’s shipping lanes

The Royal Navy has committed to deliver cutting edge maritime mine warfare capability as part of the Maritime Mine Counter Measures (MMCM)’s £184m programme, delivered by Thales and partners in the South West. Dorset-based ATLAS ELEKTRONIK UK has already delivered multiple autonomous mine countermeasures systems to UK and export customers which are in operational use today.

Defence applications for marine autonomy will be increasingly used going forward

Research shows that the military market for autonomous vessels is already worth £877m. This market is set to grow, with increasing interest in Maritime Cyber, to ensure all data collected by Marine Autonomous Systems is Cyber Secure.

Plug into the Defence Science and Technology Laboratory (Dstl) Autonomy Programme and the Defence Battlelab (formerly known as the Defence Innovation Centre)

The MOD has various programmes related to AI and autonomy, including the Autonomy programme, which explores technologies (including artificial intelligence) that can be used within all environments and that will provide the most significant military impact over current capabilities. spark.adobe.com/page/HWO2JxeqlgaYu

Connect with leading marine autonomous defence contractors at Turnchapel Wharf

Thales has created the UK Centre for Maritime Autonomy in Plymouth providing a secure location to conduct a full evaluation cycle for multi domain platforms and the location boasts rapid access to both shallow and deep water for all your testing needs.



Deploy your Aquaculture autonomous marine systems in the South West

The South West of England has the unique natural assets, a sustainable environment and the local infrastructure to support aquaculture

The UK domestic aquaculture industry is the eighth largest producer of fin fish from marine and coastal aquaculture in the world, worth an **estimated £1.4bn** a year

Aquaculture farms in the South West are reliant upon a critical network of workboats, which will be needed for infrastructure maintenance, installation and removal and general farm work.

There is a need for autonomy to help reduce costs by increasing productivity, predictability, efficiency and safety in the following areas:

- › Real time water quality monitoring
- › Infrastructure Installation and Deactivation
- › Maintenance, Support and Transfer
- › Work boats for harvesting and husbandry tasks

Companies can benefit from working alongside the Centre for Environment, Fisheries and Aquaculture Science (Cefas) – who have extensive experience of the regulation of aquaculture systems and deploying innovative, cutting edge technologies alongside cost-effective data sources. www.cefas.co.uk

3.2%
average annual increase in fish consumption globally

By 2030
aquaculture projected to be the prime source of seafood

£200bn
global market by 2030

outpaced population growth
1.6%

- Design, develop and validate systems
- Manufacture and commercialise
- Across...
- Offshore Energy
- Defence and Security
- Aquaculture**
- Shipping

Source: <https://ec.europa.eu/jrc/en/news/how-much-fish-do-we-consume-first-global-seafood-consumption-footprint-published>; <https://www.seafish.org/article/uk-seafood-industry-overview>; <https://www.seafoodsource.com/features/technavio-report-global-aquaculture-markets-growth-accelerating-through-2022>; <https://sea-machines.com/aquaculture-workboats-net-big-gains-with-autonomous-technology>



Revolutionise the shipping industry

The South West of England has an established ecosystem to drive technological change in shipping, allowing you to partner with existing operators to drive costs down in the shipping industry.

Create rapid change by developing the smart ship of the future

Commercial shipping will be a major adopter of autonomous shipping and initiatives are already underway by major players such as Kongsberg to demonstrate such opportunities.

Optimise commercial flexibility as a result of real-time data mining and analytics

Ultimately the goal will be a just-in-time service where shippers and customers are able to instantaneously tailor dispatches and receive deliveries from this autonomous logistics transport chain.

Home to the World's first AI autonomous vessel – The Mayflower Autonomous Ship (MAS)

The MAS is an initiative led by marine research non-profit ProMare with support from IBM and a global consortium of partners. Working with oceanographers and other vessels, MAS provides a flexible, cost-effective and safe option for gathering critical data about the ocean.

www.mas400.com

Lower operating costs by automating ship functions

By driving down fuel costs, crew costs and environmental needs such as small data collection and hull inspection for security and maintenance.

- Design, develop and validate systems
- Manufacture and commercialise
- Across...
- Offshore Energy
- Defence and Security
- Aquaculture
- Shipping**

Autonomous Shipping

£103bn estimated worth by 2030





Explore the South West

A compelling case for your business

Skills & Research

Cluster Information

Soft Landing

Sector Support & Case Studies





3

Skills & research

Access world-class research, help to translate that to a business setting, and access relevant skills.

A skilled and professional workforce

The South West region has the skills and capabilities to succeed in the marine autonomy sector.

Plymouth University Autonomous Marine Systems Research Group focuses on the application of AI techniques to the navigation, guidance and control of autonomous vehicles, wave energy devices and marine propulsion systems.

Beyond the focused MSc programme, the University of Plymouth will also be integrating modules in 'Applied Autonomy' within key marine courses to provide hands-on experience across autonomy end user disciplines.



MSc in Autonomous Systems

a unique degree offered by University of Plymouth



21

world class research organisations



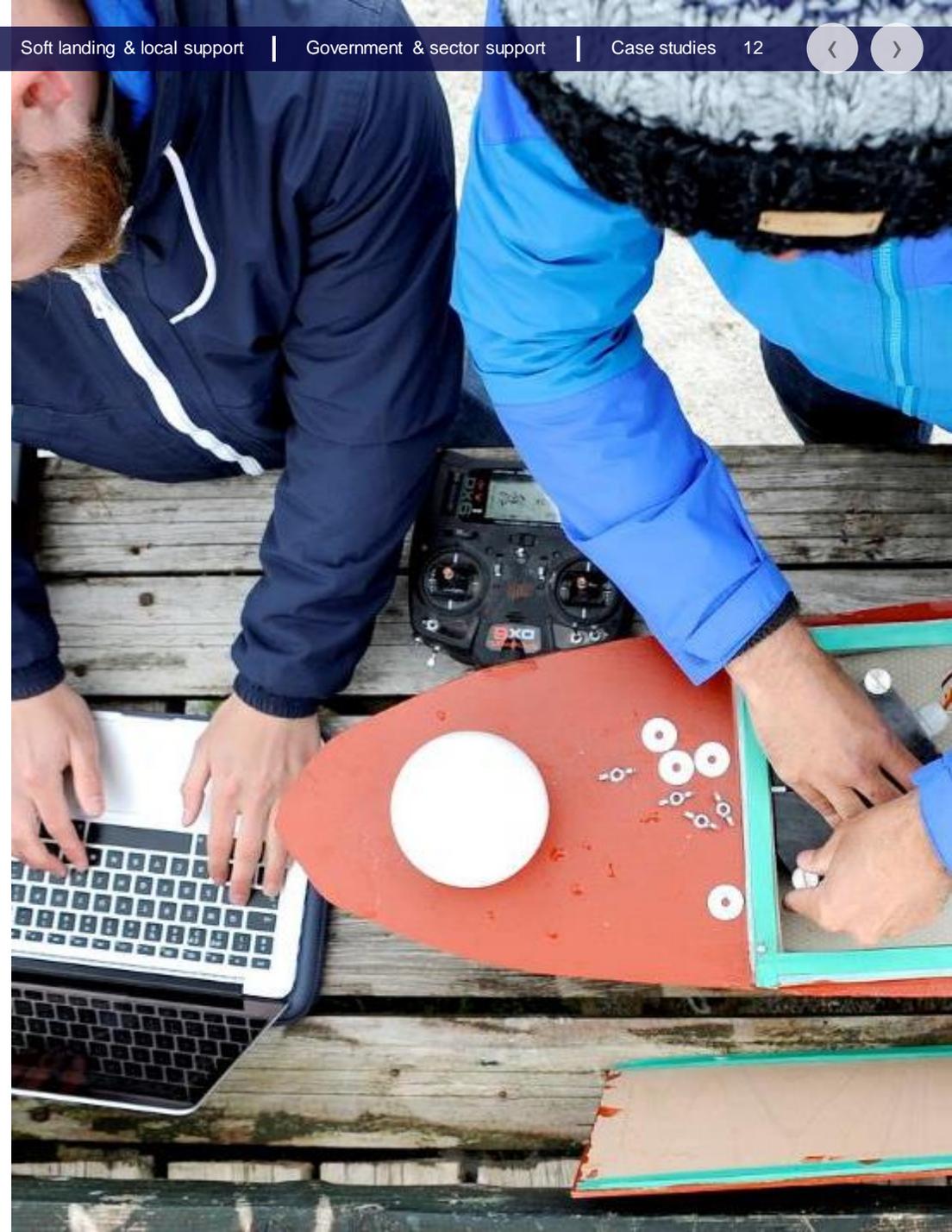
25,000

jobs in the Marine Ocean Economy



4

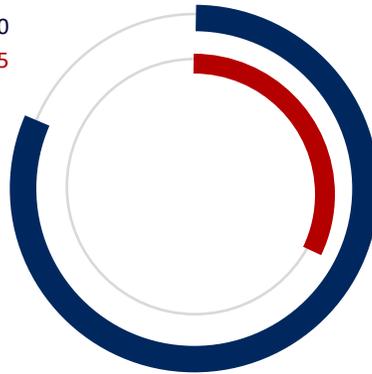
Universities with highly trained graduates



With leading institutions developing a pipeline of talent for your future

South West Education Institutes are supporting a steady pipeline of students and graduates educated for the maritime sector.

Students in key related subjects: 3,320
 Graduates in key related subjects: 1,035



Globally ranked universities such as the University Plymouth are offering degrees in relevant courses.

Students currently studying at all South West Higher Education institutes



Maritime Technology



Science of aquatic and terrestrial environment



Computer Science

The graduate pool is strengthened by Marine specific courses and world-class research centres

University of Plymouth

19,645 students across all subjects

The University of Plymouth is world renowned for its excellence in marine and maritime environments and has built a unique breadth of disciplinary interests in matters relating to marine and maritime settings and societies. The University of Plymouth is unique in offering the MSc in Autonomous Systems.

The University's recent partnership with the Royal Navy will allow world-leading academics in autonomous marine vessels and maritime cyber security to work closely with navy personnel on a range of innovative projects, to advance understanding on the future potential of marine autonomy. www.plymouth.ac.uk

Bournemouth University

19,000+ students across all subjects

Bournemouth University is ranked as one of the top 100 young universities in the world with a focus on digital innovation. The institution offers more than 150 undergraduate degrees and over 100 master's and doctoral degrees. www.bournemouth.ac.uk

University of Exeter

25,010 students across all subjects

Part of the Russell Group, The University of Exeter has world-leading researchers committed to understanding all aspects of the marine environment, from their campuses in the South West of England, in Exeter and Cornwall. www.exeter.ac.uk

Bournemouth and Poole College

11,000 students across all subjects

The college is the largest in the area, based in 3 sites at Lansdowne (in Bournemouth), North Road (in Poole) and The Fulcrum (Poole). The college offers a range of marine and related courses. www.thecollege.co.uk



Innovate. Incubate. Accelerate.

Links to institutions dedicated to enabling the transfer of technology from research to industrial applications.

Marine Business Technology Centre

The Marine Business Technology Centre is a key asset at the new Oceansgate waterside commercial site, offering in-depth product testing and development of marine-related technologies, supported by the vast knowledge and assets from the University of Plymouth and wider network of expert marine organisations.

www.marinebusinesstechnologycentre.co.uk

Marine-i

Marine-i provides leadership and a focal point to galvanise and support business-led and market-driven Research, Development and Innovation. (RD&I). The world class RD&I expertise, outstanding test facilities and the support available through Marine-i has already enabled many exciting new product developments, opening global market opportunities for Cornish businesses.

www.marine-i.co.uk

Defence Battlelab

The £5.7m Defence Battlelab at Dorset Innovation Park will become fully operational in early 2022. It will allow the MOD to work in collaboration with academic institutions, corporates and SMEs to develop new products and technologies with the potential to be commercialised. The first part of the Defence Battlelab opened in May 2021 and will be available for SMEs to move in from November 2021 with full operational capability being achieved in Spring 2022. It will provide 1,100m² of new office space and 450m² new workshop space for MOD innovation as well as associated conference and collaboration space.

news.dorsetcouncil.gov.uk/2021/05/19/defence-battlelab-a-world-leading-innovation-hub

Dorset Innovation Park

Dorset Innovation Park is developing as an advanced engineering cluster of excellence for the South West, building on its strengths in marine, defence, energy and cyber-security.

The Park offers office space, workshop facilities and fully serviced commercial employment land with Enterprise Zone status benefits such as business rate relief, simplified planning and full fibre accessibility.

The Park offers the space and support to expand, access to local finance and a growing occupier community. It offers a secure facility and the presence of two world leaders in defence technology - ATLAS ELEKTRONIK UK and QinetiQ.

www.dorsetlep.co.uk/dorset-innovation-park



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Met Office – Operations Centre Exeter

The Met Office is the national meteorological service for the UK, providing critical weather services and world-leading climate science.

As a Government funded establishment in the SW locality, it can provide regional digital and environmental data to support maritime autonomy research, studies and digital twins.

www.metoffice.gov.uk/about-us/who

UK Hydrographic Office

UKHO is a world-leading centre for hydrography, specialising in marine geospatial data to support safe, secure and thriving oceans. Marine geospatial information is a foundation dataset that enables almost every activity in the ocean, from emerging and existing blue economy sectors, to environmental protection and security. At the UKHO we provide accurate, authoritative and reliable marine geospatial data to help partners around the world make the best use of our marine environment.

With over 200 years of expertise in creating a world leading portfolio of navigation tools and services, over the last few years we have been working with partners in this maritime cluster to support the development of autonomous navigation by using our data holdings, skills and expertise.

www.gov.uk/government/organisations/uk-hydrographic-office

Plymouth Marine Laboratory

PML's globally acknowledged leading scientists and technologists operate at the forefront of marine technology development and the delivery of advanced monitoring systems. Collaborations cover an extensive network of innovative businesses who have access to PML's expertise as well as first class facilities. These include state-of-the-art laboratories, high performance computing (rent £1M investment in a GPU cluster to advance their AI and ML capability), a well equipped autonomous systems and marine technology workshops, offshore assets such as large moored platforms, autonomous surface vessels and crewed research vessels.

www.pml.ac.uk



Innovate. Incubate. Accelerate.

Links to institutions dedicated to enabling the transfer of technology from research to industrial applications.

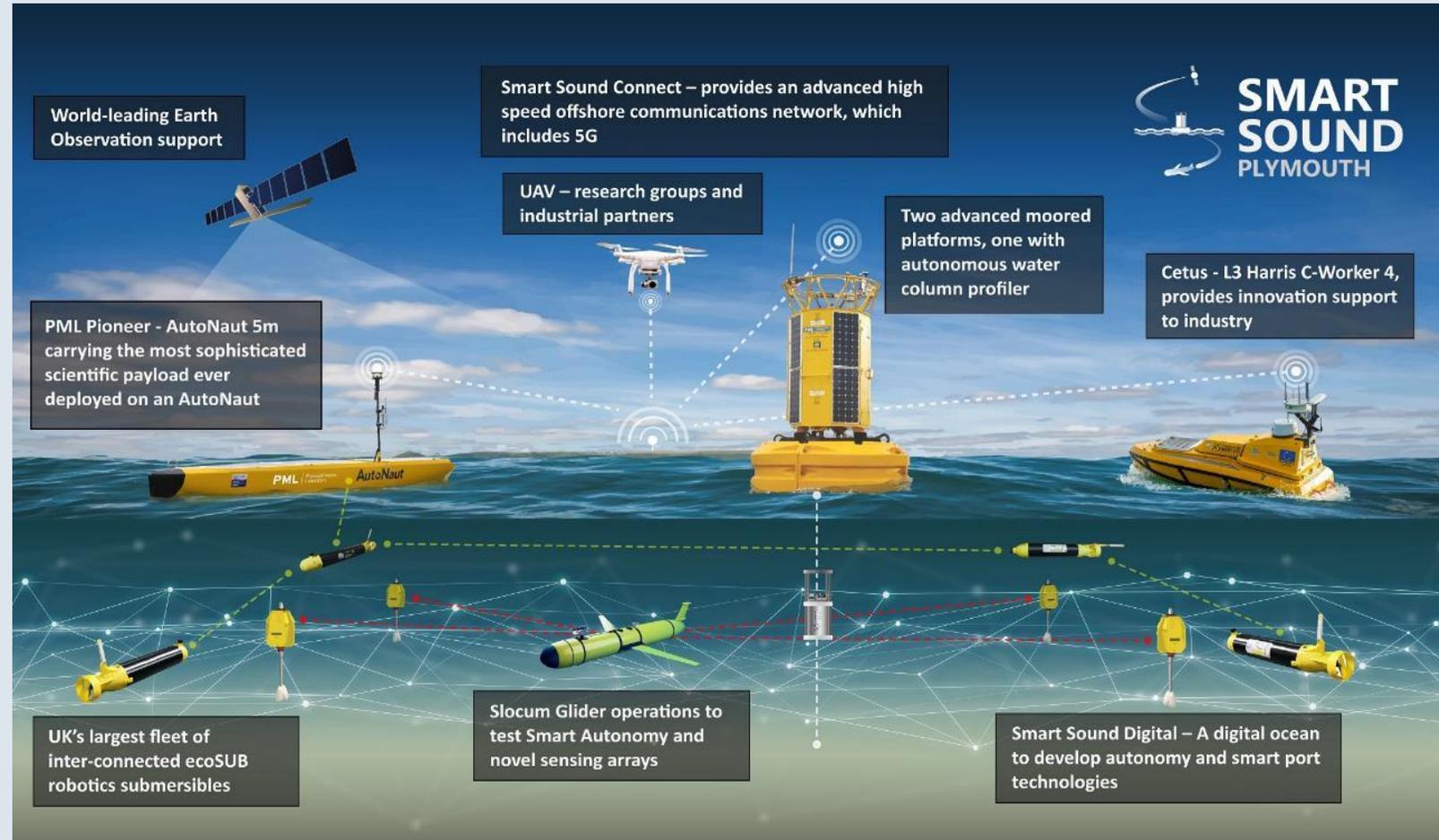
Connect with Smart Sound Plymouth

Smart Sound allows you to trial and validate your technologies in 1000km² of authorised and de-conflicted water space.

Support is available for your trials and ‘at sea’ missions from a professional team, and research and support vessels.

Companies can also tap into Smart Sound Connect: a £1.8m investment to deliver the world’s first 5G ocean-based marine testbed.

www.smartsoundplymouth.co.uk/Home





4

Cluster information

The peninsula boasts superb connectivity to the rest of the UK and the world

Get connected to the world

A connected transport network providing access to the rest of the UK, Europe and beyond.



Air

3 airports with local and international connections.

Exeter

Serves 22 national and international destinations and over 1 million passengers (2019 data).

Newquay

Serves 14 national and international destinations and nearly half a million passengers per year (2019) data).

Bournemouth

Serves over 800,000 passengers and 24 destinations. (2019 data)

Rail

Well connected to the Midlands, London and the South East.

2hr travel time to London from Dorset.



Road

Well connected to the rest of UK through an excellent motorway and dual carriageway road network via M5 & A road network.

Shipping

Plymouth Port

Handles 80,000 tonnes of cargo per year with ferry services to France and Spain.

200-metre long berth and anchorage ground, accommodating vessels up to 300 metres in length;

5,420sqm of covered storage;

34,000sqm of additional open storage for goods or vehicles.

Poole Harbour

Europe's largest natural harbour and regular services to the continent.

Portland Harbour

A dock estate of nearly **200 hectares** and a marine jurisdiction stretching over 2,400 hectares.

Over **2,000 metres of alongside berths**;

11.6 metres depth of water at the deepest alongside berth, **6 designated anchorages** in the outer harbour

with depths at anchorage of up to 20 metres, **9 designated anchorages** within the inner harbour with

depths at anchorage of up to 15 metres.



Access a clear customer, partner and supply base

South West Marine Autonomy and Geospatial Data Leadership Group

Established by Maritime UK South West partners, the group enables strategic guidance, promotion and lobbying to drive investment and growth into the sector.

www.maritimeuksw.org

The Future Autonomous at Sea Technologies' (FAST)

As an active autonomy cluster, FAST boasts over 30 leading organisations delivering advanced autonomy solutions including platform manufacture, advanced sensor systems, communications, power solutions, system integrators, and autonomy application specialists. The cluster represents strong collaboration contributing to high productivity and export business to the region.

www.smartsoundplymouth.co.uk/Industry

The UK Marine Science and Technology Compendium

The database provides an overview of the UK's marine research institutes and university departments, the marine industry sector, government bodies representing marine and marine-related Non-Governmental Organisations.

www.naqbase.noc.ac.uk

National Oceanography Centre

The NOC is one of the world's top oceanographic institutions. They undertake world leading research in large scale oceanography and ocean measurement technology innovation; working with government and business to turn great science and technology into advice and applications.

www.noc.ac.uk

The largest maritime cluster in the UK

World beating research offers, from 21 research organisations including UK's largest marine institute

£2.54bn GVA per year to South Coast economy

Almost 4,000 businesses and 25,000 jobs

Large uncongested waters with direct access to English Channel and Western Approaches





5

A competitive package against other leading global locations

Our industry insights identify key cost drivers for this industry

Soft landing & local support

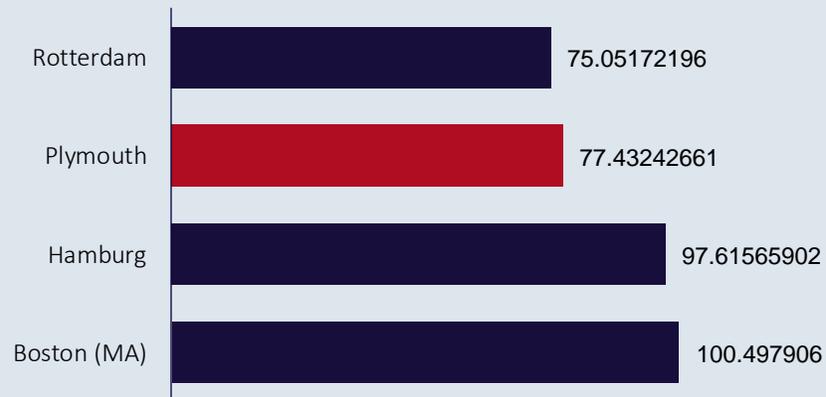
A cost competitive location against leading global markets



Industrial Space Costs

The South West has some of the lowest industrial space costs compared to its major competitors.

Cost £GBP per square metre per annum



■ Boston (MA) ■ Hamburg ■ Plymouth ■ Rotterdam



Cost Effective Salaries

Salary costs in the UK are competitively lower than other key global locations.

	Technology Engineering Specialist	Robotics Engineer	Electronics Engineer
Plymouth	45,645	47,291	42,511
Rotterdam	63,284	65,866	60,463
Hamburg	83,457	85,922	51,759
Boston	105,457	111,227	103,507

Averages in £000s (European cities converted from €). Total costs indicated.

Source: fDi Benchmark from the Financial Times Ltd 2019



Access a well-connected network of support

Local Enterprise Partnerships (LEPs) offer support and help to drive your business forward

The Heart of the South West LEP (covering Devon and Somerset)

provides a tailored business support brokerage for international businesses, including property and site searches, networking opportunities and a business introduction service.

www.heartofswlep.co.uk

Dorset LEP

Dorset LEP offers tailored soft landing packages for new investors including relocation support, commercial property searches (introduction to land and real estate agents), local economic intelligence provision and introductions to local sector networking groups.

www.dorsetlep.co.uk

A wide range of funding and finance options for your investment are available.

www.dorsetlep.co.uk/invest-in-dorset

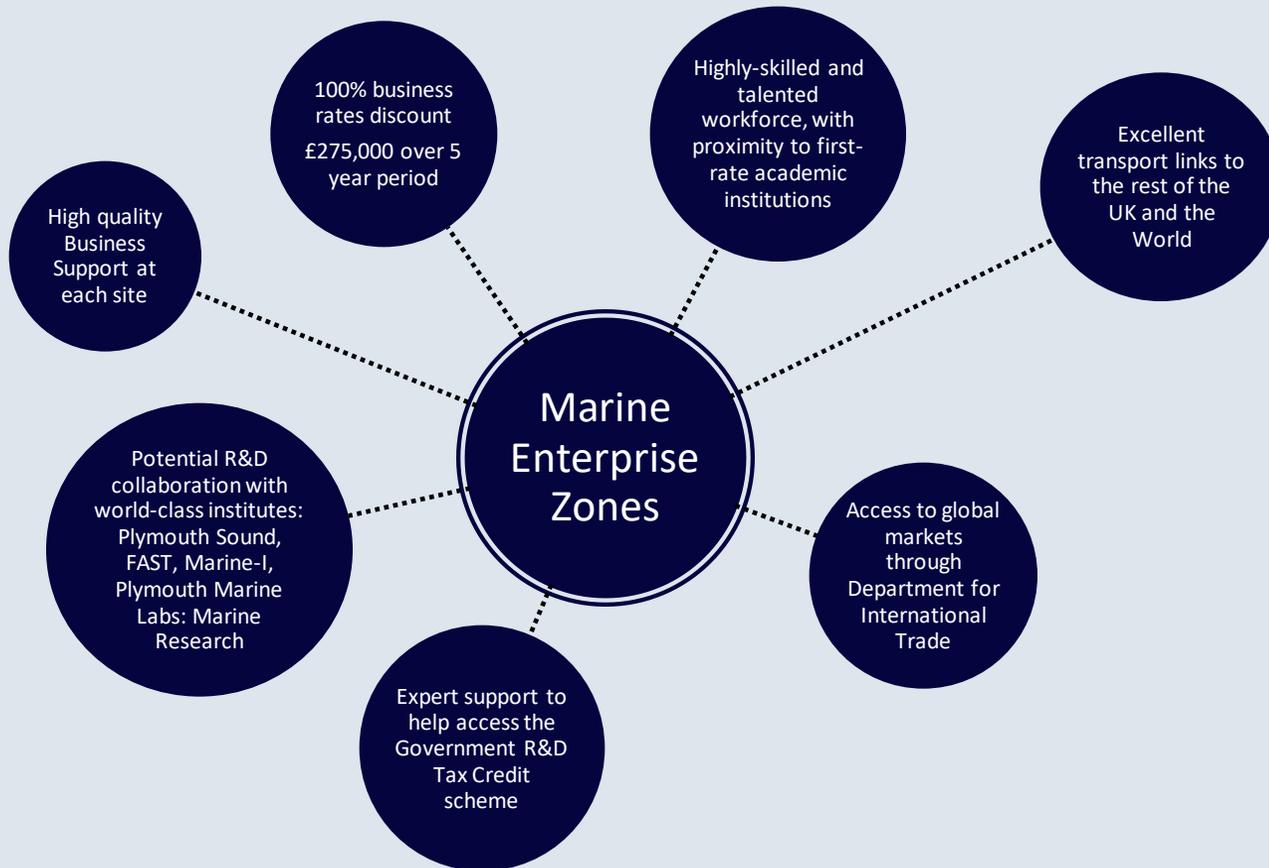
Cornwall and Isles of Scilly LEP

Cornwall and Isles of Scilly LEP work with businesses, to find the right guidance and support to help their business work smarter, develop and grow.

www.cioslep.com

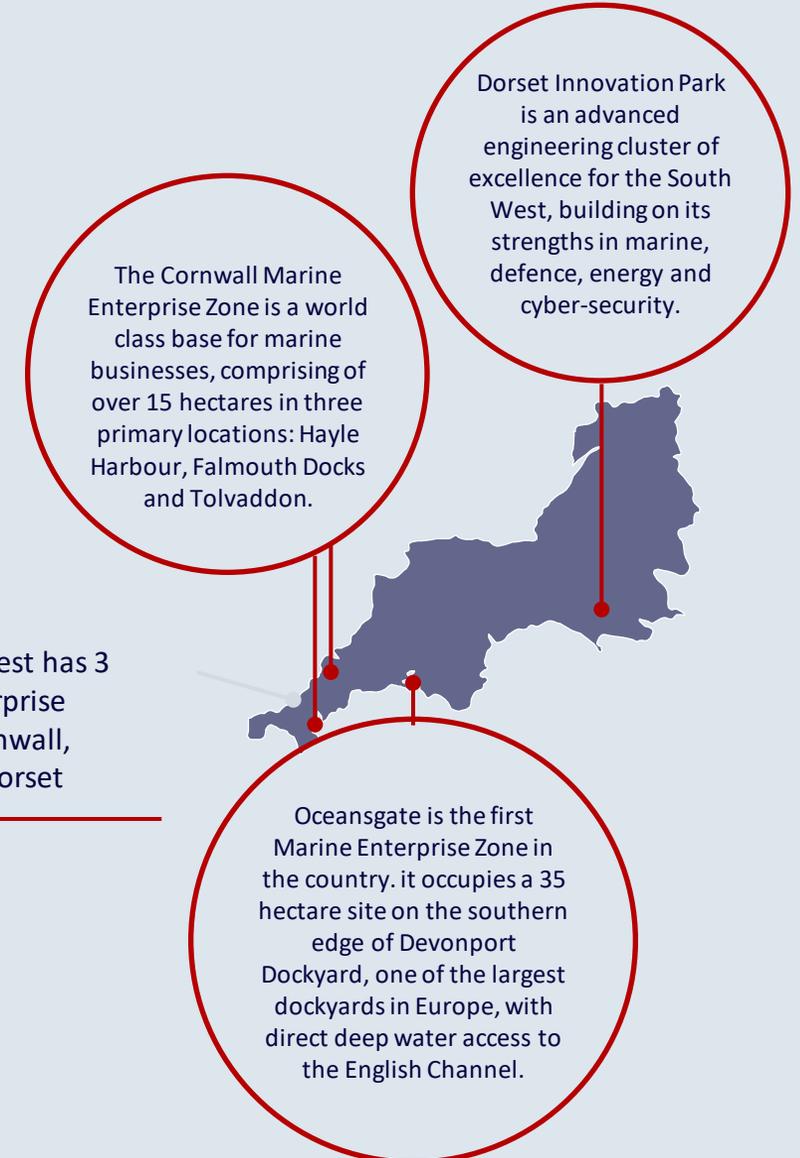
Marine Enterprise Zones

Providing businesses with significant advantages to enable them grow and gain a competitive edge.



Support doesn't end once you've landed. Local specialist advice is available throughout the entire journey your business takes.

The South West has 3 Marine Enterprise Zones in Cornwall, Devon and Dorset





6

Government & sector support

A dynamic and flexible maritime sector, underpinned by a supportive regulatory environment

The UK Government wants the UK to be at the heart of the global maritime autonomy industry

The UK expects to be world-leading in the design, manufacture, uptake and use of smart shipping technologies, the associated skills base and the relevant regulatory framework.

Ideas

Open up R&D funding to catalyse innovation. The Industrial Strategy Challenge Fund and industry will invest an estimated £93mn made available to industry and researchers in order to de-risk research and innovation in advanced robotics and create a safer working world for sectors such as offshore energy and defence.

Places

Government will establish a Centre for Smart Shipping (CSmart) to coordinate and implement Government policy on technology and innovation in the maritime sector, with a focus on autonomous technology.

People

Raise awareness of the maritime sector in schools by having a single industry body overseeing a more coordinated cross-sector in-school awareness and ambassador programme. Government aims to establish a Maritime Skills Commission, bringing existing leading maritime skills experts together to report on the existing and future skills needs of the industry on a 5-yearly cycle to inform the maritime training curriculum and keep it up to date with the evolving needs of the sector.

Maritime 2050

This strategy sets out the Government's vision and ambitions for the future of the British maritime sector. Maritime 2050 is about anticipating the challenges and opportunities ahead and recognising the UK's strengths so we are well placed to capitalise on them. The ambitions and goals will be achieved by focusing on the following 7 themes.

- › UK competitive advantage
- › technology
- › people
- › environment
- › infrastructure
- › trade
- › Security

www.gov.uk/government/publications/maritime-2050-navigating-the-future

Plymouth and South Devon Freezone

As part of the Government's UK Freeports initiative, the Plymouth and South Devon Freezone could provide:

- › Innovation: a deregulated test environment in the Smart sound and support for 40 business/research collaborations and PhDs per year
- › Simpler planning – 108 hectares of land designated for employment purposes and released for further development
- › Infrastructure funding – to improve transport links
- › Cheaper customs – with favourable tariffs, VAT or duties
- › Lower taxes – with tax breaks to encourage construction, private investment and up to 9000 new jobs



UK industry bodies enable quick and easy access to suppliers and customers

Connect with businesses and research institutions via the Maritime UK South West cluster.

Maritime UK SW

The leading UK ocean technology cluster for the South West

South West Aquaculture Network

The Network exists to promote and develop aquaculture in the region.

South West Regional Defence and Security Cluster

Industry and academia led collaboration and the first pan-Defence and Security cluster in the UK

UK Chamber of Shipping

The UK Chamber of Shipping is the trade association and voice of UK shipping

Innovate UK

The United Kingdom's innovation agency

Maritime London

The industry-led body representing maritime professional services in the UK

British Marine

The trade association for the UK leisure, superyacht and small commercial marine industry

The Society of Maritime Industries

The voice of the UK's maritime engineering and business sector

Lloyds Register

Lloyds Register is a marine classification society

MASRWG

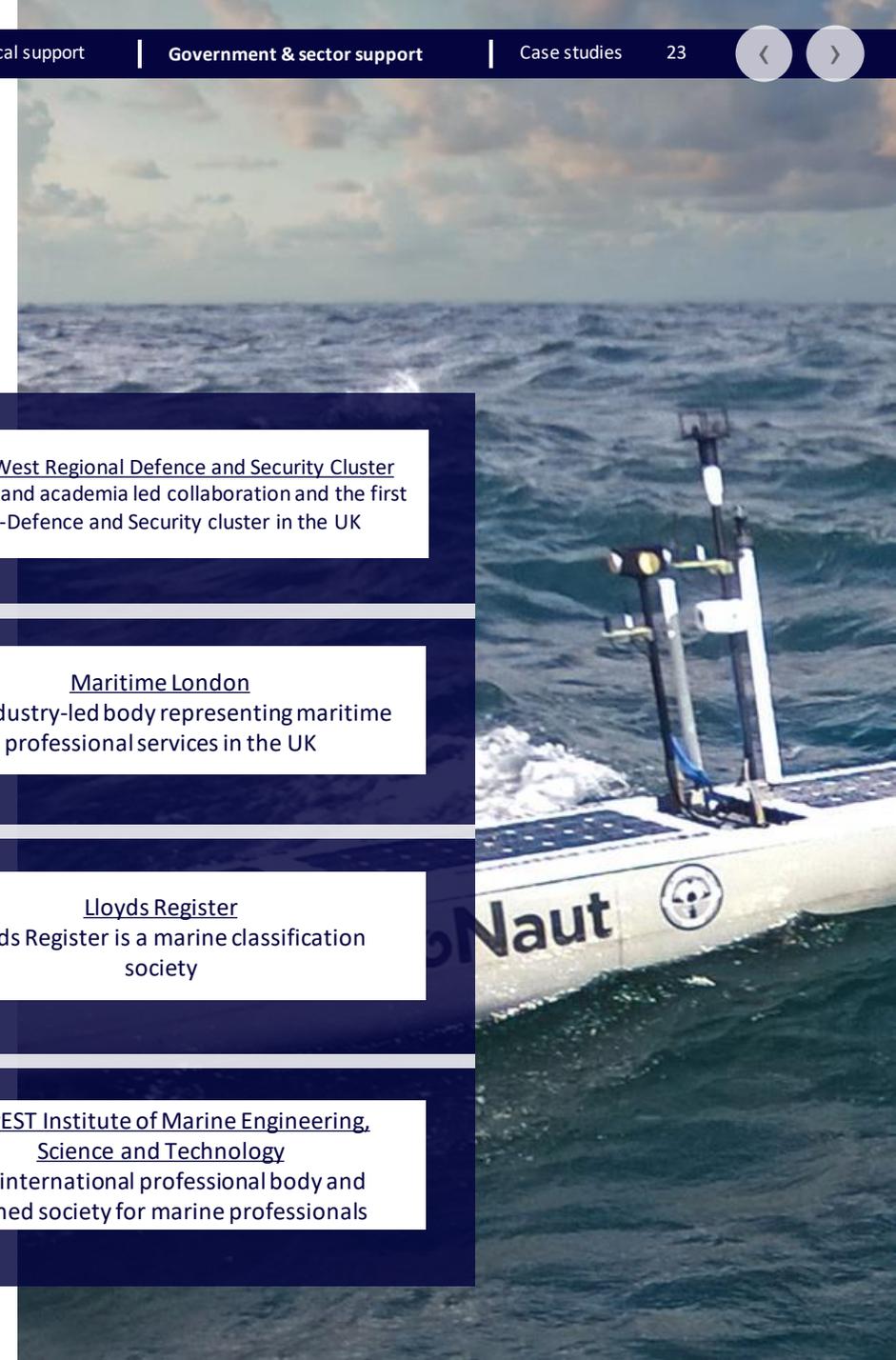
MASRWG is responsible for producing the code of practice for autonomous vessels.

Maritime & Coastguard Agency

The MCA work to prevent the loss of life at sea. They produce legislation and guidance on maritime matters

IMarEST Institute of Marine Engineering, Science and Technology

The international professional body and learned society for marine professionals





Accompanied by the right support from local partners and Government to ensure a seamless investor process



Read on to see how this combines with local government to provide you with world-class support services.

Real companies. Real experience. Real value.

Case Studies

How the South West can work for your business

ATLAS ELEKTRONIK UK

AutoNaut

Coda Octopus

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This next-generation autonomous technology will be instrumental to our goal of protecting the safety and security of our personnel, while also reaffirming the UK's unwavering commitment to improve the safety of international waters.

Defence Minister, Jeremy Quinn

ATLAS ELEKTRONIK UK

ATLAS ELEKTRONIK UK (AEUK) are renowned worldwide for their innovative maritime systems, including their autonomous minesweeping system which is used by the UK Royal Navy. The system can clear mines from an area at sea without the need for an on-board crew, bringing the Navy closer to a future where they can remove the human from the minefield. A combination of the Dorset Innovation Park and Portland Harbour Integration, Test & Evaluation waterside facilities provide excellent support for development and deployment of maritime autonomy.

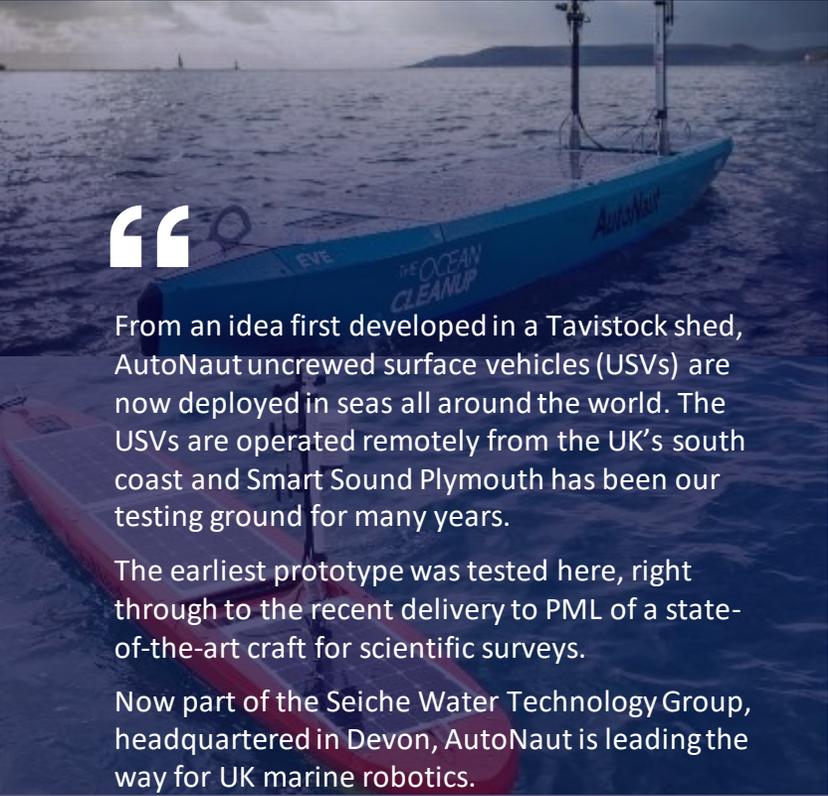
The MOD has signed an agreement with AEUK to deliver three autonomous minesweeping systems. Deployed from AEUK's autonomous uncrewed surface vessels (USVs) the state-of-the-art capability enables the rapid countering of maritime mines, assuring safe passage for Royal Navy and commercial ships. By removing Service personnel from the minefield the system protects lives and offers a step change in tempo for mine countermeasures (MCM) operations. The minesweeping system has been rigorously evaluated by the Royal Navy's Maritime Autonomous Systems Trials Team in a range of environments and conditions. The system provides a world leading mine sweeping payload benefitting from the flexibility of deployment from the 11m USV. The whole system is fully road, air and sea transportable and can be deployed and operated worldwide providing a high degree of readiness.

AEUK's success has supported the company's continued growth and enabled a £3.4m investment, to construct an innovative integration facility at their site on Dorset's Innovation Park, which secures employment opportunities far into the future. The facility was opened in 2019 by the Minister for Defence Procurement, Mr Stuart Andrew MP. The building is being used to accommodate AEUK's growing range of autonomous and manned vessels, most recently delivering the 15 metre RNMB HEBE vessel to be used for the Royal Navy's autonomous route survey capability. With 2 other ARCIMS USVs, RNMB HEBE will conduct a variety of tasks including the launch and recovery of sonars, autonomous underwater vehicles (AUVs) and remotely operated vehicles. The Route Survey Systems will be capable of operating autonomously with C2 connections to land- or sea-based portable command centres. Sea testing of the autonomous systems is being conducted from AEUK's test facility in Portland Harbour, which provides ideal conditions for autonomous craft.



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From an idea first developed in a Tavistock shed, AutoNaut uncrewed surface vehicles (USVs) are now deployed in seas all around the world. The USVs are operated remotely from the UK's south coast and Smart Sound Plymouth has been our testing ground for many years.

The earliest prototype was tested here, right through to the recent delivery to PML of a state-of-the-art craft for scientific surveys.

Now part of the Seiche Water Technology Group, headquartered in Devon, AutoNaut is leading the way for UK marine robotics.

Phil Johnston, Business Development, AutoNaut Ltd.



AutoNaut

SEICHE

WATER TECHNOLOGY GROUP

AutoNaut Ltd

AutoNaut Ltd design, manufacture and operate uncrewed surface vehicles (USVs). AutoNaut USVs use patented wave-foil technology for propulsion and solar photo-voltaic panels to power onboard systems and sensors. This technology enables data collection at sea over many weeks, without risk to offshore personnel and without use of carbon fuels. Able to carry a range of sensors, AutoNaut has been used in a range of applications including:

- › Meteorological and oceanographic surveys
- › Monitoring for marine-life
- › Measuring underwater sound
- › Communications Gateway
- › Surveillance

The marine science community has been a key early adopter and commercial missions have been completed for the oil and gas sector in the USA and Africa. In defence, missions have been completed for NATO navies to demonstrate the detection of hostile submarines and communication with friendly sub-sea assets. The offshore renewable energy sector is growing rapidly and increase in uptake of this technology is expected.

Image (top): AutoNaut USV "Eve" was deployed in the Pacific to support The Ocean Cleanup

Image (middle): Testing in Plymouth SmartSound of UEA's USV "Caravela": The first USV to deploy an OceanGlider, without any use of fossil fuels.

Image (bottom): The PML Pioneer, AutoNaut USV fully outfitted with cutting-edge scientific sensors.

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Martech has been developing marine technology in Weymouth, Dorset for over 30 years and as part of Coda Octopus Group develops subsea technology sold across the world. Originally founded to support the UK Defence Research facilities, Martech now works with many leading UK defence primes designing and manufacturing electronic and mechanical systems.

Together with our sister company Coda Octopus Products Limited, Martech is closely involved in the development of cutting edge sonar technology including the world's only real-time 3D imaging sonar, Echoscope™.

Paul Baxter, Managing Director, Coda Octopus Martech Ltd

Coda Octopus Martech

Coda Octopus Martech's unique and world-leading 3D sonar technology, Echoscope™ generates high-resolution images of subsea scenes in real-time. This patented technology is already adopted for commercial underwater construction and maintenance, as well as defence and security. Applications include:

- › Autonomous vehicles
- › Offshore renewable energy,
- › Defence diving operations
- › Marine infrastructure development
- › Port and harbour security
- › Geophysical and environmental mapping

Generating instantaneous high-resolution 3D images, 3D sonar provides real-time subsea vision for autonomous vehicles resulting in unprecedented navigation and obstacle avoidance capabilities. Coupled with AI, real-time 3D sonar can enhance robotic platforms beyond autonomy enabling the creation of highly sophisticated 'Smart Vehicles' with the potential to automatically undertake routine inspections, safeguarding infrastructure.

With unmanned and autonomous vehicles predicted to take over many routine tasks in the future, 3D sonar is forecast to be a critical tool, enabling autonomous sub-sea and surface vessels to safely navigate in hazardous waters.

Given the anticipated growth in autonomous technology, Coda Octopus Group is looking at how it can expand its capabilities and offerings from its engineering base, close to Portland harbour.

Images: Coda Octopus 3D sonar technology and examples of real-time 3D sonar imaging.

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MSubs

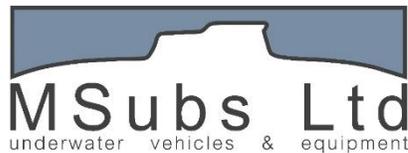
Msubs is a UK SME that specializes in the design, manufacture and operation of manned and unmanned submersibles for military and commercial markets, as well as commercial machine automation, unmanned surface vehicles and higher-level autonomy.

MSUBS is a world leader in the rapid design and delivery of specialist prototype marine vehicles. Its vehicles are in service with both the US Navy (USN) and the US Special Operations Command (USSOCOM). More recently MSubs has been awarded a UK Defence and Security Accelerator (DASA) contract to provide the RN with its first Extra Large Unmanned Underwater Vehicle (XL UUV). Under final assembly, the XL UUV will begin sea trials in July 20. Based on the proven ability to deliver rugged systems on time and budget, MSubs is increasingly invited to provide subject matter advice to the UK MoD, both directly and indirectly through the NDP and Progeny portals.

Image (top): MASTT – Mobile Anti-Submarine Training Target, the world’s largest unmanned underwater vehicle

Image (middle): S351 Dry Combat Submersible Prototype diver lock-out submersible for SOF

Image (bottom): Royal Navy XLUUV Tech Demonstrator on trials with MSUBS Ltd in Plymouth Smart Sound



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ProMare

ProMare is a non-profit corporation and public charity based in the UK & USA; the company was established in 2001 to promote marine research and exploration throughout the world.

Our team of experienced archaeologists and marine professionals execute a variety of research projects independently and in concert with academic, corporate, public, and governmental organizations and agencies that are designed to advance man’s knowledge of history and science.

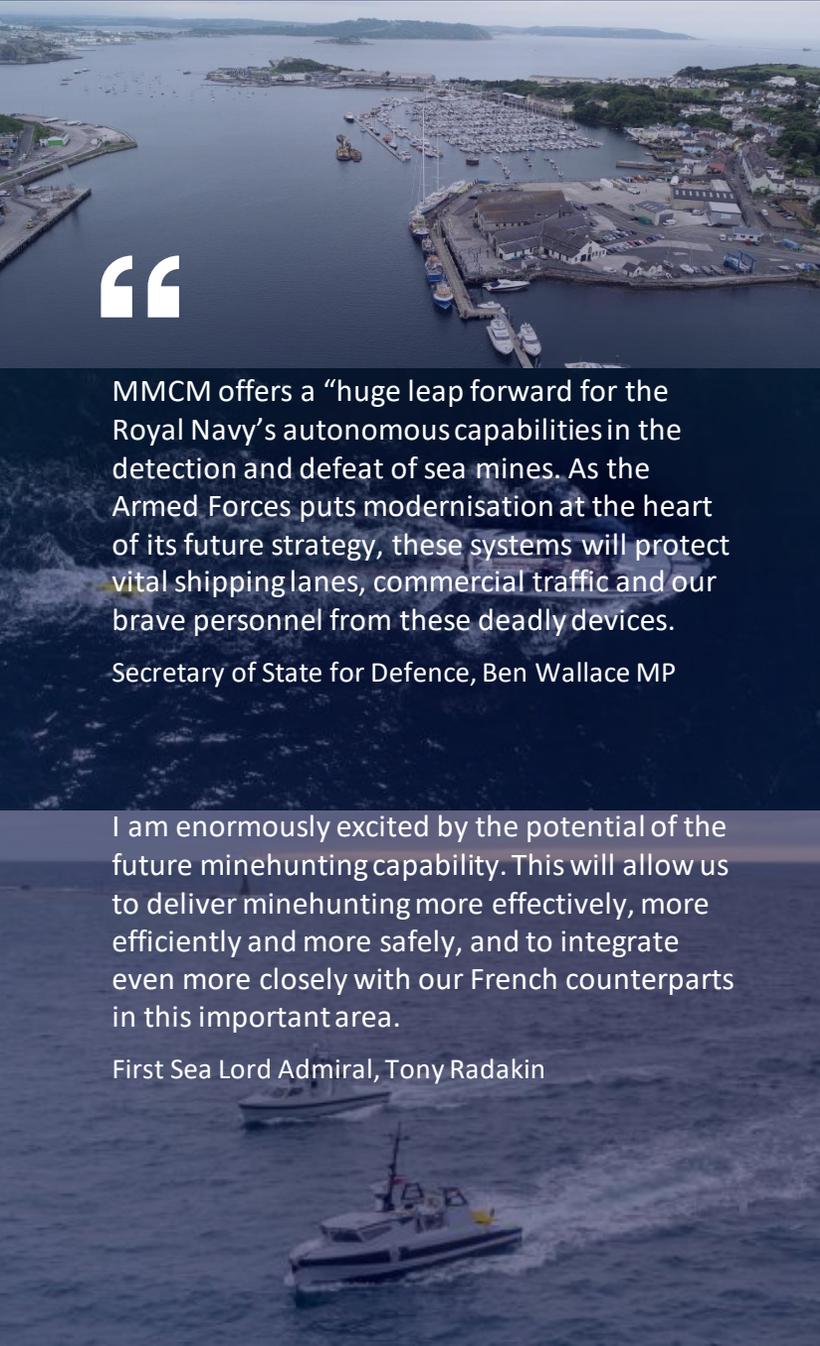
Image (top): the Mayflower Autonomous Ship designed and built to advance autonomous ocean and climate research.

Images (middle; bottom): Ictineu3 submersible deployed to locate lost Amphibious truck (DUKW) and in Lake Garda, Italy.



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MMCM offers a “huge leap forward for the Royal Navy’s autonomous capabilities in the detection and defeat of sea mines. As the Armed Forces puts modernisation at the heart of its future strategy, these systems will protect vital shipping lanes, commercial traffic and our brave personnel from these deadly devices.

Secretary of State for Defence, Ben Wallace MP

I am enormously excited by the potential of the future minehunting capability. This will allow us to deliver minehunting more effectively, more efficiently and more safely, and to integrate even more closely with our French counterparts in this important area.

First Sea Lord Admiral, Tony Radakin

Thales

In 2018, Thales opened its Maritime Autonomy Centre; an important new test and evaluation facility in Plymouth with access to both shallow and deep-water trials, enabling progressive testing to be done from sheltered bays to open sea.

The new site at Turnchapel Wharf is a £1 million capital investment in the local area to develop and test marine autonomous systems. The first major programme to benefit from the capability is the joint UK-France Maritime Mine Counter Measures (MMCM) venture. The MMCM programme will allow the RN to fundamentally change its approach to mine warfare, by employing unmanned capability for mine hunting, identification and disposal. Complex prototype systems have been put through their paces at the Maritime Autonomy Centre, supported by digital techniques to de-risk and accelerate. MMCM is now in its production phase.

Thales has also collaborated with offshore renewable energy experts in a robot team challenge as part of the MIMRee (Multi-Platform Maintenance, Inspection and Repair in Extreme Environments) project. The project is funded by Innovate UK under a £4 million grant and is set to develop the world’s first fully autonomous robotic inspection and repair solution for offshore wind farms. Thales will play a central role in the project, providing the Thales Halcyon unmanned robot boat which will not only transport the robotic crews, but also continuously scan the wind turbines and feed data through to MIMRee’s ‘Brain’.

Thales has had a connection with the Royal Navy (RN) for more than a century, during which time Thales has supplied the periscope and optronics mast to every RN submarine; built a strong partnership on naval electronic warfare; played a leading role in delivering the Queen Elizabeth-class carriers; and helped the UK maintain operational advantages in the underwater battlespace.



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Built by surveyors, for surveyors, our unmanned vessels are designed with true insight into how the surveyor needs to undertake survey operations.

Unmanned Survey Solutions (USS) design, build and operate battery & hybrid powered autonomous Unmanned Surface Vessels (USV's) for conducting Hydrographic, Geophysical and Environmental surveys at sea.

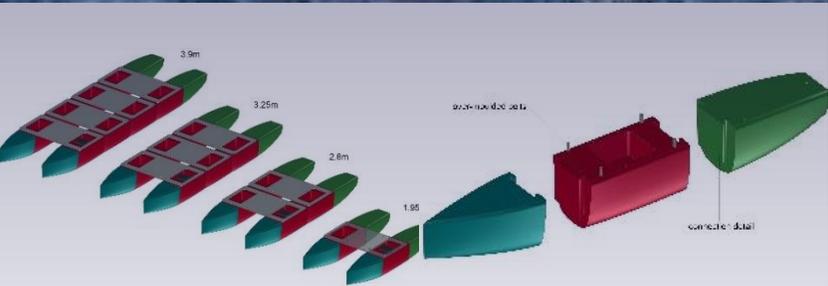
USS

USS offers safe and cost-effective ways to conduct vessel-based surveys by removing the person from the vessel. The USS offer includes greater sensor carrying capacity and stability compared to other vessels of similar size, and modular vessel designs which can come apart to be shortened or lengthened depending on the application.

For example: a 3.50m vessel can be extended to 5.00m to increase endurance and/or carry additional payload sensors.

USS are based in Hayle, in the SW of England, and have exceptional access to the sea for product development and testing.

Thanks to USS's excellent relationships with local Universities, to company has access to graduate recruitment from a talented pool of students.



on, amidships and stern sections are all 0.65m in length.

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