



中国经济信息社
CHINA ECONOMIC INFORMATION SERVICE



Baltic
Exchange

2024 

Xinhua-Baltic

International Shipping Centre Development Index Report



Xinhua-Baltic International Shipping Centre Development Index Report (2024)



中国经济信息社
CHINA ECONOMIC INFORMATION SERVICE



CONTENTS

I. Openings 01

- Introduction 03
- Message from Xinhua News Agency 06
- Message from Baltic Exchange 09
- How the rankings are decided 11
- Global rankings – 2015 to 2024 13
- Overall rankings – scores 15

II. Challenges & opportunities 17

- Trade patterns shift as vessel rerouting intensifies 19
- Shipping continues to adapt to the needs of e-commerce 23

III. International shipping market reviews 27

- Dry bulk market remains robust despite shifting market patterns 29
- Container shipping in 2023: back to normalcy 33
- Oil & gas shipping: Reshuffling patterns support voyage distances 37

IV. Maritime service centre ranking analysis 45

- Top 10 Ports 47
- 11 to 20 Ports 81



V. Maritime finance and insurance 109

- Western shipowners increasingly seek Chinese leasing structures 111
- Shipping braces for financial impact of rerouting disruption 115
- Freight derivatives continue to flourish as volatility endures 119
- Shipbrokers report strong numbers as mergers dominate headlines 123
- Marine insurers rally following difficult risk period 126
- Global marine insurance premiums continue post pandemic resurgence 129
- London remains global centre for maritime arbitration 133

VI. Decarbonisation in the maritime industry 137

- Bunkering's record-breaking year for traditional and alternative fuels 139
- Oceans of opportunity: Bunkering zero-emission fuels at ports 143
- Alternative fuel solutions pick up pace in 2023 146
- Wind-propulsion systems pick up the pace 150
- Shipping prepares for enforcement of Hong Kong Convention 153

VII. Ports & Seafarers 157

- Cyber security risks on the rise as ports further integrate AI 159
- Ports continue the drive to digitise 163
- New leader emerges as flag states face increased scrutiny 168
- Incentives driving ports and vessels to curb emissions 172
- Smarter ports require smarter ship agents 176
- Crew welfare in the spotlight as maritime flags safety risks 179

Appendix 183

I. OPENINGS



- Introduction
- Message from Xinhua News Agency
- Message from Baltic Exchange



- **How the rankings are decided**
- **Global rankings – 2015 to 2024**
- **Overall rankings – scores**

Introduction



INTRODUCTION



The Xinhua-Baltic International Shipping Centre Development Index (ISCDI) provides a comprehensive ranking of the world's top 43 port cities and maritime centres, employing a diverse array of metrics. These metrics encompass every facet of a shipping-centred environment, from business elements involving maritime service providers such as lawyers, financiers, and shipbrokers, to port factors including cargo throughput, draught, and container berth length. Additionally, the index evaluates the overall business climate, factoring in customs tariffs and logistics performance.

The maritime landscape has seen some noteworthy shifts over the past number of months. However, global ports continue to show robust and positive growth amidst a particularly turbulent period for global supply chains and commerce, providing a degree of stability and certainty for the shipping industry. Singapore once again retains its top position in the ISCDI for the eleventh consecutive year, while several other cities have maintained their position in the rankings, reflecting their continued importance to local economies and global supply chains.

London, Shanghai, Hong Kong, Dubai, and Rotterdam all maintained their positions as the top six shipping centres in the world, owing to their continued role in providing key maritime services, industry-leading port infrastructure and adhering to global environmental regulations. Athens/Piraeus and Ningbo Zhoushan have all moved up one place in this year's report, while Hamburg has fallen two places to ninth place. New York/New Jersey, meanwhile, once again rounds out this year's top 10.

This year's ISCDI also takes a deep look at the ports ranked in top 20. Once again, most ports have maintained their position in the rankings, with Tianjin becoming the only new entry in our official top 20 this year in 19th place.

In 2023, the international shipping markets faced a year of normalisation and robust activity amidst various challenges. The dry bulk sector set a record by transporting 5.37 billion metric tonnes of commodities, although freight rates remained low for most of the year. The Baltic Dry Index saw significant fluctuations, with a low in February and a recovery by December. Key commodity patterns included a recovery in iron ore trade, record high coal imports, and significant grain export increases from Brazil, despite a drought-affected drop in Argentina's output. Minor bulk trades also saw modest growth, with notable increases in bauxite/alumina and steel trade. The dry bulk fleet expanded by 3%, with Ultramax vessels growing the most.

The container shipping market returned to pre-Covid normalcy after a boom period, with freight and charter rates falling significantly. The Freightos Baltic Global

Container Index reflected this decline, stabilising towards the end of the year due to geopolitical instabilities and rerouted shipping routes. North-South routes remained resilient, particularly in Africa, South America, and Intra-Asia.

The tanker and gas market saw increased VLCC employment, though demand pressures emerged later in the year. Suezmaxes and Aframax benefited from Russia's long-distance crude exports, while clean tankers found opportunities in East of Suez motor fuel exports despite reduced Russian diesel exports. Geopolitical instability and environmental events like the Panama Canal drought, significantly influenced shipping patterns and extended voyage distances, ultimately boosting demand for extra tonnage and freight rates across the board.

The industry continued to adapt to new environmental regulations, including the EEXI, CII, and the upcoming EU ETS. The commitment to achieving net-zero emissions by 2050 remains a significant challenge, but ongoing investments in low-carbon technologies and alternative fuels indicate a positive trajectory towards sustainability.

In summary, 2023 was a year of adjustment and resilience for the shipping industry, with continued growth in global trade and significant progress towards environmental goals despite economic uncertainties and market volatility. This report aims to provide valuable insights into these developments and the performance of the top maritime centres that support this critical global industry.

We extend our gratitude to our partners at AXS, Vortexa, IFCHOR GALBRAITHS, The Global Maritime Forum (GMF), Anemoi Marine Technologies, International Association of Ports and Harbours (IAPH), International Union of Marine Insurance (IUMI), GAC, Bigyellowfish, and the numerous representatives from the shipping centres who provided the articles and data that make this report possible.

This year also marks the eleventh anniversary of the ISCDI, a testament to the ongoing collaboration between China Economic Information Service, a subsidiary of Xinhua, and Baltic Exchange.

We hope this report will enhance your understanding of ocean-going shipping and the dynamic maritime centres that support this global industry.

Message from Xinhua News Agency



**MESSAGE FROM
XINHUA NEWS
AGENCY**

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

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 2023, the world economic recovery did not meet expectations, protectionism and unilateralism have risen, bringing challenges to the global shipping industry. Heightened risks in the Red Sea, economic sanctions and intensifying geopolitical conflicts have expanded these challenges. From a positive perspective, the shipping market still exhibits strong vitality and excellent resilience, driven by global demand for goods.

The ISCDI report of the year 2023 shows that, the world's trade and shipping network had undergone some subtle changes. Singapore, London and Shanghai had become the most important centres in the world and played an crucial role of ensuring the smooth operation of the global shipping system. Hong Kong and Rotterdam are still the most important shipping centres of Asia and Europe, and even for the globe, but urgently need transformation to keep their influence. Meanwhile, Dubai is consistently enhancing its capabilities to secure a lasting competitive edge. In particular, Athens-Piraeus and Ningbo Zhoushan play an increasingly important role in the global port and shipping supply chain, with both having improved their rankings.

Decarbonisation has also become the consensus in the global shipping industry. As of 1 January 2024, the European Parliament implemented significant amendments, including expanding the EU ETS to encompass maritime transport. It will have an impact on global shipping, ship operators are required to hold the correct number of EUAs equivalent to every tonne of CO₂ emitted. This means shipowners are directly liable for their emissions, which could increase operational costs and freight rates.

In addition, digital technologies such as AI, digital twins, IoT, and automation are constantly empowering the shipping industry and promoting its development.

An efficient, safe, green and smart future is our expectation for the global shipping industry.



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





The international shipping industry in 2023 demonstrated remarkable resilience and adaptability, reinforcing its indispensable role as the cornerstone of global trade. Despite facing significant economic slowdowns, geopolitical tensions, and environmental challenges, the sector maintained stability and continued to facilitate the movement of essential goods around the world.

The dry bulk market, while experiencing fluctuations in freight rates, saw an unprecedented volume of commodities shipped, setting a new record of 5.37 billion metric tonnes. This robust activity highlights the sector's ability to thrive even in turbulent times. Similarly, the container shipping market normalised after the extraordinary post-Covid boom, returning to pre-pandemic levels but maintaining steady growth on North-South routes. Tanker and gas markets also adapted well, with longer voyage distances contributing to elevated freight rates and sustained demand.

As we navigate the complexities of the current global landscape, it is clear that shipping remains the backbone of international commerce. The sector's ability to adjust to shifting trade patterns, environmental policies, and geopolitical developments ensures the continuity of global supply chains. Shipping centres like Singapore, London, and Shanghai continue to lead the way, providing world-class services and infrastructure that underpin the industry's success.

Looking ahead, the shipping industry will continue to face challenges such as decarbonisation and evolving trade routes. However, its inherent resilience and strategic importance will ensure that it remains a critical driver of global economic growth and stability. We commend all shipping centres for their contributions to this year's Xinhua-Baltic International Shipping Centre Development Index Report and look forward to another year of progress and innovation in the shipping sector.

Mark Jackson

Chief Executive, 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.

Global rankings of the last decade – 2015 to 2024



**GLOBAL RANKINGS
OF THE LAST
DECADE – 2015 TO
2024**



#	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
1	Singapore	Singapore	Singapore	Singapore	Singapore	Singapore	Singapore	Singapore	Singapore	Singapore
2	London	London	London	Hong Kong	Hong Kong	London	London	London	London	London
3	Hong Kong	Hong Kong	Hong Kong	London	London	Shanghai	Shanghai	Shanghai	Shanghai	Shanghai
4	Rotterdam	Hamburg	Hamburg	Shanghai	Shanghai	Hong Kong	Hong Kong	Hong Kong	Hong Kong	Hong Kong
5	Hamburg	Rotterdam	Shanghai	Dubai	Dubai	Dubai	Dubai	Dubai	Dubai	Dubai
6	Shanghai	Shanghai	Dubai	Rotterdam	Rotterdam	Rotterdam	Rotterdam	Rotterdam	Rotterdam	Rotterdam
7	Dubai	New York/ New Jersey	New York/ New Jersey	Hamburg	Hamburg	Hamburg	Hamburg	Hamburg	Hamburg	Athens/ Piraeus
8	New York/ New Jersey	Dubai	Rotterdam	New York/ New Jersey	New York/ New Jersey	Athens/ Piraeus	Athens/ Piraeus	New York/ New Jersey	Athens/ Piraeus	Ningbo Zhoushan
9	Busan	Tokyo	Tokyo	Tokyo	Houston	New York/ New Jersey	New York/ New Jersey	Athens/ Piraeus	Ningbo Zhoushan	Hamburg
10	Athens/ Piraeus	Athens/ Piraeus	Athens/ Piraeus	Busan	Athens/ Piraeus	Tokyo	Ningbo Zhoushan	Ningbo Zhoushan	New York/ New Jersey	New York/ New Jersey

Overall rankings – 2024 scores



**OVERALL RANKINGS –
2024 SCORES**



	City	Compared to 2023
1	Singapore	same
2	London	same
3	Shanghai	same
4	Hong Kong	same
5	Dubai	same
6	Rotterdam	same
7	Athens/Piraeus	up one
8	Ningbo Zhoushan	up one
9	Hamburg	down two
10	New York/New Jersey	same
11	Houston	same
12	Tokyo	same
13	Guangzhou	same
14	Busan	same
15	Qingdao	same
16	Antwerp	same
17	Shenzhen	same
18	Oslo	same
19	Tianjin	new entry
20	Melbourne	down one

II. CHALLENGES & OPPORTUNITIES

A large container ship is shown from a side-on perspective, sailing on a calm blue sea. The ship has a white upper hull and a dark lower hull. In the background, there are rolling mountains under a blue sky with some light clouds. The overall scene is serene and professional.

- Trade patterns shift as vessel rerouting intensifies



- **Shipping continues to adapt to the needs of e-commerce**

Trade patterns shift as vessel rerouting intensifies



TRADE PATTERNS SHIFT
AS VESSEL REROUTING
INTENSIFIES



Commercial shipping rarely makes mainstream headlines for positive reasons and in 2023 this trend continued as two major news stories dominated headlines for their impact on vessel voyages: droughts affecting the Panama Canal and security challenges in the Red Sea.

In Panama, more than 15,000 vessels traversed the canal in 2022, transporting fuel, grain, minerals and commercial goods from Asia to the US East Coast and beyond. However, since the start of 2023, owing to a combination of El Niño and climate change, water levels in Gatún Lake, which supplies the water needed for vessels to pass through the Panama Canal, fell to a historic low. As a result, Panama Canal authorities reduced the number of vessels that can transit the waterway from its usual 38 per day to just 24 per day to mitigate the resulting challenges.

The knock-on effect of this reduced throughput led to delays, vessel backlogs and increased shipping costs across the board. From an economic perspective, the US lost roughly US\$1.5 billion per week in GDP as a result of the disruption, while Panama's neighbours such as Colombia and Costa Rica faced a much larger percentage hit to GDP.

Meanwhile, the Red Sea became a hotspot of tension and disruption in 2023 as Houthi rebels targeted commercial vessels with missile and drone strikes in a bid to prevent ships from navigating this key waterway linking Asia to Europe. Attacks on vessels in this region has resulted in major disruptions to global supply chains and commerce as many vessels look to access to Suez Canal as a means to move cargo in the quickest way possible.

According to research from UNCTAD, based on data from Clarksons Research, the number of monthly transits in December 2023, compared to those in October 2021, fell by 42% in the Red Sea and by 49% in the Panama Canal.

While both issues are based on very different circumstances, shipping players have looked to ensure their vessels keep moving despite limited access to key waterways by extending their voyages and rerouting their ships. To mitigate issues in both Panama and the Red Sea, ocean bulk and container vessels are rerouting via the Cape of Good Hope in South Africa, adding about 3,500 nautical miles and 10 to 12 days sailing time to each trip. Data from IMF PortWatch shows that the volume of trade transiting around southern Africa surged by 74% in late 2023 year-on-year.

All of this means that 2023 saw a fundamental shift in global trade patterns. To compound this problem, the number of new global trade restrictions has been steadily rising year-on-year, from 650 in 2017 to more than 3,000 in 2023.

However, as has been seen time and time again, supply chains and the maritime sector have remained remarkably resilient in the face of major market shocks. This has been seen recently with Brexit, the Covid-19 pandemic and the conflict in Ukraine, and the same is likely to be the case with issues in Panama and the Red Sea. Shipping players made quick decisions in 2023 to ensure their vessels kept moving and cargo reaches its destination, albeit somewhat delayed.

UNCTAD Secretary - General Rebecca Grynspan said in November 2023, "In a world rife with cascading crises - geoeconomic fragmentation, retreating development, and climate change - maritime trade serves as a stabilising anchor, holding fast against the turbulent currents of disruption."

Deciding to reroute, nevertheless, has both financial and environmental consequences for shipping players. From an economic perspective, detouring can contribute to a surge in ocean freight rates, while ship owners and charterers also have to account for the cost of additional war risk premiums and fuel and crewing costs. Reports in late 2023 indicated that the risk premiums have risen from 0.7% of a vessel's value to 1%, while at a time it had once been less than 0.1%. All of these increase in costs usually result in an increased cost of the cargo to the consumer once it reaches the shelves.

"Most of the main carriers are invoking Bill of Lading clauses allowing them to pass on extra costs related to the sudden need to deviate vessels for cargo already loaded on board. Shippers will in most cases have no real choice but to accept those added charges," said Lars Jensen, Chief Executive Officer of Vespucci Maritime.

In a bid to minimise cargo delays, reduce costs and make up the extra distance due to traversing the Cape of Good Hope, as well as managing fleet capacity, shipping lines are increasingly speeding up their vessels. This means commercial vessels, many of which continue to run on heavy fuel oil, are burning through more fuel to get their vessels up to speed.

UNCTAD calculated that a ship increasing its speed from 14 kt to 16 kt would increase bunker fuel consumption per mile by 31%. "In this context, longer distances travelled due to rerouting away from the [Red Sea] and through the Cape of Good Hope imply that greenhouse gas emissions for a round trip from Singapore to northern Europe would rise by over 70%," the company noted.

This increase in carbon emissions as a result of rerouting is a complete contradiction to the shipping industry's push to decarbonise its operations. In 2023, the IMO announced its commitment to ensure shipping becomes net-zero by 2050 and boost the uptake of



alternative or near-zero greenhouse gas fuels. Maritime has made significant steps to become more sustainable and concerns are mounting that increased vessel speeds due to rerouting could easily 'erode' environmental gains.

This problem is particularly noticeable as stringent environmental regulations are now becoming more commonplace in shipping. Regulations such as the IMO's Carbon Intensity Indicator are designed to assess vessel carbon emissions and impose financial penalties for those that exceed those levels. Evidence therefore suggests that shipping lines are choosing to pay those financial costs by rerouting and keeping their vessels running as close to schedule as possible, putting environmental targets on the back seat.

Rerouting became a viable and go-to option for shipowners looking to mitigate issues in Panama Canal and the Red Sea in 2023, and it is an issue that looks to persist in 2024. With the advantages and disadvantages laid bare, ship owners now face a host of choices about how to balance commercial operations with environmental pressures as they also face the choice about whether to reroute or not.

Shipping continues to adapt to the needs of e-commerce

SHIPPING CONTINUES
TO ADAPT TO

THE NEEDS OF
E-COMMERCE





E-commerce continues to reshape the global retail landscape, and 2023 has been a pivotal year in cementing its influence. The rise of online shopping, accelerated by the Covid-19 pandemic, has led to significant changes in consumer behaviour, logistics requirements, and international shipping markets. For the maritime sector, the rise of the e-commerce market has presented a number of new opportunities in a sector that is increasingly shaping the supply chain.

The global e-commerce market has seen exponential growth, with sales projected to reach US\$5.4 trillion by 2023, up from US\$4.9 trillion in 2021. The increase in online shopping has been driven by improvements in digital payment systems, logistics infrastructure, and consumer trust in online transactions. Regions such as Asia-Pacific, particularly China and Southeast Asia, have become hotspots for e-commerce activities due to high internet penetration and a burgeoning middle class.

E-commerce platforms have diversified, offering a range of products from electronics to groceries. Companies like Amazon, Alibaba, and Shopify have led this charge, creating sophisticated logistics networks to handle the massive volumes of goods being shipped globally. The advent of technologies such as artificial intelligence (AI), machine learning, and big data analytics has enabled e-commerce companies to predict consumer trends and optimise supply chains more efficiently.

However, it is worth noting that while established major e-commerce players such as Amazon and Alibaba, along with growing players such as SHEIN and Temu, are able to implement systems like these effectively, small e-commerce businesses around the world are increasingly relying on the maritime sector to provide an efficient means of moving their goods, meeting the 'just-in time' supply chain and changing needs of consumers.

As major names continue to disrupt the supply chain with the implementation of technology, the maritime industry must find ways to innovate to remain competitive in an e-commerce market.

Impact on the International Shipping Industry

The boom in e-commerce has had several direct and indirect impacts on the international shipping industry. One of the most significant changes is the increase in shipping volumes. As more consumers turn to online shopping, the demand for shipping services has surged. According to a report by Shopify, international shipping volumes related to e-commerce grew by approximately 25% in 2023 compared to the previous year.

E-commerce has also altered traditional shipping patterns. Unlike bulk shipments typical of traditional retail, e-commerce involves a high volume of smaller parcels. This shift has necessitated changes in logistics strategies, including the use of more localised distribution centres and the adoption of multi-modal transportation methods. The need for speed in e-commerce deliveries has also increased the reliance on air freight for high-value or time-sensitive goods.

A report released by Baltic Exchange in June 2023 highlighted the industry's adaptability, noting a buoyant mood in Munich at the Air Cargo Europe event a month earlier despite falling freight rates, suggesting a robust response to the evolving demands of e-commerce. Speaking to delegates on the e-commerce topic, WestJet cargo EVP Kirsten de Bruijn cited the huge growth in e-commerce during the Covid period, noting that it is seen as a sector that would continue to grow in the medium to long term.

However, in the current falling market, de Bruijn conceded, there were indeed now plenty of "cost-cuttings and de-orderings".

Technology and the Environment

The integration of technology in shipping has been pivotal in managing the e-commerce boom. Blockchain technology, for example, has been increasingly adopted to improve transparency and efficiency in shipping operations. By providing a secure and immutable ledger for tracking shipments, Blockchain helps in reducing fraud, streamlining customs processes, and enhancing the overall reliability of the supply chain.

Automation and robotics have also been employed in warehouses and ports to handle the increased volumes and improve efficiency. Automated sorting systems, drones for last-mile delivery, and autonomous ships are some of the innovations being explored to meet the demands of e-commerce logistics.

The environmental impact both in and out of maritime of increased e-commerce activity is a growing concern. The surge in packaging waste and the carbon footprint of shipping have prompted both e-commerce and logistics companies to seek sustainable practices. Efforts include the use of eco-friendly packaging materials, optimising delivery routes to reduce emissions, and investing in electric vehicles for last-mile delivery.



Strategic Adaptations by Shipping Companies

Shipping companies have had to adapt strategically to the changing landscape. Partnerships between e-commerce platforms and logistics providers have become more common, allowing for integrated solutions that enhance efficiency. Shipping players are also investing in expanding their fleets and infrastructure to cater to the growing demand.

For instance, major shipping lines have increased their capacity by adding more container ships and expanding port facilities. These expansions are aimed at reducing congestion and improving turnaround times for e-commerce shipments. Additionally, there has been a push towards developing smarter ports equipped with IoT (Internet of Things) devices to monitor and manage cargo movements in real-time.

Conclusion

The e-commerce boom of recent years has undeniably transformed the international shipping industry and this trend continued in 2023. Increased shipping volumes, changes in logistics strategies, technological advancements, and a heightened focus on sustainability are some of the critical impacts observed. As e-commerce continues to evolve, so too will the shipping industry, adapting to new challenges and opportunities in a globally interconnected marketplace.

Understanding these dynamics is crucial for stakeholders in both sectors. E-commerce companies must continue to innovate and optimise their supply chains, while shipping companies need to enhance their capabilities and embrace technological advancements to stay competitive. The symbiotic relationship between these industries will shape the future of global trade in the coming years.

III. INTERNATIONAL SHIPPING MARKET REVIEWS



- **Dry bulk market remains robust despite shifting market patterns**
- **Container shipping in 2023: back to normalcy**



- **Oil & gas shipping: Reshuffling patterns support voyage distances**

Dry bulk market remains robust despite shifting market patterns

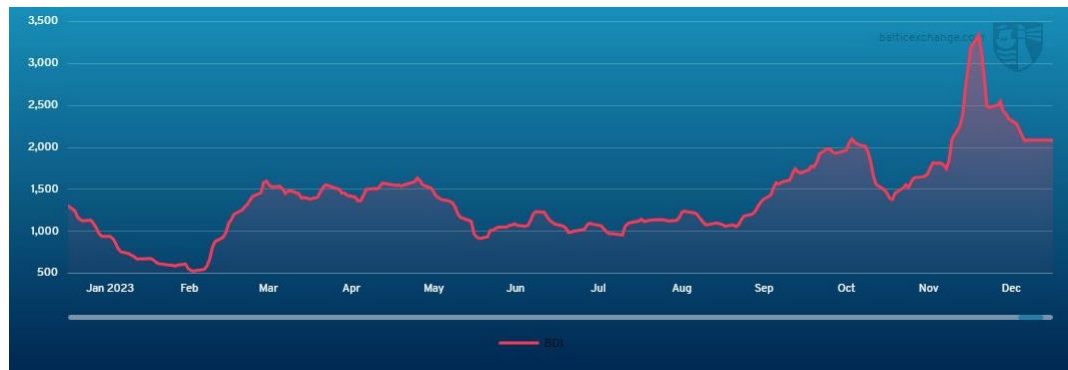
A large dry bulk carrier ship is shown from a low angle, sailing on the ocean. The ship has a dark hull and a white superstructure. The deck is visible with several large cargo holds. In the background, there are port cranes and another ship. The sky is clear and blue.

DRY BULK MARKET
REMAINS ROBUST DESPITE
SHIFTING MARKET
PATTERNS



The dry bulk sector was a tale of two stories in 2023. Global dry bulk seaborne trade set an all-time record for quantities transported, with more than 5.37 billion metric tonnes of commodities shipped throughout the year. However, freight rates for dry bulk cargo remained at a lower level for most of the year, despite a late recovery in December 2023 as evidenced by the Baltic Dry Index (BDI) for the year.

According to the BDI, rates fell to its lowest level in 2023 in February during the Lunar New Year – the market's traditional lower end of the cycle – hitting just 538 before rallying to reach 3,346 in the final weeks of the year.



The reason behind this level of activity was due to a significant shift in commodity patterns seen in 2023, exacerbated by a difficult economic environment in China and geopolitical tensions in Europe. A slowdown in Chinese economic growth impacted infrastructure and construction activity, which influenced iron ore prices and demand for raw materials. This was further affected by Chinese environmental policy measures to reduce steel production capacity and reduce reliance on coal as countries across the Asia-Pacific region, including Japan and South Korea, diversify their energy portfolios.

However, as noted, it was a strong 12 months in terms of the amount of cargo moved throughout the year. According to AXSMarine, every single quarter of 2023 set its own record, surpassing 2022 levels by more than 3.1%, with the strongest year-on-year performance seen in the fourth quarter of 2023.

Looking at the global dry bulk fleet, more than 150,000 individual laden legs were carried out by dry bulkers in 2023, roughly the same as 2022. Meanwhile, the dry bulk

fleet increased by 3%, with the Ultramax segment growing the most at more than 8% last year while Panamax and Capesize vessels also gained year-on-year.

One of the best performing routes in 2023 was the C2 route from Brazil to Western Europe, which saw a 76.7% rise in Capesize rates. Meanwhile, routes to India (S8_58, P9 and C18) also saw major rises, while the C7 route from Colombia to Europe also increased 20.1%. On the other side, Panamax routes to China showed dramatic drops in rates in 2023, including P7, P8, P5_82 and S10_58.

Iron Ore

Following a drop of 4.7% in 2022, global iron ore trade recovered by 3.3% in 2023. Despite this recovery, volumes remained lower than the recent highs set in 2020 and 2021, while patterns of trade have remained relatively unchanged compared to 2022.

China imported more than 1,181 million tonnes of iron ore in 2023, a 6.4% rise compared to last year, despite a weakening of the country's property sector. Iron ore demand in the rest of the developed world was weaker in 2023, with Western Europe, South Korea and Japan noting reduced levels of imports. However, there was stronger import demand for iron ore in the Middle East, India and Africa.

Coal

There was a major shift in coal trades in 2023. Global trade hit an all-time high of 1.49 billion tonnes, which was an increase of 13% and a rise of 50 million tonnes compared with the previous high in 2019.

China increased its coal imports by 442 million tonnes last year, a rise of 144%, due to a lack of hydro-energy power following a year of poor rainfall. Imports to Western Europe also fell in 2023 due to a low gas prices putting gas-fired power generation ahead of coal, while other countries in Asia, including Japan, South Korea and Taiwan, also showed reduced import levels as they turn to renewable sources instead of coal for energy.

Nevertheless, there were increases in imports from Indonesia, Australia, Russia and the United States. Of note, there continued to be a major shift in Russian coal exports as more than 80% of exports were directed to China and India, with a major reduction of export levels to Japan and South Korea, as well as a continued ban on imports into Europe.



Grain

Brazil was one of the biggest winners in 2023 when it came to grain exports, owing to favorable weather conditions for both corn and soybean production. Both commodities saw an increase in exports last year, with corn exports rising 20% and soybean growing by a third to exceed the 100 million tonnes per year mark for the first time. Despite this, Brazil's neighbor Argentina saw its exports more than half in 2023 due to severe drought conditions, with exports reaching just over 32 million tonnes. In Europe, despite the Black Sea Grains Corridor being terminated in mid-2023, wheat and corn exports from Ukraine rose 10% compared to 2020 levels. Meanwhile, exports of grain from Russia rose 50% in 2023.

Minor bulks

The minor bulk trade saw a slight incline in 2023, with a rise of 49 million tonnes, a 2.4% increase year-on-year. This performance was a complete reversal of the activity seen in 2022, which saw a decline of 46 million tonnes.

The bauxite/alumina trade saw positive growth of 14 million tonnes last year as economies shifted to lighter construction projects and manufacturing materials for green technology. Steel trade also increased by 12 million tonnes, with a particularly notable increase of imports to China. Meanwhile, owing to poor weather conditions and crop output, argibulks declined by 8 million tonnes in 2023.

Conclusion

Looking forward, the same problems that plagued the dry bulk sector last year are likely to persist in 2024. Despite this, the sector is expected to remain robust as volume of maritime cargo movements increase. Additionally, issues surrounding the Panama Canal and the Red Sea will continue to result in vessels taking longer, alternative routes, which will increase tonne-miles.

With shipyards also building vessels for almost all other sectors except dry bulk ships, capacity is expected to be limited, pushing rates and demand for bulk carriers higher over the next few years.

Container shipping in 2023: back to normalcy

AXSMarine



ONE
CONTAINER
SHIPPING IN 2023:
BACK TO NORMALCY



The container shipping market returned to normality in 2023, after an exceptional two-year high driven by the post-Covid cargo boom. The freight and charter rates seen during this extraordinary period became a distant memory, with both carriers and non-operating owners (NOOs) witnessing a sharp drop in revenues, and in some cases, returning to financial losses, against a backdrop of weakening demand.

Freight rates fell back close to pre-Covid levels and were disappointing on East-West routes due to a combination of soft volumes and rising supply, caused by the introduction of a large number of newbuilding vessels of 13,000-24,000 twenty-foot equivalent units (teu).

The Freightos Baltic Global Container Index (FBX), one of the liner industry's key performance indicators, reflected this development. Whilst typically lingering between US\$1,300 and US\$1,600 forty-foot equivalent unit (feu) through most of 2018, 2019 and 2020, the FBX substantially increased to US\$10,000 and above towards the end of 2020. It then plateaued from mid-2021 to mid-2022 when the index began its slow but inevitable decline towards a 'new normal'.

Last year, the FBX started slightly over US\$2,000, and finally levelled off, before fluctuating between US\$1,000 and US\$1,600.

Over the last few weeks of 2023, the index climbed back to around US\$2,400 since the spectre of a new supply chain meltdown reared its head: geopolitical instability in the Near East, attacks on container ships in the Red Sea, and the subsequent vessel diversions via the Cape of Good Hope, made container transport a lot more costly again.

For most of the year, though, container freight rates were lacklustre at best, especially considering that the carriers' cost base had increased significantly.

The North-South routes meanwhile, particularly Africa, South America, India, the Middle East and Intra Asia were a little more resilient and appear as promising relays of growth for the future.

With a world economy expected to grow by around 3% in 2024, a reduced inactive fleet of only 315,000 teu in the last weeks of 2023 and additional tonnage needed to meet the CII lower speed environment, there were wide expectations at the end of the year that cargo rates could be up for a rebound in the first quarters of 2024. However, the 3 million teu of newbuilding capacities expected to hit the water in 2024 remained a threat to a lasting recovery.

Charter rates meantime had a reasonable year, especially in the first half although they were only a fraction of the extreme highs seen during the post-Covid demand boom. However, after a rally in the spring, they started declining again in the summer, impacting first the smaller ships, and later in the year, the larger ones. But despite the steady decline, charter rates remained at the end of 2023 a little higher than at the onset of the Covid pandemic. Nevertheless, the continued shortage of charter market ships, especially larger or energy-efficient units, pointed to a rate rebound in the new year.

A source of concern for the future of the charter market were the continued sales of NOO tonnage to end users, which is causing the pool of charter market vessels to shrink rapidly. In December, the charter market fleet was around 1.2 million teu smaller than its pre-Covid level. Tonnage providers would need to invest more significantly to renew their fleets but many are reluctant to do so, due to a number of reasons including the choice of fuel, construction prices and financing.

Otherwise, despite a bearish trading environment, 2023 saw a continued order spree, mostly for 'green' ships, with 1.9 million teu of newbuilding contracts placed by both carriers and non-operating owners. New ship deliveries meanwhile hit 2.3 million teu. Against this, recycling recovered from a 17-year low in 2022 but remained modest despite continuously healthy demolition prices, with only 167,000 teu taken out of the market. However, it was hoped that a move by the EU to consider adding Indian recycling yards to its list of authorised recycling facilities could boost demolition sales in 2024, thereby mitigating risks of overcapacity.

Finally, 2023 was again a year of major geopolitical instability and climate-related issues across the globe. On the geopolitical side the shipping world saw a second year of war in Ukraine. In August, the only containership trapped in the country further to the war outbreak with Russia, the 9,403 teu JOSEPH SCHULTE was finally released, after having spent nearly 18 months stuck in the port of Odessa. Meanwhile, Russia organised its own container shipping corridors with a number of freshly-established third party carriers who filled a gap left by the major shipping lines who by and large exited Russia-linked routes.

As mentioned earlier, another conflict, this time in the Near East and opposing Israel to the Hamas in Gaza, further to the 7 October attacks in Israel, became a new threat to container shipping at the end of the year.

In November and December, attacks on Israel-linked vessels in the Bab Al-Mandab strait area by pro-Palestine Houthi rebels, later extended to all vessels calling



at Israel regardless of their nationality, saw four container vessels hit by drone strikes and a couple of additional ships involved in near-misses. Although these attacks caused only slight damages, the fast deterioration of safety in the area prompted most shipping lines to reroute via the Cape of Good Hope the tonnage they deploy on East-West routes.

In the meantime, Latin America was hit by an exceptional El Niño-related drought, which caused the Panama Canal to drastically reduce its traffic. With rainfalls 40% below their usual average and freshwater level in the Panama Canal's reservoirs falling to historical lows, the number of daily ship transits had to be cut from 40 to 25, an unprecedented development in the history of the canal. As a result, a number of carriers decided to reroute services via Suez (before the Red Sea problems started developing), the Strait of Magellan or the Cape of Good Hope. Some shipping lines also had to resort to the Panama Canal railways to ship containers between each end of the waterway.

Ironically, both the Red Sea and the Panama Canal crises proved to be a blessing in disguise for container shipping. As the disruptions have extended in the new year, they have resulted in demand for a significant amount of extra tonnage, a boon to cut the threatening overcapacity in the industry and stimulate charter rates. They have also been a booster for freight rates, which have been on a fast-recovering trend since December.

Oil & gas shipping: Reshuffling patterns support voyage distances

Emma Li, Senior China Market
Analyst at Vortexa



OIL & GAS SHIPPING:
RESHUFFLING PATTERNS
SUPPORT VOYAGE DISTANCES



Oil tanker and gas carrier freight rates have been elevated from a historical perspective over the recent past, fuelled by significantly longer travel distances. This trend has contributed more to clean and dirty tonne-miles than underlying volumes.

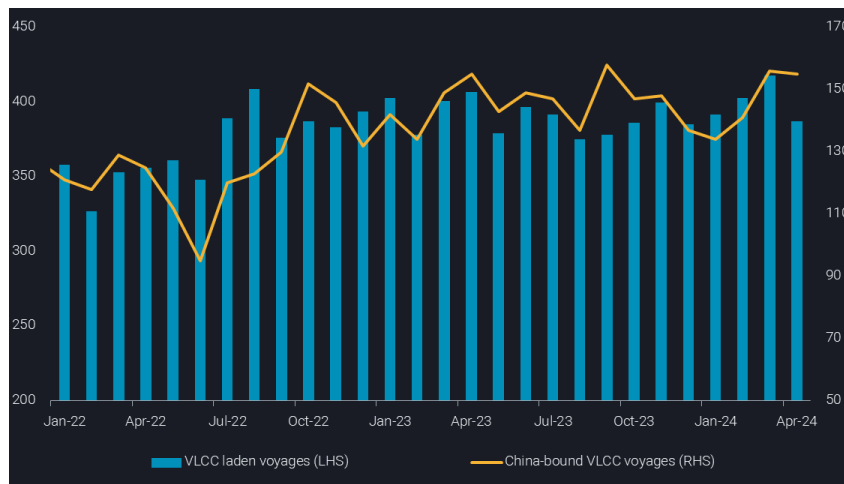
Dirty tankers: weak demand weighs on VLCC freight, smaller tankers benefit from longer voyages

In 2023, very large crude carrier (VLCC) laden voyage counts saw a 5% year-on-year increase, primarily fuelled by record China-bound voyages. China's seaborne crude oil imports surged by 14% year-on-year to 10.4 million barrels per day (mbd), driving VLCC employment up by 16% year-on-year to 1650, as Chinese refiners ramped up refining run rates and bolstered onshore crude inventories throughout the year.

However, VLCC demand has been under pressure since Q4 2023, following the cessation of China's robust crude import momentum. March witnessed heightened VLCC employment due to increased Mideast Gulf loadings towards Northeast Asia and a 58% surge in voyages originating from the US Gulf to North- and Southeast Asia, most notably on the TD22 route.

The narrowing US Gulf-Asia arbitrage economics in April, coupled with declining employment from West Africa and Brazil to Asia, are constraining global VLCC tonne-mile demand and hindering upward momentum in Atlantic Basin VLCC freight rates.

While a resurgence in crude purchases after spring refinery maintenance could bolster VLCC demand across wider Northeast Asia, China's crude demand is anticipated to remain within historical norms and last year's highs. Moreover, unplanned refinery run reductions in Asian nations amid bearish middle distillate cracks, along with the potential extension of OPEC+ production cuts, could also cap upsides on VLCC demand.



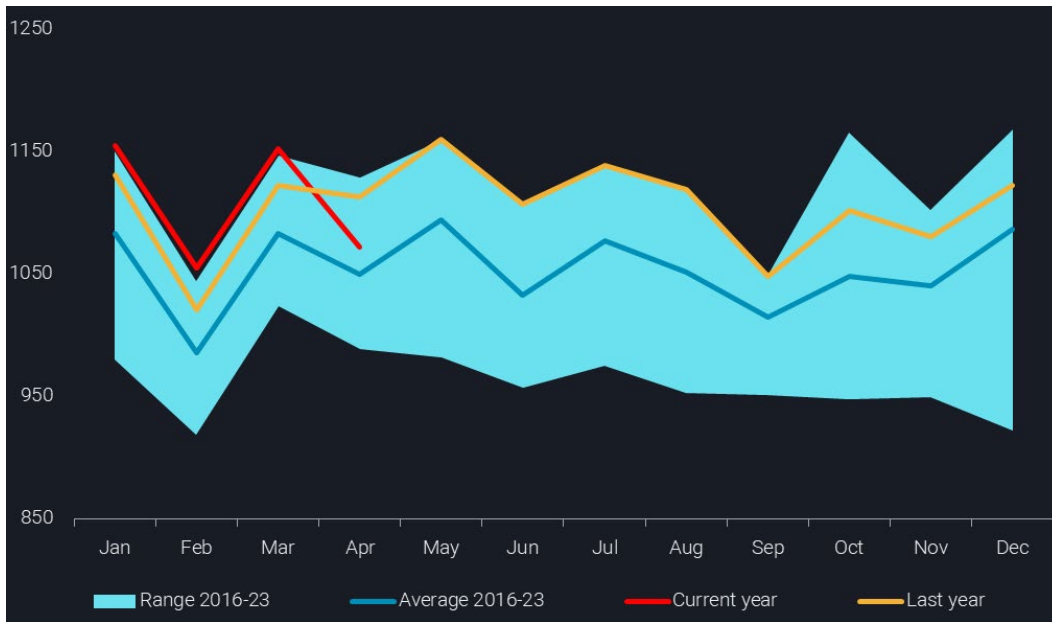
VLCC laden voyages on a departure basis (no. of voyages)

While VLCCs are facing challenges in long-haul voyages into Asia in recent months, other dirty tankers continue to benefit from Russia's crude reshuffling and robust American crude exports.

Russian crude exports from the Baltic, Black Sea, and Arctic regions remained robust at 2.15mbd in both 2023 and the first four months in 2024, unaffected by the price cap. These cargoes, primarily transported on Aframaxes and Suezmaxes, are now traveling much longer distances to buyers East of Suez.

Meanwhile, crude exports from the Americas have risen to 11.9mbd in 2023, up from 10.3mbd in 2022 and 8.9mbd in 2021, with more than half of the volume headed to Europe, partly replacing Russian crude.

Overall dirty tanker tonne-miles stayed significantly above seasonal averages throughout 2023 and Q1 2024, despite recently lower VLCC long-haul employment. While there was a notable drop in tonne-mile demand for Aframaxes in April, attributed to reduced demand in ex-USG employment, tonne-mile demand for Suezmaxes and Aframaxes is expected to remain robust for the rest of 2024.



Dirty tanker tonne-miles by arrival month (bn tonne-miles)



Clean tankers: reshuffling patterns keep tonne-miles above seasonal averages

Not only Russian crude, but diesel-led Russian clean product exports are also traveling longer distances to reach new key discharge areas, such as Brazil, Türkiye, West Africa and Kalamata STS, following the implementation of price caps.

While we anticipate Russia maintaining high-value oil product exports in the long term, refinery outages caused by Ukrainian drone strikes have notably, temporarily reduced Russian refined product output. This temporary reduction comes at a time when refinery maintenance season is already impacting production. Russian diesel exports amounted to 920 thousand barrels per day (kbd) in April, marking a 20% year-on-year decrease and a 13% month-on-month decline.

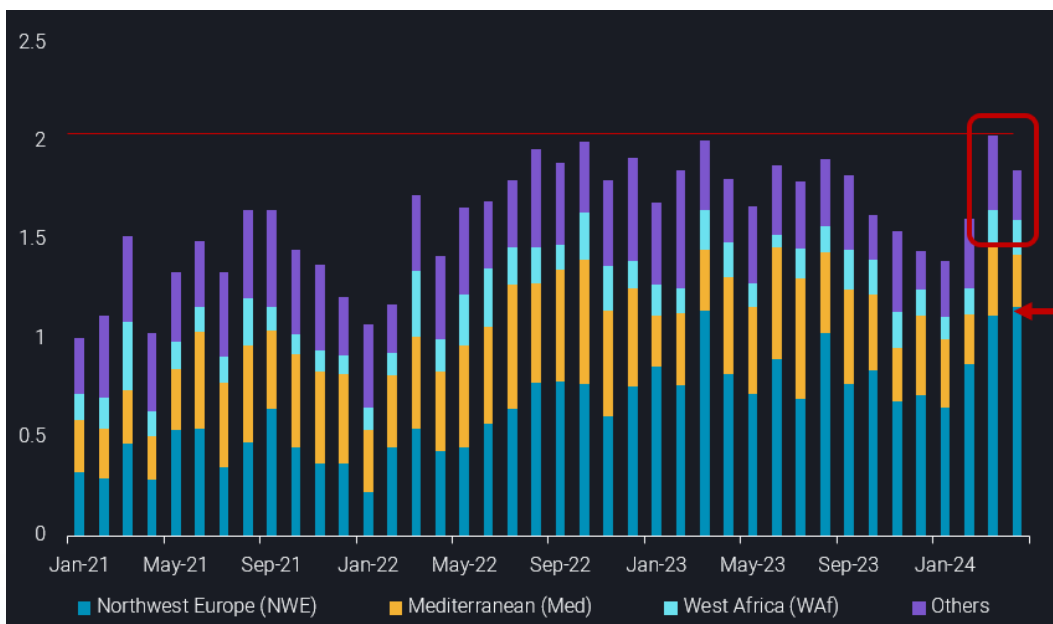
The decline in Russian diesel exports has prompted some tankers to exit the Russian clean petroleum product (CPP) trade. The number of tankers leaving Russian trade in March and April is significantly higher than at any point since the introduction of the price cap, resulting in a notable temporary loss in Russian fleet capacity.



Net fleet growth per month for fleet trading Russian CPP (no. of vessels)

Clean tankers departing from Russian trade may discover opportunities in East of Suez motor fuel exports. These motor fuel exports to the Atlantic Basin, dominated by middle distillates, remained strong at over 1.9mbd in April, after exports rebounded from a temporary disruption earlier in 2024 due to extensive refinery maintenance in the wider Arabian Sea region.

Additionally, the Red Sea attacks drove a rerouting of vessels travelling from the East-to West of Suez from the Bab El Mandeb to the Cape of Good Hope, further bolstering tanker tonne-miles.



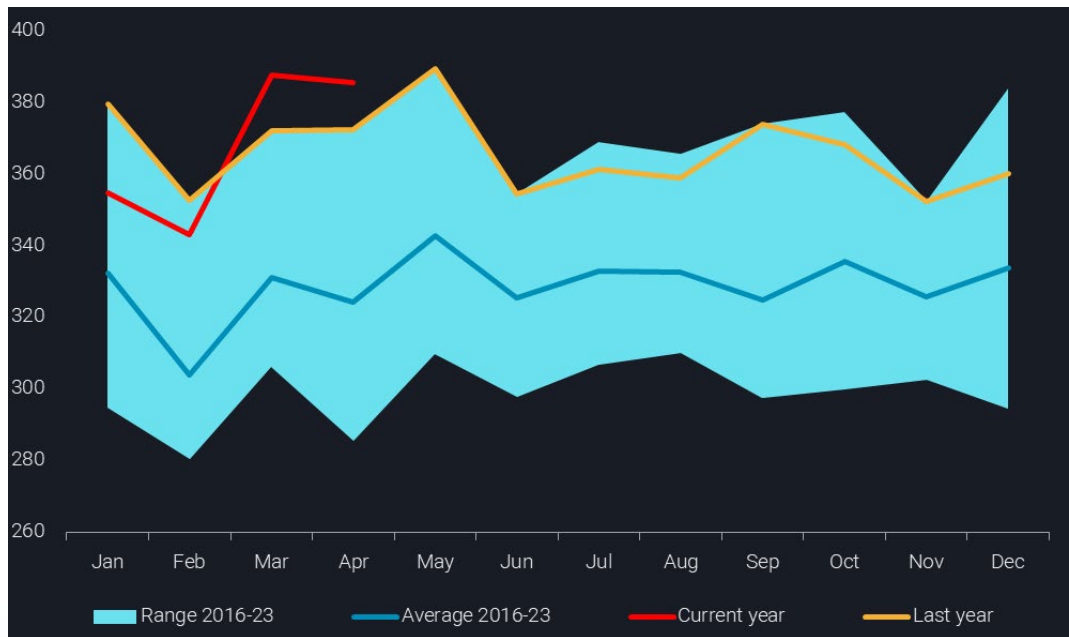
East of Suez motor fuel exports to the Atlantic Basin by destination shipping region (mbd)





A geographical rigidity in tonnage has emerged in the Panama Canal since Q3 of last year, driven by the severe drought, prompting tonnage flows between the Atlantic and Pacific Basins to take longer routes. Transits through the canal are gradually recovering but remained below seasonal norms in April.

Consequently, weather patterns and geopolitical events, including the Russian invasion reshuffling, the Red Sea rerouting, and the Panama Canal congestion, have propelled clean tanker voyage distances to new highs in recent months.



Clean tanker tonne-miles by arrival month (bn tonne-miles)

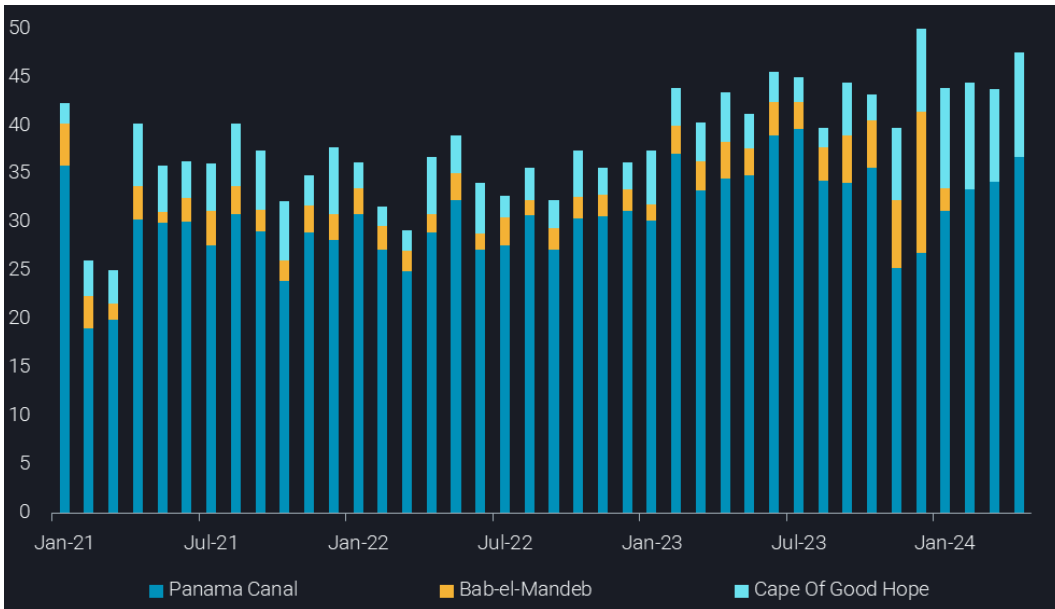
LPG & LNG shipping: Key waypoint transits are slow in recovering

A similar trend is observed in the LPG and LNG flows for crucial US exports.

US LPG exports totalled 2.1mbd in the first four months of 2024, marking a 7% year-on-year increase amid soaring LPG production and declining domestic demand seasonally. However, further growth is unlikely in the quarter due to the bearish demand outlook in Asia and Europe.

Moreover, the easing of Panama Canal congestion will limit very large gas carrier (VLGC) tonne-miles in the coming months. US-origin VLGCs destined for Northeast Asia were partially diverted to the Cape of Good Hope since Q4 last year, leading to a decline in US LPG exports transiting through the Panama Canal to 910kbd in October. This figure surged to 1.37mbd in April as transit and draught restrictions gradually eased.

Vortexa's newly released Panama Canal weekly report highlights an increase in southbound Neopanamax vessels awaiting transit through the Panama Canal in April. With daily transits gradually rising, VLGC utilization will decline due to the shorter voyage distances from USG to Northeast Asia as compared to transiting through the Cape of Good Hope.

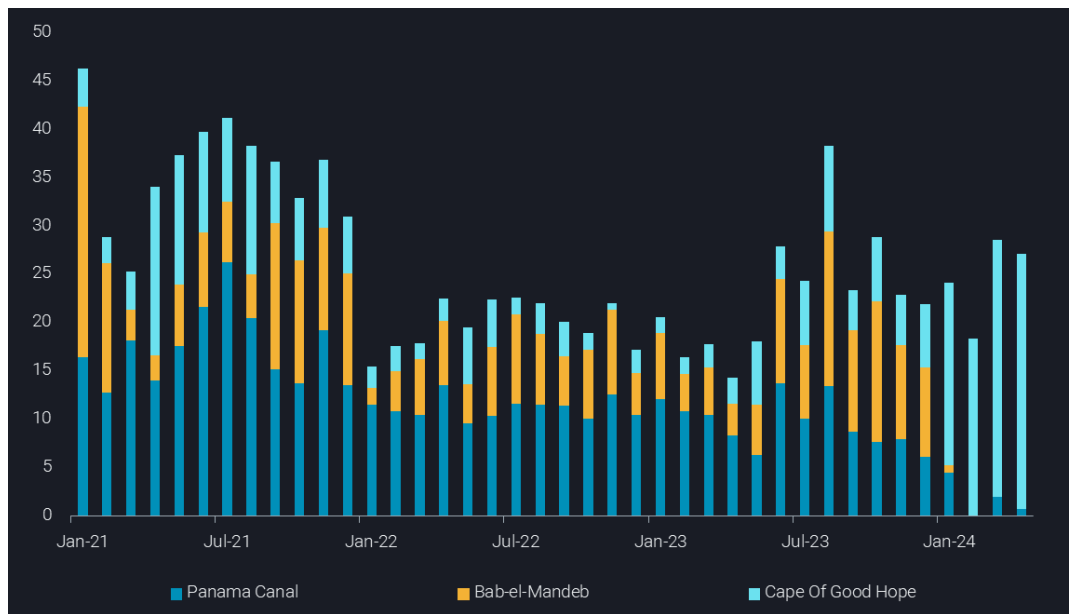


US LPG+ flows by selected waypoint entry time (mtpa)

US-Europe LNG flows continued to grow in 2023 as EU countries moved away from Russian gas. At the same time, US exports to Northeast Asia also increased due to rising demand.

In the first four months of 2024, US LNG exports totalled 85.6 million metric tonnes per annum (mtpa), with Asia accounting for 28% of the volumes, trailing behind Europe's share at 61%. This slight increase in US-Asia flows contributed to a rise in overall US exports, compared to 84.3mtpa and 26% to Asia in 2023, and 77.4mtpa and 23% in 2022.

Additionally, more US-origin LNG vessels are also choosing to transit via the Cape of Good Hope this year, driven by factors such as the Panama Canal drought and avoidance of the Bab el Mandeb route.



US LNG flows by selected waypoint entry time (mtpa)

Both oil tanker and gas carrier tonne-miles are trending above seasonal averages so far in 2024, supported by extended voyage distances. However, the potential for upward movement in freight rates may be limited without a more robust acceleration in oil and LNG demand growth unless new disruptions arise. Meanwhile, the commencement of refinery operations in Nigeria and Mexico, as well as the commissioning of Canada's TMX pipeline, pose downside risks for most clean and dirty freight rates.

IV. MARITIME SERVICE CENTRE RANKING ANALYSIS



- **Top 10 Ports**



• 11 to 20 Ports

Singapore reigns supreme as global maritime leader once again



SINGAPORE
REIGNING SUPREMACY AS
GLOBAL MARITIME LEADER



Singapore has solidified its position as the undisputed maritime capital of the world, retaining its crown for an astounding 11th consecutive year. The city-state's achievements in 2023 were nothing short of remarkable, marking a series of firsts across the maritime value chain, particularly at the illustrious Port of Singapore. As the world grapples with shifting trade patterns and geopolitical strains, Singapore's maritime prowess shines ever brighter, a testament to its unwavering dedication and strategic vision.

The Port of Singapore's vessel tonnage crossed an unprecedented three billion gross tonnage for the first time in its history, registering an impressive 9.4% year-on-year growth in 2023. This outstanding achievement becomes even more remarkable when viewed through the lens of global trade, which is expected to shrink by 5% to below US\$31 trillion, according to the United Nations Conference on Trade and Development.

Singapore's container throughput also reached dizzying heights, growing by an impressive 4.6% to a record-breaking 39.01 million teu, surpassing the previous record of 37.57 million teu set in 2021. This remarkable feat was fuelled by the opening of new berths at the ambitious Tuas Port project, bringing the current total to eight berths.

The city-state's commitment to maritime decarbonisation and transformation was evident in its pioneering efforts to supply alternative fuels and electrify harbour craft. In a world-first, the Maritime and Port Authority of Singapore (MPA) successfully conducted a ship-to-containership methanol bunkering operation in 2023, supplying around 300 tonnes of green methanol in the Port of Singapore. Simultaneously, the port welcomed new fully electric 200-passenger ferries and supply vessels to further reducing its environmental footprint.

Singapore's dedication to sustainability was further underscored by its remarkable progress in biofuel blends and liquefied natural gas (LNG) bunker sales. Bunker sales of biofuel blends more than tripled in 2023, soaring from 140,000 tonnes in 2022 to 520,000 tonnes, showcasing the unwavering commitment of the port and operators to reducing shipping's environmental impact. Biofuel blends of up to B30 are now commercially available, while trials of up to B100 are ongoing. LNG bunker sales also experienced a significant jump, rising from 16,000 tonnes in 2022 to 110,000 tonnes in 2023.

Bunkering operations at the Port of Singapore had another record-breaking year, registering a staggering 51.82 million tonnes of bunker sales in 2023, surpassing the previous record of 50.64 million tonnes set in 2017. Of this, 1.2% was comprised of greener bunkering options with predictions of further growth in alternative fuel bunkering for 2024.

Singapore's maritime prowess extends far beyond the boundaries of its illustrious port. Total business spending by key maritime companies overseen by the MPA exceeded a remarkable S\$4.8 billion, up from S\$4.3 billion in 2022. This growth was further bolstered by the establishment or expansion of 25 maritime companies in Singapore in 2023, including maritime service companies and firms setting up sustainability desks as part of their decarbonisation strategy and growth plans. Singapore is now home to more than 180 international shipping groups, as well as other maritime companies in finance, insurance, cyber-security, shipbroking, law, and arbitration.

Meanwhile, the Singapore Registry of Ships (SRS) continues to rank among the largest ship registries globally, with the total tonnage of ships under the Singapore flag reaching an impressive 99.56 million gt, a 4% increase from 95.47 million gt in 2022. Furthermore, 22 Singapore-flagged ships from 10 companies received the coveted Green Ship Certificates under the Green Ship Programme, recognising their efforts in reducing their fleet's environmental impact through the use of low-carbon fuels such as methanol and energy-efficient technologies that exceeded the Energy Efficiency Design Index requirements mandated by the International Maritime Organization (IMO).

Singapore is also home to one of the fastest-growing arbitration centres in the Singapore Chamber of Maritime Arbitration (SCMA), which specialises in bunker claims, collisions and smaller disputes. In 2023, SCMA dealt with 55 reported cases for a total claims amount of US\$135 million, with 62% of cases involving Asian shipping companies. Although London remains the world's leading maritime arbitration centre, Singapore's expertise in certain sectors and handling Asian clients speaks volumes of its importance to the region's shipping industry.

As the industry continues its decarbonisation efforts to meet the IMO's carbon emissions targets, Singapore remains a steadfast leader. The city-state has established four Green and Digital Shipping Corridors (GDSC), serving as valuable platforms for the piloting and trial of alternative fuels and digital solutions to support the transformation of the maritime sector. In April 2023, the MPA established GDSCs with the Port of Los Angeles and Port of Long Beach, further solidifying its commitment to sustainability. In December 2023, two MoUs were signed to establish the Tianjin-Singapore GDSC and Japan-Singapore GDSC, which covers six Japanese ports.



In a bold move, the MPA issued an expression of interest in December 2023, inviting potential suppliers to explore methanol as a bunker fuel. This pivotal step marked Singapore's determination to establish itself as a hub for methanol bunkering and propel the fuel's journey towards becoming a commercially viable option for shipowners seeking to decarbonise their vessels.

Singapore's commitment to alternative fuels was further cemented when Fortescue's dual-fuel ammonia supply vessel became the first to undergo an ammonia bunkering operation in the city-state. This historic milestone not only showcased the potential of ammonia as a cleaner energy source for commercial vessels but also highlighted Singapore's commitment to developing safe port operations for handling fuels with stability concerns.

Throughout 2023, Singapore's maritime ecosystem diligently prepared for the adoption of alternative fuels. Crew members, engineers, and port officials involved in bunkering operations underwent rigorous training exercises to ensure they were adequately prepared. These exercises were crucial for developing vital standards and safety procedures, laying the foundation for the long-term development and adoption of cleaner fuels in the Singapore port.

Singapore's global leadership in the maritime sector was further reinforced by its re-election to the Council of the IMO for the term 2024-2025, as well as the International Association of Marine Aids to Navigation and Lighthouse Authorities for the term 2023-2027.

The MPA Academy has also expanded its efforts in nurturing the future generation of global maritime leaders through its leadership programmes. In April 2023, Singapore announced an enhanced technical cooperation and training package amounting to US\$5 million, building upon the current Singapore-IMO TCTP MoU, which had already benefitted over 2,300 participants from more than 100 countries.

As the global shipping industry continues its decarbonisation efforts, Singapore has positioned itself as a hub for the development and adoption of alternative bunker fuels, paving the way for a more sustainable maritime future. With its unwavering commitment to innovation, sustainability, and global leadership, the city-state stands tall as the undisputed maritime capital of the world, setting the pace for the industry and inspiring others to follow in its footsteps.

London drives forward with green goals in mind

An aerial photograph of London, England, featuring the River Thames. In the foreground, the Tower Bridge is visible, with its two stone towers and suspension cables. A large, multi-decked cruise ship is sailing on the river. The background shows the dense urban landscape of London, including the City of London with its modern skyscrapers and the City of Westminster with its historic buildings. The image has a blue tint.

LONDON DRIVES FORWARD WITH GREEN GOALS IN MIND



Retaining its second place in the annual report, London continues to be one of the world's leading shipping centres for maritime professional services, including a world-class legal system, and being the home to some of the world's largest shipbrokers, ship managers, marine insurers and financial institutions, many of which continue to offer green financial solutions to the maritime sector.

Home to the headquarters of the International Maritime Organization (IMO), one of the major strengths in 2023 coming out of London was the UK Government's commitment to supporting the shipping industry's goal to decarbonise its operations and create a more sustainable industry.

This is pinpointed by the UK's Maritime 2050 Scheme, which aims to maximise its maritime professional services and lead the way when it comes to promoting and investing in innovative technologies and service options to improve the sustainability of the global maritime industry. To this end, throughout the year, London announced a series of multi-million-pound funding pledges to improve environmentally friendly technologies and vessels, including £77 million to build zero-emission vessels, almost £100 million to develop clean maritime solutions, and £80 million to improve the carbon footprint of the United Kingdom's coastal ports.

The government also announced a number of major new laws to improve the rights of seafarers in 2023, including the Seafarers' Wages Act to improve working conditions and protect pay rights, as well as the launch of the Seafarers' Charter in collaboration with France to boost employment protections of crew members. Both events came as a result of P&O Ferries' decision to fire nearly 800 staff members without consultation in 2022.

Meanwhile, 2023 also saw the very first meeting of the UK's new Maritime Council to discuss the delivery of the UK's Maritime 2050 Strategy, as well as the launch of its Freight Energy Forum to support all modes of transport – rail, road, air, maritime and warehousing – in reaching net zero by 2050.

The City of London, as a leading global financial centre, is home to a concentration of maritime services, including Lloyd's of London, P&I clubs, and shipbrokers. This proximity to financial expertise and capital markets ensures that the maritime sector benefits from seamless access to insurance, banking, and investment services.

Lloyd's Register, the renowned maritime classification society and risk management organisation, also plays a pivotal role in bolstering London's maritime status. Established in 1760, Lloyd's has a rich history of providing critical services to the shipping industry, including the certification of ships' seaworthiness and the

development of safety standards. Its longstanding expertise and extensive network lend credibility and comprehensive risk management solutions to maritime stakeholders. This coverage is vital for maintaining the trust of global shipping lines, which prefer to operate in secure and well-insured environments and as a result, Lloyd's Register has become a renowned and well respected name in the industry.

London is also home to some of the world's biggest ship broking firms that contribute significantly by facilitating the chartering and sale of vessels, connecting shipowners with cargo owners, and ensuring smooth and efficient operations. These brokers provide critical market intelligence and negotiation expertise, enhancing the port's operational efficiency and attractiveness. The presence of top-tier global ship brokers in London, such as Clarksons, Braemar, SSY and Ifchor Galbraiths fosters a competitive market and the ability to offer better rates and services.

Alongside this, London continues to be the home of almost all major P&I clubs, which offer comprehensive coverage for vessels, cargo, and port facilities. This minimises the financial risks associated with maritime trade and port operations. It is also the home of the Baltic Exchange, the trusted provider of data for the settlement of physical and derivative freight contracts, underpinning risk management tools for the shipping and transportation markets for more than 280 years.

London is internationally recognised as the home of maritime law, a status underpinned by its historical and ongoing contributions to the field. Central to this is the London Maritime Arbitrators Association (LMAA), which provides world-leading arbitration services for the resolution of maritime disputes. Established in 1960, the LMAA is the largest and most prominent association of its kind, setting the benchmark for maritime arbitration standards globally. Its presence in London ensures that the city remains at the forefront of maritime legal practices, attracting international shipping companies seeking expertise and impartiality in maritime arbitration.

At a port level, meanwhile, the London Gateway continues to thrive as a centre for a diverse range of cargo. Containerised cargo remains the dominant force in the UK, reflecting a global trend towards containerisation. In 2023, the London Gateway facility emerged as a particular area of strength. In 2023, the Port of London Authority reported that it handled more than 51.6 million tonnes of cargo across its more than 70 different terminal operators, with London Gateway one of the leading terminals in the United Kingdom. Overall, London handled over 12% of all UK cargo traffic in 2023, beating Grimsby & Immingham, Milford Haven and Southampton.



"Within a decade, London Gateway is likely to be handling up to 30% of the country's containerised trade," said DP World UK CEO, Ernst Schulze. "It's port-centric logistics park will be one of the largest in Europe, employing 12,000 people and underpinned by investment in a second rail terminal and a new fourth berth."

However, 2023 presented the London Gateway with its fair share of challenges. The lingering effects of the Covid-19 pandemic, coupled with geopolitical tensions, continued to disrupt global supply chains, resulting in port congestion, container shortages, and increased shipping costs, creating a complex operational environment. Surging fuel prices further pressured shipping companies and port operations, adding to the overall strain. The UK's exit from the European Union in 2020 continued to have an impact, causing adjustments in trade patterns and customs procedures for both port authorities and businesses alike.

Despite these challenges, the Port of London Authority (PLA) demonstrated its commitment to navigating this ever-changing landscape.

Proactive steps were taken to ensure the port's continued efficiency and competitiveness, including upgrading infrastructure, expanding container terminals, modernising navigation systems, and enhancing riverside facilities. A notable example is DP World's £350 million investment in a fourth berth at London Gateway, which is expected to increase the terminal's capacity by 33%. This berth will be the world's first all-electric berth, powered by cutting-edge technology including electric straddle carriers and automated stacking cranes. These advancements mark a significant leap towards DP World's sustainability goals and push towards full electrification by 2050.

Recognising the importance of technological advancements, the port continues to embrace digitalisation and automation. Implementing automated systems for cargo handling and logistics management are aimed at improving operational efficiency, reducing costs, and allowing for data-driven decision-making. Sustainability also remained a high priority for the PLA. Efforts included promoting the use of cleaner fuels for ships, investing in renewable energy sources to power port operations, and implementing programmes to reduce waste.

At its core, however, is the strength of London's maritime services. It offers an unparalleled history and choice of legal, arbitration, insurance, P&I, shipbroking and finance services to the maritime sector that have a legacy of quality and assurance. As maritime continues to navigate choppy waters, the United Kingdom and London remain a cornerstone of reliability for the industry.

Shanghai remains the container port giant

A vibrant photograph of the Shanghai skyline, featuring the Oriental Pearl Tower as the central focus. The tower's three spheres are prominent against a clear blue sky with light, wispy clouds. To the left, a dense cluster of modern skyscrapers with glass facades reflects the sky. In the foreground, the Huangpu River flows, with several white ferries and boats moving across its surface. The overall scene is bright and clear, capturing the essence of a major global port city.

SHANGHAI REMAINS
THE CONTAINER PORT
GIANT



Following a difficult few years owing to the challenges caused by the Covid-19 pandemic, China's ports are once again showing their resilience and continued position as some of the world's most important maritime hubs. Leading the pack once again is Shanghai, which has maintained its position as the largest and busiest container port in the world for the 14th year in a row, as well as being named the world's most connected port by the United Nations Conference on Trade and Development's (UNCTAD) Port Liner Shipping Connectivity Index (PLSCI).

Situated at the confluence of the Yangtze, Huangpu, and Qiantang Rivers, Shanghai boasts some of the world's most impressive maritime facilities, including deep-water and riverport terminals to efficiently managing both international and domestic cargoes. Operated by the Shanghai International Port Group (SIPG), it serves as a crucial hub for global trade, connecting over 600 ports across 214 countries. The port's strategic location, robust infrastructure, and advanced logistics capabilities enable it to handle a wide array of cargo types, including containers, bulk commodities, and liquid cargoes.

In 2023, Shanghai handled a total of 49.16 million teu, an increase of 1.7 million teu or 3.6% compared to 2022 levels.

The port's strategic location is a key factor in its success. Situated near the Yangtze River, the lifeblood of China's inland transportation network, and with direct access to the vast expanse of the East China Sea, the port facilitates seamless movement of goods between the nation's heartland and international markets. This positioning makes Shanghai an attractive proposition for numerous industries, particularly those heavily reliant on exporting manufactured goods.

Shanghai's port infrastructure comprises several key zones: the Yangshan Deep Water Port, Waigaoqiao Port, and Wusongkou Port. The Yangshan Deep Water Port, an artificial island, stands out for its cutting-edge automation and deep-water berths that accommodate the largest container ships in operation today. Integration with Shanghai's free trade zone further boosts its appeal as a logistics hub, offering favourable trade policies and streamlined customs procedures. Yangshan posted a container volume of 25 million teu in 2023, an increase of 4.6% from 2022.

Container terminals dominate the landscape in Shanghai, equipped with state-of-the-art quay cranes capable of handling the largest of container ships. The port boasts a highly skilled workforce and advanced automation systems, ensuring efficient cargo loading and unloading. These innovations contribute to high efficiency, reduced turnaround times, and lower operational costs.

In 2023, the Port of Shanghai showcased remarkable resilience and adaptability amid global economic uncertainties and fluctuating trade volumes. The port maintained its position as the world's busiest container port, handling over 47 million teu, marking a slight increase from the previous year despite challenges posed by economic slowdowns and geopolitical tensions.

The ongoing expansion and upgrading of its port facilities played a crucial role in this growth. The completion of new berths at the Yangshan Deep Water Port, along with the introduction of additional automated handling equipment, significantly boosted the port's capacity and operational efficiency. These improvements enabled the port to accommodate larger vessels and handle increased cargo volumes more effectively.

In 2023, the Port of Shanghai continued to benefit from China's robust export activities. Despite a sluggish global economy, China's export sector remained strong, supported by a diversified manufacturing base and increasing demand for Chinese goods in international markets. The port's strategic location and efficient operations made it a preferred gateway for these exports.

The port's integration with advanced digital technologies has also enhanced its operational capabilities. The implementation of AI-driven logistics management systems, Blockchain for secure and transparent transactions, and IoT devices for real-time monitoring of cargo movements streamlined port operations, reduced delays, and improved overall service quality. These technological advancements also contributed to the port's ability to handle a higher volume of e-commerce shipments, reflecting the growing importance of online retail in global trade.

Moreover, the port's proactive approach to environmental sustainability has been noteworthy. In 2023, Shanghai made significant strides in reducing its carbon footprint through the adoption of green technologies and practices. Initiatives such as the use of shore power for vessels at berth, investment in electric and hybrid port equipment, and implementation of energy-efficient systems helped lower emissions and promote sustainable port operations.

In September 2023, the Port of Shanghai advanced its environmental initiatives by participating in the creation of a Green Shipping Corridor, a voluntary collaboration with major maritime stakeholders including the Ports of Los Angeles and Long Beach. This initiative, supported by some of the world's largest shipping lines and input from leading cargo owners, aims to accelerate emissions reductions along one of the



busiest container shipping routes. The Green Shipping Corridor Implementation Plan Outline is a significant step towards sustainable maritime practices, underscoring the port's commitment to reducing its environmental impact.

The Port of Shanghai's business performance in 2023 highlights its critical role in global trade and its ability to adapt to changing market conditions. Through continuous investment in infrastructure, technological innovation, and sustainable practices, the port not only maintained its leadership position but also set new benchmarks for efficiency and environmental stewardship in the maritime industry. As global trade dynamics evolve, the Port of Shanghai is well-positioned to continue driving economic growth and facilitating international commerce.

Hong Kong set to reinvent itself as leading maritime centre





Hong Kong's status as a leading maritime hub in Asia is poised for an exciting transformation. The special administrative region has recognised the evolving landscape of global shipping and is seizing the opportunity to reinvigorate its maritime sector with an ambitious and forward-thinking plan unveiled in 2023.

As the year drew to a close, Hong Kong's maritime industry demonstrated its resilience and adaptability in the face of changing global trade patterns. Hutchison Port Holdings Trust (HPH Trust), which controls several facilities at Kwai Tsing, reported a 15% drop in box volumes compared to 2022, reflecting broader shifts in regional shipping dynamics.

HPH Trust's revenue for 2023 was HK\$1.48 billion, with overall throughput across its global network of ports adjusting by 6%. The trust's analysis identified structural shifts by shippers towards direct shipments to Chinese ports as a key factor influencing volume changes at Kwai Tsing terminals like HIT, COSCO-HIT and ACT.

This evolving landscape presents Hong Kong with unique opportunities to leverage its strengths and adapt to new market realities. The proposed 'Gemini Cooperation' partnership between Maersk and Hapag Lloyd, which is set to launch services in February 2025, is expected to reshape regional shipping patterns, bringing new challenges to Hong Kong's agility and strategic importance.

While overall container throughput for Hong Kong's port in 2023 was 14.345 million teu, this figure has catalysed a response from both industry and government. The past decade has seen Hong Kong's maritime sector evolve in response to increased regional competition and global events, positioning the territory to emerge stronger and more competitive.

November 2023 saw the Hong Kong government announce plans for a comprehensive strategy to enhance its high-end maritime services, champion sustainable shipping practices, drive digitalisation and facilitate greater global outreach.

This proactive approach culminated in the formal unveiling of an ambitious revitalisation strategy by Hong Kong's Transport and Logistics Bureau (TLB). The plan includes innovative initiatives such as feasibility studies into developing cutting-edge bunkering infrastructure for green methanol fuel and other clean fuels, with the goal of formulating a groundbreaking action plan in 2024.

A key focus of the strategy is to attract more premium maritime services like shipping finance, marine insurance and shipbroking through potential new tax concessions.

This move underscores Hong Kong's commitment to diversifying its maritime offerings and cementing its position as a leading financial hub.

The plan also capitalises on Hong Kong's strategic position within the Greater Bay Area, aiming to fully harness cargo sources and logistics links to the economically booming manufacturing heartlands of mainland China. This approach promises to create synergies that will benefit the entire region.

In a move that further showcases Hong Kong's commitment to industry collaboration, the maritime strategy will enhance the existing Hong Kong Maritime and Port Board, an industry advisory group under the TLB. This decision reflects a dedication to building on established strengths while fostering closer partnerships between government and industry stakeholders.

Looking to the future, Hong Kong is exploring visionary infrastructure projects to solidify its position as a leading maritime centre. One proposal put forward during Hong Kong Maritime Week in November 2023 is for an integrated "mega-port" spanning islands south of Hong Kong to consolidate regional port resources. The deepwater port, which is estimated to cost several billion dollars, would look to accommodate 22,000 teu box ships, very large crude carriers and 400,000 dwt valemex ore carriers. Most importantly, it would attract shipping players looking to access mainland China.

The year 2023 marked the beginning of Hong Kong's maritime renaissance. The comprehensive nature of the government's strategy demonstrates a nuanced understanding of the industry's evolving needs and a steadfast commitment to long-term growth. By focusing on high-end services, sustainable practices, and digital innovation, Hong Kong is set to lead the way in maritime excellence.

In the coming years, the global maritime community will be casting a keen eye on Hong Kong's action plan. The territory's proven ability to adapt and innovate in the face of change bodes extremely well for its future as a vibrant, world-class maritime centre. As the Pearl River Delta's great port city embarks on this journey, its proactive approach and comprehensive strategy signal a bright and dynamic future for its maritime sector.

As Hong Kong charts this exciting course of reinvention, it is not just reclaiming its position as a leading maritime hub-its redefining what that role means in the 21st Century. With its rich maritime heritage, strategic location, and renewed commitment to innovation, Hong Kong is ideally positioned to navigate the opportunities ahead and set new standards of maritime excellence in Asia and beyond.

Dubai cements its place as the Middle East's leading maritime powerhouse

A wide-angle photograph of the Dubai skyline, featuring numerous skyscrapers of varying heights and architectural styles. The buildings are set against a bright blue sky with scattered white clouds. In the foreground, a sandy beach is visible, with several white beach umbrellas and lounge chairs. The water of the sea is a clear, light blue, and a small pier extends into the water on the right side. The overall scene is bright and sunny, capturing the essence of a modern coastal city.

CEMENTS ITS PLACE AS
THE MIDDLE EAST'S LEADING
MARITIME POWERHOUSE

Dubai's tenure as host of the pivotal COP28 climate summit further amplified its maritime credentials in 2023. The emirate provided a high-profile stage for major international maritime companies and organisations to announce ground-breaking decarbonisation initiatives and partnerships at COP28.

One of the major highlights was the proliferation of partnerships and coalitions aimed at accelerating the maritime industry's transition to net zero emissions by 2050. The "Green Shipping Challenge" saw upwards of 60 announcements related to new green shipping corridors, adoption of zero and low emission fuels/technologies, and supporting the implementation of the IMO's greenhouse gas strategy.

Underpinning Dubai's ascendancy in 2023 has been its own championing of eco-friendly, sustainable shipping practices across the value chain. The UAE has pledged more than US\$500 million towards reducing carbon emissions over the next five years in pursuit of net zero emissions by 2050.

This environmental commitment is embodied by DP World-the Dubai-headquartered global logistics titan. The company's 2023 full-year results highlighted 6.6% revenue growth buoyed by leveraging an expanded logistics portfolio to deliver value-added solutions in rapid-growth markets and commercial verticals.

DP World explicitly cited its strategic focus on high-margin cargo, integrated end-to-end logistics offerings and stringent cost optimisation as pivotal factors to enable strong financial results despite macroeconomic and geopolitical headwinds.

The group is doubling down on bolstering its worldwide integrated maritime, logistics and supply chain capabilities via approximately US\$2 billion in capital expenditure budgeted for 2024. This investment proliferates across DP World's global footprint including flagship UAE facilities like Jebel Ali and regional terminals from the UK's London Gateway to emerging hubs in India, Senegal, Indonesia, Peru and Saudi Arabia.

Aside from environmental leadership, Dubai has swiftly solidified its status in 2023 as a nerve centre for integrated logistics and supply chain solutions engineered to enhance trade efficiency and connectivity along strategic worldwide freight corridors.

DP World crystallised this evolution, with resilient 2023 earnings propelled by capitalising on burgeoning demand for tailor-made logistics products among cargo owners navigating volatile global operating landscapes. The group's ability to seamlessly blend high-calibre maritime infrastructure with expansive overland logistics capabilities across growth markets proved a key differentiation.



Highlighting Dubai's versatility, the UAE's maritime gateways recorded stellar throughput volumes in 2023 despite turbulent global economic crosswinds. Jebel Ali remained the leading port in the UAE, with more than 14.47 teu handled in 2023, up from 13.97 million teu in 2022.

Part of this growth can be attributed to Dubai's emergence as a premier hub for oil shipments, driven by recent geopolitical developments and the evolving landscape of international sanctions. These changes have facilitated the rise of a new generation of Middle Eastern shipping owners, who have adeptly navigated this landscape to capitalise on emerging opportunities in specialised segments.

Although 2023 witnessed Dubai's ascent to elite maritime status, the emirate remains ravenous for future growth.

The Dubai Maritime Authority unveiled new directives to promote fair competition and transparency for local sea container charges. In parallel, urban masterplans foresee Dubai's marine passenger network expanding 188% to serve more than 22 million annual passengers by 2030 - a marked 50% increase on current volumes. However, the ongoing situation in the Red Sea that began at the end of 2023 has caused an early set-back for Dubai's cruise industry.

From spearheading decarbonisation and cultivating eco-friendly maritime ecosystems to seamlessly blending seaborne and overland freight capabilities, Dubai has ascended to the apex of the global logistics landscape in 2023. However, the emirate shows no signs of breaking stride in its pursuit of comprehensive maritime supremacy for decades to come.

Rotterdam further bolsters its environmental credentials



ROTTERDAM FURTHER BOLSTERS
ENVIRONMENTAL CREDENTIALS



The Port of Rotterdam, Europe's largest maritime hub, had a year of transition in 2023 as it continued efforts to reduce emissions and move towards a more sustainable future, even as throughput volumes declined due to geopolitical instability and economic headwinds.

Total cargo throughput in 2023 was 438.8 million tonnes, down 6.1% compared to 467.4 million tonnes in 2022, according to figures from the Port of Rotterdam Authority. The fall was driven by lower volumes across several key segments including coal, containers, and other dry bulk cargoes.

Coal throughput plummeted 20.3% to 23.1 million tonnes as demand for coal used in power production dwindled. This played a major role in pushing overall dry bulk volumes 11.8% lower year-on-year. Container throughput declined 6.8% to 130.1 million tonnes as consumption fell and the impact of sanctions on Russia disrupted trade flows.

There were some bright spots. Iron ore and scrap traffic increased 9.9% as steel production recovered and ore stockpiles were replenished after low imports in 2022. Agribulk volumes surged 31.3% following crop failures in Europe that drove a 50% spike in maize imports into Rotterdam. LNG throughput edged up 3.7% to 11.9 million tonnes as Europe continued boosting LNG imports to replace pipeline gas from Russia.

Despite the throughput declines in 2023, the year marked major progress in Rotterdam's transition towards a cleaner, more sustainable port and industrial complex to serve northwest Europe. CO₂ emissions within the port precinct decreased by 2.2 million tonnes or 10% compared to 2022 levels. This was driven primarily by a 38% emissions reduction at the two coal-fired power plants on Maasvlakte as they produced 20% less electricity from fossil sources.

The port noted that 2023 emissions of 20.3 million tonnes dipped below the 1990 baseline of 20.6 million tonnes for the first time, representing a one-third decline from 2016's peak. Further reductions will be needed to align with European and Dutch ambitions of a 55% cut versus 1990 levels by 2030, requiring a further 9.3 million tonne reduction.

Significant strides were made on this front in 2023, with the final investment decision taken in October 2023 to proceed with the Porthos project for CO₂ transport and storage. When operational, Porthos will capture and permanently store 2.5 million tonnes of CO₂ emissions per year from industrial facilities in the port. Construction also commenced on a national hydrogen network, with the first section linking the

Maasvlakte with the Pernis plants.

Other sustainability initiatives included new shore power installations for cruise ships and the launch of Distro Energy's intelligent trading platform to optimise green energy consumption across the port cluster. Land reclamation work also began to create 85 additional hectares to accommodate future clean energy projects.

While overall throughput fell, Rotterdam maintained its status as Europe's key container hub with total box movements of 13.4 million teu in 2023. Its position was boosted by expansion investment commitments from major operators APM Terminals and Rotterdam World Gateway. The new Container Exchange Route, a closed 17 km road network linking terminals, also enhanced the port's efficiency and sustainability.

As the port authority's CEO, Boudewijn Siemons summarised: "2023 saw many major investment decisions and milestones in the transition to a sustainable port." However, he cautioned that an active, supportive policy approach would be needed from the Dutch Government to maintain industry competitiveness and attract future investments.

Looking ahead to 2024, Siemons expects it to be "an unpredictable year" given the uncertain geopolitical and economic backdrop. However, Rotterdam intends to maintain momentum, with construction set to start on Porthos and the development of a second hydrogen conversion facility. Investment decisions are also anticipated for new hydrogen plants, bio-refineries and infrastructure projects.

Further steps will be taken to facilitate shore power for cruise ships, containers and roll-on/roll-off vessels, while investments in charging infrastructure for electric trucks are planned to support sustainable road transport. The availability of renewable fuels is another key area of focus.

Overall, 2023 marked a year of considerable progress for Rotterdam in enhancing its sustainability credentials and transitioning towards a greener future, even as cargo volumes were impacted by external turbulence. With major investment decisions taken and projects initiated, the stage is set for the port to reinforce its position as a leader in building up Europe's sustainable maritime supply chains in the years ahead.

Athens continues to prove its shipowning power



ATHENS CONTINUES
TO PROVE ITS
SHIPOWNING POWER

Rising in the rankings this year is Athens, which moves up one position to seventh place compared to last year's report.

Greece continues to play one of the most significant roles in the global maritime sector, with more than 1,000 shipping offices having a home in either Athens or the wider region of Attica. As of 2022, more than 5,500 vessels, or approximately 22% of the global fleet are owned by Greeks, according to the Union of Greek Shipowners (UGS). The power of the Hellenic maritime community has only improved over the past decade as this number has grown more than 50%.

The dominance of Greek shipping is underpinned by tankers and bulkers. According to UGS data, Greek shipping constitute 31% of the world's tanker fleet, 25% of the bulk carrier fleet, 22% of LNG carriers, 15% of chemical and product carriers and 11% of LPG carriers. However, only 8% of the world's containerships are Greek-owned.

Greek shipping also plays an oversized role in the European economy. On average, Greek tonnage accounts for 60% of the EU-controlled fleet, with its closest rival Germany at 12%. Greek shipowners control 80% of the EU-controlled bulk carriers, 73% of oil tankers, 85% of LNG carriers and 17% of the EU-controlled containerships. In this sense, the EU's supply chain resilience is dependent on Greek shipping, UGS asserted.

Shipping remains one of the most productive pillars of the Greek economy. In 2022, inflows to the Greek balance of payments by sea transport surpassed US\$23 billion, the largest contribution recorded in the last 20 years. For the period 2012-2022, shipping contributed US\$162 billion in inflows to the Greek economy, reaching 7% of the country's GDP.

Athens is also gaining a large amount of traction for its involvement in shaping the future of maritime technologies. The Greek capital is home to a number of innovative and dedicated technological start-ups that work closely with the large shipowning community in Athens to develop unique and modern solutions that are boosting the capabilities and efficiencies of fleet managers. These tech companies are now spreading their wings and bringing those solutions to shipowners all over the world.

While almost all maritime service companies have a presence in Athens, owing to its historical position as a leading Mediterranean shipping hub, Greece is also strengthened by the continued position of the Port of Piraeus as one of the biggest ports in Europe.

The port is segmented into three main areas: the central port, the cargo port, and



the passenger port. The central port predominantly handles container and cargo traffic, significantly contributing to Greece's economy and the broader Mediterranean maritime sector. The cargo port accommodates a diverse range of goods, including bulk cargoes, vehicles, and industrial products, while the passenger port is one of Europe's busiest, with millions of passengers annually, primarily from cruise ships and ferries.

In recent years, substantial investments and upgrades have modernised the port's infrastructure and boosted its capacity. A transformative milestone was the acquisition of a majority stake by the China Ocean Shipping Company (COSCO) in 2016. Under COSCO's management, Piraeus has improved operational efficiency, increased container handling capacity, and expanded services, making it a competitive global port. Strategic initiatives at Piraeus include developing logistics centres, expanding its rail network, and enhancing intermodal transport options. These efforts aim to reinforce the port's status as a leading logistics hub in Europe, facilitating the seamless movement of goods across the continent.

In 2023, the Port of Piraeus displayed continued resilience and growth despite global economic challenges and managed to stabilise its throughput after previous declines.

In 2023, the port's three container terminals reported a combined total throughput of 5,100,920 teu, up 2% on 2022. The Piraeus Port Authority (PPA) released its financial results for the fiscal year 2023, further showcasing significant growth. Total revenues reached € 219.8 million (US\$236.2 million), marking a 12.9% increase compared to € 194.6 million in 2022, a rise of € 25.2 million. Moreover, profits after taxes surged to € 66.8 million, up from € 52.9 million in 2022, representing a substantial 26.3% increase. This notable financial performance reflects the port's successful strategies in boosting its revenue streams and enhancing operational efficiencies over 2023.

The port's business strategy focused on expanding its role as a central logistics hub. Investments in infrastructure, including the expansion of container terminals and modernisation of facilities, played a critical role in enhancing capacity and efficiency. The implementation of advanced technologies and digital solutions also contributed to streamlined operations and improved service delivery. Piraeus has leveraged its strategic location to attract increased transshipment traffic. The port serves as a pivotal transshipment centre for the Mediterranean, linking major shipping routes between Asia, Europe, and Africa. This position has been strengthened by partnerships with global shipping lines and logistics companies, ensuring a steady flow of cargo through the port.

In 2023, the PPA and the Port of Guangzhou embarked on a significant partnership to establish a green shipping corridor, reflecting a commitment to sustainability and reducing greenhouse gas emissions in maritime activities. This collaboration was formalised through a Memorandum of Understanding (MoU) signed in October 2023, which focuses on enhancing operational efficiencies and promoting environmental stewardship between the two ports. The green shipping corridor initiative aims to decarbonise the maritime supply chain by implementing measures such as the adoption of low and zero-carbon fuels, improving port operations to minimise emissions, and sharing best practices and technological advancements. This effort is part of a broader strategy to support global environmental goals and enhance the sustainability of international trade routes.

This partnership aligns with similar initiatives undertaken by major global ports to address the urgent need for decarbonisation in the shipping industry. By working together, the Piraeus Port Authority and the Port of Guangzhou aim to create a scalable model that can be replicated by other ports worldwide, thus fostering a more sustainable future for global maritime trade. The port's commitment to sustainability not only enhanced its environmental footprint but also attracted business from companies prioritising eco-friendly logistics solutions.

The passenger port segment saw a robust recovery in 2023, driven by a resurgence in cruise tourism post-pandemic. Piraeus welcomed almost 1.5 million passengers in 2023, compared to 880,416 in 2022, reporting a 68.6% increase, and returning to near pre-pandemic levels. Moreover, there was a 12.4% increase in cruise ship calls, with 761 calls compared to 677 the previous year. The port's upgraded passenger terminals and enhanced services contributed to a positive experience for tourists, reinforcing its status as a premier cruise destination in the Mediterranean.

The dedicated car terminal handled a higher-than-expected increase in automobile shipments due to a rise in demand for vehicles in the region, with imported car registrations rising by 31.4% to 153,381. The port's efficient handling and storage facilities, coupled with robust distribution networks, supported this segment's expansion.

Ningbo-Zhoushan poised to flex its muscles

NINGBO ZHOUSHAN
POISED TO FLEX
MUSCLES

The Port of Ningbo-Zhoushan, situated on China's eastern coast, ranks among the world's busiest and most pivotal ports, hence its continued rise in the top 10 shipping centres globally.

Formed in 2006 through the merger of Ningbo and Zhoushan ports, this extensive complex boasts impressive infrastructure to handle various cargo types efficiently. It has 191 berths, 36 of which are deep-water, and spans a vast area, equipped with numerous terminals specialised for containers, bulk cargoes, general cargoes, liquid chemicals, and oil products.

Ningbo-Zhoushan has more than 300 container routes, of which more than 250 are international routes, connecting more than 600 ports in more than 200 countries and regions.

Continuous expansion and modernisation have been key to the port's growth. Advanced technological solutions, such as automated container handling systems and real-time tracking, have increased efficiency and reduced turnaround times. Additionally, it benefits from a well-developed network of road and rail connections, ensuring seamless transportation of goods.

In 2023, Xinhua reported the port has become the third port in the world, after the ports of Shanghai and Singapore, to achieve an annual container throughput above 35 million standard containers.

Environmental sustainability is also prioritised, with initiatives aimed at reducing emissions and promoting green practices.

The Ningbo-Zhoushan port area is also underdoing a number of green and low-carbon development projects to enhance its regional and cross-border trade by evolving its multimodal logistics facilities and smart container terminals. This includes major projects to its railway infrastructure and adding smart technologies to its terminals. The port is also looking to implement the use of shore power for vessels at berth in order to reduce vessel emissions and improving air quality at the port. All of these improvements are looking to emphasis the port's focus on environmental stability and social responsibility.

Additionally, the port has major investments in renewable energy sources and adopted eco-friendly practices in daily operations, aligning with global environmental standards and regulations.

The port's comprehensive services and excellent connectivity have attracted numerous international shipping lines and logistics companies, cementing its status



as a crucial node in the global supply chain. Ningbo-Zhoushan's adaptability to market conditions and commitment to innovation ensure its continued prominence in the maritime industry.

In 2023, the Port of Ningbo-Zhoushan showcased remarkable resilience and operational efficiency amid global economic fluctuations and supply chain disruptions. The port maintained its position as the third-busiest port in the world, with a significant throughput of 33,351,000 teu, reflecting a 7.3% increase from the previous year.

A key driver of this performance was the port's ability to efficiently handle a diverse range of cargoes. The container throughput saw substantial growth, driven by strong demand for Chinese exports and strategic partnerships with major shipping alliances. Additionally, the port managed significant volumes of bulk cargoes, including coal, iron ore, and grain, which are essential for China's industrial and agricultural sectors. The port also offers sea-rail intermodal transportation business, connecting 65 prefecture-level cities nationwide and handled 1.65 million standard containers in 2023.

The port's infrastructure played a crucial role in accommodating the increased cargo volumes. Continuous investments in expanding and upgrading terminal facilities ensured the port could handle larger vessels and more cargoes efficiently. The deep-water berths, capable of accommodating ultra-large container ships, helped reduce congestion and improve turnaround times. Moreover, the integration of advanced technologies, such as automated cranes and smart logistics systems, enhanced operational efficiency and minimised delays.

Despite the challenges posed by global supply chain disruptions, the Port of Ningbo-Zhoushan remained adaptive and proactive. Robust contingency plans were implemented to mitigate disruptions, ensuring a continuous flow of goods. Collaborative efforts with shipping lines, logistics providers, and government agencies played a crucial role in maintaining operational stability and meeting customer demands.

Looking ahead, the Port of Ningbo-Zhoushan is poised for continued growth. Ongoing infrastructure projects, including new terminal constructions and expansions, will further increase the port's capacity and efficiency. The port's commitment to innovation and sustainability will also play a pivotal role in its future success, ensuring it remains a key player in the global maritime industry.

Hamburg heats up amid takeover pursuit



HAMBURG HEATS UP AMID TAKEOVER PURSUIT

DOCK ELBE 17



One of the biggest movers in this year's report is Hamburg, which has fallen two places to ninth due to the increased strength of Athens and Ningbo Zhoushan that have now overtaken Germany's largest seaport.

The Port of Hamburg has evolved into a highly sophisticated logistics hub, known for its strategic location along the Elbe River, and connections to the North Sea. This positioning allows it to efficiently handle a significant volume of cargo traffic, catering to both the European hinterland and international markets.

The port boasts state-of-the-art facilities including four modern container terminals, over 50 multi-purpose berths, and extensive warehousing and logistics centres. These facilities enable it to manage a diverse range of cargo types, from bulk goods and containers to specialised project cargoes. The port is also integrated with a robust network of rail, road, and inland waterways, facilitating seamless intermodal transport.

Economically, the port plays a vital role in the regional and national economy, providing employment for over 150,000 people and contributing significantly to Germany's GDP.

In September 2023, the Port of Hamburg announced that Mediterranean Shipping Company (MSC) was looking to purchase a 49.9% share in the port, resulting in it becoming a joint venture managed between MSC and the City of Hamburg. Following the deal, MSC will gradually increase its handling volume to 1,000,000 teu by 2031, alongside moving its Germany headquarters to Hamburg. The move, which is estimated to be worth nearly US\$1.4 billion, has received criticism from both unions and political opposition, although political leaders have reinforced the move as a positive for Europe's maritime sector.

Container throughput was a critical metric in 2023. Despite the global economic slowdown, the Port of Hamburg managed to handle approximately 8.3 million teu, reflecting a slight decline compared to previous years due to reduced trade with Russia, historically one of Hamburg's significant trading partners. The ongoing sanctions and geopolitical tensions resulted in a noticeable drop in container traffic from this region.

Bulk cargo, including both dry and liquid bulk, showed resilience in 2023. The port handled substantial volumes of bulk commodities such as coal, iron ore, and agricultural products. The increase in renewable energy projects and the continued demand for raw materials in the European market supported this segment. Liquid bulk, particularly chemicals and petroleum products, also saw stable throughput, driven by sustained industrial activities in the region.

The automotive sector, a crucial part of Hamburg's cargo portfolio, experienced

mixed results. While the export of German-made vehicles faced challenges due to global supply chain disruptions and changing consumer preferences, the import of electric vehicles and automotive components showed growth.

One of the key strengths of the Port of Hamburg is its commitment to innovation and sustainability. In 2023, Hamburg Port Authority invested heavily in digitalisation initiatives, such as the smartPORT concept, which leverages real-time data to optimise port operations and reduce environmental impact. In addition, real-time data analytics, automated processes, and enhanced cybersecurity measures have been implemented to streamline port operations and improve service quality.

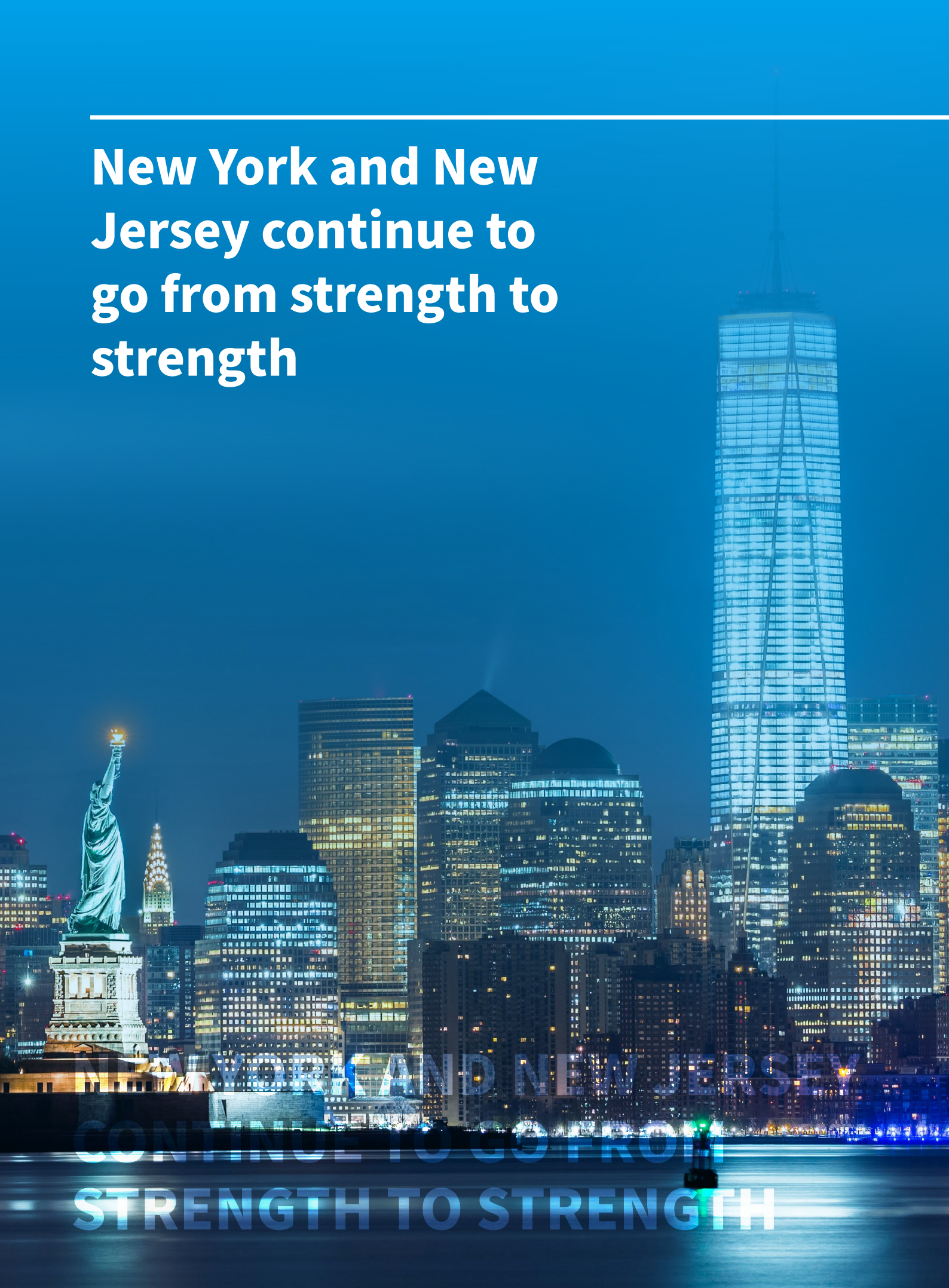
In October 2023, Hamburg signed a deal with Halifax and Valencia to create a network of innovation centres, including startups, entrepreneurs, companies, researchers, universities, and investors, to share innovative ideas, project results, innovation experiences, methodologies, and best practises to drive innovations at global port systems.

Like many ports in Europe, Hamburg has also made bold steps to improve its sustainability credentials. The Hamburg-Halifax green shipping corridor, originally signed in October 2022, offers both ports a significant opportunity to develop hydrogen as a marine and commercial fuel, as well as fostering collaboration between the two ports to accelerate decarbonisation efforts, just as they have done with their ongoing innovation centre development.

Additionally, Hamburg is actively pursuing green energy solutions, including the expansion of shore power facilities and the use of alternative fuels to minimise emissions. The port has invested heavily in infrastructure to support the use of alternative fuels, such as LNG and hydrogen.

The Port of Hamburg navigated a challenging yet dynamic year in 2023. Through strategic initiatives, technological advancements, and a focus on sustainability, the port demonstrated resilience and adaptability. While facing external pressures such as geopolitical tensions and global economic shifts, it continued to serve as a vital gateway for international trade and a cornerstone of the German economy. Looking ahead, the port's commitment to innovation and green practices positions it well to meet future challenges and capitalise on emerging opportunities.

New York and New Jersey continue to go from strength to strength



NEW YORK AND NEW JERSEY
CONTINUE TO GO FROM
STRENGTH TO STRENGTH

Rounding out the top 10 once again is the New York/New Jersey maritime cluster, which continues to be the beating heart of the US shipping industry.

With more than 250 shipping companies, including those in the financial, insurance and arbitration sectors, present in the Big Apple, New York has become a thriving community of shipbrokers, owners and charterers.

The New York Stock Exchange remains a vital part of the maritime sector, with more than 40 major shipping names, including Ardmor Shipping, Carnival, Dynagas, Eagle Bulk, Frontline, Navios Maritime, Norwegian Cruise Line Holdings, Royal Caribbean, Scorpio Tankers, and Tsakos Energy Navigation, present on the exchange. More shipping companies are named on the New York Stock Exchange than any other exchange in the world.

New York is also the epicentre for private equity, bonds and alternative financing all of which provides much needed capital to the maritime industry. Similarly to its European rivals, such as London and Athens, New York is also home to key financial institutions, law firms, insurance houses, brokerage firms and arbitration services that are crucial to the successful running of the maritime industry

Further to its position as a leading maritime services centre is its thriving and evolving port centres that play a critical role in supporting one of the biggest cities in the world and beyond.

New York and New Jersey are amongst the busiest and most vital ports on the eastern seaboard of the United States. Positioned strategically at the mouth of the Hudson River, the ports serve as a crucial gateway for international trade, facilitating the import and export of goods to and from the northeastern United States and beyond. Managed by the Port Authority of New York and New Jersey, the ports boast robust infrastructure, including extensive terminal facilities, deep-water berths, and state-of-the-art cargo handling equipment.

In recent years, the ports have undergone significant expansions and modernisation efforts to accommodate the increasing volume of container traffic. These improvements include the raising of the Bayonne Bridge to allow for larger vessels, the deepening of harbour channels, and the enhancement of terminal operations through advanced technology and automation. The ports are also key players in the global supply chain, connecting to major rail and highway networks that facilitate the efficient distribution of goods across North America.

The ports' strategic importance is underscored by their role in supporting the region's economy. In 2022 they generated nearly US\$15.7 billion in tax revenue and economic activity and paid out a staggering US\$47.2 billion in income to its workforce. It did this



whilst boosting both direct and indirect jobs to more than 563,000 in 2022, up from the 506,000 jobs supported in 2019.

In 2023, the Ports of New York and New Jersey experienced robust business activity, continuing their trend as leading hubs in the maritime industry. In December 2023, seaport volumes reportedly increased by 7.2% over December 2019 levels. The ports did see a notable increase in container throughput, reflecting their strategic importance to the region and their improved operational efficiency.

The ports handled close to 9.5 million teu in 2023, marking a significant rise from previous years. This growth can be attributed to several factors, including the resurgence of global trade post-pandemic, increased consumer demand, and strategic operational improvements. The port authority's six vehicular crossings also serviced 122.6 million eastbound vehicles through 2023, an increase of 1.6% year on year. The ports have successfully managed recent congestion issues, which have plagued many global ports, through enhanced coordination and investment in infrastructure.

A key driver of this growth has been the diversification of cargo types and the ability to handle a wide range of goods. The ports' facilities have been optimised to accommodate various cargoes, from bulk commodities to specialised goods, ensuring that they remain competitive and adaptable to market changes. The investment in the terminal's cold chain logistics has also improved their position to import and export perishable goods.

Additionally, the ports have embraced digital transformation to streamline operations. The implementation of advanced tracking systems, real-time data analytics, and automated cargo handling processes has significantly improved efficiency. These technological advancements have reduced turnaround times and enhanced the overall customer experience for shipping companies and other stakeholders.

Environmental sustainability has also been a focus for the Ports of New York and New Jersey in 2023. The ports have undertaken initiatives to reduce their carbon footprint, including the adoption of cleaner energy sources, the electrification of port equipment, and the implementation of stricter emissions standards for vessels. These efforts align with global sustainability trends and enhance the ports' reputation as environmentally responsible operators.

The competitive landscape of the global shipping industry has driven the ports to continuously innovate and improve. Collaboration with international shipping lines, investment in workforce training, and strategic marketing efforts have all contributed to the ports' success in attracting new business and maintaining high levels of operational performance.

Houston: Continued resilience in the United States



HOUSTON: CONTINUED
RESILIENCE IN THE
UNITED STATES



Port Houston in Texas remains one of the largest and busiest ports in the United States. Strategically situated on the Gulf Coast, its proximity to key oil and gas markets makes the port a vital hub for energy, international trade and commerce. The port stretches over 25 miles in the Houston Ship Channel and consists of a complex network of facilities, including container terminals, general cargo terminals, and bulk handling terminals.

As a major gateway for imports and exports to the southern United States, Houston handles a diverse range of goods, from petroleum and chemicals to consumer goods and machinery. The port's infrastructure is well-equipped to manage large volumes of cargoes, supported by state-of-the-art technology and efficient logistics systems.

In 2023, cargo volumes handled at Houston's two container terminals were down just 4% compared to its own historic high in 2022, with a total of 3,824,600 teu handled in 2023. This small decrease is mostly attributed to a large drop in empty repositioning volumes. Houston remained insulated against any major decrease in volumes by its strong exports, which thrived in 2023 due to demand for resin.

Houston continued its momentum into 2023 despite challenges faced in the previous year, such as congestion and labour uncertainties on the US West Coast. Although these issues have since subsided due to a decline in import demand nationwide, Houston's performance remained resilient. While other major ports experienced double-digit declines in volumes, Houston saw only a marginal 4% in cargo volumes in 2023 compared to the port's record-shattering performance in 2022 with a total of 3,824,600 teu handled in 2023. This small decrease is mostly attributed to a large drop in empty positioning.

One of the key developments in 2023 is the completion of the first stage of the US\$1 billion widening and deepening project of the Houston Ship Channel, which commenced in November 2022 and is scheduled for completion in 2025.

The Houston Ship Channel requires expansion to address safety and economic concerns. The current conditions of the channel pose navigation risks and limit economic efficiency. The high volume of vessel traffic increases the likelihood of collisions and certain types of vessels are constrained by the channel's depth and width. To address these issues, the proposed modifications involve widening the channel by 170 ft in the Galveston Bay to reach 700 ft. Other improvements include enhancing turning basins, creating bend easings, and managing the placement of dredged materials.

Port Houston is also taking significant strides towards sustainability by committing

to become carbon neutral by 2050. Through a comprehensive plan involving technology upgrade, infrastructure improvements, and the adoption of alternative fuels and clean energy sources, the port has already reduced its carbon footprint by 55% since 2016. In December 2023 they announced their latest sustainability venture in cooperation with The Center for Houston's Future and WaterstofNet alongside agents from Belgium, including the Port of Antwerp-Bruges, Exmar, and the Blue Sky Maritime Coalition, to open a green shipping corridor with the aim to boost transatlantic cooperation on the green transition via the exchange of best practices, knowledge and research.

Port Houston remains a key cornerstone in the economic output of the state of Texas. In 2022, the Houston Ship Channel supported 3.4 million jobs across the US, with 1.5 million of those based in Texas. The channel also generated US\$439.2 billion in total economic value for the state, representing 18.6% of the Texas' GDP and a US\$100 billion increase in economic value since 2018.

Tokyo: Turning to tourism



The Port of Tokyo remains one of Japan's largest and most significant ports, playing a crucial role in both domestic and regional maritime trade. Established in 1941, the port has developed into a comprehensive logistics hub, handling a diverse range of cargoes including containers, bulk, and specialised goods. Its strategic location in Tokyo Bay, combined with state-of-the-art facilities, ensures efficient handling and distribution of cargoes. The port's infrastructure includes extensive berths, warehouses, and advanced cargo handling equipment.

In 2023, the Port of Tokyo saw a slight dip in total container throughput, moving 4.57 million teu throughout the year, which was a 7.2% decrease year-on-year owing to challenging economic difficulties. These challenges post-pandemic and the reduction in direct calls by major shipping alliances, such as the 2M alliance, underscored the challenges faced by the Port of Tokyo amidst global and domestic economic pressures.

One highlight for the Port of Tokyo in 2023 was its new high in cruise traffic, with 49 cruise ships calling at the port, the highest since records began in 2012. This surge in cruise traffic is attributed to the post-pandemic recovery in tourism and the opening of the Tokyo International Cruise Terminal in 2020, which was built to accommodate larger vessels. In March 2023, the cruise ship Queen Elizabeth was among the notable vessels that visited, marking a milestone for the port's cruise operations. The port's expansion and strategic promotional activities are expected to further boost cruise tourism in the coming years.

In 2023, the Port of Tokyo established several green shipping corridors, significantly enhancing its environmental initiatives. These corridors are part of an international effort to reduce greenhouse gas emissions from maritime activities. A notable example includes the agreement between the Port of Tokyo, the Port of Los Angeles and the Port of Yokohama at the 2023 California Japan Clean Energy Trade Mission to promote the use of low and zero-carbon fuels for ships operating between these ports.

In December 2023, Japan and Singapore announced a new Green and Digital Shipping Corridor, which includes the Port of Tokyo, that facilitates pilot projects for alternative fuels like ammonia and hydrogen, alongside bunkering infrastructure development. The corridor will also promote digital solutions to enhance port clearance efficiency and cyber security, fostering collaboration between Singapore and Japan. These initiatives underscore Tokyo's commitment to sustainable shipping practices and its role in global environmental stewardship.



Beyond 2023, the Port of Tokyo is actively improving its sustainability credentials through various initiatives. One such initiative includes waiving port fees for ships powered by LNG and hydrogen as part of a broader strategy to incentivise the use of cleaner energy sources in maritime transport. This policy aims to reduce carbon emissions and promote the adoption of sustainable technologies within the shipping industry. These efforts highlight Tokyo's dedication to leading by example in the pursuit of a greener maritime future.

Guangzhou: Increasingly interconnected



**GUANGZHOU: INCREASINGLY
INTERCONNECTED**



The Port of Guangzhou, located in the Guangdong province of southern China, is one of the country's busiest ports. The port handles a wide variety of cargoes, including containers, automobiles, coal, oil, and grain. It boasts extensive infrastructure, including deep-water berths that capable of accommodating the world's largest vessels, alongside advanced logistics facilities. The port is divided into several key areas, including Nansha, Huangpu, and Xinsha, each serving different types of cargo and industrial needs.

Strategically situated near major shipping routes and within a vibrant economic region, the Port of Guangzhou plays a crucial role in China's Belt and Road Initiative, enhancing its connectivity with global markets and supporting the regional economy's growth and development.

The Port of Guangzhou handled 25.41 million teu in 2023, a rise of 2.0% from 2022. The port also handled more than 675 million tonnes of cargo throughout 2023. It is now aiming to achieve a throughput of 700 million tonnes and a container turnover of 27 million teu by 2026. Guangzhou showcased impressive performance last year, marked by significant developments and strategic alliances. A key expansion was the US\$1 billion investment in a new 500,000 teu berth at Nansha port area, enhancing its capacity to handle increased cargo volumes and reinforcing its status as a crucial global trade hub.

Scheduled for completion in 2025, the automated terminal at Nansha, the first of its kind in the Guangdong–Hong Kong–Macau Greater Bay Area, adds to the four berths that were opened in November 2021 and June 2022. This expansion is designed to bolster the economic and social development of the hinterland, enhancing the port's service capabilities for both domestic and international markets. The port's modernisation efforts, including multimodal transportation integration, positions it as a leader in efficient and sustainable operations.

The Port of Guangzhou's performance in 2023 was also driven by strategic investments in automation and digitalisation. A noteworthy partnership with the Port of Los Angeles focused on creating a digital supply chain and a Green Shipping Corridor were announced last year, leveraging technology to streamline operations, and improve transparency and coordination. This initiative is aiming to enhance cargo handling efficiency and reliability at both ports in a bid to reduce delays.

Another major announcement in 2023 was a partnership between Guangzhou and Jiangsu ports to enhance services and collaboration in a bid to further enhance efficiencies at both ports within the Great Bay Area and Yangtze River economic belt.

Positioned strategically along the Pearl and Yangtze rivers, these ports are vital hubs for container handling and logistics in China.

With the introduction of an express shipping service between Nanjing and Guangzhou, the ports continue to maintain a close partnership on shipping and logistics services, as well as the development of green intelligent port infrastructure.

The Port of Guangzhou's 2023 performance was characterised by major infrastructure investments, strategic international partnerships, and a strong emphasis on digitalisation and automation. These initiatives ensured the port remained a key player in regional and global trade, capable of handling growing cargo volumes while maintaining high standards of efficiency and reliability. The ongoing development and modernisation of its facilities firmly positioned the Port of Guangzhou as a forward-thinking and resilient hub in the global supply chain.

Busan: Back to strength

An aerial photograph of the Busan port and city skyline, overlaid with a blue tint. The image shows a large container terminal with numerous stacks of colorful shipping containers and several large gantry cranes. In the foreground, several large cargo ships are docked at the pier. The city skyline is visible in the background, with various buildings and a mountain range in the distance.

**BUSAN: BACK
TO STRENGTH**

Busan Port in South Korea is positioned strategically at the crossroads of major shipping routes in Northeast Asia, acting as a vital gateway connecting East Asia to the rest of the world. With cutting-edge facilities and terminals, Busan Port ranks among the top ports globally in terms of throughput, servicing containers, bulk, liquid, automotive and general cargo. The port's significance extends beyond its regional borders, playing a crucial role in facilitating trade and fostering economic growth not only for South Korea but also for neighbouring countries and international trading partners.

In 2023, Busan Port faced several challenges amid the volatile global economic landscape and regional geopolitical dynamics. The port's business was significantly impacted by declining throughput, reflecting the broader uncertainties affecting global trade patterns. As a major transshipment hub influenced by trade flows from China and Japan, as well as supporting South Korea's exports, Busan Port experienced a 2.8% decrease in throughput to 22.1 million teu in 2022. This decline was attributed to various factors, including deteriorating geopolitical conditions and disruptions in the global supply chain.

The port witnessed a notable slump in container demand, particularly towards the latter half of the year, due to the lingering effects of Covid-related lockdowns in China and geopolitical conflicts in Europe. These events added pressure to an already strained global supply chain, leading to a significant impact on Busan Port's container volumes. However, the port saw a slight increase in transshipment volumes in 2023, with around 12.4 million teu moved in the year, an increase of 4.8% compared to 2022.

Busan Port aimed to increase throughput by 2% to 22.31 million teu in 2023, although achieving this target posed significant challenges amidst the unpredictable nature of global trade. In a reversal of fortune, container traffic at Busan reached a new high of 22.75 million teu in 2023, with an increase of 3.1% on the previous year and an increase of about 44,000 teu compared to the previous all-time high recorded in 2021. Despite hurdles, Busan Port's efforts in enhancing capacity, diversifying markets, and modernising operations underscore its commitment to maintaining its crucial role in global maritime trade.

The reduction in transshipment volumes in 2022 was influenced by several factors, including disruptions at major feeder ports in northern China, such as Shanghai and Dalian. Further delays and congestions at the port came as a result of supply chain disruptions and lingering effects of Covid-related lockdowns. Despite efforts to stabilise port operations, such as utilising inter-terminal transportation routes,



Busan Port grappled with prolonged dwell times and decreased traffic following truckers' strikes in June and November.

Despite ongoing developments at the port, including the completion of Phase 1 of the North Port Redevelopment Project and the commencement of operations at the West Container Terminal, Busan Port remained susceptible to the whims of the global economy and regional trade dynamics.

Qingdao: Reaching new markets



**QINGDAO: REACHING
NEW MARKETS**



The Port of Qingdao, situated in Shandong province, is a crucial maritime hub in northern China. Managed by the Shandong Port Group (SPG), the port's strategic position on the Yellow Sea allows it to act as a vital gateway to major sea routes, facilitating extensive trade with countries such as Japan, South Korea, and the Association of Southeast Asian Nations (ASEAN) nations. Key zones of the port include Qianwan, Dagang, and Huangdao, and it handles a diverse range of cargoes, including containerised goods and bulk commodities, such as crude oil, coal and grain.

In 2023, the Port of Qingdao maintained strong year-on-year performance, reinforcing its status as a leading global port despite challenges in the global shipping industry. The port reported significant throughput, with container volumes reaching 28.7 million teu, a 12.1% increase from the previous year. Throughout the year, Qingdao handled substantial cargo volumes, with daily container throughput often surpassing 30,000 teu. This was facilitated by the port's advanced automated systems, which saw a 37.3% increase in daily handling capacity compared to the previous year.

Furthermore, Qingdao's bulk cargo handling experienced substantial growth, with volumes rising by 6% compared to 2022. This increase was propelled by higher demand for commodities like iron ore, coal, and crude oil. The liquid bulk terminal, one of the largest in China, handled record volumes of crude oil in 2023.

One of the key highlights in 2023 was the addition of 30 new shipping routes, increasing Qingdao's connectivity to more than 180 ports worldwide. This expansion facilitated higher cargo traffic, particularly in trans-Pacific and European trade lanes. The port also invested in advanced technology, including automated cranes and smart logistics systems, improving handling efficiency and reducing operational costs. In recent years, Qingdao has also expanded its operations with new berths and advanced automated systems, enhancing its capacity to manage large container ships efficiently. This growth is supported by robust infrastructure, including extensive rail and road networks, ensuring seamless integration with inland transport.

The Port of Qingdao has also made significant strides in sustainability through various green initiatives. Qingdao Qianwan Container Terminal (QQCT) has introduced hydrogen-powered heavy-duty trucks, saving over 400,000 litres of fuel annually and reducing carbon dioxide emissions by more than 1,200 metric tonnes each year. Additionally, the port has installed three advanced shore power facilities to decrease fuel consumption, emissions, and noise during docking. In 2023, QQCT completed 47 shore power connections, producing 178,000 kWh, marking substantial year-on-year increases. Furthermore, battery modifications on 61 rubber-tired gantry cranes have led to annual fuel savings of 170,000 litres and a reduction of over 450 tonnes of carbon emissions.

Antwerp-Bruges: Future proofing amid reduced throughput



ANTWERP-BRUGES:
FUTURE PROOFING
AMID REDUCED
THROUGHPUT



The Port of Antwerp-Bruges in Belgium is one of Europe's most significant seaports and a crucial gateway for trade into the European Union. It is the second-largest port in Europe, after Rotterdam. The port boasts extensive infrastructure, including modern container terminals, expansive docklands, and a vast network of logistics and distribution centers. It handles a diverse range of cargoes, including containers, bulk goods, and breakbulk, facilitating the transport of everything from raw materials to finished products.

With its strategic location, the port provides direct access to major European markets and serves as a key transit point for goods entering and leaving the continent. The Port of Antwerp is renowned for its advanced technological capabilities and sustainability initiatives, aiming to minimise its environmental impact while maximising efficiency and throughput.

The performance of the Port of Antwerp-Bruges in 2023 was significantly affected by global economic instability and geopolitical tensions, resulting in varied outcomes across different cargo segments. Total throughput declined by 5.9% to 271 million tonnes, reflecting the broader economic slowdown, rising energy costs, and reduced demand for container transport across Europe.

Container throughput saw a notable decrease, with a 5.9% drop in tonnage and a 7.2% decline in total teu. Despite this, the port managed to increase its market share within the Hamburg-Le Havre range by 0.6%, reaching 30.2%, showing a relative strengthening in its competitive position amidst the challenging conditions.

The liquid bulk segment at the port experienced a 2.1% decline during 2023 to a total of 88.7 million tonnes. Diesel and paraffin throughput increased, while petrol, fuel oil, and naphtha volumes fell due to reduced European industrial demand. The chemical sector, a major component of the port's operations, saw an 8.1% reduction in throughput due to higher costs of energy and raw materials concurrent with a decrease of demand across Europe. Dry bulk cargo also faced a significant drop of 13.8%, driven by reduced demand for coal and fertilisers. Coal throughput decreased after peaking in 2022 due to the energy crisis, while fertiliser volumes continued to fall, exacerbated by high prices and sanctions against Russia.

Conversely, ro-ro traffic remained relatively stable, with only a slight decrease of 2.1%. The port handled 3.56 million new cars, marking a 9% increase from the previous year. The throughput of unaccompanied cargo saw a minor decline of 1.5%, with traffic to and from the UK dropping by 4.9%, while traffic related to Ireland increased sharply by 17.9%.

Despite these challenges, the port made substantial progress in its cruise operations, welcoming 155 cruise ships and more than 950,000 passengers, an all-time high for Antwerp-Bruges.

Strategically, the Port of Antwerp-Bruges continued to invest in infrastructure and sustainability projects. Plans include a €2.9 billion investment programme over the next decade, focusing on new infrastructure, energy transition initiatives, and digitalisation to maintain its position as a leading global port. A significant portion of the investment is earmarked for green energy initiatives. The port is channelling resources into infrastructure enhancements to facilitate the intake, storage, and dissemination of green hydrogen and alternative renewable energy reservoirs. These endeavours are geared towards supporting the Belgium's transition towards a low-carbon economy and curtailing the port's carbon emissions.

Shenzhen: Running with new technology



SHENZHEN:
RUNNING WITH NEW
TECHNOLOGY

The Port of Shenzhen, located in China's Guangdong Province, serves as a crucial gateway for trade, handling a vast volume of cargo and acting as a major hub for manufacturing and technology exports from China.

Strategically positioned near Hong Kong, the port comprises key terminals, such as Yantian, Shekou, Chiwan, and Dachan Bay, which collectively enable the port to manage a diverse range of cargoes, including containers, bulk goods, and oil products. Shenzhen's port infrastructure is highly advanced, featuring logistics networks that ensure efficient cargo handling and distribution. Its connectivity to major international shipping routes and integration with rail and road networks bolster its role in the global supply chains.

In 2023, the Port of Shenzhen exhibited outstanding performance despite global economic challenges. The port sustained robust growth in cargo throughput, achieving a new high in container handling for the port. Shenzhen managed over 30 million teu in 2022, marking a 4.4% increase from the previous year. This growth continued into 2023, driven by strong demand for Chinese exports and the port's efficiency improvements.

Shenzhen continues to invest in its infrastructure and technology. Upgrades to port facilities include berth expansions and automated systems, enhanced operational efficiency and reduced turnaround times. Moreover, strategic initiatives to improve environmental sustainability, such as adopting green port technologies and enforcing stricter emissions controls, positioned Shenzhen favourably amid growing regulatory pressures and environmental concerns.

In 2023, the Port of Shenzhen also made significant strides in sustainability, driven by a substantial increase in the export of new energy vehicles (NEVs), lithium batteries, and solar cells. According to Shenzhen Customs, these products were pivotal in enhancing the quality of foreign trade. From January to November last year, the export value of these three products surged by 42.3% year-on-year, totalling 82.42 billion yuan (US\$11.55 billion). Notably, electric passenger vehicles led with 60.24 billion yuan in exports, followed by NEVs at 19 billion yuan and solar cells at 3 billion yuan, reflecting increases of 19.4%, 273.9%, and 32% year-on-year, respectively.

Shenzhen also benefits from its strategic location within the Greater Bay Area, an economic zone that includes Hong Kong, Macau, and several cities in Guangdong Province. This region's economic dynamism and robust industrial base provided a steady flow of cargo, reinforcing Shenzhen's role as a central logistics hub. The port's



ability to maintain uninterrupted operations despite global supply chain disruptions highlighted its resilience and reliability in 2023.

The Port of Shenzhen showed a strong performance in 2023 and can be attributed to its advanced infrastructure, strategic location, and robust economic environment. Investments in port facilities and technology, coupled with initiatives to enhance environmental sustainability, have significantly boosted operational efficiency and resilience. The port's ability to adapt to global economic conditions and maintain uninterrupted operations underscores its reliability. With its strategic role in the Greater Bay Area and burgeoning export sectors like new energy vehicles and green technologies, Shenzhen is well-positioned to continue driving economic growth and facilitating international trade.

Oslo: Tourism booms post-pandemic





The Port of Oslo in Norway stands as the country's premier cargo and passenger port. It serves as a crucial hub for maritime traffic within the Oslofjord, providing vital connections to both domestic and international markets. The port is equipped with innovative facilities that handle a variety of cargoes, including containers, bulk goods, and general freight. It also offers extensive passenger services, with regular ferry routes to numerous destinations across Europe.

The Port of Oslo has long been a cornerstone for the region's economic development, supporting industries such as shipping, logistics, and trade. The port comprises modern container terminals, ample warehousing, and efficient cargo handling systems. Additionally, it serves as a significant entry point for cruise ships, playing a major role in Oslo's local tourism sector.

Managed by the municipally owned entity Oslo Havn KF, the port's operations focus on innovation, sustainability, and environmental stewardship, aligning with Oslo's broader objectives of reducing carbon emissions and promoting green initiatives.

In 2023, the Port of Oslo exhibited strong performance, marked by increases in both cargo and passenger traffic. From 2019 to 2022, container traffic grew by 8.3% in tonnes and 16.4% in teu, with approximately 299,000 teu arriving in Oslo in 2022. This growth was largely due to an increase in containerised cargo, bulk goods, and construction materials.

Oslo also imported 59,960 cars, a 5.4% increase from 2021. Other cargo, including ferry cargo, totalled 614,000 tonnes, up 19.6% from 2021. Dry bulk amounted to approximately 1.7 million tonnes, up 6.9% from 2021. Liquid goods imports reached 1.8 million tonnes, up 14.7% from 2021.

Cruise traffic saw 266,000 passengers in 2022, a significant rise from the 14,000 during the pandemic in 2021. In 2023, Oslo's port welcomed a total of 171 cruise ships. This figure highlights the port's continued appeal as a key destination for international cruise lines, reflecting its strategic importance and attractiveness in the cruise industry.

Domestic passenger traffic saw 3.8 million passengers in 2022, nearly 50% more than during the pandemic in 2021. International passenger traffic increased by 227% from 2021, with international ferries carrying 1.6 million passengers, up 188% from 2021. This growth was driven by the tourism sector's recovery post-pandemic and the introduction of new ferry services at the port.

By 2030, Oslo aims to reduce its greenhouse gas emissions by 95%, with the Port

of Oslo targeting an 85% reduction in the same timeframe and striving for zero emissions in the long term.

In 2023, the Port of Oslo continued to excel in sustainability initiatives, reaffirming its dedication to environmental responsibility and green practices. A major accomplishment was the expansion of its shore power facilities, enabling more ships to connect to the electrical grid while docked. This has significantly cut down greenhouse gas emissions and air pollutants, improving air quality around the Oslofjord. The port also introduced a fleet of electric and hybrid vehicles for its operations, further reducing its carbon footprint. Additionally, the port upgraded its waste management systems, implementing advanced recycling and waste reduction programmes to lessen environmental impact.

Tianjin: Demonstrating China's maritime dominance



TIANJIN: DEMONSTRATING
CHINA'S MARITIME
DOMINANCE

Tianjin Port, located on the Bohai Sea in northern China, is one of the country's key maritime hubs and the latest entry to the Top 20 of Xinhua-Baltic International Shipping Centre Development Index.

A significant lynchpin in global shipping, it connects more than 500 ports across 180 countries. It is the largest man-made port in mainland China and has consistently ranked among the top 10 busiest ports worldwide in terms of cargo throughput. Its comprehensive infrastructure supports extensive maritime trade, making it a critical component of China's Belt and Road Initiative and a vital gateway for international commerce.

The port is not only known for its vast cargo handling capabilities but also for its advancements in technology and sustainability. Tianjin Port has been at the forefront of integrating cutting-edge technologies, such as the Internet of Things (IoT), big data, and artificial intelligence, into its operations for years. This has enhanced its overall efficiency and contributed to its green transformation efforts. The port operates several zero-carbon terminals, reflecting its commitment to boosting its green credentials and achieving carbon neutrality. These initiatives align with China's broader environmental goals and set a benchmark for other ports worldwide.

In 2023, Tianjin Port demonstrated robust performance and sustained growth, solidifying its position as a leading global port. In 2023, the port moved 22.19 million teu of containers, an increase of 5.6% year-on-year compared to 2022. In a similar fashion, total cargo throughput rose 1.8% year-on-year to more than 558 million tonnes, reflecting the port's capability to handle a substantial volume of cargo efficiently and maintaining its position as one of the busiest ports in the world.

A notable aspect of Tianjin Port's operations in 2023 was its commitment to technological innovation and environmental sustainability. The port continued to enhance its IoT-supported terminals, which significantly improved operational efficiency. The implementation of these technologies reduced cargo loading and unloading times by 26.2% and increased the anchoring time for ocean vessels by 28%. These advancements are part of the port's broader strategy to leverage technology for better performance and environmental stewardship.

Moreover, Tianjin Port has been expanding its renewable energy initiatives. In 2023, its wind and photovoltaic power installations generated substantial green power, contributing to significant reductions in coal usage and carbon dioxide



emissions. The port's zero-carbon terminals, particularly the Beijiang port area, have set new standards in the industry for sustainable port operations.

Looking ahead, Tianjin Port has ambitious plans to further increase its container throughput, aiming for over 27 million teu annually by 2027. With 144 container shipping routes currently in operation, the port is well-positioned to achieve this target and will continue to play a pivotal role in global maritime trade.

Melbourne: Flying in the face of cyber challenges



SEAMAX GREENWICH
MAJURO

SEAMAX GREENWICH: FLYING
IN THE FACE OF
CYBER CHALLENGES



The Port of Melbourne, situated at the heart of Australia's southeast, is the largest container and general cargo port in Australasia and one of the top four container ports in the Southern Hemisphere. Strategically located in Port Phillip Bay, it serves as a crucial gateway for international and domestic trade, handling approximately 3.2 million teu annually.

The port manages a diverse range of cargoes including containerised goods, motor vehicles, liquid bulk, and dry bulk commodities, ensuring robust connectivity with major global markets. The port's infrastructure supports efficient logistics and supply chain operations, making it a pivotal component of Australia's trade and commerce.

The port's trade statistics indicate a decline in certain sectors. For instance, total container throughput for June 2024 was 238,000 teu, marking a 2.8% increase compared to June 2023. The volume of liquid and dry bulk cargo increased by 25.89% and 8.23% respectively, but bulk commodity trade volume decreased by 39.41%.

Despite these declines, there were areas of growth. Full container transshipments rose significantly by 42.5% in June 2023 compared to June 2022, and motor vehicle imports increased by 3.3%. The port also witnessed a notable rise in dry bulk trade, which grew by 19.7%. Notably, the port handled around 900 new motor vehicles daily, underscoring its critical role in the automotive supply chain.

In November 2023, DP World Australia, a major port operator responsible for 40% of maritime freight in the country, suffered a significant cyber-attack. The incident affected port operations in Melbourne, as well as those in Sydney, Brisbane, and Fremantle, disrupting the movement of goods and causing a backlog of approximately 30,000 shipping containers.

The cyber-attack resulted in some employee personal data being compromised, although no customer data was affected. DP World Australia's response involved engaging cyber security specialists and coordinating with various government agencies, such as the Australian Cyber Security Centre and the National Cyber Security Coordinator. While full operations were restored within a few days, the incident highlighted vulnerabilities in critical infrastructure and emphasised the need for robust cyber security measures to protect against such threats.

Of note, the port is embarking on a substantial A\$235 million expansion project aimed at enhancing its capacity and efficiency. Scheduled for completion in 2024, this project includes the development of additional berths and the enhancement of existing facilities to accommodate larger vessels and increased cargo volumes. This expansion is expected to further cement the port's status as a leading trade hub and support the growing needs of Australia's economy.

V. MARITIME FINANCE AND INSURANCE



- **Western shipowners increasingly seek Chinese leasing structures**
- **Shipping braces for financial impact of rerouting disruption**
- **Freight derivatives continue to flourish as volatility endures**



- **Shipbrokers report strong numbers as mergers dominate headlines**
- **Marine insurers rally following difficult risk period**
- **Global marine insurance premiums continue post pandemic resurgence**
- **London remains global centre for maritime arbitration**

Western shipowners increasingly seek Chinese leasing structures



WESTERN SHIPOWNERS
INCREASINGLY SEEK CHINESE
LEASING STRUCTURES



Rising interest rates globally have ignited significant profits for numerous banks. By capitalising on the rising base rates, banks have benefited by increasing the rate of their assets ahead of the cost of their funding.

This dynamic has prompted financial institutions to recalibrate their investment strategies, increasingly favouring sectors with robust cash flow potential, such as shipping, while diminishing their exposure to more volatile assets like real estate, as reported by Hamburg-based ship finance company oceanis.

In its most recent quarterly State of Ship Finance Report, oceanis observed that shipowners are strategically deploying their capital to reduce debt, given the heightened financing costs and limited investment avenues. This trend has compelled banks to react by adopting more competitive pricing and launching new financial products to sustain and expand their portfolios.

Shipowners have significantly benefited as a result. Banks have been lowering their pricing to retain their client base and attract new customers. The reduced margins are attributable to three primary factors: improved credit quality of shipowners, compelling underlying market conditions reducing lender risk, the strategic pricing adjustments by banks to counterbalance loan prepayments, and the sustained profitability of these margins due to the relatively slower rise in depositor interest rates compared to loan rates.

Additionally, banks' policies on the age of vessels are increasingly influential in shaping their portfolios, with a preference for financing newer, environmentally friendly ships. Shipowners flush with cash are prioritising the repayment of debt on older vessels, a move justified by the current high base rates, making this debt repayment strategy both prudent and financially advantageous.

To remain competitive and foster portfolio growth, banks are exploring and introducing cutting-edge financial products designed for the current interest rate landscape, such as non-recourse senior-secured revolvers and construction finance, providing shipowners with the necessary flexibility and readiness to capitalise on emerging investment opportunities.

In its report, oceanis highlighted the advantages of these financial tools. The non-recourse revolvers are particularly beneficial for owners poised to capitalise on investment opportunities as they mitigate the burden of full interest payments on readily available funds, streamlining the approval process when an investment opportunity arises.

Additionally, projections indicating a potential downturn in the Secured Overnight Financing Rates (SOFR) present an opportunity for shipowners to secure favourable terms. Interest rate swaps are another strategic option to manage short-term interest expenses, enhancing the financial standing of borrowers in anticipation of market adjustments.

Rise of Chinese lenders

The rise of Chinese leasing over the past decade has notably altered the landscape of ship finance. While Chinese leasing has expanded at the expense of Western banks, this growth has primarily capitalised on the challenges faced by Western financial institutions, including regulatory hurdles and strategic shifts towards larger shipping groups locally in the West. Larger European shipowners typically secure financing from major corporate banks, underpinned by guarantees from holding companies. However, the European ship ownership remains highly fragmented with many small and medium-sized shipowners, creating an imbalance between supply and demand for financing in the region.

Chinese lessors have effectively utilised their increasing industry expertise and cyclic awareness to capture a significant market share. Offering higher leverage than banks but with lower pricing than alternative lenders, Chinese leasing structures, typically sale and leaseback arrangements, are now highly sought after among Western shipowners. This trend has also been influenced by the shifting global focus towards sustainable energy sources, with Western banks being wary of new oil and gas projects due to environmental regulations.

In its report, oceanis also notes improvements in the earnings across various dry bulk vessel categories, driven by increased demand from Chinese steelmakers and a revival in Pacific trade. The financing conditions for newer dry bulk vessels are increasingly favourable, particularly offers from Chinese lessors, which are more attractive than those from European entities. Conversely, older dry bulk vessels are benefiting from decreasing interest costs, indicating a positive trend in financing accessibility.

In the tanker financing segment, there has been minimal activity in the first quarter of 2024 as lenders have temporarily halted aggressive pricing strategies. Although high earnings continue to bolster confidence in asset values, challenges persist in securing sufficient rates for high-leverage, long-term charters.



Similar to the container financing markets in mid-2022, the tanker sector has completed most refinancings, with new loans predominantly aimed at acquisitions and newbuilds. Middle Eastern buyers, often opting for equity investments, have led to a decrease in debt transactions within the sector.

While pricing remains stable, opinions among financiers vary regarding the sustainability of the tanker bull market, influencing their lending practices and terms offered. A recent report from Danish Ship Finance noted a challenging forecast for the future of seaborne trade, suggesting a significant divergence from historical trends where trade volumes expanded in concert with global economic growth. The report indicates that through 2050, seaborne trade volumes are expected to decline, highlighting a diminishing correlation with global GDP, significantly impacting shipyard capacity and, in turn, ship finance.

Shipping braces for financial impact of rerouting disruption

Mark Jackson, Chief Executive Officer, Baltic Exchange

Paul Mazzarulli, Americas

Representative, Baltic Exchange

A paper boat made of a 100 Euro banknote is shown floating on a sea of other banknotes. The boat is constructed from the top portion of the note, with the '100' denomination clearly visible. The background is a dense field of various banknotes, including 100 Euro and 100 US Dollar bills, creating a textured, sea-like appearance. The overall color palette is dominated by the green and yellow tones of the currency.

SHIPPING BRACES FOR
FINANCIAL IMPACT OF
REROUTING DISRUPTION



As the world continues to face the threat of geopolitical and climate disruption, the past year has only added to the maritime sector's list of logistical complexities and unprecedented disruptions.

Two significant challenges that impacted global shipping routes in 2023 were the drought - induced limitations at the Panama Canal and security concerns for commercial vessels in the Red Sea. These obstacles have not only compelled shipping companies to reroute certain vessels but have also sparked a significant reevaluation of hard asset investment strategies. However, as is the way in the financial world, where there is volatility and challenge, there is also opportunity for reward.

With shipping increasingly in the headlines, for better or worse, investors outside the maritime industry are wondering how to take advantage with shrewd investments. This is where the Baltic Exchange's Investor Indices (BII) comes into play, offering critical insights for entering this field of play more confidently.

Panama Canal and the Red Sea

The strategic importance of the Panama Canal and the Red Sea to global maritime trade cannot be overstated. The Panama Canal serves as a vital conduit for international maritime traffic between the Atlantic and Pacific Oceans, while the Red Sea is a crucial passage for Europe to Asia trade routes. Disruptions in these key areas - whether due to environmental factors or geopolitical tensions - force shipping companies to consider longer, more expensive routes that impact both operational costs and global supply chains.

As vessels reroute, shipping companies face increased fuel costs, higher crew wages due to extended travel times, and potential delays in cargo delivery. Such factors can significantly diminish profitability unless managed with strategic foresight. Baltic Exchange has long been a trusted partner in helping to showcase market trends and data; this offering provides a new and unparalleled value, making it the most important economic indicator since the Baltic Dry Index (BDI). By furnishing investors and ship managers with robust data on asset values, earnings health, and operational expenses, the BII enables stakeholders to make informed decisions amid a landscape marred by disruptions.

Recent data from the BII illustrates a notable uptick in the value of second-hand vessels, particularly in the Capesize and Suezmax sectors. For instance, since January 2023, the price of a five-year-old Capesize vessel has surged from US\$41.98 million to US\$56.92 million, a jump of more than 35%. Similarly, in the same period Suezmax tankers have seen a price increase from US\$64.28 million to US\$82.7 million, a nearly 29% appreciation. This rise in asset value can be attributed to a tightening vessel supply, driven in part by the necessity to reroute around troubled waters, thereby escalating demand for available tonnage. On-the-water vessels (again using a benchmark five-year-old example) are also trading at a premium to newbuilding order prices, given the demand for operating assets available promptly.

5-year old (Baltic standard vessel specification) value:	Price – (US\$1,000,000)		
	6-Jan-2023	1-May-2024	increase:
VLCC	\$93.380	\$109.154	16.9%
Suezmax	\$64.278	\$82.690	28.6%
Aframax	\$59.242	\$71.728	21.1%
MR	\$41.613	\$45.788	10.0%
Capesize	\$41.977	\$56.918	35.6%
Panamax	\$29.009	\$36.313	25.2%



Daily op-ex assessments

The BII not only tracks these changes but also provides an easy-to-use dashboard that includes indices on the residual value, spot and five-year timecharter earnings, five- and 10-year old benchmark asset values, and daily operating expenses, among other metrics. This comprehensive approach allows stakeholders to gauge the immediate financial health of their investments and plan for long-term profitability in a volatile market.

The BII's partnership with leading third-party ship managers ensures the reliability and relevance of its data. By collaborating with organisations that collectively manage more than 2,600 vessels, Baltic Exchange guarantees that its op-ex assessments reflect the most current and pertinent industry standards.


In addition to vessel valuation and operational costs, the BII also offers insights into market sentiment, regulatory changes, and global trade demand - all of which are crucial for making timely investment decisions. As the shipping industry continues to grapple with the ramifications of rerouting, the ability to access such data becomes not just advantageous but essential.

Cyclical nature of shipping

Investing in shipping is notoriously cyclical and fraught with complexities. The current global challenges underscore the necessity for a reliable, easy-to-navigate suite of data that can aid investors and shipping companies alike in making prudent decisions. The BII, with its comprehensive and accessible indices, stands out as the crucial tool for the job.

Understanding how asset values fluctuate and the various elements that influence vessel profitability is essential for shipping stakeholders seeking returns on their investments. As volatility continues to affect key maritime regions for the foreseeable future, ship managers and institutional investors now have access to an expanded range of datasets from Baltic Exchange, that can prove instrumental in committing funds confidently. This additional data supports better decision-making, offered by the world's most trusted provider of maritime data and market information.

Freight derivatives continue to flourish as volatility endures



**FREIGHT DERIVATIVES
CONTINUES TO FLOURISH
AS VOLATILITY ENDURES**



Figures published by Baltic Exchange show that the 2023 was another strong year for the freight derivatives market.

Dry bulk Forward Freight Agreement (FFA) volumes reached more than 3 million lots in 2023, a rise of more than 37% compared to 2022, with Capesize and Panamax levels proving the most popular. Compared to levels seen in 2018, this is a rise of more than 159%. In the tanker sector, total volumes rose more than 12% year on year to reach 825,578 lots by the end of 2023, with dirty routes showing their prowess in the market.

FFAs are typically brokered through shipbrokers with specialist futures desks. Companies, including Clarksons, SSY, Freight Investor Services, Braemar and Arrow, have teams in financial centre such as London, Singapore, Dubai and New York that focus on this market, as well as offering access to carbon, iron ore, oil brokerage and other specialist areas.

Driving freight derivatives trading is the volatility in the physical freight market. Freight rates can fluctuate in the region of thousands of dollars per day as the market assesses vessel availability versus cargo demand. Sentiment can also play a significant role. Shipping companies, banks, investment houses and other institutions seek to manage freight exposure by reducing this risk through hedging or taking positions with an expectation of profiting from the volatility.

It is this volatility in freight rates that has resulted in the surge of activity in the FFA market in 2023. With disruption across the board from issues in the Red Sea, droughts in the Panama Canal, the ongoing Russia-Ukraine conflict, emissions regulations in Europe and increased port congestion at key hubs, shipping players are increasingly turning to FFAs to manage their risk. In addition, a large number of algorithmic trading funds have now begun to trade dry bulk FFAs, which is another reason for the surge in activity in 2023.

With shipping making more mainstream news during 2023, an increasing number of non-traditional shipping traders and financiers have been looking at the FFA market as a means of investment, which is yet another reason for the increased level of activity seen in the market in 2023.

During a panel discussion at SGX Commodities Day in October 2023, Matthew Cox, Head of Benchmark Production at Baltic Exchange, said, "We are seeing more people request curves and the actual physical data that goes behind them. We are also seeing lots of interest from non-traditional shipping traders, such as funds and algorithmic traders, for FFAs and more participation will lead to more volume and liquidity."

Increased volatility also brings with it more hedging requirements, which causes speculative players to open and close positions more frequently. For example, the C5 FFA saw a large increase in liquidity over the past couple of years, resulting in the steep rise in Capesize FFAs traded since 2020.

Derek Langston, head of dry research at shipbroker Braemar Shipping, noted in late 2023 that the surge in Capesize rates seen last year, despite a drop-off towards Christmas, pointed to an obvious element of volatility, noting "there's a sense we're not heading back to those low levels we have had in previous years".

It would very seem as though continued volatility will continue to drive the FFA market, with all signs pointing to another strong year in 2024.

	Capesize	Panamax	Supramax	Handysize	Total
2018	476,451	559,342	140,253	2,205	1,178,251
2019	532,899	662,878	171,070	600	1,367,447
2020	592,519	744,237	225,897	0	1,562,653
2021	867,488	1,204,172	436,266	16,095	2,524,271
2022	866,884	904,687	416,993	29,685	2,218,249
2023	1,246,704	1,247,164	522,948	35,960	3,052,776



	Total Options	Clean	Dirty	Total
2018	297,955	125,404	189,322	314,726
2019	234,421	171,440	310,005	481,446
2020	327,183	225,992	426,776	655,810
2021	409,255	167,774	385,761	553,535
2022	395,163	236,359	498,613	734,972
2023	576,517	222,709	602,869	825,578

Shipbrokers report strong numbers as mergers dominate headlines

Emanuele Ravano, Co-Chief
Executive Officer, IFCHOR
GALBRAITHS



SHIPBROKERS REPORT STRONG
NUMBERS AS MERGERS
DOMINATE HEADLINES



The shipbroking industry saw significant consolidation and strategic realignments in 2023, with mergers and acquisitions, or at least talk of the subject, taking place throughout the year that were indicative of a broader trend towards consolidation as shipbrokers look to enhance their competitive edge through scale and diversification.

The year started in such a manner for the team at the newly formed IFCHOR GALBRAITHS, which officially began its operations in January 2023, following a swift merger procedure. The newly formed entity now boasts circa 350 employees across 23 global offices, and is now offering a diverse range of services, from dry bulk and tanker markets to renewables and carbon advisory services, to shipping players around the world.

Despite the long-awaited merger, IFCHOR GALBRAITHS continued its expansion in the shipbroking market with the on-boarding of about 45 people since January 2023 to date, and notably the purchase of Norwegian offshore specialist UNO Offshore in May 2023, which was later rebranded as IG Offshore, the purchase of Tide Maritime Geneva Shipbrokers a Petro Chemicals expert based in Geneva, later rebranded IG Chemicals, and the takeover of the Advisory team of oceanis, later rebranded IG Capital. The move enabled the company to bring a greater level of expertise across an increased number of services.

Amid this strategic realignment, with other major players including Clarksons, Fearnleys and Maersk making headlines in 2023 due to merger rumblings, came another strong year for shipbrokers in general. IFCHOR GALBRAITHS closed 2023 with very strong results, with record volumes and a significant net profit allowing the firm to position itself for further growth.

In the dry bulk market, fluctuating demand and supply chain distribution in Panama and the Suez Canal resulted in a favourable environment for shipbrokers who can advise their clients on the best strategies to face those challenges. IFCHOR GALBRAITHS is reputed for its grain expertise and its coal research. Combined with its strategic positioning and extensive market network, this expertise has enabled it to fully realise its potential.

In the tanker trade, geopolitical challenges once again impacted global oil demand in 2023. However, this resulted in increased demand for long-haul trades, particularly from Europe as it continues to pivot away from Russian crude oil products. The closure of several European refineries necessitated higher imports of refined products into the region, boosting intermediate tanker activity. This trend, coupled with strong

post-Covid recovery in refining margins, contributed to a positive outcome for IFCHOR GALBRAITHS in this market.

There was also an expected flurry of activity from the Sale & Purchase divisions of most shipbrokers. With ship owners looking to modernise their fleets amidst tightening environmental regulations, shipbrokers reported continued strong numbers in owners seeking more modern vessels that have improved efficiency levels or run on more sustainable fuel options. IFCHOR GALBRAITHS strengthened their position in the S&P market following the merger as its enhanced capacity enabled it to service a wider portfolio of clients amid renewed demand for both second hand and newbuildings where IG has been particularly active.

In the offshore and renewables market, particularly following the purchase of UNO Offshore, shipbrokers have reportedly continued to expand into the sector as more ship owners look to take advantage of emerging opportunities in the transition to greener energy sources. This diversification strategy for shipbrokers is vital as they continue to adapt to the changing needs of shipping players globally.

Shipbrokers are also having to account for the developing needs of the carbon regulatory market. With new emissions guidelines such as the EU's Emissions Trading Scheme and FuelEU Maritime impacting vessels of more than 5,000 gt, shipbrokers like IFCHOR GALBRAITHS are increasingly offering decarbonisation services to clients as they look to upgrade their fleets and enable ship owners to comply with new standards. IG Sustainability has on boarded multiple large clients for EUA services and offered carbon emissions tracking and estimating to many customers through their co-owned platform Maritime Carbon Solutions. All of this is offering a new financial avenue for shipbrokers that has enabled them to post strong numbers.

Adaptability has been key for shipbrokers as they continue to navigate new and choppy waters, with no sign of geopolitical tensions slowing in the near term. Nevertheless, shipping remains resilient amid this volatility and shipbrokers continue to play a critical role in connecting shipping players together, building lasting relationships, facilitating S&P of vessels and keeping goods moving, despite a great number of challenges ahead.

Marine insurers rally following difficult risk period



MARINE INSURERS RALLY
FOLLOWING DIFFICULT
RISK PERIOD

Marine insurers were kept particularly busy during 2023 as geopolitical challenges in the Red Sea and adverse weather conditions in Panama caused vessels to take much longer routes, resulting in insurers having to provide additional coverage or simply stop insuring some cargo vessels all together.

In addition, marine insurers have now had to account for related risks associated with new and upcoming EU regulations, as well as ongoing sanctions and the related emergence of a 'dark fleet', which is estimated to be at about 700 tankers.

Despite these issues, affiliates of the International Group of P&I Clubs – the now 12 Protection & Indemnity (P&I) Clubs of the marine insurance market that represent the owners of more than 90% of the world fleet by tonnage – showed a relatively strong bounce back from a challenging previous 12-month period. Importantly, most Clubs declared break-even or better underwriting results in February 2024, with no major fleets known to have changed hands during the most recent renewals period.

Heading into the renewals season, five Clubs announced in November 2023 that they sought 5% increases, while the remaining seven demanded 7.5%. However, this was the lowest level in increase seen since 2020 following several challenging years of rate increases.

Exactly one year after officially merging, the newly formed NorthStandard Club – made up of the former North of England and Standard Club – produced a significant increase during the most recent renewals period, announcing that its premium revenues for the 2023-24 insurance year topped US\$825 million, growing from a combined US\$796 million from February 2023. NorthStandard's mutual poolable tonnage now stands at 256 million gt.

The other major player in the marine insurance sector is Gard, which registered an increase in mutual tonnage to 284 million gt, securing 99.4% of existing tonnage, indicating a clear vote of confidence in some of the biggest affiliates from the International Group.

Meanwhile, Norwegian marine insurer Skuld increased its mutual book by 11% to reach 116 million gt, while also noting that it experienced substantial growth in its hull & machinery, charterers, energy and Freight, Demurrage and Defence (FD&D) cover. In addition, Steamship Mutual announced it grew its total tonnage by 7.5% to reach 125 million gt during the February 2024 renewals season.

It was also positive news for the traditionally small London P&I Club, which boasted a nearly 9% increase in mutual tonnage to reach 44.1 million gt. Meanwhile, other



increases were noted from UK P&I Club, which saw a year-on-year growth of 2 million gt in mutual tonnage due to an increase in volumes from newbuilding commitments, while West of England P&I Club saw an increase of 4 million gt during the most recent renewals period to reach a total of 100 million gt.

This year's renewals season faced an additional challenge as many reinsurers pulled cover for war risk extensions in the Red Sea from fixed premium products, an impact felt by oil majors and big name trading houses looking for cover against liabilities to shipowners and cargo in the region.

However, despite this last-minute decision, it was another positive year for P&I Clubs generally following several years of record losses and going some way to lifting the pressure off clubs' bottom lines.

Global marine insurance premiums continue post pandemic resurgence



GLOBAL MARINE INSURANCE
PREMIUMS CONTINUE POST
PANDEMIC RESURGENCE



It has been another strong period of growth for the marine insurance sector following a prolonged period of negative returns. Despite high interest rates, reduced inflation and recovering consumer confidence post-pandemic are providing a much-welcomed improvement for marine insurers stemming from changes to frame conditions and skilled underwriting.

Global marine insurance premiums reached US\$35.8 billion in 2022, an uplift of 8.3% on 2021, according to the latest statistics published by the International Union of Marine Insurance (IUMI), which represents the world's hull, cargo and offshore energy underwriters.

The report noted that a post-pandemic rebound in global trade in 2022, coupled with reduced market capacity, were predominantly responsible for the uplift in premiums. Increased vessel values, more offshore activity and an upward adjustment in premiums also contributed.

By line of business, cargo continued to command the largest share with 57.3%, followed by hull (23.4%), offshore energy (11.5%) and marine liability (excluding P&I cover, which is supplied by Clubs of the International Group) at 7.7%.

By region, Europe continued to dominate marine premiums in 2022 with 47.7% of cover coming from the region, followed by Asia (28.4%), Latin America (10.3%), North America (8.5%) and Rest of the World (5.1%). European markets continued their upward trend in 2022, having bottomed-out in 2019, while Asia experienced slower growth due to regional economic factors and weaker Japanese and Chinese currencies compared to the US dollar.

Global marine hull insurance premiums also saw a rise in 2022, reaching US\$8.4 billion, an increase of 5.7% from 2021. This was largely due to a combination of growing activity, an increased number of vessels and their rising values, and reduced market capacity. Regionally, Europe continued to take the lion's share with 51.7%, followed by Asia with 37%, with all other regions making up the remaining 11.3%.

The IUMI report also noted that the gap between total gross tonnage/number of vessels and global premiums, which opened markedly from 2011–2018, has closed slightly since 2020 and now appears to be relatively stable, following a market correction.

It was also a positive year for the global marine cargo insurance sector, which continues to show signs of recovery and resilience post-pandemic. According to IUMI, the global premium base for the cargo market in 2022 was US\$20.5 billion,

an increase of 8.3%. In terms of major markets, Brazil, the United Kingdom and the United States grew strongly in 2022, although China and Japan turned downward due to a depreciation of their currencies against the US dollar.

In 2022, a total of 553 claims records were made, up from 495 in 2021. However, the average cargo loss during this period was US\$2 million, meaning that smaller losses are growing in number whilst the larger losses are decreasing.

The level of activity is also based on the cargo type. According to the IUMI report, year-on-year ocean carriage of cars has jumped by 23% in 2022 whereas container trades shrunk by almost 4%. There were also year-on-year rises in commodities such as coal, LPG, crude oil, iron ore and grain.

Meanwhile, there is a fundamental shift underway in the global offshore energy insurance market. Having bottomed-out in 2019, the upward trend seen in 2021 continued into 2022 with a 7.3% rise in the offshore energy premium base to reach US\$4.1 billion. The two major markets - Lloyd's and IUA in the United Kingdom – continued to grow in share, while other markets have remained relatively stable.

As noted in the IUMI report, the offshore energy market is likely to see its fundamentals shift over the coming years much more significantly compared to other sectors due to an expected accelerated growth in low carbon technology. Floating wind capacity, for example, is expected to grow exponentially over the coming years due to increased levels of investment. This evolution of technology will come with new risks that will need to be insured.

Other technologies that insurers will need to develop competence and products for include carbon capture and storage facilities, methane gas leak detection systems, and the electrification of offshore platforms.

While 2022 showed continued post-pandemic growth in the marine insurance sector, IUMI noted that there are also future challenges that are likely to inject a degree of uncertainty into all lines of business.

Jin Lin, Chair of IUMI's Facts & Figures Committee, noted, "Asset prices continue to rise and inflationary pressure will only add to the value of claims. The oil price is fluctuating, and global trade forecasts vary. Trade routes are changing, not least as a result of the war in Ukraine which, itself, is changing the political landscape. New cargoes such as lithium-ion batteries are creating new risks that must be fully understood and mitigated, as are new propulsion technologies resulting from our combined environmental protection ambitions.



"Added to this, climate change and new weather events are also making themselves known to insurers. We are increasingly managing new types of risk such as cyber and having to deal with the accumulation of risk as cargo of increasing value is being stored in single port facilities or is being carried on vessels that continue to grow in capacity," he added.

London remains global centre for maritime arbitration



LONDON REMAINS
GLOBAL CENTRE FOR
MARITIME ARBITRATION



London has once again held the crown with regard to global dispute resolution, although Singapore has seen a noticeable increase in popularity regarding international maritime arbitration. Despite this, London is still unchallenged as the global leader of the global maritime arbitration, evident from the 2023 London International disputes week.

The United Kingdom's capital's position in the Top 10 maritime centres in the 2024 Xinhua-Baltic International Shipping Center Development Index (ISCDI) is highly influenced by the professional services hub. This hub includes maritime legal teams, consisting of more than 800 members of the London Maritime Arbitrations Association (LMAA).

The 2023 LMAAs report, published in March 2024, reported 3,268 new appointments, presenting an increase of 75 appointments. This report also saw an increase in the estimated number of references with 1,845 references in the 2023 report, an increase of 38 references from the previous year.

There are three main contributors to London's success as the globally leading dispute resolution centre: English language, geographical location and most notably, common law. Common law provides foundations for legal systems in nearly one third of the world's 320 jurisdictions. As such, it is understandable that English law accounts for the largest share of awards approved by the International Chamber of Commerce awards.

Arbitrators published an estimate of 436 awards, which has again increased since the previous year, and 69 awards being made after hearings.

In a statement LMAA president David Steward stated, "The LMAA's case statistics continue to reflect the huge number of parties worldwide who choose international arbitration on the Association's Terms and Procedures to resolve their maritime disputes, not only in the shipping industry but also in offshore energy and international trade. We are very grateful to all the arbitrators who contributed to these statistics."

In addition to London and Singapore, other countries and regions that have seen demand for dispute resolution include China, France, Hong Kong, the United States and the United Arab Emirates.

In Singapore, approximately 96 new international arbitrations were seen in the maritime hub in 2022, an increase from the 92 seen in 2021. Meanwhile, the Hong Kong International Arbitration Centre (HKIAC) administered about 32 new arbitrations in 2022, up from 31 in 2021.

Although the volume of maritime arbitrations in Singapore and Hong Kong are steadily increasing, the numbers indicate that both regions have some way to go to attract a more significant proportion of the maritime industry's litigants compared to London.

The United States, meanwhile, saw a major decrease in maritime arbitration appointments in 2022, with the Society of Maritime Arbitrators (SMA) recording 102 new appointments in that year, down from the 163 in 2021. While complete case figures are not available, New York's position as an arbitration centre suggests it now has just 3.1% of the number of appointments when compared to London.



A large cargo ship is docked at a port. The ship's hull is dark blue with a red stripe. The upper part of the ship is white. The background shows a clear blue sky and some port infrastructure. A blue gradient bar is at the bottom of the image.

VI. DECARBONISATION IN THE MARITIME INDUSTRY

- Bunkering's record-breaking year for traditional and alternative fuels
- Oceans of opportunity: Bunkering zero-emission fuels at ports
- Alternative fuel solutions pick up pace in 2023



- **Wind-propulsion systems pick up the pace**
- **Shipping prepares for enforcement of Hong Kong Convention**

Bunkering's record-breaking year for traditional and alternative fuels



BUNKERING'S RECORD-BREAKING
YEAR FOR TRADITIONAL AND
ALTERNATIVE FUELS



2 023 was something of a correction year for bunkering, both in terms of rates and volumes for traditional marine fuels and operations of alternative fuels.

The average global bunker indices for 380 High Sulfur Fuel Oil (HSFO) increased by 8.5%, while Very Low Sulphur Fuel Oil (VLSFO) and Low Sulfur Marine Gasoil (LS-MGO) decreased by 7.2% and 22.0% respectively. There was, however, significant regional price differences.

The highest growth rate for HSFO came from Asia and Oceania with an average increase of 22.5% compared with a 10.9% decrease in South America. When it comes to VLSFO, a decline of 17.2% was seen in Central America whilst Africa and the Middle East were the only regions to see an increase with a 4.4% average rise. The spread was even more marked in LS-MGO with prices dropping in every region from just 0.1% in South America to 32.3% in South America.

Singapore remained the world's largest bunker hub with a record-high number of bunker sales volumes achieved in 2023, reaching 51.82 million tonnes and breaking its previous record high of 50.17 million tonnes in 2017, with more than 50% of volumes coming from VLSFO.

The Global Scrubber Spread – the price difference between 380 HSFO and VLSFO – saw stabilisation in 2023 after an early sharp rise. By the end of 2023 the Spread sat at US\$129 close to the US\$100 break even point and indicating a significant steadying in the bunker market. Again, however, there were regional variations.

In Singapore, the Spread dropped to a low of US\$48 on 3 August before ending the year at US\$156. In Rotterdam, the Spread remained much narrower across the year, hitting historic lows of US\$25 on 14 September, before rising to US\$97 at the end of the year.

Alternative fuel uptake continues to rise as more vessels come online that run on more sustainable forms of energy. According to Clarksons Research, 539 newbuilding orders were placed in 2023 for alternative fuel capable vessels, marking 45% of all orders by tonnage.

The Port of Rotterdam, Europe's largest LNG bunkering hub, also reported record volumes of LNG for 2023, demonstrating a full recovery from the slump seen in 2022. Elsewhere, ship-to-ship LNG bunkering also increased for Europe, North and South America, Asia Pacific and Australia as vessel owners seek more flexible refuelling options.

Meanwhile, as the world's largest refuelling hub, the Port of Singapore continues to prepare for a multi-fuel future that will require the storing and bunkering of a variety of low and zero-carbon fuels by 2030. Singapore's Minister for Transport Chee Hong Tat said in early 2023 that "Singapore has made progress in supplying alternative fuels, such as biofuels, to support maritime decarbonisation", adding that 140,000 tonnes of biofuel blends had been supplied across more than 90 biofuel bunkering operations.

Bunker sales of biofuel blends more than tripled to 520,000 tonnes from 140,000 tonnes in 2022, while LNG bunker sales increased almost seven times to 110,000 tonnes from 16,000 tonnes.

Following sharp price increases in 2022 that saw LNG lose its competitive edge, 2023 saw it reclaim its position as the most favoured alternative bunker fuel for ship owners. In December LNG was US\$117 less than LS-MGO in Sines.

2023 was also something of a breakthrough year for methanol bunkering, with 10 operational methanol bunkering facilities worldwide and a further 11 facilities under development. Another major breakthrough for methanol came from the Maritime and Port Authority of Singapore (MPA) issuing an expression of interest to potential suppliers in December 2023.

In July 2023, Maersk and Hong Lam Marine conducted the world's first ship-to-containership methanol bunkering operation in Singapore, marking the ports first methanol bunkering operation and a major step forward for the fuel as a commercially viable option for ship owners looking to decarbonise their vessels.

Meanwhile, ammonia is also emerging as one of the most viable low-emission bunker fuels. With ammonia engines expected to be delivered from late 2024 onwards, bunkering is being increasingly eyed for development.

In the world's first ammonia bunkering operation, Fortescue's dual-fuel ammonia supply vessel has recently taken on ammonia as a marine fuel in Singapore. This is a significant moment for the commercial viability of ammonia as a fuel. Not only has it demonstrated the potential of another cleaner energy source for commercial vessels, but it also showed the importance of safe port operations for a fuel that has stability concerns.

Crew members and engineers, as well as port officials, involved in the bunkering process took part in a series of rigorous training exercises throughout 2023 to ensure they were suitably prepared for the bunkering process, as well as to develop



standards and safety procedures that will be vital for the long-term development of the fuel.

With 2024 shaping up to be another transformative year for global bunkering, the lessons learned from 2023 will be vital to ensure the viability and practicality of alternative fuels as they become more sought after. Crucially, more ports and terminals will look to ensure they have the infrastructure and resources to supply these cleaner fuel options and will look to the world's leading maritime hubs, such as Singapore and Rotterdam, to provide guidance on industry best practices and solutions.

Oceans of opportunity: Bunkering zero- emission fuels at ports

Bianca Garvin, Project Coordinator,
Global Maritime Forum



OCEANS OF OPPORTUNITY:
BUNKERING ZERO-
EMISSION FUELS AT PORTS



The widespread deployment of zero-emission fuels for ocean-going vessels will be critical to the maritime industry's decarbonisation. Green methanol and green ammonia are promising options to reach the decarbonisation goals set by the International Maritime Organisation (IMO), but there is uncertainty around their availability, their deployment is only at a nascent stage, and supply chains still need to be built out.

The Zero Emission Shipping Mission, a government-led platform to catalyse innovation in shipping decarbonisation, has highlighted some challenges that need to be overcome before these fuels can be bunkered at scale. Fuel infrastructure needs investors, but costs and the aforementioned uncertainties are major barriers. A policy landscape that facilitates alternative fuel bunkering also needs to be developed, and achieving community acceptance for ports that are in close proximity to local populations is crucial.

A new study, 'Oceans of Opportunity: Supplying Green Methanol and Ammonia at Ports', by the Global Maritime Forum and RMI, explores how these challenges can be overcome by providing insights into where these fuels may come from, what their likely costs will be, and what must be done to ensure sufficient availability by 2030 to meet the fuel uptake targets set by the IMO.

Although bunkering scalable zero-emission fuels presents certain challenges, 2030 maritime fuel uptake goals are not out of reach. The study demonstrates that fuel supply dynamics will change dramatically, with extensive trade of green ammonia and methanol linking low-cost production locations with bunker ports.

The cost of renewable energy impacts the delivered cost of methanol and ammonia significantly far more than the cost of transport. This means that areas with good renewable resources, low capital costs, and extensive policy support mechanisms are likely to emerge as fuel-producing regions, creating trade flows as they export these fuels to ports over relatively large distances globally. For instance, green ammonia trade is expected to be diversified as low-cost production regions, including the United States, South America, Australia, and Sub-Saharan Africa, will transport the produced fuels to bunkering hubs like Singapore and Rotterdam.

While supply is expected to be sufficient, there will likely be fierce competition for the lowest cost volumes, and certain constraints on the availability of green methanol and ammonia may also shape trade flows between producers and ports. There will likely be limited availability of green methanol, which may result in a concentration of supply in major bunkering hubs and European ports. This may also create an

opportunity for developers to further expand green methanol production. It is therefore vital that the shipping industry move fast to secure the volumes it needs, boost the confidence of project developers, and ensure planned production projects reach final investment decision.

Multiple key actors need to be involved in building out bunkering value chains, with a focus on infrastructure, regulatory framework, fuel sourcing and demand generation. Actions can span target setting for zero-emission fuel sales, development and coordination of bunkering standards, partnerships with low-cost production regions, financial incentives for zero-emission bunkering, and demand aggregation initiatives.

The study identifies four port archetypes – importing incumbents, producing incumbents, bespoke players and future exporters – based on the cost of local production and bunkering demand volumes, and outlines appropriate strategies for each of these archetypes.

Ports are already implementing a number of actions. For instance, Singapore is leveraging its existing bunkering activity to aggregate demand and secure low-cost fuel volumes and has published expressions of interest for ammonia and methanol bunkering, while Rotterdam is incentivising the use of zero-emission fuels through a port fees reduction scheme.

Chinese ports can especially benefit from locally planned green methanol production projects, as the country is expected to become one of the largest global producers of green methanol by the end of the century. Both large established Chinese bunkering hubs like Hong Kong and emerging bunkering hubs like Zhoushan can benefit by expanding or retaining their market share while preventing other first-mover ports from absorbing regional green bunkering demand.

Since assurances regarding fuel feedstocks are increasingly solicited, especially for biomass and CO₂ sourcing, transparency and traceability in the local green methanol value chain should be prioritised to secure sustainable and long-term demand for local fuels.

Alternative fuel solutions pick up pace in 2023



ALTERNATIVE FUEL SOLUTIONS PICK UP PACE IN 2023

2023 was a landmark year for maritime decarbonisation regulations, with requirements for Ship Energy Efficiency Management Plan (SEEMP) Part III, Carbon Intensity Indicator (CII) and Energy Efficiency Existing Ships (EEXI) certification coming into effect on 1 January 2023. With further changes in 2024 with the inclusion of maritime within the EU Emissions Trading System (EU ETS) from 1 January 2024 and FuelEU Monitoring Plans needing to be submitted to a verifier by 31 August 2024, maritime decarbonisation regulations show no sign of slowing.

As the industry gets to grips with the latest raft of regulations, alternative fuels are becoming a growing need to achieve the International Maritime Organization's 2050 ambitions of net-zero greenhouse gas (GHG) emissions and associated indicative check-points for 2030 and 2040.

There is no one-size-fits-all approach when it comes to alternative fuels, meaning a rethinking of the rules of conventional bunkering. Instead, shipping needs a mix of fuels that can cater to different needs. According to Wärtsilä, a global leader in innovative technologies and lifecycle solutions for the marine and energy markets, there needs to be a growing focus on coordinating action between the various stakeholders in alternative fuel adoption. As noted in their report, Sustainable fuels for shipping by 2050 – the 3 key elements of success, industry needs co-ordination "across policymakers, industry and individual operators to develop the production, infrastructure, supply chains and technology for a mix of sustainable fuels needs."

Meanwhile the industry craves certainty and timelines.

Wärtsilä predicts that biofuels derived from non-food organic sources will see major growth starting in the 2030s. These include diesel-like biofuels, biomethanol, biomethane, and bioethanol, which is already produced at significant scale today, especially in Brazil and the United States.

The report also forecasts the rise of "blue" fuels like blue ammonia in the latter half of the decade. Produced from fossil fuels but with carbon capture and storage, blue fuels benefit from existing oil and gas infrastructure, making them simpler to scale up than synthetic fuels.

Green synthetic fuels, made from renewable hydrogen, are not expected to reach large volumes until the late 2030s, with production likely concentrated in areas with abundant solar and wind resources.

As for costs, Wärtsilä's modelling shows sustainable marine fuels will be up to five times more expensive than today's fossil fuels by 2030. However, the report states that strong regulation akin to EU ETS and FuelEU could dramatically narrow that cost gap and even achieve cost parity by 2035.



Meanwhile, speaking at Singapore Maritime Week in April 2024, IMO Secretary-General Arsenio Dominguez stated that he was "very confident" that the IMO would agree carbon pricing measures in 2025, which could help to further incentivise the use of alternative fuels.

When it comes to newbuilds, 552 ships capable of burning alternative fuels were contracted at shipyards in 2023, representing 45% of all the new tonnage ordered according to Clarksons Research data. When taking into account 'ready' status, the orderbook shows there are 579 in fleet and newbuilds that are LNG 'Ready', 322 that are ammonia 'Ready' and 272 that are methanol 'Ready'.

The orderbook also shows that there had been significant interest from maritime players in 2023 in ammonia and methanol as potential and viable alternative fuels.

Ammonia has seen significant advancements across the supply chain that are bringing the clean fuel closer to viable use in the maritime sector, according to the October 2023 update of the Lloyd's Register Maritime Decarbonisation Hub's Zero Carbon Fuel Monitor.

Safety knowledge has also progressed due in part to a joint study by the Maersk McKinney Moller Centre, which issued recommendations for the design and operation of ammonia-fuelled vessels.

Investment readiness in ammonia is also increasing, with Yara International ordering 15 floating bunkering terminals for ammonia supply, signalling growing industry confidence.

On the technology front, key gains have been made in improving the readiness levels of ammonia handling and propulsion systems. In November 2023, Wärtsilä Marine launched the world's first 4-stroke ammonia engine as part of the Wärtsilä 25 engine platform. Promising data suggests an immediate cutting of GHG emissions by more than 70% in a major milestone in the transition to a clean shipping future.

At the same time, the outlook for methanol as a sustainable marine fuel is enhancing, with green methanol production projects proliferating and major shipping firms ordering methanol-capable vessels in sizeable numbers.

About 80 green methanol plant projects are now in development globally, set to generate nearly eight million tonnes of the eco-friendly fuel annually by 2027. While not solely dedicated to shipping, this production ramp-up represents a significant boost to availability.

On the supply side, methanol bunkering infrastructure is also maturing in key maritime hubs. Barge-to-ship refuelling operations are already proven at the Port of Antwerp via a Stena Bulk-Proman joint venture. Meanwhile, OCI is supplying ship-to-

containership bunkering for Maersk's methanol-fuelled boxships in Singapore and Rotterdam.

This improving supply chain readiness comes as shipping's demand trajectory rises sharply. Major carriers like Maersk Line and CMA CGM are placing orders for large numbers of methanol dual-fuel vessels. Projections indicate that if all such dual-fuel ships used methanol exclusively by 2028, based on the current orderbook, demand would reach 25% of the total green methanol production capacity anticipated for 2027.

At the same time, technological advancements were also made by engine manufacturers, with the addition of another four methanol engines to the Wärtsilä portfolio seen late last year. Each of these engines is capable of delivering significant carbon emissions savings when compared to conventional LFO, as well as drastic reductions in NO_x, SO_x, and particulate emissions.

The adoption of alternative fuels, not just in shipping but across the transportation and logistics sectors, has often faced a classic 'chicken-egg dilemma': ship owners want to adopt greener fuel options but suppliers are reluctant owing to a lack of demand. This past year saw some of the industry's biggest players step up and make the adoption of alternative fuels a more viable, practical and cost-effective option. However, the implementation of much more stringent emissions regulations, particularly in Europe, could well quicken that adoption over the coming years as greener vessels hit the water and ship owners look to more commercially viable.

Wind-propulsion systems pick up the pace



WIND-PROPULSION
SYSTEMS PICK UP
THE PACE

The 80th session of the International Maritime Organization's (IMO) Marine Environment Protection Committee (MEPC) in July 2023 brought with it a revised greenhouse gas (GHG) strategy, pushing the maritime industry to reach net-zero GHG emissions by 2050.

This followed the introduction of the Carbon Intensity Indicator (CII) regulation in January 2023, which ranks vessels based on the carbon intensity of their operations. In practice, shipowners are now increasingly under pressure to reduce their Scope 3 emissions and many are seeking ways of making their vessels more efficient.

Aside from the benefits of alternative fuels, such as ammonia, hydrogen and biofuels, there are a number of efficiency measures available to shipowners to reduce the risk of drag on their vessels or provide alternative means of propulsion aside from the traditionally used diesel-combustion engine. These include redesigned propeller designs, more regular hull cleaning, air lubrication and engine rerating.

However, wind-propulsion technology is increasingly being turned to as a viable option for ship owners as a means to provide completely carbon-free alternative propulsion to vessels, with delegates at the MEPC 80 meeting noting the technology's potential to helping shipping meet its 2050 goal. In its Maritime Decarbonisation Strategy 2022, the Mærsk Mc-Kinney Møller Center for Zero Carbon Shipping noted that vessels installed with effective wind-propulsion systems can stand to be up to 8% more efficient.

According to the International Windship Association (IWSA) Secretary General Gavin Allwright, one of its main advantages compared to alternative options is the zero cost. For instance, even at the end of the ship's life, the system can be put on another ship to secure another lifetime of zero emissions.

Wind-propulsion projects hit the headlines in 2023 as ship owners looked to snap up off-the-shelf technologies that can be easily installed or retrofitted to make an immediate impact on their vessel's efficiency.

In January 2023, under its Horizon Europe project, the European Union provided EUR9 million in funding to support the building of Orcele Wind, a full-sized wind-powered ro-ro vessel from Wallenius Wilhelmsen, while in August 2023, Cargill announced a collaboration with Bar Technologies to develop a new type of wing sails that could generate up to 30% of annual fuel savings on new build vessels.

In one of the biggest stories of the year, Brazilian mining giant Vale announced it signed a deal with Anemol Marine Technologies to fit five Rotor Sails to the 400,000 dwt Very Large Ore Carrier (VLOC) Sohar Max, the world's largest ore carrier, that could cut up to 3,000 tonnes of the vessel's carbon emissions annually.



Rotor Sails made a number of headlines in 2023 as more shipowners realise the long-term benefits of an off-the-shelf technology that can enhance the Energy Efficiency Design Index (EEDI) and Energy Efficiency Existing Ship Index (EEXI) of their vessels.

Harnessing the power of an aerodynamic phenomenon called the Magnus Effect – a force that acts on a spinning body in a moving airstream - these tall cylinders are installed to the deck of the vessel, combined with a range of deployment systems that enable them to move along or across the deck, or fold from the vertical, to provide sufficient alternative propulsion for additional vessel speed or to maintain vessel speed by reducing power from the main engine.

Data from another of Anemol's projects in 2023 – the installation of three Rotor Sails on board the 82,000 dwt Kamsarmax bulk carrier TR Lady in July 2023 in Chengxi Shipyard in China – showed that the vessel can save an estimated 10% of fuel and emissions annually as a direct result of the Rotor Sails.

Kim Diederichsen, Chief Executive Officer at Anemol, said in an interview with Kormarine in late 2023, "The initial results we have seen from the TR Lady project so far are incredibly positive. Wind propulsion and Rotor Sails have found their place in modern shipping. With pressure growing on ship owners to go green, Rotor Sails are a visible, viable and cost-effective decarbonisation technology."

Wind-propulsion technology has been shown to be ideal for vessels with a large amount of available deckspace, making them particularly suitable for bulk carriers and tankers. With the aid of a deployment system that can move these cylinders up and across the deck, or in some cases folded, they have the added benefit of being able to be moved out of the way during cargo operations, ensuring they do not impede the commercial viability of vessels.

Work is also underway to find ways of fitting these technologies to new vessel types in novel ways. In November 2023, Ocean Network Express (ONE) began trials with Dutch marine wind-powered technology specialist Econowind to install two VentoFoil containers aboard the MV Kalamazoo container vessel, while in October 2023 Hudong-Zhonghua Shipbuilding Group began working with Anemol to develop a new design of Rotor Sail specifically for LNG carrier newbuildings.

With wind-propulsion technology making a lot of news in 2023, players are ramping up production to ensure they prepare to meet demand in 2024 and beyond. According to research by the European Union, up to 10,000 ships will feature some form of wind-propulsion technology by 2030, while the United Kingdom government foresees that up to 45% of all ships will have this eco-friendly technology installed by 2050.

Shipping prepares for enforcement of Hong Kong Convention

A large cargo ship is shown under construction on a dry-dock slipway. The ship's hull is painted in dark grey and red, with a white superstructure. The ship is positioned on a concrete slipway that is partially submerged in water. In the background, there are trees and a small building with a blue roof. The sky is clear and blue.

**SHIPPING PREPARES FOR
ENFORCEMENT OF HONG
KONG CONVENTION**



The maritime industry stands on the brink of significant regulatory change with the forthcoming enforcement of the Hong Kong International Convention for the Safe and Environmentally Sound Recycling of Ships in 2025. This convention addresses the environmental and safety concerns associated with ship recycling. As the enforcement date nears, ship owners, financial analysts, and maritime business leaders must understand the implications of this convention and the necessary steps to ensure compliance.

Adopted in 2009 by the IMO, the Hong Kong Convention seeks to ensure that ships, when being recycled after reaching the end of their operational lives, do not pose unnecessary risks to human health, safety, and the environment. Key elements of the convention include the development of an Inventory of Hazardous Materials (IHM) for each ship, the authorisation of ship recycling facilities, and the establishment of a 'Green Passport' for ships. The IHM must be maintained throughout the ship's operational life and verified by authorities before the vessel can be recycled to ensure all hazardous materials are identified and managed appropriately.

Compliance and regulations

The Hong Kong Convention is crucial for several reasons. Firstly, it promotes environmentally responsible ship recycling practices. Traditional shipbreaking, often conducted on the beaches of South Asia, has been notorious for its environmental degradation and poor labour conditions. By establishing clear guidelines and standards, the convention aims to mitigate these adverse impacts. Additionally, the convention enhances the safety of workers in ship recycling facilities. By mandating better training and safety protocols, it helps to reduce the high accident rates that have plagued the industry.

Shipowners must also obtain the necessary certificates to demonstrate compliance with the Hong Kong convention, including the International Certificate on Inventory of Hazardous Materials (ICIHM) and, for ships bound for recycling, the International Ready for Recycling Certificate (IRRC).

Another critical step is choosing authorised ship recycling facilities. Shipowners must ensure that the chosen recycling yard is certified and authorised under the convention's guidelines. This includes verifying the facility's compliance with environmental and safety standards and its ability to handle hazardous materials properly.

Prior to recycling, a ship-specific recycling plan must be developed. This plan outlines how the vessel will be dismantled, ensuring that all hazardous materials are managed safely, and environmental impacts are minimised. Collaborating with recycling

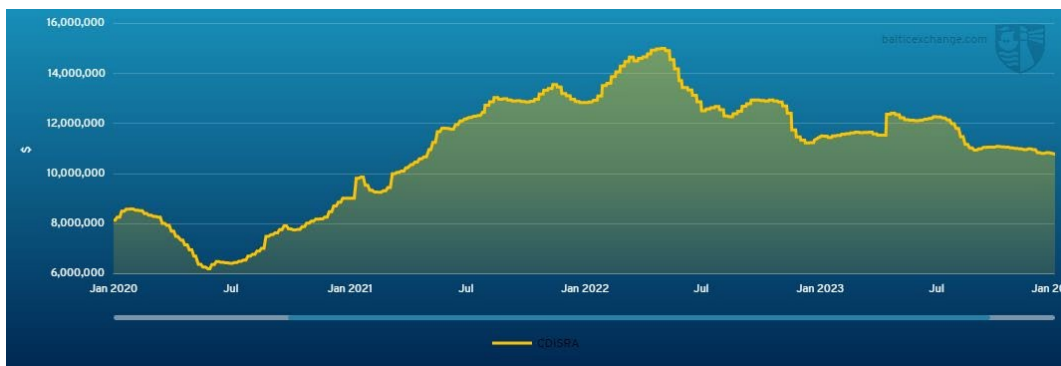
facilities to create and approve this plan is crucial for compliance. Furthermore, engaging with class societies and regulatory bodies is essential. Class societies play a pivotal role in the certification process under the Hong Kong Convention. Shipowners should engage with their class society to ensure that all necessary surveys and inspections are completed.

Financial implications

The enforcement of the Hong Kong Convention has significant financial and strategic implications for shipowners and investors in the maritime sector. Compliance with the convention entails costs related to the development and maintenance of the IHM, certification processes, and potential upgrades to recycling facilities. However, these costs are offset by the long-term commercial benefits of sustainable and responsible ship recycling practices.

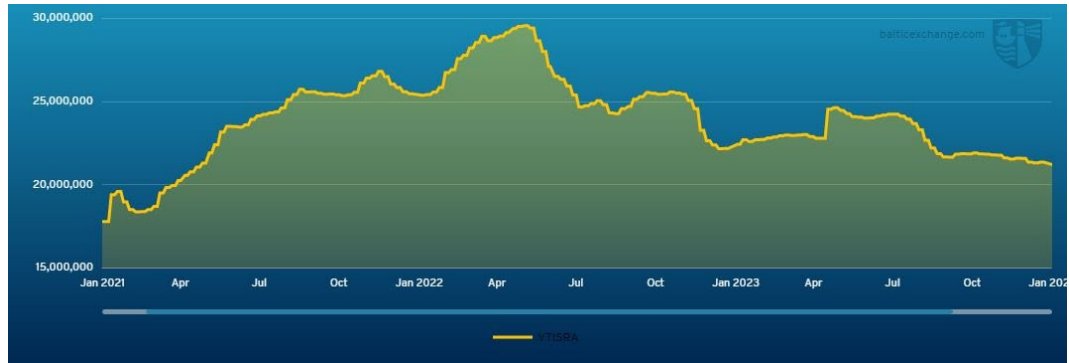
Understanding when is the right time to scrap a vessel is also vital for ship owners to ensure they seek the best return on investment. The Baltic Investor Indices, which includes a recycling value for bulkers and tanker vessels, has shown that the scrap value of vessels has fluctuated widely over the past three years, with 2022 proving to be a positive year for owners looking to maximise the scrap value of their ships.

For Capesize vessels, the BII Recycling Value between January 2020 to December 2023 has shown that the recycling value of this vessel type grew from US\$6.2 million in July 2020 to US\$15.1 million in May 2022 before flatlining to about US\$11 million throughout 2023.





VLCC vessels have seen a similar pattern. In January 2021, the recycling value of a VLCC stood at US\$17.8 million before climbing to US\$29.6 million in May 2022 before settling at about US\$23 million in 2023, according to data from the BII.



The reduction in recycling value throughout last year is indicative of the level of scrapping activity seen in 2023. Demand for scrap material dramatically fell in 2023 due to an abundance of cheap steel from Asia and, with most of the 446 vessels scrapped last year being broken down in either Bangladesh, India and Türkiye, there was little appetite for recycled vessel materials, at least compared to the levels seen in 2022.

Conclusion

The Hong Kong Convention fosters a more stable and predictable regulatory environment, reducing the risks associated with non-compliance and potential penalties. By adopting a proactive approach to compliance, shipowners can mitigate risks and position themselves favourably in the market. It also represents a pivotal shift towards more responsible and sustainable ship recycling practices.

As the enforcement date of 2025 nears, shipowners must take deliberate and informed steps to ensure compliance. By developing comprehensive IHMs, obtaining necessary certifications, choosing authorised recycling facilities, and implementing detailed recycling plans, shipowners can navigate the regulatory landscape effectively. For investors and financial analysts, the convention underscores the importance of ESG considerations in the maritime sector. Compliance not only mitigates risks but also enhances the long-term viability and attractiveness of shipping companies. As the industry evolves, embracing sustainable practices will be key to maintaining competitiveness and securing investment in an increasingly conscientious market.

VII. PORTS & SEAFARERS



- **Cyber security risks on the rise as ports further integrate AI**
- **Ports continue the drive to digitise**
- **New leader emerges as flag states face increased scrutiny**



- **Incentives driving ports and vessels to curb emissions**
- **Smarter ports require smarter ship agents**
- **Crew welfare in the spotlight as maritime flags safety risks**

Cyber security risks on the rise as ports further integrate AI



CYBER SECURITY RISKS ON THE RISE AS PORTS FURTHER INTEGRATE AI



With the digitalisation of ports and vessels, combined with increased automation across the industry, the use of artificial intelligence (AI) has shown to have its benefits when it comes to optimising shipping processes, such as order and inventory management, logistics and analysing data regarding shipping routes. However, without the appropriate cyber security measures in place, AI poses significant cyber threats within the maritime industry. In order to reduce or mitigate these risks, it is first necessary to identify what these risks are and in which ways the industry needs to account for them.

Before looking at AI specifically, it is relevant to note the ways in which the maritime industry is embracing digitalisation in port and vessel technology. There are many technological advancements that are being utilised within the maritime industry such as the Internet of Things (IoT): a network of connected devices, allowing for the collection and exchange of data and enabling devices to communicate and share information. One benefit of this is that devices are able to make data-driven decisions without human oversight, arguably mitigating the risk of human error and increasing port and vessel efficiency. With reference to the maritime industry, the IoT is highly applicable; for example, vessels can be fitted with IoT sensors that can monitor operational aspects such as engine performance and fuel consumption. The data collected can be relayed to shipping companies, enabling them to track their fleet and preempt technical and maintenance issues. However, due to the interconnectivity of the IoT, there are security and privacy concerns. The vulnerability of one device has the power to compromise the entire network, leading the entire system to be at risk.

One of the most common examples of AI-use with reference to port technology is the development of Smart Ports. A Smart Port is a digital port that has improved efficiency by utilising advanced technology such as the IoT and AI. One of the main benefits of Smart Ports is their automation enables them to operate 24/7 without human oversight, increasing efficiency and reducing labour costs. In recent years, there has been a rise in the integration of AI into Smart Ports to automate port operations, optimise berth management and manage congestion. Despite the clear benefits of the use of AI in Smart Ports, this increased digitalisation of ports also presents significant cyber-security vulnerabilities.

On 10 November 2023, DP World, Australia's biggest port operator, faced a cyber-attack from Russian cyber-crime group, Lockbit, disrupting imports and exports at the ports of Melbourne, Sydney, Brisbane and Perth for several days. After detecting unauthorised access to the company's corporate network, DP World disconnected from the network in an attempt to contain the incident; despite their efforts and quick

response, data was compromised. Additionally, as DP World accounts for roughly 40% of Australia's imports and exports, there was a resulting backlog of about 30,000 containers. In this incident, the decision to disconnect from the network was vital in minimising the damage caused by the attack, however, DP World took a reactive, rather than proactive cyber security approach. With more robust cyber security measure in place, the attack may have been prevented or the resulting damage mitigated.

In order to identify the best ways of preventing cyber attacks and mitigating the risks associated with the integration of AI into the maritime industry, it is vital to acknowledge the vulnerabilities regarding cyber security. The use of AI in navigation, communication and control systems can make the maritime industry an 'easy target' for cyber-attacks due to increased interconnectivity of devices and the lack of understanding regarding the importance of cyber security. Additionally, the reliance, or arguably overreliance, on automated systems could pave a path for the exploitation of misunderstanding with regards to vessel and port systems. It could be argued that human operators lack the crucial skills to identify when to appropriately intercede if the AI systems defects or is compromised through a cyber attack.

There are also legal and ethical implications for the integration of AI into port and vessel tech. When an incident occurs involving an AI-controlled vessel or port, the ease of determining who is at fault is contentious. If the AI model is responsible for making the decisions that led to the incident, then it becomes a grey area in identifying culpability.

Another key factor to consider is the data used for AI models to learn and make decisions. It is vital that this data is accurate, up to date, extensive and impartial. If the data used for AI models does not fit this criteria, it could result in the AI model making flawed decisions due to inaccurate data and therefore compromising the safety of the vessel or port. Additionally, it could be argued that AI-models are incapable of accounting for all events, specifically unforeseen or unprecedented situations that shipping is notorious for. As such, AI systems may be unable to make accurate and informed decisions when facing events on which they have little or no data to learn from, again, compromising the safety of the vessel or the port.

Having identified the risks associated with the integration of AI into the maritime industry it is crucial to note how to reduce and mitigate these risks. Firstly, robust cyber security measures are needed. By implementing protocols and regularly assessing the effectiveness of current cyber security measures, the risk of falling victim to a cyber security attack is reduced, aiding in safeguarding shipping players



against cyber threats. Effective collaboration between AI and human input is needed to provide a holistic approach, combining the benefits of AI with the necessary human oversight. Not only does this account for ethical considerations and supply job security to some extent, it also mitigates overreliance on AI that can further enhance vessel and port safety within the maritime industry.

There is also a need for ethical considerations in AI development processes. By acknowledging ethical considerations when creating AI, it is ensured that the data being used for the AI to learn from is unbiased and accurate, allowing for transparency in AI decision making. Although this does not mitigate the risks of AI being unable to account for unforeseen and unprecedented situations, this does help to ensure that the AI-model has accurate and up to date information, with scope for adaptation, which is vital in the ongoing development of technology and specifically AI. Ongoing innovation and adaptation is encouraged to account for the changes that occur with the rapidly developing field of technology. By accounting for these changes, it is ensured that AI models are appropriately aligned with the technological landscape.

To ensure that the benefits of AI are utilised effectively, it is necessary to implement appropriate cyber security measures. In order to do this appropriately, there is a need for both proactive and reactive risk management plans. As evident from the DP World case in 2023, the need to act swiftly and make vital decisions to contain the extent of the damage is crucial. However, a structured proactive plan to reduce and mitigate cyber attacks within the maritime industry is vital as the use of AI becomes more prevalent in ports and on vessels.



Digitalisation continues to drive port development across the globe as maritime hubs leverage technology to improve efficiency and commercial viability, bolster the resilience of a supply chain that remains under pressure, and enhance the long-term sustainability of port operations.

The need for ports to invest in more digitalised operations has become more paramount in recent years as squeezed supply chains, rising interest rates, geopolitical tensions, sanctions and environmental regulations have all tested the maritime sector, with 2023 proving to be no exception.

Ongoing issues in the Red Sea and the Panama Canal, combined with global economic challenges, have spurred port authorities to seek essential upgrades to their infrastructure to improve operational efficiency, with digital platforms increasingly playing a significant role in these upgrades.

The subject of port digitalisation was a major point of discussion at 2023's Smart Port: Piers of the Future event in Barcelona, where 'Sailing towards Innovation' was the theme. The opening panel of the forum included representatives from the ports of Barcelona, Hamburg, Antwerp-Bruges, Los Angeles and Chicago, all of whom highlighted the positive benefits of digitalised operations at their own respective ports and maritime centres, alongside sustainability and innovation improvements.

So what kind of upgrades are ports making? Increased use of automation systems, sensors and cameras, artificial intelligence (AI) and Internet of Things technologies are helping to create a more accurate port operation management setup, with minimised waiting times, reduced operational errors, improved inventory management and inland transport coordination.

Access to real-time data enable port authorities to make more informed decisions on space allocation, equipment utilisation and personnel management to make better use of available resources and reduce operating costs. In addition, the implementation of advanced security systems, such as surveillance cameras, intrusion detection systems and biometric identification technologies, can improve port safety and enable rapid response to emergency situations.

Digitalisation can also contribute to improved environmental sustainability efforts of ports. Improved operational efficiency can reduce energy consumption and carbon emissions, as well as improving water management efficiency. In addition, electrified technologies in cargo handling can further reduce the environmental footprint.

All of these have led to the rise of the Smart Port: a modern and technologically

advanced port that uses digitalisation to drive operational efficiency, safety and sustainability. According to a September 2023 report from Allied Market Research, the Smart Port market, as of the end of 2022, was valued at US\$2 billion. However, this is anticipated to rise to US\$15.5 billion by 2032.

Ports around the world have spent the past year investing in new technologies as they look to use digital platforms to become smarter and more efficient.

Tuas Port in Singapore continues to be a champion in the development of digitalised and automated port operations. The port, which officially opened in September 2022, has spent the past year continually embracing automation and establishing an innovative command centre to oversee its operations and maintenance that has enabled it to further streamline its supply chain and provide enhanced support to vessels docking at the port.

Elsewhere in Singapore, in July 2023 PSA Singapore announced it was implementing a new propriety cloud-based transport management system that utilises AI to facilitate smarter trip planning for hauliers accessing the port. According to PSA Singapore, the system has been shown to reduce empty truck trips by more than 50%, resulting in an annual reduction of 10 million kg of carbon emissions or the same as planting 300,000 trees annually.

Staying in the Asia-Pacific region, in May 2023, Taiwan officially began operations at the Port of Kaohsiung's highly anticipated newest container terminal, which includes the country's first automated container-handling wharves that are equipped with UAVs, remote control technologies and AI systems.

Meanwhile, the Port of Tianjin in China has developed a new smart terminal in collaboration with Huawei that leverages 5G, AI and autonomous driving technologies to build the port's resilience. Speaking at the Mobile World Congress in 2023, Yue Kun, Chief Technology Officer of Smart Road, Waterway and Port BU of Huawei, stated, "The new industrial revolution, including the application of autonomous driving and AI technologies, will significantly benefit port production security management, green development, intelligent decision-making, and efficiency increase."

European ports have also pushed forward with technological developments. Rotterdam, for example, launched a new digitised solution for container operations in early 2023 to increase the efficiency and speed of inland handling vessels, as well as optimising the use of quays. Later in the year, Rotterdam announced it was installing 'smart bollards' along the quayside of one terminal to collect data and gain insights into the consequences of berthing, docking and idling of container ships at the port. It



is hoped this data can then be used to make port operations safer and more efficient.

In Ireland, the Port of Cork announced in March 2023 that it was speeding up its digitalisation efforts by implementing a new port management system to automate and improve the scheduling of port, tug and pilotage services by harnessing the power of AI and machine learning. It is hoped that by boosting the efficiency of service fleets at the port, it will reduce overall distance travelled, eliminate unnecessary journeys and reduce greenhouse gas emissions.

In Spain, Valenciaport collaborated with Nextport in 2023 to create an innovative software that utilises AI to forecast and schedule truck volumes at the port. The software takes advantage of key information and historical data to predict the loading and unloading of vessels, enabling the port to make more informed decisions on movements at terminal gates and the number of truck entries.

The Port of Antwerp-Bruges also made the news in May 2023 with the launch of the world's first network of drones to enable the port authority to manage, inspect and supervise a large area of the port quickly to improve overall security efforts, manage berth operations, detect oil spills and floating waste, and inspect infrastructure.

However, the increased use of digitalisation at ports comes with a number of cyber security risks and a number of ports faced major cyber security challenges in 2023. The Port of Lisbon in Portugal saw a cyber-attack on Christmas Day in 2022 that took down its internal security systems and saw financial reports, audits, budgets, cargo information, ship logs and port documentation stolen. Meanwhile, several ports in Canada were targeted by a 'denial-of-service attack' that flooded their websites with traffic, causing them to crash.

One of the biggest cyber attacks of the year happened in November 2023 as DP World Australia was targeted by hackers that stole personal employee data. The incident led to the operator temporarily closing its network and port operations at the ports of Melbourne, Sydney, Fremantle and Brisbane, resulting in containers and cargo being stuck on the docks for several days.

In a bid to help mitigate further cyber security risks, July 2023 saw the launch of a maritime cyber attack database from Dutch university NHL Stenden that includes incidents impacting vessels, ports and maritime facilities. The hope is that, by developing a bank of cyber incidents, the system will be able to develop simulations of maritime cyber incidents that are realistic and relevant, so that companies, organisations, and ports can prepare for attacks.

While the development of digital improvements at ports have led to a lot of headlines in 2023, ship owners and managers are also taking similar steps to improve the efficiency and sustainability of their vessels by implementing onboard technological advancements.

In June 2023, A.P. Moller-Maersk signed a deal with Microsoft to use its range of cloud-based services to deliver reliable and secure products with improved time to market. The system, which also leverages machine learning and data analytics, will enable Maersk to gain greater insights and support new ways of working.

Meanwhile, Columbia Shipmanagement launched a new platform, known as the PANGIA Project, that is designed to consolidate data collection and analysis of vessel operations to boost ship performance and reduce fuel consumption. The platform can also offer early detections of health hazards to protect the health and safety of crews and passengers through machine learning.

Communication systems onboard vessels was also a common theme last year. Mitsui O.S.K. Lines (MOL) announced in October 2023 that it was installing the Starlink satellite communication systems from SpaceX onboard 233 of its ocean-going vessels, while in the same month Maersk announced it was installing the same system onboard 330 of its vessels. Both companies have stated that by installing the Starlink system, it will improve the capability of onboard communication systems that has also been shown to have a benefit for crew members being able to contact family and friends while at sea.

From a sustainability perspective, one of the biggest stories of the year occurred in October 2023 that saw Hapag Lloyd launch an AI-powered Fleet Deployment Optimizer system to help customers accurately simulate future emissions and compare the efficiency of different vessels across potential schedules. Hapag-Lloyd stated that the technology will play an important role in enabling maritime companies to meet their emissions reduction targets.

Ports remain vital hubs in the global supply chain and, for many, the need to digitalise is a necessity. With the rise and developments of Smart Ports set to continue over the next decade, many port authorities are seizing the opportunity to kick start their digital development in a bid to improve operational efficiencies and reduce their carbon emissions.

New leader emerges as flag states face increased scrutiny



NEW LEADER EMERGES
AS FLAG STATES FACE
INCREASED SCRUTINY

Liberia has dethroned Panama to become the world's largest flag state in 2023, ending Panama's 20-year reign at the top, according to data from Lloyd's List. This achievement is the result of an aggressive 10-year plan by the Liberian registry, led by Chief Executive Officer Alfonso Castellero, to reach the pole position. Last year, Liberia saw an impressive 10% increase in registered gross tonnage to 258.2 million gt, driven by a clear vision, strong team and loyal clients, according to Castellero. Significantly, Liberia maintained its place on the respected White Lists of the Paris and Tokyo MoUs, as well as retaining US Qualship 21 status.

Panama slipped to second place with 252.3 million gt despite 2.6% growth year-on-year. More concerning for Panama was its demotion to the Paris MoU's Grey List, the only Top 10 registry to sit outside the White List. The Panama Maritime Authority vowed to address this by purging ships with poor detention records from the flag. On a positive note though, Panama achieved US Qualship 21 status for the first time in 2023.

The Marshall Islands (189 million gt), Hong Kong (127.8 million gt) and Singapore (99.1 million gt) retained their third, fourth and fifth places, respectively. The top performers all emphasised quality and compliance as key priorities alongside growth.

Malta remained Europe's largest registry in sixth place, although its tonnage dipped 3.5% to 78.3 million gt, partly due to Russia's invasion of Ukraine impacting trading patterns. Newly appointed Registrar General of Shipping Dr Ivan Tabone highlighted digitalisation as a future priority for the flag.

Despite 10% growth matching Liberia's pace, China only retained its spot in seventh, closing the gap to Malta to less than one million gt. The Bahamas was the other faller in terms of tonnage but retained its eighth place. Greece and Japan retained their ninth and tenth places, though Greece's tonnage continuing a decline, this year by 2.4%, as it battles seafarer shortages.

When it comes to quality, the International Chamber of Shipping (ICS) rankings for 2023 showed a mixed pattern.

Liberia stands out as an exceptional performer across all the criteria evaluated by the ICS, surpassing the Marshall Islands which also meets every positive indicator assessed. Both make all the major Port State Control White Lists, ratify conventions, use sufficient high-performing Recognized Organizations, report properly to the International Labour Organization (ILO) and the IMO, attend IMO meetings regularly, have been audited by the IMO, and have relatively younger fleets.

Hong Kong and Singapore likewise perform admirably on most fronts, only slightly behind Liberia and the Marshall Islands. A minor gap is Hong Kong's absence from the



Qualship 21 list, while Singapore meets that criteria along with the others.

In contrast, Malta and China demonstrate some more notable gaps in their performance compared to the top performers. Malta misses Qualship 21 and has an older fleet age, though it ratifies conventions, attends meetings, has been audited and uses approved Recognized Organizations sufficiently. China's biggest weakness is not fully reporting to the ILO as required. Whilst making most White Lists apart from Qualship 21, China does have a very young fleet, ratifying conventions and has good IMO attendance.

Greece and Japan generally score well, but Greece is let down by the age profile of its fleet despite making White Lists and meeting other positive criteria like Japan. Both ratify conventions, attend meetings and have been audited.

At the lower end of performance of the Top 10, Panama has notably lost its position on the influential Paris MOU White List, though it makes the Tokyo MOU and US Coast Guard lists and has other positives. The Bahamas also has some gaps in performance, missing from Qualship 21 and lacking ratification of some conventions, but still making most White Lists.

Outside the Top 10, at the highest end of the ICS performance spectrum, Denmark, Norway, the Netherlands, and the United Kingdom meet every single positive indicator criteria evaluated.

On the opposite end, states like Bolivia, the Democratic Republic of Congo, Iran, Libya, and Syria performed extremely poorly against the ICS criteria. None of them meet any of the positive performance indicators - they miss all Port State Control White Lists, have not ratified most conventions, do not report properly, miss meetings, have older fleets on average, and have not yet been audited by IMO.

2024 will likely be a tough year for flag states, as attention continues to focus on them regarding servicing elements of the so-called 'dark fleet'. The Paris Memorandum of Understanding on Port State Control (Paris MoU) held its 57th committee meeting in Madrid in early May and released allegations relating to some un-named flag states who have been seeking to avoid vessel detentions.

Despite the IMO's recent calls on flag states to crack down on the illicit activities of shadow tankers and enforce regulations on ship-to-ship operations, the Paris MoU described how unspecified flag states have recently been seeking bilateral agreements with port states to avoid detentions.

Whatever the rankings at the end of 2024, the year will undoubtedly be a difficult and uncomfortable one for some flags who will undoubtedly come under increasing scrutiny as the year progresses.

Position	Flag	Total Gross tonnage	Position in 2022
1	Liberia	258,182,222	2
2	Panama	252,304,982	1
3	Marshall Islands	189,539,006	3
4	Hong Kong	127,773,817	4
5	Singapore	99,122,510	5
6	Malta	78,278,216	6
7	China	77,351,837	7
8	Bahamas	62,952,774	8
9	Greece	34,723,053	9
10	Japan	30,721,674	10

Source: Lloyd's List Intelligence

Incentives driving ports and vessels to curb emissions

Nick Blackmore

Director of Business Development,
International Association of Ports & Harbors (IAPH)



In recent times, numerous reports, guidelines and portals have appeared on the selection and potential use of alternative low- and zero-carbon fuels, methodologies on measuring emissions during ships transit and in and around ports, as well as anticipated new initiatives to facilitate decarbonisation of the maritime sector.

Assessing this myriad of options and performing a cost-benefit analysis on many of these studies and reports, irrespective of the type of fuels considered for deployment, can be a challenge.

One proven service that more than 70 ports and maritime administrations, as well as owners of nearly 7,000 cargo and passenger vessels, have used is the IAPH Environmental Ship Index (ESI). This includes half of the world's container fleet and a multitude of other vessel types.

Created, designed, and implemented by ports for ports, ESI has become the established global standard for ports to incentivise the improvement of shipping's environmental performance.

In 2023, with the signing of the Memorandum of Understanding between IAPH and the International Maritime Organization (IMO), ESI was recognised as the standard basis for port incentives for low- and zero-carbon ships.

The index, which is based on a simple scoring system, and which is administered and audited by an independently-appointed certification organisation, rewards fleets that perform above base IMO-standards in terms of emissions. Ports that register as incentive providers to the index then offer incentives to owners with these ships calling at their ports, such as reduced port dues.

After 13 years of successful operation, ESI is set to evolve with a revised and expanded offering that will include a new GHG methodology, reward innovations such as use of alternative energy on board, as well as application of zero-emissions techniques onboard vessels. There will also be a module which enables vessels that reduce their underwater noise emissions to obtain a higher score.

Calculating ESI

All indexed vessels begin from a baseline of performing beyond current IMO emission standards.

In its present configuration, ESI scores these vessels on their nitrogen oxide (NO_x) and



sulphur oxide (SOx) emissions, rewarding reporting and continuous improvement of energy efficiency measures (in terms of greenhouse gas (GHG) emissions). Vessels also receive bonuses for being equipped to use onshore power supply in ports.

Taking these factors into account, ESI analyses a ship's average performance over a six-month period and produces a score out of 100.

Via a separate module, ESI Noise also scores noise emissions of vessels, directly and proportionally, and gives a fixed bonus for a noise-reduction measurement report.

The most flexible aspect of the index is that each individual participating port can set its own qualifying level, in terms of points, and an incentive – most frequently a reduction in port dues – that a ship owner will receive if their vessel meets, or exceeds, that benchmark.

ESI has been designed for optimal ease of use and effectiveness. Once an Incentive Receiver (ship owner) or Incentive Provider (port or service provider) is enrolled within the scheme, there is no complex software to install and no expensive emission-monitoring technology to maintain. The system is clear and simple, and it is automatically calculated and maintained.

ESI is also flexible, allowing a port to choose the qualifying level that it wishes to set for vessels and to choose the incentive – be it a reduction in port dues or preferential berthing. ESI can be instituted at any port of any size and applied to any type of sea-going merchant vessel.

The index, and the vessels registered on it, are also subject to a robust onboard data-verification programme by its administrator, with 100 verifications conducted per quarter across the fleet on a strategic, targeted basis to ensure that ESI remains fair, accurate and effective.

Adapting ESI to regulatory changes reflecting the new IMO GHG reduction strategy

ESI entered a new era in March 2024, with the confirmation of an expanded planned suite of performance modules to support ports and vessel owners on the journey to decarbonisation and lowering emissions.

Coming online in 2026, ESI's revised and expanded offering will take into account a range of potential emissions, introduce a new GHG methodology, and reward innovation and application of zero-emissions techniques onboard vessels.

The decision to revise and expand ESI's modules and formulae, alongside the introduction of the new GHG and innovation modules, was a result of major developments in global maritime environmental regulations, which the scheme encourages ships to exceed.

In March 2023, the IMO's Maritime Environment Protection Committee (MEPC) agreed on an illustration of a possible draft outline of an 'IMO net-zero framework' for cutting GHG from international shipping.

In line with these significant developments, the evolution of ESI's main emissions module will entail a significant revision of formulae, including the introduction of the new GHG emissions calculation, with the new core module coming online at the beginning of 2026.

In addition, and also in line with recent developments at the IMO MEPC on regulatory developments in the field, from 2026 ESI will offer a new option to reward the mitigation of underwater radiated noise.

The transition process to the new suite of ESI modules will take place through 2024 and 2025, ensuring that ample support and time is available. That process has already commenced with incentive receivers already being requested to enter a new data set for checking with both administrators and incentive receivers to ensure that the formulae are robust and relevant for when they come on stream in January 2026.

Smarter ports require smarter ship agents



SMARTER PORTS
REQUIRE SMARTER
SHIP AGENTS

Just as many across the shipping landscape have adopted digitalisation in recent years in a bid to automate, streamline and reduce costs, ports and terminals have also been turning to technology to help rationalise their day-to-day activities to address economic and environmental performance during periods of calm and at times of great disruption.

The rise of the "smart port" has led to some of the world's biggest and most important maritime hubs, such as Rotterdam, Hamburg, Singapore, Los Angeles, Qingdao and Busan, to deepen their digitalisation efforts to boost efficiency and shore up their supply chains and relationships to manage changing shipping trends and trade flows.

Interconnected

By implementing digital processes, including robotics, artificial intelligence, and automation, into port infrastructure, along with modern communication and monitoring systems such as cameras and sensors, ports can create an interconnected network of systems and facilities that enable every player involved in their operations to have access to more data and make better and more efficient decisions.

This is particularly the case for ports in Asia and the Middle East. According to the 2022 Global Container Port Performance Index, the ports of Yangshan in China, Salalah in Oman and Khalifa in the United Arab Emirates were in the top five most efficient ports in the world due, in part, to their increased use of technology.

Tuas Port in Singapore is set to become the world's leading smart port. By the time it is fully operational and capable of handling more than 65 million teu annually in 2040, it will be entirely digital and automated, enabling stakeholders to streamline vessel clearance processes, allow just-in-time operations and improve the turnaround time of ships in the port. At a cost of US\$14 billion, Tuas Port is also set to use drones, self-driving electric vehicles and automated pavement functions to minimise human-to-human contact and embrace its position as the 'port of the future'.

Adapt and evolve

Against the backdrop of rapid change in port development, modern ship agents have had to evolve alongside the ports and customers they serve.

They play a vital role in coordinating all aspects of a vessel's port call, acting as



a liaison between the ship's crew, port authorities and local service providers. This includes providing supplies of provisions, ship spares and bunker fuels, crew transfer and husbandry services. Over the years, ship agents have had to adapt to the changing needs of shipowners and their vessels by offering a wider breath of services. Many agents now offer a range of complementary services such as hull cleaning, Protection & Indemnity (P&I) and Hull & Machinery (H&M) representation and support for offshore operations.

With the rise of smart ports, ship agents must continue to evolve their role as the primary information hub for vessels, ship owners and port operators, keeping all parties interconnected.

Real-time data

"Greater access to data gives ship agents a greater understanding of the complexity of modern vessel port calls," says Simon Xu, Managing Director of GAC China which is part of the global provider of shipping, logistics and marine services GAC Group. "By embracing technology to improve informed communication on port regulations or weather conditions, ship agents of the future will be better placed to provide greater services and certainty in real-time to vessels and crews that dock at ports worldwide."

In-depth access to real-time information at smart ports will be vital for ship agents to advise ship owners and ship management companies to ensure they meet local requirements and regulations. Agents are the local experts, with deep knowledge to ensure a vessel can dock successfully, crews can disembark and board smoothly and cargo can be processed efficiently.

Vital cog

"Smart ports will become fully interconnected networks of information for all parties of a port call. But that will not diminish the role of the ship agent on the ground to support the needs of a vessel and its crew," adds Simon.

"What's more, their detailed knowledge of local requirements that can vary widely depending on location can help avoid issues or delays. Ship agents will remain a vital cog in the smart port machine by providing the accurate and detailed information that ship owners need."

Crew welfare in the spotlight as maritime flags safety risks

Captain Soma Sundar, Co-founder & CEO, Bigyellowfish

A photograph of two workers in blue overalls and yellow hard hats walking on a red deck of a ship. The background shows the white structure of the ship and a blue sky with clouds. The text 'CREW WELFARE IN THE SPOTLIGHT AS MARITIME FLAGS SAFETY RISKS' is overlaid at the bottom in a semi-transparent, bold, sans-serif font.

CREW WELFARE IN THE SPOTLIGHT AS MARITIME FLAGS SAFETY RISKS



Crew safety, welfare and wellbeing continues to be a shared responsibility owing to the maritime sector's vastness and complexity, and given that it involves a high amount of physical activity and long durations of time spent at sea and away from friends and families.

Crew welfare encompasses the physical, mental and emotional well-being of seafarers during their time at sea. Despite advancements in technology and safety protocols, seafaring remains a demanding profession characterised by long periods away from home, isolation, and exposure to hazardous conditions. Ensuring adequate living conditions, access to medical care, and opportunities for rest and recreation are essential for maintaining crew morale and performance.

According to the 2023 SEAFiT Survey, the largest survey on crew welfare with more than 1,600 vessels and 19,000 seafarers responding, wellbeing amongst sea-going crew members continues to improve year-on-year, with 67% of respondents noting positive wellbeing experiences onboard, a marked improvement from the 59% seen in 2021.

However, while overall wellbeing levels continues to improve across all sectors of shipping, there were areas on life on board a commercial vessel that remain challenging for seafarers, including excessive workloads, access to the internet and a more stable work/life balance.

The prevalence of fatigue due to extended work hours and irregular schedules among seafarers is an issue that needs addressing. Fatigue not only affects crew performance but also increases the risk of accidents. The lack of proper training and insufficient manpower onboard ships can also compromise safety standards and emergency response capabilities.

Other factors such as limited communication with loved ones and the pressure to meet operational deadlines contribute to mental health issues among crew members. Addressing these challenges requires a holistic approach that prioritises mental health support services, social connectivity, and recreational activities onboard vessels.

Recognising the importance of addressing these challenges, stakeholders in the maritime industry have launched various initiatives to enhance vessel safety and crew welfare. For instance, the Seafarer Mental Health Study conducted by the International Seafarers' Welfare and Assistance Network (ISWAN) aims to understand the factors influencing seafarers' mental wellbeing and develop support mechanisms accordingly.

Moreover, advancements in technology, such as the implementation of electronic navigation systems and remote monitoring tools, have contributed to improving

situational awareness and operational efficiency, thereby reducing the risk of accidents at sea. Additionally, training programs focused on safety awareness, emergency response, and fatigue management help equip seafarers with the skills and knowledge needed to mitigate risks effectively.

One of the main reasons for this need to develop crew welfare is to shore up the safety levels of vessels, cargo and crew.

Maritime safety is paramount to prevent accidents, environmental damage, and loss of lives at sea. The risks inherent in maritime operations, such as collisions, groundings, and machinery failures, underscore the need for robust safety measures. Moreover, adverse weather conditions and human error further compound these risks. While external factors are uncontrollable, the human element is again guided by factors such as physical, emotional abilities, and wellbeing, cognition at work, psychosocial influences, and organisational culture. Therefore, a proactive approach to safety management is essential for safeguarding both human lives and the marine environment.

According to various studies and reports, human error constitutes a significant factor in maritime accidents, with percentages ranging from 60% to 90% of the total incidents. While technological advancements aim to reduce these occurrences, human involvement remains inevitable in maritime operations. The blame often falls on the crew, despite complexities involving technical failures and organisational factors. Numerous studies highlight the prevalence of human error in maritime incidents, emphasising the need for a comprehensive understanding of its causes and implications. Despite efforts to mitigate risks, the maritime industry continues to grapple with the challenge of addressing human error effectively to enhance safety at sea.

To promote maritime safety, the IMO has established conventions and regulations governing various aspects of ship operations. The International Convention for the Safety of Life at Sea (SOLAS) sets minimum safety standards for ships, covering areas such as construction, equipment, and operational procedures. Similarly, the International Safety Management (ISM) Code requires shipping companies to develop and implement safety management systems to ensure safe operations.

The Maritime Labour Convention (MLC), established as the fourth pillar of international maritime law by the International Labour Organization (ILO) in 2006, consolidates standards from existing maritime labour conventions and recommendations, along with fundamental principles from other international labour conventions. As one of the pillars alongside SOLAS, STCW, and MARPOL, the MLC applies to all ships entering port states and flag states.



The convention comprises 16 articles and a code with five titles, detailing regulations for seafarers' working conditions. Notably, it stipulates a minimum age of 16 years (18 for night work and hazardous areas) and mandates medical fitness for duties, along with specific training requirements. Contracts must be legally enforceable, with wages paid at least monthly, and rest hours not exceeding 14 in any 24 hours or 72 in any seven days. Seafarers are entitled to at least 10 hours of rest in any 24 hours and annual leave, with repatriation rights in case of ship loss. The convention also outlines standards for accommodation and food quality, as well as health care provisions and social security coverage availability. Inspections by flag and port states are conducted to ensure compliance, with labour agencies supplying maritime workers subject to inspection for adherence to convention regulations.

Ensuring maritime safety and crew welfare is a shared responsibility that requires collaboration among shipowners, operators, regulatory bodies, and maritime stakeholders. By adhering to international regulations, implementing best practices, and investing in crew training and support services, the maritime industry can mitigate risks, enhance operational efficiency, and safeguard the well-being of seafarers.

Technology is a great enabler, helping to build solutions on demand that stitch together the impact of various influencing factors while also enabling the collaboration of various stakeholders.

The maritime sector continues to engage with digital platforms that amalgamate maritime operational expertise with inputs from behavioural psychologists, human factors specialists, online educators, gaming professionals, and AI/data analytics experts. This approach can help to emphasise seafarer wellbeing, collaboration and ongoing learning, all while mitigating risks, optimising human performance, and furnishing actionable insights to enrich the employee experience aboard vessels.

As the industry continues to evolve, it is imperative to prioritise safety and crew welfare as fundamental pillars of maritime operations at all costs.

Appendix





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

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 services (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 berth. 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 berths 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 markets. 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 transparent. 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, $m=1,2,\dots,6$, $\bar{x}_{l,mi}$ 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.

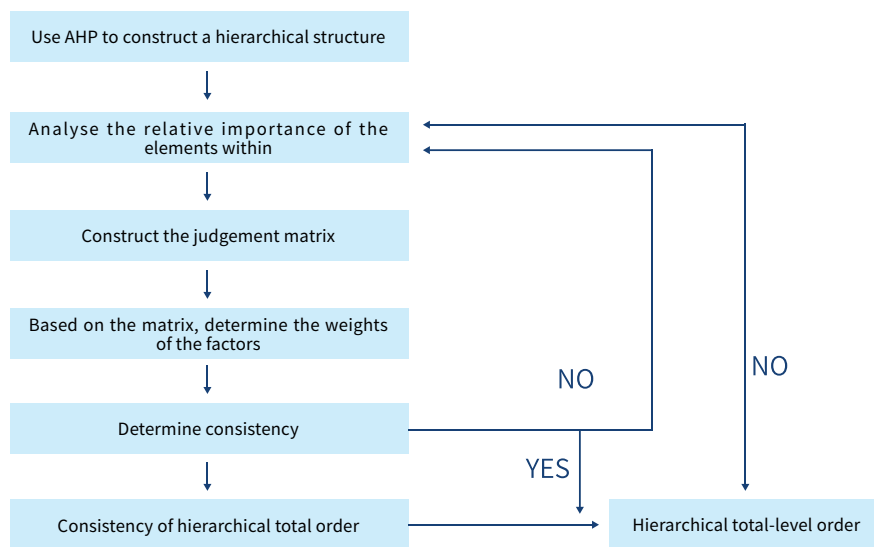
4. Model Computation

(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:



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 $b_{ij} = 0$, 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 i is slightly more important than element j ;
- 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 (B1)	—	3	5
R&D capability (B2)	—	—	2
Innovation management capability (B3)	—	—	—

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 (A1)	—		
Shipping Services (A2)	—	—	
General Environment (A3)	—	—	—



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 (A1)	B ₁	B ₂	B ₃	B ₄	B ₅	B ₆
Container throughput (B1)	—					
Dry bulk cargo throughput (B2)	—	—				
Liquid bulk cargo throughput (B3)	—	—	—			
Number of cranes (B4)	—	—	—	—		
Total length of container berths (B5)	—	—	—	—	—	
Port draught (B6)	—	—	—	—	—	—

(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 (A2)	B ₇	B ₈	B ₉	B ₁₀	B ₁₁
Shipping brokerage service (B7)	—				
Ship engineering service (B8)	—	—			
Shipping business service (B9)	—	—	—		
Maritime legal service (B10)	—	—	—	—	
Shipping finance service (B11)	—	—	—	—	—

(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 (A3)	B ₁₂	B ₁₃	B ₁₄	B ₁₅	B ₁₆
Government transparency (B12)	—				
Extent of e-government and administration (B13)	—	—			
Customs tariff (B14)	—	—	—		
Ease of doing business index (B15)	—	—	—	—	
Logistics performance index (B16)	—	—	—	—	—

Xinhua-Baltic
International Shipping Centre
Development Index Report
(2024)



中国经济信息社
CHINA ECONOMIC INFORMATION SERVICE

