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Baltic
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Xinhua-Baltic

International Shipping Centre
Development Index Report

2022



Xinhua-Baltic
International Shipping
Centre Development
Index Report



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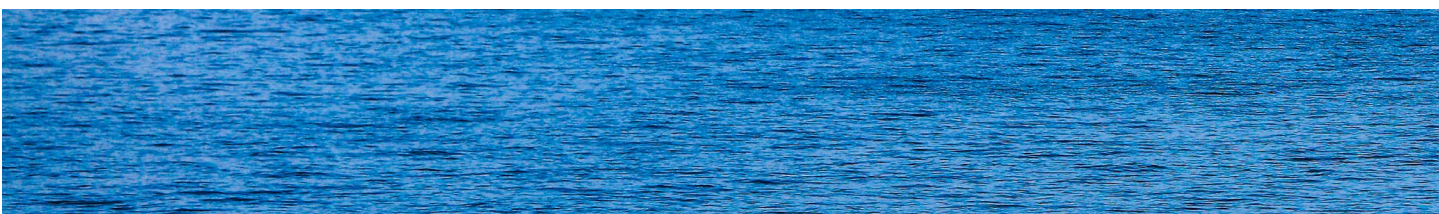






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2022

Xinhua-Baltic
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Introduction

Welcome to the 9th edition of the Xinhua-Baltic International Shipping Centre Development Index report

Produced by the China Economic Information Service, a subsidiary of Xinhua, in collaboration with the Baltic Exchange, the report ranks the top port cities and maritime centres around the world.

Based on a combination of metrics, including port factors such as cargo throughput, draught and container berth length; business factors including the number of professional maritime service providers such as lawyers, financiers and shipbrokers; as well as assessments of the general business environment including customs tariffs and logistics performance, the rankings look at 43 locations around the world and highlight the top 20. It should however be noted that this year we used the last available data from the World Bank's Doing Business report for 2020 following its discontinuation in 2021.

We thank our partners at Alphaliner, Deloitte, Drewry, Hill Dickinson, IACS, Intercargo, International Association of Ports & Harbors, International Group of P&I Clubs, IUMI, LMAA, Mission to Seafarers, SMAA, Society of Maritime Arbitrators, and UNCTAD for contributing data and commentary to the report.

This year's rankings saw little significant change from the previous year. Whilst New York overtook Athens, this was not due to the

fact that Athens' performance had declined, but rather the huge volume of container traffic through New York in 2021. COVID-19 related restrictions severely impacted economies around the world and the sharp rebound in trade snarled up supply chains globally. Terminal expansion projects which had been put on ice began to restart. The main shipping segments experienced mixed fortunes with the container industry enjoying unprecedented profit levels, but tankers ran at or below operating costs. Investment in digital technology continued at a rapid pace and the report looks at how this is impacting ports, shipping companies and service providers.

This year's report once again awards top spot to Singapore. Home to a huge port and bunkering hub as well as internationally oriented shipbrokers, financiers, lawyers and insurers, Singapore has continued to innovate and cement its position at the top of the table.

We congratulate the top three, Singapore, London and Shanghai, and commend all the locations covered in our report.



Message from Xinhua

An international shipping centre is an important port city with a range of key characteristics. These include excellent port facilities, advanced logistics systems and a key geopolitical location; it also has highly efficient shipping services as its core driver, as well as global shipping resources.

In 2014, China Economic Information Services, in collaboration with the Baltic Exchange, introduced the first "Xinhua-Baltic International Shipping Centre Development Index" to the industry. Since its inception nine years ago, it has been gaining international influence.

Impacted by the COVID-19 global pandemic, the international shipping industry has been undergoing significant changes since 2020. Facing such a big challenge, all international shipping industry practitioners had done an incredible job to maintain the global logistic stable and reliable. It ensured the supply of pandemic prevention materials.

In addition to data, the editorial team has also conducted an in-depth quantitative analysis of the development of international shipping centres globally to bring new perspectives to traditional concepts. We hope the evaluation results offer additional insight that is objective and impartial.

There will inevitably be inadequacies in this research report, but we constantly strive to update and improve it. As such, we value and

appreciate our readers' comments and feedback. Our Comprehensive Environmental Index aims to reflect, as accurately as possible, the differences in the comprehensive environment amongst domestic shipping cities within a large country.

We welcome and encourage other ports to join us in a collaborative effort to explore how we can further develop international shipping centres. A collective industry effort is required to help promote a rational allocation of global shipping resources, enhance the movement of global commodities and support the scientific development of international shipping centres.

*Editorial Board,
Xinhua-Baltic International Shipping
Centre Development Index*

Message from Baltic Exchange

Now in its 9th year of publication, the Xinhua-Baltic International Shipping Centre Development Index (ISCDI) report once again makes interesting reading as maritime centres globally and the industries they serve react to the challenges of a world in turmoil. Projects which were put on hold during 2020 and 2021 are coming back on stream. Supply chain problems have highlighted the problems of switching economies on and off and the complexities of our global trading ecosystem.

The way in which many of us work has changed as COVID-19 restrictions fast-tracked remote working. Many businesses looked hard at their structures and processes. But location still seems to matter. The right location gives companies access to clients and a talent pool. A successful shipping centre provides everything that the international shipowner might need. It offers an efficient port with good onward connections and a competitive port services environment. It needs to be a one-stop shop for the shipowning and chartering community, providing access to world-class finance, legal, shipbroking, IT and classification services. It should be a place which is able to attract the best international talent. It should have a robust and transparent legal system, backed up by efficient courts and arbitration services.

A successful shipping centre has office space of a good standard and should offer a good quality of life. It should offer an attractive tax regime for

international owners who, in theory, can base their operations anywhere.

All of the locations featured in the International Shipping Centre Development Index have their areas of excellence. Some are great port cities whose constant innovations mean that they are able to facilitate and open up trade to the wider region in which they operate. Others' excellence lies in their provision of business services. Here experience counts for much. A city which can offer a choice of the best lawyers, brokers, bankers and insurance underwriters is always going to be a crucial part of the global trading system.

The report is based on numerous datasets and offers an impartial, independent view of the merits of the world's leading maritime locations.

We hope that this report helps shape shipping company executives' thinking and spurs cities and their governments to provide the best support possible for the maritime community. A successful shipping centre is after all a successful global city.

Mark Jackson
Chief Executive, the Baltic Exchange

How the rankings are decided

The rankings are based on the following categories:

Port inputs (20% of weighting)

- Container throughput (TEU)
- Dry bulk cargo throughput (tons)
- Liquid bulk cargo throughput (tons)
- Cranes (no. of)
- Container berths (length of)
- Port draught (m)

Sources: Drewry, Shanghai International Shipping Institute

Business services inputs (50% of weighting)

- Shipbrokers, managers, liner & bulker companies (no. of)
- Classification society offices (no. of)
- Maritime legal (no. of lawyers & arbitrators)
- Ship finance (no. of banks)
- Hull underwriting premiums (\$)

Sources: Baltic Exchange, International Association of Classification Societies, International Union of Marine Insurers, Dealogic, Legal 500, London Maritime Arbitrators Association, Singapore Chamber of Maritime Arbitration, Alphaliner

General environment inputs (30% of weighting)

- Government transparency
- Extent of e-government and administration
- Customs tariffs
- Logistics performance index

Sources: United Nations
For full methodology details, please see Appendix 1.

The top 10 2022

Singapore once again tops our assessment of global maritime cities thanks to its status as one of the world's leading ports and its importance as an international maritime business centre. The past 12 months have not seen significant changes in the rankings as port developments and many major investments were put on hold around the world.

Ranking	City	Score
1	Singapore	94.88
2	London	83.04
3	Shanghai	82.79
4	Hong Kong	79.15
5	Dubai	75.74
6	Rotterdam	73.85
7	Hamburg	73.07
8	New York/New Jersey	72.58
9	Athens/Piraeus	68.67
10	Ningbo-Zhoushan	66.12

Previous years' top 10 rankings

Ranking	2021	2020	2019	2018
1	Singapore	Singapore	Singapore	Singapore
2	London	London	Hong Kong	Hong Kong
3	Shanghai	Shanghai	London	London
4	Hong Kong	Hong Kong	Shanghai	Shanghai
5	Dubai	Dubai	Dubai	Dubai
6	Rotterdam	Rotterdam	Rotterdam	Rotterdam
7	Hamburg	Hamburg	Hamburg	Hamburg
8	Athens/Piraeus	Athens/Piraeus	New York/New Jersey	New York
9	New York/New Jersey	New York/New Jersey	Houston	Tokyo
10	Ningbo-Zhoushan	Tokyo	Athens/Piraeus	Busan

Overall rankings 2022

	Country	City	Score	Vs 2021
1	Singapore	Singapore	94.88	→
2	UK	London	83.04	→
3	China	Shanghai	82.79	→
4	Hong Kong SAR China	Hong Kong	79.15	→
5	UAE	Dubai	75.74	→
6	Netherlands	Rotterdam	73.85	→
7	Germany	Hamburg	73.07	→
8	USA	New York/New Jersey	72.58	↑
9	Greece	Athens/Piraeus	68.67	↓
10	China	Ningbo-Zhoushan	66.12	→
11	Japan	Tokyo	65.96	→
12	USA	Houston	65.90	→
13	China	Guangzhou	64.41	→
14	Belgium	Antwerp	64.26	→
15	China	Qingdao	64.08	→
16	Korea	Busan	63.61	→
17	China	Shenzhen	59.14	→
18	Denmark	Copenhagen	58.33	↑
19	USA	Los Angeles	57.81	↓
20	Australia	Melbourne	57.60	↑



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Gateway to Asia

Singapore's position as the number one maritime centre remains secure for ninth consecutive year

Singapore is the complete package. Its location at the epicentre of cargo movements from east to west, coupled with its established ecosystem of professional global maritime services, good governance, ease of doing business and efficient port operations add up to retain its place at the top of this year's rankings.

Central to the rise of Singapore as a maritime hub is its port. Whilst its cargo handling throughput may not be as high as Shanghai's just over 4,000 km northeast of Singapore, its numbers still stand up.

In 2021, Singapore handled nearly 600 million tonnes of cargo, of which more than half – 363.7 million tonnes - were containerised. Last year it also achieved a personal milestone when it handled 37.5 million TEU.

Its location close to the South China Sea and Straits of Malacca offers Chinese and other Asian exporters a strategic route to western markets, and as a result a significant volume of the cargo is for transshipment.

The development of a new port in Tuas, slightly west of the main terminals' current location, is evidence that the Singapore government believes there is scope to further increase its market share in handling cargo in the already well-served region. Once complete, the new terminal will be able to handle 65 million TEU per year, with all container operations moving to the site in the 2040s.

The island nation is also the world's top bunkering hub. In 2021 there were 39,447 bunker calls by vessels. Bunker sales hit a four year high in 2021 with just under 50 million mt. 50,000 mt of LNG bunkers were sold in the same year. Singapore

imports more than two thirds of its oil from the Middle East where it is refined at one of three large refineries.

As a key node in the bunkers landscape, Singapore is a pioneer in low sulphur- and low carbon marine fuels- development and bunkering. As part of its Maritime Singapore Decarbonization Blueprint: Working Towards 2050 plan announced in March 2022, it will commit additional funds to the development of biofuels, methanol, ammonia and hydrogen. Further, as a low sulphur fuel, LNG bunkers have been available in Singapore since 2016.

Singapore is also a recent signatory to the Clydebank Declaration which aims to establish six green corridors where shippers, carriers and fuel providers cooperate to cut emissions and try out new sources of ship energy.

Further, in August last year public-private partnership, the Global Centre for Maritime Decarbonisation, was established between MPA and six founding partners with SGD20 million (USD85.4 million) funding available to pilot and deploy green fuels and technologies.

“The Centre will strengthen the translation of green technologies for deployment by partnering the industry and working with the research institutes on studies and pilot projects to implement identified decarbonisation pathways and create new business opportunities,” the Maritime and Port Authority of Singapore (MPA) told the Xinhua-Baltic ISCDI Report.

The Singapore Registry of Ships - to which 4,400 ships are registered and which ranks amongst the top 10 globally - is offering favourable fees for

low emissions vessels. In June 2022 Singapore's Maritime and Port Agency announced that ships using zero-carbon fuels, such as ammonia, hydrogen, as a primary fuel will receive a 100% reduction on the initial registration fee and 100% rebate on the annual tonnage tax until 31 December 2024.

Whilst the port may be the catalyst for Singapore's rise to become the most recognised shipping centre in the world, this has by no means been the only factor securing its position.

Trust is an important lubricant which facilitates the smooth functioning of any jurisdiction and earlier this year the Singapore Trade Data Exchange (SGTraDex) was launched with 70 participants. SGTraDex is a digital infrastructure that facilitates trusted and secure sharing of data between supply chain ecosystem partners. The platform's participants include bunker suppliers, cargo traders, oil terminals, traders, carriers and the port. It will initially be used for optimising bunkering, container logistics and trade finance fraud detection.

Often considered the place where 'east meets west', Singapore is an easy place in which to do business. It has a multicultural outlook and English and Mandarin are widely spoken. As such, Singapore's International Maritime Centre (IMC) has one of the world's highest concentrations of international shipping groups and has developed itself as a highly regarded centre for maritime services and law, which plays a crucial role in its top ranking in the Xinhua-Baltic ISCDI Report.

Asia's prolific growth as an exporting region has prompted most international shipbroking companies to have a presence in Singapore. And more than 30 marine insurance players have offices in the city-state, including Lloyd's syndicates and International P&I Group Clubs, offering direct insurance or reinsurance to all

sectors of the maritime industry. There are also around 60 licensed insurance brokers, many of which are marine specialists.

The country's Sea Transport Industry Transformation Map has been recently updated to drive industry transformation and "aims to grow the sector's value-add by SGD2 billion between 2020 and 2025," said the MPA.

Further, Singapore's legal framework is founded on the internationally accepted practice of English law and its roots go back to the days when it was a British colony. Consequently, Singapore is considered a choice jurisdiction for parties seeking impartial arbitration and resolution of maritime disputes. In more recent years, Singapore has established itself as a leading ship financing market. A number of large shipping finance institutions have established a presence there in acknowledgment of the shift from Europe to Asia.

Singapore is a forward-thinking country that recognises the need for continual investment in technology and digitisation as a key driving force to further enhance the maritime industry.

The Maritime and Port Authority of Singapore (MPA) has developed a plethora of initiatives including the Living Lab and PIER71 [see page 47]. Other initiatives to facilitate data sharing and transparency include the Singapore Maritime Data Hub (SG-MDH) - an online platform where industry can collaborate and integrate their systems; and its single window for regulatory transactions known as digitalPORT@SG™, and digitalOCEANS™ to foster interoperability between digitalPORT@SG™ and other digital platforms through the use of common data standards.

This small nation is a giant in the international shipping industry, and the continuous development of its port, and focus on decarbonisation and technology will continue to set it apart in years to come.

Maritime country profiles

"What makes a country a maritime nation?" asks Jan Hoffmann, Head, Trade Logistics Branch, UNCTAD

Throughout most of history, "maritime nations" had their own national fleets, which were built, owned, and manned by nationals of the same country whose flag the ship flew. Today, most countries specialise in but a few maritime sectors. A typical cargo carrying ship may well be built in Korea, owned by a German investment fund, operated by a Danish container shipping line, and fly the flag of the Marshall Islands. The crew may be Filipino on contract through a crewing agency in Cyprus. The ship may be classed by a society from Norway and be insured in London. Once the ship becomes too expensive to maintain, it will most likely be recycled in Bangladesh, India, or Pakistan. At the same time, maritime clusters still exist and in some aspects, we seem to see a return to "maritime nations" which have successfully managed to attract a range of companies that benefit from synergies between some maritime sectors.

UNCTAD publishes maritime country profiles for 230 economies. Each profile depicts key data on charts with:

Basic maritime statistics

- The market shares of the country in different maritime businesses.
- Merchandise trade
- Trade in transport and other services
- The national fleet
- Liner shipping connectivity
- Port calls and port performance

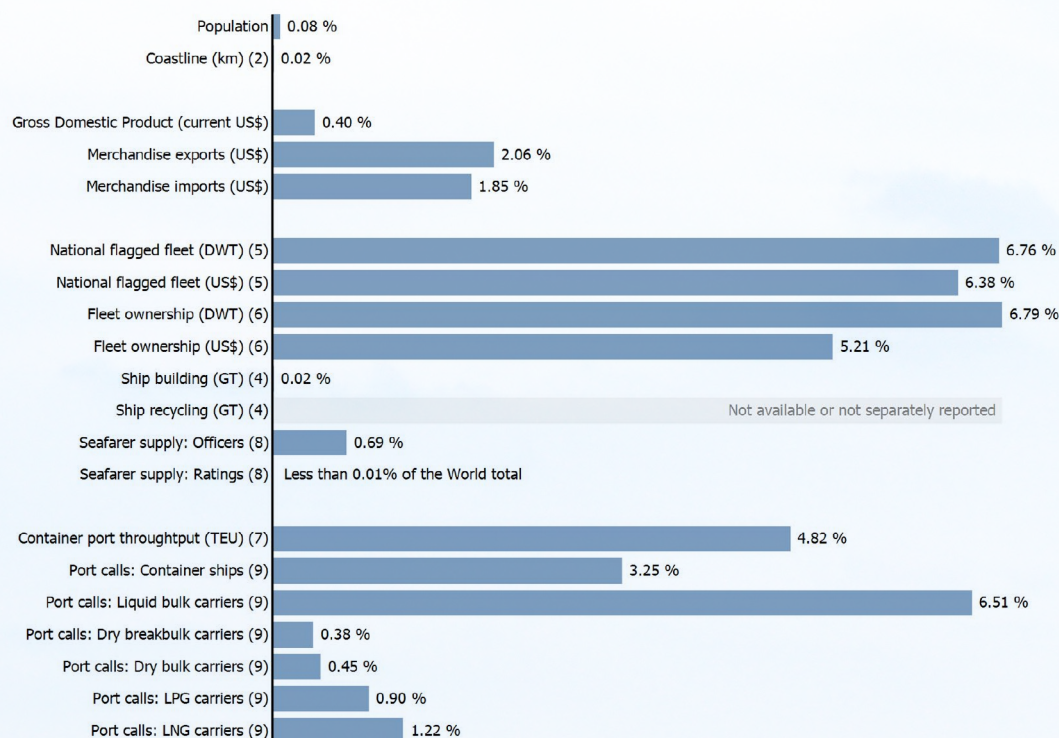


By way of example, Figure 1 depicts the market shares of Singapore in major maritime sectors.¹ A lot can be deduced from just one simple chart: First, the country is very rich: its share in GDP is five times the share of its population, i.e. its GDP per capita is five times the world average. The country has a merchandise trade surplus (higher share in exports than in imports) and is a very open economy (higher share in trade than in GDP). The fleet, both owned and registered in Singapore, has a higher share in tonnage (dwt) than in commercial value (USD). There is only minor shipbuilding and no ship recycling activity in the country.

Compared to its population, a relatively high share of Singaporeans works as officers, while only few ratings (crew) are from Singapore. The share of the Singaporean fleet is far higher than that of officers, from which we can deduce that Singaporean companies and Singaporean flagged ships employ mostly foreign seafarers. As regards port calls, the country has its highest market share in tanker arrivals, followed by port calls by container ships. The share in container port traffic in TEU is higher than the share of container ship arrivals, showing that the container port has high port call sizes, i.e. more containers are loaded and unloaded than the world average. The share in port calls is even higher than that of Singapore's foreign trade – a reflection of the importance of maritime trade and transshipment for the country.

¹ <https://unctadstat.unctad.org/CountryProfile/MaritimeProfile/en-GB/702/index.html>

Figure 1: Maritime Country Profile of Singapore



Other countries have very different maritime profiles.

Germany is one of the world's largest trading nations, but not all of its foreign trade is handled by its container ports, but rather by land transport with its neighbouring countries, and through seaports in the Netherlands and Belgium; Germany's largest market share in maritime services is in shipowning.² Greece also has its highest share in shipowning, followed by its share of the national flag fleet.³ India purchases ships for scrapping; many Indians also work as officers on foreign owned and flagged ships.⁴ The Republic of Korea specialises above all in shipbuilding.⁵ Malaysia provides transshipment services to international

² <https://unctadstat.unctad.org/CountryProfile/MaritimeProfile/en-GB/276/index.html>

³ <https://unctadstat.unctad.org/CountryProfile/MaritimeProfile/en-GB/300/index.html>

⁴ <https://unctadstat.unctad.org/CountryProfile/MaritimeProfile/en-GB/356/index.html>

⁵ <https://unctadstat.unctad.org/CountryProfile/MaritimeProfile/en-GB/410/index.html>

container shipping lines, and many Malaysians work as seafarers abroad foreign-owned and foreign-flagged ships.⁶ Marshall Islands has its highest market share in ship registration.⁷ Panama, too, is mostly known for its open registry; relative to its population and GDP, Panama also has a high market share in port traffic.⁸

The countries which are active across different maritime businesses are on average richer, i.e. they have a higher than average GDP per capita. The exception is ship scrapping, which takes place mostly in Bangladesh, India and Pakistan. The richest countries are those with shipowning interests, followed by those with high container port traffic and shipbuilding.

As countries specialise in different maritime businesses, the other side of the coin is concentration. The most concentrated sectors are shipbuilding, where the top three countries (China, Korea, and Japan) together account for 93 per cent of global production, and ship scrapping, where the top three countries (India, Bangladesh, and Pakistan) have a combined market share of 77 per cent. In shipowning, China, Greece, and Japan together control 41 per cent of global dwt, while in vessel registration, the top three (Panama, Liberia, and Marshall Islands) provide their flags to 43 per cent of the world fleet.

Some maritime sectors are more likely to be found in the same country than others. Countries that

provide many officers as seafarers are also likely to provide ratings. Countries with a high GDP per capita are also likely to be larger importers and exporters. The same countries are also more likely to record high volumes of containerised port traffic. Most maritime sectors, however, are more likely to be dispersed across different countries.

In past centuries, a maritime nation would benefit from synergies between the different maritime businesses. Shipowners would fly their own country's national flag and employ their own compatriots – all speaking the same language and being geographically close. They would find it easy to operate their ships, calling in their home seaports and having ships built and repaired in national shipyards. An experienced captain could find employment in maritime and port administrations or in classification societies that supervise shipbuilding. Steel from a recycled ship could be reused for new constructions.

In principle, these synergies are still valid today. However, other aspects have gained importance. There may be more synergies between shipbuilding and other industrial activities such as car manufacturing than between shipbuilding and shipowning. Labour costs and qualifications are of different importance for different sectors. Vessel registration is provided by countries that may also be active in offshore financial and other services. The clustering of insurance and legal services may be beneficial for trading and ship operations.

⁶ <https://unctadstat.unctad.org/CountryProfile/MaritimeProfile/en-GB/458/index.html>

⁷ <https://unctadstat.unctad.org/CountryProfile/MaritimeProfile/en-GB/584/index.html>

⁸ <https://unctadstat.unctad.org/CountryProfile/MaritimeProfile/en-GB/591/index.html>

London calling

The UK and London, an established centre for maritime service providers, has seen an uplift in government support and funding to expand its presence

London's right to sit at second place on this elite list of maritime centres is due almost entirely to the unparalleled capacity of its maritime professional services hub. Expertise in the UK capital can be found across shipbroking, maritime law, insurance and finance, and it is home to a number of international shipping bodies, including the International Maritime Organization (IMO).

According to statistics from the Baltic Exchange, headquartered in London, UK-based shipbrokers transact around 30-40 per cent of dry bulk and 50 per cent of tanker fixtures. The UK capital has a 30 per cent share of the global insurance market and 90 per cent of P&I cover is handled by clubs that have offices in the UK, says Maritime London, which promotes the UK as a place for international shipping to do business.

Its leading status as a legal centre is also unchallenged due to UK law being ubiquitous in maritime contracts and dispute resolution, in particular arbitration. The reputation of its legal systems is unsurpassed and 80 per cent of maritime-related cases heard in UK courts involve one or both parties based outside the UK.

"Our statistics still hold up remarkably well," says Jos Standerwick, CEO of Maritime London, "despite the fact that there is an enhanced focus on this [professional services] from other jurisdictions."

London's strength as a shipping services hub has been developed over the centuries, but it is not resting on its laurels.

In September 2021, the UK government set up a Shipping Concierge Service, whose sole purpose is to provide advice and support for shipping interests looking to invest in the UK and promote the UK's wares overseas as a destination for shipowning interests.

The concierge was set up in response to a report from Maritime London delivered during London International Shipping Week in 2019. Standerwick told the Xinhua-Baltic ISCDI Report that he knows of a "number of companies actively using the shipping concierge service at the moment and it's proving incredibly useful in terms of its engagement with government to make sure that they have their structures correctly constituted within the UK."

Also at government level was the March 2022 launch of a new campaign office to promote the UK maritime sector overseas, with particular focus on shipbuilding. The Maritime Capability Campaign Office will "work with industry and the government's National Shipbuilding Office to line up high-quality maritime trade opportunities for UK firms in the maritime sector looking to export worldwide," and will invest GBP 4 billion (USD 5 billion) into the shipbuilding sector, said the government in a statement.

This government support, combined with the finance aligned to it, "will really help us compete with some of the jurisdictions who have historically enjoyed that government support, particularly when it comes to their overseas engagement," said Standerwick. "And again, I think that's a real significant shift in the way the UK promotes its maritime businesses overseas and also looks to win inward investment."

He is optimistic about the possibilities to bring more shipowning businesses to London.

Whilst a number of shipowning interests have left the UK, many still retain a commercial management footprint in the UK, and "that's something we sometimes forget," he asserts. "If you go to the West End [of London] nowadays, there are a number of asset managers with significant shipowning portfolios that choose London as a base. That's a real growing demographic within the UK and that's sort of area that should be of genuine focus moving forward."

Maritime London is actively looking at the ways in which the UK government can provide assurance to investors seeking to fund zero-carbon tonnage and infrastructure in the form

of a number of government-based incentives. He says, "Once we get that in place, we can become a really attractive jurisdiction store for shipowning interests, particularly given the cluster of professional services which already exist in the jurisdiction."

Also part of the government's shipbuilding strategy is UK Shore, an office set up in March 2022 dedicated to making shipping greener through new technology that the UK government hopes "could make journeys by sea as green as they were hundreds of years ago." With GBP 206m (USD 260m) earmarked for investment its remit is to support the transition to greener and cleaner ships and ferries, support zero emission sailing and create skilled maritime jobs.

It is part of a broader set of efforts to position the UK as a leader in shipping's decarbonisation efforts. Standerwick looks to members of Maritime London, many of whom are embracing decarbonisation and not only from a government or internationally mandated level, but also from a commercial standpoint. "I think that's really encouraging for the future," he concludes.

Further downstream

Port of London may be small in comparison to the mighty ports of Singapore and Shanghai, but it is the largest in the UK and of significant logistical importance to the area that it serves. Situated outside of London downstream on the Thames River, it handles around 45 million tonnes of cargo each year through its 70 independently owned terminals and port facilities. It employs around 40,000 people and contributes over GBP 3 billion (nearly USD 4 billion) to the UK economy each year.

Shanghai aims high

The east coast port city is creating an attractive environment for new and established maritime businesses to flourish

Over the past five years, Shanghai has risen from fourth in the rankings in 2018 and 2019, to sit at third, when in 2020 it jumped ahead of Hong Kong.

Its place in the top three is well deserved. Over the past 20 years the city has established itself as an international maritime hub and boasts the busiest port in the world. Located at the mouth of the Yangtze River, the port's 2021 container throughput exceeded 47 million TEU with overall cargo handled of nearly 540 million tonnes.

It has an attractive business environment and, according to the Shanghai International Shipping Center (SISC), most of the more than 3,000 shipping-related enterprises are located in the recently redeveloped North Bund region of Shanghai.

The Shanghai International Shipping Institute (SISI), an international research body affiliated to Shanghai University, told the Xinhua-Baltic ISCDI Report that the Chinese government has issued many policies to support Shanghai's growth as a maritime centre. In particular it has seen infrastructure investments and business-conducive policies put in place since 2011, when the reinvention of Shanghai began in earnest. Policies include those related to the Shanghai

Pilot Free Trade Zone, which opened in 2013; and foreign investment opportunities. Shanghai is not just a port and business centre, but also an important location for shipyards and marine technology innovation. In 2021 the China State Shipbuilding Corporation (CSSC) and Shanghai municipal government signed a co-operation agreement to strengthen development of the maritime sector in Shanghai, highlighting the strong link between ship and offshore engineering research and development, manufacturing, testing and port machinery manufacturing.

The maritime centre's large port, good supply chain connections, growing shipping cluster and good service are amongst the key strengths of Shanghai as a maritime centre, says SISI. The government has a number of initiatives underway to retain and encourage new businesses to the region, including development programmes and policies for innovative enterprises.

As a relatively new maritime centre on the global stage, Shanghai is placing great emphasis on the role of technology to enable its growth and recognises that this will disrupt certain aspects of the industry and generate new ways of working. Port, shipping and supply chain companies already cooperate in data and information exchange, SISI said.

It is also looking to technology to reduce emissions from shipping, including clean energy supplies for ships and clean energy in ports. These projects link with the July 2021 introduction of the national emissions trading system, so far only applicable to power plants, in line with the country's plans to cap emissions by 2030 and be climate neutral by 2060. In 2021 Shanghai also announced that it would be co-operating with Los Angeles and a network of shipping companies and cargo owners to create the Green Shipping Corridor Implementation Plan to transition to low, ultra-low and zero-carbon fuelled ships within the decade, as well as reduce supply chain emissions from their port operations.

SISI believes that location continues to matter in a shipping centre, and is driven by where the goods come from, and where the demand is. Beyond that it recognises that whilst professional services can be located away from physical shipping infrastructure, it is advantageous to the customer to be close to the market to make face-to-face communications easier. However, it notes that COVID-19 has demonstrated that most businesses can continue to function with minimal in-person contact.



Outside the top three...

At the centre of shipping

There is no quick win or sure-fire solution to becoming a successful maritime hub as the rest of the top 10 in the Xinhua-Baltic ISCDI Report reveals. Many of the top 10 shipping centres have matured over the centuries whilst others have defined themselves out of necessity. Either way, these first-class hubs all excel in slightly different ways.

Number four - Hong Kong

Hong Kong port's throughput numbers may be on a downward trajectory but this historic trading hub is still very much in the game at number four. Conveniently situated on the Pearl River estuary and only 50 km from China's third most populous city, Shenzhen, Hong Kong is a gateway for primarily containerised trade between mainland China and the rest of the world.

The city has nearly 900 operating maritime-related companies, covering marine insurance, maritime legal and arbitration, ship agency and management, broking and leasing. It has a competitive tax regime, and a reputation as an international business and finance centre. Together these attributes augment Hong Kong's long-term outlook as a competitive international maritime hub and justify its high score in the Xinhua-Baltic ISCDI Report ranking.

Handling nearly 17.7 million TEUs in 2021, a fraction less than the nearly 17.8 million TEU the previous year, Hong Kong Port lists as amongst the busiest container ports in the world.

Tax concessions are also being considered by the Hong Kong Maritime and Port Board (HKMPB), that would provide specific shipping commercial principals - such as ship managers, ship agents and shipbrokers - with a 50 per cent reduction on the regular 16.5 per cent corporate tax rate. The same tax break was introduced in March last year for qualifying ship lessors and ship leasing managers.

Importantly, the central Chinese government is continuing to proactively develop Hong Kong's ties with the Greater Bay Area ports, to leverage the individual ports' respective complementary strengths.



Number five - Dubai

Strategically situated on the Gulf of Oman, Dubai is a relative newcomer in this list of predominantly centuries-old maritime centres. This UAE city, initially built off the back of the region's oil industry, has heavily invested in infrastructure, which has in turn attracted business and tourism. Today, maritime plays an important part in Dubai's diversified mix of industries.

It has a lot to shout about with its established ports including DP World-operated Jebel Ali and Mina Rashid, and purpose-built Dubai Maritime City - a 2.5 km² site developed in 2004 and situated between Mina Rashid and Dry-docks World. The latter also includes a free trade zone offering tax relief, and this, combined with a 2020 UAE decision to enable foreign ownership of certain maritime businesses, furthers its ambitions to position itself as an attractive option for international business and investment.

Dubai offers a number of different locations in which to do business, including, free zones, industrial areas and commercial buildings. "There are number of free zones that allow 100% foreign ownership of businesses. Mainland business regulations allow full foreign ownership in 122 economic activities across 13 sectors and offer 100% profit repatriation," Dubai Maritime City Authority told the Xinhua-Baltic ISCDI Report.

Further, in February 2022, Dubai Maritime City announced a USD38m plan to invest in roads and infrastructure to better integrate the maritime city and attract more businesses.

"The major upgrade to the roads and infrastructure at Dubai Maritime City is part of our efforts to support the Dubai Maritime Vision 2030, which aims to develop, regulate and enhance the local maritime industry and strengthen Dubai's position as a world-class, premier international maritime hub," said Mohammed Al Muallem, Executive Vice President, DP World at the time of the announcement.

Number six - Rotterdam

Rotterdam port is the largest in Europe and central to container transshipment handling in the region. Its deepwater port has also enabled the port city to position itself as a leader in the crude oil storage and logistics space, as well as supporting a burgeoning petrochemicals industry.

Of the nearly 469m tonnes of cargo handled in 2021, nearly half of this trade relates to energy products. In the same year it also handled 15.3 million TEU, a record for Rotterdam.

Its location on the Meuse River, and enviable network of rail, river and road networks enable it to reach central Europe and the Black Sea.

Rotterdam is much more than a thriving cargo handling centre. The Dutch port city has carved itself a position as an influential shipping hub and offers access to financial institutions, accountants, brokers and technology specialists.

The port and the city together have ambitious targets to modernise shipping and has placed great weight on sustainability and innovation to achieve its 2030 goals.

The port is a pioneer in sustainable operations and has set a target to have reduced CO2 emissions by 55 per cent and be CO2 neutral by 2050. By the same year, 2050, it also aims to be a circular economy port, and an international waste-to-value port. It has become a fast-growing manufacturing and logistic hub for the offshore wind sector, and also a substantial producer of wind energy.

Rotterdam hosts the largest biofuel cluster and the largest carbon capture and storage project in Europe. It has been instrumental in developing LNG as a marine fuel and actively offers the low-sulphur fuel to vessels via truck. According to the port, more LNG-fuel infrastructure will be added as demand grows.

Its maritime cluster is also working to develop a network for the exchange of hydrogen, including blue hydrogen, steam, CO2 and other energy resources so that together it can develop a greener energy stream.

Number seven - Hamburg

Hamburg is a historical shipping city with a very modern outlook. Its port and maritime community offer classic German efficiency, combined with a pragmatic approach to shipping's digitalisation and decarbonisation evolutions.

Germany's shipping fortunes took a significant dip following the financial crisis of 2008, but the country remains a strong player in container shipping and has held its own at the number seven spot for the past five years. According to Germany's Federal Ministry for Digital and Transport, the country has around a 30 per cent international market share of the container shipping sector and its shipping industry overall represents an annual turnover of more than Euro 50 billion (USD 54 billion).

The German Shipowners Association's (VDR) new president Gaby Bornheim, said of shipping as a whole, but especially in Germany: "Small and medium-sized shipping companies in particular have been economically weakened after more than 10 years of crisis, and they will need more than just one year of positive returns to be able to financially shoulder the challenges of the future, especially when it comes to making the needed investments, such as for climate protection. Given the encouragingly positive developments in the container markets, we are now starting to see the first signs of the calm after the storm."

Home to the world's largest classification society, DNV GL, and still with a presence in ship financing, building and broking, Hamburg is the nation's biggest maritime city and home to its largest port, and third largest port in Europe after Rotterdam and Antwerp. Port of Hamburg enjoyed a positive 2021, with 128.7m tonnes of cargo handled - nearly two per cent more than 2020. Included in this figure were 8.7 million TEU containers, representing a 2.2 per cent increase on the previous year.

To improve its efficiency and support emissions and pollution reduction, the port authority has also invested in digital intelligence. Coined as the smartPORT, the technology adopted at Hamburg includes sensor technology, analysis, forecasting and information systems.

Number eight - New York/ New Jersey

Sitting on the estuary of the Hudson River and with a hinterland reach of 134 million consumers within 36 hours, the Port of New York and New Jersey is the third largest US port and the largest on the US east coast.

New York/ New Jersey is the only US maritime region, to make it into the Xinhua-Baltic ISCDI Report's top 10, and this year deprived the mighty bulk shipping hub of Athens/ Piraeus to take the number eight spot.

In terms of throughput in the US, New York/ New Jersey is eclipsed only by the port of Los Angeles, the biggest US port which achieved 10.7 million TEU in the same year, and Long Beach, with nearly 10 million TEU, both on the US west coast.

New York/ New Jersey, meanwhile, handled nearly 9 million TEU in 2021, an increase of 18.5% on the previous year. This uptick in volumes was mainly due to congestion on the US west coast, which led logistics companies to move their cargoes through other ports. These high throughput figures are the main reason it climbed up one place in this year's ranking.

New York is the country's largest city by population and is the world's leading financial centre. Its place in the top 10 is due to its successful maritime services hub offering world-class financial services, law and arbitration, insurance, broking, cargo handling and freight forwarding. Further, the New York Stock Exchange lists more maritime companies than any other exchange.

According to the 2020 New York Shipping Association (NYSA) Economic Impact Study, the port supports more than USD 99.5 billion in business activity.

The Port Authority of New York and New Jersey works closely with the Economic Development Corporations of both New York and New Jersey to identify new businesses and new opportunities for the port. "If an organisation is starting up or looking to move into the New York/New Jersey area, we work closely with them to identify options for their importing and exporting needs," the port authority told the Xinhua-Baltic ISCDI Report.

Number nine - Athens/Piraeus

Greece is synonymous with shipping and the biggest shipowning nation in the world. Its capital, Athens has a strong maritime heritage going back to antiquity and today is a hub for shipowners and managers with businesses ranging in size from fleets of one ship to 100+.

This great shipping nation dropped one place in this year's Xinhua-Baltic ISCDI Report, to be overtaken by New York/ New Jersey. Its place in the top 10 remains secure, however, due to the high concentration of owners that operate in and around Athens and Piraeus. Around 20 per cent of the world fleet is controlled by Greek businesses, and according to the Union of Greek Shipowners, it controls around 30 per cent of tankers, 20 per cent of bulk carriers, and 15 per cent of both the chemical and product carriers and LNG/LPG fleet. It's not only involved with the tramp and bulk business, as today it also owns nearly 10 per cent of containerships.

The Greek maritime cluster has grown organically over the centuries, but in 2016 Maritime Hellas was created, to augment and officially represent the cluster. An entrepreneurial approach to business, so essential in shipping, is now spilling over into Athens' thriving maritime tech hub.

The port city is spawning numerous young businesses all geared towards supporting the next generation of shipping, including MarineTraffic, DeepSea, Metis, Signal Group and Harbor Lab. This scene has been supported in recent years by venture capital and investment funds. These new companies can recruit from Athens' talent pool of graduates from the universities of Athens and Piraeus, both of which offer specialist shipping courses.

On the Saronic Gulf, 14 km from the city of Athens is the Port of Piraeus, Greece's largest port, and one of the biggest on the Mediterranean Sea. The COSCO majority-owned port had a bumper year in 2021, when it achieved its highest profits in history. According to the Piraeus Port Authority, compared to the previous year, it handled 13.9 per cent more TEU, and 40.6 per cent more vehicles moved through its car terminal. In October 2021 COSCO increased its stake in Piraeus to 67 per cent and announced that it would further expand its investment, increase its input of resources and launch new shipping routes to build the port into a regional logistics distribution centre.

"The company aims to help the port of Piraeus strengthen its position as a major port in the Mediterranean and become an important bridge of civilization, economy and friendship between China and Greece under the Belt and Road initiative," said COSCO.

Number 10 - Ningbo Zhoushan

This Chinese port crept into the top 10 last year. Its place in this list is almost entirely due to it being the third busiest port in the world in terms of cargo handling, following Singapore and Shanghai.

In 2022 Ningbo Municipal Transport Bureau launched a scheme to help to set up more shipping companies in the city and support existing line operators to expand their capacity and business. Start-ups will receive a bonus of up to Yuan500K (USD75K) from the government. Ningbo will also raise subsidies for carriers who increase their capacity by building or chartering new vessels. Dry bulkers, containerships and tankers carrying dangerous goods are covered by the policy. The city is also offering incentives of Yuan500K to carriers whose cargo volume of international trade increased by 20 per cent year on year.



Still standing strong

Number 11 - Tokyo

Once again the Japanese port of Tokyo narrowly missed out on featuring in the top 10. Japan's focus on technology may reap rewards in the future, however, as the island nation aims to become a hub for LNG bunkers. Japan is the world's largest importer of the low sulphur fuel, and its ports rank among the largest in the Pacific Ocean, handling around 100 million tonnes of cargo a year. Its strategic location, along with its familiarity with the super chilled transition fuel, could boost its ports to greater heights.

It is also moving forward with the possibilities of autonomous shipping and successfully completed a project in Tokyo Bay - one of the world's busiest shipping routes. The 204 TEU containership, Suzaku, sailed between Tokyo Bay and Tsumatsusaka port in Ise Bay on Japan's southeast coast as part of the Nippon Foundation's Meguri 2040 project.

Number 14 - Antwerp-Bruges

Antwerp remained at number 14 this year, following a jump in 2020 to number 16. A 2022 merger with Port of Zeebrugge to create Antwerp-Bruges makes the Belgian port an even more significant rival to Rotterdam (see page 28).

Already a significant chemical cluster, Antwerp is positioning itself for great things not only through its port but as a centre for digital innovation, especially in relation to Internet of Things (IoT) and artificial intelligence (AI). It is a growing start up hub, with much focus on the technology to support the port and city's sustainability agenda.

The port city adopted the ambitious Climate Action Plan 2030 at the end of 2020 and similar to Rotterdam, it aims to reduce carbon emissions by 50-55 per cent by 2030 and become a climate-neutral and climate-proof city by 2050.

The undecided

A position amongst the top ten maritime cities is hard won. All of these locations fight to remain on top and attract talent, cargo and businesses. There was little movement amongst this year's rankings, and within the top 10 only New York/ New Jersey flipped with Athens/ Piraeus to take the eighth spot.

It's not until number 18 when changes start to be seen, with Copenhagen, Denmark going up one point to 18, pushing Los Angeles down by one.

With the West's insatiable desire for Chinese-produced products, it's no surprise that of the 43 shipping centres that were assessed, eight are in mainland China.





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Port mergers: an emerging trend

To the casual onlooker the ports of Los Angeles (LA) and Long Beach (LB) make natural bedfellows. The two ports have collaborated on many activities over the years including the well-publicised Clean Air Action Plan and Clean Truck Program. In 2020, the San Pedro Bay duo went one step further and signed an MoU to "strengthen collaborative measures in the areas of cargo movement efficiency, connectivity, workforce development, cybersecurity and metrics," said Port of LA in a statement.

However, LA and LB remain fiercely competitive and there are no signs that the pair will be tying the knot and merging anytime soon. LA's attempts over the years to woo its neighbour have been brushed aside, and so their relationship seems set to remain a collaborative one.

Elsewhere in the world, however, ports have been taking the next step and fully merging their enterprises.

The Belgian ports of Antwerp and Zeebrugge finally merged in Q1 this year and now operate under the name of Antwerp-Bruges. The merger is a result of co-operation talks that started in 2018, that now sees 80.2 per cent of the port owned by the City of Antwerp and 19.8 per cent owned by the City of Bruges.

The two ports complement each other with the coastal port of Zeebrugge handling a variety of

cargoes, including natural gas through its LNG hub. The Flanders port is prominent in the ro-ro and passenger ferry space and in 2021, handled over 2.2m new cars.

Meanwhile, the river port of Antwerp is situated approximately 91 km inland on the River Scheldt and reaches its hinterland through a network of railways, roads, rivers, canal waterways and pipelines.

As Belgium's largest port, and the second largest in Europe after Rotterdam, it handled more than 12m containers in 2021 and around 11.5m tonnes (excluding ro-ro cargoes) of break bulk cargoes.

The Port of Antwerp-Bruges told the Xinhua-Baltic ISCDI Report that the merged entity allows for "a faster and better response to challenges such as economies of scale, energy transition, innovation and digitalisation."

As one team, however, Antwerp-Bruges positions itself as a worthy contender to rival Europe's largest port - Rotterdam in the Netherlands. Container throughput figures from 2021 support this argument, with Rotterdam handling 15.3 million TEU and Antwerp and Zeebrugge combined handling 14.2 million TEU in 2021, with only a little over a million TEU between them.

Three French ports also amalgamated in June 2021, when Le Havre, Rouen and Paris came

together as Haropa Port - now the largest port complex in France - surpassing Marseille Fos on the Mediterranean.

Spread over three locations, Haropa Port offers easy Atlantic Ocean access via the English Channel, and links to international markets through its east coast port of Le Havre. France's northern hinterland is reached by the River Seine, with Rouen situated about 90 km upriver, and Paris and its vast consumer catchment area, a further 112 km inland.

Commenting on the merger, Haropa Port said: "France's central government has provided this new port complex with massive financial underpinning of Euro 1.45 billion [USD 1.52 billion] for the years 2021-2027 to allow the funding of numerous ambitious projects for development and redevelopment of port facilities."

China, meanwhile, is in the middle of a port consolidation plan that aims to reduce competition and better align resources. To date, activities include the 2019 integration of Liaoning Port, which includes Dalian, Jinzhou and Yingkou ports as a result of an earlier merger into state-owned port company China Merchants Group.

That same year, Shandong Port Group took ownership of Qingdao, Yantai, Rizhao ports. Further, COSCO Shipping Ports entered into an

agreement with Tianjin Port Holdings and China Merchants to merge Tianjin's container terminal assets - Tianjin Port Container Terminal Company, Tianjin Five Continents International Container Terminal Company and Tianjin Orient Container Terminal Company.

These activities are taking place against a backdrop of increasingly closer ties between Hong Kong and the Greater Bay Area on the mainland.

China's aims to reduce competition within its regions by bringing together its ports, is in line with Antwerp-Bruges and Haropa ports' rhetoric of 'being stronger together'. The argument to reorganise these facilities' activities to form a more streamlined, cohesive approach to moving trade, is compelling.

The ports of LA and LB, however, stand proud as individual and competitive entities, who get the best of both worlds - a neighbour with similar challenges with whom to collaborate, and some healthy competition to keep prices low and service quality high.

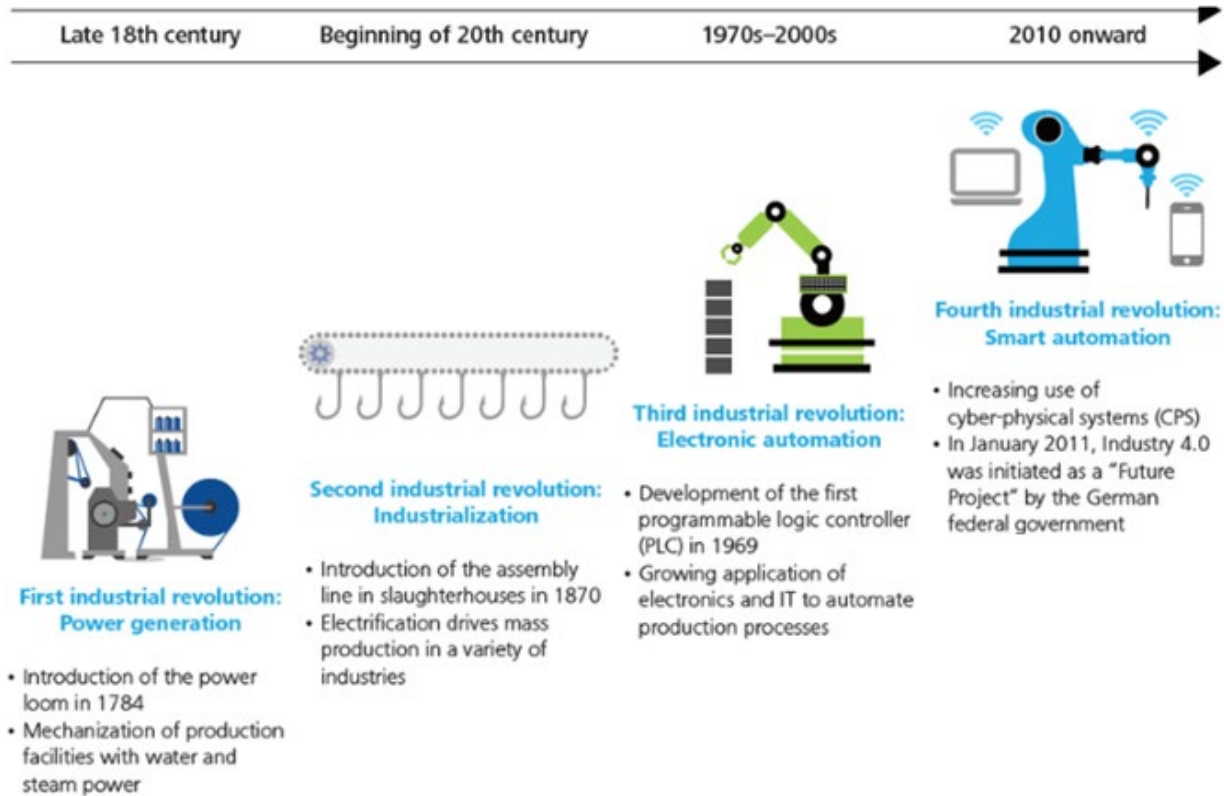
Wave of port digitisation

Indra Vonck, a senior manager at Deloitte Port Services, looks at how AI enabled technologies are being used around the world

Ports are part of larger transport and logistics supply chains and are in themselves clusters of companies and businesses active in a variety of marine related activities. Over the past three to five years we have seen a wave of digitisation initiatives and automation programmes hitting the industry. Examples include automated terminals, cargo platforms, smart energy grids, and various other Internet of Things (IOT) related implementations. This stems mostly from a pressure on efficiencies induced by a professionalisation and scale increase in the adjacent industries such as container shipping and logistics, requiring ports to become smarter in managing traffic flows and focussing on better utilisation of infrastructure.

In addition to the pressure on efficiencies brought on by the clients and other linked sectors, the push for ever greener and "smarter" operations by adjacent stakeholders such as communities and city authorities is also a major contributor to the digitisation of ports. Both the regulations such as the Green Deal Fit for 55 package, a proposal for EU regulation to set climate goals for all member states, and community pressure forces ports to be as smart as possible, and what is smarter than Artificial Intelligence (AI)?

We can now confidently say that the port industry is slowly entering the fourth industrial revolution, where AI-enabled technologies are being increasingly used to generate efficiencies and disrupt the remaining pockets of "traditional port management". To keep with the nautical theme, oceans of data are being generated each second within every organisation. Humans alone cannot extract the full value of data without the aid of AI and analytics solutions to unravel its complex relationships and generate the insights to help transform business.



Within the port industry and port ecosystems AI can potentially:

- Generate new levels of organisational excellence and efficiency.
- Allow for real-time predictions and insights that drive smarter decision-making.
- Build capabilities to create whole new lines of AI-driven products.
- Facilitate intelligent automation that detects and eradicates errors and inefficiencies, streamlines processes, and improves customer experiences.
- Free a workforce from repetitive, mundane tasks.

The benefits ascribed above can be witnessed in multiple use cases. Some of the world's biggest ports, notably Rotterdam, Singapore, Rotterdam and Hamburg, are using the same AI tools to improve business operations. One of the most prominent examples is the port of Antwerp's solution to combat port congestion. The port, already an innovator in its field and keen to use new technologies, had invested in a digital 3D version of its docks simulated in real-time. However, the system still relied heavily on manual operations due to limitations of current localisation technology.

In a collaboration with Deloitte and Spectrum, existing camera infrastructure is used as vision sensors, in combination with the Automatic Identification System (AIS) of ships coming into the port. The amount of data to be processed is simply too vast for a team to manage. AI is the perfect tool to provide machine learning and image recognition capabilities in order to get an exact overview of what is happening in the port at any time of the day or night.

The case above is one of many. AI platforms can predict failure of critical infrastructure based on usage, risks in supply chains based on real time events, future equipment needs, long term yard utilisation, container damage, number of gate visits etc. Essentially, with the help of AI, ports could process their data to help them to make accurate decisions, plan for shipping arrival and departure times and optimum storage solutions, and quickly load and unload containers and cargoes from ships. The possibilities are literally limitless.

As with any technological development those who prefer the status quo find the process daunting and often see more risks than benefits. However, we see that (not just in the port industry) forward-thinking organisations use AI as an opportunity to grasp the future and mould it to their competitive advantage.

Does that mean that each port must implement AI capabilities? As with any digitisation programme the answer is no. Each port, terminal or organisation is different and should be aware of exactly what they need and where best the technology can be utilised. For some organisations, introducing artificial intelligence begins tentatively with explorations of select enterprise opportunities and a few interesting use cases. While testing the waters this way may deliver some benefits, it likely won't be enough to make the port or terminal a market driver (rather than a follower).

To become a true AI-fuelled organisation, a port may need to fundamentally rethink the way humans and machines interact within operational and strategic environments. Executives should also consider deploying machine learning and other cognitive tools systematically across potential core business processes and enterprise operation to support data-driven decision-making. Likewise, AI could drive new offerings (just in time port call platforms), business models (new pricing tools) and many others. These are not minor steps, but as AI technologies standardise rapidly across industries, becoming an AI-fuelled organisation will likely be more than just a strategy for success.

Container rates: expect turbulence

The container shipping market has seen unprecedented turmoil over the past year, and the coming year is likely to be equally fraught with challenges.

Before looking at the developments in the year ahead, it is important to get a sense of where the market is and why we are where we are.

Looking at freight rate development over the past year, there are no words to describe how extreme the development was at its apex. A few examples with numbers describe the situation better than words.

According to the Freightos Baltic Index (FBX), rates on the FBX 1 Asia to US West Coast route climbed above USD 20,000 per 40 ft container (FFE) whereas previously the rate level was typically around USD 1,500/FFE and only in extreme cases went significantly below USD 1,000 /FFE or above USD 2,000/FFE.



FBX 1: Box rates China/East Asia to North America West Coast June 2021 - June 2022

In the past year, container vessels were at times chartered in at rates exceeding USD 150,000/day – where the same vessels before the pandemic had commanded a charter rate of USD 6-10,000/day.

Vessel reliability became so poor that on the Pacific, more than 90 per cent of the vessels were delayed, and at its worst the average delay was 19 days per vessel. The average transportation time from when the cargo was ready at the exporter in China until the customer took delivery in the US went from 45 days to 112 days.

The underlying reason for this is to be found in the combination of several events. The pandemic itself had led to a series of lockdowns and re-openings which caused severe bottlenecks in the supply chain along with problems in repositioning empty containers in the correct locations. US consumers shifted spending away from services and onto goods leading to a large and sustained boom in imports which in turn overwhelmed

the port and inland infrastructure's ability to handle the sharp growth in volumes. The blockage of the Suez Canal led to ripple effects triggering congestion in European ports. These elements all work together to create severe capacity shortages in the supply chain.

The capacity shortages meant that over the past year, there has been more demand than capacity which in turn drove freight rates to new extremes. In essence, this is how pricing works in an open market. If there is insufficient capacity and no ability to bring additional capacity to the table, then prices will increase until demand is reduced to match capacity. This describes the dynamics over the past year – and especially the extreme peaks seen in the later parts of 2021.

Looking forward, the market is going to be equally turbulent with a range of existing as well as new dynamics coming into the equation.

Right now, in May 2022, there is a major uncertainty as to the short-term direction of the market. The re-opening of Shanghai is expected to cause a surge of export cargo, and this is likely to also coincide with an early onset of the peak season. The bottlenecks and delays in the supply chain have not been resolved and hence it is likely that the peak season might experience the same problems as we saw in 2021.

But there is also a very different scenario with the potential to play out in the near term. Rising inflation and fuel prices, augmented by the Russia-Ukraine conflict, is leading to concern that consumers are about to reduce their spending significantly. Should this happen, it will quickly lead to inventories rising to unsustainably high levels and importers will cancel production orders. This in turn will lead to plummeting demand for container shipping triggering cancellations of sailings and declining freight rates.

These two scenarios are clearly very different and the problem for market participants is that both of these are very likely outcomes and hence risk management for the second half of 2022 becomes paramount.

Should the stronger scenario turn out to prevail the market is still likely to then begin a decline back towards normality once the peak season of 2022 is over. This means a development where freight rates will decline back to a new normality and bottlenecks will be gradually resolved during 2023.

2023 will see the injection of 9 per cent new capacity owing to the many new vessel orders placed by the carriers in 2021 and lead to plenty of capacity being available on the main deep-sea trades. However, we will also see the new environmental rules, IMO 2023, implemented which will mainly impact the smaller vessels. This in turn will skew the market such that some places might still see vessel capacity shortages for shortsea and feeder trades as the new vessels being delivered are predominantly large vessel unsuitable for smaller trades.

Finally, the gradual return in 2023 to normality will of course also lead the carriers to revert to more normal profitability levels. During this process there will be friction between alliance members as the carriers do not have the same strategic ambitions. A misalignment in strategic ambitions impedes the ability to effectively operate in an alliance. It is very likely that this will lead to a break-up and subsequent re-assembly into new alliance constellations different from what we know today. These new constellations are therefore likely to come into play from spring 2024.



Drewry oil and LNG outlook for 2022 and beyond

Positive outlook for FRSUs, Aframaxes and Suezmaxes, writes Drewry's managing director, Tim Powers

The world is facing increasing uncertainties in 2022. Key themes include the Russia-Ukraine conflict, uneven recovery from the pandemic, tight energy markets and a spike in inflation in Western economies. Global post-pandemic economic growth is expected to slow due to the effects of the ongoing Russia-Ukraine conflict, constraints to production and reduced demand arising from 'zero-Covid' strategies and strict lockdowns in major cities, dampened consumer demand and business confidence due to elevated inflation and tightening monetary policy.

Maritime Sector Business Environment: Stormy Weather



Crude Tanker

The ongoing Russian-Ukraine conflict and lockdowns in major cities have led to severe demand destruction in the oil market in 2022. Before the conflict, the market was expecting a recovery in oil demand and the



unwinding of supply curbs by OPEC+ this year. However, soaring oil prices, slowing economic growth and lockdowns are likely to curb global oil demand growth by 1% in 2022. Global oil demand is now likely to return to pre-Covid levels in 2023 instead of 2022. In the long run, we expect oil demand growth to decelerate after 2023 with a progressive shift towards demand towards clean energy. Although oil demand in developing countries will continue to increase, in developed countries consumption will reduce after 2023. Global oil consumption is expected to improve at a CAGR of 1.0% between 2022 and 2027 to about 105 mbpd (million barrels per day).

Despite current demand destruction, the oil market is expected to be in short supply this year, as Russia will be forced to reduce production because of weak demand for its oil in the domestic as well as international market. As one of the world's top three crude producers, Russia has

been a significant supplier to Europe. In 2021, 14% of Europe's crude oil imports came from Russia, which accounted for 58% of Russia's total exports. As the European Union (EU) is turning away from Russian oil and even contemplating a complete ban on Russian imports by the year-end, the decline in Russia's oil production will deepen from about 1 mbpd in April to 3 mbpd by July 2022. Although oil supply from Middle East OPEC+, the US and Latin America will rise this year, it will be insufficient to fully replace the lost Russian volume and meet the incremental demand, forcing further inventory drawdown. OECD inventories are already 300 million barrels below the five-year average. Deflated oil demand and inventory drawdown will thus decelerate the global crude oil trade in 2022.

The Russian-Ukraine conflict has altered the patterns of the global oil trade. European buyers will replace the short-haul imports of Russian crude from the Black Sea and Baltic Sea with imports



from the Middle East and the US, benefitting Aframaxes and Suezmaxes. On the other hand, Russia will sell a part of its surplus crude to Asian buyers with price discounts. As most of this trade will be served via the Black Sea ports, it will again benefit smaller crude takers. Total crude oil exports from Russia are likely to decline from 239 million tonnes in 2021 to 160 million tonnes in 2022. VLCCs will suffer if Russian crude exports reduce the share of Middle Eastern crude in the Asian market. Moreover, as more US crude will move to Europe, it will decrease the share of US crude in Asia, hurting demand for the large crude tankers.

The crude tanker market is currently oversupplied with strong tonnage growth in 2022 and weak demand. However, a small orderbook of 6.4% of the fleet and the expected slowdown in fleet growth after 2022 is likely to ease the supply burden from the market. After strong growth of 2.1% in 2022, the crude tanker fleet will increase at

a modest 0.9% per annum during 2023-27. While weak ordering over the next couple of years will curb deliveries, the upcoming decarbonisation rules will force owners to scrap old and inefficient vessels. Crude tankers have already reduced speed now because of the demand weakness and high bunker prices. The ongoing slow steaming is likely to continue next year to comply with the upcoming EEXI(Energy Efficiency Existing Ship Index) and CCI(Carbon Intensity Indicator) regulations, which will come into force from January 2023. Slow fleet growth coupled with reduced vessel speed will cap the growth in tonnage supply in the following years and assist with the supply-demand balance in the trade.

LNG shipping

LNG prices are highly volatile in 2022 due to uncertainty created over future Russian gas supply into Europe. In 1Q22, Asian spot LNG averaged USD31 per MMBtu(Metric Million British Thermal Unit) while the Dutch TTF averaged USD33 per MMBtu. TTF(Title Transfer Facility) prices have remained at a premium to the Asian spot price as Europe needed to attract LNG cargos into the region. Meanwhile, US Henry Hub gas prices have soared to record high level due to increased US LNG exports to Europe. European gas storage volume remains low at 26% of capacity as of end March 2022, while the EU is targeting its storage to be 80% utilised by 1 November 2022. The low storage volume, potential Asian demand rebound, and the possibility of sanctions on the Russian gas supply and damage to pipeline infrastructure will mean that volatility in LNG prices persists.

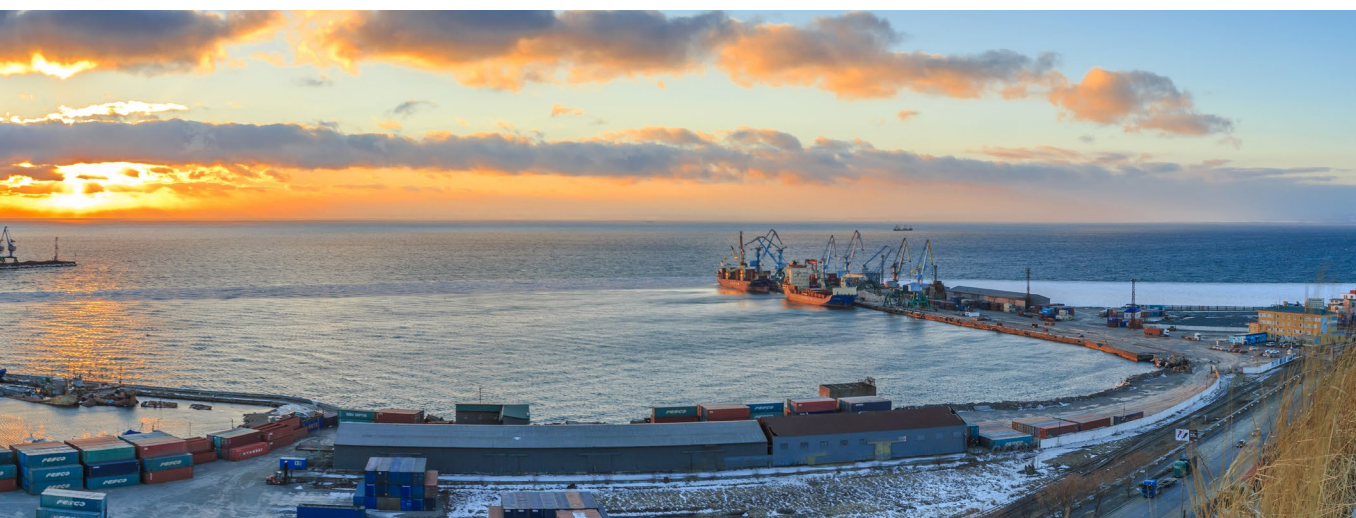
Uncertainty over Russian gas supply is pushing European countries to import more LNG which is resulting in Asian-bound LNG cargoes being diverted to Europe. The top five European LNG importers – Spain, France, the UK, Italy and Belgium – imported a record level of estimated 21.1 million tonnes of LNG in 1Q22. On the other hand, Asia' s top five LNG importers imported 60.7 million tonnes of LNG in 1Q22, down by 9% YoY due to high spot prices and Europe diversions. However, a potential rebound in Asian demand in the second half of the year could create a tug of war between Europe and Asia for spot LNG cargoes. Higher European premiums are expected to distort LNG trading patterns with Europe becoming the key factor in LNG activities in 2022.



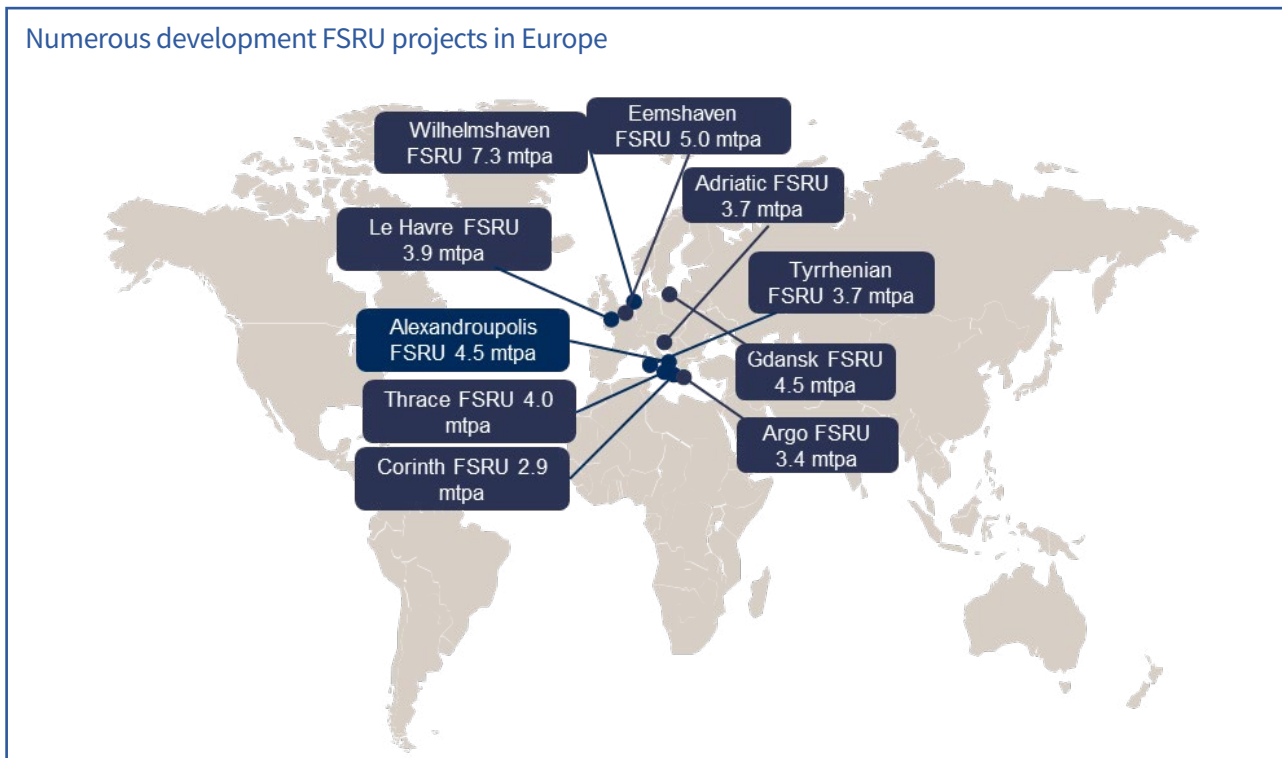
Global LNG exports reached about 99 million tonnes in 1Q22, at par with exports in 4Q21; the US remained the top LNG exporter. We expect LNG supply to remain tight over 2022-24 due to Europe's additional demand and limited addition of liquefaction capacity.

The Floating Storage Regasification Unit (FSRU) market has become "red hot" with high demand emerging from Europe due to the geopolitical tensions. European countries are aiming to reduce dependence on Russian pipeline gas supply by 2030 after reducing it by near 30% in 2022. This difficult target has led the European utilities to fast-track LNG projects and to scramble to secure FSRUs. FSRUs provide the most suitable short-term measure for addressing energy security concerns as their low cost and faster installation attracts energy importers while their flexibility and re-deployment potential also addresses environmental concerns. Since the Ukraine conflict, European LNG importers Germany, Greece, Poland, Italy, France, Netherlands, Estonia, etc. have been actively pursuing the FSRU option to safeguard gas supplies.

At end 1Q22, the FSRU fleet comprised 48 vessels, of which 34 are on long-term charters as regasification units while 12 are used for LNG trading. The FSRU sector was considered to be oversupplied until recently, but supply is expected to be tight due to the sudden surge in demand and a thin orderbook.



Numerous development FSRU projects in Europe

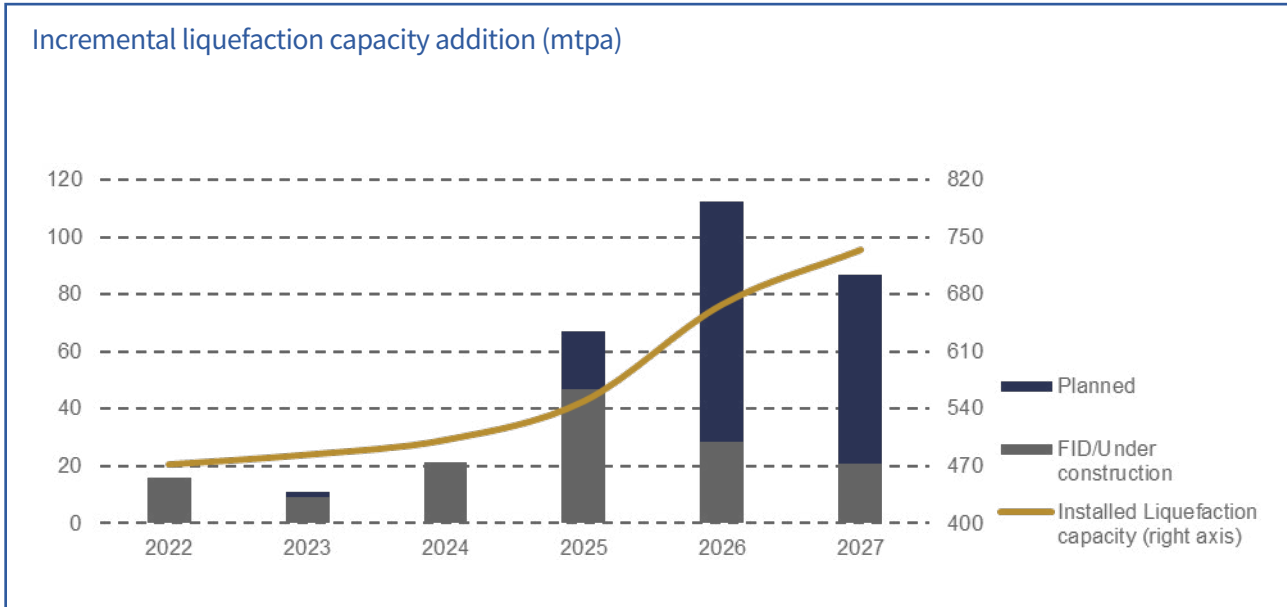


European moves towards LNG have raised the demand for LNG which, along with low liquefaction capacity addition and high LNG prices, is likely to encourage the next wave of LNG projects. Drewry expects high Final Investment Decision (FID) activity in 2022-23 as new liquefaction projects receive a boost from the EU's strategic shift to LNG amid high spot prices. We expect 55 mtpa of liquefaction capacity to reach the FID in 2022 and another 125 mtpa capacity could reach the FID stage in 2023-24. The majority of the projects are in the US with a few projects under development in Mexico and Canada. Meanwhile, European sanctions on investing in the Russian oil and gas

sector have created deep problems for the Russia's planned and under-construction LNG projects.

Drewry projects global LNG liquefaction capacity at 735 mtpa by end 2027, with 262 mtpa of liquefaction capacity expected to be added between 2022 and 2027.

We believe that shipping rates in 2022 will be defined by the scarcity of LNG rather than by vessel availability. Tonne-mile demand for LNG shipping is expected to fall in 2022, but a bright long-term outlook awaits. Drewry expects LNG shipping rates to weaken in 2022 with increasing short-



Source: Drewry

haul US-Europe LNG trade and reducing long-haul US-Asia trade. We estimate that 60% of US LNG exports in 2022 will move to Europe (up by 25% YoY), impacting around 90 billion tonne-miles of vessel demand. Moreover, the US deal with Europe to supply 10-12 million tonnes of additional LNG in 2022 could keep LNG carriers focused on the Atlantic for most of the year, increasing vessel availability in the region and in turn depressing shipping rates.

In the long term, Drewry projects LNG trade to grow at a CAGR of 5.5% from 2022 to 2027 because of increasing LNG demand from power generation, residential and transportation sectors. However, as LNG prices are expected to remain high until 2024-25 due to low liquefaction capacity addition,

imports will reduce in emerging countries, leading to higher demand destruction and faster fuel switching to either renewable/zero-carbon sources or back to coal and fuel oil. On the vessel supply side, we expect vessel ordering to remain robust over 2022-24 as several LNG projects are nearing their FID stages and vessel demand in Europe is growing on the back of increasing LNG imports. Moreover, the IMO's EEXI and CII regulations are expected to compel owners to invest in fleet renewals: older steam turbine vessels are likely to be converted to FSRUs or FSUs, or may operate with speed limitations on shorter routes. We project the LNG fleet to expand at a CAGR of 7% between 2022 and 2027.



Navigating new opportunities

We are stronger united, writes Guy Platten, Secretary General of the International Chamber of Shipping

If there's anything that the past two years has taught us it is that we are stronger united. The COVID-19 pandemic led to significant disruptions to the way we all work and intensified some of the challenges we were already facing, but as an industry we rose to these challenges and tackled them together.

It is hard to exaggerate the impact of the pandemic on international seafarers and shipowners. We all know that the maritime industry plays a vital role to the global economy, transporting 90% of global trade volumes, so at the outbreak of the crisis, International Chamber of Shipping (ICS) sought to ensure that seafarers were rightly identified as 'key workers' to ensure that maritime trade could continue to flow. Around 1.9 million seafarers work to facilitate the way people live, and during the pandemic, seafarers demonstrated great professionalism and dedication in helping to deliver essential food and medical supplies.

Unfortunately during the height of the pandemic, 400,000 seafarers were affected by the crew change crisis, unable to return to shore or access ships due to travel restrictions imposed by national and local authorities. Some seafarers were serving on ships for 20 months without shore leave and there was real concern for the welfare and safety of seafarers, and a real threat to the supply chain. Even Pope Francis voiced his concern and urged governments to address the crisis.

As soon as the global scale of the pandemic became clear, ICS moved quickly to get clarity on what this meant for the maritime industry. We met with the World Health Organisation (WHO) early on to ensure that any guidelines for industry and governments to help limit the

spread of COVID-19 allowed international trade to continue. This was followed by the issuing of new COVID-19 guidance for the shipping industry produced in collaboration with international bodies. The work did not end there, as we wrote a joint open letter to United Nations agencies, calling for the G20 to support the maritime sector and global supply chains. Utilising the strong relationships that ICS already has with these bodies has led to even closer collaboration across the industry that we continue to see to this day.

I am pleased to say that the industry now has regulations in place to improve access to onshore medical care, strengthen PPE (personal protective equipment) requirements, and to make sure seafarers can continue to communicate with their loved ones. There is still more work to do in this area but this is a great start building on lessons learned from the pandemic.

COVID-19 has taught us the importance of being resilient and working together to find solutions. With new variants and ongoing lockdown restrictions continuing to disrupt the supply chain, we must continue to put in practice what we have learned so far to keep global trade moving. In all my time working in the maritime industry, we are more united than ever.

This was also reflected when industry leaders from around the world came together at last year's COP26 climate change summit. The ICS conference 'Shaping the Future of Shipping' showed that change is coming and shipping can play a leading role in creating a decarbonised future. We cannot achieve decarbonisation targets alone and

instead we must come together to address the challenges we face. A unified approach between shipowners, ministers, maritime, energy and infrastructure leaders puts us in the strongest position to create practical solutions to achieve (net) zero goals.

Shipping must step up to play its part in the journey to (net) zero, and our latest report Fuelling the Fourth Propulsion Revolution shows that innovation and opportunity will crucially go hand in hand. Up to 50% of new fuels could be transported by ships and this report looks into how shipping will play a fundamental role in delivering these fuels globally and act as an enabler for governments and industries to achieve their climate targets. It showcases why the maritime industry must be included in international decarbonisation plans and have access to the same (net) zero carbon fuels they will be transporting to decarbonise. The world's renewable energy generation would need to increase up to 100% just to supply enough (net) zero carbon fuel to power the shipping industry. The enormous scale of the opportunity and transformation for governments, ports, developing economies, and key maritime stakeholders is clear.

Ours is an industry I am incredibly proud to be a part of. For shipping, as for the whole world, there are challenges ahead and it is important that we look to the future and the opportunities that lie before us, and the unprecedented level of collaboration shown throughout the pandemic must continue as we recover from the pandemic. Together we can and must play a leading role in creating a decarbonised future, not just for shipping but the whole world.

High speed change

How the maritime industry is embracing digitalisation

In late 2021, a senior IT manager at shipping giant A.P. Moller-Maersk sparked debate when he stated that the company, which operates around 17 per cent of the world's container fleet and employs over 12,000 seafarers, was "now a technology company where we have some physical devices we need to move around." The furious subsequent reaction by a Maersk ship captain on social media that without seafarers and ships there would be no Maersk, was widely shared and highlighted the two very different sides to shipping today.

It crystallised the idea that, as part of an increasingly digitalised and transparent supply chain serving ever more eco-conscious consumers, shipping is changing from the inside out.

The raft of new IMO regulations set to come into force at the beginning of 2023 is just one part of the story as it spawns new technologies to help reduce emissions. The other side is the adoption of technology, both onshore and at sea, to increase competitiveness and enhance operational efficiencies.

The power of big data, artificial intelligence and digitalisation is also informing decisions across the maritime services industry and the pandemic has accelerated this uptake. Insurance companies now utilise data from remote surveys and casualties to better inform underwriting decisions. Meanwhile, shipbrokers are investing millions of dollars in their data platforms to speed up vessel fixing and better inform their clients on anticipated vessel movements and cargo flows.

Signal Ventures - the investment arm of the Athens-based Signal Group - recently reported

that the maritime technology market had grown 18% faster than anticipated pre-pandemic and was on track to reach USD 345 billion by 2030. An estimated USD 3 billion has been invested by venture capital in a huge range of shore-based maritime support businesses since 2020.

"In order to stay competitive in the market you have to utilise the digital tools that are available to you," said Jos Standerwick, chief executive of Maritime London.

And it doesn't stop there. The data transition has created a role for a new type of maritime professional - the data scientist - to manage platforms, standardise and draw insight from the data. This next generation of talent is currently at university or in the early stages of a career in a tech start-up or software company.

For the past two years Antonis Malaxianakis has been recruiting for his Athens-based maritime tech start up as it grows. He believes that over the next decade all decisions made in shipping will become data driven. "Maritime companies will increasingly require technology competencies across their workforces if they want to stay relevant in the near future," the company's CEO and founder told the Xinhua-Baltic ISCDI Report.

His company Harbor Lab has created a digitalised disbursement platform that is driven by high quality port data crunched by trained analysts. "Technology and attracting talent go hand in hand," he said.

"Maritime needs bright young minds the same as any other sector and shipping's transformation into a technology-focussed industry makes it more desirable to young potential employees. We will see an employees' market over the next

few years, where companies will compete to secure the best emerging talent to support their data-driven agendas," he added.

This next wave of shipping professionals will be well-placed to move with technological advancements, such as the opportunities that can be found in artificial intelligence and machine learning.

Underpinning the boom in maritime technology has been the huge reduction in the cost of connectivity. Thanks to the advances in satellite technology and the 5th generation mobile network (5G), high bandwidth connectivity for a ship in any location is possible, facilitating automation and the Internet of Things. At the same time many ports have been partnering with telecommunications providers to harness elements of the 'smart port' philosophy and use the technology to increase efficiency and reduce costs.

Some examples include collaborations between Maritime and Port Authority of Singapore (MPA), PSA Singapore, the Infocomm Media Development Authority (IMDA) and telecommunications companies M1 and Singtel; Antwerp with Orange; Hamburg with Nokia; Ericsson and China Unicom with Qingdao, China; and in March this year it was announced that Hutchison Ports in Felixstowe UK has partnered with Three.

5G is also central to enabling the autonomous and remote-operated ships envisaged for future years. For vessels to operate independent of humans they must utilise multiple different communication technologies including satellites, mobile networks and dedicated narrowband systems, to connect to other ships and operations centres.

The strength of 5G lies in the number of devices it can support and the fast response of the network enabling it to bring together all of the various radar technologies and stream data in real time.

One example of the high-speed network supporting automation can be found on the Kiel Fjord that aims to introduce autonomous passenger ferries that connect its east and west banks. Known as the Clean Autonomous Public Transport Network (CAPTN) initiative, it is funded by Germany's Federal Ministry of Transport and Digital Infrastructure and rolled out with project member Raytheon Anschutz.

The Förde 5G project is trialling a 5G cellular network for ship traffic on the fjord to pave the way for the development and testing of new systems that enable ship-to-ship and ship-to-shore communication, remote control of ships, and autonomous manoeuvres.

"Sensors aboard the autonomous ships create a vast amount of data for example when it comes to collision avoidance, manoeuvring or docking," said Daniel Sommerstedt, who is responsible for strategic development and technology road maps at Raytheon Anschutz.

New technologies are emerging and informing decisions across the supply chain, from backroom administration and broking, to port and shipping operations. Shipping will need to align its talent and workforce for a digitalised future.

Sowing the seeds

The roadmap to decarbonisation and digitalisation requires new technology and bright ideas. But behind every new idea is the funding needed to make it a reality

US-based Nautilus Labs made maritime media headlines when in March 2022 it announced it had secured USD34 million in funding from tech giant, Microsoft's M12 venture fund and Microsoft Climate Innovation Fund. The Series B funding will be used by the voyage optimisation prediction tool developer to create new products to support shipping's decarbonisation efforts, with game-changing regulations due to come into force in January 2023.

At six years old, Nautilus Labs is now out of the start-up cradle and on its second tranche of funding, and as a solutions provider that is offering to help shipping navigate a low-carbon future, is evidently able to present itself as a long-term partner to the industry.

It is a different reality, however, for many fledging companies, especially at a time when venture capitalists, spooked by the crisis in Ukraine and possible recession, have reduced the funding available since the beginning of the year.

But as shipping companies come to terms with the need to adopt new ways of working in a reduced emissions environment and align their operations into what is increasingly becoming a transparent and digitally-enabled supply chain, there is still scope for maritime tech start-ups to find the funding they require to move their businesses forward.

One example is Japanese shipping line NYK's investment in 'Navigator II' an investment fund focused on start-up companies that research and

develop innovative technologies for shipping, ports, and supply chains. Navigator II is managed by Israeli-based, theDOCK, an investment company specifically focussed on maritime opportunities. NYK said in a statement in May 2022 that its decision to invest in Navigator II is due to its belief that that it will become increasingly important to collaborate with start-up companies focussed on technologies that support the fast-growing fields of decarbonisation and digital transformation "on a global scale".

Meanwhile, German-based United Shipping Group announced in March that it had invested in early B2B maritime start-ups investment company, TecPier. United Shipping Group's managing director, Andreas Rolner, recognises the challenges and changes facing global supply chains. "The maritime industry is increasingly tackling digitalisation and decarbonisation, but much more investment is needed and, last but not least, professional venture capital for start-ups. That's why we're happy to be part of TecPier and to invest in the most promising start-ups in shipping and beyond," he said in a statement.

Most if not all of the major shipping hubs host either an established or developing maritime tech scene, with pockets of funding available through various channels. The Maritime and Port Authority of Singapore (MPA), for example, announced in May that it has given grants to eleven start-ups to develop a prototype and testbed a new product. These grants form part of MPA's and NUS Enterprises' (the

entrepreneurial arm of the National University of Singapore) Smart Port Challenge (SPC). Since the programme was set up in 2017, it has given grants to 50 recipients, totalling over S\$2.45 million (USD 1.76 million), MPA said in a statement.

SPC forms part of Singapore's PIER71 community of start-ups, corporate maritime and technology companies to foster innovation. Grants are awarded for the development of smart sensors, vision and data analytics, artificial intelligence and wearables, amongst others, for use in the fields of smart ports and ships, crew safety, logistics and green technology.

Hong Kong's government has invested more than USD 130 billion in the information and technology ecosystem over four years. There are 17 funding schemes under the Innovation and Technology Fund (ITF), with various objectives including supporting R&D, facilitating technology adoption, nurturing technology talent, supporting technology start-ups and fostering an information and technology culture.

InvestHK has also formed StartmeupHK to attract and support innovative and scalable start-ups from overseas to set up or expand in Hong Kong. InvestHK told the Xinhua-Baltic ISCDI Report: "Our services include providing information about the start-up ecosystem here in Hong Kong, connecting people to the start-up community, hosting start-up events and helping to foster a positive environment for start-ups to thrive. We host a very successful StartmeupHK Festival every year, with the 2022 event scheduled in September".

Earlier this year, Eastern Pacific Shipping (EPS) announced that it has invested in nine maritime start-ups, bringing the total number it has funded to 18. EPS is collaborating with operational investor Techstars and seven of the nine companies in its February announcement are being funded and mentored through the programme.

"EPS has committed to using a green and technology-driven approach to change the maritime industry. Doing this means sourcing, funding, and nurturing the next generation of maritime entrepreneurs whose vision and abilities can carry the industry forward," the Singapore-based company said in a statement.

French shipping company CMA CGM is also supporting start-up tech companies. In 2018, it launched start-up incubator, Ze Box in Marseille. Ze Box is home to 12 international start-ups that form part of CMA CGM's strategy to make digitalisation one of the pillars of its development, it said in a statement.

Necessity is the mother of invention and there is no escape for shipping as it aligns its future operations with the raft of mandatory decarbonisation rules coming from the IMO and regional authorities. Investment in new ideas is increasingly seen as an essential part of the industry's planning as it re-focuses its efforts to meet emissions reduction targets.

The feeling is mutual

The P&I club system remains resilient despite last year's spate of high value insurance claims writes Nick Shaw, CEO, the International Group of P&I Clubs

A number of high-profile shipping incidents over the past 18 months has drawn increased attention to the importance of the shipping industry in the global supply chain and also to the mutual personal and indemnity (P&I) structure that provides liability insurance in the event of crew, pollution, wreck removal and other ship related claims.

In an average year, the International Group of P&I Clubs (IGP&I) receives around 20 pool claims (claims above USD10m per incident). Whilst last year we received a smaller than average number, those pool claims we did receive were of higher value with more claims closer to the pool limit of USD100 million, where the Clubs stop sharing the risk and above which the IGP&I collectively buys reinsurance from the global reinsurance markets.

The IGP&I managed pooling system for claims of between USD10-100m together with reinsurance for claims above that level is designed to protect its shipowner members when claims are high by sharing those claims as widely as possible both amongst other shipowners and then through high levels of reinsurance cover.

The now infamous Ever Given incident, where the vessel blocked the Suez Canal for six days, and the X-Press Pearl wreck removal in Sri Lanka, are just two examples of some of the high-value claims passed onto the pool in 2021.

These and other claims, together with the hardening general reinsurance market conditions, justified increased insurance/reinsurance premiums of often more than 10 per cent announced by IGP&I clubs at the end of last year. However, setting appropriate levels of premium helps ensure ongoing sustainable P&I cover for over 90 per cent by tonnage of the global shipping

fleet. This also helps to satisfy maritime authorities and their relevant regulators including IMO and rating agencies around the world of the financial strength of the Clubs to have the ability to respond to claims as and when they arise.

Where rates are concerned, as non-profit organisations, the Clubs seek to maintain their combined ratios (premium versus claims less expenses) as close to 100 per cent as possible. In recent years, most Clubs have tended to post a combined ratio in excess of 100 per cent and have looked to their investment returns to cover any combined ratio loss. Well managed investment of reserves have helped ensure that Clubs remain well funded and has contributed to the surpluses which have led to some Clubs offering rebates or premium discounts in the past.

IGP&I has a robust system for dealing with emerging risks. We continuously identify and examine trends to improve loss prevention going forward. If there is an area of our industry that we believe we can help improve, we will push it through our committees, give guidance to shipowners, and work with maritime administrations and industry partners, such as class, to improve that position and prevent claims going forward.

A good example of a trend that has changed course is pollution from oil tankers. Statistics published by the ITOPF (International Tanker Owners Pollution Federation Limited) show that oil is carried far more safely today than it was in the 1970s. This is due to the combined efforts of the industry to protect the environment and bring down the volume of claims.

The most significant claims we see today tend to be maritime casualties that necessitate wreck

removals. The 2012 Costa Concordia and 2019 Golden Ray were two of the largest maritime insurance claims ever seen. An essential part of our work is to engage with reinsurers, maritime authorities and other industry stakeholders to increase cooperation, to reduce the risk of such incidents and to encourage the most effective response to such claims.

We have signed a number of memoranda of understanding with maritime authorities around the world designed to increase preparedness for serious maritime incidents and encourage cooperation in responding to such an incident.

Similarly, where industry is concerned, we have been investigating whether the procurement of salvage services is being delayed following an incident and what the impact of such delay may be. In particular, the Group commissioned a report which considers whether any such delay is associated with a decline in the use of the Lloyd's Open Form salvage contract which has traditionally enabled salvage to begin as quickly as possible. It's in our interests to understand this dynamic, as the speed of response often directly impacts on the ability to protect life, the environment and the vessel.

Robust system

With around 80 per cent of major maritime disputes still settled in London, the UK capital continues to sit at the heart of the maritime services scene. Its centuries-old legal system has been built on precedent and brings a level of certainty to indemnity insurers who look for a fair and reliable system for the resolution of disputes which thereby encourages the reasonable settlement of claims. Hong Kong, which follows English law on maritime cases, is also an important

maritime dispute resolution centre and 12 out of 13 of the IG Clubs have offices there.

Professional and indemnity insurance is a global industry and many of the Clubs have offices around the world, including in the Americas, Asia and Northern Europe. The Clubs also have strong relationships with local insurers in certain regions such as China. China P&I Club reinsures its fleet with six of the IGP&I Clubs and therefore benefits from IGP&I's system of claims sharing and reinsurance. In this way, IGP&I is directly or indirectly supporting much of the Chinese shipping fleet.

In recent times, the global nature of P&I has presented obstacles for IGP&I. One recent example is the sanctions imposed by the US, EU and UK against Russia which ultimately led to some Clubs pulling cover on Russian-flagged and some Russian linked vessels. The increasing use, and fast pace of, economic sanctions represents a new challenge for IGP&I.

The pooling system is a complex but equitable mechanism for sharing large claims. The Group insures 90 per cent of the world's ocean-going tonnage meaning that a broad range of vessel types and owners, insured by large and small clubs, participate in the pool. Sharing claims spreads the risk of serious maritime incidents and ultimately results in premium that is good value.

IGP&I's system has been tried and tested for over 100 years and has proven itself to be robust. With the support of IGP&I's reinsurers, IGP&I has been there for its members during some of the highest claims seen in maritime history. It remains to be seen whether the recent spate in high-value claims represents a trend. However, IGP&I is confident that its system will prevail for the benefit of shipowners in the decades to come.

Mixed fortunes for marine insurance as the sector returned to break-even in 2020

Lars Lange, Secretary General, International Union of Marine Insurance (IUMI)



The global marine insurance market has been challenged for the past decade or so but 2020 (the most recent period for which IUMI statistics are available) demonstrated positive development for the first time in many years. Absolute premiums for the period totalled USD 30 billion, representing a 6.1 per cent increase on 2019, and were derived as a combination of volume (trade, values and global fleet size) as well as rates per insured unit.

Europe remains the dominant underwriting market with a 47.7 per cent share and it appears that the region is now emerging from the bottom of a market cycle. Asia continues its upward trend since stagnation in 2016 whilst other regional markets remain stable. In terms of insurance lines (except P&I), all sectors have enjoyed positive market development both in terms of income and results. That said, it is important to note that whilst the premium base has grown, reduced shipping activity in 2020 (due to the pandemic) significantly drove down the frequency of claims which had a correspondingly positive impact on underwriting results. The post-covid economic bounce-back has encouraged global seaborne trade and shipping activity to return to more normal levels and so it remains to be seen if the modest uptick experienced in 2020 can be sustained.

Low claims impact positively on the hull sector

Looking at the market sectors in more depth and turning to ocean hull insurance first, it really is still too soon to identify if any recovery will be sustained over the longer-term, particularly in Europe. Our 2020 premium returns demonstrated a six per cent increase on the previous year with strong growth from the Nordic markets, modest growth from Asia and a decline from the Lloyd's market in the UK. The good news, however, was to see a closing of the gap between global fleet size and global premiums. This has the potential to herald a return to more sustainable underwriting results, albeit modestly.

On the claims side of the equation, the frequency of hull and machinery claims and total losses continued their downward trend to a historic low. But there is concern that this might be the result of Covid driving down shipping activity which, now that more normal levels have returned, will reverse the low claims profile.

On a more positive note, ocean hull underwriting achieved a technical break-even in the 2020 underwriting year following many years of unprofitability. As we move into early 2022, the improvements seen this market appear to have been carried forward but at a reduced rate. Most regions are seeing single digit growth but markets such as China appear to be enjoying a stronger return.

Uncertainty prevails for cargo underwriting

The cargo insurance market is the largest marine line and this also enjoyed a six per cent jump in its global premium base in 2020. The fortunes of this market tend to follow changes in world trade which took a dip due to Covid but then rallied to reach a record USD 28.5 trillion in 2021 representing an increase of 25 per cent on 2020 and 13 per cent higher than in 2019. As with the hull sector, cargo underwriting returned to technical break-even in 2020 for the first time in many years. This was largely due to a benign claims environment and a distinct reduction in natural catastrophes (nat cats).

The outlook is not so sunny, however. It appears that the frequency and severity of claims is on the rise, particularly stemming from nat cat events such as summer floods and hurricanes. 2021 was the fourth largest nat cat year on record culminating in more than USD 105 billion in insured/reinsured losses. Non-cat losses such as containers overboard, vessel fires, vessel groundings, general average and static losses are also impacting this line of business and we expect to see higher losses in 2021/2 than in 2020. Another related issue is an increasing tendency for assureds to accumulate large amounts of risk in single locations such as ports or warehouse complexes. Exposing such high values to the possibility of a nat cat or man-made event increases the potential for record claims.

An interesting, and longer-term issue stems from the way Covid exposed the frailties within our global supply chains. It's possible we'll see a re-organisation and a move to near shoring with manufacturing bases being re-located closer to consumers. This is bound to be detrimental for cargo underwriters.



A fragile balance for the offshore energy market

The positive news for the offshore energy underwriting market was that 2020 saw an increase in the global premium base for the first time since 2014. In this sector, premium income tends to mirror the oil price which appears to have reached the bottom of the current cycle in 2019. An oil price rally tends to kick-start offshore activity which, after an 18-24 month lag, begins to impact insurance requirements and this was seen in 2021. However, the crisis in Ukraine caused an unprecedented disconnect of most underwriting markets from the Russian oil and gas industry which has offset any gain made by the high oil prices. It remains to be seen how this situation will develop.

2020 was a year of historically low claims for the offshore sector with nat cat events such as hurricanes almost absent. Low activity levels meant that other claims were also reduced but a reactivation of offshore projects is likely to reverse that position.

In the longer-term, a reduced reliance on fossil fuels will inevitably impact this sector, but it is hoped that a move towards offshore renewables and carbon capture and storage will offset that change. Interestingly, in 2020/21 – for the first time – the value of approved offshore wind projects overtook the value of approved projects in the offshore oil and gas sector.

A cause for optimism?

After a prolonged period of unprofitability in the global marine insurance market, there does now appear to be some cause for optimism. The technical break-even results achieved in 2020 do appear to have been sustained in 2021 and into early 2022, albeit modestly. Although claims costs per vessel have returned to pre-Covid levels with increased vessel activity, they remain at a surprisingly moderate level despite an ageing global fleet. The exception is the frequency of fires onboard large container and ro-ro vessels; and an increase in nat cat events, which continue to be a concern.

However, marine underwriters are continuing to look to the future and are embracing new ways of working. They are gearing up to meet the challenges of digitalisation and a low or zero carbon environment and will ensure that their assureds are offered the optimum insurance products to manage their risk and continue their business unhampered.

IUMI collects premium income data from all relevant marine insurance markets which are released as global market averages. The most recent IUMI data given in this article are from the 2020 underwriting year. 2020 numbers will be adjusted as the underwriting year develops and 2021 numbers will be published in September 2022 at IUMI's annual conference which, this year, will be held in Chicago.

About IUMI

The International Union of Marine Insurance (IUMI) represents 45 national and marine market insurance and reinsurance associations. Operating at the forefront of marine risk, it gives a unified voice to the global marine insurance market through effective representation and lobbying activities. As a forum for the exchange of ideas and best practice, IUMI works to raise standards across the industry and provides opportunities for education and the collection and publication of industry statistics. IUMI is headquartered in Hamburg and traces its roots back to 1874.

www.iumi.com





Maritime services consolidate hubs as tech drives change

Jim James, a consultant with international law firm Hill Dickinson, looks at the evolving fortunes of global maritime hubs

The strength of the leading global maritime hubs lies not solely in port-based throughput, but also in the depth and breadth of their provision of maritime services.

Success in attracting and retaining the providers of services which are important to the maritime community is a key factor in London's pre-eminence among maritime centres.

Boasting a plethora of banks and financial institutions, insurers and P&I Clubs, lawyers, law courts and arbitrators, brokers, accountants, consultants and international maritime organisations, London's importance in the maritime world, remains high.

London, like Liverpool, has a lengthy history as a major international port. Uniquely, Hill Dickinson has long had offices in both London and Liverpool, as well as offices in Manchester, and Leeds, all of which are major commercial and trading centres, as well as international offices in Hong Kong, Singapore, Athens and Monaco. We are therefore

well-positioned to note the changes in fortunes of ports over many years.

Since WWII, Hong Kong and Singapore have risen to become important maritime hubs. Ports have been the gateway to economic development in Southern China and South East Asia.

Over the past 40 years, Mainland China has taken advantage of its strategic geographical location and its status as one of the world's top manufacturing regions to become home to many of the world's top ports. This rapid port sector development, which is a critical component of the country's economic advancement, has its foundations in the links between China's macroeconomic and regional development strategies. Key factors enabling China's ports to expand and evolve include decentralising port management to facilitate the development of special economic zones, and changes in port governance and the way in which essential investments are financed.

Developing relationships between ports and the

cities they are located in has enabled China and South East Asia's ports to attract further domestic and international investment to drive production aimed at the export market, which in turn has driven further expansion of port capacity.

In the long-term, it will be technology which provides the game-changer. Global value chains are becoming increasingly reliant on the more technologically-integrated and advanced ports, leaving less efficient shipping centres behind.

While Asian ports dominate in terms of throughput volumes, it is ports such as Shanghai and Singapore which are leading when it comes to technological advancements. China's Digital Silk Road drive will help consolidate this technological enhancement of its ports, while Singapore's focus on innovation, through projects such as its Living Lab and Maritime Transformation Programme, is intended to deepen its research and development capabilities.

In response to this rapid maritime development it is not surprising that most maritime law firms have opened offices in Shanghai, Hong Kong and Singapore.

The region is proving particularly important to maritime arbitration, with Hong Kong establishing its international arbitration centre (the HKIAC) in 1985 while Singapore opened its SIAC in 1986. Other cities across Asia and the Middle East have followed suit – in fact, dispute resolution centres are regarded as essential components of aspiring international financial centres.

A substantial number of references to arbitration in Hong Kong and Singapore spring from maritime disputes. Although the confidential nature of arbitration makes it impossible to determine the exact number, it is believed that Hong Kong usually has more maritime references than Singapore.

The popularity of these two port cities for arbitration, admiralty and commercial court services is an obvious reason for maritime law firms to maintain a presence there. The rule of law is a vital feature of these two jurisdictions, as indeed it is of London. Like London, they both attract the providers of services that characterise successful maritime hubs. In response to this rapidly developing maritime legal infrastructure, Hill Dickinson continues to expand its presence in the area.

Reflecting the significance of Singapore as a maritime hub, our Singapore office retains one of the region's largest and busiest shipping teams. The practice, which includes two master mariners, has broadened considerably recently, now providing all services within the firm's maritime, trade and energy practices to top-tier clients. A notable regulatory and sanctions practice is also established in this office, particularly known for its work with leading insurance groups.

Similarly, Hill Dickinson Hong Kong assists shipowners, charterers, insurers, international group P&I clubs and shipyards with trade and transport-related disputes and transactional business. Signalling the breadth of the Hong Kong maritime marketplace, the team has extensive experience in all aspects of dispute resolution whether through litigation, arbitration or mediation. The office also has two partners who are much in demand as arbitrators and a well-established reputation locally and on Mainland China for cross-border disputes and insolvency work.

The firm's Far East team of lawyers are admitted in several jurisdictions including Hong Kong, England, Australia, New Zealand and Mainland China.

London's dominance as the home of international maritime services provision means our marine team in the UK capital and regionally continues to



grow. Thanks to its lengthy maritime history, vast experience, and breadth and depth of inter-related, globally-recognised specialist services, London sits at the heart of international maritime regulation, finance, insurance and maritime law.

Of course, when it comes to shipowning, the world's biggest accumulation of ship-operating knowledge and experience rightly sits in Athens, and Hill Dickinson is also well-represented in the Hellenic marketplace. Established in 1994 to support our longstanding relationships with Greek shipowners, insurers and charterers operating in the Greek market, our operations in Piraeus provide a full spectrum of English law legal services to marine and energy sectors, advising on all forms of shipping litigation and dispute resolution, ship finance and corporate transactional matters.

Additionally, Monaco, long-favoured by the owners of yachts and super yachts, is the location of our smallest office. In combination with long established offices in St James' s London, Hong Kong and Singapore, it provides one of the world's most experienced and popular yacht and super yacht practices, discreetly providing services to this growing maritime sector.

Hong Kong and Singapore, like other former Commonwealth countries, share with the United Kingdom a common law heritage which is richly

endowed with case law spanning all aspects of commercial and maritime affairs. Although each is a separate and distinct jurisdiction, the case law they produce individually is usually accepted as persuasive authority in the other jurisdictions within the group.

While this does not mean that the application of local law always produces the same result it does mean that developments in the law of one jurisdiction is informed by, and so matches to some extent, developments in the others.

Historically shipbuilding contracts and to a lesser extent, charterparties, bills of lading, contracts of affreightment and loan and security documents have invariably provided for English law as the governing law, and London courts or London arbitration for disputes. Hong Kong, Singapore and Athens are first class alternatives to London – indeed they have increased their share of contentious and non-contentious maritime business in the past three decades. However, London retains its dominant position challenged but unrivalled by competitors.

As the shipping community emerges from the worst of the global pandemic, it will be interesting to see how the legacy of international cooperation, together with technological maritime developments, fast-tracked thanks to shipping's

need to embrace change to overcome recent obstacles, impacts on the future development of the world's leading maritime hubs.

About Hill Dickinson LLP

Hill Dickinson LLP is a leading and award-winning international commercial law firm employing 850 people including 185 partners and legal directors, with offices in Liverpool, Manchester, London, Leeds, Piraeus, Singapore, Monaco and Hong Kong. Hill Dickinson's network of international offices reflects the global nature of its work; the Monaco office focuses on the needs of its yacht and superyacht client base, and its offices in Piraeus, Singapore and Hong Kong specialise in the marine, trade and energy markets.

For further information about the firm, please visit www.hilldickinson.com



Get connected

Why providing all crew with free internet onboard now could help secure a workforce in the future

A life at sea is tough and not for everyone. Those that choose it give up vital support networks, such as family and friends, that are so easy to take for granted by those with land-based jobs. Further, whilst technology has made many of the tasks carried out by seafarers easier, it remains a tough and physically demanding job.

The advent of the pandemic coupled more recently with the knock-on effects of the crisis in Ukraine is taking its toll on the seafaring community. The plight of seafarers was acknowledged by the United Nations International Labour Organisation (ILO) when in May this year, it agreed to implement new measures to strengthen the Maritime Labour Convention (MLC), based on lessons learned from the COVID-19 pandemic.

These measures include improved legal requirements to enable access to medical care ashore and strengthened health and safety policies onboard ship.

Importantly, the Geneva meeting also addressed the need to improve seafarers' access to communication with their loved ones ashore and it was agreed that all seafarers should have access to the internet whilst onboard ship. Seafarer lobbyists such the International Transport Workers' Federation (ITF) called for this access to be available free of charge, however shipowners deflected the argument and insisted that access be limited and chargeable if required.

"Being able to keep in touch with family and friends isn't just a nice-to-have, it's a basic human right. That's why we fought so hard for seafarers to be given internet access and to have a mandatory provision in the MLC," said Mark Dickinson, vice-chair of the ITF Seafarers' Section, vice-president of the MLC's special tripartite committee and spokesperson for the Seafarers Group.

Seafarers' contact with friends and family has long been cited as a key factor for their mental and emotional wellbeing. International trade union for seafarers, Nautilus International, launched in 2017 a campaign that called for reasonable access for all seafarers to ship-to-shore telephone communications, email and internet facilities.



Five years on and many seafarers are still without reliable connectivity, as the Mission to Seafarers' most recent (Q1 2022) Seafarer Happiness Index (SHI) reveals. The report published in April says that in response to the question, 'how happy are you about contact with family when at sea' many replied "no internet" One seafarer wrote: "not having Wi-Fi is the biggest challenge on board and the voyages we take are long voyages which means we only talk to our loved ones after two months. Sometimes when we reach port, you find that sim cards are expensive."

As the report notes, connectivity and contact with friends and family "shapes the happiness of seafarers massively."

Seafarers' happiness is at its lowest ebb in eight years, says the report which is released on a quarterly basis. Further, it is only the second time that happiness levels have fallen across all categories, which not only include contact with family, but also access to shore leave, wages, food, fitness, training, and interaction on board with fellow crew and workload.

"This drop in happiness is against a backdrop of seafarers experiencing wave after wave of problems," said the report, which cited "a confluence of concerns" from COVID-19, conflict on board, and contracts being changed and extended.

"It appears that Q1 2022 has seen a rising tide of concerns and issues, which have left morale and the mood on board at an all-time low," it stated.

Operators are also working in very difficult conditions, and a great many of the influencing factors such as arranging crew change and disruption to crew travel, and resultant contract changes, are beyond their control.

However, growing discontent onboard and a narrowing recruitment pool, further exacerbated by the Russian-Ukraine conflict in Ukraine, is leading shipping towards a significant crew shortage that could see the power shift from the operator to the seafarer.

A Bimco and International Chamber of Shipping' s joint Seafarer Workforce Report(ICS), published in 2021, says that the changing supply and demand of seafarers will result in a workforce shortage unless it significantly increases its recruitment levels. It writes that there has been an 11.8 per cent rise in demand for officers who are qualified to meet the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) since 2015, and unless this is addressed there will be a shortfall of 26,000 officers in 2026.

It encourages the industry to diversify its crew, noting that at the time of the report, women made up only 1.28 per cent of the global shipping workforce.

With fewer seafarers available and demand remaining consistent, seafarers will be in a situation to be more selective about which companies they choose to work with.

Seafarer training company, Ocean Technologies Group's creative director, Raal Harris, says that in his experience "seafarers are very good at crowd sourcing information. So if you get yourself a bad reputation as an employer it will catch up with you," he told the Xinhua-Baltic ISCDI Report.

Recent discussions about raising seafarers' wages earlier this year have fallen away as a suitable compromise failed to be reached between unions and shipowners. Harris believes, however, that whilst money is a motivator, seafarers will look at the whole package of their employment, and ensure that both they and their families will be cared for. They will also consider what the company does to ensure a happy working environment and whether the company's values are in line with their own.

"They also want to know that they will be able to progress, acquire new skills and move through the ranks and into more lucrative positions. So creating a good employee experience and investing in building them as professionals will set operators apart in my view," said Harris.

Training and education of seafarers to operate the emerging fleet of more sustainable and digitally connected vessels will be essential, and opportunities to learn these new skills could be central to seafarers' decisions of who to work with.

A breakdown by age of those who took part in the SHI shows that 46 per cent are between the ages of 25-35 years old, whilst a further 10 per cent were between 16-25 years old. This age bracket grew up with technology and are well-placed to become the technologically literate crew the industry will need to embrace over the next few years. Further, they will view free internet access on board as an essential part of their agreement with a company.

The technology to give all seafarers virtual access to their friends and family back home is already onboard, but making it available to all crew on a ship could be a tie-breaker between securing a workforce or not.

Supporting seafarers

How the Mission to Seafarers is supporting seafarers, explained by Ben Bailey, Director of Advocacy and Regional Engagement, The Mission to Seafarers

It has been a difficult few years for the seafarer, with our most recent Seafarers Happiness Index for Q1 2022 showing the lowest level of crew satisfaction in eight years. The COVID-19 pandemic and now the Russia-Ukraine conflict have severely impacted seafarers across the globe and will continue to do so in the coming months. While the pandemic broke out in 2020, the effects are still being felt today, with restrictions still in place in many parts of the world. These types of measures are necessary, some argue, to curb the spread of the pandemic, but result in seafarers facing a maze of different regulations, ongoing port restrictions, extended contracts and very limited to no shore leave.

To support seafarers during this time, The Mission to Seafarers (MtS) has carried out gangway visits and launched technological solutions such as its Digital Chaplaincy where crew can chat to a chaplain online. Of course, this is of no use without internet access and so the MtS has also been providing Mifi (individual WiFi internet units) to ships so that seafarers have vital internet access whilst they are in port. In Singapore, the MtS has been delivering one of these Connectivity Pilot Projects and as a result of the positive response in Jurong Port, an additional 24

SIM cards have been procured to extend this service in Pasir Panjang. In total, the MtS now has 40 SIM cards and 32 portable routers servicing these two ports. Schemes like this will continue to support seafarers in the months and years to come and deliver the much-needed connectivity they need to keep in contact with loved ones while in port, but with restricted access to port services.

Connectivity has been a perennial problem for seafarers and a lack of ship-to-shore communication is a key contributing factor to a decline in crew welfare, morale and social cohesion. It has been encouraging to note the discussions to amend the Maritime Labour Convention and make access to internet a legal right for seafarers. When implemented, this will make a huge difference, from providing seafarers with access to independent helplines as well as much-needed calls to family and friends, and access to online training services and welfare programmes.

A life at sea will always have its challenges. MtS is dedicated to helping crews manage these difficulties, from long-term issues like connectivity or shore leave to unprecedented global events whose impact is felt around the maritime world.



Recruiting the crews of tomorrow requires global cooperation

Captain Kuba Szymanski, Secretary General of InterManager, international trade association for ship and crew managers

Challenges over the past few years – including the COVID-19 pandemic; global supply chain issues; political rivalries; and the hostilities in Ukraine – have highlighted the strengths of the shipping industry but also its weaknesses.

Shipping as an industry is truly international but too often it can take a small-scale or localised approach which adversely impacts the overall business. In order to achieve major change on a global scale, it is time for the shipping industry to speak with one voice.

At present there are numerous maritime organisations defending their sector, but the pandemic underscored the international nature of shipping and its importance in the global supply chain. The world has witnessed how a crew change prevented in one country can impact the delivery of vital goods to another continent and how, in our 'just-in-time' world, ships delayed by unexpected events can result in shortages to a very wide range of goods – from food and medicines to technology, clothing, cars.

Shipping must ensure it raises a collective voice and takes a cohesive global approach to legislative and international matters.

During the pandemic the IMO advised that seafarers should be afforded "key worker" status. We saw many countries adopting this proposal but not enforcing it – in other words not walking the talk! This compounded problems for our already stretched industry which fulfils a crucial role in global trade. A strong comprehensive voice at the international level is essential to fight for our industry and for our seafarers.

The shipping industry is still feeling the impacts of individualised decision taking – on a countrywide basis and even by individual ports. Major maritime hubs often take a unilateral approach to matters such as crew change, shore leave or even medical repatriation.

The good news is that, after some initial challenges, ports such as Hamburg, Amsterdam, Rotterdam, Houston or Southampton, Liverpool or Felixstowe, working with their governments, have displayed a 'can do attitude'.

From the perspective of crew and ship managers, the shipping hub 'crown' belongs to Cyprus which, with its excellent maritime administration and dedicated ministerial support, is working very closely with ship managers and owners.

At a time when the international maritime industry is predicting a global seafarer shortage by 2026, the treatment of seafarers needs to be brought to the forefront. With increasing competition from other job markets, the pressure is on shipping to

offer an attractive career with improved terms and conditions – and the entire maritime community has a part to play in this.

Today we see a growing demand from owners to source reliable, knowledgeable and willing seafarers. It seems that shipping is finally emerging from a period where seafarers were treated on a 'hire and fire' basis with basic employment conditions. There were too many seafarers and therefore owners did not feel any need to do anything above minimum requirements. That kind of approach does not promote loyalty.

The tables have now turned and there are fewer seafarers and increasing numbers of ships need crew. The shipping industry has grown by 280 per cent since 2008, with 110,000 ships today compared to 42,000 in 2008.

The COVID-19 pandemic saw some historically very strong seafaring supply countries struggling with crew travel, vaccination and quarantine arrangements and this created a disruption to crew change patterns and the global supply of seafarers. Shipowners and crewing managers sought replacements elsewhere, for example switching from Indian and Filipino to Eastern European and Baltic States crew, but Russia's action in Ukraine has severely impacted that approach, with travel restrictions and sanctions removing many Russians and Ukrainians from the global seafarer pool.

All this comes at a time when seafarers are facing growing demands created by fast-moving developments. Seafarers are being asked to learn completely new tasks, and perform them in addition to their existing responsibilities. We are

seeing new equipment placed on board – ballast water treatment, scrubbers, new fuels, new monitoring equipment – and with no prospect of increasing crew numbers. Meanwhile, increasingly stringent international regulations are escalating reporting regimes and onboard bureaucracy. That means more training, bigger job descriptions and less time.

What the industry needs to do now is to honestly present itself to new recruits – who, let's face it, have many other opportunities ashore which don't require them to spend months away from friends and family – and then address some of the issues which are creating barriers to entry into the shipping industry. We can see progress being made in these areas: greater support for seafarers' mental and physical health, increased access to the internet and voice communications on ships, and diversity campaigns to support more women in taking up careers at sea. But there is more to be done and shipping must ensure it maintains momentum.

Over the coming months and years we can predict a power-shift. Crew shortages will mean competent and experienced seafarers will have better bargaining positions, making it easier for them to negotiate financial conditions and secure satisfying roles on ships. Ship and crew managers who grasp this new situation quickly will be able to position themselves as 'employers of choice', revising and improving terms and conditions to retain the best crews. I would even go so far as to forecast that senior officers might be offered permanent employment contracts to secure their availability. Importantly, the world needs to increase the level of respect it shows for the role of seafarer.

As the industry starts to look holistically at the humans employed on board its ships, I wonder whether seafarers will finally be able to renegotiate conditions such as the Hours of Rest Regulations, last discussed in Manila 12 years ago, and reduce the current 90 hours working week to something more akin to other professions.

retention. Health and safety must also be considered. Short port turnarounds are forcing seafarers and stevedores to tackle essential but risky tasks, such as tank cleaning, in impossible time frames, thereby contributing to deaths and injuries.

Technology is transforming every industry and shipping is no different. Shipping is traditionally slow to transition but the pandemic accelerated the digitalisation of onboard processes and increased the volume of ship to shore data transfer. It is important that this technological advancement takes a human-centric approach to ensure it benefits those onboard and is user-friendly. Industry-wide standards and a collective approach to computerisation and applications is also needed: at present we have something of a hotchpotch of technology as individual shipping businesses develop their own unique systems, making transfers of crew from vessel to vessel, company to company more challenging while increasing accident risks.

In an ideal future I hope that seafarers will finally gain the recognition they deserve and will be proud to be a member of this ancient profession, sailing onboard well-run ships and satisfied by a job well done and well remunerated. The measures the shipping industry takes now, and the progress it makes over coming years, will determine whether this nirvana is attained.

InterManager is the international trade association for third-party and in-house ship and crew managers. Established more than 30 years ago, the association represents ship operators and seafarers at international level, working with industry counterparts on key issues and holding non-governmental organisation status at the International Maritime Organisation.



Pressure for greater ambition in shipping decarbonisation

The race to decarbonise the global shipping industry is on. A sector which continues to account for almost three per cent of global carbon emissions needs to find alternative ways to significantly reduce its carbon footprint if it is to stay in line with the Paris Agreement's goals. The Paris Agreement, a legally binding international treaty to limit global warming to well below two, preferably to 1.5 degrees Celsius, compared to pre-industrial levels, requires the global shipping industry to completely rethink the way it operates. A global zero emissions fuel infrastructure and a new generation of ships able to be powered by these fuels is urgently needed. But shipping emissions remain on an upward trajectory.

At the time of writing (May 2022), the International Maritime Organisation (IMO) in London was set to host one of its most critical meetings with nations proposing various measures to bring down emissions from the sector.

In 2018, the IMO announced an initial climate change strategy with an ambition of halving greenhouse gas emissions from shipping by 2050 compared with 2008 levels. But many nations feel that this goal does not go far enough. The pressure for rapid action on climate change has grown sharply, especially since the COP26 climate conference in Glasgow in November 2021.

Countries including Japan, UK and the USA have tabled proposals to bring shipping emissions to zero by 2050 through a carbon tax. China is leading a proposal for a new market-based measure to cut shipping emissions supported by Argentina, Brazil, South Africa and the United Arab Emirates. The proposed International Maritime Sustainability Funding and Reward mechanism would be a mid-term measure to

reduce greenhouse gas emissions from ships. The Marshall Islands, one of the world's largest shipping registries and a nation facing an existential threat from rising sea-levels, is calling for a \$100 per tonne of equivalent CO₂ levy on shipping by 2025 to fast-track investment in new fuels.

Pressure is also building from the private sector for more ambitious targets. In the autumn of 2021, The Call to Action for Shipping Decarbonization was signed by over 200 organisations including major shipping companies, charterers and ports. This calls on shipping to be run entirely on net-zero energy sources by 2050 and for governments to deliver policy measures that will make zero emission shipping the default choice by 2030.

The financial sector also plays a significant role and can select the type of ships in which it invests based on their environmental profile. There are currently 29 signatories, who cover over 50 per cent of global ship finance, to the Poseidon Principles, a scheme designed to align shipping bank lending practices with the IMO's 2050 targets. However as of December 2021, only 11 out of 23 ship finance portfolios were reported to be aligned with the IMO's decarbonisation target.

Large shipping companies, particularly those in the container sector, have already set themselves ambitious targets which go beyond the current IMO ambition. According to shipping intelligence provider Alphaliner, the 10 leading publicly listed container shipping lines earned a record USD 115 billion to USD 120 billion in profit in 2021, giving the carriers the ability to make huge investments in the next generation of low carbon vessels and fuel infrastructure.



The challenge facing the sector is immense. Energy efficiency technology retrofits and slow steaming can reduce shipping's carbon intensity and total emissions within this decade. However, to reach even the current level of ambition, zero emissions vessels need to start entering service by 2030. Vessels can have a working life of up to 30 years. The owners and operators of fossil-fuel powered ships in service during the 2020s will need to maximise the energy efficiency of their vessels and switching to zero emissions fuels in the 2030s. Not doing so could mean that fossil-fuel assets become stranded assets and need to be written off balance sheets.

Key to success will be the ability of governments and industry to direct funds towards the development of scalable zero emission fuels such as ammonia, methanol, biofuels and hydrogen or the introduction of carbon capture.

The European Union (EU), seemingly frustrated by the lack of scale of international ambition, is taking matters into its own hands and will be bringing shipping into its emissions trading system (ETS) in 2023. An ETS sets a gradually decreasing cap on the amount of emissions that a sector, or group of sectors, can produce. It subsequently creates 'carbon permits', which companies must buy for each tonne of CO₂ they emit. However, the measure only applies to ships over 5,000 gross tons and there will be various exemptions, including vessels servicing offshore oil and gas.

The ETS is built on a decarbonising mechanism that lifts the carbon price partly by restricting the number of allowances (European Union Allowances or EUAs) that industries can purchase.

The EU's carbon market is at the heart of its strategy to slash greenhouse gas emissions. The scheme forces power plants and industry to buy permits when they emit CO₂, which effectively seeks to put a price on pollution.

But is the EU's carbon market just a tax on imports from outside the region?

The Asian Shipowners' Association (ASA), whose members control and operate around 50 per cent of the global merchant fleet, strongly opposes the EU measure.

"The extension of the EU ETS to shipping will only serve to impede the process of decarbonisation of international shipping, putting the EU in conflict with the achievement of both IMO and UNFCCC (United Nations Framework Convention on Climate Change) climate change objectives," the ASA said in a statement.

The ASA further maintains that the only way to achieve ambitious net zero targets would be through the adoption of the IMO Maritime Research Fund (IMRF), which will guarantee funding for the R&D necessary to accelerate the development of zero emission ships.

The ASA, along with the International Chamber of Shipping, thinks that the IMRF, funded by mandatory R&D contributions from shipowners globally via a levy on actual fuel consumed, will be the most efficient tool to decarbonise the industry - because these are fixed contributions that demonstrate industry's commitment to decarbonisation, they offer a measure of stability to support for R&D efforts and will be relatively insulated from external shocks that may result in increased volatility in carbon markets.



The Baltic Exchange and carbon emissions

The IMO has developed a suite of metrics and indicators to measure the shipping industry's progress towards its carbon reduction goals. One of these is the Energy Efficiency Operating Indicator (EEOI), a calculation which looks at the ratio of a vessel's CO₂ emissions to work performed, making it a useful tool for understanding the operating efficiency of individual vessels for a particular voyage.

The Baltic Exchange provides daily freight assessments for the spot markets including dry bulk, tankers and gas carriers. To support the shipping industry's decarbonisation drive, the Baltic Exchange has calculated a set of indicative CO₂ emissions figures and EEOI reference values for its dry bulk route assessments and will be adding tanker assessments shortly. Over time it is hoped that this benchmark will provide the shipping industry with a valuable point of reference as the market seeks to factor in carbon emissions alongside charter rates. By understanding the variability in operating efficiencies across routes and size classes, shipowners and charterers will be able to take practical steps to minimise their carbon footprint.

Sample route (18 May 2022)

Capesize vessel (160,000mt or 170,000mt iron ore)

Route	Description	CO ₂ (tonne) Eco Speed	CO ₂ (tonne) Full Speed	EEOI Eco Speed	EEOI Full Speed	Freight Rate (\$/Mt)
C3	Tubarao to Qingdao	8,075	9,981	4.12	5.09	36.75

Carbon offsetting for shipping

Shipbrokers, traditionally responsible for arranging voyages, are increasingly offering their customers carbon offsetting services. At its simplest, carbon offsetting is a way for a shipowner or charterer to compensate for their voyage-related emissions by funding an equivalent carbon dioxide saving elsewhere. This could be carbon which has been permanently avoided or removed from the atmosphere.

Baltic Exchange shipbrokers including BRS, Clarksons, Affinity, SSY, IFCHOR, McQuilling and Charles Weber have set up desks or partnerships with carbon offset specialists and bunker brokers are also entering the space. There are two types of carbon markets: mandatory and voluntary. Shipping will be entered into the EU's Emissions Trading Scheme next year, but to date all carbon offsetting from the industry has been voluntary. The value of the global voluntary carbon market (not just from shipping) was worth over USD 1 billion in 2021 according to information and analysis group Ecosystem Marketplace.

Carbon offsetting is not designed to relieve a shipping company of its obligation to reduce its own carbon emissions, but as Trifon Tsentides, head of business development at IFCHOR explains: "The voluntary carbon market plays an important role in helping companies achieve net-zero ambitions and sits comfortably alongside any shipping company's decarbonisation programme."

Berge Bulk, a Singapore headquartered dry bulk shipping firm, is one such company. With a fleet of 80 bulk carriers, it has set out an ambitious plan to be carbon neutral by 2025. It says that it will achieve this with its energy efficient fleet and by supporting and investing in companies which are developing alternative fuels. It is retrofitting carbon saving devices such as solar panels and sails on its ships. This is further supported by a carbon offsetting programme which includes a commitment to plant 25m trees by 2025.

However, the concept of carbon offsetting has been controversial. Critics point to an unregulated, opaque market and a huge range in the quality of offset schemes.

The issue of double-counting emissions, or two parties claiming credit for the same climate action is a complex one. If a company claims to be carbon neutral through offsetting a project such as planting a new forest which is also counted towards the host country's goals, then as far as the climate is concerned, the company has not done anything. At COP26, a new set of clear accounting guidelines were agreed to ensure that two parties cannot claim the same carbon removal or emission reduction through the means of corresponding adjustments of national carbon inventories. This means that the nation hosting the offsetting project can make the ultimate decision whether the emission reductions will be counted towards its own targets or sold to another nation or party.



The IAPH Environmental Ship Index

How ports are trying to incentivise ships to lower their impact explains Victor Shieh, Director Communications & Events, International Association of Ports and Harbors (IAPH)

The IAPH Environmental Ship Index (ESI) was established in 2011. It is the industry's standard voluntary index designed and used by port authorities and maritime administrations to incentivise shipowners, operators and managers to improve the environmental performance of their vessels.

The index identifies seagoing ships that perform better than required by the current emission standards of the International Maritime Organization (IMO) related to air emissions. With 6,908 vessels registered as of end Q1 2022, ESI is an automated, maintainable environmental performance system for ships which potentially results in lower port dues or fees for vessels calling at ports registered as an ESI-incentive provider.

The strongest representation on the Index comes from the container shipping sector, with a significant percentage of the world fleet registered. Tankers (gas, chemical and oil) are also well represented with over 20% of the world fleet. Future focus is on growing the number of registered dry bulk and general cargo ships as well as ro-ro and cruise vessels.

ESI-air scores vessels on their nitrogen oxide (NO_x) and sulphur oxide (SO_x) performance, rewarding reporting and improvements over time of energy efficiency. Vessels are also rewarded for being equipped with onshore power supply connectivity.

On a separate module, ESI-noise also scores reduced noise of vessels, directly and proportionally and calculates a fixed bonus for a noise reduction measurement report.

Since 2020, ESI was fully integrated into IAPH with a governance structure. It is currently administered and operationally run for IAPH by the office of Green Award in the Netherlands, a long-standing member of ESI. The ESI subscription fee now being paid by shipowners enables robust data verification onboard to ensure the accuracy and reliability of the ESI scores and its professional administration.

The scores for the ships enrolled in the IAPH ESI for the quarter starting 1 January 2022 have been released recently. Compared to the previous quarter, the number of ships with a score of 20 or more in the database increased from 4,684 to 4,731 and the number of incentive providers led mainly by ports around the world rose from 60 to 63.

New at-berth module under development for ESI, starting with cruise vessels

IAPH is also in the process of building a new module for the ESI which will focus on the environmental performance of ships at berth for each port call.

The module will initially focus on cruise shipping and will be funded by contributions from major cruise ports and IAPH. It will develop in two phases, starting with the reporting model, followed by the development of an at-berth performance- and emissions indicator. A core working group of ports, representatives from the cruise industry and the Cruise Lines International Association (CLIA), and the website building company Nalta, has been established to accompany the development phases.

The project is led by the Port of Los Angeles and the Port of Amsterdam, being supported by the IAPH Climate and Energy Committee and Green Award Foundation, which administers the ESI operation, and Starcrest. The aim is to have the at-berth module in full operation by the beginning of 2023.

The ESI at-berth module will be aimed at assessing and rewarding actual performance related to each port call. This will feed port emission inventories and trigger further emissions reductions through the voluntary application of incentives by the ESI ports. Starting with cruise vessels as a pilot for a two-year period, the at-berth module is then expected to expand to other types of traffic subject to positive evaluation.

Reaching zero together

As ports transition to a low carbon landscape, shipping also gains. The International Association of Ports and Harbors collates projects from around the globe to share knowledge and demonstrate ports' commitment to the UN Sustainable Development Goals

The route to decarbonise global logistics infrastructure is proving long and unfamiliar and cannot be achieved if addressed in silos. Ports are a central node in the supply chain and the interface through which 80 per cent of world trade passes. What affects shipping, also impacts ports and vice versa, and a coordinated effort between the two is required to meet forthcoming regulations.

The International Association of Ports and Harbors (IAPH) recognised that to reduce emissions in ports, emissions from ships must also be reduced, and in response it launched the Environmental Ship Index (ESI) in 2011. [see page xx]

IAPH was and still is ahead of its time when it comes to indexing vessels' emissions and rewarding low scoring ships, and today it has 60 ports registered as incentive providers and nearly 7000 vessels in the programme. The ESI went on to become one of the first components of the World Ports Sustainability Program (WPSP), and is now the standard tool used by ports to reward and incentivise shipowners.

Shipowners and operators are currently working towards a new set of indices to meet the industry's Greenhouse Gas (GHG) emissions reduction targets. IMO is scheduled to introduce a system that will score and reward vessels based on their efficiency. The Energy Efficiency Existing Ship Index (EEXI) and the Carbon Intensity Indicator (CII), are both scheduled to come into force in January 2023.

These indices are just one set of regulations designed to meet shipping's carbon emissions reduction targets that call for a reduction of GHGs by at least 50 per cent by 2050 compared to 2008, and for at least a 40 per cent reduction in the carbon intensity of international shipping by 2030 relative to 2008. [see page xx]

More challenging international targets could be on their way as certain IMO member states want shipping to have net-zero carbon emissions by 2050.

Ports are introducing their own strategies to support emissions reduction in their communities and, in turn, shipping's GHG emissions reduction roadmap. The WPSP curates participating ports' projects for dissemination for a wider audience within the industry.



Ten port projects

There are 237 projects in the WPSP portfolio from across 109 ports, IAPH' s confirms, each aligning with one or more of the United Nations Sustainable Development Goals. Here we look at 10 projects submitted to WPSP in recent years that support emissions reduction. This list is by no means exhaustive and represents only a fraction of the activities undertaken by ports.

Onshore power

IAPH' s working group for onshore power supply (OPS), which enables ships to turn off their auxiliary engines and hook up to an electrical grid, has been established for over ten years. Gothenburg has been a lead port for this research and a forerunner in its implementation.

OPS was first introduced at the Swedish port in 2010. Today it offers OPS free of charge and has introduced other financial incentives to encourage its take up. The next step for the port is the world-first installation of OPS for tankers in a hazardous area.

Another European port to have adopted OPS is Hamburg. The city port is introducing the technology at three of its container terminals closest to the city centre and all of its cruise terminals, 11 in total, by 2025.

The German port expects OPS to make a considerable contribution to its aim to be carbon neutral by 2040.

Meanwhile in China, Guangzhou port championed a project to bring OPS to the Guangdong-Hong Kong-Macao Greater Bay Area in China and aims to improve the rate and reliability of its infrastructure. The port is now able to offer OPS during the berthing and port-side operations of a 50,000 dwt ship.

Clean fuels

IAPH has been working to deliver clean marine bunkers to ships for over a decade. Its working group of port authority engineers has developed unique insights by taking international standards and applying them to bunker operations. It then creates practical tools for ports to adopt the relevant bunkering facilities. LNG, methanol, ammonia and hydrogen are currently on the working group' s agenda.

Hydrogen is considered a high potential fuel to facilitate the low carbon bunker transition. Two ports that have submitted projects to the WSPSP portfolio are Vienna and London.

The Austrian port's H2 meets H2O project aims to assess the feasibility of hydrogen supply along the Danube River. The R&D product has a budget of USD 330,000 and trials are scheduled for between April 2022 to March 2023.

The project aims to understand the technical, legal and socio-economic impact of a potential multimodal hydrogen supply chain, from production up to the end-users.

Port of London Authority (PLA) is leading a UK consortium aiming to develop a land, sea and ports hydrogen highway network. The highway will consist of six projects covering energy diversity research, trialing hydrogen power generation for vessels based at PLA's Denton Wharf, establishing the business case for back-hauling hydrogen into central London, ship design and health and safety requirements.

The Singapore port operator, PSA Marine, was one of the first to introduce dual-fueled LNG powered tugs into its operations. The two tugs can operate in either diesel or LNG mode and carry up to 25 m³ of LNG in a Type C tank located within the vessel body. Operational now for two years, PSA Aspen and PSA Oaktugs have demonstrated that there is no difference in performance compared to conventional tugs.

Other initiatives

Carbon capture and storage is a widely regarded activity in the transition away from fossil fuels, and one of several R&D projects are underway, including the CinfraCap project at Gothenburg. This project aims to understand the logistics required for western Sweden to capture carbon dioxide from port activities, including ships' emissions, and load and transport the liquefied carbon dioxide onto ships to the repository site 3km below the surface of the seabed.

Rotterdam's Zero Emission Services (ZES) project plans to introduce 400 electric ships onto its inland waterways by 2050. The vessels will be powered by interchangeable battery containers (ZESpacks) charged with renewable power, and charging stations, technical support and an innovative payment concept for shipowners will be developed.

When the project is operational, 650 ZESpacks will be available on 40 routes via an open-access network of 20 docking stations. The project aims to reduce emissions on the planned routes by 400-480,000 tonnes of CO₂ and around 2,800 tonnes of nitrogen per year. Additionally, ships sailing with ZES produce no particulate matter and no noise pollution.

In Marseille, France, a ship simulator has been introduced for pilots to practise manoeuvres on all types of vessels and in all conditions as efficiently and using as little fuel as possible - known as eco-piloting. The Friend Ship Solution has demonstrated that on a 200 meter-long ferry, fuel savings of more than 10 per cent can be calculated if manoeuvred in a certain way.

Still relevant today

The US San Pedro Bay ports of Los Angeles and Long Beach began the introduction of anti-air pollution strategies as far back as 2006. The duo recognised that ships are the largest GHG emitters in the port environment and as part of the Clean Air Action Plan, introduced a number of measures to improve air quality, including financial incentives for low-emitting ships and vessel speed reduction programmes, and were amongst the early adopters of OPS. As of 2020, the Port of Los Angeles had 79 OPS hook ups - more than any other port in the world.

Sustainability across world ports

Every other year IAPH recognises six ports that have introduced sustainable projects to their facilities. Awards are given across six categories, digitalisation, environmental care, health, safety and security, infrastructure, and community building in line with the United Nations Sustainable Development Goals.

Fiji Ports Corporation was one of two winners, along with DP World Posorja's Mangrove Plantation Program, to be awarded a climate and energy award. Fiji's Green Port Initiative to reduce climate impact across its islands by 2023, serves as an example of a smaller port committed to carbon emissions reduction. Fiji Ports has implemented a number of energy efficiency upgrades such as LED lighting, solar photovoltaic systems and replacement of a diesel-powered incinerator with an electric incinerator.

Fiji Ports has achieved an 11 per cent reduction in its GHG emissions over the last five years. Looking forward, its initiative will also cut 220 tonnes of carbon emissions by 2023, and its goal is to be carbon neutral in terms of energy use by 2027. Fiji Ports has also implemented an 'energy tracker' to monitor its progress in achieving the intended goals.

The Spanish port of Vigo's Living Port project caught the attention of judges to receive the infrastructure award. The European Commission Horizon 2020-funded project aims to encourage a shift from obsolete construction to nature-inclusive infrastructure that brings environment and socio-economic benefits. The three-year project to be completed in 2024, includes the installation of 100 Econcrete Coastalock units to provide coastal stabilisation as well as habitat creation.



More scope for reform

Private participation in port operations continues to be sought for improved performance

Each port situated in the top three shipping centres listed in this report has a slightly different ownership structure. At the top of the tree sits Singapore. PSA International and Jurong Port are the two main private operators that provide cargo handling and port services to their carrier clients.

Next is Port of London, a trust port that has no shareholders and operates for the benefit of its stakeholders and customers, and like Singapore its terminals are operated by private companies. The final port in the trio is Shanghai, which is state owned and operated by state-owned Shanghai International Port Group.

There is a lot of truth in the old adage, 'when you have seen one port, you have seen one port', as each has been structured, both physically and governmentally, to fulfil the individual needs of the region, community, type and volume of cargoes handled and commercial drivers.

Port privatisation, when almost all functions are placed under private control, emerged as a trend in the 1990s as a way for administrations to offload the expensive costs of running a port, and entrust the facilities to a professional company that could maximize the port's

performance and increase its competitive advantage.

Often plagued with setbacks and political wrangling, port reform can be a time-consuming process that can take years to complete. Nonetheless, projects continue to take shape across the globe.

Brazil's Jair Bolsonaro government is seeking investment in its port infrastructure and is in the middle of a privatisation programme across four of its government-owned ports to raise these funds. It's part of a broader infrastructure project to boost the economy that lost traction during the pandemic but picked up pace again in 2021.

The port authority of Espirito Santo (CODESA), which manages the smaller ports of Vitória, Capuaba, Praia Mole and Barra do Riacho, went up for auction in March 2022 and was won by independent investment fund Quadra Capital Partners, and represents the first private operation of a port authority in the country.

The country's largest port, Santos, will go up for auction in November 2022, with Sao Sebastiao and Itaji also slated for auction.

Brazil's waterborne infrastructure is essential to its economy and 95 per cent of its exports move



through its ports. Whilst some privatisation opportunities in past years have faced political hurdles and been left unfilled, recent activities suggest positive results this time around, and should result in international investment for increased efficiency and expansion of the nation's port gateways.

Meanwhile, on the west coast of India, state-run Jawaharlal Nehru Port Authority (JNPA) is in the middle of a privatisation process of its last state-operated container terminal. Reports in March suggested that the process was almost complete, however, plans were stalled in May as private port operator Adani challenged its exclusion from the tender process.

Jawaharlal Nehru has five terminals, two of which are operated by DP World, with PSA and APM Terminals also operating one each. The fifth port remains operated by the port JNPT until privatisation plans are complete.

One port that has been mooted for privatisation due to its low productivity levels is South Africa's port of Cape Town, and in March this year (2022), two politicians put forward their support for reform.

Western Cape Minister of Finance and Economic Development, David Maynier, said he supports

opportunities to "increase private sector investment in port operations and infrastructure which will grow the economy and create jobs in the Western Cape."

City alderman, James Vos, later seconded the idea and said in a statement that logistics, equipment and infrastructure as being amongst the "problems plaguing [Cape Town's] port operations."

These opinions were voiced nine months after the government announced plans to establish Transnet National Ports Authority as an independent subsidiary of Transnet, South Africa's state-owned rail, port and pipeline company.

President Cyril Ramaphosa said in a statement: "The functional and legal separation of these roles, which are currently operating divisions of the same company, will enable each to be fulfilled more independently and with greater efficiency."

"In particular, it will mean that revenues generated by the ports can be invested in port infrastructure, both for the replacement of old equipment and for the upgrading and expansion of our ports."

Appendix I

Methodology for International Shipping Centre Development Index

1. The General Rationale

The research process for the Xinhua-Baltic International Shipping Centre Development Index consists of 7 steps:

Step 1

Theoretical research on index: Collate and study relevant literature to achieve a comprehensive understanding of the theoretical foundation of international shipping centres and the current state of development. Conduct in-depth interviews with government organisations, university academia and professional experts to collate their expertise and suggestions on the rationale for selecting indicators and the methodology for index computation.

Step 2

Index system design: The Xinhua-Baltic International Shipping Centre Development Index system is jointly developed by the China Economic Information Service and the Baltic Exchange, which is authenticated by an expert committee.

Step 3

Data collection and processing: Initial data for indicators is collected through two channels: China Economic Information Service and the Baltic Exchange. This data has then gone through a normalisation process to form the relevant indicator data.

Step 4

Index model construction and computation: Based on earlier theoretical research and in accordance with correlations between indicators, an index model is constructed. Subsequently an index is computed using the model.

Step 5

Index report writing: A report about the creation of the index is produced under the guidance of the index expert committee.

Step 6

Organise an expert team to ascertain the scientific foundation of the research and confirm the final result.

Step 7

Announcement of index results.

2. Index System

Table 1 Indicator system and associated weightage for Xinhua-Baltic International Shipping Centre Index

Primary Tier		Secondary Tier
Name	Weight	Name
Port Factors (A1)	0.20	Container throughput (B ₁)
		Dry bulk cargo throughput (B ₂)
		Liquid bulk cargo throughput (B ₃)
		Number of cranes (B ₄)
		Total length of container berths (B ₅)
		Port draught (B ₆)
Shipping Services (A2)	0.50	Ship brokerage services (B ₇)
		Ship engineering services (B ₈)
		Shipping business service (B ₉)
		Maritime legal services (B ₁₀)
		Shipping finance services (B ₁₁)
General Environment (A3)	0.30	Government transparency (B ₁₂)
		Extent of e-government and administration (B ₁₃)
		Customs tariff (B ₁₄)
		Ease of doing business index (B ₁₅)
		Logistics performance index (B ₁₆)

A₁ Port Factors

This refers to the infrastructures of the port city and the throughput of various types of cargo.

A₂ Shipping Services

This refers to the level of shipping services provided by the port city.

A₃ General Environment

This refers to the business and economic environment together with government policy measures to support the development of the port city.

B₁ Container throughput Source of data: China Economic Information Service Database

Container throughput is an important indicator of the size of the port. It refers to the number of containers passing through the boundary of the port via its waterway for loading or unloading within the reported period. The computation unit is “10,000 TEU”.

B₂ Dry bulk cargo throughput Source of data: China Economic Information Service Database

This refers to the quantity of dry bulk cargo passing through the boundary of the port via its waterway for loading or unloading within the reported period. The unit is “ton”.

B₃ Liquid bulk cargo throughput Source of data: China Economic Information Service Database

This refers to the quantity of liquid bulk cargo passing through the boundary of the port via its waterway for loading or unloading within the reported period. The unit is “ton”.

B₄ Number of cranes Source of data: Drewry

Cranes are machinery for loading and unloading containers in the wharf area. The operating capacity of cranes can determine the cargo handling capacity of a wharf.

B₅ Total length of container berths Source of data: Drewry

Berths refer to locations within the port where ships can dock. A single location equipped with berthing facilities to accommodate a single ship is called a berths. The length of a berth is determined by the length of ships it plans to accommodate and the safety distance required for two adjacent ships. These include quayside berths, pontoon berth and anchorage berths.

Berthing facilities are an important indicator reflecting the ability of a port to accommodate berthing ships. It is one of the basis for measuring the size and capacity of the port. Total length of container berth refers to the actual length of berth available – including various types of fixed or floating wharf – for berthing of ships for loading and unloading of containers within the reported period. The unit of computation is “metre”.

B₆ Port draught Source of data: Drewry

The draught of a ship refers to the maximum depth of the ship that is under the water line. Different ships have different draught. Moreover, the draught of a ship may even differ depending on its load and the salinity of water in the region. Port draught is an important indicator that reflects the deadweight of a ship that can be accommodated by the port. Port draughts in this report refer to water depth statistics of the deepest container berth in the port.

B₇ Ship brokerage services Main source of data: The Baltic Exchange

An important component of shipping services, shipbrokers provide professional agency, brokerage and consultancy services covering a gamut of industries including transportation, insurance, financial and commerce, which facilitate shipping development.

In this report, shipping brokerage services is assessed based on the number of shipbrokers in each port city.

B₈ Ship engineering services Main source of data: International Association of Classification Societies (IACS)

Ship engineering service enterprises are companies with marine engineering professionals having the ability to provide ship engineering technology and related services. The sector also provides training on basic theory and technical skills in seamanship and transportation that comply with relevant occupational certification by the authorities; as well as training of professionals on advanced applied technologies to enable them to navigate vessels.

In this report, ship engineering service are assessed based on the number of shipping companies available in the port city. Services offered by ship engineering companies include ship engineering, repairs, quantity surveying and ship classification.

B₉ Shipping Business services Main source of data: Lloyd' s List

A shipping company may manage its own vessels or vessels commissioned by other owners. In this report, shipping business services consist mainly of the following three indicators: the number of ship management companies operating in the port city, the number of branches of top 100 container shipping companies and top 100 bulk carrier companies.

B₁₀ Maritime legal services Main source of data: London Maritime Arbitrators Association, Singapore Chamber of Maritime Arbitration, Society of Maritime Arbitrators, Legal 500, Chambers

In this report, the overall level of maritime legal services is assessed from the two perspectives of maritime arbitration services and total number of partners practicing in legal offices. Maritime arbitration refers to the agreed system whereby any dispute shall be arbitrated in an agreed arbitration institution in accordance with the arbitration agreement (terms) established before or after the dispute event.

In this report, maritime arbitration service are assessed based on the number of arbitrators located in international arbitration centres in London, Singapore and New York. The number of partners in law firms is assessed based on data from the Legal 500 Law Firm Index, Chambers and law firm websites.

B₁₁ Shipping finance services Source of data: Marine Money, International Union of Marine Insurance (IUMI)

The scope of shipping finance services cover four areas: namely ship financing, capital settlement, maritime insurance and maritime financial derivatives.

Ship financing includes syndicate loans, debt capital markets and equity capital market. Maritime insurance refers to insurance taken out on cargo or ship against the potential risks of loss or unforeseen expenses during the sea journey. The types of maritime insurance include cargo insurance, ship insurance, freight and P&I insurance. Statistical collation by IUMI includes maritime insurance premiums for ship insurance, cargo insurance, maritime liability insurance and offshore energy insurance.

In this report, shipping insurance service is assessed based on maritime insurance expenses of the port city. Shipping insurance services are assessed based on maritime insurance premiums associated with each port city. To derive this figure, the total ship and cargo insurance premiums for each country is calculated and then allocated to each port city based on their respective port' s cargo throughput.

B₁₂ Government transparency Source of data: Transparency International

Government transparency related to publicised rules, plans, processes and operations so that the general public understand the why, how, what and how much of policies. Transparency can ensure that the conduct of public officials, civil servants, administrators, are open and understandable. Reports can also be made against them so that they would be held accountable for their conduct. This is the most reliable way to prevent corruption.

B₁₃ Extent of e-government and administration Source of data: United Nations e-Government Development Database

e-Government and administration refers to the government' s willingness and ability to implement information technology in the provision of public services. Ability, as used here, refers to the extent of support provided by the government towards national finance, infrastructure, human resources, management, administration and system function.

B₁₄ Custom tariff Source of data: "Wall Street Journal" and The Heritage Foundation, Index of Economic Freedom Report

Custom tariffs refer to the rate applicable to computation of tax on targeted taxable goods stipulated in custom regulations.

B₁₅ Ease of Doing Business Index Source of data: World Bank Database

Economies are ranked on their ease of doing business, from 1 to 189; 1 being the best. A higher rank means the regulatory environment is more conducive for doing business. The index is derived from simple averages of national ranking by percentage scores on 10 themes under the Doing Business ranking by the World Bank.

B₁₆ Logistics performance index Source of data: World Bank Database

Logistics performance index is a score that reflects the following logistics attributes of a country: The efficiency of customs clearance process; quality of trade and transport related infrastructures; the ease of arranging competitively priced shipments; quality of logistics services; ability to track and trace cargo; and the frequency with which a shipment reaches the recipient within the expected delivery schedule. The index ranges from 1 to 5; a higher score means better logistics performance. The data is derived from the Logistics Performance Index Survey, which is conducted by the World Bank in cooperation with academic institutions, international organisations, private enterprises and international logistic professionals.

3.Data Processing

Data for secondary indicators required for the Xinhua-Baltic International Shipping Centre Development Index is mainly sourced from authoritative organisations such as the United Nation, Drewry, and World Bank.

Due to the differing nature of various indicators (size, ranking, ratio, etc.), if the raw values of these indicators are used directly in analysis, then indicators with large quantitative values may weaken the effects of indicators with smaller quantitative values; thus resulting in unequal contribution of each indicator to the computation. To avoid such phenomenon, each indicator is normalised – through relative processing to make its statistical variables dimensionless – before using it in index computation.

The raw data is divided into two categories: The first comprises indicators with score values ranging from 1 to 100. This category of indicators is used directly for computation. The second category comprises indicators with absolute score values. These indicators are normalised by applying the standard deviation approach on data distribution.

(1) Determining sample mean and standard deviation

Supposing that the data distributions of secondary indicators are all normal distributions, bootstrap resampling is applied to these samples. After 500 resampling, the mean value and standard deviation are computed from the normal distribution of each indicator.

$$mean_{l,m} = \frac{1}{a} \sum_{i=1}^a \bar{x}_{l,mi}, sd_{l,m} = \frac{1}{a-1} \sum_{i=1}^a (\bar{x}_{l,mi} - mean_{l,m})^2$$

Where, $m=1,2,\dots,6$, $m=1,2,\dots,6$, $\bar{x}_{l,mi}$ is sample mean of each sampling of the m-th indicator, $a=500$ indicates a total of 500 resampling, $mean_{l,m}$ is the mean value obtained after bootstrapping the m-th secondary indicator, and $sd_{l,m}$ is the standard deviation obtained after bootstrapping the m-th secondary indicator.

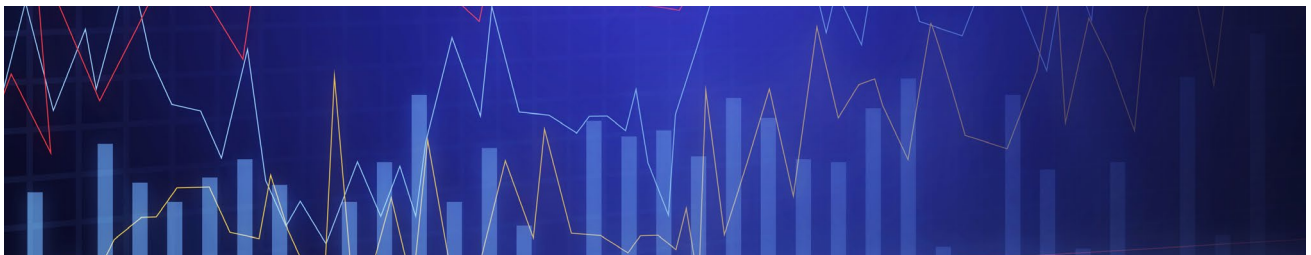
(2) Computing the score for secondary indicators of sample cities

Based on the mean value and variance of each indicator, the indicator's quantile is computed for each city.

The quantile score of the m-th indicator for the p-th city is computed with the following formula:

$$y_{l,mp} = \phi\left(\frac{x_{l,mp} - mean_{l,m}}{sd_{l,m}}\right)$$

Where, $y_{l,mp}$ is the quantile score of the m-th secondary indicator for the p-th city, $x_{l,mp}$ is the indicator value of the m-th secondary indicator for the p-th city, and $\phi(\)$ is the distribution function of standard normal distribution.



4. Model Computation

(1) Design of weighting system

The design of the weighting system for the Xinhua-Baltic International Shipping Centre Development Index employs an analytic hierarchy process (AHP algorithm).

The basic principle of AHP is to break down the problem into a hierarchical structure consisting of goals, sub-goals (guidelines), constraining criteria and departments to analyse the various factors. From the hierarchical structure, apply pair-wise comparison to determine the judgement matrix. Derive the components of the eigenvector corresponding to the largest eigenvalue of the matrix. These components represent the corresponding coefficients that will be used to compute the weight of each factor (degree of priority).

AHP algorithm can be broken down into the following 6 basic steps:

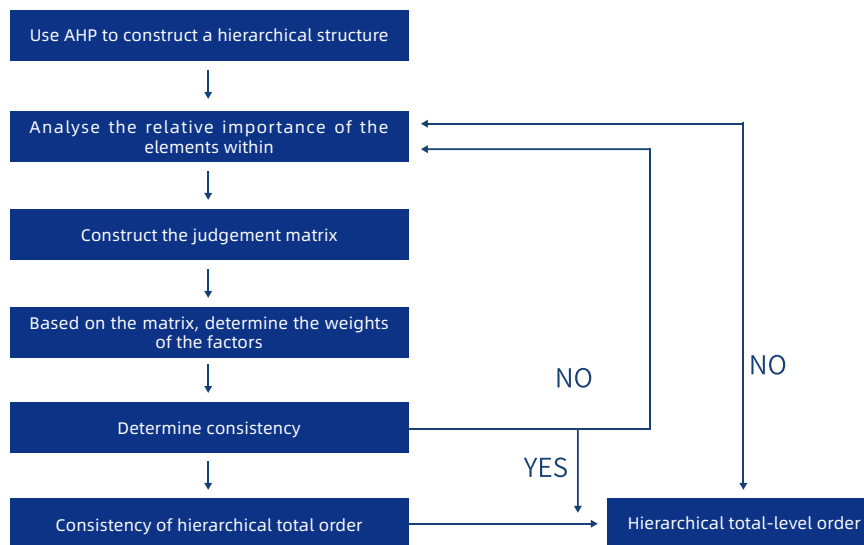


Figure 5 Basic processes of AHP algorithm

(1) Defining the problem: Clarify the problem in terms of scope, contributing factors and the relationship between different factors in order to have sufficient understanding of the problem.

(2) Construct a hierarchical structure: In this step, the factors are assigned to different hierarchical levels. It comprises the goal at the top level (goal level), several intermediate levels (guidelines levels) and the bottom level (solutions level). If an element is linked by all elements from the next level immediately below it, this element is said to have complete hierarchical relationship with the next level. If an element is linked by only some elements from the next level immediately below it, this element is said to have incomplete hierarchical relationship with the next level. A sub-level can be inserted between two hierarchical levels. This sub-level is subordinate to one element on the main level. The elements of the sub-level may be linked with the next level, but the sub-level may not constitute an independent level.

(3) Construct judgement matrix: This is the critical step in AHP. The judgement matrix defines the relative importance of relevant elements within a hierarchical level that is linked to an element in a higher level. For n indicators, $\{A_1, A_2, \dots, A_n\}$, a_{ij} is the judgement value that signifies the importance of A_i relative to A_j . a_{ij} is generally assigned a 5-grade rating scale of 1, 3, 5, 7, 9. A rating value of 1 means A_i and A_j are of equal importance; 3 means A_i is slightly more important than A_j ; 5 means A_i is relatively more important than A_j ; 7 means A_i is significantly more important than A_j ; and 9 means A_i is extremely more important than A_j . The mid values of 2, 4, 6, 8 may also be used for intermediate judgement, especially when five grades become insufficient to represent the level of importance.

(4) Single-level order: The purpose of single-level order is to sort elements in the current level in order of their importance with respect to a linked element in a higher level. It is the basis for ordering all the elements in the current level in terms of importance with respect to an immediate higher level.

If we take the weight vector, $W = [w_1, w_2, \dots, w_n]^T$, then we have : $AW=\lambda W$

If λ is the largest eigenvalue of A, then W is the eigenvector of A with respect to λ . Hence, single-level order process can be achieved by solving the judgement matrix for the values of λ_{max} and its corresponding eigenvectors to obtain the relative weighting of this group of indicators.

In order to test the consistency of judgement matrix, we need to calculate its consistency index:

$$CI = \frac{\lambda_{max} - n}{n - 1}$$

When $CI = 0$, judgement matrix is complete consistency; conversely, a larger CI value indicates lesser consistency in judgement matrix.

(5) Hierarchical total-level order Using the results of single-level order of all the levels with respect to the same level, we can compute the weight values representing the importance of all elements in this level with respect to the immediate higher level. This is known as total-level order. Total-level order must be carried out layer by layer from top to bottom. For the highest level, its single-level order is the same as total-level order.

If total-level order for all elements A_1, A_2, \dots, A_m of a higher level is completed, and the corresponding weight values a_1, a_2, \dots, a_m , a_j are obtained, then the results of single-level order for B_1, B_2, \dots, B_n corresponding to elements in the current level are . Now, if B_i is not linked to A_j , then $b_i^j = 0$, and total-level order is achieved.

(6) Analyse consistency Similar to single-level order, we need to assess the consistency of the results of total-level order. Therefore, we perform consistency check as follows:

$$CI = \sum_{j=1}^m a_j CI_j$$

$$RI = \sum_{j=1}^m a_j RI_j$$

$$CR = \frac{CI}{RI}$$

CI is the consistency index for total-level order; CI_j is the consistency index of judgement matrix a_j corresponding to level B; RI is the random consistency index of judgement matrix RI_j corresponding to level B; and CR is the ratio of total-level order consistency index to random consistency index. Similarly, when $CR < 0.10$, the consistency of computation results of total-level order is deemed to be satisfactory; otherwise, the judgement matrices for the current level need to be adjusted until satisfactory consistency is obtained for total-level order.



(2) Model for Index Computation

Specific computation formulae for the Xinhua-Baltic International Shipping Centre Development Index are as follows:

Use weighted sum method to compute the primary index:

$$y_{lp} = \sum_{m=1}^{l_m} y_{l,mp} * w_m = \sum_{m=1}^{l_m} \phi\left(\frac{x_{l,mp} - mean_{l,m}}{sd_{l,m}}\right) * w_m$$

Where, w_m are the weights of m secondary indicators; and y_{lp} is the score of the l -th primary indicator of the p -th city.

The computation formula for comprehensive score of the sample cities is:

$$y_p = \sum_{l=1}^3 y_{lp} * w_l = \sum_{l=1}^3 \left(\sum_{m=1}^{l_m} y_{l,mp} * w_m \right) * w_l = \sum_{l=1}^3 \left(\sum_{m=1}^{l_m} \phi\left(\frac{x_{l,mp} - mean_{l,m}}{sd_{l,m}}\right) * w_m \right) * w_l$$

Where, w_l is the weight of l -th primary indicator; and y_p is the score of the p -th city.

5. Survey Questionnaire

Dear experts,

Greetings! China Economic Information Service and the Baltic Exchange have embarked on a joint research to develop the Xinhua-Baltic International Shipping Centre Development Index. The aim is to produce an objective, impartial and scientific review and assessment of the competitiveness of cities with international shipping centres. The main purpose of this questionnaire is to obtain some fundamental information regarding weight assessment for analytic hierarchy process (AHP). Your response is of utmost importance to this research. Therefore, we sincerely seek your support to fill out the questionnaire carefully. Thank you for your support!

(1) Explanation for scoring

This questionnaire uses scoring rules based on the 1-9 scoring scale method of AHP:

- 1 means elements i, j are equally important;
- 3 means element j is slightly more important than element i ;
- 5 means element i is relatively more important than element j ;
- 7 means element i is significantly more important than element j ;
- 9 means element i is extremely more important than element j ;

The values 2, 4, 6, 8 may also be used as mid value judgement for 1-3, 3-5, 5-7, 7-9 respectively.

An example is shown below (vertical column represents element i , while horizontal row represents element j):

Technological innovation capability (A)	B ₁	B ₂	B ₃
Innovative output capability (B ₁)	—	3	5
R&D capability (B ₂)	—	—	2
Innovation management capability (B ₃)	—	—	—

In the above table, the value 3 (2nd row and 3rd column) means that for Technology Innovation Capability (A) on the target level, Innovative Output Capability (B₁) is slightly more important than R&D Capability (B₂).

(2) Scoring by experts

1. Scoring for primary indicators

Please fill in the value of importance between the primary indicators (A₁-A₃) with respect to the ultimate indicator (D). The shaded areas need not be filled (same for all tables below).

Xinhua-Baltic International Shipping Centre Development Index (D)	A ₁	A ₂	A ₃
Port Factors (A ₁)	—		
Shipping Services (A ₂)	—	—	
General Environment (A ₃)	—	—	—

2. Scoring for secondary indicators

(a) Please fill in the value of importance between the secondary indicators (B₁-B₆) with respect to the primary indicator (A₁).

Port Factors (A ₁)	B ₁	B ₂	B ₃	B ₄	B ₅	B ₆
Container throughput (B ₁)	—					
Dry bulk cargo throughput (B ₂)	—	—				
Liquid bulk cargo throughput (B ₃)	—	—	—			
Number of cranes (B ₄)	—	—	—	—		
Total length of container berths (B ₅)	—	—	—	—	—	
Port draught (B ₆)	—	—	—	—	—	—

(b) Please fill in the value of importance between the secondary indicators (B₇-B₁₁) with respect to the primary indicator (A₂). Shaded areas need not be filled.

Shipping Services (A ₂)	B ₇	B ₈	B ₉	B ₁₀	B ₁₁
Shipping brokerage service (B ₇)	—				
Ship engineering service (B ₈)	—	—			
Shipping business service (B ₉)	—	—	—		
Maritime legal service (B ₁₀)	—	—	—	—	
Shipping finance service (B ₁₁)	—	—	—	—	—

(c) Please fill in the value of importance between the secondary indicators (B₁₂-B₁₆) with respect to the primary indicator (A₃). Shaded areas need not be filled.

General Environment (A ₃)	B ₁₂	B ₁₃	B ₁₄	B ₁₅	B ₁₆
Government transparency (B ₁₂)	—				
Extent of e-government and administration (B ₁₃)	—	—			
Customs tariff (B ₁₄)	—	—	—		
Ease of doing business index (B ₁₅)	—	—	—	—	
Logistics performance index (B ₁₆)	—	—	—	—	—

Xinhua-Baltic

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