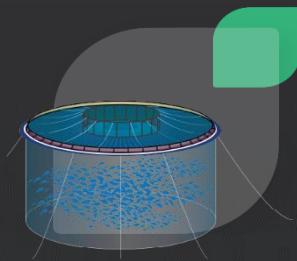


OCEAN CLEANTECH

MARKET INTEL WEBINAR SERIES



UK



WEBINAR TEXT

This is the script used in the webinar titled 'Ocean Cleantech: Market Intel Webinar Series – UK' published on August 31, 2023. The webinar can be accessed [here](#).

Here in Atlantic Canada, we are on the leading edge in ocean cleantech, specifically when it comes to environmental sensing, monitoring, and characterization technologies. Our businesses and research institutions are experts at using laser, sonar, radar, satellite, environmental DNA, and other technologies to understand our impact on the environment, operating in harsh and dynamic conditions, and climate change's impact on our industries and communities.

Atlantic Canada's capabilities are world class, but in order for the region to maintain its competitive standing it must continue to look outwards. We know that small and medium-sized enterprises (or SMEs) and institutions that engage more on the international stage tend to be more productive and more innovative.

We are Thinkwell Research and Strategy, and in this webinar series, we are exploring other jurisdictions in the world with strong clusters of ocean cleantech activities with capabilities analogous to our own.

We hope this series provides you with new market intelligence and ideas on where you can partner and collaborate on projects and innovations. At the end of the webinar, we will provide you with some information on the various funding mechanisms that exist which can help you move your ideas forward.

As our final jurisdiction webinar, we're looking at the UK, which is one of the world's leaders in marine industries such as offshore wind power and other marine renewables, ocean technology, and the blue economy overall.

Clusters and networks have been key drivers for innovation and research globally, and the UK is no exception. Through these clusters, as well as the work of other organizations, academia, and research institutions, several advancements have been made in the field of marine technology, which have further supported key marine sectors in the UK.

[Clusters and networks]

Maritime UK South West is a public, business and research partnership that brings together knowledge and expertise to create a world-leading ocean technology cluster. The cluster's main focuses are to foster collaboration and innovation, to aid in both developing and finding business skills and support, and to drive strategic development and investment.

The Cluster brings together a large network of partners to develop its Centres of Excellence, which include the South West Marine Autonomy and Geospatial Data Cluster, Ocean Science and Aquaculture, Offshore Renewable Energy, and Marine Manufacturing.

Of particular relevance to this webinar series, is the South West Marine Autonomy and Geospatial Data Cluster, which is essentially a 'cluster within a cluster'. It provides a wide range of testing and development facilities, and includes a high concentration of supply chain companies which develop various technologies, including sensors, and data, navigation and communications tech. Key cluster members include: Atlas Elektronik, BAE Systems, Thales, Plymouth University, Plymouth Marine Laboratory, and Exeter University.

Another key UK cluster is **National Maritime**. It is the UK's largest maritime network and is based in both London and Southeast England. It is a business and research partnership which focuses on collaboration and sustainable growth within the ocean sector, and provides business supports to SMEs. National Maritime's main objectives are to promote the sector (from regionally to internationally, drive clean growth, build Centres of Excellence, maintain the UK's competitive advantage within the sector, and to boost opportunities and investment within coastal communities.

The cluster's main strengths are based in maritime research, environmental and digital technology, shipping and shipbuilding, and advanced marine engineering.

The next two clusters and networks differ slightly, in that one is a large-scale project intending to develop projects under a network, and the other is an industry-specific cluster.

The Islands Centre for Net Zero is an innovation project which supports Shetland, Orkney, and the Outer Hebrides to "become lighthouse communities in the energy transition". The project stems from the Islands Growth Deal, which is a 10-year investment package funded by both UK and Scottish Governments. This project will work with local communities and businesses to push for decarbonization and to foster economic development and sustainability.

Research projects which are conducted under the Islands Centre for Net Zero are supported by a wide range of partners from across the academic, public and private sectors.

As part of the Islands Growth Deal programme, there are three joint-island innovation-focused proposals, in the areas of low carbon technologies, creative industries and wellbeing, and skills and talent retention. The projects undertaken as part of these areas will deliver benefits to all communities within the Islands region.

Specific to the offshore wind industry is the **Offshore Wind Growth Partnership**. This is a long-term business program which will promote and foster collaboration within the offshore wind sector, by increasing access to funding, knowledge and expertise, and partnership opportunities. The main objective of the partnership is to further the UK's position as a world leader within the offshore wind industry. The partnership includes four main areas, which are Collaborating for Growth, Business Competitiveness, Building New Capacity, and Supply Chain Features.

Through this partnership, a total of eight regional clusters have been developed across the UK, including:

- The Offshore Energy Alliance (OEA)
 - Deep Wind Cluster (North Scotland)
 - Forth and Tay Offshore
 - Energi Coast (Northeast)
 - Team Humber Marine Alliance (Humber)
 - East Wind Offshore Cluster (East Anglia)
 - Solent Local Enterprise Partnership (Solent)
 - Celtic Sea Cluster
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[Organizations and research groups]

The UK's National Oceanography Centre is a major contributor to ocean research and technology world-wide. Its main objectives are to:

- Undertake research and technology development to advance ocean knowledge
- Create public benefit from NOC's capabilities
- Translate research and technology development to have a broader impact
- Provide capabilities that enable the UK and globe to undertake scientific research

The Centre has four main research areas, which include Ocean Biogeosciences, Marine Systems Modelling, Marine Physics and Ocean Climate, and Ocean Technology and Engineering.

NOC's Ocean Technology and Engineering field includes a multidisciplinary team including specialists in fundamental sciences, engineering, as well as analytical and marine science. Within Technology Development, teams work to further autonomous vehicle and instrument and sensor capabilities.

The team has developed and implemented a wide range of sensor technologies, including lab-on-chip sensors which are intended to be integrated with several autonomous vehicles, and can measure biogeochemical components, such as nutrients carbonate chemistry, cells and nucleic acids, and trace metals.

The team has also developed several other sensing technologies, including a silicate sensor, alkalinity sensor, nitrate sensor, dissolved inorganic carbon sensor, a CYTOCHIP (which measures optical and electrical properties of cells, and can be very useful in identifying and monitoring biotoxins, such as harmful algal blooms), and a CTD (conductivity, temperature, and depth) sensor.

In addition to these sensing tools, samplers, landers (ten-year duration deep-sea landers and communication systems), wave-buoys, and multi-wavelength optical backscatter (to determine sediment properties), and acoustic telemetry (for both shallow and deep-water use) have been developed and implemented.

NOC also has a large focus on the development of Autonomous Vehicles and identifies them as "the future of marine science". NOC have several vehicles in development, including:

Autosub2KUI – to be equipped with state-of-the-art sonars and camera systems, and will have under-ice navigation capabilities, to operate under areas of vast sea ice coverage as well as glaciers.

Autosub Long Range 1500 – will be NOC's longest range AUV to date. This AUV will be capable of lasting longer and have increased payload capacity, and will also be capable of surveying the continental shelf and upper slope. The AUV will also be able to complete a full trans-Arctic mission under ice.

BRIDGES deep glider project – the NOC is working in collaboration with 19 other public and private partners from a wide range of industries, SMEs, and scientific institutions to develop two new deep-sea autonomous gliders. The gliders will have enhanced sensing abilities and will be able to monitor oceanographic features within the deep sea (up to depths of 2,400 to 5,000 metres).

Plymouth Marine Laboratory, or PML, is a world-leading non-profit organization undertaking cutting-edge, innovative marine research. The laboratory has several key science groups, including a Centre for Geospatial

Applications, Earth Observation Science and Applications, Marine Biogeochemistry and Observations, Marine Ecology and Biodiversity, Marine Systems Modelling, and Sea and Society.

The laboratory has over 20 science research topics, but of particular interest to this webinar regarding technology is autonomous sampling, autonomy, technology and digitization, and artificial intelligence and machine learning.

AI and Machine Learning

Plymouth Laboratory has identified AI and machine learning as a rapidly growing research technique. AI and machine learning are playing an increasingly important role in analyzing and interpreting data, as well as producing meaningful outputs for both those within the science community as well as the public. PML has a team of AI and machine learning experts through the NERC Earth Observation Data Acquisition and Analysis Service, which can train and provide support on development of AI and machine learning in environmental research.

Autonomous sampling

PML has several autonomous vehicles as part of their fleet, including a new autonomous data buoy, which is 8.5 metres tall, and contains several on-board sensors which provide high-resolution data to scientists working on Western Channel Observatory. As well, PML has the PML Pioneer, which is a five-metre AutoNaut AUV, and is propelled and powered by wave action and solar panels. This AUV is one of only two of its kind in the UK!

Conclusion

The UK's clusters, networks, and organizations within the clean oceantech sector are incredibly innovative and collaborative. While this webinar just covers a handful of examples, we are hopeful this information presented has provided you with some valuable information and inspired you to continue to explore.

If you are an SME in Atlantic Canada and would like to further explore this market with more targeted research, there are programs that can help through your provincial government, the Atlantic Canada Opportunities Agency, NRC-IRAP, and Export Development Canada. Also, be sure to connect with Canada's Trade Commissioner Service as a first step to better understand the market and the opportunities that it might present for you.

Be sure to check out our other webinars in this market research series!