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MARITIME ECONOMY

THE TIMES

Published in association with



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Cleaning up dirty emissions in shipping

Action to clean up harmful sulphur oxide emissions has sent a shockwave through the shipping industry

SHARON THIRUCHELVAM

hipping is the last bastion of dangerous low-grade, high-sulphur fuels. accounts for just 2 per cent of global carbon emissions, but produces 13 per cent of the world's sulphur emissions and 15 per cent of nitrogen oxides.

Banned from every other industry, these fuels have remained in marine economy partly because shipping routes tend to be far from human habitation. On January 1, 2020, however, this exemption will be lifted, when landmark regulation introduced by the International Maritime Organization (IMO) will slash the permitted sulphur content in ships' fuel from 3.5 to 0.5 per cent.

At the heart of the IMO's decision is a desire to protect health. Shipping's dirty, cheap fuels cause around 400,000 premature deaths a year through heart and lung illnesses, and asthma in 14 million children, according to research published in Nature. Cleaner fuels could almost halve the number of premature deaths and diseases caused by the industry, with people living close to ports and major shipping routes seeing the greatest health benefits.

However, uncertainty over the economic impact and probable rise in crude oil prices, which is expected to be passed on to consumers, concern some analysts. Shipping accounts for 10 per cent of the world's demand for oil in the transport sector, with one container vessel consuming 80 tonnes of high-sulphur fuel a day, the equivalent of 46 million cars running on diesel, according to HSBC.

Cost estimates range from an alarmist \$1 trillion to the global economy, with crude prices rising \$7 a barrel in 2020, predicted by S&P Global Platts, to the phlegmatic from Maersk, which runs the world's biggest container shipping line, estimating an annual total cost to the container shipping industry of between \$5 billion and \$30 billion.

Paddy Rodgers, chief executive of Euronav, a global oil tanker operator, is sceptical about predicted shocks. "The cost of transport is always connected to the price of oil and nothing will change, so there is no big seismic shock coming to the industry as a result of this," he says. "It is within the normal volatility range of the price of oil.'

Some waters, including the Baltic Sea. North Sea. Mediterranean.



Caribbean and most of the US and Canadian coasts, which have signed up as sulphur emission control areas (SECA), are already subject to a far more stringent sulphur cap at 0.1 per cent. And most of the global oil majors, including Shell and Exxon. say they will produce enough compliant fuel to meet demand, while HSBC predicts an initial compliance rate of 80 per cent.

What these compliant fuels will be is unclear. Low-sulphur oil is the most obvious option, but lingering concerns remain over oil producers' capacity. Liquified natural gas has its proponents as it emits about 25 per cent less carbon dioxide than conventional shipping fuels, contains virtually no sulphur, 85 per cent less nitrogen oxide and 99 per cent less particulates. But its higher methane emissions, closely linked to climate change, are a problem. Bevond fossil fuels, battery technology and hydrogen power are climate-change safe, but as vet untested.

One under-scrutinised aspect of the International Convention for the Prevention of Pollution from Ships (MARPOL) is the option to use alternative abatement

technologies. These "scrubbers" as they are called remove exhaust sulphur emissions from ships' smoke stacks, enabling a continuing market for high-sulphur oil. It is a booming sector, despite the high capital cost of installation at as much as \$5 million a ship, with the number of companies manufacturing scrubbers up from three to thirty since the 2016 updated MARPOL regulations.

But Mr Rodgers cautions: "Unlike any other industry that uses sulphur-rich fuel, the scrubbing system will not capture and neutralise the sulphur, it will simply pump the sulphur out of the ship and have it bind to seawater which will be returned to the ocean." Whether this is environmentally safe is open to question because of the limited amount of scientific research, leaving aside the carbon-dioxide emissions.

What is more, the use of scrubbers creates a two-track system within the industry and attendant worries over enforcement, which is already an issue in the northern European SECA region.

Researchers at Sweden's Chalmers University of Technology found the lowest levels of compliance in the western part of the English Channel, near the SECA border, where 13 per cent of vessels were in violation of the sulphur regulations in September 2016.

"In general, the vessels carry both low-sulphur fuel oil and the less expensive high-sulphur oil on board," says Chalmers University's Johan Mellqvist, professor of optical remote sensing. "If they switch fuel well in advance of their passing of the measuring stations, they won't be caught out."

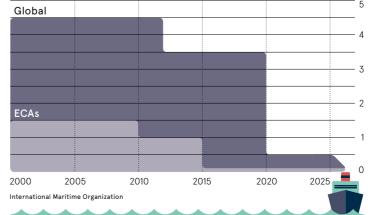
For this reason the university developed an aerial system for monitoring marine vessels' emissions, which advises port authorities which ships they should select for on-board fuel inspections.

Sulphur emissions are only one part of the vast environmental challenge facing the marine economy. Ocean pollution, including plastics, rising carbon levels causing acidification and widespread death of marine life, ocean warming and rising sea levels present a manyheaded hydra of problems.

In April, the IMO agreed to at least halve the industry's carbon emissions from 2008 levels by 2050 and at the Global Maritime Forum, in early-October, 34 chief executives demanded faster climate action.

Global sulphur cap

Sulphur content of fuel permitted outside and inside emission control areas (%)



raconteur.net /maritime-economy-2018

Navigating regulation is slow going

It may be full speed ahead with the technology, but autonomous vessels face slower-moving regulatory checks



ccording to Rolls-Royce Marine, by 2030 autonomous ships will be a common sight on the oceans. Last month the firm teamed up with Mitsui O.S.K. Lines (MOL) in a demonstration test on a ferry serving Japan's Seto Inland Sea route equipped with its intelligence awareness system.

"Sunflower ferry operates in some of the most congested waters in the world and will provide an opportunity to test rigorously Rolls-Royce's intelligent awareness system," says MOL director Kenta Arai. "This can give our crews an enhanced decision support tool, increasing their safety and that of our vessels.'

This encapsulates the state of autonomous shipping at present, as there are paramount concerns about safety, and rigorous testing to ensure decision-making can be sufficiently robust to ensure conformity with the law and regulations of the sea.

However, Maersk chief executive Søren Skou has cast doubt on just how far and how fast matters will progress. Mr Skou does not see much advantage in taking the last few people off the vessel, even if

commercial reasons and the technology suggested otherwise.

"I don't expect we will be allowed to sail around with 400-metre-long container ships weighing 200,000 tonnes without any human beings on board," he says. "I don't think it will be a driver of efficiency, not in my time."

In the short term, we are likely to see automated technologies and reduced crew on board for some manoeuvres, particularly short distances, and the desire to innovate will continue apace.

Iiro Lindborg, Rolls-Rovce general manager of remote and autonomous operations, says: "The intelligence awareness system forms part of our ongoing development of the autonomous ship, but we decided to make the technology available today as it offers real benefits to the existing shipping environment. It is undoubtedly one of the most significant advances made to date in terms of ship navigation safety. It provides bridge personnel with a much greater understanding of the ship's surroundings."

Get it right and there are certainly benefits ahead for the industry. Isolated islands could be served, inhospitable routes navigated and remote areas accessed, much of it with diminished risk to seafarers.

As 80 per cent of accidents are human error, autonomous shipping offers safer solutions than crewed shipping. However, risk in shipping will remain; it's just that the risk of human error is transferred onshore to a remote control centre. Also, with opportunity comes fear, as the industry worries about autonomous shipping leading to new forms of piracy.

Autonomous shipping projects began in 2015, with the advanced autonomous waterborne applications project, backed by the Finnish government, involving

kev players including Rolls-Royce and FinnFerries.

In the same year, a European Union-sponsored research project. maritime unmanned navigation through intelligence in networks. was completed. Other projects and research have ensued in Norway, the UK and China.

Last year, YARA and Kongsberg entered into a partnership to build the world's first fully electric and autonomous container vessel, the YARA Birkeland. It is scheduled to switch to remote operation in 2019 and start performing fully

Rolls-Royce's concept of a fully

container ship

Rolls-Royce's autodocking system automates the first nd last phrases of crossings, with various sensors that assess proximity to harbour structures

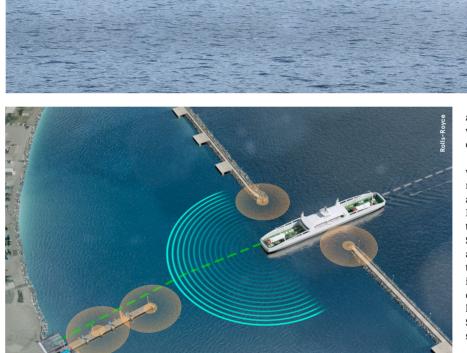
autonomous operations from 2020 when it will sail between the ports of Porsgrunn, Brevik and Larvik.

Scandinavia may be the place where regulation of autonomous shipping will emerge first, according to Professor Masamichi Hasebe, senior legal counsel at the Japan Association of Marine Safety. He says: "Denmark, Norway and Finland can change domestic regulation without waiting for international regulation. They can adopt by themselves. Also, like-minded countries such as Singapore and China may take the same approach."

Existing international conventions, including Safety of Life at Sea, Convention on the International Rules for Preventing Collisions at Sea, Prevention of Pollution from Ships, and Standards of Training. Certification and Watchkeeping for Seafarers, were drafted on the assumption there is a crew on board.

Stephan Piazza, KPMG manager of shipping and yachting in Malta, says: "We want to get ahead of the game, but also we need to be sure certain provisions are self-adapting to future challenges.

"When it comes to ships and navigation, you must keep in mind that the lawmaker often ranks the protection of seafarers and the sea





Commercial feature

environment at the top of its priorities, ahead of such strictly navigational or commercial aspects, which also arise from the use of autonomous ships. It will be interesting to see how these two differing interests can and should coexist with each other."

The International Maritime Organization (IMO) has agreed on a definition of maritime autonomous surface ships (MASS), as well as a framework for analysing the applicable IMO regulations. The IMO's Maritime Safety Committee (MSC) has kicked off what will be years of regulatory and legal work by issuing a scoping exercise to determine the extent of the need to amend the regulatory framework to enable the safe. secure and environmental operation of MASS within the existing IMO instruments.

Speaking at an MSC meeting, IMO secretary general Kitack Lim said there needs to be a balance between new technologies, the efficiency of shipping, and "keeping in mind the role of the human element and the need to maintain safe navigation, further reducing the number of marine casualties and incidents". The Comité Maritime International is also considering this issue through an international working group, analysing how international conventions and regulations can adapt themselves to autonomous ships.

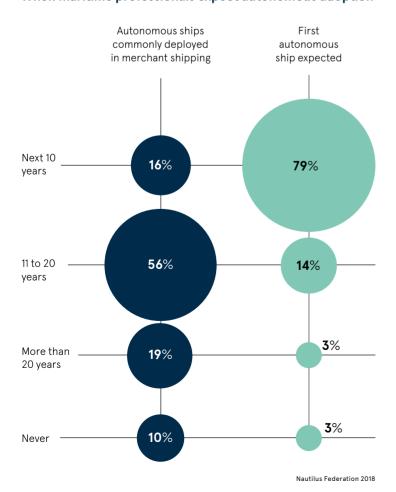
Though Dr Piazza believes the IMO scoping should focus more on cybersecurity measures, as he explains: "The role of the IMO is that of creating uniformity, and uniformity is essential in shipping, so perhaps Scandinavia could become a model that is tried, tested and exported. Why not? Probably it is the best option. The IMO can move slowly for various reasons."

Professor Hasebe says: "The IMO scoping exercise will go to the end of 2020, then actual practical drafting discussion will start and there is also a need to amend a number of conventions. Some could be straightforwardly amended, within two or three years, but more controversial ones could take longer, by which I mean the more political amendments addressing seafarers, for instance, We cannot expect to see all these changes within ten years.

He believes shipping won't take the lead because there is not yet enough interest in autonomous ships and navigation. However, he says: "If they can see the benefit on land, they will see the benefits of autonomous shipping. Solutions to autonomous driving on land can perhaps be achieved quicker, though they are more complex than sea, so if people can see the benefit of land solutions [with autonomous cars] then there will be a lot of pressure to achieve this on the sea.

KPMG's Dr Piazza concludes: "There's a lot of work to be done and it will take 20 to 25 years, but it is good these tests have begun and discussions have moved forward: it is positive." Law and regulation commonly lag behind, but there is an opportunity that with autonomous shipping, lawmakers may for once manage to keep pace with, if not get ahead of, innovation. ◆

When maritime professionals expect autonomous adoption





Creating ports of the future

Shipping hubs will soon have much more efficient systems and a truly collaborative culture, with ports in the UK and Europe leading the way

or port operators worldwide, business as usual will no longer do. Increased efficiencies are required as a matter of urgency across maritime supply chains and technology is inevitably at the forefront of emerging transformations.

With Brexit approaching and the new customs declaration service being phased in by HM Revenue & Customs, the UK's most advanced port operators are looking at how to become hubs of increased efficiency, common systems and enhanced integration. The ambition is to enable truly frictionless trade in which highly efficient systems ensure extremely smooth processes.

Among those advanced port operators is Associated British Ports (ABP). which handles around £150 billion of annual trade - £68 billion exports and £81 billion imports - around a quarter of the total UK trade in goods. It recently created the Trade Resilience Forum, which brings together government and key industry players from across the supply chain, including manufacturers, retailers, shipping



Group head of marketing, ABP

lines and logistical suppliers, to discuss trade needs and processes.

These efforts are increasingly international, with work being done to expand the forum into the Netherlands and Belgium. An advanced project is also being undertaken in collaboration with the Port of Rotterdam, Port of Hull and others, which involves working together to share best practice.

"As an important trading hub with 21 ports, and supporting nearly 120,000 jobs across industries, we have the opportunity to bring all the different supply chain players together to discuss their current challenges and future requirements, and foster discussion that will lead to stable future growth," explains Ron Crean, ABP's group head of marketing.

ABP has stepped up its efforts around supporting customers and exploring frictionless trade, involving development of highly efficient processes for the movement of all cargo. Its solutions are being designed to be capable of optimising the performance, efficiency and resilience of international supply chains, from automotive to food to chemical industries and beyond

Technological innovation is at the heart of improving these supply chain processes. The right systems are key to enabling frictionless trade, says Mr Crean.

We need to make sure that everyone can integrate with systems easily, from large freight companies to smaller shipping firms," he says. "We already work with innovative port community software providers, such as CNS and MCP, in some of our ports. This latest pilot is another strand in our quest to ensure we stay ahead of the requirements of new legislation, and the technical demands and opportunities that may arise from it."

ABP recently began a pilot project with technology firm Marine Transport International to use blockchain technology, a digital ledger, so that systems can more easily integrate and creating, in effect, a single version of the truth for individual items of data, with fewer manual information entry processes. The project aims to enable each firm to connect seamlessly with the port operator's systems and is potentially capable of significantly simplifying the flow of trade.

£**150**br

of trade passes through ABP ports

across the UK

According to Mr Crean, ports have an increasingly important role to play as facilitators and enablers of trade across the supply chain. This provides an important opportunity to make sure trade continues to flow and grow in the future.

To find out more about ports of the future please visit abports.co.uk



Marine geospatial opportunity

When business strategists and governments look for opportunities, they do not often gaze out to sea. They should do. Because the scale of the opportunity in what is called the "blue economy" is compelling

o what do we mean by blue economy? Namely, the sustainable use of ocean resources for economic growth. And according to the UK government's chief scientific adviser in the Foresight Future of the Sea Report, the gross value added of the blue economy is projected to double to \$3 trillion by 2030.

This value exists in industries such as trade, tourism, aquaculture and renewable energy. But it is also dependent on the sustainable use of these marine resources to protect our oceans and the people who rely on them.

Underpinning all this activity is marine geospatial data on safe shipping routes, deep-sea biodiversity, movement of the seabed and more. This also includes bathymetry, the underwater version of topographic mapping.

Here in the UK, the organisation responsible for the collection and analysis of this data is the UK Hydrographic Office (UKHO).

At its core, the organisation supports the defence of the UK and the safe passage of ships in UK waters. They do this by making the latest data available to the Royal Navy and merchant mariners to protect lives at sea.

The UKHO also uses its wealth of marine data to create commercial value on a global scale. More than 90 per cent of all ships trading internationally rely on the navigational charts, publications and digital services made available under its ADMIRALTY Maritime Data Solutions brand.

But its repository of data contains so much more than just navigational information; water salinity, maritime boundaries, marine mammals and tides are just some of the datasets processed by the organisation. It's this wealth of data that's being used to help others create sustainable economic growth and support decision-making across the globe.

A key example of this is the work carried out through the Commonwealth Marine Economies Programme, an initiative being delivered by the UKHO and government partners on behalf

of the Foreign & Commonwealth Office, which aims to unlock a £2-billion return for 17 nations across the Caribbean and Pacific.

Harnessing marine resources can bring huge benefits for these nations, from improving trade to protecting the marine environment. This, in turn, can create jobs, reduce poverty and build resilience against environmental challenges such as natural disasters and climate change.

A nation to benefit from the programme is the coastal nation of Guyana, where export trade was previously limited by the poor quality of navigational information available. The UKHO captured information on seafloor features, depths and currents, as well as navigational aids such as lights and buoys, all of which will be used to update ADMIRALTY charts of the area. With the second lowest per capita income in the Caribbean region, these charts are expected to provide a catalyst for long-term, sustainable economic growth through increased trade.

Another example is the Caribbean island of Grenada, where its marine area is 75 times larger than its land mass, so it is largely reliant upon its marine resources. UKHO teams conducted high-resolution bathymetric surveys to capture data of the marine environment, enabling islanders to use their marine resources more effectively and sustainably.

Data collected in these areas can also be used to inform important decisions around coastal protection, disaster modelling and crisis response. This became particularly visible in the aftermath of Hurricane Irma, which struck in August 2017, affecting a number of nations including the British Virgin Islands, a UK Overseas Territory. Using satellite imagery and basic soundings, UKHO staff processed data to create and supply special-purpose emergency charts in under 48 hours to support UK relief efforts. As a result, aid and medical supplies could be delivered

Value of marine geospatial data and the diverse applications

Marine geospatial data is key to unlocking the potential of the blue economy, from seabed to surface

Maritime and coastal tourism

Shipping and trade

Energy

Fisheries

Aquaculture

Communications infrastructure

£47bn
estimated gross value added of the blue economy in the UK

53trn
predicted value of the global blue economy by 2030

Foresight Future of the Sea Report

Ocean Economy, OECD

as quickly and safely as possible by sea.

Whether in the Caribbean or the UK, the UKHO is using its technical expertise and global network of partnerships to meet a growing range of maritime needs. It is continuing to invest in its capabilities, so wider sets of data can be processed, accessed and used in smarter ways, unlocking even greater value to the global economy.

All this work is part of the UKHO's broader transformation into a Marine Geospatial Information Agency, a digital-first, data-centric provider of marine geospatial information services.

At the heart of this transformation is a new data science team, new data platform and new appetite for technology.

One particularly eye-catching innovation from the organisation is a bespoke artificial intelligence system

We have seen first hand how accurate marine geospatial data can contribute to the dual aims of marine protection and development of the blue economy for automated offshore object detection. This system employs open-source radar satellite imagery, a "blob detection" algorithm (that really is the technical term) and deep-learning to detect unidentified objects visible in the ocean.

Since it went live in June, the system has processed satellite imagery covering almost 900,000 sq km of ocean, detecting 342 hazards previously unknown to the organisation, which are now highlighted in ADMIRALTY charts and publications. As a result, the risk of maritime incidents diminishes, while our understanding of the marine environment deepens.

Further innovation at the UKHO has led to the creation of a new ADMIRALTY Tidal API (application programming interface), offering predictions on high and low-tide times from its vast database of tidal information. This is enabling software developers to build UK tidal data into their own apps.

This forward-thinking approach to technology and data science is now being recognised across government. It was announced last year that the UKHO will be a key partner in the newly formed Geospatial Commission. This aims to drive economic growth by maximising the value of all location-based data in the UK, unlocking up to £11 billion of extra value

for the UK economy a year. And much of that value lies out there in the blue.

"We have seen first hand how accurate marine geospatial data can contribute to the dual aims of marine protection and development of the blue economy," says John Humphrey, the UKHO chief executive. "We will continue to enable governments and companies to make critical maritime decisions, both in the UK and worldwide."

With its impressive repository of data, combined with the tools, expertise and global relationships to use it, the UKHO is enabling sustainable growth of the blue economy.

Marine geospatial data not only has the potential to unlock a wealth of economic benefits for developed and developing nations alike, but is the key to unlocking a deeper understanding of the world's oceans.

For more information please visit admiralty.co.uk

ADMIRALTYMaritime Data Solutions



Combating piracy by striking at causes

Probably the most feared crime at sea, piracy can be the result of illegal or unregulated fishing displacing fisherman who turn to maritime robbery and extortion

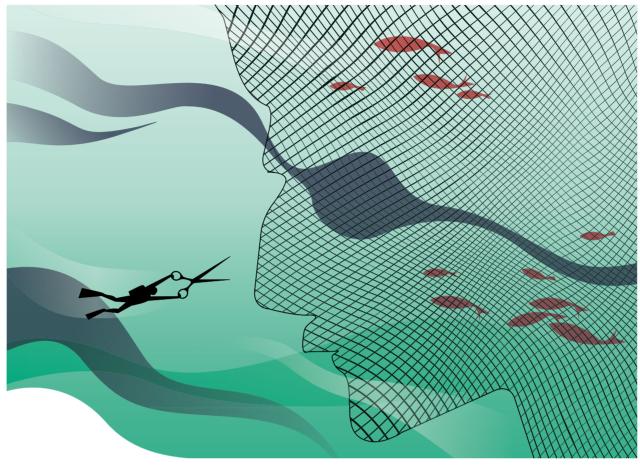


n September 24, 2018, news broke of an attack on the motor vessel Glarus 45 nautical miles southwest of Bonny Island en route to Port Harcourt in Nigeria. Sailing from Lagos, the Massoel Shipping vessel, carrying wheat, was boarded by pirates and 12 of its 19 crew members taken hostage.

The Gulf of Guinea accounted for more than 40 per cent of the world's incidents of piracy in the first quarter of 2018, underlining the very real threat that robbery or violence at sea still poses.

Illegal maritime arrivals, exploitation of natural resources, illegal activity in protected areas, marine pollution, prohibited imports and exports, biosecurity risks, and maritime terrorism have all been listed as additional dangers to the marine economy by the Australian Department of Home Affairs. But it is piracy that continues to be the greatest fear and steal the headlines.

International Maritime Bureau (IMB) assistant director Cyrus Mody says: "Somalia was the initial turning point and real eye-opener for everyone. The sheer level of violence seen there was unprecedented in modern-day shipping."



Attempting to solve one problem without understanding the associated threats in other maritime and land-based spheres often results in failure

"Traditionally, the response to incidents was the subsequent allocation of resources to vessels in high-risk areas, to reduce the number of incidents in a particular region over time.

"However, in the past ten years, there has been a series of modifications to this process due to the complexities involved in tackling threats in different regions. After Somalia, the threat moved to southeast Asia and now the focus is on west Africa."

The IMB has since gone to great lengths to counter the threat of piracy by utilising international relationships with maritime agenand encouraging heightened collaboration between states. strengthening defences of potentially endangered vessels and greater vigilance among shipowners.

But what if piracy is just the culmination of factors, rather than a sole strand? Philip Barber, marine security specialist with I.R. Consilium, believes that a new threat should be added to the list: "The threat to freedom of navigation, caused by boundary disputes over territorial waters.

Mr Barber explains: "Maritime security threats are seldom binary and are usually interrelated, and attempting to solve one problem without understanding the associated threats in other maritime and land-based spheres often results in failure.

"For example, Somalian piracy was the end result, but had its origins in illegal unreported and unregulated (IUU) fishing. The fisherman, deprived of their livelihood by foreign IUU fishing vessels, resorted instead to piracy and so a criminal enterprise was born.'

He believes the same is now transpiring in the Gulf of Guinea and southeast Asia, with the initial catalyst to both being states' failure to control fisheries and their own exclusive economic zones.

reversed by tackling IUU fishing and engaging with the local fish ermen to act as the eyes and ears of the maritime police," Mr Barber offers as a solution embedded in mostly technology-driven modern-day methods.

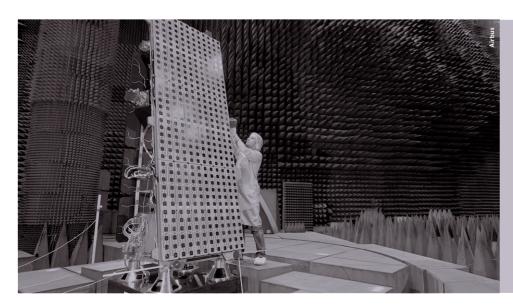
"At sea, the introduction of automatic identification systems and its fishing equivalent, vessel monitoring systems, has meant that vessels can now be tracked to a greater extent than before. However, the former are frequently turned off and the latter can be, and are, tampered with.

"A recent innovation to combat this has been integrated maritime surveillance systems, which enable the sharing of data between multiple agencies and ultimately nations. The use of artificial intelligence within the systems enables the most advanced to identify, through satellite tracking, those vessels displaying high-threat behaviour and then highlight them to an operator."

The use of unmanned aerial vehicles, or UAVs, and more recorddriven traceability of fish stocks are further ways to meet illegal maritime activities at the start line, rather than the pirate-ravaged finish line, but only when complemented by real-time communication between international agencies and non-governmental organisations such as the IMB.

"It is now down to individual states, vessel masters and shipowners to take responsibility for implementing these processes and systems and, vitally, reporting every incident that occurs," says the IMB's Mr Mody. "The first step towards prevention is knowing that a crime is actually happening.

"If an incident occurs, other vessels or states in that vicinity need to be alerted of the potential dangers and, with the kind of transparency we encourage as a not-forprofit organisation, this is how we can look to combat illegal maritime activities in west Africa and the rest of the world."



Case study **NovaSAR**

supply chains.

While piracy poses a clear physical threat to the global shipping industry out at sea, a host of additional economic risks also threaten international trade and

Fraud, data manipulation and tampering with a vessel's automatic identification system (AIS) necessitates the need to oversee the movement of ships in real time, and this is now being

facilitated by NovaSAR, following the synthetic aperture radar (SAR)

AIS signals are positional indicators that vessels must broadcast under international suggests smuggling, illegal fishing or other deviations. Designed to operate for seven years, NovaSAR will help

authorities combat crime at sea, including piracy and drug trafficking, and also deal with oil spills, while facilitating environmental studies.

The lightweight NovaSAR was manufactured by Surrey Satellite Technology in the UK, which also made the highresolution optical satellite S1-4 that can pinpoint objects on the Earth's surface or at sea as small as 87 centimetres across.

Airbus Defence and Space UK have further contributed to the UK government-funded, state-of-the-art project, which is expected to generate as much as £150 million of investment.

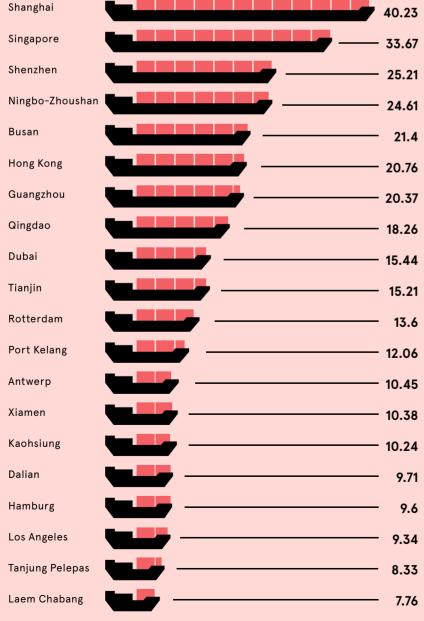
PORTS AND

PATHWAYS

Modern ports have become multimodal distribution megahubs which link sea, river, canal, road, rail and air transport routes, vital for international trade and linchpins for the global economy. Since the advent of container shipping in the 1950s, globalisation has led to the vast expansion of ports, and trade flows show the importance of Asia as a major transport region. The continent now dominates the scene, handling nearly two thirds of global annual container port volumes, and is home to fifteen of the twenty largest ports in the world, eight of which are located in China

World's largest ports by volume

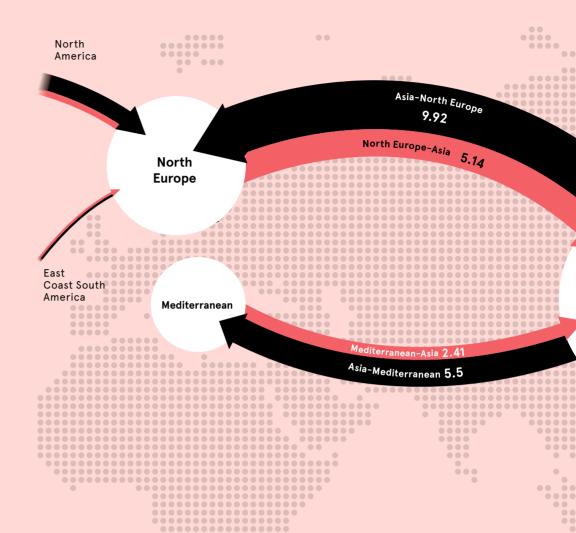
Annual capacity of container ports in 2017, calculated by twenty-foot equivalent units or TEU



United Nations Conference on Trade and Development 2017

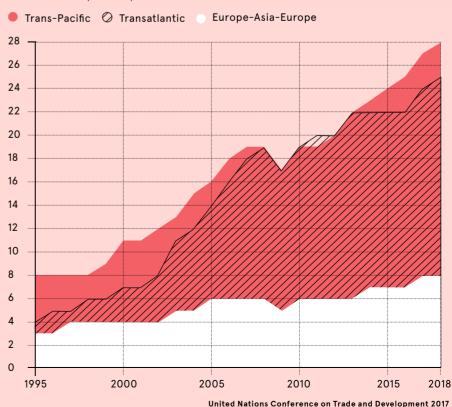
Top liner shipping trade routes

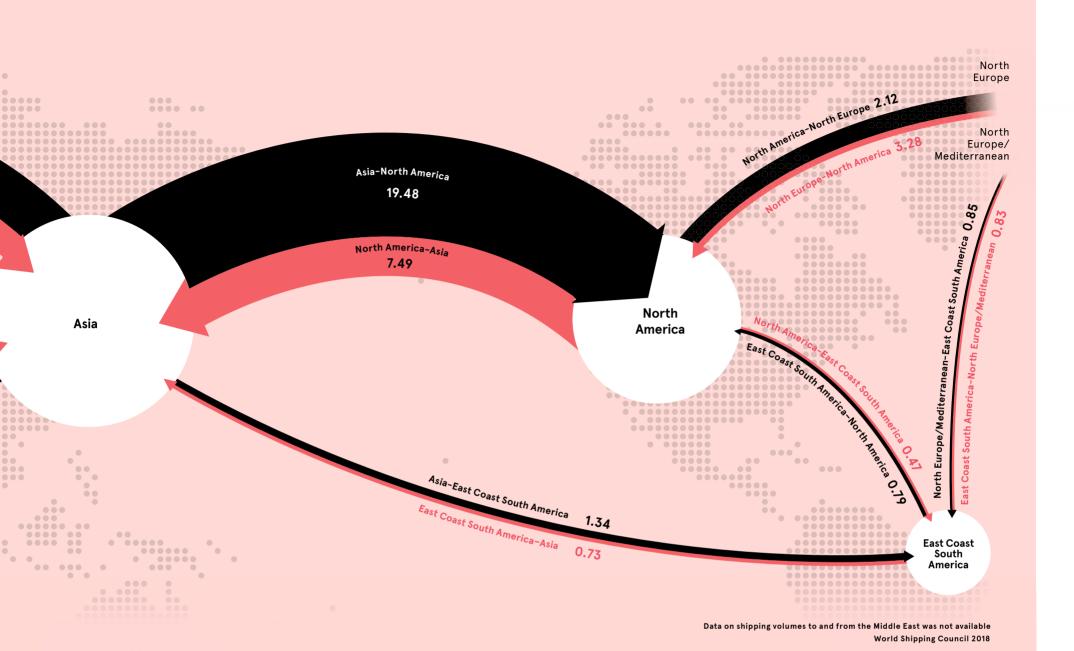
Total volumes shipped, in terms of million twenty-foot equivalent units or million TEU



Containerised cargo flows on major East-West trade routes

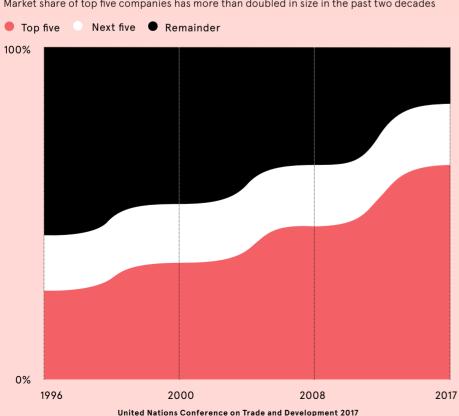
In million twenty-foot equivalent units or million TEU





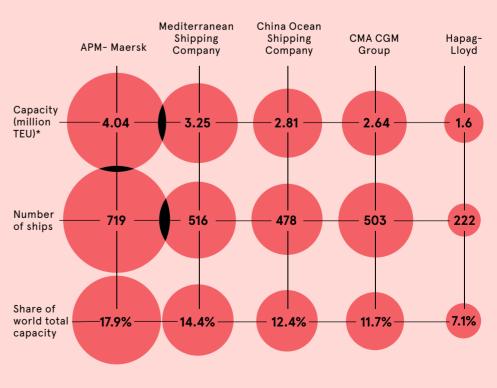
Container shipping industry continues to concentrate

Market share of top five companies has more than doubled in size in the past two decades



Top five largest container operators by fleet size

Includes owned, chartered and ordered vessels, as of October 1



United Nations Conference on Trade and Development 2017

DIGITAL PORTS

Ships unloaded by remote-control cranes

Digital technology is revolutionising ports, introducing remote-control cranes, self-driving trucks and other innovative systems to speed up loading and unloading of vessels



hile the days of broad-shouldered stevedores manhandling cargo nets to the quayside may have slipped by in our maritime past, few could have anticipated that the time when a ship could arrive in port to be unloaded without a human being in sight would arrive so quickly.

Yet this is exactly the scenario being predicted for the harbour at Caofeidian, a reclaimed chunk of land 200km east of Beijing. Port bosses say that by the end of the year the facility will be completely autonomous, with ships loaded and unloaded by automatic cranes, and containers driven away by self-driving trucks, all co-ordinated from a central remote-control room.

With their restricted, confined roadways, lack of pedestrians and predictable driving scenarios, ports are the perfect proving ground for autonomous vehicles. Europe's biggest port, Rotterdam, is being used to test the concept of truck-platooning in which a series of unmanned trucks follow a lead vehicle, mimicking the actions of its driver. These small convovs make for a smoother traffic flow, as well as cutting CO₂ emissions.

Technology is driving other changes in Rotterdam too, as the port gears up to receive autonomous vessels by 2025. Working with IBM and Cisco, port authorities are creating a new digital dashboard to replace traditional radio and radar communications between captains, harbour pilots and terminal operators.

The system will use a complex array of internet of things (IoT) sensors to collect data around tidal streams, wind strength and visibility, helping to reduce vessel waiting times and automatically guiding the crewless ships into berth.

We are taking action to become the smartest port in the world," says the port's chief financial officer Paul Smits, "Speed and



efficiency is essential to our business, and requires us to use all the data available to us."

It is estimated that using this realtime information could save operators as much as \$80,000 each time they dock a vessel

It's all about speeding things up and meeting the demand from online consumers, who now expect nextday delivery

In the UK, DP World London Gateway is also embracing automation. The state-of-the-art deepsea port on the lower reaches of the Thames is home to 12 of the world's largest ship-to-shore cranes, colossal 138m giants which can be controlled remotely as they unload four 20ft containers at a time.

The remote-control cranes bring operational efficiencies and because they're unmanned, the port can continue to run when high winds make it too dangerous for traditional cranes to operate and force other ports to close.

In addition, the port has 60 automated stacking cranes, unique to the UK, which run up and down tracks straddling the containers, stacking them dockside. The cranes also load and unload around 1,800 trucks a day using sensors and sophisticated cameras, all in a bid to get goods on the road as quickly as possible.

"It's all about speeding things up and meeting the demand from online consumers, who now expect next-day delivery," explains Matt Abbott, the port's head of communications. "We are constantly testing new initiatives. Automation across the port is becoming more and more prevalent."

Although Mr Abbott is quick to add that docks are still major employers and, while automated cranes may no longer need drivers, the complex machinery is creating more maintenance and engineering jobs.

Tim Morris, chief executive of the UK Major Ports Group, agrees and says the automation of ports is ushering in "a trend towards better jobs, more highly skilled jobs and

It's about upskilling, he continues, with digital technology and artificial intelligence taking care of physical tasks, such as moving containers, leaving operators to concentrate on more complex roles.

Another technology being trialled by some ports is the digital twin. This virtual version of the port enables operators to

different scenarios, using real-time information to improve decision-making and problem-solving, and support predictive planning.

Data, information and how it's handled will be at the core of the way ports operate in the future. says Mr Morris. "Ports are global gateways for physical traffic and there is a role for them as digital gateways as well," he says.

Take an imaginary widget, which could pass through around 30 different stages moving from Chengdu in China to Wolverhampton.

"Digitisation can streamline this. reduce the number of stages, make it contractually a lot simpler and a lot smoother," he says. "The greater level of visibility also makes the physical transfer more efficient. Better data flow means better predictability about where the widget is going to be at any given time."

Which leads to blockchain, described by Jody Cleworth, chief executive of digital logistics business Marine Transport International, as "the buzzword of the logistics industry".

The company has recently signed a memorandum of understanding to work with Associated British Ports to create a pilot programme to use blockchain technology to improve port connectivity.

Blockchain offers a way of securely linking the disparate systems that shippers, port operators and hauliers use to record and track goods, also reducing the time spent manually re-entering data.

200km east of Beijing, is expected to be completely autonomous by the end of 2018

"Blockchain-enabled technology has the potential to provide a transparent, secure and accurate way of capturing and sharing data with key parties," says Mr Cleworth.

The logistics industry is awash with proprietary technology that forces users to work in a certain way: with blockchain, we can connect all those systems to ensure data is accurately and quickly shared, helping speed up and simplify the flow of trade in and out of the UK." ◆

How smart-port technologies can improve operations

Monitor health and status of critical port and terminal infrastructure

Cargo handling Enhance productivity by optimising cargo operations

Co-ordinate vehicle movement to improve traffic flow between ports and cargo destinations

Customs and collections

Streamline the sharing of cargo and customs information and documents

Safety and security

Control port access and provide detection and early-warning systems

Energy and the environment

Reduce energy consumption and monitor environmental impact

Boston Consulting Group

Shipping sets innovation agenda

With the shipping industry under huge pressure to reduce greenhouse gas emissions (GHG), innovation holds the key to a solution, as well as realising opportunities for growth that lie in embracing digital and data tools to improve performance

t the end of 2015, the Paris Agreement confirmed it was not a question of whether climate change should be addressed, but a question of how, and

Shipping is the most efficient mode of transport and it currently accounts for 2.3 per cent of global CO₂ emissions. However, in a study on GHGs in 2014, the International Maritime Organization (IMO) anticipated emissions will rise in all future scenarios, starting at 50 per cent and rising to 250 per cent under a business-as-usual scenario.

The temperature goals of the Paris Agreement, to stabilise temperature increases to below 2C and aim for 1.5C, place a challenging burden on all sectors. There will be no space in the carbon budget to allow the emissions of shipping, currently approximately 1 gigatonne a year, to be ignored.

In April 2018, the IMO adopted its initial GHG strategy, establishing a significant ambition for the shipping sector to reduce GHGs by at least 50 per cent by 2050, based on a 2008 baseline. There is also a strong emphasis on reducing by 100 per cent by 2050 if this is shown to be possible.



Alastair Marsh Chief executive, Lloyd's Register

"When the IMO speaks about something like this, the whole industry has to listen," says Alastair Marsh, chief executive at Lloyd's Register (LR). "This deal provides a clear signal to the industry that the overarching aim is to end the use of fossil fuels.

"Fossil fuels provide us with a high-density, low-cost energy source that is comparatively easy to store, handle and transport. In terms of shipping, we have had decades to optimise the design, maintenance and operation of the shipping system around these fuels. As the world's attitude towards fossil fuels is changing, shipping is working to find a non-fossil, zero-emission and sustainable energy source, but it's a complex task."

LR has worked with several academic partners to produce research reports looking at fuel and technology trends for the marine industry, including Shipping in Changing Climates, a \$4-million multi-university and cross-industry research project funded by the Engineering and Physical Sciences Research Council, and University Maritime Advisory Services, a partnership between the University College London Energy Institute and MATRANS,

These studies have made it clear that the industry needs to advance thinking beyond marginal gains in energy efficiency and alternative fossil fuels, and zero-emission vessels will need to be entering the fleet in 2030 and form a significant proportion of new builds from then on if the sector is meet the ambition set out by the IMO

"This is probably the biggest single challenge facing the industry, over and above all the global trade movements and changes in trading patterns," says Mr Marsh. LR has committed a significant chunk of its research and development spending and efforts on looking at how viable zero-carbon fuels are as a scalable alternative.

"It's things like battery-electric power and trying to store electric power, which is a massive engineering challenge, but also things like ammo nia, potentially, or hydrogen," he says.

"It is hard to predict the future, but we expect to see a diverse range of zero-carbon technologies and fuels deployed across the world's fleet. There are a range of innovative technologies already being piloted and deployed, and we expect the curve of technological innovation to increase with the adoption of this strategy."

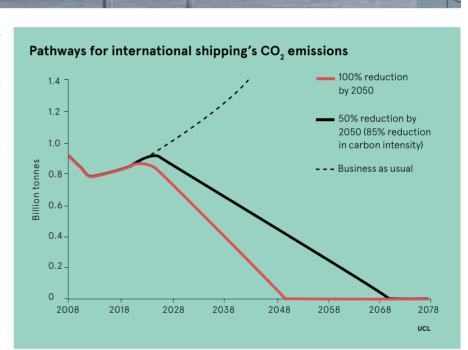
Running parallel with the environmental challenges facing shipowners is a relatively overdue digital transformation of the industry. Countless other sectors have already seen much of their processes and models overhauled by the new data insights that come from providing digital services. Now, it seems, it is the turn of shipping.

The hype surrounding big data when it first rose to prominence five or so years ago unsurprisingly caused many shipowners in an old and traditional industry to raise a sceptical eyebrow. However, with much of the technology involved in data analytics now at a mature stage, it's clear that it can be applied to very specific industry problems.

"It shouldn't be digitisation for the sake of it, so let's not talk about this wonderful big-data world when in reality it means different things to different sectors," says Mr Marsh. "However, in shipping there is now a massive advantage to be gained in using data in the right way in terms of very practical applications."

The airline industry has considerably advanced its approach to constantly monitoring engine performance, in

We expect to see a diverse range of zero-carbon technologies and fuels deployed across the world's fleet



real time, due to the capabilities available with data-analytics tools and Mr Marsh believes ships can now benefit massively from similar technology.

"You can take engine performance data in real time from sensors, which are embedded in most marine engines on ships today, harvest that data and apply data-analytics tools. Up until two or three years ago, that hadn't been done at all in shipping," he says.

You can start to get some very interesting data about how to optimise the control settings of certain engines in certain weather conditions and modes, and you can start to improve the optimisation of fuel efficiency as a result of that.

LR, which has been a trusted adviser to the maritime industry for close to 260 years, now provides services that enable shipowners to start harnessing the use of data to improve their processes and efficiencies. It is innovation in this area that underpins a strategy to build on LR's long heritage and traditional classification services.

Due to this heritage, as well as advising shipowners when building

and maintaining ships, LR also advises the IMO when formulating the rules shipowners will have to comply with and identifying practical issues that should be built in

"When I talk to clients about their challenges, they tell me that we probably know as much about their ships as they do, but we're also very aware of the bigger-picture implications around rule changes and other challenges," says Mr Marsh. "At this major inflexion point for the maritime industry, we're investing heavily to become a more innovative organisation and trusted adviser to our clients for 260 more years to come."

For more information please visit



WOMEN

Slow ahead for women in shipping

Despite greater awareness of the gender imbalance, advancement of women in shipping, particularly at sea, is slow

MAGDA IBRAHIM

n 1918, Victoria Drummond became an apprentice at the Caledon Shipyard in Dundee, the start of a journey to becoming Britain's first female marine engineer, earning honours for bravery at sea during the Second World War.

A century later and Victoria's personal battle to conquer the maritime industry has yet to translate into gender equality.

While progress has been made, statistics still show a woeful 2 per cent of seafarers worldwide are women, while just a third of global shore-based maritime positions are filled by women.

£**16.50**

in the UK maritime industry, compared with £30 for mer

gender pay gap, compared with the ational average of 17.4 per cent

of management positions are held by women

"There is more action today to raise equality than ever before and that has to be recognised," says Despina Panayiotou Theodosiou, president of the Women's International Shipping & Trading Association (WISTA International) and chief executive of Cyprus-based Tototheo Maritime. "But substantial, effective change needs time, collaboration and patience.

Change is gaining momentum: The International Maritime Organization (IMO) has picked empowering women as its theme for World Maritime Day 2019: the International Labour Office is set to hold a global sector meeting discussing opportunities for women seafarers at the end of February; and the European Union has a dedicated platform for change to promote equal opportunities in the transport sector.

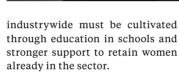
In the UK, the new Women in Maritime Charter urges companies to sign up to action plans setting specific targets on gender diversity.

Around 60 signatories, including BP Shipping, Hapag-Lloyd (UK) and Stena Line UK, have already pledged support, with pilot businesses expected to announce their action plans shortly.

Susan Cloggie-Holden, who sails as a chief officer and is female champion for the Royal Fleet Auxiliary (RFA), was involved with the charter's taskforce.

"It's a hidden industry and still seen as a man's world," she explains. "We'll start to see little wins quickly, but big changes will take up to 15 years.

While the RFA outperforms global statistics, with 7 per cent women seafarers on its crews. Cloggie-Holden says the "diverse pool of thinking" needed



Back in 1988, the IMO launched its now-renamed Women in Maritime Programme. There are seven regional associations in Africa, the Middle East, Asia, Caribbean, Latin America and Pacific, covering 70 countries and organising regular outreach events.

"Access to these regional associations could go some way to narrowing some of the institutional barriers and cultural stigma that women who enter the maritime industry face," says Helen Buni, who leads the IMO programme.

In India, the state-owned Shipping Corporation of India's attached Maritime Training Institute allows for a "coherent policy" and "effective affirmative action" to employ women, according to World Maritime University associate professor and former seafarer Momoko Kitada.

And the country's first female merchant navy captain, Radhika Menon, last year launched the International Women Seafarers' Foundation to raise awareness of the profession, protect women's rights and provide support.

But gender-related challenges are still an issue, says Dr Kitada, citing difficulty in work-life balance, access to education and leadership opportunities. "Awareness has been created, but statistically the maritime industry hasn't made much progress in the past 25 years," she

Many organisations are now specifically targeting young women. WISTA Sri Lanka has planned dedicated careers days at the Port of Colombo for the past four years, with more than 100 students from nine girls' schools attending the events.

Meanwhile, major shipping companies, including Maersk and Hapag-Lloyd, recognise the need to diversify the workforce and support women.



Leading Steward Sarah Green of the Royal Navy with the replenishment at sea board, indicating the course and speed of HMS Duncan off the Sicilian coast

ictoria Drummond Britain's first female marine engineer, was awarded an MBE for bravery at sea during the Second World War

While Hapag-Lloyd does not have specific targets to increase the number of women, its latest cohort of 25 marine apprentices includes seven young women - 28 per cent - on a three-year traineeship in Germany to become a ship mechanic, nautical officer or technical officer.

An Instagram channel sharing experiences aims to attract talent, while Hapag-Lloyd has a Women's Business Forum for internal support.

Attracting women is also a priority for A.P. Moller-Maersk as it aims to increase its 2 per cent of women in marine roles and 28 per cent across other positions. "We all play a part in accelerating the pace of change," says Rachel Osikoya, the Danish conglomerate's head of diversity. "Maritime is a male-dominated industry, so we do have a challenge bringing female talent to join us."

Initiatives include introducing the concept of unconscious bias the social stereotypes made outside conscious awareness - to leaders, and a maternity policy with a minimum standard of 18 weeks' leave worldwide and the option of 20 per

Substantial, effective change needs time, collaboration and patience

cent reduced working hours upon returning. This has increased retention rates to 71 per cent, with an ultimate goal of 90 per cent.

A campaign with the Danish government, focused on science, technology, engineering and maths, aims to reach out to female students by showcasing role models in the field.

BP Shipping, where women make up a third of the workforce. recently appointed its second female chief executive after Carol Howle took the baton from Susan Dio in February.

While it is tight lipped about specific goals or initiatives in its shipping arm, BP's annual report states it is "developing mentoring, sponsorship and coaching programmes to help more women advance".

For Kate Pike, associate professor at Solent University in the Warsash School of Maritime Science and Engineering, mentoring can be extremely important because of a lack of role models.

"Better outcomes for recruitment and retention start with education, training, legislation, and going through the spectrum of how we can support women and men on board and on shore,' explains Dr Pike. "It's hard to have a co-ordinated response because it's a global industry with multicultural crews, cultural differences and hierarchies of rank.

"However, there is recognition of the need to change and an appetite for that. It's going in the right direction, but it's going slowly."

'Many post-industrial coastal communities are crying out for redevelopment'



Ben Murray
Director
Maritime UK

he UK is inextricably tied to the seas that surround it. Some 95 per cent of all trade is carried by ship and through UK ports; half a trillion pounds-worth of goods pass through our ports each year.

With less than 200 days left until Brexit, and regardless of the type of deal agreed with Europe, the maritime sector will be key to delivering prosperity through trade. At the centre of the sector lay our coastal communities.

Often overlooked and underappreciated, these communities are the heartbeat that pumps global trade. However, an ever-widening range of social and economic indicators has put distance between these communities and their inland counterparts.

One vital change needed is investment in better connectivity. The development of transport connections to our ports should be considered equally as important, if not more so, as the other major transport infrastructure operations currently underway, such as High Speed 2, Crossrail and the expansion of London's airports.

Once you leave the port gate, you see that connectivity to the main markets and to the other ports is poor. There is not enough capacity on our rail network, most of the motorway network has to operate beyond capacity and there are too many constrictions on the road network to allow for the efficient transfer of goods.

Increasing the volume of coastal shipping – moving goods on ship around different parts of our coastline – could also help, but the development context needs to be right. Many post-industrial coastal communities are crying out for redevelopment, and their proximity to ports and the sea make them uniquely attractive for manufacturing, distribution and as centres for maritime innovation and collaboration.

We need a planning framework that preserves waterfront access for innovation and leisure marine. UK ports will do their bit, investing £2 billion over the next five years if the planning and development environment is right. Industry is also preparing a national rollout of aligned and co-ordinated regional maritime cluster hubs, which bring industry, academia and local government together to collaborate, foster innovation and drive growth.

The government expects the "blue economy" to double in value to \$3 trillion between now and 2030 and coastal communities are well placed to drive that growth. A brand new, national initiative for collaborative maritime research and innovation is being launched called Maritime Research and Innovation UK. This innovative arm of Maritime UK brings together many of the UK's leading research and innovation assets with a growing number of UK companies from across the sector. Government matching funding to get this initiative off the ground will speed up progress.

And that investment in maritime is a smart bet. The maritime sector holds a unique advantage in productivity, 53 per cent higher than the national average. On top of this, the average maritime sector job generated £77,897 in value to the economy in 2015, a third more than the average job in the UK. Growing the sector in coastal communities, where productivity and other socio-economic indicators often lag behind the rest of the country, is a valuable mission.

The benefits of effective investment can be seen across thriving coastal hubs in the UK, such as Albert Docks in Liverpool, Gun Wharf Quays in Portsmouth and Plymouth's Oceansgate development. Investment in key areas of technology, academia and connectivity has bought renewed growth and opportunity to these areas. We know this coastal focus works, but the UK must do more.

Open Europe has identified £41 billion of untapped potential trade partners for the UK outside Europe. Our coastal powerhouses sit in a unique position to tap into significant growth opportunities and to benefit from increased trade, as well as becoming centres of maritime innovation, manufacturing and leisure marine.

We have an unprecedented opportunity to transform our coastal communities, and industry and government, working together, can make it happen.

Big data and blockchain will transform profitability of marine insurance

Marine insurance has lagged behind in terms of innovation, but big data and blockchain will push it to the forefront

he marine insurance industry has been highly effective over its 300 years. However, during the last decade, it has suffered from underinvestment and a lack of innovation. With high expense ratios and low profits, the pressure to find a better operating model is inescapable.

There has been some \$6 billion of investment made in insurtech over the last four years, according to FinTech Global, with an acceleration in spending this year. Insurers themselves have only recently caught on to this trend.

A newly published report by the London Market Association predicts advanced analytics will transform business growth and product creation for all insurers, and adds that they must ensure data and innovation is consistently on the boardroom agenda.

"Investment in big data, artificial intelligence (AI) and blockchain will transform the marine insurance industry from technology laggards to trailblazers," says Andy Yeoman, chief executive at insurance software business Concirrus, whose AI platform helps insurers segment risk by analysing highly complex marine data. "The main impact will be on pricing, policies and placement, benefiting all players in the market, from brokers and insurers to fleet operators."

In terms of price, which has typically been based on standard factors such as vessel type and age, data promises to be transformative. With 50 billion sensors connected to the internet of



Andy Yeoman
Chief executive, Concirrus



things (IoT), including on ship hulls, machinery and cargo, insurers can now learn everything about how assets are used, changing business fundamentals.

"Currently, insurance products assume that several similar ships, in the same conditions, have a similar risk. But we know risk varies between similar ships and during a journey," explains Mr Yeoman, whose firm's Quest Marine software uses advanced Al to analyse data in real time. "With the IoT data and our Al behavioural models, we can beat the traditional approach every time and, importantly, explain why."

Insurers can also improve policies, allowing them to focus on a given set of perils, using insights to add coverage automatically. "With IoT connected policies, they can track ships going into war zones, automatically turn on the coverage, issue documentation and invoice," says Mr Yeoman. They can also pull different policies, such as for the hull, cargo and engine, into single coverage and much shorter or more specific policies can be written. "Instead of marine policies being annual, with connected policies we can write them monthly or even daily," he says.

The blockchain, a digital ledger of transactions, enables a significant shift in insurance placement and Concirrus is working closely with consultancy firm EY, whose Insurwave blockchain venture simplifies and automates marine insurance administration. Policies can be efficiently placed on an electronic platform and then data used to insure in real time.

Just as in-play betting allows book-makers to generate odds automatically on events as a sporting contest unfolds, policy automation based on live data will constantly enable insurers to manage accumulations. A previous inability to see changing risk had contributed to enormous losses, such as the more than \$3-billion estimated loss from a large blast at the Chinese port of Tianjin.

"The challenge for insurers is not being lulled into inaction, even if this kind of change hasn't happened broadly among competitors yet," says Mr Yeoman. "As with in-play betting, these technologies make entire industries change overnight."

The marine insurance industry has the potential to increase tenfold by using new technology to automate pricing, policies and placement, Concirrus predicts. "There will be more premiums and new target markets, improved loss ratios and better risk, and active risk management and reinsurance in real time," Mr Yeoman concludes. "The change has begun and the opportunity is unmissable."

To find out more about transforming marine insurance policies with big data and blockchain please visit www.concirrus.com



Conflict threatens maritime trade routes

Gulf of Aden

expand

by 8.5 per cent this year,

but is landlocked

and therefore heavily

dependent on Djibouti.

Since sweeping to power

April, Ethiopia's new,

reform-minded prime minis-

ter Abiy Ahmed, 42, has made port

development a key priority, calling for

"It is very important for Ethiopia to

diversify its trading streams," says

But Gulf interest in the Horn

of Africa is also being driven by

regional political rivalries, with dif-

ferent states seeking to secure stra-

tegic locations, especially in the

context of the war in Yemen, where

a military coalition led by Saudi

Arabia and the UAE has been fight-

ing Iranian-backed Houthi rebels

The UAE has been launching oper-

ations in Yemen from a military base

around the Eritrean port of Assab

and also has armed forces present in

As geopolitical interest in the

Horn increases, observers fear these

regional Gulf rivalries could end up

This was the case after the Gulf cri-

sis of June 2017, when Saudi Arabia

and its allies severed diplomatic ties with Qatar, which they accuse

of supporting Iran, the Muslim

Brotherhood and a form of political

Islam which threatens the stability of

 $During \, the \, crisis, the \, governments$

of Djibouti and Eritrea sided with

Saudi Arabia and the UAE, causing

from a disputed border between the

two Horn of Africa countries, where

they had been patrolling since 2010.

Somaliland, which is not interna-

tionally recognised as an independ-

ent country, also chose the side of

Saudi Arabia and the UAE, while the

Somalia's breakaway region of

Berbera, a port in Somaliland.

investments across the region.

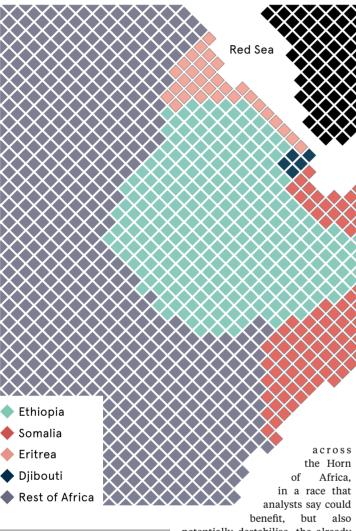
Mr Milland.

since March 2015.

spilling over.

their regimes.

The Horn of Africa, with its developing ports, is an area of significant commercial and military strategic importance where investments carry an increasing risk



PHILIP KLEINFELD

or decades it has been one of the world's most fragile regions, plagued by armed conflict, poverty and periodic droughts. But in the 1990s, the Horn of Africa, comprising the states of Somalia, Eritrea, Ethiopia and Djibouti, became the focus of a somewhat surprising investor: DP World, a global port operator that is majority owned by the government of Dubai, part of the United Arab Emirates (UAE).

From its headquarters in Dubai's sprawling port of Jebel Ali, the maritime company and its Emirati owners saw in the Horn of Africa what many others didn't: an area of vast economic potential and geostrategic

In 2006, DP World won a contract to build the Doraleh container terminal in Djibouti, now the small nation's biggest employer and source of revenue. Years later, in 2016, it signed a \$442-million agreement with Somalia's secessionist region of Somaliland, to manage and invest in the deep-sea port of Berbera. Both decisions proved prescient.

Today, the UAE is among a number of Gulf and Middle-Eastern countries scrambling for control of ports

potentially destabilise, the already fragile east-African region. In recent years, Saudi Arabia and

the UAE have become active in ports and military bases in Diibouti. Eritrea and Somalia, while Oatar and Turkey, who align with Saudi Arabia's regional rival Iran, are building in the Somali capital, Mogadishu, and the Red Sea port of Suakin, off the coast of Sudan.

"We are seeing a race between regional and global players to take advantage of big opportunities located in the region," says Camille Lons, programme co-ordinator at the European Council on Foreign Relations.

One reason for this scramble is commercial. The Horn of Africa is strategically located next to one of the world's busiest sea lanes, with access to both the Red Sea and Indian Ocean. Every day around five million barrels of crude and petroleum products flow through the Bab el-Mandeb Strait, a neck of water bordered by Eritrea and Djibouti.

"It is one of most trafficked shipping lanes in the world," says Olivier Milland, a political risk analyst at Allan & Associates.

More ports and better infrastructure are also needed to handle growth in the Horn of Africa's largest economy, Ethiopia, which is predicted to central government in Mogadishu, which is closer to Qatar and Turkey, Analysts say this has amplified dan-

gerous divisions between Somalia and its regions, a divide that can be seen most clearly in Berbera, an ancient port town in Somaliland.

Last year the UAE began constructing a military base in Berbera, which is 190km south of Yemen. In March this year, DP World also finalised a contract with the Somaliland authorities to develop and operate Berbera's port, in which Ethiopia also has a 19 per cent stake.

The venture has the potential to turn Somaliland into a regional maritime hub, but has prompted a furious response from Somalia's federal government which regards the region as part of its territory and says the secessionists have no right to sign international agreements.

"The deal has been perceived as a foreign intrusion by Mogadishu," says Ms Lons.

On March 12, Somalia's federal parliament took the step of banning DP World from operating in the country in a move Somaliland's president Muse Bihi Abdi referred to as a declaration of war.

The crisis has since soured relations between Mogadishu and the UAE. In April, Somali security forces confiscated millions of "undeclared" US dollars from a UAE plane landing in the capital. The UAE responded by ending a military training programme it was running in Somalia.

Despite its long-standing involvement in the region, the UAE has also run into problems in Djibouti. In February, following years of dispute, the Djibouti government dramatically seized control of the DP

World-operated Doraleh Container Terminal.

The Djibouti government accused the company of poor performance and failing to expand the terminal as quickly as it had promised. It also claimed the company paid bribes to secure the original concession, a claim rejected by the London Court of International Arbitration.

With the UAE sidelined in Djibouti, analysts say other countries could step in and that Gulf nations aren't the only ones in the running. Some have speculated that the Diibouti government may hand over Doraleh to investors from China, which is currently building a naval base in the country.

The involvement of China in the Horn of Africa's ports adds "another dimension to an already complicated equation", says David Styan a lecturer in politics at Birkbeck, University of London.

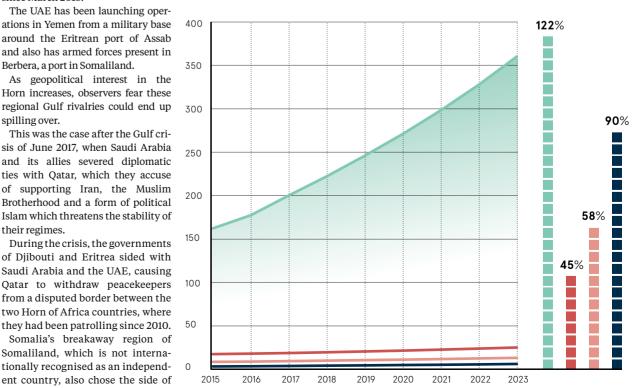
"You have the largest Middle-Eastern maritime logistics shipper DP World in an implicit, forward-looking contest with another global shipping alliance, which includes the Chinese, Dr Styan adds.

But as different nations scramble for control of ports in the Horn of Africa, Mr Milland says it is worth remembering that the region is still prone to instability. Somalia is dealing with the threat of resilient al-Shabaab militants, Eritrea remains one of the world's most repressive countries, and even Ethiopia, considered relatively stable, is currently facing widespread ethnic violence and displacement.

"The area has huge commercial potential," Mr Milland concludes, "but there are still regional and country tensions that could put new investments at real risk."

Horn of Africa GDP projections (\$bn)

GDP growth (2015-2023)





Innovation is **what** we do, supporting the shipping industry is **why** we do it.

IMO Sulphur Cap 2020

Today, Total Lubmarine is developing the next generation of lubricants to support your 2020 compliance strategy.

Join us as we tour the world's major shipping hubs to discuss how we can collaborate with you to find the best solutions.

To find out more, visit www.totallubmarine.com

Trade: they think it's all Dover – it is now!













Port powerhouse key to Britain's Brexit success

How about alternative North Sea routes?

- Up to 120 new ferries needed they do not exist.
- Crossings are too long.
- Sailings are too infrequent.

How about resurrecting alternative Short Sea routes?

- Massive investment in infrastructure would be needed.
- Crossings would still be too long and sailings too infrequent.

Does diverting a small amount at a higher price really help British consumers?

The UK's reliance upon continued frictionless trade at the Port of Dover has been accepted at the heart of Government. So has the need to preserve it.



Dover's operation cannot be replicated elsewhere and there would be significant cost in trying.... £2.5bn

Dover's success is Britain's success.... the solution is here

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