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Ministerial Foreword



Graham Stuart

Minister for Investment and responsible Department for International Trade Minister for the Maritime sector

"The UK maritime sector is already an acknowledged world-leader in the adoption of digital technologies and associated business services, including legal and insurance services for autonomous vessels."

The Department of International Trade was set up three years ago in recognition of the rising importance of trade to the UK's future prosperity. No sector is more fundamental to UK trade than maritime and that's why I am delighted that, together with Maritime UK and its member organisations, we have created this collaborative plan.

The UK's maritime sector has enviable strengths but, in the light of growing international competition, it is essential that both the UK industry and the UK government become better coordinated and more effective in winning global business. This trade and investment plan follows the launch of "Maritime 2050: Navigating the Future", which set out the challenges and opportunities for the sector more broadly. This plan sets out how the UK maritime sector can use the UK's technological expertise to grow market share in the fast developing segments digitalisation, autonomous and green maritime as well as strengthen its performance in services and leisure marine. Combined with our recognised strength in marine science and our world leading marine legal and insurance capabilities we have the breadth of expertise to be able to strengthen our position even as global competition increases.

DIT published the government's Export Strategy in 2018. It set out an ambition to make the UK one of the world's great trading super powers and to grow exports from 30% to 35% of GDP. A healthy and successful UK maritime sector will contribute directly to that aim by increasing its own exports but will also support other industries by strengthening the UK's offer at ports and at sea. DIT stands ready to encourage, inform, connect and finance global maritime exports and I recommend this plan to all in the industry.

Maritime UK Foreword



Harry Theochari Chair of Maritime UK

As an island nation, it is perhaps unsurprising that the maritime sector is one of Britain's biggest industries, supporting over £40bn in GVA and well over one million jobs. It facilitates 95% of the UK's trade, totalling over £500bn each year. With maritime in our DNA, we are home to world-class marine manufacturers, service providers, educational and research establishments, and offer a globally competitive environment in which to base a maritime business. What is more surprising is that other maritime nations have been far better at promoting their offer to the world.

Whilst the UK has long been a maritime player, today it faces strong competition from dynamic maritime centres in the Far East and Scandinavia as well as elsewhere. For the UK to maintain and enhance its position, it must respond to this competition. This five-year plan is central to that mission.

Globally, the sector is on the cusp of huge and disruptive change. Just as Britain led the industrial revolution, we must position ourselves to steer this new fourth industrial revolution rooted in clean growth, digitisation and automation. The global maritime sector will be worth a staggering \$3trillion by 2030, and UK industry is determined to ensure it captures as large a slice of the pie as possible.

The good news is that for the first time, the UK has a cross-government long-term strategy for the sector, crafted with industry. Maritime 2050 sets out the steps that both industry and government must take to ensure the UK's competitiveness. A key deliverable of Maritime

2050 has been the establishment of Maritime Research and Innovation UK; the national collaborative research and innovation body for the sector. Its initial innovation focus is on decarbonisation, digitisation and automation. This five-year plan identifies the same areas as major global growth opportunities. We are now much better joined up to ensure we create the products and services that the world wants, and then get them to market through the actions set out in the five-year plan.

When crafting this plan with the Department for International Trade, we were determined that it be more than just another strategy, and instead be a robust and credible plan to deliver targeted actions to support more British companies to export more, to market the UK's maritime offer, and attract new business to our shores.

Through the actions set out in this plan, working together, industry and government will realise ambitious goals to boost the export of our world-class maritime products and services, and attract foreign direct investment into the sector.

With maritime uniquely tied to our coastal communities, realising the growth potential set out in this plan will support economic development across all parts of the United Kingdom. Industry looks forward to working with government to deliver upon the commitments set out in this plan and ensure the UK's position as a leading, competitive, global maritime nation into the future.

Executive Summary

The UK is a leading maritime nation. The maritime sector presents considerable potential for UK trade and exports and this plan has been devised in collaboration with industry and stakeholders to address this. It is structured in three parts. Section one sets out the rationale for action and outlines the scope and scale of the sector; section two addresses the key challenges which present future opportunity for the UK; and section three spells out how Department for International Trade (DIT) and industry will together raise our game to seize these opportunities and grow our global exports.

The UK has a competitive advantage in maritime professional and business services and a strong reputation in areas such as marine equipment and systems, autonomous vessels, marine science and other specialist technical areas. We are a market leader in the design, manufacture and refit of commercial, naval and leisure vessels. There is also expertise in superyachts, high-end powerboats and sailing yachts. The UK maritime sector is an export intensive sector contributing around £12bn to UK exports.

Significant investments have been made in UK infrastructure ports recently to upgrade port capacity, which is already the second largest in the European Union, handling around 5% of the world's total maritime freight. The UK is also a large provider of international maritime training and is one of the safest places in the world to do maritime business, actively promoting seafarer safety and international safety standards.

Based on the UK's maritime sector strengths described in the plan, the case for supporting this sector to develop its exports and promote its offer to investors is set out in Section 1.2.

The rise of ship-owning, shipbuilding, operating, and associated maritime services in far eastern centres including China, South Korea and Singapore is creating an increasingly competitive environment. The Government has an ambitious plan to develop the maritime sector through **the Maritime 2050 strategy** and this plan responds to the call to action for both the sector and Government in (Section 1.3).

The plan argues in Section 1.4 that there is a **role for Government** working with industry, in line with the UK's Export Strategy, to secure an increased share in the global maritime sector. A complex matrix of decision makers based in different countries can be challenging for small UK supply chain companies to navigate. DIT's

network of commercial officers worldwide can play an important role in helping UK companies connect with the right decision makers. Many buyers of complex vessels are often state-owned, regulated, or financed and DIT can influence these through Government to Government discussion in support of the UK's maritime offer. The UK Government recognises the importance of the maritime industry across our four nations, and will work with the devolved administrations to ensure that this plan delivers for the whole of the UK. The plan will also complement wider cross-government ambitions to sustain the UK as a shipbuilding nation by addressing themes that assist future civil as well as military construction, evidenced by the UK's exportable Type 31 frigate offer, and related in the National Shipbuilding Strategy.

Much has already been achieved and in Section 1.5 the plan explains how Industry and DIT are working on export campaigns focussed on marine engineering in China, Brazil, and South Korea. These are now expanding to support maritime services, and ports infrastructure in countries like Greece and Singapore. DIT consults with industry to prioritise those markets that provide the greatest opportunity, and helps to bring other large-scale opportunities to the attention of the maritime sector. DIT provides a range of digital services, an international trade advisor service, and a network of commercial officers in over 100 countries around the world who can assist individual companies. UK Export Finance (UKEF), the UK's export credit agency, works to ensure that no viable UK export fails for lack of finance or insurance from the private sector, and DIT leverages the GREAT brand to promote the sector at key international events such as London International Shipping Week, and through the Tradeshow Access Programme (TAP).

The Maritime sector enables around 95% of UK trade and the government is also looking afresh at the idea of **Freeports**. Section 1.6 restates the government's ambition in this area and the potential advantages to be had once the UK leaves the EU.

The UK maritime sector is an export intensive sector contributing around £12bn to UK exports.



With growing pressure from international competition driving the need to improve productivity through adoption of new technology, as well as challenges to become cleaner and greener, we recognise that we need to increase our efforts.

Section 2 addresses the changing nature of the sector and how it is directly engaged in three of the **Industrial Strategy Grand Challenges:** Artificial Intelligence, Future of Mobility, and Clean Growth. The technical and sustainability challenges facing the global maritime sector in the next five years represent a considerable opportunity for UK business as these align well with UK strengths. The plan recommends focussing more of our activities on uncovering opportunities in green maritime, digitalisation, autonomous vessels, marine science, and maritime services.

The combined market for **green maritime** including installing ballast water and exhaust gas cleaning systems is an estimated US\$260 billion based on the global fleet size of approximately 53,000 ships. The UK is well placed to provide solutions to help ship owners and operators meet new International Maritime Organization (IMO) regulations and reduce greenhouse gas emissions (Section 2.1)

According to the UK Chamber of Shipping, the UK's shipping technology sector is now a £4 billion industry and is estimated to be worth £13 billion per year by 2030. Digitisation is driven by the need for efficiency backed up by safety, compliance and environmental awareness in maritime industry. Increasing satellite communication options, and lower data transfer and storage prices have enabled telemetrics that make it possible to manage and optimise their fleets (Section 2.2).

Technology is helping human beings with the most dangerous maritime tasks. The impact of autonomous systems within the maritime sector is likely to be significant. According to Credence Research, the global autonomous ships market was valued at US\$ 56.75bn in 2016 and is expected to grow at a compound annual growth rate of 12.8% from 2017 being worth US\$155bn by 2023. The UK is a world leader for smaller **autonomous surface and underwater vessels**, especially for defence, energy, and marine science. UK-based insurers, law firms and consultancies

are building the regulatory frameworks for autonomous shipping (Section 2.3).

The ocean economy is estimated to be worth \$3 trillion by 2030. Greater awareness of the economic role of oceans and the environmental impact of exploitation is increasing demand for **marine science** services including oceanography, offshore surveying and environmental monitoring and pollution control. The UK marine science & technology sector has a turnover of £1.63bn, exports £551m and employs close to 23,000 people. The UK's National Oceanography Centre (NOC) is one of world's top oceanographic institutions researching large scale oceanography and ocean measurement technology innovation (Section 2.4)

London is the world's pre-eminent maritime services hub. **Maritime professional and business** services include accounting, consulting, education, finance, insurance, law and shipbroking. Maritime 2050 sets out the strategic ambition to maintain the UK's strength in services and to develop the UK's green finance offer. Attracting owners, operators and chartering clusters to the UK is a vital component in growing the UK's maritime services sector and DIT will strengthen our offer to support this area (Section 2.5).

Section 3 responds to these opportunities by setting out how, over the next five years, DIT and the maritime industry will further improve our collaboration in support of maritime trade and exports. Our ambitions are:

- To support the UK maritime sector to capture significant global market share in products and technologies to improve the environmental performance of the global maritime fleet.
- That the UK maritime sector becomes an acknowledged world-leader in, and increases UK global export market share through, the adoption of digital technologies including in cyber security and the move to greater autonomous systems in both vessels and ports
- To promote the UK's capability in marine science and technology
- To maintain the UK's number one position for maritime services against increasing global competition

To realise these ambitions will require a step change in the way DIT and the maritime industry work together. The plan sets out in Section 3.2 how industry will play a leading role in its implementation, with progress being reviewed bi-annually by the newly established Maritime Export and Investment advisory Group (MEIG) chaired by trade body Maritime UK.

This plan follows the structure of the Export Strategy; Sections 3.3 and the table in 3.4 describes in more detail agreed actions and responsibilities for both industry and Government.

The plan covers how we will encourage new to export companies and inspire buyers and international influencers regarding UK capability. DIT and industry will collaborate to organise new exporters workshops covering market access, overcoming barriers, and knowledge sharing on identified markets. The UK Government's Tradeshow Access Program (TAP), helps eligible UK SMEs exhibit overseas at events as part of their export development plans. We will promote UK expertise through a range of effective marketing tools to highlight UK company capabilities and showcase the best of what the UK has to offer. We will also jointly promote the UK maritime offer to the ship building and ship owning communities by means of the GREAT campaign.

The plan provides our framework to inform industry and better co-ordinate marketing and promotional activities to help realise opportunities for the maritime sector. DIT and Maritime UK will run a regular forum to advise maritime companies on trends and the support to access global opportunities as well as to hear from industry the market access issues they want Government to prioritise. An interactive webinar programme will provide the sector with regular, relevant market and project updates. We are committed to running training weeks to ensure that front-line DIT overseas staff remain informed about the entire UK offer and we will equip our staff with credible collateral material on technical design, supply chain, case studies, and

upcoming trends. Industry-led technical briefings will update DIT staff on particular issues.

The plan aims to **connect** the UK businesses to international buyers and each other. We will support UK consortiums to develop around key global projects, to put forward more effectively the full width and depth of the UK offer. Senior industry trade advocates with leading industry experience will act as thought leaders to help buyers understand UK expertise. We will promote the UK's maritime offer at major maritime events which attract a global audience. We will seek to prioritise those events of most relevance to the areas of future focus outlined in section 2 of this plan, to enhance networks, showcase the UK maritime offer, and support companies to convert opportunities into business deals.

The plan also sets out the Government's export **finance** offer for UK companies through UKEF which can help them win and fulfil export contracts, and insure risks of non-payment.

In addition to our ambitions for exports, we want to better communicate **Foreign Direct Investment** (FDI) opportunities to potential inward investors from the maritime sector. Section 3.4 commits to develop better information to outline the UK maritime investment opportunity and the support available to inward investors.

This plan is a key step in realising the future export opportunities in front of the UK maritime sector. If we get this right, the UK sector will be able to play an important role in addressing global challenges around green maritime, adoption of new digital technology, maritime autonomy, the role of the oceans in the global economy, and the associated changes and challenges for maritime legal, financial and other professional services.

We know there is always more we can do, and most importantly we are committed to work with industry to **continuously review** and improve our support for maritime business and international trade.





1. Introduction

1.1 Maritime 5-year plan for the UK

The recently published "Maritime 2050: navigating the future" (2019)1 strategy and the associated trade route map sets out a bold new approach for the maritime sector. This 5-year plan represents the Department for International Trade's (DIT's) contribution to the ambitions outlined in Maritime 2050 and aims to strengthen collaboration between the Government, industry and wider stakeholders to maintain the UK's global market share in the face of strong competition and to achieve greater success in international trade and investment for the UK's successful maritime industry. Its workstreams will support and help to inform our trade policy development. This builds on the public consultation on future free trade agreements (FTAs) with the US, Australia

and New Zealand and potential accession to the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP), which the Government launched last year. The plan will also contribute to the ambition set out in the Government's Export Strategy to raise exports as a proportion of GDP from 30% to 35%.2 The actions outlined will improve collaboration between the Government and the UK's maritime industry, enabling maritime trade and exports to capitalise on global trends which match well with UK strengths and the Grand Challenges outlined in the UK's Industrial Strategy³. This plan is primarily focussed on supporting the UK's civil maritime sector to export globally although its principles enable greater co-operation to promote the wider maritime sector.



Container ship

¹ https://www.gov.uk/government/publications/maritime-2050-navigating-the-future

 $^{{\}tt 2\ https://www.gov.uk/government/publications/export-strategy-supporting-and-connecting-businesses-to-grow-on-the-world-stage}$

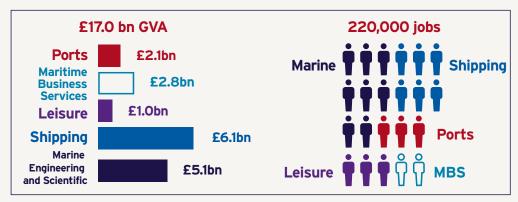
³ https://www.gov.uk/government/publications/industrial-strategy-building-a-britain-fit-for-the-future



1.2 UK's Maritime Sector

Contribution of Maritime Sector to UK Economy⁴

In 2017, the UK maritime sector directly contributed:



Including the value generated and jobs supported in industries that supply the maritime sector and from the spending of maritime employees' wages, this rises to:

£46.1bn GVA

1.1 million jobs

The UK remains one of the world's leading maritime nations and has genuine competitive advantage in the provision of maritime professional services. The UK continues to enjoy a world-class reputation in areas such as marine equipment and systems, autonomous vessels, marine science and specialist technical areas such as composites. The UK is a market leader in the design, manufacture and refit of commercial, naval and leisure vessels. The UK is also a significant exporter of supervachts, highend powerboats and sailing yachts.

The maritime sector includes shipping, leisure

marine, marine engineering, ports, and maritime business and professional services. It remains a vital part of the UK economy, and in turn, the UK remains an important player in the international maritime sector. The competitive pressures resultant from the entrance of new international players have already seen significant change to the UK industry in recent years. Although these developments have challenged the UK's position of dominance in some areas of the sector, the UK remains at the forefront most notably in services, with the maritime sector estimated to contribute £17 billion to the UK economy, directly supporting an estimated 220,000 jobs⁵.

⁴ The economic contribution of the UK Maritime sector, Centre for Economic and Business Research (CEBR)

⁵ Maritime Sector Report 2019, Centre for Economic and Business Research (CEBR): https://www. maritimeuk.org/media-centre/publications/state-maritime-nation-report-2019/

The maritime industry is a critical element in the UK trade in goods. Around 95% of British imports and exports in goods by weight are moved by sea, including 25% of the UK's energy supply⁶ and almost half of the country's food supplies⁷. Reliable and timely importation processes therefore constitute not only a bedrock of the national economy, but a foundation to the UK's national security. In 2017, it contributed around £12.4bn to UK exports⁸, around 2.0% of UK total exports, and larger than exports for the defence and security sectors. However, pro-activity is required if the UK is to remain a leading light.

Maritime plays a key role in the tourist and leisure industry with nearly 2 million cruise passengers passing through UK ports in 20169. 85% of these passengers passed through Southampton, making it Europe's most popular port for starting cruise liner journeys¹⁰. With British-based companies including Carnival, Fred Olsen, and Saga Cruises, the maritime leisure industry is an important strength of the UK economy. Additionally, UK has leading superyacht manufacturers like Sunseeker and Princess Yachts which showcase UK's strength in leisure marine.



⁶ https://www.gov.uk/government/publications/maritime-successes-2017-to-2018

⁷ Maritime Annual Report 2017-2018, Department for Transport

⁸ Maritime Sector Report 2019, Centre for Economic and Business Research (CEBR): https://www.maritimeuk.org/media-centre/publications/state-maritime-nation-report-2019/

⁹ Sea Passenger Statistics, 2018, Department for Transport

¹⁰ https://ec.europa.eu/eurostat/web/products-eurostat-news/-/DDN-20170810-1?inheritRedirect=true



Marine engineering includes a whole range of often smaller companies which design, build, refit and modernise ships, and supply equipment and engineering services for all types of ships, ports and terminals infrastructure, as well as offshore energy installations. This subsector also includes companies developing technologies for use in the maritime sectors including digital applications, cyber security systems, maritime autonomous systems, as well as marine science and technology. The marine engineering and science segment together contributed £5.1 billion GVA in 2017". Offshore energy supply remains the largest segment, but most of the recent growth has come from supply into shipbuilding, and marine science and technology. The Defence and Security Organisation of DIT promotes the maritime offer in the defence sector including the over the next few years the newest Royal Navy frigate offer, the Type 31. The new Shipbuilding Tsar will lead the crossgovernment work on the National Shipbuilding Strategy which aims to transform UK defence and commercial shipbuilding's productivity and competitiveness. DIT will support this endeavour by developing and delivering a commercial Export Plan for the sector which will focus on a range of high-value complex vessel types where the UK can be competitive globally. Outputs of this plan, such as our capability material and how we work collaboratively with industry is complementary to this work. Technological developments are central to the strength of the UK offer, the screw propeller and RADAR are two innovations still prevalent today that the UK was instrumental in conceiving.

This rich history continues - several British companies are producing early-stage autonomous vessels, such as the SEA-KIT unmanned vessel that stands to enable long-range oceangoing journeys of over 10,000 nautical miles. Promoting such cutting-edge R&D globally, on both port-side and ocean-side projects, is therefore a top priority providing opportunities for the UK to gain market share in the maritime technologies of the future as set out later in this plan.

The UK port sector is the second largest in the Western Europe, handling around 5% of the world's total maritime freight traffic at some point in its journey. Significant recent investments have been made to the UK's maritime infrastructure to ensure British ports are fit to handle the demands of 21st-century maritime trade, and to promote the uptake of carbon neutral fuels. The Government is also investigating the potential for creating new Freeports in the UK.

Maritime business services constitute a key area of the UK economy, contributing £2.8 billion GVA in 2017. The City of London is the global leader in this area; the largest share of worldwide maritime insurance premiums and shipbroking transactions occur in the UK. Important actors in this business sector are based in London - notably Lloyd's of London and the Baltic Exchange. Recognising and promoting the world class offering British businesses provide will, therefore, prove vital to ensuring that UK maritime services continue to thrive at the forefront of the industry.







The UK offer also includes providing high-level training for people within the maritime industry; acting as an important source of thought leadership; and setting the benchmark for the promotion of industry standards in safety, regulation and seafarer welfare. The UK remains one of the largest providers of maritime training in the world leading the way in the quality of seafarers produced and the Support for Maritime Training (SMarT) programme aims to boost further the number of seafarers trained in the UK.

The impact of autonomous vessels may in the long term engender changes in the skillset requirements of industry professionals. The UK must continue to adapt to these changes, so that its academies and training centres remain the goto sites for upskilling of staff globally. An additional aspect of the maritime labour market relates to the male dominated maritime labour force. Just 4% of the 10,480 UK certificated officers active at sea are female¹². This gender imbalance, which is mirrored in the global maritime workforce,

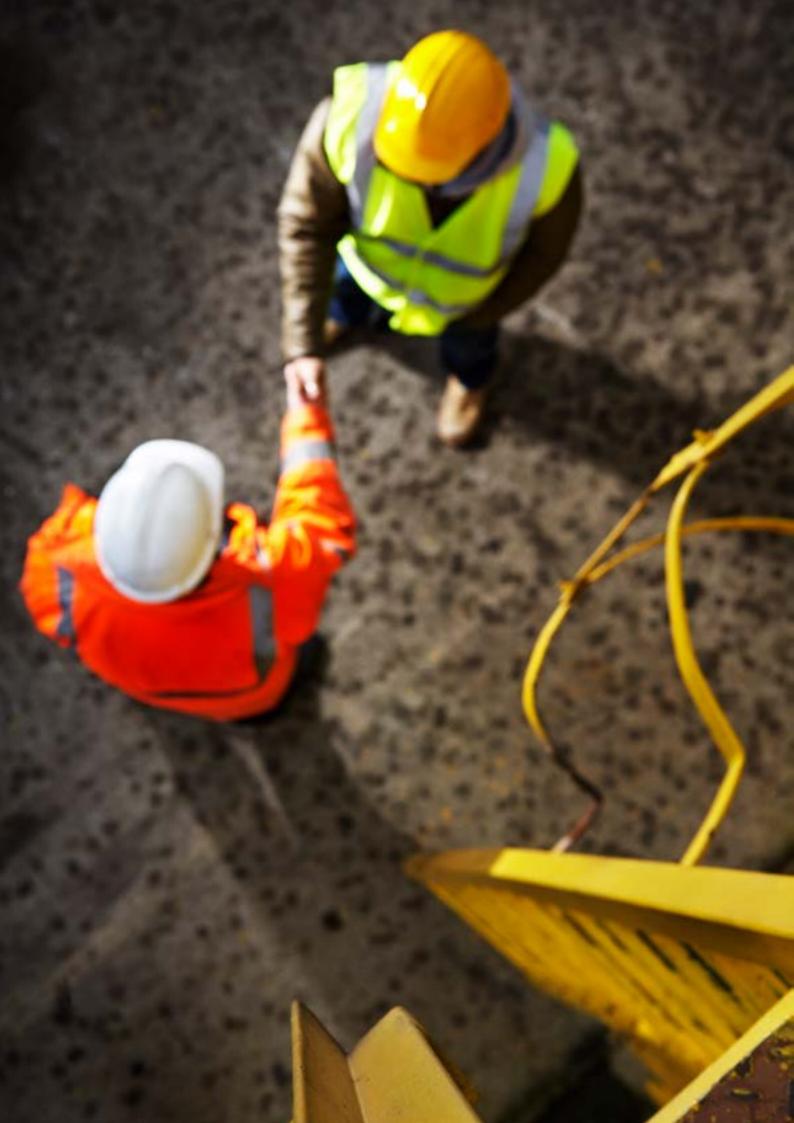
presents another opportunity for the UK to show global leadership through efforts such as the Women in Maritime Taskforce.

Protecting people who work in the industry is an area in which the UK has long excelled, continually striving for the highest standards in safety and security. The result is that the UK is one of the safest places in the world to do maritime business, and the country actively promotes safety and security standards in international fora.

The UK continues to be forward thinking in its global outlook. The country has played a leading role in promoting the agenda for a reduction in emissions from the maritime industry through international fora, most notably the IMO. The IMO is the only UN body based in the UK, and the UK has continued to press for climate cooperation through this avenue, helping to agree the target of a 50% GHG emission reduction from the maritime sector by 2050.



Baltic Exchange, London



1.3 Maritime Sector Values and Ambitions

The values and ambitions set out in Maritime 2050 are the bedrock of the UK's international offer and underpin the work set out in this plan:

Values

- A premium brand, not compromising on safety
- A balanced set of priorities
- A commitment to the rules-based approach
- A truly global United Kingdom
- Real partnership between Government and Industry

The UK intends to continue to compete and win business internationally based on the quality of its marine engineering, technological innovation, professional skills, and safety standards, and this plan will contribute to realising the following ambitions from Maritime 2050.

Ambitions

- Maximise our strength in maritime professional services, retaining and enhancing our **UK competitive advantage** in the provision of maritime law, finance, insurance, management and brokering, and developing our green finance offer.
- Lead the way on clean maritime growth enjoying economic benefits from being an early adopter or fast mover.
- Strengthen our reputation for maritime innovation, maximising benefits to the UK from new maritime technology through our world leading universities, maritime SMEs and global companies.
- Continue to be recognised as the global leader in maritime safety and security standards and expertise worldwide.

- Promote our UK wide leading maritime cluster offer with Government, the maritime sector and academia working in partnership to make the UK the place to do maritime business.
- Showcase our UK maritime offer to the world, promoting all parts of the maritime sector including shipping, services, ports, engineering and leisure marine, and through London International Shipping Week maintaining its status as the leading global maritime event.

These complement the Government's intention to improve the UK's shipbuilding offer in both civilian and military vessels through supporting the UK's competitiveness in specialist and emerging technologies. Success will improve the maritime sector's growth and productivity and underpins DIT's efforts to support UK companies to succeed internationally in an increasingly competitive world.



1.4 Role of Government

supporting the international exporting success of has a particularly critical role. Specifically, today's the maritime sector. The Export Strategy sets out maritime sector is global and dynamic with the general role of Government in export support challenges arising for UK exporters from the under four key themes:

- Encourage
- Inform
- Connect
- Finance

In addition to all the work under those themes, there are some considerations particular to the

The Government has an important role to play in maritime sector which mean that the Government geographical spread of decision makers across several different locations. An example of the matrix of influencers for a typical new ship build is shown in the following diagram. The ultimate decision maker will be the ship owner (in this case Greek) but services and systems may be specified in conjunction with the ship operator and the shipyard each of which may be from different countries as shown on the next page:

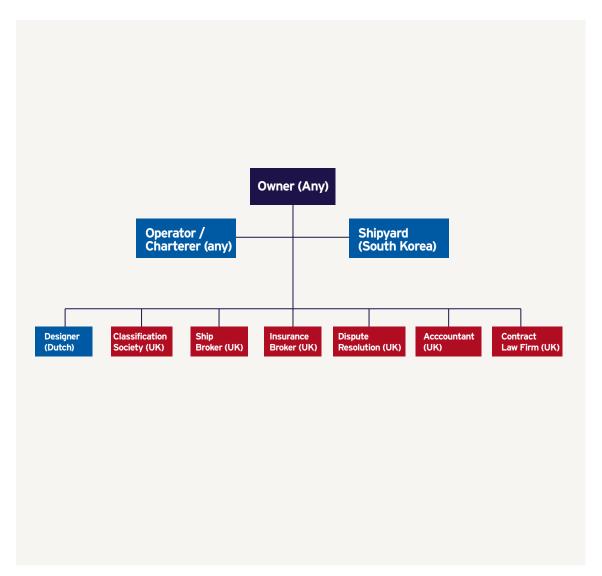


Figure: Operating in a complex and global maritime ecosystem

This complex and international spread of influencers will be different for each project and is therefore hugely challenging for small UK supply chain companies to navigate by themselves. DIT can play a key role in using our network of commercial officers worldwide to build relationships and help connect the right UK companies to the right decision makers on each project.

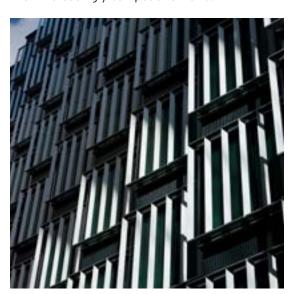
We will continue to build relationships with owners as well as charterers, ship managers, the facilitators and providers of finance, yards, integrators, design houses and Government departments worldwide with the recognition that the supply chain is truly global. In the UK, we will work with industry to understand and map the UK offer. Government also has a crucial role because in many countries of the world the buyers of complex vessels in sectors such as offshore energy is state-owned, regulated, or financed. This necessitates Government-to-Government discussion in support of the UK's maritime offer.

Maritime Directorate within the Department for Transport (DfT) leads on the development and delivery of Maritime Policy and is the owner of the Maritime 2050 Strategy - which sends a clear message to the world that the UK will continue to be a leading maritime nation for the next 30 years and beyond. The focus is on six key areas:

- Maintaining a clear strategic vision for the UK's maritime sector, and coordinating the work towards its delivery
- Maximising the UK's global maritime influence
- Delivering safe, effective and profitable maritime infrastructure and services
- Minimising disruption to the UK's maritime interests from security threats and other risks
- Promoting the UK's maritime sector
- Moving the UK maritime sector to meet the environmental and technological standards of the 21st century

DfT has set out a clear high-level vision for 2050 that both Government and industry together can follow to maximise the potential for UK's maritime sector. This strategy framework informs policy development and industry decision making for the future, as well as provide even greater confidence to potential investors in the UK economy.

This plan is intended to foster wide collaboration, the UK is a historic and leading maritime trading nation, with major ports throughout. The UK Government recognises the importance of the maritime industry across our four nations, and will work with the devolved administrations to ensure that this plan delivers for the whole of the UK, presenting a truly global Britain. The Five year plan complements the Government's objective to improve the UK's shipbuilding offer in both civilian and military vessels through supporting the UK's competitiveness in specialist and emerging technologies. The plan identifies key technology areas for high value complex vessels for build, refit, repair and their associated supply chain. The UK's National Shipbuilding Strategy (NSbS) exists to provide certainty to industry so that it can invest not only in technologies and capability but in people and skills. The plan recognises the importance of education, training and accreditation as part of the overall offer. Success will improve the maritime sector's growth and productivity and underpins DIT's efforts to support UK companies to succeed internationally in an increasingly competitive world.



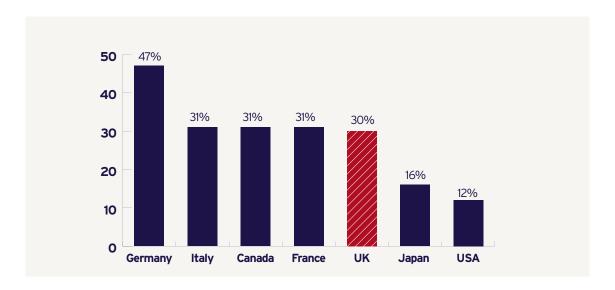
1.5 Maritime Exports: The Story so Far

The UK's maritime sectors (marine engineering, maritime services, leisure marine, ports, & shipping) are global-facing export intensive sectors, which are already taking advantage of opportunities to expand into new markets. The UK's expertise in technical, high value-add marine engineering and maritime professional service sectors are already in strong demand across the world as set out above. The Government has been backing industry in this effort. Coordinated and effective Government maritime export campaigns have been launched to ensure British companies

are aware of the demand for maritime products and services and to ensure buyers around the world are aware of the UK's expertise.

In 2018, the UK Government published its Export Strategy¹³ which highlighted the UK's export challenge. While the UK punches above our weight in exports across the economy, we punch significantly below our potential. Exports represent 30% of the equivalent value of our GDP, which is broadly equivalent to France, Italy and Canada, but substantially behind Germany.

Exports of Goods and Services as a % of GDP for G7 nations¹⁴



The Export Strategy is a first step towards achieving our national ambition for exports to represent 35% of our GDP. Demand for maritime sectors, and associated marine engineering, components, and maritime services is closely linked to the success of the global economy and levels of global trade. In the short-to-medium term changes in supply and demand for maritime sectors can be extremely volatile. However, over the medium to long term significant growth in international trade has driven similar growth in demand in the maritime sector. Given that 95% of the UK's trade in goods by weight is carried by sea, successful delivery of the UK's export ambition will further raise demand for maritime sectors including services as more trade flows through UK ports, and we want UK industry to be

in strong position to benefit from any increase in trade from these shores.

The UK has a world class reputation in areas such as maritime equipment and systems, the development of autonomous vessels, marine science, and specialist areas such as composite materials used in the manufacture of vessels. The UK is also a market leader in the building and exporting of leisure craft such as superyachts; the marine sector contributes £6.4bn GVA to the UK economy with leisure marine accounting for £0.9bn of that¹⁵. The UK currently accounts for 10% of the global non-defence vessel systems market, within a total global marine sector value that exceeds £100bn¹⁶. The maritime sector is highly export-orientated because of the constraints of the domestic UK ship construction

¹³ https://www.gov.uk/government/publications/export-strategy-supporting-and-connecting-businesses-to-grow-on-the-world-stage

¹⁴ https://www.gov.uk/government/publications/export-strategy-supportingand-connecting-businesses-to-grow-on-the-world-stage

¹⁵ https://www.maritimeuk.org/value/marine-industry/

¹⁶ https://www.maritimeindustries.org/write/Uploads/UKMIA%20Uploads%20-%20D0%20 NOT%20DELETE/UK-Marine-Industries-Technology-Roadmap-2015.pdf

market, with 30% of UK leisure, superyacht and small commercial marine industry revenue in 2017 originating from export transactions¹⁷.

To promote UK maritime expertise internationally, a range of coordinated DIT Maritime Export Campaigns have been running for over two years. These initially focussed on marine engineering, predominantly marine equipment and services. These were designed to target those markets that aimed to develop capabilities in higher margin, more complex and intelligent vessels. DIT's current campaigns are focussed on China, Brazil, South Korea and Singapore. During 2018 we also explored opportunities in Vietnam and Indonesia, but we have concluded that those markets are not yet mature enough for the UK's high value offer to be competitive

there. In addition, a maritime services campaign is running focussed upon Greece.

In addition to the sustained focus on the campaign countries above, the DIT maritime sector team works with our commercial officers in the UK's embassies and high commissions round the world to bring ad hoc large-scale opportunities to the attention of the maritime sector. For example, during 2018 we took advantage of the 200th anniversary of the Chilean navy working closely with industry bodies to promote the UK's expertise to that country. Underpinning these campaigns is the message that the UK offer is differentiated by a premium service and expertise. The key focus markets are as given below:

Key focus markets for DIT



The map highlights focus campaign markets (blue) as well as other campaign markets (red) where DIT works on an occasional basis. DIT works closely with industry and reviews our campaigns each year to ensure that we continue to focus our efforts and prioritise resource on those markets which will provide the UK industry with the

greatest scale of the opportunity. For example, as a result of industry advice we have expanded our maritime sector team to add a maritime services perspective to our campaign work in future. As resources permit and opportunities arise, we will look to add further maritime export campaign markets in future.



Some examples of our current work on maritime campaign markets follows:

a) China

DIT focuses efforts in China to connect UK supply into Chinese demand for equipment and services for complex vessels such as cruise ships, oceanographic research vessels and Liquid Natural Gas (LNG) tankers including the creation of consortiums around areas such as naval architecture, interior design, interior fit out, complex marine engineering and safety systems and electrical & pipefitting, and marine engineering.

To take just one of these areas as an example, China aims to grow its domestic cruise ship market from 2.5 million passengers per year to 30 million - over the next 10-years. To achieve this, it intends to build 40 cruise ships (some for domestic market, some international) over this time. At roughly US\$1 billion a ship, and with potential UK content of a typical cruise ship being as much as 40%, this market alone has a potential of US\$ 16 billion.

For Maritime Professional and Business Services we want to connect the UK's expertise in financing insurance, legal and classification with tier 2 Chinese owners.

b) Brazil

DIT introduces companies to the market and supports them in achieving the local content requirements they need to be successful in this market. DIT is promoting opportunities to supply into mainly 'new build' vessel types and offshore plant across key technology areas which match UK strengths in design, procurement, construction, operation and maintenance. The focus for the Brazil campaign is on the maritime supply into offshore energy, river and port transportation of agricultural goods, and increasingly the leisure marine and luxury sectors.

Some new opportunities are emerging including a range of new builds by Petrobras / Transpetro coming back on stream following a 3-year hiatus. This could be a significant opportunity for the UK supply-chain including maritime business services. We introduce Brazilian opportunities to the UK companies through an annual Brazil maritime road show to the key UK clusters.

c) South Korea

DIT is working to raise the profile of the UK's expertise with South Korean ship builders in 3 key areas:

- Smart ship technologies / ship intelligence, Hi-Tech Sensors, Big Data analysis and Satellite Communication Technology
- Environmental shipping Ballast Water Treatment Systems, Nitrogen Oxides (NOx) / Sulphur Oxides (Sox) and Tier III engine emission control & management.
- LNG chain including LNG fuelled ship, LNG plant, LNG bunkering vessel and Cargo Containment System (CCS) technology.

DIT introduces companies to opportunities in key equipment and services areas like offshore plant and topside builds including drilling vessels, Floating Production and Storage Offloading (FPSO) and Floating Liquefied natural Gas (FLNG).

DIT's support for the maritime sector is not limited to these targeted campaigns. The maritime sector offer will also be relevant to DIT campaigns in other sectors for example offshore energy. Additionally, as set out in the Export Strategy, we have a range of digital services, an international trade advisor service, and a network of commercial officers in 108 countries around the world who can assist individual companies with particular issues. UKEF can provide attractive finance terms to overseas buyers who procure from the UK and can support UK bidders into projects. DIT leverages the GREAT brand to deliver high-impact maritime campaign as well as promote the sector through promotional events like London International Shipping Week and other international events through Tradeshow Access Programme (TAP).

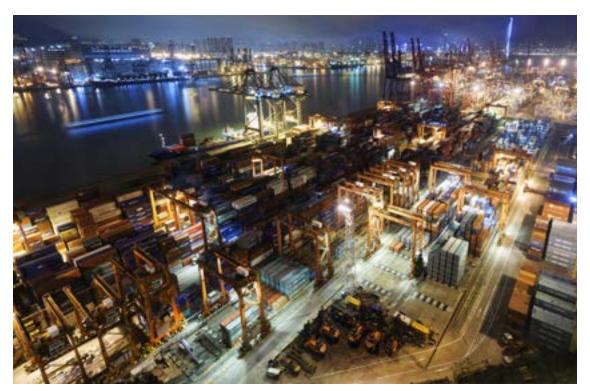
1.6 Freeports: accelerator for UK trade

Now that the we have left the EU, the Government will establish a series of new Freeports, to drive growth and ensure towns and cities in the UK benefit from Brexit trade opportunities. There are many international examples of successful Freeports . It is important that the UK takes this learning and designs a bespoke model to deliver its policy objectives. Ports and airports will be invited to bid to become Freeports. The response to a government-commissioned consultation on Freeports was published in October 2020. The Government will use the findings from the consultation to promote a model of freeport which specifically addresses the needs of UK businesses and coastal communities.

Our aims are:

■ To support the UK in becoming an acknowledged world-leader in areas such as marine digital and green technologies, creating hotbeds for innovation.

- To support the UK maritime sector by establishing Freeports as national hubs for global trade and investment across the UK.
- To maintain the UK's number one position for maritime services against increasing global competition.
- To promote regeneration and job creation across the country leveling up the regions and nations of the UK.



Hong Kong port

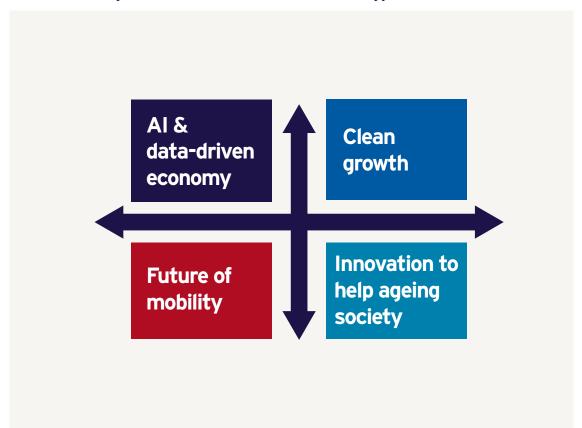


2. Drivers of future growth: Innovating to be future ready

The Industrial Strategy sets out four Grand Challenges, focussed on long-term global trends which will shape our future: Artificial Intelligence and the Data-Driven Economy, the Future of Mobility, the Ageing Society, and Clean Growth. These challenges affect many industrial sectors,

and the maritime sector is no exception. This chapter explores the challenges facing the global maritime sector to become cleaner and greener and remain competitive through adoption of new digital technologies.

Grand Challenges set out in the Industrial Strategy



Three of these challenges are core to this 5-year plan: Al, future of mobility, and clean growth. The technical and sustainability challenges facing the global maritime sector in the next five years represent a considerable opportunity for UK business to grow their export

market share. DIT's industry focussed activities are already covering opportunities in these areas, including for companies who might not currently be active in the maritime sector. These opportunities are elaborated in this section.



2.1 Green Maritime

Key drivers

Global regulations by the International Maritime Organization (IMO), a United Nations body, are the key drivers in the "greening" of maritime. The IMO has adopted regulations to reduce water pollution, air pollution and greenhouse gas emissions from maritime globally, with deadlines by which ship owners and operators will have to comply. One example is a mandated 50% reduction in carbon emissions by 2050 and decarbonise as soon as possible this century. Industry innovators and leaders are already pushing a cleaner environmental message. With over 90% of world trade delivered by ship and their emissions being about 2.2% of the global GHG emissions like that of a major economy, there is clearly an issue to tackle¹⁸.

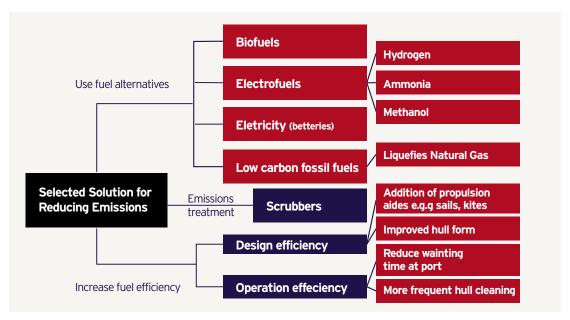
The UK could be a global leader in this area which maps onto two of the UK's Industrial Strategy Grand Challenges: Clean Growth and the Future of Mobility. But the UK faces strong competition in this ambition from competitors in Norway, Denmark, Netherlands, Singapore and Germany who all have strong Government-led trade promotion support for their industry. The Northern European countries have a similar hightech industry and research base to the UK.

Where are we now?

The global maritime industry is experiencing a time of major change as it responds to environmental issues including the need for urgent decarbonisation. Reducing sulphur oxide and nitrogen oxide in exhaust emissions, improving ballast water treatment, and the transition to low to zero emission fuels are all part of this challenge. The UK industry is well placed to provide solutions to lead in this revolution.

While the potential scale of the global market for green maritime technology is yet unknown, growth predictions for similar markets are impressive. For instance, Global Markets Insights Inc. have estimated the fuel cell electric vehicle market is estimated to reach over USD 9 billion by 202419. Meanwhile, Goldman Sachs recently estimated the value of the global market for lithium-ion batteries associated with the electric vehicles as reaching USD 40 billion by 2025²⁰. In the short term, change is being driven by the new regulations from the IMO on exhaust emissions (coming in on January 1st, 2020) and ballast water treatment (changes required dependent on vessel from September 8th, 2019). The combined market for installing ballast water and exhaust gas cleaning systems is an estimated US\$260 billion based on the current fleet size of approximately 52,000 ships²¹.

Selected Solutions to reducing emissions



¹⁸ http://www.ics-shipping.org/docs/default-source/resources/environmental-protection/ shipping-world-trade-and-the-reduction-of-co2-emissions.pdf?sfvrsn=6

¹⁹ https://globenewswire.com/news-release/2018/01/22/1298259/0/en/Fuel-Cell-Electric-Vehicle-Market-worth-over-9bn-by-2024-Global-Market-Insights-Inc.html

²⁰ https://www.ft.com/content/8c94a2f6-fdcd-11e6-8d8e-a5e3738f9ae4

²¹ Figures source: Maritime UK

Through DIT's maritime export campaigns, we are already promoting UK solutions for ballast water treatment systems and emissions reduction in key markets such as South Korea. Although there are few "total system" suppliers for ballast water treatment and scrubber installation based in the UK, many UK companies are involved in supply of consultancy, system design, fabrication work, pump and valve work. UK based law firms, brokers and insurers, class and consultants are actively involved in providing services support as the global shipping industry prepares for 2020 implementation of IMO emissions regulations. Beyond that UK technology providers are well placed to supply sustainable environmental solutions to the world's maritime sector including alternative sources of propulsion. LNG as an energy source is gaining momentum and consultancy with specialist engineering is a very good fit for UK capability.

Additionally the UK maritime sector is home to a number of innovative zero carbon energy projects - for example the use of hydrogen fuel cells on workboats and ferries, which have the long term potential to be scaled up to meet the need to decarbonise the sector and provide a significant export market for the UK.

One of the most significant debates in global maritime today is where the finance will come from to enable the industry to successfully enact the IMO mandated emission targets. The UK is the world's largest provider of green finance.

This coupled with the expertise that exists in the facilitation of debt and equity finance in maritime provides an opportunity for the UK to provide ship finance. The UK is also the world leader in ship broking, marine insurance and maritime law and is well placed to respond to this increased demand.

Where are we going?

The caps on exhaust pollutants and drive to reduce greenhouse gas emissions will create demand for decommissioning, ship building, as well as retrofitting. And all of this will require associated professional services. There is also likely to be a rise in claims and dispute resolution as the industry adapts to new fuels, propulsion and tonnage.

In medium term, the challenge is move to lower greenhouse gas emission fuels and hybrid systems with the longer-term objective of moving to zero emission systems. The goal set by the IMO is to reduce greenhouse gas emissions by at least 50% by 2050 compared to 2008 and to fully decarbonise this century. Underpinning this is the efficiency gains that digital connectivity and big data can provide. The 2050 targets will be a fundamental economic driver in the next thirty years. As new fuels, technologies and tonnage are introduced into the market in response to 2020 and 2050 targets, there will be increased need for complex brokerage, and it is likely there will be rise in insurance claims and an increased need for dispute resolution services.

Case Study: Cammell Laird's 'Red Kestrel' - a highly efficient freight ferry designed and built in the United Kingdom



Cammell Laird have built Red-Funnel Lines first hybrid-powered ferry. Launched in early 2019 it is constructed to provide year-round additional freight capacity for the Southampton-East Cowes route. The construction used 45 British supply chain businesses and employed 200 direct workers, 200 sub-contractors and 10 apprentices.



2.2 Digitisation

Key Drivers

Efficiency backed up by safety, compliance and environmental awareness are the key drivers for digitalisation in the maritime industry. Owners and operators will invest in new technologies if efficiencies can be demonstrated.

Where are we now?

Digital technologies are expected to increasingly become the backbone of the shipbuilding and operating market as owners look to create efficiencies, reduce costs and increase their cyber security. According to the UK Chamber of Shipping, the UK shipping technology sector is now a £4 billion industry, estimated to be worth £13 billion per year by 2030²². The global fleet of 53,000 ships²³ will adopt "smart shipping" technologies at different rates with the defence sector followed by the cruise industry leading the way. However, given that ships are built for a 30-year life, the older fleet requires monitoring and compliance while we see the newer fleet increasingly being built with digital technologies in mind.

No longer are ships stand-alone units traversing the globe. Increasing satellite communication options, lower data transfer and storage prices have enabled telemetrics that alongside automation make it possible to manage fleets of ships optimising their cargoes, routes, compliance and maintenance. This all feeds into increased productivity and quality control increasing reliability which contributes to profitable enterprises. The scale of the revolution is comparable to the containerisation of the 1960's.

The innovators in the maritime digital space often come from the defence sector through the need for cyber defence and warfare but also for the cost reductions that new autonomous systems can deliver in defence spending e.g. expanding the anti-submarine warfare capability of a frigate by deploying several autonomous underwater drones which report back via satellite communications. All this digital transfer needs to be secure. The supply chain to the shipbuilding industry increasingly has to offer connectivity to ship automation systems and remote access. The shipowners and operators are demanding increased collaboration between ship systems in order to drive increased economies and "big data" helps in the analysis and delivery. The services sector is also looking at the digital sector with blockchain solutions for trade and optimisation of container loading via different "TradeTech" applications.

The utilisation of big data has the potential to revolutionise the marine insurance market, giving underwriters significantly more information to assess what are high value and complex risks. VR and big data are currently being utilised to assess marine casualties, pioneered by UK based consultancies. Blockchain technology proved by a UK based firm is being trialled now by the world's largest shipping company to streamline the process between owner, insurance broker and underwriter. UK based law firms, insurers and marine consultancies lead the world in providing products, thought leadership and dispute resolution regarding cyber security threats.

UK shipping technology sector is now a £4 billion industry, estimated to be worth £13 billion per year by 2030

Where are we going?

The UK maritime sector will be 'digital by default' with accessible, easy-to-use, and secure processes. Paperless maritime governance and e-registration of vessels will make the UK flag an attractive business prospect. Digitised, and standardised means of certifying skill levels will provide a transparent means of ensuring competence requirements. The real-time sharing of open data between all parts of the supply chain will drive efficiencies and generate significant cost savings, with digital seals offering better means of verifying cargo, 'smart contracts' allowing for the real-time calculation and adjustment of insurance premiums, and the throughput of ports and optimisation of routes is achieved through data analytics. The Government will assess the technological options that could assist the effective development and management of Freeports.

The Internet of Things and greater digitalisation connecting consumers, producers and intermediaries will create opportunities and costs as smart maritime provides improvements in productivity for ship operators. The cross-over

technologies from other areas of manufacturing as well as the need for regulation and standardisation will create a revolution in the utility and management of maritime and port operations. Block chain, big data, virtual reality (VR), online trading platforms and cyber security are vital drivers for maritime services from ship broking to marine insurance.

Shorttermbusiness wins will centre on the traditional supply chain companies delivering product wins, with increased sensor and connectivity options as IOT becomes more widely adopted. Designers and naval architects will make increasing use of virtual reality and system manufacturers will increasingly utilise augmented reality to lower service costs. Automation will develop with the increased use of machine learning and artificial intelligence as the drive to reduce crew costs comes in. The ultimate end game is fully autonomous ships managed by AI but there is a long road to travel before that is achieved and estimates have been close to the end of the century before that is achieved in transocean shipping.

Case Study: Inmarsat Network Operations Centre



Satellite service provider Inmarsat has developed a series of ship-shore connectivity tools to drive and protect digital transformation after launching its high speed maritime broadband Fleet Xpress in 2016. Through its CAP (Certified Application Provider) programme, it allows the application and software developers working to improve vessel efficiency to choose their own route to digital enablement. CAP can accommodate developer requirements for either dedicated bandwidth services or a dedicated interface to Fleet Data - Inmarsat's cloud-based IoT platform. Maritime's digital transformation is also being enabled through the fully managed Crew Xpress service, which includes a separate, managed Wi-Fi 'Fleet Hotspot' for crew but also harnesses that demand to encourage owners and operators to engage with higher speed broadband. A further vital element is Inmarsat Fleet Secure, which protects Inmarsat's satellite services against cyberattacks. Fleet Secure identifies external attacks or malware introduced accidentally or otherwise to the vessel's local area network. The package also includes Fleet Secure Endpoint to isolate infected systems and prevent network disruption, plus the Fleet Secure Cyber Awareness training app for mobile devices, so that seafarers remain alert to the tactics cyber criminals use to infiltrate ship systems.

2.3 Autonomous Vessels

Key Drivers

A reduction in crew reduces operating expenditure and safety concerns. For example, clearing unexploded ordinance from the seabed autonomously removes humans from areas of danger.

Where are we now?

The UK is a world leader in the application of Artificial Intelligence and has already displayed strong capability in the theoretical development autonomous shipping. The environment is a notoriously harsh environment both for engineering and for people to operate in. Safety and environmental considerations mean that crew costs on a commercial vessel can be over 50% of the operating costs. Operating costs for the global cargo fleet exceeded \$100bn in 2017 with crew costs constituting of \$43bn of that (figures from Clarkson Research). The economic driver to reduce that figure ensures an ongoing interest in autonomous vessels. Increased automation and telematics also play an important role in maintenance and asset management.

The UK is a market leader in the sub-24 metre segment in the design and build of autonomous surface and underwater vessels. In this segment, the use of autonomous vessels, both surface and underwater, is already prevalent. The defence and energy sectors have led the investment as they seek to reduce costs and yet still meet all their different operational requirements. These have strong links into the energy, defence and marine science industries as the lower costs will enable greater deployment.

In the larger maritime sector, autonomous vessels are one of the key focus areas for research and development for the larger consultancies with the more innovative shipowners. A UK based P&I Club was the first insurer to provide a policy for autonomous vessels. UK based insurers, law firms and consultancies lead the world in providing products, thought leadership and regulatory frameworks for autonomous shipping. Complex vessel design and build is high value and a good match for the UK supply chain. Cruise ships, research vessels, and cryogenic tankers all come into this market, with a global market of £4bn per annum and an accessible value to the UK of circa £500m ²⁴.



Picture: Autonomous Surface Vehicle

Case Study: Autonomous vessels from SEA-KIT™ International



SEA-KITTM International was created to provide unmanned and autonomous solutions to the maritime industry. Its unmanned capabilities feature the ability to remotely control vessels from an operation centre located anywhere in the world. Being truly unmanned means SEA-KIT can conduct missions without placing personnel in harm's way at a significantly reduced costs and carbon footprint.

The UK is working on implementing nextgeneration communications technologies that can be utilised securely by an increasingly connected and technologically advanced maritime sector. This connectivity will be underpinned by resilient, high-bandwidth satellite technology that provides global coverage and is developed, built and launched from the UK. Autonomous technology will increase our capability to understand the ocean including high-resolution mapping of the deep seabed. An improved understanding of the ocean will be critical to enable the conservation and sustainable use of marine resources. The UK is a world leader in hydrography and exports data for global use. This data that has been gathered and has been successfully digitised into 'smart charts' is used for the safe navigation of unmanned and autonomous vessels. UK law firms, insurers and consultancies lead the world in providing innovation, regulatory frameworks and insurances for the autonomous vessel sector.

Where are we going?

The impact of autonomous systems within maritime and across the maritime sector is likely to be significant with human beings being

removed from the most dangerous tasks and digital systems augmenting human productivity in the management of complex vessels. Increased use of autonomous systems will improve safety, increase cargo space, and save on operating costs. The first movers in commercial autonomous vessels over 24 metres in length will be point-to-point operators over short distances. As experience and technologies develop there will be a gradual reduction in crew numbers and an increase in offshore voyages utilising greater control from shore based operational hubs.

Autonomous vessels according to the Foresight Future of the Sea Report²⁵ "are expected to be the most significant technological development for the marine economy transforming the majority of marine industries and sectors, notably monitoring and mapping, maintenance of offshore infrastructure and shipping". According to Credence Research, the global autonomous ships market was valued at US\$ 56.75bn in 2016 and is expected to grow at a compound annual growth rate of 12.8% from 2017 to 2025, making a market value of circa US\$155bn by 2023²⁶.



2.4 Marine Science

Key Drivers

Marine science is a diverse sub-sector which includes oceanographers, offshore surveyors, as well as those concerned with environmental monitoring and pollution control. These services are in high demand including in the defence and security, offshore energy, ports and harbours, and aguaculture sectors. Demand for marine science is growing and this is driven by greater awareness of the role of the oceans in our environment and economy. The challenges and recommendations for the oceans are set out in the Government's "Foresight Future of the Sea Report".²⁷ The marine environment is coming under threat from climate change and pollution whilst at the same time world population increases are driving up demand for aquaculture. The report estimates the ocean

economy will be worth \$3 trillion by 2030.

Where are we now?

Technology and innovation are at the heart of the industry with companies often closely tied to UK universities. The marine science & technology sector in the UK has a turnover of £1.63bn, exports of £551m and close to 23,000 full time employees. UK industry is well placed to capitalise on the challenges ahead. Exportable products include for example sensors and the autonomous vessels and systems they are built into. The services include, for example, survey companies undertaking hydrographic surveys using the sensors to determine seabed geological composition.



Built in the UK the RRS Sir David Attenborough is a state of the art scientific survey vessel.

²⁷ https://www.gov.uk/government/publications/future-of-the-sea--2

In this sector, there are strong links between companies and universities. The UK's National Oceanography Centre (NOC) is one of world's top oceanographic institutions strengthening the capability needed to be a top global player and to lead and participate in international cooperation on Ocean Science. The NOC undertakes world leading research in large scale oceanography and ocean measurement technology innovation. The NOC supports the UK science community based in universities and smaller research institutes with scientific facilities, research infrastructure and irreplaceable data assets - enabling the UK to harness the full power and diversity of its scientific talent in ocean science. NOC has a business incubator program called the "Marine Robotics Innovation Centre". This centre includes manufacturers, researchers, survey companies and system suppliers. Marine science is critical in understanding the environmental challenges facing the planet, such as climate change, degradation of the ocean and loss of biodiversity. Marine science is also critical in providing solutions for these environmental challenges. As a key player in the field, the UK has an important role to play.

The UK's marine science expertise is already being promoted globally. Two industry exhibitions enable UK companies to increase their profile and make new connections. The largest global exhibition for the industry, Oceanology International, is based in London and runs on a biennial basis. Approximately 125 UK companies exhibit at the show which receives 70% of its visitors from outside of the UK. Ocean Business in Southampton also enables companies to demonstrate their products and services in the water.

The UK Government has several agencies involved in delivering blue economy programs internationally. For example, the Government's Science and Innovation Network supports developing countries to develop their blue economy research and understanding. The Centre for Environment, Fishing and Aquaculture Science (CEFAS) provides fisheries advice around the world to enable more sustainable management of fish stocks. The UK Hydrographic Office (UKHO) undertakes hydrographic work in the UK, the British Overseas Territories, and for approximately 70 other countries. Better understanding of sea-beds enables easier and safer trade.

Where are we going?

The marine science sector provides the underlying data on resources as well as environmental impact for renewables, aquaculture, oceanographic and environmental industries. The growth in offshore energy is expected to decrease carbon emissions with wind farms being installed further out to sea increasing the engineering, conservation and monitoring challenges. Aquaculture through farmed fishing accounts for just under 50% of all food fish and increasingly large farms are being developed and positioned in offshore locations. The issue of marine litter and micro-plastics has thrown a spotlight on the oceans. Water quality and general pollution is affecting the food chain and human health. Ocean warming is creating issues for biodiversity and coral bleaching. Climate change is creating new challenges in coastal erosion as sea levels rise. Analysis and monitoring of the seas offers opportunities for UK businesses.

Case Study: RS Aqua WaveRadar REX mounted on the port side of Royal Caribbean's Mariner of the Seas



RS Aqua WaveRadar REX are fitted ahead and to the port and starboard bows. They are trusted to monitor wave conditions to improve navigational efficiency. They also aid berthing and most importantly help keep passengers and crew safe.

2.5 Maritime Professional and Business Services

Key Drivers

Digitisation, automation and environmental regulation are going to have an unprecedented effect on the maritime industry. For maritime services the current evolutions in maritime will mean significant changes and opportunities, whether it is in complex insurance risk, contract law and dispute resolution, broking and financing.

Where are we now?

The UK is a global strength in maritime services and London is the world's leading maritime services hub. Technological change and new entrants from Fintech to Cyber providing innovative solutions for the UK to sustain its lead in the provision of regulation, arbitration, finance and professional services to the world.

The UK has the largest share of worldwide marine insurance premiums and shipbroking, comprising 35% and 26% of the global market respectively.

UK global market shares in major maritime services sectors²⁸



The UK is home to the largest maritime law firms and conducts over 80% of global maritime arbitrations. This is primarily because English is the

preferred jurisdiction for worldwide commercial and maritime contracts. The sector directly employs over 10,000 professionals and contributes £5.6bn to the UK economy.

Top 10 maritime services hubs in Xinhua-Baltic Exchange²⁹



²⁸ https://www.cityoflondon.gov.uk/business/economic-research-and-information/research-publications/Pages/maritime-professional-services.aspx

²⁹ https://www.gov.uk/government/publications/maritime-2050-navigating-the-future

It is globally recognised that the UK is the leader in maritime services. However, the rise of ownership, management and chartering of ships in Singapore and China has created an increasingly competitive environment for UK companies. Although, the maritime services firms from the UK dominate in these emerging markets, we cannot be complacent.

Where we are going?

Maritime 2050 sets the strategic ambition to maximise our strength in maritime professional services, retaining and enhancing our UK competitive advantage in the provision of maritime law, finance, insurance, management and brokering, and developing our green finance offer. The Department for International Trade wants to integrate the UK maritime services

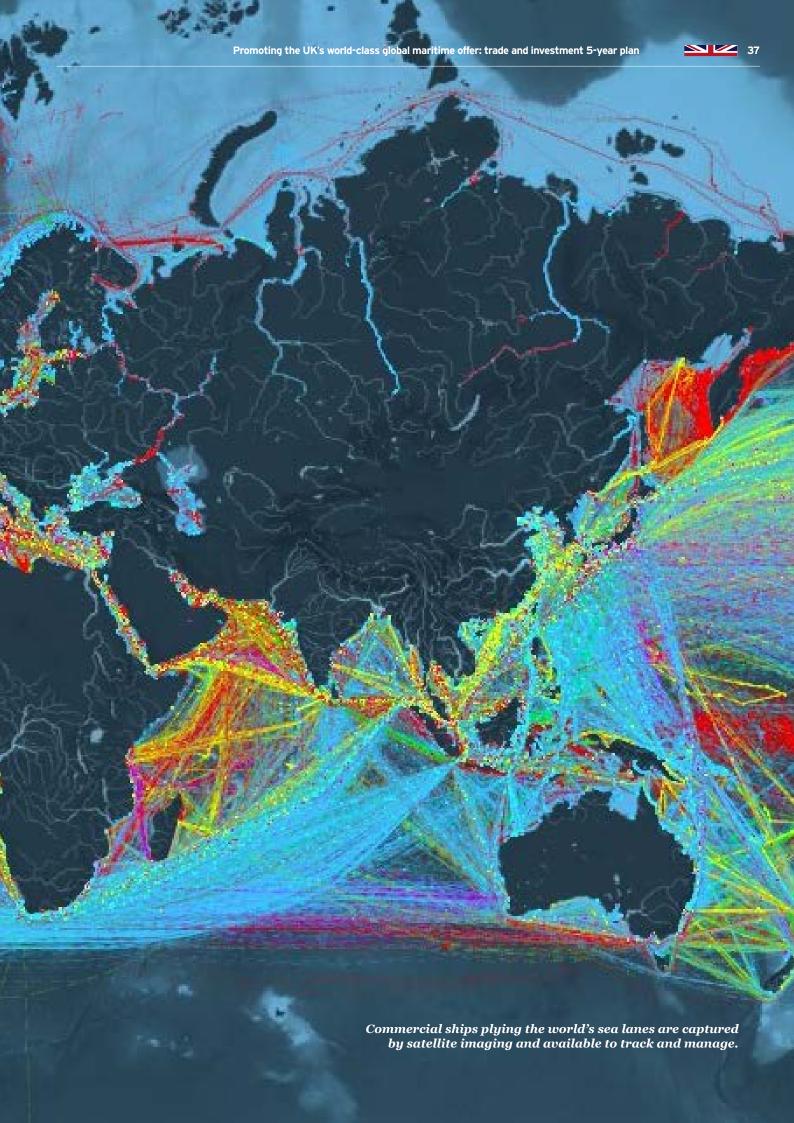
offer into our wider maritime promotional work, ensuring the UK offer is well understood. We intend to work closely with Maritime London and the wider UK maritime services industry to scope out the key opportunities for potential growth. A study into the competitiveness of the sector as identified in the Maritime 2050 Trade Route Map would be part of this workstream.³⁰ In addition, DIT will work with the sector to improve our promotion of the UK as an inward investment destination for the global maritime community. Strengthening the UK's owning, operating and chartering clusters is vital to maintain the holistic expertise that exists in the UK market. The International Education Strategy³¹ highlights the UK's global reputation for education and DIT will promote the UK's world class maritime education offer in line with this strategy.

Case Study: Galbraith's Ltd



Galbraith's has been at the forefront of shipbroking since 1845 and we are one of the longest established and most respected shipbroking houses in the world. Headquartered in London and offices in Oslo, New Delhi, Shanghai, Seoul, Houston and Stamford, it is well placed to service the needs of all our clients. It has a tanker, dry cargo as well as an LNG/LPG division in order to cover both owners and charterers. The S&P division provides a complete service from the contracting of NBs through to second-hand sales and demolition. It provides services for tanker operations, specialist financing, research and consultancy. As a member and/or shareholder of the Baltic Exchange, the London Tanker Brokers' Panel and the Worldscale Association (London), the company has excellent input to key industry bodies.







2.6 Meeting the Challenge

DIT will look to adopt these future focussed themes across our campaign activity, marketing and event support. There will be a greater emphasis on these new opportunities in future. However, this will be a gradual transition. We recognise that there is still much continued value in promoting more traditional areas of UK strength. Therefore, we will continue to support key opportunities in existing areas with industry and our partners.

The table below highlights the key maritime events that DIT intends to support over the next five years.

	Jan-Mar	Apr-Jun	Jul-Sep	Oct-Dec
2019			London International Shipping WeekLondon	Kormarine - Busan, S KoreaMarintec China - Shanghai
2020	Oceanology InternationalLondon	Posidonia - GreeceSeawork - UK	SMM HamburgGermany	■ Inmex China-Guangzhou
2021	Oceanology Americas - USA	 Ocean Business - UK Nor shipping - Oslo Seawork - UK 	■ London International Shipping Week - London	 Kormarine - Busan, South Korea Dubai Maritime Summit - Dubai Oceanalogy China Hong Kong Maritime Week Marintec China - Shanghai
2022	Oceanology InternationalLondon	Posidonia - GreeceSeawork - UK	SMM HamburgGermany	Seatrade Middle East - DubaiInmex China - Guangzhou
2023	Oceanology Americas - USAInmex Vietnam	 Sea Asia - Singapore Ocean Business - UK Nor shipping - Oslo Seawork - UK 	London International Shipping WeekLondon	■ Kormarine - Busan, South Korea

This table is necessarily indicative given that decisions on future programmes and budgets are not yet taken. However, we want to show the level of ambition. This could be for example through taking trade missions, running 'meet the buyer' events, or by supporting small companies through the Tradeshow Access Programme.

London International Shipping Week (LISW) is one of the most important events in the UK maritime calendar. Organised biennially by industry in partnership with the Department for Transport and Maritime UK, LISW is attracting increasing numbers of visitors from overseas and is an

opportunity to showcase the UK capability across all these themes. One of the first events under the plan will be a technology showcase at LISW 2019 aimed at shipowners and operators, providing an opportunity for UK technology leaders to engage with these decision makers.

The next chapter gives details of a range of other actions Government & industry will be taking to improve the maritime trade and investment offer.

3. How will we get there?



Large container vessels dominate the consumer goods trade

3.1 Realising the opportunities

Over the next five years, DIT and the Maritime industry want to further improve our collaboration in support of maritime trade and exports, with the aims being:

- To support the UK maritime sector to capture significant global market share in products and technologies to improve the environmental performance of the global maritime fleet
- To ensure that the UK maritime sector becomes an acknowledged world-leader in, and increases UK global export market share, through the adoption of digital technologies including in cyber security and the move to greater autonomous systems in both vessels and ports

- To promote the UK's capability in marine science and technology
- To maintain the UK's number one position for maritime services against increasing global competition

These are ambitious aims and to realise them will require a step change in the way DIT and the maritime industry work together. The actions below are designed to support new to export companies, better leverage DIT's overseas network, improve information sharing and better co-ordinate marketing and promotional activities in support of these opportunities for the maritime sector.

3.2 A Sector led Industry

which support exporting and outward and inward opportunities set out in Chapter 2.

DIT and Maritime UK have agreed to establish foreign direct investment. The MEIG will ensure a Maritime Export and Investment advisory close communication and collaboration between Group (MEIG) chaired by Maritime UK, with the DIT and the industry. The group will regularly secretariat provided by DIT and comprising key review progress against this 5-year Maritime trade bodies, companies, regional groups and Action Plan and will ensure that the actions being representatives of other Government bodies taken are well-aligned with the challenges and

3.3 Helping UK companies export

The Government's 2018 Export Strategy set out the role of Government in supporting exports under four key headings - encourage, inform, connect and finance. These overarching themes in relevance to the Maritime sector are listed below and elaborated further in the Action Plan:

Encourage

Those businesses that can export but have not started or are just beginning their export journey need encouragement and inspiration. Industry and Government will encourage and guide such businesses partner to gain knowledge on areas like market access and barriers to entry through different platforms. To deliver success, it is important to support and encourage these companies on their marketing and promotion effort through means such as high-quality UK capability collateral, global support on events with industry, GREAT branding and appropriate 'pillars' from other Government strategies, marketing material developed for overseas such as industry case studies and UK events as well as through an annual promotional plan with Maritime UK and their member trade bodies.

Inform

Information empowers businesses to take decisions. It is imperative to ensure the seamless flow of information, advice and practical assistance about exporting to build success stories. The planned bi-annual Maritime Exporting and Investment Forum (MEIF) will encourage, inform and connect companies from the wider maritime industry to exporting

support. Likewise, it is also important for the maritime industry to convey the market access barriers to enable identification and resolution of issues. It is important to consistently upgrade sectoral, technical and market expertise for DIT and industry colleagues through training programmes as well as for example through industry secondees.

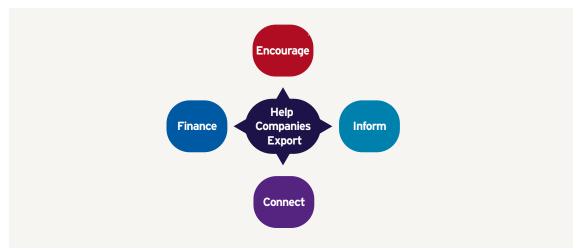
Connect

To improve exports, it is important to help UK businesses connect with overseas buyers and each other by leveraging our networks, relationships and influence. This can be achieved through trade bodies and through the development of UK consortiums to strengthen engagement with key projects, by connecting industry experts with companies as well as through DIT UK & overseas staff who can play a key role in expanding networks and exploring new opportunities.

Finance

The Export Strategy places finance at the heart of its offer. UKEF's wide range of products and services to support UK companies helps to ensure that no viable UK export fails for lack of finance or insurance. UKEF and DIT will work together to promote UKEF's support in the maritime sector, helping them access finance and insurance to win, fulfil and get paid for international sales. DIT will work with UKEF to increase UK content in overseas projects, using UKEF's competitive finance offer to attract overseas buyers to maximise procurement from the UK.

UK's Export Strategy



3.4 Foreign Direct Investment in Maritime

Our presence in markets globally places us in an advantageous position to connect foreign investors with the UK's maritime offer. DIT's FDI strategy is committed to improving FDI flows through focusing on projects which will contribute to the UK economy. This includes attracting investment in maritime infrastructure like ports as well as foreign maritime companies and ship owners to setup base and invest in the UK. DIT will work with the maritime sector to

improve our promotion of the UK as an inward investment destination for the global maritime community, including supporting the investment narrative associated with the implementation of Freeports. Strengthening the UK's owning, operating and chartering clusters can play a vital role in maintaining the holistic expertise that exists in the UK, especially in our maritime professional and business services centres.

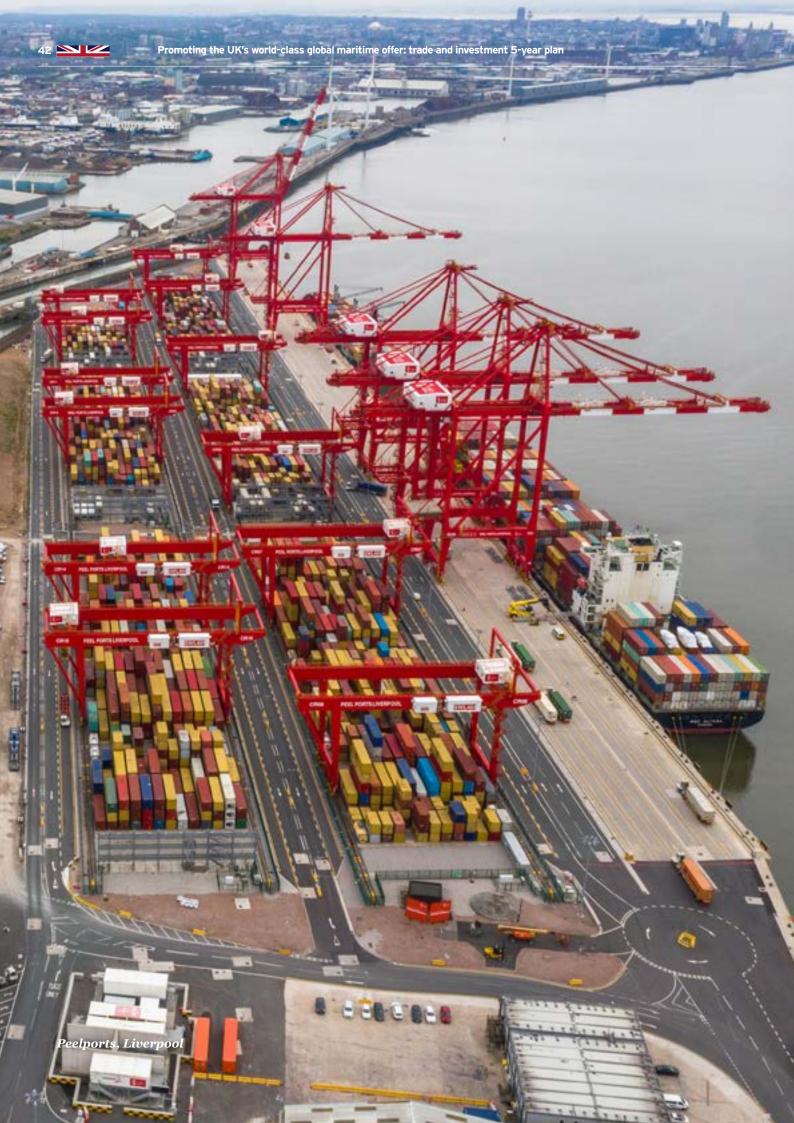
Case Study: MSC Cruise Management



"The UK was the natural choice for our relocation. It's a world-leading maritime centre, built upon strong maritime heritage, with a competitive business environment and access to skilled and experienced professionals. The UK offers an unrivalled cluster of expertise and services to global maritime businesses. This foundation, coupled with a rapidly growing domestic cruise market, made the UK the obvious and natural choice for our move."

Testimonial from Emilio La Scala, President & Managing Director, MSC Cruise Management







3.5 Action Plan for DIT and Industry

	Export and Trade Theme	DIT	Maritime UK & Industry	Frequency
A.	Encourage			
1.	New Exporters Workshops Support new exporters or new to market companies on their exporting journey Run a series of workshops covering market access, overcoming barriers and knowledge sharing on identified markets	Recruit the companies Provide market expertise	Identify and supply relevant case study companies Provide venues if required Provide other industry experts where relevant	Four times per year
2.	TAP Programme The Tradeshow Access Programme (TAP) is UK Government's scheme to help UK SMEs exhibit overseas Eligible organisations can learn how to use exhibitions as a key tool in their export development plans Work as part of a development programme for eligible businesses and organisations through TAP's Trade Challenge Partners (TCPs) and DIT's regional network Participation in TAP helps businesses gain market knowledge, experience in attending and getting the most from overseas trade shows and advice and support from trade experts	DIT overseas network to engage and manage key decision-makers and facilitate introductions to UK companies as required by industry	In line with TAP terms and conditions	Ongoing
3.	Promoting UK Maritime Offer in target markets Raise awareness of the UK maritime sector within identified target markets leading to an increased level of orders secured by UK companies Collaborative effort to promote UK maritime sector in identified target markets leveraging the overseas DIT staff and networks	DIT overseas network in target markets will en- gage and manage key decision-makers and facil- itate introductions to UK companies	Case studies, imagery, and expertise	Ongoing

	Export and Trade Theme	DIT	Maritime UK & Industry	Frequency
В.	Inform			
1.	Maritime Exporting and Investment Forum (MEIF) Forum to facilitate dynamic engagement between maritime industry executives and Government officials to exchange ideas relevant to export & investment, including new trends in technology like Green Maritime, Digitisation, Autonomous Vessels, Marine Science, and Maritime Services Different from MEIG as its scope doesn't involve governance of this plan but rather encourages participation of the wider maritime industry	Provide dedicated secretariat Co-ordinate attendance from across HMG as required for particular topics	Provide venue and catering via member organisations	Twice Annu- ally



	Export and Trade Theme	DIT	Maritime UK & Industry	Frequency
2.	Developing Sector Knowledge (DSK) Facilitate high-level understanding of the maritime sector for DIT UK and overseas commercial officials Ensure that front-line DIT staff remain conversant with the entire UK offer, including new products, supply chain and technology trends like Green Maritime, Digitisation, Autonomous Vessels, Marine Science, as well as Maritime Services Improve skills required for developing dynamic selling propositions relevant to their own market and customers	Manage DIT Overseas staff costs attending the event Cover some catering costs	Industry will have significant input into the programme content with DIT, to reflect the challenges and opportunities facing the sector Provide some venues and catering	Once Annually
3.	Technical Briefings Industry-led activity to update DIT staff's knowledge on technical aspects Ensure that front-line DIT staff remain conversant with key developments in between formal training weeks Augment sector knowledge of DIT staff on emerging trends	Manage IT / AV facility interface / marketing	Content and speakers / mar- keting	On a needs basis
4.	Offering an annual briefing for HMTCs & Ambassadors	DIT will work alongside in- dustry to flag relevant issues to the HMTCs and Ambassa- dors in respective markets Briefings will be made annu- ally with periodic updates on issues being fed into over- seas DIT staff	Identify areas where companies need support from HMTCs and Ambassadors Support DIT on annual briefing and HMTCs & Ambassador to cover the relevant and pressing issues for the industry in respective markets.	Annually

	Export and Trade Theme	DIT	Maritime UK & Industry	Frequency
5.	Suite of Capability Collateral Allowing DITs front-line teams to more effectively sell the UK offer Equip DIT staff with credible collateral material on technical design, supply chain, case studies, upcoming trends among others to position and market the strength of the UK maritime sector to the global maritime industry	To collate and develop relevant content using sector team expertise Print-ready design Translation as required and as resources allow	Provide case studies, images and other information within agreed timelines The Maritime Export and Investment advisory Group (MEIG) will act as a key platform to steer and enable this.	On a need basis
6.	Exploring new market opportunities Industry will support the DIT network by offering specific specialist technical knowledge where required operation- ally to explore new market opportuni- ties, and industry and Government will work together to consider their rela- tive priority and how best to address	DIT will continually horizon scan for significant new opportunities for UK maritime exports, whether geographically or in terms of products & technologies DIT will work with industry to find ways to scope such opportunities to understand their scale and relative priority	Assist DIT to identify significant export opportunities for the maritime sector which require Government support, and which are not currently being addressed This include for example providing written reports, providing short-term secondments of industry experts, or providing briefings for UK & overseas commercial officers The Maritime Export and Investment advisory Group (MEIG) will act as a key platform to steer and enable this.	On a need basis
7.	Webinar Programme Provide the sector with regular and relevant export market and project updates and offer an interactive forum to discuss developing issues Promote opportunities to new to export companies	Provide IT / AV support	Provide venues, expert speakers, content and pro- gramme	Four times per year



	Export and Trade Theme	DIT	Maritime UK & Industry	Frequency
8.	Communicating barriers to entry and market access issues To allow industry to communicate and receive timely feedback on key issues as they develop Identify and prioritise maritime industry market access barriers to international trade jointly through MEIF Ensure these are raised with the DIT Market Access Unit to take necessary steps	Commitment to regular engagement through normal channels Report back to industry where appropriate	Commitment to regular engage-ment and follow up.	Ongoing
9.	Rest of World Trade Policy Engagement Through a range of engagement fora, we should aim to facilitate closer communication between industry and Government on trade policy issues, informing our future trade agreements with non -EU countries on maritime matters.	Commitment to regular engagement through normal channels, including upcoming Expert Trade Advisory Group	Commitment to regular engagement Provision of industry expertise and analysis	Ongoing

	Export and Trade Theme	DIT	Maritime UK & Industry	Frequency
C.	Connect			
1.	Maritime Export and Investment advisory Group (MEIG)	Provide dedicated secretariat to MEIG	Provide venue and catering via member organisations Jointly approve MEIG	Twice Annually
	Collaborative group of maritime industry executives and DIT officials to:	Co-ordinate attendance from across Government as required		
	Review progress against this 5-year action plan	Jointly approve MEIG members	members	
	Agree joint objectives for the sector around export and investment promotion, and advise DIT on planning of relevant activity			
	Drive efforts on the focus areas of Green Maritime, Digitisation, Autonomous Vessels, Marine Science and Maritime Services			

	Export and Trade Theme	DIT	Maritime UK & Industry	Frequency
2.	Support for UK consortiums Support UK consortiums to develop around key global projects to put forward more effectively the full width and depth of the UK offer	Formulate and promote the UK offer Bringing opportunities to the attention of the full width of the UK industry Help secure UKEF finance support for UK consortiums Industry Trade Proponents to help promote the UK consortiums	Actively support and help engage relevant companies	Need basis
3.	Industry Trade Proponents Leverage leading industry experience and expertise to help international buyers understand UK capability A pool of senior Industry Trade Proponents will act as thought leaders, and will make themselves available to support these efforts and promote the UK offer	Suggest opportunities for such thought leadership and supply industry advocates with relevant briefing material. Create a network of Export Champions offering expertise and guidance to other companies on their exporting journey as identified in the Maritime 2050 Trade Route Map	Identify relevant individuals for the programme	Ongoing
4.	Global Events We will promote the UK's maritime offer at major maritime events which attract a global audience. We will seek to prioritise those events of most relevance to the areas of future focus outlined in section 2.6 of this plan, to enhance networks, showcase the UK maritime offer, and support companies to convert opportunities into business deals	DIT will work with industry to identify and prioritise which events to support Events will be supported by the GREAT campaign materials Events will be better than today with more companies attending and improved perceptions Greater clarity on what support is on offer - marketing, profile in country, overseas network support, advocacy from commercial officers including at senior level, UK based specialist support, networking events, support before & after from ITAs.	Industry to support representation at key events to showcase UK maritime strength	As per the 5-year event plan highlighted in section 2.6



	Export and Trade Theme	DIT	Maritime UK & Industry	Frequency
D.	Finance			
1.	Finance Assistance to exporting companies Provide UK companies with help on finance to win and fulfil export contracts and insurance to cover risk of non-payment Financial support through UKEF to eligible exporting companies	Resolve financial constraints for exporting companies through available UKEF schemes and provisions	Identify and report financial assistance required for exporting companies and constraints, if any, on a timely basis	On a need basis

FDI Theme	DIT	Industry	Frequency
Communicating Foreign Direct Investment (FDI) opportunities to potential investors on a responsive basis.	Promote the opportunities to attract ship owners and operators through the Invest in GREAT campaign.	Contributing case studies and success stories.	Ongoing
DIT will work with the sector to improve our promotion of the UK as an inward investment destination for the global maritime community. [] Strengthening the UK's owning, operating and chartering clusters is vital to maintaining the expertise that exists in the UK particularly around maritime professional and business services.	Create a maritime sub-sector proposition identifying reasons to invest in the UK. DIT will explore the opportunities to attract foreign capital investment into our ports infrastructure		





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DIT

The Department for International Trade (DIT) helps businesses export, drives inward and outward investment, negotiates market access and trade deals, and champions free trade.

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