



Department  
for Transport

maritime  
2050  
NAVIGATING THE FUTURE



**MARITIME 2050**  
Navigating the Future







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# MARITIME 2050

*Navigating the Future*

January 2019

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# Contents

Foreword by the Secretary of State	2
Foreword by the Minister for Maritime	3
<b>Maritime 2050 executive summary</b>	
Introduction	4
Maritime 2050 values and ambitions	6
Development of the strategy	8
Implementation	8
Maritime today	9
Maritime trends	11
UK competitive advantage	12
Technology	16
People	18
Environment	21
Trade	24
Infrastructure	27
Security and resilience	31
Maritime 2050 recommendations	34

# Foreword by the Secretary of State



When I launched Maritime 2050 in February 2018, I was confident that with engagement across Whitehall, the full breadth of the maritime sector, and our maritime academic partners, we would produce a truly visionary long term strategy for the UK maritime sector. This document is bold and aspirational, cementing our ambition to be a world leading maritime nation long into the future.

The global economic picture may change and new technologies emerge, but of one thing I am certain - this country will continue to rely upon the maritime sector for its trading success and many of our essential needs, from the clothes we wear to the food we eat.

The maritime sector is the key enabler for UK manufacturers and suppliers to reach out into international markets and I do not envisage that changing through to 2050. However, to remain a competitive maritime nation it is essential that we capitalise on new opportunities, being both innovative and forward thinking in meeting any challenges that arise.

Maritime 2050 is substantial, reflecting our intention to be as wide ranging and comprehensive as possible. It is founded on a number of core ambitions, demonstrating our bold and aspirational objectives as we head towards and beyond the second half of the 21st century. Our desire is for the UK to be a

global leader, promoting a liberalised trading regime that delivers maximum benefit for our maritime sector. In doing so, we must take action now to ensure we are at the forefront of technological advancements, to transform and grow our maritime workforce and be bold and ambitious in progressing clean maritime growth. Underpinning this will be the delivery of maritime infrastructure that matches our future expectations.

Government is committed to working with industry and the wider sector to deliver on our Maritime 2050 commitments and in the development of the route maps. Together we can encourage innovation and investment, collectively shaping and ensuring the success of our UK maritime sector for generations to come.

I am extremely grateful to all those who contributed to the development of Maritime 2050, through an extensive programme of stakeholder engagement and consultation. Your input has been vital, demonstrating real partnership between government and the maritime sector.

A handwritten signature in black ink, appearing to read 'Chris Grayling', written in a cursive style.

**Chris Grayling**  
Secretary of State for Transport

# Foreword by the Minister for Maritime



As Minister for Maritime I am proud to have responsibility for our outstanding maritime sector. I have seen first-hand how vital it is to each and every one of our lives and the instrumental role it plays in the UK economy. I know that everyone in the UK who works in our maritime sector, or has an association with it, is proud and passionate about it. I share that passion, and together we are determined to ensure our status as a world-leading maritime centre is undiminished long into the future.

It is clear that the present time is a pivotal period for the sector, one of change and potential. Maritime 2050 charts an ambitious course for the industry that outlines the coming opportunities. Collaboration across the sector will be necessary to achieve these aims, and industry has already demonstrated an admirable willingness to work with government. This strategy is one such result of this cooperation and further partnership will continue to be vital to our ongoing success.

I wish to extend my thanks to all those who contributed to this strategy; those who submitted written evidence, took part in the numerous workshops, and the many individuals who spoke to me directly throughout the year. These thoughts and ideas were heard and contributed to the evidence base that informs Maritime 2050. The strategy and its recommendations are all the richer for them.

I am passionate about this strategy because it sets out our ambition to strengthen our

status as a global maritime leader. In taking action in crucial areas like the environment, security and trade, the UK will be a standard bearer on the international stage. This will also be seen in one of the areas closest to my heart: the welfare and talent of our maritime people. Without them, their dedication and high-quality skills, the maritime industry simply would not function. This workforce is, however, not suitably diverse. We therefore have an opportunity to improve our maritime offer by addressing this challenge, attracting a full breadth of skilled individuals who will be needed in the coming decades. Through Maritime 2050 I hope the good work that has begun in the Women in Maritime Taskforce can gather pace and broaden out to look at wider diversity issues.

Maritime 2050 is a hugely ambitious undertaking. As the champion for the sector, I can assure you that I will provide the leadership in government that the sector rightly expects and deserves. I ask in return, that all those wanting to ensure our UK maritime sector strengthens its position as a global leader in the coming years, join with me in our endeavour.

A handwritten signature in blue ink, appearing to read 'N Ghani', written in a cursive style.

**Nusrat Ghani**  
Minister for Maritime



# Introduction

The UK is one of the world's leading maritime nations. Its status is built upon a remarkable historical foundation, our geography, and a large and vibrant economy. But leading maritime nations only hold that position because they adapt and plan for the future. So, the UK is looking far ahead, to allow us to support and grow the maritime sector with strength and determination. This is a maritime strategy to take the UK into the second half of the 21st century.

The maritime sector has played a critical role for centuries in the growth and development of the UK as a primary facilitator of global trade. Our highly successful commercial ports have constantly evolved, investing billions in their operations to ensure they remain at the fore of new patterns of trade. Today we rely on the sector not only for the import and export of goods, but also the value the wider maritime sector brings to our economy through the likes of businesses services. Its absence would be quickly felt.

The government and the maritime industry are clear that maritime has an integral role to play in the future of the UK. The government has not taken a strategic look at the future of the maritime sector

for many years. The need to do so was identified in the 2015 Maritime Growth Study (MGS), which recommended the development of a national strategy for the maritime sector “which could send a strong signal to international customers and competitors.

As the UK looks to reframe its relationship with the world, the time is right to set our vision for the future of the maritime sector. We are confident the maritime sector will thrive and strengthen, as it harnesses the opportunities that EU exit brings. We are working with countries across the world to explore the best ways to develop our current trade and investment relationships and ensure that Britain becomes a global leader in free trade upon departure. We also want a positive future relationship with our European neighbours, encompassing both economic and security cooperation, working in the interests of all.

Although maritime is largely a reserved policy responsibility in the UK there are some key interests in the devolved areas, with wide involvement in seafaring and coastal industries. Devolved administrations have some direct responsibility for areas such as ports, which themselves have a huge local and regional impact on the economy. The strategy

recognises these interests by building on the strong partnerships between UK government and the devolved administrations.

Maritime 2050 is intentionally ambitious. If we do not set the ambition high, we risk limited progress. Maritime is truly global and will move where business is best. Therefore, we must maintain and improve our offering. Maritime 2050 is a recognition that our maritime future will not look like our maritime past. While we will not be world-leaders across the entirety of the sector, the expertise we have honed over generations will allow us to lead in certain areas such as technological and environmental innovation, and in high quality maritime business services.



# Maritime 2050 values and ambitions

Underpinning our work is a set of five **core values** for UK maritime:

- 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

These values are enduring and distinctive core beliefs that guide the activities and goals of this strategy. They establish why we do what we do and what we stand for. They will be crucial in influencing the attitudes and behaviours of all those involved, as we develop the capabilities and capacity to meet future challenges and opportunities within the sector.

Our strategy coalesces around a set of 10 **core strategic ambitions**.

These ambitions provide, in their simplest form, our bold and aspirational objectives as we head towards and beyond the second half of the 21st century.

## Maritime 2050 Strategic Ambitions

The UK will...

- 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 in taking action 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 small and medium enterprises (SMEs) and global companies.
- Continue to be recognised as the global leader in **maritime safety and security** standards and expertise worldwide.
- Grow our **maritime workforce and transform their diversity** enhancing our reputation as the world leader in the provision of maritime education and training.
- Promote a **liberalised trading regime** that delivers maximum benefit for our maritime sector.
- Support the continued multi-billion pound commercial investment in **maritime infrastructure** that makes the UK a globally attractive destination for all maritime business.
- Strengthen and enhance our reputation as a **leading country in the International Maritime Organization (IMO), International Labour Organization (ILO) and all international fora** working with like-minded countries to take action.
- 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 (LISW) maintaining its status as the leading global maritime event.

Maritime 2050 is built on seven high level themes: the UK's competitive advantage, environment, infrastructure, people, security, technology and trade. The themes were chosen because we see them as being of fundamental importance throughout the life of the strategy. These have been further divided into sub-themes which seek to capture a greater level of detail, including on issues which are fundamentally important to the UK, such as safety, where we seek to lead the way.

In each thematic chapter there are recommendations which seek to set out our short, medium and long term priorities. Some are for government, some are for the UK maritime sector which includes our social partners, and an overwhelming majority will only be achieved through collective endeavour.

This executive summary provides an overview of each of the seven themes with comprehensive detail set out in the full report available at [www.gov.uk/government/organisations/department-for-transport](http://www.gov.uk/government/organisations/department-for-transport).

This strategy is of course only a starting point and must evolve in the future, as we respond to future challenges and change. A series of route maps are being published that will clearly define the steps we expect to take over the next ten, twenty and thirty years to deliver on our ambitions. Two are published alongside this report, covering Trade and Technology and Innovation focussing specifically on maritime autonomy as a case study.



# Development of the strategy

Maritime 2050 builds upon an extensive body of work already dedicated to the role of the maritime sector in the UK. It sits alongside other government strategies and is supported by specific sectoral plans. It has been developed through an extensive programme of stakeholder engagement and

consultation. The appointment of an independent panel of academics, industry leaders, maritime business services providers and promotional bodies – the Maritime 2050 Expert Panel – provided challenge to government and review throughout the development of this strategy.

## Implementation

Maritime 2050 will only succeed if steps are taken to achieve the vision it sets out. We are clear that achieving these ambitions is not for government or industry alone and that a continued partnership is crucial. We recognise that change will come rapidly in some areas, and incrementally in others, that some steps can be taken quickly while for others the path needs to be paved. That is why the recommendations have been identified across the

short (up to 5 years), medium (5 to 15 years) and long term (15 years and beyond). Delivery of the vision and recommendations in Maritime 2050 will be supported by a series of thematic route maps. These will set out in greater detail what steps government and industry will take now and in the coming years to achieve the ambitions of Maritime 2050. Through the route maps, we will review the actions being taken at an appropriate time.

*Photo courtesy of Maritime UK*



# Maritime today

For the sector to move forward, we must understand its current position. Today, the global maritime sector remains a key enabler of international trade. Indeed, international trade at current levels is only possible thanks to the maritime sector. Other transport modes have reached the practical limits of scale, yet maritime container ships continue to respond to economic forces, having more than doubled in size within a generation. That said, the maritime sector has not been immune to recent global economic recessions and a decline in global trade significantly damages the shipping sector. The financial crisis which began in 2008 has had a prolonged and adverse impact on the maritime sector with a great decline in some traditional forms of finance. Yet the importance of maritime in moving goods and commodities around the globe persists.

The UK no longer enjoys the unprecedented global pre-eminence it once did, yet it continues to be a significant maritime power. This position is not static or stable and while the country solidified its maritime power over centuries, others have quickly risen to capitalise on geographic location or the ability to compete on price and incentives. Taking the right action now means the UK is well-placed to take a leading role in the new global maritime industry.

The shipping industry is a critical element in the UK economy. Around 95% of British imports and exports in goods are moved by sea, including 25% of the UK's energy supply, and 48% of the country's food supplies. Reliable and timely importation is therefore fundamental to the UK's national security. Maritime

In 2015, the UK maritime sector directly contributed:

**£14.5 billion GVA**

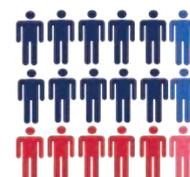
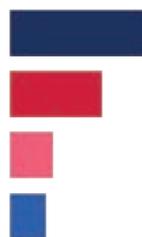
**186,000 jobs**

Marine £6.4bn

Shipping £4.3bn

Maritime Business Services £2.0bn

Ports £1.7bn



Marine  
Ports  
Shipping  
Maritime Business Services

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:

**£37.4 billion GVA**

**957,000 jobs**

Source: The economic contribution of the UK maritime sector, CEBR

business services directly contribute £2 billion gross value added (GVA) to the UK economy. When impacts on the wider economy are accounted for, including the rest of the maritime sector, this rises to nearly £5 billion. The City of London is a global leader in this area; the largest share of worldwide marine insurance premiums and shipbroking transactions occur in the UK, comprising 35% and 26% of the global market respectively.

In addition to trade in goods, the UK enjoys a globally significant maritime tourism and leisure industry. Total revenue from the UK's leisure, superyacht and small commercial marine industry was put at £3.12 billion in 2017 with export success counting for just over 30% of the sector's total revenue. Our cruise sector is an exciting and fast growing one with 1.96 million cruises sold in the UK in 2017, half of which started at a British port.

The UK has played a leading role, through the IMO, in

securing agreement to the target of a 50% greenhouse gas (GHG) emission reduction from the sector by 2050.

Investment in maritime infrastructure, aimed at promoting the uptake of carbon neutral fuels and the generation of renewable energy such as using biomass or rotor sails, highlight the UK's commitment to environmental goals and the leading role business can play in achieving these.

Macro issues such as the use of data and digitalisation will shape the future of the sector which is why technology is at the heart of this strategy. The UK has a long history of innovation and invention; the light bulb, the telephone, the World Wide Web, the television, and the jet engine are all British born creations. This rich history continues - several British companies are producing early-stage autonomous vessels, such as the SEA-KIT unmanned vessel. The UK maritime sector has a wide range of innovative and ambitious SMEs bringing new products to market that

will improve performance and enable better business led decisions to be taken by the global maritime sector.

Fundamental to our success is our maritime people, their education and training with world-class universities and institutes providing top-level training for people within the maritime industry. The UK is a world leader in this regard. Moreover, it acts as an important source of thought leadership, setting the benchmark for the promotion of industry standards in safety, regulation, and seafarer welfare. The UK recognises that the statistic that just 4% of the 10,480 UK certified officers active at sea are female, a figure which is poorer still globally. The UK is actively working Maritime UK and specifically the Women in Maritime Task Force to address this imbalance. This should be a start on a much wider focus on determining the reasons why there is a lack of diversity and implementing policies to attract the best and most diverse talent to the sector both on shore and at sea.



Photo courtesy of Hushcraft

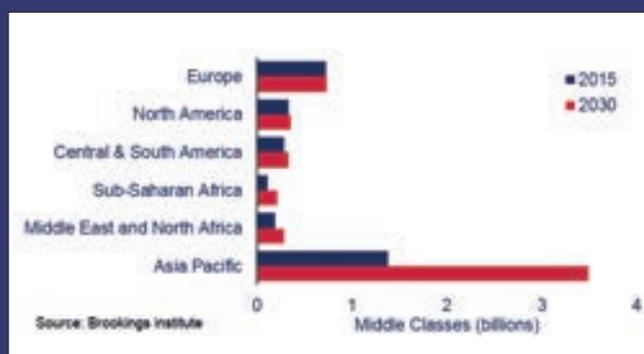
# Maritime trends

To a greater degree than any other transport sector, maritime is affected by global trends. Attempting to understand the impact of these trends will help the UK sector plan for its place in the global maritime industry and factor in the inherent uncertainty of what the world will look like in 2050.

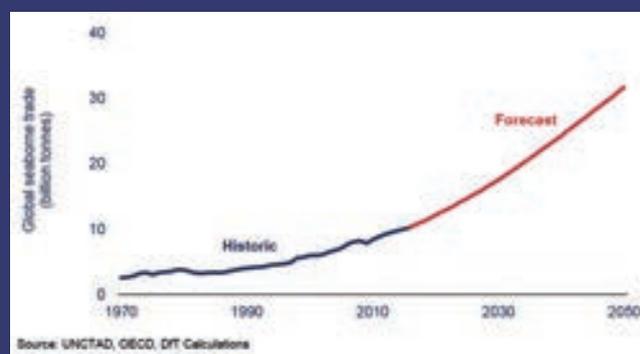
## Key trends influencing the direction of Maritime 2050 include:

- **A long term growth in seaborne trade.** The volume of goods transported by ships and demand for associated maritime services has grown steadily and there is no sign of significant change.
- Maritime is significantly affected by the **changing shape of world population**. Developing countries will see the greatest growth potentially shifting trading patterns and demands for imports and exports. The UK's population and relative importance to other major European countries is expected to increase.
- **Ageing populations** may also influence a decline in some demand whilst creating challenges for the UK workforce both in terms of skillset and fulfilling vital roles in the wider logistics supply chain.
- **The shift in the world economy** eastwards and new emerging markets will have a significant impact on the maritime sector.
- With a potential **shift in political power bases** there could be a change in rules-based discussions in the IMO and other international fora.
- New **disruptive technologies** are likely to emerge and change the maritime sector in ways we may not yet anticipate, including in the areas of artificial intelligence (AI), blockchain and digitisation.
- **Climate change and significant climatic events** will have an impact both on the resilience of the maritime sector and changing patterns of trade whilst also amplifying the need to act to protect the marine ecosystem and environment.

Growth of the global middle class



Projections of global seaborne trade





# UK competitive advantage

The government working in close collaboration with the maritime sector will identify and take the action needed to retain its competitive advantage as a leading maritime nation. Our vision for the UK is to be viewed globally as a top tier place to do maritime business with a number of established strengths and new opportunities to seize.

Several of our top Maritime 2050 ambitions are covered in this theme. The UK recognises the importance of being a global leader in the IMO and other international fora to take forward our policy and regulatory ambitions and to bring our thought leadership to bear.

## Fiscal competitiveness

This section recognises the importance of the UK being viewed globally as a great place to do business and to do it with ease. It also recognises the importance of ship owners, managers and operators to the UK. The City of London and our world leading maritime professional services are highlighted here and their unparalleled expertise in law, arbitration, shipbroking, financial services and consultancy. The section explores the action that will be needed, and is being taken by the government in close

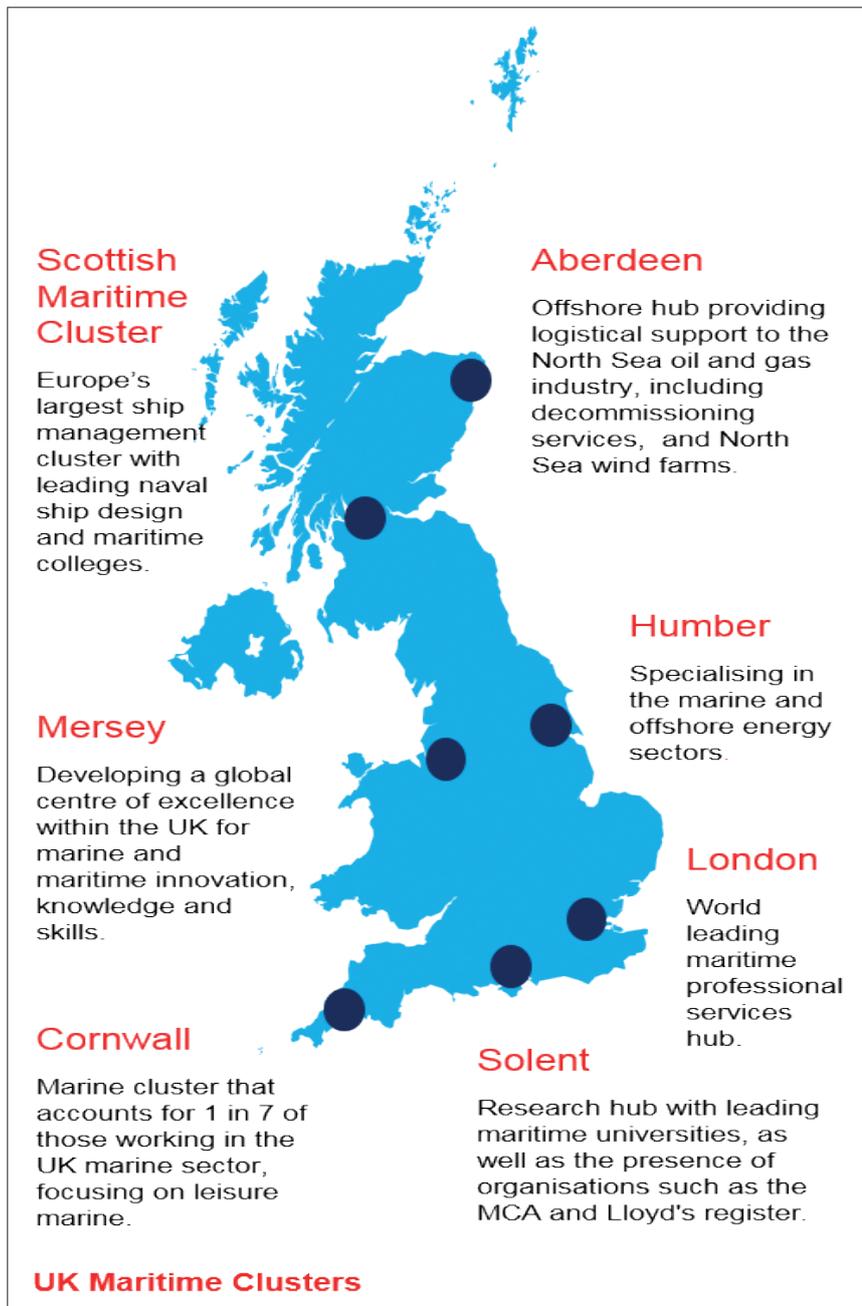
collaboration with the sector, to remain fiscally attractive to the global shipping and maritime community.

## The UK's maritime cluster

This section explores the wider power of our maritime clusters in London and throughout the UK. This is seen to have a significant impact on the regional and national economy and on our international attractiveness. Close collaboration in clusters of industry and academia working with government, creates dynamic and innovative synergies. These attract highly skilled and ambitious people, thereby bringing economic opportunities to the global maritime sector.

## Thought leadership

The UK's thought leadership fosters a dynamic and innovative maritime industry. Moreover, it is demonstrated through negotiations at the IMO and other international fora. This section explores how we translate UK pioneering research and thought leadership into tangible benefits. Attracting the best intellectual talent to the UK, continued support for our universities and hosting renowned international academic conferences play



### Strong partnership

Ever closer collaboration between the government and the UK maritime sector is seen as fundamental to our competitive advantage. The creation of an increasingly influential Maritime UK has brought a more powerful single voice representing the maritime sector. Maritime UK is able to engage government at the highest levels by demonstrating its global success, and setting out what it needs for the future to enhance our attractiveness to the international maritime community. The merits of a deep and extensive collaborative relationship between government and the sector is recognised as fundamental to future collective success. Government ministers and parliamentarians across parties have never been more cognisant of the importance of the sector to the UK.

### A modern approach to UK regulation

To be able to deliver on our ambitions for Maritime 2050 the need to have an appropriate and forward looking domestic legislative regime in place is crucial. This sub-theme makes the case for a new framework and a constant evaluation and evolution of the existing regime and its application. The essential role of one of government's leading maritime agencies, the Maritime and Coastguard Agency (MCA), is set out in



a key part. Beyond research, tighter partnership between the maritime industry, academia and government will maximise transfer of knowledge, and our commitment to retain the IMO in London will consolidate our position as a global thought leader. Creating a blue print for future collaboration with leaders in the maritime educational and training sector will help the UK make the most of future actions.

this theme. The sub-theme also explores the future of registration and the value and importance that we attach to the UK Ship Register (UKSR). It sets out very clearly that the UK seeks to offer a premium level of service that matches modern expectations but remains uncompromising on core values particularly in quality and safety.

## Safety

The importance that the UK attaches to a safe maritime sector is set out in this sub-theme and is vital to our future. There is recognition that globally, maritime safety standards are poor with fatal accident rates in the merchant shipping fleet high, particularly in sectors like fishing. This section explores the steps that are being taken and need to be pursued during the implementation of Maritime 2050.



## UK flag

Global recognition of the UKSR as a quality brand, and having the capability and flexibility to be at the forefront of world shipping, is the vision for 2050.

Capitalising on innovation and the customer experience will be key parts to any future changes. Targeted promotion

of the UK offer along with ongoing review to ensure the service remains in a leading position are envisaged. Longer term, horizon scanning and government support through the MCA will help support growth.





## Headline UK competitive advantage recommendations

- **Government and industry to work together to maintain and enhance the attractiveness of the UK's regional maritime clusters and London** as a global maritime professional services cluster.
- To ensure that the most innovative companies and ideas are brought to market for the benefit of UK maritime, government will **explore further opportunities to continue to support maritime innovation.**
- The UK, as host of the IMO, will seek to **maximise our leadership role in the organisation.**
- Government will develop **proposals for a new Merchant Shipping Act 1995, in the next 5 years.**

# Technology

Future changes in technology will change the way in which the maritime sector operates, driving performance enhancements and creating opportunities for maritime businesses to take better decisions. Big data analytics, digitalisation and more advanced communications will lead to better connectivity, efficiency gains and cost savings but also present risks to business continuity such as through cyber-attack. This section sets out the UK's ambition to utilise advancements and changes in maritime technology to make the sector a cleaner, safer and more efficient place to work with the creation of highly skilled job opportunities at sea and on shore.

## Future of shipping

The UK is determined to be world leading in the design, manufacture, uptake, and use of smart shipping technologies. To achieve this, we will develop a UK legislative framework for autonomous vessels and lead efforts to establish an international regulatory framework. We will support industry in developing and testing new technologies by funding flagship projects, and learning from other sectors like the automotive industry. The UK will be a vibrant hub of research

and development. Shipping companies will benefit from a highly competitive register for technologically advanced and autonomous vessels.

## Smart ports

As critical maritime and logistics infrastructure, ports will form part of an advanced and integrated supply chain by 2050. By pioneering new business models and realising the benefits of new digital and automated processes they will maximise throughput of goods with seamless onward connections, while continuing to act as a gateway for passengers into and out of the UK. Small port developments will be led by industry with government support. Joint competitions to develop existing technologies, test new ideas, combined with the establishment of a cross-sector innovation hub at a UK port by 2030, will encourage innovation and the adoption of these technologies. Building on this expertise to further develop a network of regional R&D clusters will benefit local economies into the future.

## Digitalisation

Digitalisation is crucial to the future of maritime. Replacing paper-based processes and transactions will increase operational and cost efficiency for shipping. Digital documentation for seafarers will reduce the burdens on businesses and individuals, when checking required training and certification. The benefits of new technologies such as distributed ledgers (e.g. blockchain) will be identified along with government's role in supporting and developing their use. UK will lead efforts to set international standards at the IMO and ensure interoperability of systems. Agile UK regulation will allow transparency, competition, and improved efficiency while enabling secure and easy-to-use systems that attract business to the UK flag. By 2050, we anticipate globally harmonised standards governing a transparent data-driven 'digital by default' UK maritime space.

## Communication, navigation, and exploration

In future years increasing demands are expected on maritime communications and infrastructure, from the development of remotely operated vessels to the need for increased satellite coverage of remote areas like the Arctic. Understanding the potential for 'Future Navigation', what information the sector requires and UK

capabilities to provide it will be key to maximising the UK's opportunities. By linking existing UK space manufacturing and R&D capabilities to the maritime sector, cross-sector potential will be unlocked. Mapping the UK's own seabed and Exclusive Economic Zone

(EEZ) – the fifth largest in the world – could realise potential economic benefits. Building on expertise gained from mapping UK waters, we anticipate leading a coalition of like-minded nations to substantively map all international waters.



## Headline technology recommendations

- **The UK will legislate for a domestic framework for autonomous vessels** to attract international business and allow testing in UK's territorial waters.
- **Government will work with industry to develop a 'Maritime Innovation Hub'** in a UK port as a result of an open competitive process. The hub will bring together expertise, support technology development, and boost regional productivity.
- **UK will be at the forefront of international efforts to chart the international seabed area**, helping us to understand how to sustainably manage and benefit from the global ocean environment and creating exportable hard technology and soft skills.

*Photo courtesy of Rolls Royce*



# People

The UK's vision for 2050 is a diverse and rewarded workforce with a focus on good maritime welfare that will set a global benchmark for the sector. Inspiring young people to pursue maritime careers and maintaining our world leading training offer in maritime colleges and universities will allow the UK to deliver high quality skills. Future UK seafarers will be expected to transition easily between sea and shore-based roles, using transferable IT based skills, and continuing professional development that allows them to update skills in line with technological advances. Increasingly maritime roles will likely have highly specialised elements and where science, technology, engineering, and mathematics (STEM) skills will come to the fore.

## Maritime workforce

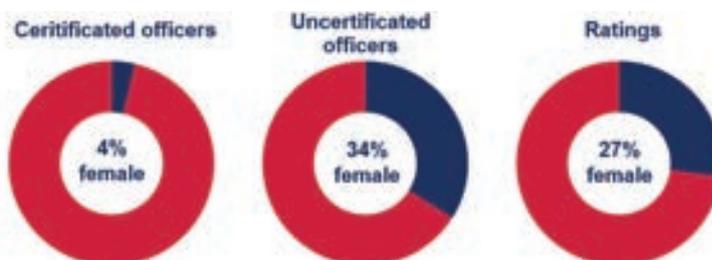
Embracing change and greater harmonisation of standards with other sectors will ensure that the UK maritime offer for skills and training remains competitive.

Aligning ratings training and apprenticeships with industry needs will help boost the number of UK seafarers. Mapping out the variety of career paths including from sea to shore, will help attract the right talent. Increased awareness in schools and taking maritime to the younger generation in a less formal way such as scouts, guides or local sea cadets could reinvigorate the image and appeal of the sector. Future reviews of the UK tonnage tax regime, including considering the training element and exploring greater potential for linkages between the Royal and Merchant Navies to showcase transferable skills, would support our maritime workforce ambitions.

## Diversity

A limited talent pool has the knock-on impact of limiting important wider skills and risks industry not meeting its full economic potential through a lack of diversity. Building on joint government and industry initiatives like the Women in Maritime

### Gender distribution of UK seafarers active at sea, 2018



Source : DFT seafarer statistics

Photo courtesy of Trinity House

Taskforce will be crucial to achieving greater gender balance. Looking to 2050, consideration of diversity as a whole, not just how it relates to women, will be one of the challenges facing the sector. Promoting a maritime culture that encompasses diversity in its broadest sense, will reap wide ranging benefits.



### Maritime skills and promotion

The skills profile of the maritime sector will change significantly over the next 30 years. The importance of STEM subjects will increase as jobs become more skilled and data driven in response to new technology. Industry roles will be multidisciplinary, potentially requiring the ability to create, operate and maintain autonomous and technological systems. There is an opportunity to build on the UK's existing advantage, developing and expanding our high-quality training programmes to meet new requirements, exploring ways to bolster our offer at home and abroad. Upskilling our

workforce to take advantage of emerging technologies such as robotics and artificial intelligence, the agility to adapt training packages in a timely way and regular review of our skills needs will allow the UK to capitalise on its skilled workforce.

### Continuous education and training

Workforce skills will need to keep pace with technological change as it continues into future years. Without continuous learning the

industry risks increased costs from high staff turnover, and individuals could suffer in terms of career progression. Mapping career paths and building professional development into training programmes will allow a proactive approach to career planning and support cross-sector mobility. Better internet connectivity at sea would remove an existing obstacle to lifelong learning, while the application of technologies such as virtual reality could facilitate retraining in new systems as well as potentially change the way

### Engineering and STEM take-up

#### Engineering graduates in UK

Projected annual demand

**101,000**

Projected annual supply

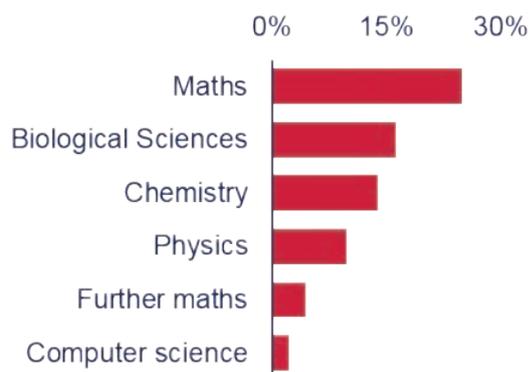
**81,000**

Shortfall

**20,000**

Source: EngineeringUK

#### Take-up of STEM subjects by A level students (England, 2016/17)



Source: Department for Education

in which traditional training programmes are delivered.

## The human in the face of technological change

Seafarers suffer a high incidence of mental health conditions, primarily due to the pressures, nature and isolation of working at sea. Changing technology could be utilised to improve sea connectivity. The UK has the opportunity to lead the way in considering the mental health of seafarers and the wider maritime workforce. We would look to develop the concept of a UK social framework, working collaboratively with industry and our social partners to set expectations for the welfare of the UK maritime workforce, while simultaneously leading the push for better standards internationally including a limit on hours per shift to combat seafarer fatigue and eradicating modern day slavery.



## Headline people recommendations

- **Government will fund the production of the 'people like me' maritime industry project** to help address the image and perception of the industry and demonstrate how we can effectively showcase its value to a wider diversity of people.
- **Government aims to establish a Maritime Skills Commission** bringing existing leading maritime skills experts together, to report on the existing and future skills needs of the industry on a 5-yearly cycle, to inform the maritime training curriculum and keep it up to date with the evolving needs of the sector.
- **UK will develop cutting edge seafarer training** maximising the use of future technologies such as virtual reality and augmented reality.

*Photo courtesy of Maritime and Coastguard Agency (MCA)*



Photo courtesy of Wightlink  
Isle of Wight Ferries

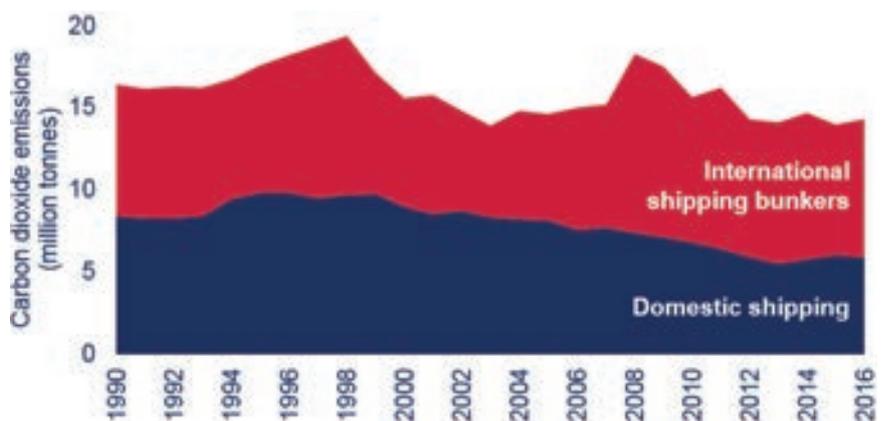
# Environment

The scale of goods and people moving around the world is greater than ever before.

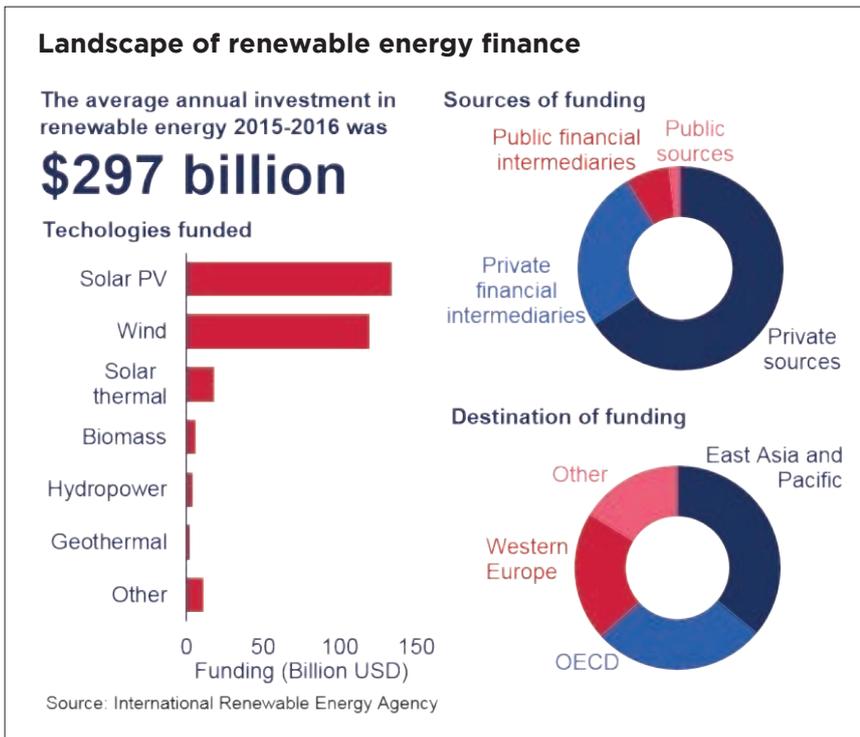
As evidence mounts for the need to act with urgency to address climate change, it is clear a global transition to a cleaner and greener maritime sector is underway. The UK can use its strengths in areas such as maritime technology and finance, to help deliver its environmental goals and international environment commitments, including the UN Sustainable Development Goals. The vision is for an environmentally sustainable sector, reducing impacts as close to zero as possible, while leading the way on green finance and setting international standards. Collaborative working with industry and academia will help identify innovative technological solutions and maximise the economic benefits to the UK economy.

Air pollution is a significant risk to human health in the UK, and as the volume of global trade increases shipping may represent a growing source of GHGs. Regulation has historically been predominantly at the international level with important milestones in recent years such as the introduction of the North Sea Emission Control Area (ECA), the agreement of a global sulphur cap to be implemented by 2020 and the adoption in 2018 of the Initial IMO Strategy on reducing GHG emissions from ships by at least 50% by 2050. These and other developments are sending a strong signal to the sector of the need for a global transition to zero emission shipping.

Source of UK shipping carbon dioxide emissions 1990–2016



Source: UK greenhouse gas emissions statistics, BEIS



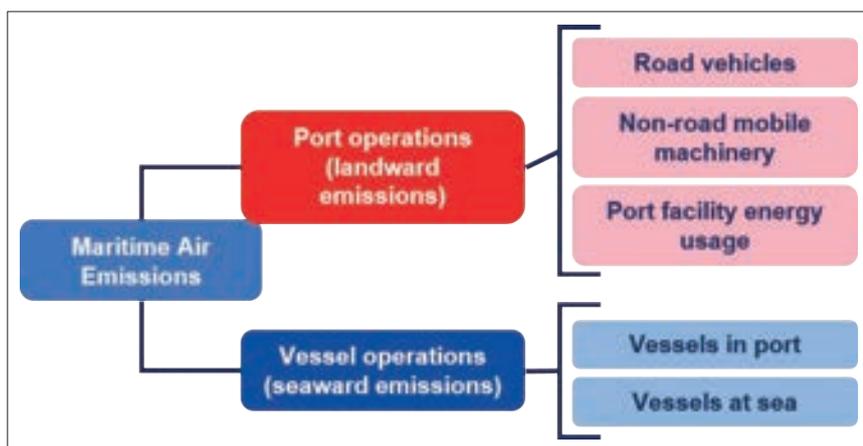
By 2050, the UK will actively drive the transition to zero emission shipping in its waters, moving faster than competitor countries and international standards to capitalise on economic benefits and be seen as a role model in the field. Close collaboration between industry, government and different parts of the supply chain, will enable lessons to be learned from other sectors, ensuring new regulation is appropriate and helping maritime companies

realise the benefits of research and investment. Ultimately this will lead to the development and swift uptake of clean technologies.

### Minimising wider environmental impacts

Maritime 2050 is concerned with the impact on the marine and the immediate coastal environment. In thirty years, the UK maritime sector will have negligible wider

### Sources of maritime air pollution



environmental impacts, with minimisation integrated into the full ship life cycle from design and construction to operation. The UK's leadership role at the IMO will ensure proportionate global regulation that also enables us to meet high standards domestically. The government will favour an outcome-based approach to environmental legislation where possible. Continued support for the Hong Kong Convention (HKC) will improve standards of ship recycling facilities world-wide. The application of new technologies such as sensors for monitoring compliance with environmental standards will improve enforcement processes, giving greater assurance to the public. The interplay between rate of uptake, cost and unintended consequences will be fully considered when developing and implementing new technology.

### Adapting successfully to the impacts of climate change

The maritime sector needs to prepare for the uncertain effects of climate change. Increased flooding of ports from tidal surges, more frequent extreme weather events and coastal erosion are predicted. The flow of goods into and out of the UK as well as connectivity to road and rail infrastructure is therefore at risk of disruption in the coming years. In order to adapt successfully to evolving climate change risks there must be continuing collaboration between industry and agencies like the

Environment Agency (EA) and Met Office, supported by government assessment of risks and opportunities. As private entities, ports have a responsibility to plan and respond to their unique vulnerabilities and improve resilience of their estates. In recognition of the potential opportunities presented by opening Arctic trade routes, the government is committed to putting the environment at the centre of maritime trade route discussions.

### Achieving our goals through continued international leadership

The UK already has strong influence at a number of global fora such as the IMO, and is a leader in the field of international maritime environmental diplomacy. Globally, economic benefits associated with the increasing importance of the blue economy will generate renewed interest in environmental regulation as we move towards 2050. Over this timeframe, the UK will maintain its leading role, ensuring the global sector plays its part in meeting climate change, air quality and wider environmental goals, using its influence or 'soft power' to shape an international regulatory framework aligned with our interests.



### Headline environment recommendations

- **Government will assess how economic instruments could support the transition to zero emission shipping** in the medium to long term.
- In line with the Industrial Strategy, **government aims to launch a number of “zero-emission shipping ambitions”** in the Clean Maritime Plan.
- **Government will consider the merits of introducing a medium term target for emissions of GHGs and air quality pollutants from UK shipping.** Further detail on this consideration will be set out in the Clean Maritime Plan.



# Trade

Trade is fundamental to the UK maritime sector, which when taking wider impacts into account, supports almost 1 million jobs and contributes around £40bn to UK gross domestic product (GDP). The maritime sector both enables our global trading ambitions, being fundamental to our export success, and is a significant trading sector in its own right. This theme also explores in more detail the steps we need to take to maintain and enhance our maritime professional services success in the face of competition.

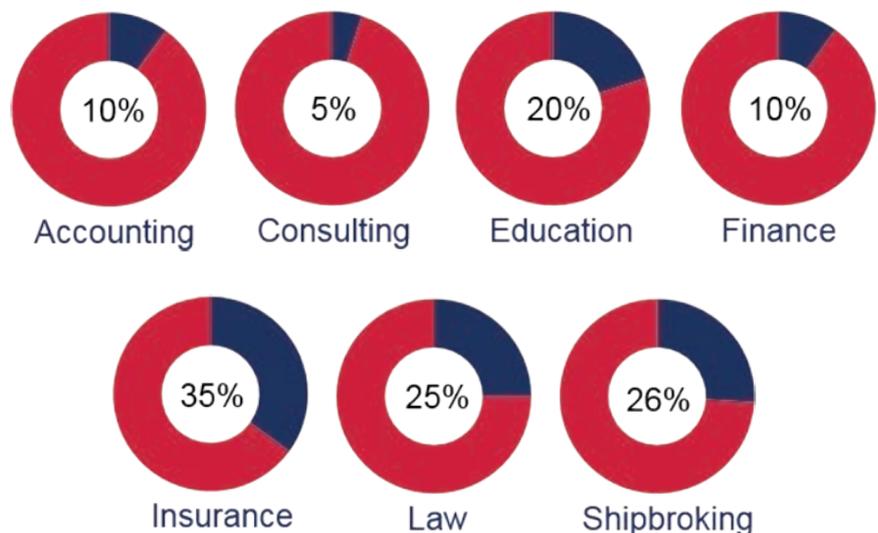
As one of our core Maritime 2050 ambitions, the pursuit of a liberalised global trading regime will have a direct impact on the maritime sector which stands to benefit from increases in trade and frictionless trade flows.

Government is committed to working with UK businesses to make trade easier, to remove barriers – whether regulatory, legislative or financial – and to unlock the potential of international exports. We envisage leveraging the UK’s experience and reputation to take advantage of opportunities as they arise between now and 2050.

## Supply and demand

The principle of supply and demand underpins global trade, and the goods we import and export are constantly changing. The UK will need to match the demand in the global maritime sector or risk losses in tax, revenue, employment and GDP. Government has already started consulting on where it should focus efforts in terms

### UK global market shares in major maritime service sectors

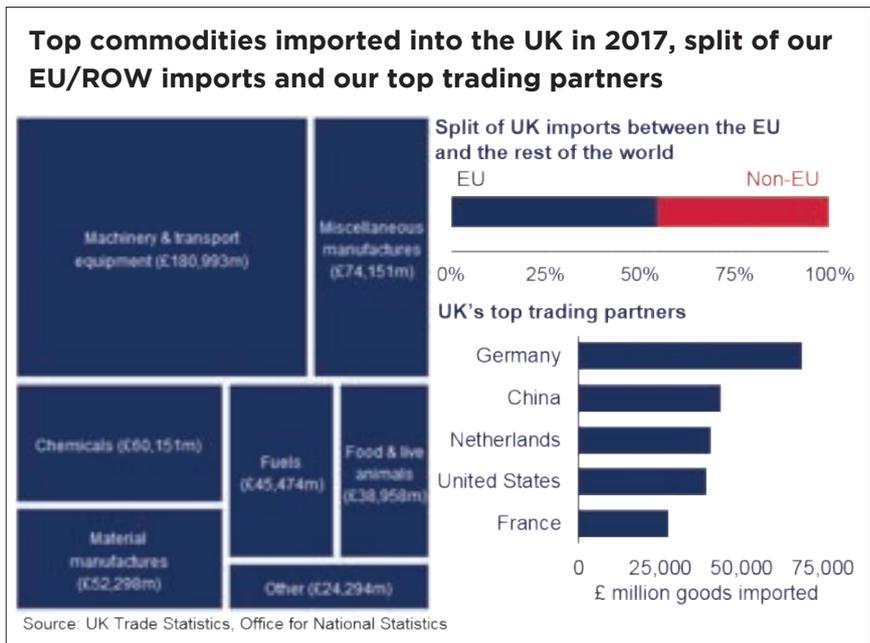


of future trade agreements and will complement this by continuing to connect industry to overseas markets and customers.

Trade is driven by many factors, including the geo-political situation, transport and production costs, seasonal commodity cycles and external shocks such as war or natural disaster. These are difficult to predict but we can prepare for changes by leading the way in innovation and capitalising on commercial opportunities as they arise worldwide. Our position as world leader in the provision of maritime services is strong and should be capitalised on, in conjunction with marine engineering, technology and innovation and marine science.

### Global rules-based trading framework

UK trade operates within a global rules-based framework, to date under the auspices of the European Community and the European Union. Following EU exit we will be able to sign bespoke trade deals and align trade policy



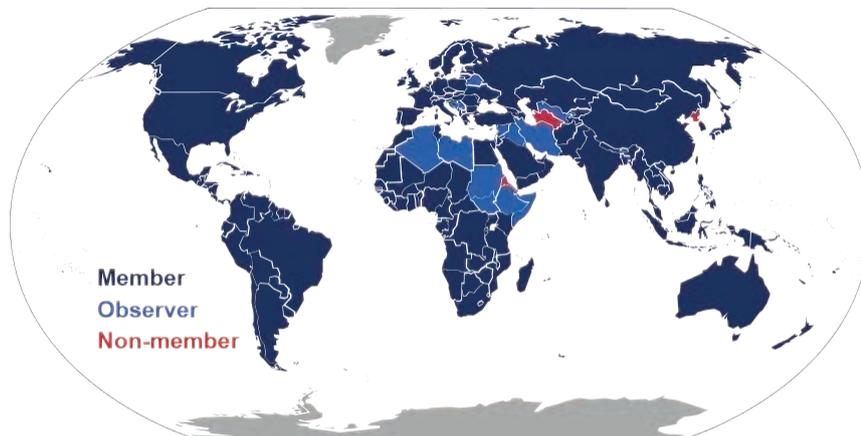
with national economic interests. Regaining our independence at international fora such as the World Trade Organization (WTO) will allow us to intensify current support for the rules-based system, maximise our influence on shaping the future of the sector and its role in facilitating global trade. Multilateral and bilateral agreements will be used to grow the UK economy and maintain the sector's competitive advantage at a global level. Beyond this, MoUs, bilateral treaties and international engagement

by Ministers are additional approaches we can use to unblock barriers and facilitate trade.

### Competition in a globalised world

Competition in the maritime sector is increasing. The UK must ensure it provides an attractive business environment and offer a competitive package of measures to attract inward investment. The aspiration for London and the UK to remain a world leader of maritime professional services will be achieved through industry and government working in partnership, while focussing on their respective areas of expertise. Online trading platforms, digital transactions and technologies like blockchain are likely to significantly impact the sector and must be harnessed to the UK's benefit. And in other areas, developing new innovative customs arrangements is an example of

### Current WTO members and observers negotiating accession



an area that could be used to encourage investment in the UK's ports and manufacturing hubs, supported as necessary by evidence collected from industry.

## New technology and future modes of transportation

A complete shift towards a new mode of transport such as hyperloop is probably unlikely by 2050, however increased investment and technological advances could make maritime and other transport modes more competitive. More fundamentally, it could profoundly influence the interconnectivity of transport modes.

Technology has the potential to alter trade patterns and demand for goods e.g. 3D printing, as well as affecting the flow of trade by facilitating cheaper or easier access to Arctic routes opened up by climate change and ensuring such routes are used in a sustainable manner. An agile UK maritime sector will be able to seize commercial opportunities arising through technology adoption and enhance its competitiveness. Moreover, the UK must integrate thinking on developing technologies into future trade agreements.

## Trade promotion

The government is already progressing a five-year implementation strategy in collaboration with Maritime UK, to coordinate international promotional activity and

identify how it can best add value. The Department for International Trade (DIT) is looking more closely at developing emerging areas – autonomous vessels, marine science and decarbonisation amongst others – and the GREAT brand will develop supporting material for a high-impact maritime campaign. There is scope for

more targeted promotional events internationally where a value for money case can be demonstrated that contributes to the UK's trade ambitions. Better coordination and a whole of government approach is anticipated to prospect for and develop opportunities into future years.



## Headline trade recommendations

- Government will work with the maritime services industry, **to commission and deliver a study into the competitiveness of the sector.**
- Government will engage with the ports and the manufacturing industry to **consider the case for free ports in the UK.**
- **Government will collaborate closely with industry to increase UK exports as a proportion of the UK's GDP from 30% to 35%**, supporting the maritime sector in its role as a key facilitator of trade.



# Infrastructure

Maritime and marine infrastructure varies enormously from vessels and physical structures at ports, to the supply chain and logistics moving freight around, to name a few. The 2050 vision is an agile sector, open to change as technology develops and adoption speeds up, matching levels in comparable industries.

Autonomy, interconnected smart systems and big data will bring the shipping, cargo handling and inland logistics elements ever closer together, maximising efficiency, reliability and reducing costs.

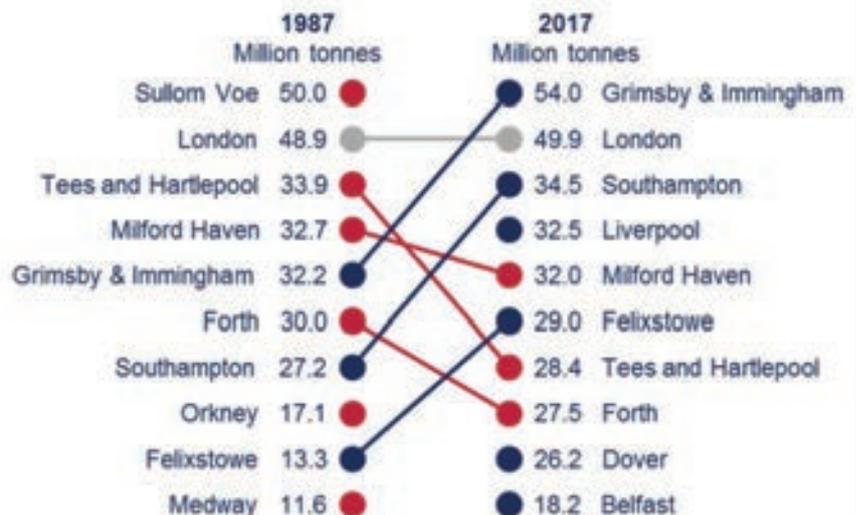
UK maritime infrastructure already pushes the boundaries of economic and technological advancement. However, future proofing to ensure the

interoperability of systems and protection against potential vulnerabilities such as cyber-attack will be key drivers, as will the development of value-added services and new uses for port land. Future trade flows will likely change in line with consumer preferences and the industry must be able to adapt.

## Ports and harbour Infrastructure

Continued investment and planning ahead to future proof or retrofit infrastructure will ensure ports and harbours are ready to adapt to future changes. This includes the ability to react to disruptors such as severe weather events or potential security threats. Aligning decisions

**Top 10 ports by amount of freight**



% of freight handled by top 10 ports: 63% (1987) vs 69% (2017)

Source: Port freight statistics, DfT

with developments in shared technology platforms and solutions with other parts of the logistics sector, will ensure a seamless supply chain. More specialisation in commodities is expected, with fewer ports handling the majority of goods entering and leaving the UK. Diversification into new activities and business models is also anticipated. The government will incentivise innovation, working with ports to support R&D, foster beneficial partnerships with SMEs and create conditions conducive to testing of new technologies. Stronger links will help leverage the maximum benefits from government and industry investments alike.

### Port connectivity, the supply chain and Logistics

Ports will adapt toward full supply chain integration, maximising land use for ancillary activities. Enhanced transparency and use of real time data will increase

operational efficiencies, while pioneering cutting edge technologies such as 3D printing. Keeping pace with the adoption of technologies in connected sectors, and engaging with manufacturers and technology companies to capitalise on opportunities for value-added services will be crucial. New transport modes and models of use such as drones, autonomous vehicles, platooning of trucks and their impact on the distribution of freight, will need to be incorporated into investment programmes. As evidenced by the 2018 Port Connectivity Study (PCS), positive impacts for ports and the wider economy can be realised through investment to improve hinterland access. The sharing of information and closer links between ports and infrastructure delivery bodies will support systems integration. Coastal and short-sea shipping could potentially support land-based modes, reducing emissions and congestion and government will explore the feasibility of this option.

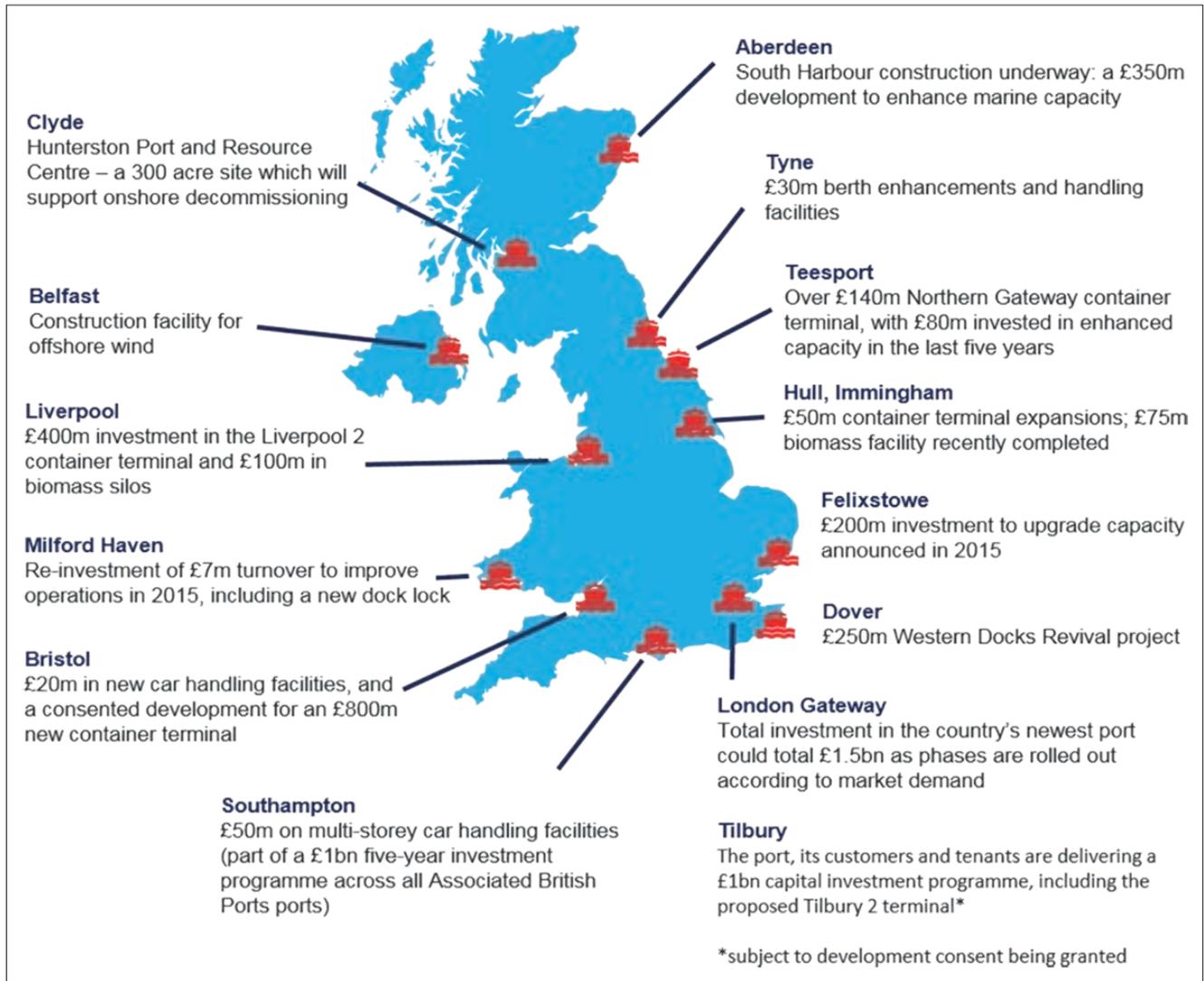
### Sectoral infrastructure

The maritime sector directly supports sectoral infrastructure such as renewable energy, marine aggregates, communications, offshore oil and gas, and the marine and leisure industries. By 2050, the sector will make the most of opportunities associated with a predicted increase in offshore wind generation, playing a key role in UK energy supply and generation, and acting as hubs for trialling and developing new fuelling options. The UK will remain a major cruise centre, with domestic and international ferry passenger services playing an important role.

Continued industry investment will be required to meet this vision but offset by exploiting opportunities such as the growing offshore wind supply chain, the decommissioning of North Sea offshore installations and emerging markets in ancillary and support technologies such as energy storage. Potential government intervention to establish an ultra-deep-water port in the UK could improve capability. Growing data requirements across all areas will lead to increased development of subsea infrastructure and government is committed to being at the forefront of developing the UK's capacity. The growth in 'blue tourism' offers benefits to the marine and leisure sectors (cruises, passenger ferry services).



## Selected examples of recent or planned port investments around around the UK



## Ship building and boat building

As outlined in the National Shipbuilding Strategy, government will work with industry to further develop the UK shipbuilding and maritime engineering industry, building on our global reputation for design, innovation and quality. Developing an enhanced export model while continuing to meet UK military needs is the ambition over the coming decades. Maintaining high quality, specialist skills within the maritime sector and focussing on markets in which the UK can successfully



Photo courtesy of Anthony Morris

compete such as retro fitment fitting of advanced technology post build and fit-out of luxury and leisure vessels will be crucial. As a major exporter of maritime equipment and systems, the UK has a platform on which to develop more advanced technologies, and exploit wider sectoral opportunities e.g. wind and tidal energy and coastal and short-sea shipping.

Closer links with academia, SMEs and maritime colleges will ensure there are the suitably skilled professionals needed for the future. Better use of existing centres of excellence (e.g. National Composite Centre) or development of additional centres if needed, is envisaged. Building on existing successes in the ship and boat building and marine engineering sectors, government will support the industry in developing facilities that maintain the UK's status as a world leader in these areas.

### Shipping in the supply chain

The UK will continue to be a global shipping destination for both international deep-sea cargo movements and more regional short-sea shipping. The adoption of new technology on vessels and port side, incorporating the latest developments in autonomy, new fuels and supply chain logistics is expected through to 2050. The volume of short-sea shipping and movement of

domestic freight between UK ports is likely to increase, potentially becoming a viable alternative to road and rail and boosting opportunities for a wide range of ports. Ports will need to invest to keep pace with technological and environmental advances and vessel types, particularly those involved in short-sea and coastal shipping

markets, to ensure increased competitiveness versus land-based freight modes. While there is some uncertainty, it is likely that vessel size will increase requiring upgrades to physical infrastructure such as dredging, quays and cranes to maintain port effectiveness and ensure the UK continues to attract vessel calls on key global shipping routes.



### Headline infrastructure recommendations

- **Government will implement a targeted programme of Port Economic Partnerships**, for ports meeting specific scheme and success criteria, leveraging the maximum benefits from both government and industry investments.
- **Government will continue to consider the needs of the maritime sector as part of rail and road infrastructure funding** to support the onward transportation of freight and passengers from maritime infrastructure.
- **Government will work with the leisure, superyacht and small commercial marine industry to ensure their needs are factored into the strategic growth agenda for the maritime sector**, in the context of government's Industrial Strategy.



# Security and resilience

Maritime security is without question essential to the UK's national interest. Without the security of our ships, ports and services, our prosperity and resilience are at risk. The sector therefore requires policing and regulation at the national and international levels, the UK is committed to strong global partnerships to enforce these. For the UK maritime sector, its security is about providing business continuity free from interference and disruption.

The security of our maritime domain presents additional challenges compared to those on land, with the UK being one of many nations seeking to deploy diplomatic, military and law enforcement powers. Security threats are constantly evolving and the UK is committed to being at the forefront of anticipating and responding to these. Technological advances offer opportunities yet also present some of the greatest security challenges, for example cyber-attack. We will develop our national expertise, sharing this with international and other sectoral partners in the common interest.

## Security of UK waters - including Overseas Territories

Monitoring and control of UK waters will require an

intelligence led, multiagency response capable of covering a large geographical area that encompasses resources such as offshore energy generation. The UK will maximise its use of developments in automated systems and technology to ensure effective surveillance and continue to support a rules-based international system (RBIS), working closely with NATO and European partners. The UK will be world leading in maritime domain awareness with regular review of the threat landscape and the processes in place to deter and counter threat activity.

## Security and resilience at ports and on ships

Technological advances will drive changes to shipping and port operations in the coming decades. Improved cargo and passenger screening, operational efficiencies and more frequent severe weather events are anticipated. UK trade interests will be protected by leading efforts to develop internationally accepted standards and regulations in line with these changes. Port infrastructure will be susceptible to flooding, risking onward disruption to connected services such as electricity, road and rail. Industry has a role to play in 'investing to protect' at ports and on ships, using innovative

solutions, and government will support this through the provision of information to encourage and enable informed investment.

## Global shipping route security

Global economic power is shifting eastwards and the balance of power may alter. The UK is heavily reliant on imports of food, fuel and other goods which is anticipated to continue to 2050. Preserving freedom of navigation, in particular strategic choke points, will remain a priority. The UK will proactively work to strengthen existing alliances, work collaboratively to monitor contraventions of international agreements like the United Nations (UN) Convention on the Law of the Sea (UNCLOS), deter acts of aggression and mitigate increasing nationalist agendas by supporting rules-based norms.

## Cyber – security of technology

The rate of technological change is likely to make critical national infrastructure increasingly vulnerable to cyber-attack. The UK has committed to lead development of appropriate standards, regulations and guidance in these fields. The onus is on industry to protect themselves and ensure resilience to cyber threats across the supply chain. However, this will be in lockstep with government, who will provide threat and risk assessments, regulation

and guidance to ensure that collectively, the UK is a centre of excellence for the provision of maritime cyber security solutions.

## Terrorism

The global terrorist threat is highly likely to persist to 2050 and beyond. Conflict

zones, failed states and the internet will provide a platform for terrorist activity. This may involve attacks on shipping where areas and groups are in close proximity to shipping lanes. Attack methodologies may change through exploitation of new or emerging technologies e.g. drones, and the UK must

DfT is responsible for regulating security in the UK across

**400+** port facilities

Compliance is monitored by a comprehensive programme of inspections.



In the last year, the Department reacted to a number of incidents ranging from industrial action, hostile cyber activity, severe weather, maritime accidents and migrant activity.

Piracy continues to threaten global shipping, necessitating security mitigations from government and industry. The UK private maritime security industry has developed significant expertise in delivering a range of security solutions to the maritime sector.

**54** incidents in 2017

**4** vessels hijacked



**97** incidents in 2017

**100** crewmembers taken hostage

Piracy figures from <http://oceansbeyondpiracy.org/reports/sop>



## Headline security and resilience recommendations

- **Government will support international efforts to maintain freedom of navigation across shipping routes.** Where nation states ignore rules-based international system norms, or pose threats to the freedom of navigation (such as blocking strategic international chokepoints or making excessive geographic jurisdictional claims) we will affirm the RBIS framework and requirements of international laws.
- **Government will assess the feasibility of undertaking a systems approach to identifying single points of failure for maritime infrastructure** – looking “beyond the fence” to identify interdependencies of connected infrastructure, supply chains and their levels of redundancy.
- **UK will continue to be alive to evolving terrorist threats** – in both their identification and the mitigation options required – working closely with industry to deliver solutions.

*Photo courtesy of the Ministry of Defence*

be alive to evolving threats in its maritime domain, both here and in Overseas Territories. A multi-agency, cross departmental response in close collaboration with international partners and industry is needed, including capacity development in vulnerable countries.

### Maritime crime and piracy

The nature of global maritime trade means it will continue to be exploited by criminal groups, including activities such as smuggling and people

trafficking. More complex, connected systems will present opportunities for interference and theft but conversely, technology may also help monitoring areas of concern worldwide. Conflict, poor economic development and climate change in coming decades may lead to more failed or poorly governed states, increasing conditions conducive to criminal and pirate activity. The UK will continue engagement with foreign partners to improve law enforcement and legislative capability and capacity in

those areas that suffer from organised criminality and piracy. Government will work closely with industry to keep guidance under review and remain responsive to changes in maritime criminal activity.



# Maritime 2050 recommendations

## UK competitive advantage

### Fiscal competitiveness

#### Short term (1-5 years)

- Government and industry to work together to ensure we have the best possible fiscal regime in place, including through taxation and the business environment.
- Government and industry to better promote the existing fiscal regime and to engage directly with both SMEs and international maritime companies.

### The UK's maritime cluster

#### Short term (1-5 years)

- The UK, as host of the IMO, will seek to maximise our leadership role in the organisation.
- Government and industry to work together to maintain and enhance the attractiveness of the UK's regional maritime clusters and London as a global maritime professional services cluster.
- Government will support, enhance and promote the strength of all regional clusters in the UK, and their importance to the economy.

- Strengthen the ties between government, industry, and academia to build on existing cluster success and identify new opportunities.

### Thought leadership

#### Short term (1-5 years)

- Strengthen the UK profile as the place for maritime thought leadership through government and industry hosting top academic maritime conferences and shipping events.
- Maximise our leadership role in the IMO and other international bodies through continued and enhanced thought leadership.
- Invite leading figures from the UK maritime academic sector to work with government, industry and social partners to create a blueprint for future maritime thought leadership collaboration, including cluster success.
- To ensure that the most innovative companies and ideas are brought to market for the benefit of UK maritime, government will explore further opportunities to continue to support maritime innovation.

## Strong partnership

### Short term (1-5 years)

- Government and the maritime sector will put in place the most appropriate mechanisms for the delivery of Maritime 2050 and its route maps.
- Government will continue to support Maritime UK and its international impact.
- Government will seek to increase its direct interaction with UK maritime companies including both SMEs and large globally successful organisations.
- Government and industry will review the governance structures supporting the UK maritime sector and consider potential rationalisation.

## A modern approach to UK regulation

### Short term (1-5 years)

- Government will develop proposals for a new Merchant Shipping Act 1995, in the next 5 years.
- Government will consider if the existing secondary regulatory regime is fit for purpose on an ongoing basis and explore opportunities to reduce burdens to business.
- Government will play a leading role in setting an appropriate and proportionate global maritime legislative regime through the IMO and other international bodies.
- The MCA is the leading government agency responsible for the development of, implementation of and enforcement of key elements of UK maritime legislation. The Agency will not compromise its safety principles but continue to recognise the need for proportionality and commercial delivery.

## Safety

### Short term (1-5 years)

- Government will ensure the UK continues to provide a significant contribution to the development of international frameworks on safety measures through the IMO organisations.

- Government will continue to support the GLAs in safeguarding shipping and seafarers, and encourage further improvements at international level through IALA.
- Government will develop a Safety Action Plan to explain what it is doing to improve safety, highlighting future actions and priorities.
- Government will continue to develop Maritime Safety Week in partnership with industry and other stakeholders, celebrating the work already underway, and encouraging innovation and sharing of best practice.
- Government will provide a significant contribution to the IMO's working groups on the development of a Universal Maritime Data Model.

### Medium term (5-15 years)

- Government will support industry to further develop and expand the HILo system.
- Government will review its mariner training and certification regimes to ensure they are fit for purpose and reflect the realities of roles on modern ships whilst maintaining a basis in traditional mariner skills and facilitating continuous improvement.
- Government will continue to support the GLAs to research innovative e-Navigation solutions and improve resilience where possible, as well as working in the IMO to ensure that regulatory requirements, guidelines and training regimes recognise developments and are continuously improved.

### Long term (15 years and beyond)

- Government will consider either through the creation of a body, similar to RSSB, or utilising existing maritime agencies, a dedicated focus can be brought to researching accident precursors, driving continuous improvement and applying lessons learned from other sectors, to safety performance.

## UK flag

### Short term (1 -5 years)

- The UKSR will keep under constant review the capability and services it needs to provide a high-quality customer service.

- The UKSR will put in place a communications and marketing strategy to increase its promotion globally and attract companies to the UK flag.
- The UKSR will develop a 'horizon scanning' capability working with the government and maritime sector as appropriate. This will anticipate and lead the way in implementing changes in registration and in the global shipping fleet.

### Long term (15 years and beyond)

- Through the MCA, the UK will lead the way in any future changes to the way in which the global shipping fleet is surveyed and inspected and future flag state responsibilities

## Technology

### Future of shipping

#### Short term (1 –5 years)

- Government and industry will deliver three flagship projects, developing technological proofs of concept and provide demonstrations of use cases for smart shipping.

#### Medium term (5-15 years)

- The UK will legislate for a domestic framework for autonomous vessels to attract international business and allow testing in UK's territorial waters.
- Government will lead efforts to establish a new proactive and adaptive international regulatory framework for autonomous vessels at the IMO.

#### Long term (15 years and beyond)

- Government and industry to work together to achieve the first multi-modal autonomous freight movement through a UK port.

### Smart ports

#### Short term (1 –5 years)

- Industry and government collaboration to find use cases and develop proof of concepts for new and existing technologies.

- Government will work with industry to develop a 'Maritime Innovation Hub' in a UK port as a result of an open competitive process. The hub will bring together expertise, support technology development, and boost regional productivity.

### Medium term (5-15 years)

- The UK will consider the need to establish the maritime equivalent of the Aerospace Technology Institute to help commercialise British R&D in the maritime sector or how to ensure the functions that the ATI perform are captured in existing maritime bodies.
- Building upon expertise gained through developing UK's existing Maritime Innovation Hub, develop a network of regional R&D clusters based in UK ports.

### Digitalisation

#### Short term (1 –5 years)

- Government will work with industry to understand the benefits to the maritime sector of innovative new technologies and government's role in supporting their development and use.

#### Medium term (5-15 years)

- UK will achieve full paperless governance of the maritime sector in the UK by 2030, including creating a fully-digital UK Ship Register by 2025.
- Government will put in place regulations and standards to ensure open data through systems like blockchain, allowing transparency, competition, and improved efficiency.

#### Long term (15 years and beyond)

- Through to 2050, the UK will lead efforts to set international standards at the IMO for digital technologies in the maritime sector to ensure interoperability.

## Communication, navigation, and exploration

### Short term (1-5 years)

- Government will commission a study into the potential for 'Future Navigation', understanding what information the sector requires and UK capabilities to provide it.
- UK to commence charting its own seabed and EEZ seabed using autonomous vessels to understand the potential economic benefits of the seafloor.

### Medium term (5-15 years)

- Working together, government and industry will link existing UK space manufacturing and R&D capabilities to the maritime sector, considering how relevant technologies and facilities can be used to unlock cross-sector potential.

### Long term (15 years and beyond)

- UK will be at the forefront of international efforts to chart the international seabed area, helping us to understand how to sustainably manage and benefit from the global ocean environment and creating exportable hard technology and soft skills.

## People

### Maritime workforce

#### Short term (1-5 years)

- Ensure the UK tonnage tax regime has a training element which continues to support UK maritime workforce ambitions while also supporting growth of the UK tonnage tax regime.
- Raise awareness of the maritime sector in schools by having a single industry body overseeing a more coordinated cross-sector in-school awareness and ambassador programme.
- Task a single industry body for bringing greater coherence and coordination to the promotion of maritime careers sector wide.

### Medium term (5-15 years)

- Ensure there is greater harmonisation of certification standards within the UK for different maritime sectors.
- Put in place a clear and universally supported careers promotion plan that achieves an outcome of UK employees being listed in the top five maritime nations' listings.

### Diversity in the maritime workforce

#### Short term (1-5 years)

- Government will fund the production of the 'people like me' maritime industry project to help address the image and perception of the industry and demonstrate how we can effectively showcase its value to a wider diversity of people.
- Joint delivery between government and industry of the Women in Maritime Charter.
- Widening the scope of the Women in Maritime Taskforce to consider diversity as a whole, including undertaking a short study assessing the diversity data of trainees across the UK maritime sector.

### Maritime skills and promotion

#### Short term (1-5 years)

- Government will support Royal Navy efforts to enhance training facilities and delivery, developing assured and accredited maritime training centres which will use their capacity to support the training of all maritime enterprise skills.
- Government will introduce appropriate regulatory changes to realise the benefits of new technologies to seafarer training.
- Government aims to establish a Maritime Skills Commission bringing existing leading maritime skills experts together, to report on the existing and future skills needs of the industry on a 5-yearly cycle, to inform the maritime training curriculum and keep it up to date with the evolving needs of the sector.

### Medium term (5-15 years)

- Government to increase UK global influence on seafarer training by providing the policy and regulatory direction needed to support further roll out of UK maritime training institutions/programmes overseas.
- UK will develop cutting edge seafarer training maximising the use of future technologies such as virtual reality and augmented reality.

### Long term (15 years and beyond)

- Through to 2050, the UK to play a leading role at IMO and ILO, in setting the global framework for maritime training and skills, and positioning the UK as the world leader.

## Need for continuous education and training

### Short term (1-5 years)

- The Maritime Skills Commission will be tasked with overseeing the identification of opportunities for the UK maritime sector to access reskilling programmes, ensuring the workforce can take advantage of a wide range of initiatives.
- Government, industry, and academia to jointly establish an internet connectivity working group to identify action needed to drive internet connectivity at sea in support of social care and continuous education.

### Medium term (5-15 years)

- The Maritime Skills Commission will, working with maritime training bodies, consider how to ensure professional development plans are built into training programmes across all roles so trainees know from the outset the routes available to them and the qualifications needed.

## Considering the human in the face of technological change

### Short term (1-5 years)

- Develop a social framework that lays out UK expectations for the welfare of the UK maritime workforce.

- Government and industry to push for worldwide recognition and standardisation of seafarer ID cards through the ILO.
- Government to introduce a National Minimum Wage for all seafarers working in the UK territorial waters, affording them the same protection as land-based workers.
- Government and industry to produce mental healthcare guidelines and develop mental resilience testing for seafarers.

### Medium term (5-15 years)

- Push for a limit on hours per shift through IMO and ILO to combat seafarer fatigue.

### Long term (15 years and beyond)

- The UK will lead on exploring opportunities to encourage greater cooperation between the ILO and IMO on seafarer welfare issues.
- Lead the way in addressing modern day slavery concerns within the industry with the aim of eradicating it.

## Environment

### Towards zero emission shipping

#### Short term (1-5 years)

##### Existing commitments

- In line with proposals in the UK Clean Air Strategy:
  - Major ports will publish Port Air Quality Strategies in summer 2019. Government will produce guidance for ports on this.
  - Government will publish consultations on the extension of SO<sub>x</sub> and NO<sub>x</sub> ECAs around the UK, and a Call for Evidence to explore options for standardising environmental regulations for vessels operating domestically with the UK, including inland waterways.
  - Government will publish the UK Clean Maritime Plan by spring 2019.
- Government will continue to actively participate at the IMO, working with industry and other key stakeholders, to support the smooth transition to new environmental standards.

## New proposals

- Government will review the existing legislative framework, including the provision of primary powers, to ensure that the UK has the flexibility to respond to public concerns in relation to pollution from the maritime sector.
- Government will consider options to promote the UK flag as the flag of first choice for vessels adopting low or zero emission technologies.
- Government will consider options to increase the registration of domestic vessels operating in the UK, as a means to improving our ability to regulate emissions from this sector.
- In parallel with increased international reporting through the IMO Data Collection System and EU Monitoring, Reporting and Verification Regulations, the government will consider domestic options to increase the transparency of emissions data from the maritime sector.
- Government will assess how economic instruments could support the transition to zero emission shipping in the medium to long term.
- In line with proposals in the UK Clean Air Strategy, the government has now established the Clean Maritime Council, working closely with research bodies like MarRI-UK to ensure strong collaboration between government, industry and academia in this field. Over the next year government will consider the potential role for the Council in directing funding into green technologies for shipping.
- Government will work to better understand the capacity of the UK's energy networks to support an increase in demand for green energy from our ports and shipping sectors. It will also consider the role the maritime and offshore renewables sectors can play in decentralised energy generation.
- Government will seek to ensure that measures which tackle the UK's maritime emissions are considered for national grants set aside for dealing with environmental issues.
- Government will consider options to support the development of technology which enables monitoring and enforcement of any

new regulations governing emissions of GHGs and air quality pollutants.

- Government will consider the merits of introducing a medium term target for emissions of GHGs and air quality pollutants from UK shipping. Further detail on this consideration will be set out in the Clean Maritime Plan.
- Government will work in partnership with the British banking sector to encourage the provision of finance towards zero emission shipping technology development and manufacturing.
- Government will review the environmental and economic case for coastal shipping, and whether the government should play a greater role in encouraging modal shift.

## Medium term (5-15 years)

- In line with the Industrial Strategy, government aims to launch a number of “zero-emission shipping ambitions” in the Clean Maritime Plan which could include:
  - A group of hydrogen or ammonia powered domestic vessels in operation
  - At least one major port in the UK to have all ship-side activity zero emission (including non-road mobile machinery like cranes, as well as ships while docked in port).
- Government will work to ensure maritime GHG emissions are appropriately taken into account in national and international emission reporting. The government will carefully consider the CCC's advice on the inclusion of international shipping within carbon budgets. Further information on the Government's plans will be set out in the Clean Maritime Plan.
- Government will consider whether and how the Renewable Transport Fuel Obligation (RTFO) could be used to encourage the uptake of low carbon fuels in maritime, taking the availability of sustainable resources, competing uses and the international character of the maritime sector into consideration.
- Government will consider how public procurement, subsidy and licensing regimes can be used to increase the uptake of green

technologies e.g. for vessels supporting the offshore energy sectors.

### Long term (15 years and beyond)

- Government will consider the introduction of a target to reduce emissions of GHGs and air quality pollutants from UK shipping towards zero. Further details on the government's long term plans to reduce emissions from UK shipping, will be set out in the Clean Maritime Plan, taking into account the IMO's 2050 GHG target.
- In line with the government's Industrial Strategy, we aspire to launch a number of "zero-emission shipping ambitions" in the Clean Maritime Plan including an aim to have all domestic ferries zero emission by 2050.

## Minimising wider environmental impacts

### Short term (1-5 years)

- Government will ratify international conventions which reduce the environmental impact of maritime including the Ballast Water Management and Hong Kong Conventions.
- UK will continue to advocate for the designation of scientifically-based spatial management measures, provided for under international law, to protect the most vulnerable environments, for example, around Antarctica.
- Government will work to bring the UK's penalty structures into line with international best practice to ensure we effectively tackle ships which break the law. This could include a wider range of sanctions including "on-the-spot" fines.
- Government will apply a new ship recycling regime from 1 January 2019, and work with industry to improve compliance. By 2023, conduct a post implementation review to assess how effective the new regime has been in improving the sustainability of end of life shipping.
- Government will cooperate with other States in the development and application of new technologies (e.g. remote sensing, fuel sampling kits, use of drones, airborne

sensors), which could be used to help industry and streamline enforcement arrangements.

### Medium term (5-15 years)

- Government will work with our Overseas Territories to ensure there is a consistently firm approach to tackling maritime pollution across British waters.
- UK will play a leading role in international discussions to promote consideration of market-based solutions for wider (non-air emission) environmental issues.
- Government will consider further alignment between the UK regime for ship recycling with the Hong Kong Convention, and whether any further measures are needed to discourage non-compliance.

## Adapting successfully to the impacts of climate change

### Short term (1-5 years)

- Government will work with ports to review their understanding and implementation of climate change adaptation measures, and encourage periodic reporting on preparedness through the adaptation reporting power.
- Government will work on the international stage to ensure effective governance and environmental protections are in place to regulate ships operating in Arctic waters as they become more accessible.

## Achieving our goals through continued international leadership

### Short term (1-5 years)

- UK will continue to maintain an active presence in developing the global maritime environmental regulatory framework at the IMO, ensuring that the UK ratifies international environmental conventions to which we are a signatory, in particular the Ship Recycling Convention and Ballast Water Conventions.
- UK will ensure that there is meaningful progress at the IMO GHG negotiations to

take forward an action plan and pursue early implementation of specific Short term measures ahead of 2023, and progress work on mid and longer-term measures to meet the targets in the Initial IMO Strategy.

- UK will take advantage of its experience on carbon pricing and market-based measures from other sectors. We will work hard to achieve this at a global level through the IMO but if progress isn't sufficiently rapid, we will need to consider options for taking additional steps with other like-minded partners.
- UK will play a leading role in the development of an action plan at the IMO on marine litter and plastics.
- UK will continue to use its influence across international and regional bodies to enhance the conservation and sustainable use of ocean resources, such as the suppression of illegal, unreported and unregulated (IUU) fishing and the development of appropriate frameworks to manage deep sea mining and biodiversity beyond national jurisdiction (BBNJ).

#### **Medium term (5-15 years)**

- UK will promote the establishment of an objective and globally recognised body of evidence in the field of shipping emissions as an important step towards monitoring progress and assessing solutions towards the temperature goals of the Paris Agreement on climate change.
- By 2030, in line with the UN Sustainable Development Goal 14, the UK will have supported the poorest and most vulnerable countries, in particular Small Island Developing States (SIDS) and Least developed Countries (LDCs), to pursue wider benefits from growth in zero emission shipping, and will encourage other countries major economies to do likewise

#### **Long term (15 years and beyond)**

- UK will push for a significant and sustained global increase in investment for new infrastructure, capacity building and technical co-operation for the poorest countries and those most affected by climate change (in particular LDCs and SIDS) for effective global implementation of the IMO Initial Strategy

on the Reduction of Greenhouse Gases from Shipping.

## **Trade**

### **Supply and demand**

#### **Short term (1-5 years)**

- Government has already committed to helping create a network of Export Champions across the UK who offer expertise and guidance to support other companies on their exporting journey. This initiative will be fully supported and implemented in the near term.

### **Global rules-based trading framework**

#### **Short term (1-5 years)**

- Government will seek opportunities to pursue an ever more ambitious free trade agenda with the rest of the world, while ensuring continuity of existing EU third country free trade agreements to maintain their benefits and provide certainty to businesses

#### **Medium term (5-15 years)**

- Government will develop new free trade agreements with like-minded countries – with a view to opening up trading opportunities and new markets

#### **Long term (15 years and beyond)**

- Government will pursue strategic development of a transparent and fair regulatory playing field through the IMO and the ILO to enable trade to continue to grow.
- The UK will maximise its trade opportunities globally and across all countries by boosting trading relationships with old friends and new allies.
- Government will continue to pursue economic prosperity for the UK and lead by example through its liberal economy and pursuit of free trade. Government will work towards developing, supporting and enforcing a fair and proportionate rules-based system for trade, domestically and internationally.

## Competition in a globalised world

### Short term (1-5 years)

- Government will work with the maritime services industry, to commission and deliver a study into the competitiveness of the sector.
- Government will engage with the ports and the manufacturing industry to consider the case for free ports in the UK.

## New technology and future modes of transportation

### Short term (1-5 years)

- UK will partner with like-minded nations to coordinate mutual understanding of how to successfully develop the services and technology necessary for safe, secure, environmentally sound and reliable Arctic maritime activity in order to maximise mutual benefit from new shipping routes.

## Trade promotion

### Medium term (5-15 years)

- Government will comprehensively consult with industry on the direction of UK trade policy, how it can best serve the maritime sector, and the mechanisms for involving them during negotiations
- Government will collaborate closely with industry to increase UK exports, as a proportion of the UK's GDP from 30% to 35%, supporting the maritime sector in its role as a key facilitator of trade.

## Infrastructure

### Ports and harbour infrastructure

#### Short term (1-5 years)

- Government will monitor the availability of funding to ports through commercial lending, identifying any market failures and developing plans to address these, together with the ports.

- Government will review Port Master Plans Guidance, identifying opportunities to better support the sector across planning, environmental and connectivity issues.
- Government will consider renewing the National Policy Statement for ports, to provide additional support if needed.
- Government will implement a targeted programme of Port Economic Partnerships, for ports meeting specific scheme and success criteria, leveraging the maximum benefits from both government and industry investments.

#### Medium term (5-15 years)

- Government will explore the feasibility of new infrastructure models (e.g. floating offshore ports) to support ambitious future development, and ensure these are responsive to land use and transport network challenges.
- Government will create an environment conducive to the testing and researching of all technologies that would enhance our maritime infrastructure, initially holding a competition for ports to bid to be designated the UK 'National Port for innovation and testing'.

#### Long term (15 years and beyond)

- By 2050, government anticipates that all commercially available land around UK ports will be in use or have a clear plan for future use.
- The maritime sector will explore, within the framework provided by government, the business opportunities for greater confluence of transport modes to help drive cost effectiveness and time efficiency.

## Port connectivity, the supply chain, and logistics

#### Short term (1-5 years)

- Government expects full implementation of the Port Connectivity Study recommendations in the short term.
- Building on UKMPG's "Dragons den", DfT will host jointly with industry, an annual seminar bringing together key stakeholders in the

maritime and technology sectors to showcase best practice.

- Government will support the work of industry, including the BPA, UKMPG and Maritime UK as they produce their visions of the future.
- Government will continue to consider the needs of the maritime sector as part of rail and road infrastructure funding to support the onward transportation of freight and passengers from maritime infrastructure.
- Government anticipates the maritime sector will continue investing to integrate and provide added value to the wider supply chain and associated industries.

### Medium term (5-15 years)

- Industry, with government support aims to explore the wider benefits of port centric development and, if backed by evidence, government will publish a policy statement indicating a presumption of support for such developments, consistent with the National Policy Statement for Ports.

### Long term (15 years and beyond)

- If future congestion levels impact on freight movements despite infrastructure investment, the UK will explore the evidence base for a system of dedicated freight routes for the import and export of goods.

## Sectoral infrastructure

### Short term (1-5 years)

- The maritime sector, with government support where appropriate, will identify and explore opportunities for the development of new and existing markets.
- The maritime sector, including ports, will actively engage the energy sector to understand the primary (generation) and secondary (manufacturing, servicing and storage) market needs, promote collaboration and identify new market opportunities.
- Industry will identify specific barriers to ports serving the energy sector and jointly with government, will actively develop and propose solutions.

- Government will explore with the maritime and marine leisure sectors where barriers to development exist and to identify opportunities to grow the sector.
- Government and the cruise and ferry sectors will have increased interaction, to better understand concerns and any barriers to growth.
- Government will support industry to proactively seek opportunities for maritime infrastructure to access existing innovation programmes and funds, making the case for inclusion commensurate with the economic profile of the maritime sector.
- Government will meet its maritime accessibility responsibilities through correct implementation of the passenger rights legislation and the delivery of the Inclusive Transport Strategy.

### Medium term (5-15 years)

- Government expect ports and the wider maritime sector to build on current successes in working with developers to secure contracts for offshore work, competing on a global scale.
- Government expects to lead on attracting new subsea communications cables to the UK.
- Government expects to take an active role in the development of increased resilience in subsea infrastructure.

### Long term (15 years and beyond)

- The ambition is for the UK to enhance international relationships on subsea cable infrastructure by collaborating with global partners and adopting best practice.

## Ship building and boat building

### Short term (1-5 years)

- Government will continue to look for appropriate means of support for SME's to export, attend tradeshows and explore opportunities to enhance their impact in the boat and shipbuilding sectors.
- Government will work with the leisure, superyacht and small commercial marine

industry to ensure their needs are factored into the strategic growth agenda for the maritime sector, in the context of government's Industrial Strategy.

- Government will work with industry to review and understand any issues which might prevent UK businesses and ship builders from being competitive in bids for UK-based contracts. And if necessary, look for options to provide appropriate support.

### Medium term (5-15 years)

- Government expects industry to utilise existing centres of excellence and where necessary develop new centres focused on specific areas of ship and boat building, and marine engineering in order to maximise international competitiveness,
- Government expects the UK ship building sector to maximise its flexibility to be able to respond to openings in niche markets, such as a rise in short-sea or coastal shipping, and the opportunities this may bring in a changing market.
- Government will work to enhance its strong relationship with key ship yards, and augment this with major fleet owners and operators of high value vessels to better share, sell and export UK expertise. Working in collaboration with government, we expect industry to focus action and capability development on specific, targeted markets to achieve world leader status and look for greater opportunities to export.

### Long term (15 years and beyond)

- Government and industry will work towards successful implementation of the National Shipbuilding Strategy.
- Government aspires to support the Maritime Enterprise Working Group to raise productivity and secure a sustainable and globally successful UK ship and boat building, and marine engineering sectors.

## Shipping in the supply chain

### Short term (1-5 years)

- UK ports will maintain their attractiveness for vessel calls on global shipping routes and the

effectiveness of UK maritime infrastructure through continued investment, in step with improvements in technology and vessel types.

### Medium term (5-15 years)

- The expectation is that shipping companies, particularly those involved in short-sea and coastal shipping markets, will adopt technology developments that can increase their competitiveness versus land-based freight modes.

### Long term (15 years and beyond)

- The ambition is for smaller ports to also embrace technological changes in shipping, and invest to take advantage of viable alternatives to land-based transport.

## Security and resilience

### Overall recommendations

#### Short term (1-5 years)

- Government will lead on the assessment of risk, analysis and emergence of new threats to shipping and port operations in the global shipping sphere.
- Government will improve the processes to address security threats and target methodologies to implement proportionate mitigations to new tactics as needed.
- The UK will broaden our already strong alliances, both diplomatic and military, to maintain and build consensus for an open and stable maritime domain.

#### Medium term (5-15 years)

- The UK will ensure that – working with the IMO, other institutions and on an inter-country basis – future development of maritime security regulations and standards aligns with potential risks and threats.

## Security of UK waters – including Overseas Territories

### Short term

- The defence of UK waters and those of our Overseas Territories from all threats will remain a standing commitment.
- The UK will maintain a cross government research and development programme to find innovative solutions to detect, monitor, and respond to threats and protect UK maritime interests including Overseas Territories and Crown Dependencies.
- Government will continue to maximise its use of capabilities by securing a long term delivery plan for the National Maritime Information Centre (NMIC) and the Joint Maritime Operations Coordination Centre (JMOCC). We will provide world class maritime domain awareness and deliver effective asset disposition.
- Government will continue to support the rules-based international system to build and deepen our relationships with emerging global markets by strengthening alliances and building partnerships. We will encourage rational behaviour by states and support the peaceful settlement of disputes.
- Government will reflect on the changing maritime security landscape and review our approaches in coordination with future defence reviews.
- Government will maintain an exchange of intelligence with our closest partners including the US and Europe and continue NATO participation to deter and adapt to threats as the maritime security picture evolves.

## Security and resilience at ports and on ships

### Short term (1-5 years)

- Government will provide information to encourage and enable informed investment to protect critical port infrastructure from future hazards such as severe weather events.
- Government will work with ports to review their understanding and implementation

of climate change adaptation measures and encourage periodic reporting on preparedness through the adaptation reporting power.

- To maintain and increase port throughput efficiency, government will support industry in seeking emerging technologies and systems to deliver screening of goods and people more efficiently and effectively.
- Government will assess the feasibility of undertaking a systems approach to identifying single point of failure for maritime infrastructure – that is looking “beyond the fence” to identify interdependencies of connected infrastructure, supply chains, and their levels of redundancy.
- Government will monitor investment activity in UK maritime infrastructure to protect national security against hostile actors who may wish to harm the UK.

## Global shipping route security

### Medium term (5-15 years)

- Government will support international efforts to maintain freedom of navigation across shipping routes. Where nation states ignore rules-based international system norms, or pose threats to the freedom of navigation (such as blocking strategic international chokepoints or making excessive geographic jurisdictional claims) we will affirm the RBIS framework and requirements of international laws.
- In the changing geo-political landscape, government will monitor contraventions of UNCLOS rules, collaborating with nation states to ensure rules and requirements of international laws are adhered to.

## Cyber – security of technology

### Short term (1-5 years)

- It is unlikely that every maritime organisation will have the resources to employ dedicated cyber security specialists so industry should consider exploring models that could provide the maritime industry with cyber support services more effectively.

- Government will continue its approach to assessing cyber threats through the National Cyber Security Centre and closely liaise with industry to warn, inform and advise of such threats.

### **Medium term (5-15 years)**

- The UK will lead in the development of regulation for the security of automated vessels and connected systems.
- In a future where the use of autonomous vessels and connected systems are progressively used, government will provide cyber security advice to industry to warn, inform, and advise on threats.

## **Terrorism**

### **Short term (1-5 years)**

- UK will continue to be alive to evolving terrorist threats – in both their identification and the mitigation options required – working closely with industry to deliver solutions.
- Our policy and inspection regimes continue to ensure that UK ports, and those of the Overseas Territories, are compliant with the current legislation and responsive to current and emerging threats.

- The UK will maintain highly effective operational counter-terrorist capabilities in policing, intelligence, and defence so that terrorist actors will have no safe place to operate.

- The UK supports the development of security regimes at foreign ports through a targeted programme of partnerships to deliver security capacity development.

### **Medium term (5-15 years)**

- Overseas, government expects to continue to develop capacity within the most vulnerable states and assess the risks to tackle instability and prevent terrorist groups operating in safe places.

## **Maritime crime and piracy**

### **Short term (1-5 years)**

- Government will continue engagement with foreign partners to improve law enforcement and legislative capability and capacity in those areas that suffer from organised criminality and piracy. Interim measures, like the use of armed guards and naval engagement, will continue and we will remain alive to changes in the locality of threats as well as methodologies of such groups.



