

Subsea Engineering:

Our Action Plan



FOREWORD

Subsea technology and engineering know-how, honed in the North Sea, in the early eighties are now used around the world in the extraction of hydrocarbons.

Scotland has the largest concentration of subsea engineering in the world, with Aberdeen recognised globally as a centre of subsea excellence.

Scottish Enterprise, along with the then Department for Trade and Industry recognised the potential of the subsea industry in the UK and supported the formation of the industry trade association Subsea UK back in 2004 to harness the country's expertise in this area of oil and gas and promote it at home and abroad.

Since then, Subsea UK has become the authoritative body representing the country's subsea sector as a self-sustaining, not-for-profit organisation. We have worked closely with Scottish Enterprise and Scottish Development International to strengthen and grow the subsea supply chain with a focus on technology development, export and diversification. These efforts, combined with the entrepreneurial spirit and pioneering ingenuity of our subsea supply chain, have resulted in an industry sector which is a real British and, in particular, Scottish success story and one of the fastest growing sectors in the country.

Subsea UK welcomes and will be supporting this action plan which sets out the ambition and the key steps to achieving success through greater focus and resource targeted towards supporting our underwater engineering capability. A stronger supply chain will generate jobs, opportunities and wealth for Scotland as well as securing our world-leading position.

Neil Gordon

Chief Executive

Subsea UK

THE AMBITION

Scotland's Oil & Gas industry has developed a cluster of companies with expertise in subsea engineering which is among the strongest in the world. Approximately half of the subsea installations in the world today are in the North Sea. Scotland enjoys a global leadership position in subsea engineering and is a world renowned hub with the potential for strong growth in international markets.

This is a strength that we want to build upon and develop even further. As well as continuing to enhance our capability in oil and gas and maximise international opportunities, there is the opportunity to extend those skills and knowledge into other sectors. To do this we need to ensure the appropriate level of investments are made; into our supply chain to keep it competitive; into our infrastructure to ensure we have the appropriate research and testing we need and also via investments into technologies with application to both oil and gas and other subsea areas.

Our ambition is to build upon existing world leading capability in the subsea sector, use that know-how to develop new opportunities, assist companies to achieve their growth ambitions and ensure that we have the test and research infrastructure needed to meet future requirements.

Scottish Enterprise, working with industry, partners and other stakeholders are convinced that subsea engineering, already one of our global success stories, provides significant opportunities for even more growth and investment. This plan sets out a call for action as to how we want to fully realise its potential.



THE MARKET

Subsea engineering encompasses all technology and engineering products & services for application below the surface of the sea (Figure 1). Largely driven by oil and gas markets to date, subsea engineering in Scotland has the potential for strong growth in markets such as subsea mining, defence, renewable energy and aquaculture.

The subsea sector in Scotland currently comprises of around 370 companies with an estimated turnover of £7.5bn per annum, dominated by our expertise in oil and gas. The sector supports over 38,000 people, split evenly between services and manufacturing. The global subsea market is currently around £50bn with an estimated growth potential reaching £140bn by 2035.¹

Figure 1. Overview of Subsea sectors



Aquaculture

Structures
Monitoring



Construction

Seabed Platforms
Pipes



Digital

Sensor Systems
Analytics
Simulation



Renewables

Anchoring
Electrics



Education

Training
Research



Defence

Vehicles
Comms



Marine

Support Ships
Port Facilities



Engineering

Consulting
Plant
Equipment
Test Facilities



Oil, Gas, Mineral Extraction

Vehicles
Comms

¹ Subsea UK 2014

SCOTLAND'S CAPABILITIES

Scotland has considerable expertise across the whole range of engineering capabilities relating to subsea, developed over many years operating in the North Sea. However, we believe our long-term future success will likely be built on the following capabilities which can be readily exported internationally:

- Specialist services throughout the Life of Field including:
 - feasibility studies (e.g. survey and analysis for oil fields or offshore wind sites);
 - front-end engineering and design (FEED) of proposed new developments;
 - equipment procurement, investment and construction (EPIC);
 - enterprise asset management (EAM);
 - inspection, repair and maintenance (IRM);
 - decommissioning; and
 - training, testing and consultancy.
- Subsea Umbilicals, Risers and Flowlines (SURF)
- Specialist tooling, sensor, control and communication products for use in ROVs, AUVs and submarines.

Many technologies developed in the North Sea are now in worldwide usage. For example, the subsea xmas tree system, commercially pioneered in the North Sea has revolutionised the oil and gas industry worldwide. Of the 5,000 subsea wells globally, almost 2,000 are in the North Sea, yielding a huge amount of technology development knowledge and expertise.

Scotland is also a hub of cutting-edge research and development, with the expertise residing within the Scottish workforce exported around the world. All the major global oil and gas engineering companies have significant operations in Scotland, including FMC, GE, OneSubsea, Aker, Subsea 7, Technip and Bibby Offshore. In addition, companies addressing the growing defence markets include James Fisher Defence and SeeByte proving this expertise can be applied to adjacent markets.



To support these operations Scotland has developed an extensive innovation ecosystem. The Underwater Centre in Fort William, National Hyperbaric Centre in Aberdeen and the Centre of Excellence for Flow Measurement and Fluid Mechanics in East Kilbride are key assets at both a Scottish and UK level. There is a variety of academic and research institutes with capability in this area such as University of Aberdeen's Oceanlab, The Datalab, Heriot Watt University's Ocean Systems Lab as well as the Innovation centre for sensors and imaging systems (CENSIS). We also have leading Universities such as Aberdeen, Robert Gordon, Strathclyde Heriot Watt and Edinburgh actively supporting research in Subsea. And both the Oil & Gas Innovation Centre (OGIC) and the recently formed £180m Oil & Gas Technology Centre (OGTC) have a subsea focus. The industry body for subsea – Subsea UK and their research arm National Subsea Research Initiative (NSRI) are also based in Scotland.

If we make the right decisions and continue to attract investment from both indigenous and overseas companies, we can help this sector grow from strength to strength. Such growth will be achieved through a mix of strategic investments in enabling infrastructure, supporting the Scottish supply chain break into and grow in international markets and investigating diversification opportunities while maintaining support for the substantial core oil and gas and decommissioning opportunities.

THE CHALLENGES

Although one of Scotland's modern success stories, the subsea market is also one which is globally competitive for investment. Other parts of the world are also actively looking at the potential of subsea as a growth opportunity so there is both an opportunity, but also a threat to Scotland if we do nothing to build upon our capability.

The current downturn in the oil and gas sector has of course had a significant impact. We recognise many companies are currently under strain with challenges around investing in innovation and investing in new opportunities in new markets to continue their international growth. We also recognise through research and discussions with industry and stakeholders that there are some gaps in the Innovation infrastructure, particularly around test and development facilities for near to market subsea technologies.

THE FOCUS

With these strengths, opportunities and challenges in mind, our analysis and conversations with industry and other key stakeholders has indicated three broad themes for focus and intervention by Scottish Enterprise, where our support, along with others can have a transformational impact:

- **Position Scotland as a global leader in Subsea Engineering**
- **Increase investment in innovation to grow our market share for Subsea Oil & Gas and to enable diversification into adjacent markets**
- **Develop Scotland's Subsea Innovation Systems / Infrastructure**



THEME 1

POSITION SCOTLAND AS A GLOBAL LEADER IN SUBSEA ENGINEERING

Many of the subsea technologies deployed around the world today were first developed or tested in the North Sea. The Scottish supply chain rose to the challenges deeper waters presented which in turn has enabled Scotland to attract many global companies, large and small, to establish the vibrant hub that the global subsea industry is today. Our objective is to capitalise on this world leading reputation by championing Scottish capability internationally while anchoring investment in Scotland.

Actions:

- Promote Scotland's expertise globally by promoting our current strengths; seeking to form strategic partnerships with key international companies; and looking to develop in countries where we assess there are significant opportunities. For example we are already developing relationships in Japan in the area of deep sea mining.
- Support companies with diversification into new subsea related markets through market advice and awareness raising. Target our support and focus to help companies move into those markets. For example, there are a number of opportunities for diversification such as defence and deep sea mining. We need to understand these global opportunities in more detail and set out how we can help companies enter these markets in addition to supporting growth in international subsea oil and gas markets.
- Use international networks to identify opportunities and to promote our capabilities. We will use our existing Scottish Development International (SDI) networks including Globalscots to support companies seeking to operate in global subsea markets

Key outputs will include:

- Strategic relationships forged with key companies, research institutes and other organisations in new markets.
- In depth market knowledge of emerging subsea opportunities shared with Scottish companies.
- Enhanced global visibility of Scotland's supply chain capability, enabling infrastructure and research excellence.



THEME 2

INCREASE INVESTMENT IN INNOVATION TO GROW OUR MARKET SHARE FOR SUBSEA OIL & GAS AND TO ENABLE DIVERSIFICATION INTO ADJACENT MARKETS

Evidence shows a strong relationship between innovation and economic growth which can also open up opportunities in new markets. In its simplest form, innovation is about research and development to deliver new products and services, new business models, fresh ideas and a drive to always do better.

Innovation has never been more important to the subsea sector and we will align our Innovation offering with the Oil & Gas Technology Centre and innovation centres such as OGIC and CENSIS. This will provide companies with the expertise they require to develop new products for both existing and new markets. We will position Scotland as a global R&D hub where both global and Scottish companies have the support they need to grow and develop further.

Actions:

- Increase investment in innovation by supporting disruptive and wider innovation improvement to increase efficiencies and enable diversification into adjacent markets.
- Identify key areas of technological challenge/opportunity and align our innovation offering with partners such as OGTC, CENSIS and OGIC to address these challenges.
- Investigate EU funding and partnership opportunities of interest to the Scottish supply chain.
- Promotion of Scotland's innovation offering and enabling facilities by raising awareness in the supply chain of what is available and how to access it.

Key Outputs will include:

- A thorough understanding of the Innovation capability of the subsea sector in Scotland that can be used to promote Scotland's capability globally.
- Increased levels of Scottish Enterprise investment into the subsea supply chain
- Shared understanding of technology challenges and opportunities in Oil & Gas and non Oil & Gas markets.
- Targeted promotion of Innovation support available from the Enterprise Agencies and others for the supply chain



THEME 3

DEVELOP SCOTLAND'S SUBSEA INNOVATION SYSTEMS / INFRASTRUCTURE

Ensuring we have appropriate and competitive test and demonstration infrastructure is crucial if we are to attract companies to continue to invest and undertake R&D in Scotland. Scotland is already well served with enabling subsea infrastructure, however, we recognise that if we want to continue to position Scotland as a world leader, continued investment in both existing infrastructure and new world leading facilities will be required. Continued investment will anchor indigenous companies and attract global companies to Scotland as the location of choice for their R&D activities.

Actions:

- In collaboration with Industry and research bodies, we will consider the need for potential major investments in subsea test and demonstration facilities. We have already begun this process and will develop it further.
- Working with the Scottish supply chain and industry bodies such as Subsea UK, we will continue to identify key infrastructure upgrades/options based on future technology, infrastructure and diversification requirements
- With industry investigate the potential for increased utilisation and investment in open access private sector facilities.
- Work with partners such as OGTC, OGIC and the National Subsea Research Institute (NSRI) to ensure that the subsea sector is at the heart of the public and private sector offering around innovation and investment.

Key outputs include:

- Increased utilisation of existing assets.
- A roadmap of potential infrastructure upgrades / options required.
- Investment in a number of open access test and demonstration facilities.

Scottish Enterprise is committed to support the continued growth of the subsea sector in Scotland. This action plan summarises the key activities that Scottish Enterprise will undertake to realise the opportunities this sector presents, focussing support on our world class supply chain and enabling infrastructure that will continue to position Scotland as a world leader in subsea engineering for years to come. Successful delivery of this plan will require a concerted and cohesive effort by industry and other supporting organisations as well as Scottish Enterprise. Together we can deliver an even more successful and diverse subsea sector in Scotland that continues to go from strength to strength.

For further details please contact:

Scottish Enterprise
Atlantic Quay
150 Broomielaw
Glasgow
G2 8LU

E: enquiries@scotent.co.uk
T: 0300 013 3385

www.scottish-enterprise.com