



The State of Ocean Freight

A supply chain view

The current performance of global shipping is the result of several commercial factors exacerbated by several unexpected world events.

Gathering insights from multiple data platforms and our global supply chain practice, we outline strategies to mitigate risks, exposing underlying drivers, some of which will remain beyond the impacts of current events.

This article will assist you in evaluating the current and future impacts of these events on your supply chain, pinpoint your risks and determine the activities you can undertake, to drive surety and future-proof your business.

Linda Venables
PwC's Chief Supply Chain Officer



Freight market disruption may continue long after the COVID-19 pandemic subsides



The COVID-19 pandemic has caused unprecedented pressures in global supply chains, which included dramatic spikes in freight rates, supply chain bottlenecks, congested ports, shortages of equipment and containers, less reliable services, lengthy delays, and increased dwell times. More recently, China's continued zero-covid policy and subsequent lockdowns and Russia's invasion of Ukraine has continued to push global supply chains into an even more vulnerable state. Closure of Russian shipping lanes and ports have resulted in significant congestion and delays - exposing the dependence of direct container shipping services from Asia to Europe via Russia.

The volatility and unreliability of international freight markets have presented a challenge to all trade-exposed businesses. Many factors have driven them, several of which will persevere long after the pandemic has subsided. These include carrier consolidation (e.g. merger and acquisitions), container and pallet imbalances, lack of supplier visibility, lack of freight availability and numerous other drivers (e.g. emissions targets). Businesses that have invested in transparent and resilient supply chains are best placed to mitigate their exposure to freight market volatility and identify market opportunities. Our recommendations include:



Supply chain risk management should be prioritised and regularly revisited to ensure strong operations and business resilience within companies.



Investigate how M&A activity has impacted capacity and frequency on key trade lanes, and what this means for your ocean freight tendering, preferred carriers/routes, and offshore/domestic inventory holdings (e.g. increased buffers)



Understand how your carriers are managing capacity and risks into the future. Key issues to understand include, average age of vessels, forward orders for new vessels (and type/size of vessels), how IMO 2020 and other sustainability requirements are being managed (i.e. carriers that are seeking to rely on retrofitting fuel scrubbers may be exposed to shortages of urea)



Understand the extent to which you can leverage the imbalance of containers to your advantage in order to seek more competitive rates from carriers or to investigate gaining space on containers being exported from Australia



Understand to what extent dehire periods of containers are limited by factors your business can influence through better risk management and facilitation arrangements (e.g. IFIP, quarantine, inspection, documentation) with Government Agencies/Regulators (e.g. Trade Facilitation Programs).



Perform a detailed review of all of contractual terms and conditions of your carriers and forwarders to understand any material changes and their impact to your international operations.



Develop a visibility strategy over your suppliers to identify the range of potential threats or opportunities, in relation to your supply chain or supplier in your value chain. For example, improved accuracy of freight forecasts will be critical when seeking to secure contracted volumes and mitigate exposure to volatile and elevated spot markets.



Undertake a review of your international supply chain to identify critical risks such as supplier concentration, capacity constraints, increasing lead times and evaluate opportunities such as trade facilitation programs with Government Agencies/Regulators, the digitisation of trade processes and visibility tools to gain improved insights



In identifying carriers for future trade, it is important to understand their strategy for responding to emissions regulations (e.g. IMO 2020), other potential risks (e.g. pulling of vessels off their network) and whether port access will be an issue moving forward.



You should continue to build capability and readiness for identifying and addressing modern slavery risks throughout your supply chain. Ensure that there are processes and procedures in place across various parts of the business (e.g. Governance, Risk Assessments, Due Diligence, Remediation, Training and Monitoring) with respect to modern slavery within your business and supply chain.

COVID-19 and the war within Ukraine has exposed the weaknesses of international supply chains

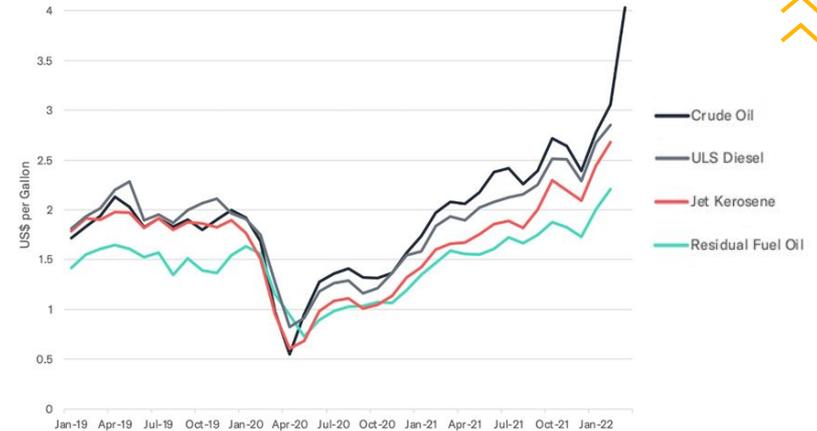
The impacts of COVID-19 were first felt in China over two years ago - lockdowns stifled global manufacturing and production facilities were subsequently locked down, resulting in a **worldwide shortage of certain goods**, while **border closures restricted the movement of goods and people**. A way out of the crisis appeared to be increasingly possible with a global vaccine rollout. However, global supply chains now face new supply chain threats surrounding the war in Ukraine and continuing COVID-19 outbreaks across Chinese manufacturing hubs.

Operational impact has been felt by global supply chains with the closure of Russian and Ukrainian airspace. Aircrafts travelling from China to Europe must now divert routes, subsequently leading to a **decline in airfreight capacity and higher cargo costs** as air cargo carriers implement surcharges due to increased jet fuel prices and longer routes. The increasing cost of fuel (31.9 increase in the cost of oil in March 2022) **may enter into into ocean freight costs** as long-term ocean shipping contracts normally have a bunker-fuel adjustment factor (e.g. typically adjusted on a quarterly basis). Sanctions imposed against Russia have also resulted in a 40% decrease in container ships stopping at Russian ports, leading to congestion and delays in ports nearby (i.e. Estonia, Latvia, and Germany) as well as broader global **shipping lane congestion and associated delays**.

China's zero-covid policy continuing well into 2022 and the emergence of new COVID-19 variants (i.e., Omicron and Deltacron) have highlighted the continuing fragility of global supply chains. For example, a recent outbreak in Shenzhen which resulted in disruption to trucking and container depots lead to considerable **shipping delays and port congestion**. Due to China's continuing zero-covid policy, Chinese cities will continue to face lockdowns, which may continue to result in ocean carriers holding ships or blanking sailings.

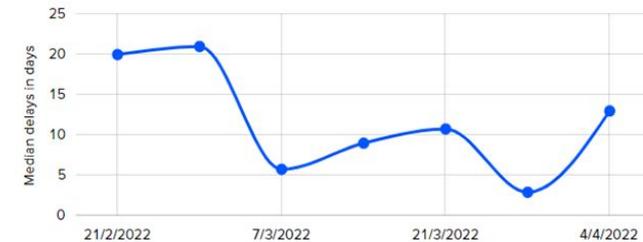
The pandemic, as well as the war within Ukraine has exposed the dependence of global logistics and supply chains on shipping and individual shipping routes. However, COVID-19 has also accelerated trends that could transform maritime transport, such as digitalisation and automation, to build resilience and visibility within global supply chains against future shocks.

US Crude Oil Based Prices



Sources: U.S. Energy Information Administration

Recent freight delay times at Riga, Latvia



As ships are being rerouted to avoid combat zones and key ports shutting down in Europe, the congestion at North Europe's container ports has become severe such as Riga.

Sources: GoComet



Recommendation: Supply chain risk management should be prioritised and regularly revisited to ensure strong operations and business resilience within companies.

M&A activity is swinging the pendulum in favour of carriers

The shipping carrier market has seen steady consolidation over the past decade - a trend which has only accelerated through recent disruptive global events such as the COVID-19 pandemic and rising geopolitical tensions, and as carriers take advantage of deflated interest rates to fuel the acquisition of various assets.

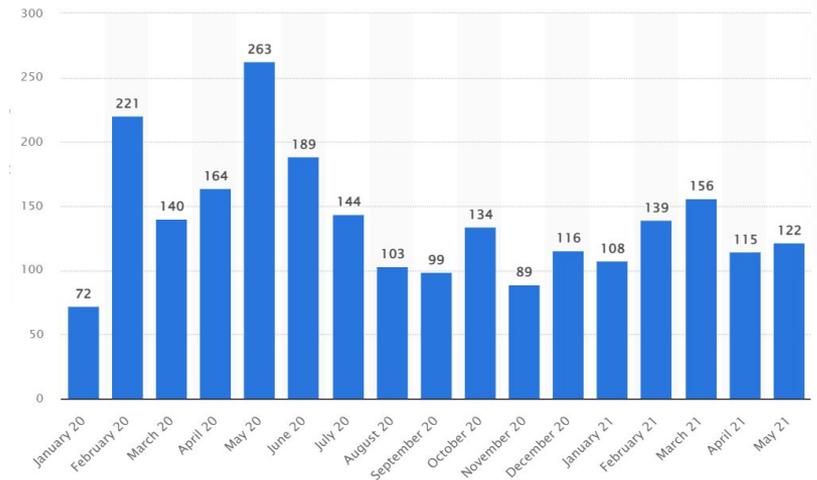
Currently, the three largest alliances (i.e. **2M, THE and Ocean**) of sea carriers account for **around 80% of overall container trade globally**. Consolidation of shipping carriers has also been driven by ship oversupply in the past few years; however, in response carriers have been acquiring smaller players and scaling back assets leading to overall reduced supply and capacity of freight. Consequently, these acquisitions have reduced freight availability, driven up prices, and pushed shippers to spot markets.

Further, it is noted that shipment delays have been mounting as shipping lines with increased power are increasingly omitting ports, rolling over cargo and cancelling bookings. Reduced voyage frequency and unpredictability of container delivery has led to bottlenecks and buffers on both sides of the equation (port of loading and port of unloading), causing increased dwell time at ports with empty containers not returning to the regions of high demand.

Due to the rise in COVID-19 cases in February 2020, there were **221 reported blank sailings worldwide in February 2020**, an increase of around **200%** compared with the previous month (72 reported blank sailing in January 2020). Over the pandemic, the number of reported blank sailings worldwide stabilised and decreased to 108 in January 2021 (still above the reported blank sailings in January 2020). The increase in the number of blank sailings since the beginning of the pandemic has effectively reduced the supply of containers, thus keeping prices elevated by making it challenging to cut freight rates and delays. At the same time, however, freight rates, surcharges and expenses, including demurrage and detention fees, have soared, though the latter rates were inconsistent across ports and carriers (discussed in further detail below).

Alliance	Carriers
Ocean Alliance	CMA CGM, Cosco Group, OOCL, Evergreen Marine
2M Alliance	Maersk, Mediterranean Shipping
THE Alliance	Hapag Lloyd, K Line, Mitsui O.S.K Lane, Nippon Yusen Kaisha, Yang Ming, Hyundai Merchant Marine

Number of blank sailings worldwide from Jan 2020 to May 2021 (Statista)



Recommendation: Investigate how M&A activity has impacted capacity and frequency on key trade lanes, and what this means for your ocean freight tendering, preferred carriers/routes, and offshore/domestic inventory holdings (e.g. increased buffers)



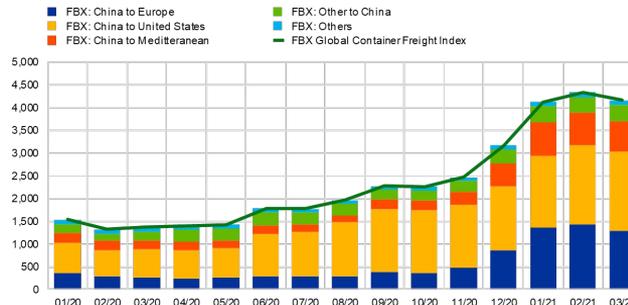
Freight availability is critically low but may improve in the mid-term

Over the last few years, there has been an overwhelming demand for containerised sea freight which has been driven by the surge in e-commerce purchases, loss of airfreight options and uneven economic recovery. Simultaneously, extreme congestion at ports globally has seen up to 376 container vessels in shipping queues around the world, leading to longer turnaround times for ships at ports, with a cascading effect on scheduling times across the globe. Data from the *Global Liner Performance (GLP) report* finds that schedule reliability (i.e. the reliability of ships arriving on time) for ships has hovered around **35% for the year of 2021, less than half of the 80% recorded in 2019**. The plummeting reliability of container delivery has effectively constrained the already scarce supply of containers further, resulting in freight and container costs to remain elevated and port congestion high.

The scant availability of freight has also been exacerbated by container imbalances (discussed further in detail below) and the fall in shipping capacity has contributed to a surge in freight rates, particularly on high value trade routes (e.g. Asia to North America) as cargo owners compete for reduced capacity.⁹ Consequently, shipping capacity has been preferentially allocated to more lucrative international routes rather than certain routes within the Asia-Pacific (e.g. Australia) which has driven up costs for freight into Australia.

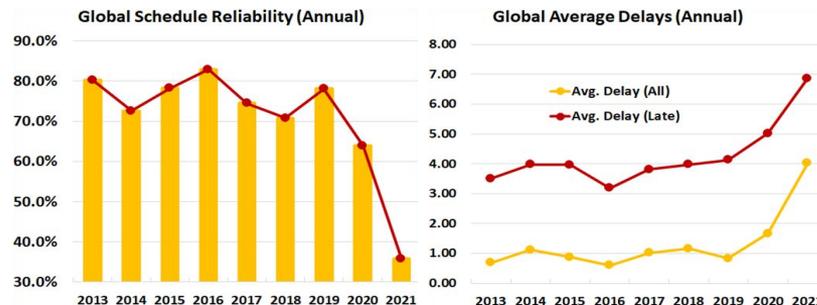
Another driver of reduced freight availability is the downward trend in new ship orders for the past few years. This trend continued in 2020, with new ship orders **declining by 16%** from the year before. However, shipping lines have responded to capacity constraints with a surge in orders for new vessels and new ship orders. For example, ship orders for 2021 which will be ready for service in 18 months increased by 74% compared to the previous year. The new additional ships should alleviate some of the current capacity constraints and price of freight moving forward.

Routes driving recent surge in shipping costs



Sources: Bloomberg, Refinitiv, and ECB calculations.

Global schedule reliability



Sources: Sea Intelligence



Recommendation: Understand how your carriers are managing capacity and risks into the future. Key issues to understand include, average age of vessels, forward orders for new vessels (and type/size of vessels), how IMO 2020 and other sustainability requirements are being managed (i.e. carriers that are seeking to rely on retrofitting fuel scrubbers may be exposed to shortages of urea).

Container and pallet imbalance



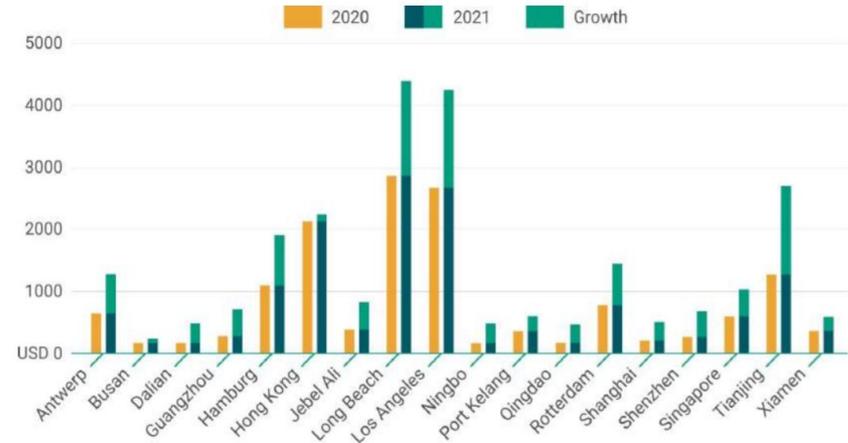
Supply-demand imbalances in relation to containers and pallets have been prevalent in many facets of the supply chain since the COVID-19 pandemic gripped the world. This imbalance has been driven by a global shift in demand for exports, trade surpluses in China, cancelled container production in 2020 and global port congestion. According to a report by the Australian Competition and Consumer Commission (ACCC), the increase in port congestion and container scarcity during COVID-19 has **driven up freight costs dramatically**, as companies wait weeks for containers and pay premium rates to obtain them.

The container market has seen an all time high with freight and charter rates up 300% in 2022, however many shipping executives believe the crux of the problem is not supply, but logistics. Port congestion and uneven economic recovery mean empty containers are stuck in the wrong areas of the world, with import-heavy countries (e.g. Australia) lacking the port capacity and freight availability to return them to export-heavy hubs (e.g. China). The effect of container imbalances have seen significant overall increases in freight container costs, with the Freightos Global Container Index estimating a current cost **increase of 170% in a 12 month period** (e.g. up to 10x the rate pre-COVID-19).

The impact of this container imbalance is significant on importer and it has been estimated that the global cost of repositioning empty containers for importers amounts to approximately \$15 - \$20 billion USD across the industry per year. Meanwhile for exporters, available empty containers aren't always those that are required for the goods being exported. For example, reefer containers are much higher in demand compared to other standard shipping containers that make up the majority of empty container numbers. Exporters are also competing for space on carriers with empty containers which carriers are looking to rebalance container supply to service lucrative routes (e.g. China, North America).

This combination of factors has also resulted in a substantial increase in penalties for shippers by shipping lines worldwide. According to the annual Demurrage & Detention Benchmark 2021 report, demurrage and detention (D&D) costs have more than doubled on average between March 2020 and March 2021 at the world's 20 largest container ports. On average, global D&D costs were **\$720USD in March 2021, up 104% or \$666USD from March last year**. The increase in D&D costs have only been exacerbated by the continued reduction in free days by shipping lines to as little as **7-8 days**, with many lines also starting the clock earlier in the process.

Combined demurrage and detention costs across ports



Source: Demurrage & Detention Benchmark 2021 report

Average combined demurrage and detention charge across shipping lines and container types for the world's 20 largest ports after two weeks in USD, import and export combined, for 2020 and 2021.



Recommendation: Understand the extent to which you can leverage the imbalance of containers to your advantage in order to seek more competitive rates from carriers or to investigate gaining space on containers being exported from Australia



Recommendation: Understand to what extent dehire periods of containers are limited by factors your business can influence through better risk management and facilitation arrangements (e.g. IFIP, quarantine, inspection, documentation) with Government Agencies/Regulators (e.g. Trade Facilitation Programs).

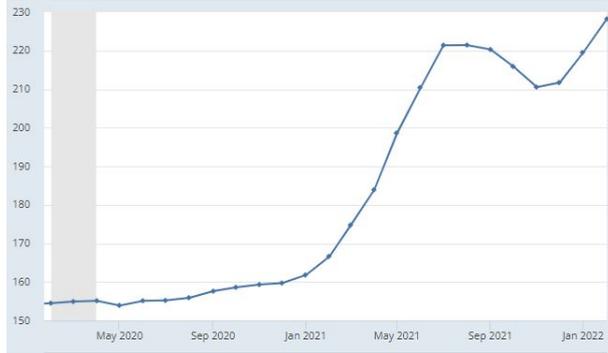
Container and pallet imbalance (Continued)

Pallet availability remained a challenge for the freight industry, with industry-wide shortages of new pallet supply across the globe. This has also affected shipping supplies, with **prices climbing for corrugated boxes and wood pallets amid tight supply** according to the Institute for Supply Management's Feb 2022 manufacturing report.

The US Bureau of Labor Statistics' Producer Price Index for wood container and pallet manufacturing rose to a record high of over 220 in September 2021 (outlined in the graph to the right) - results which are similar for corrugated and solid fiber box manufacturing. Even though albeit shortages have abated significantly over the last 6 months it appears that as a result of Russia's invasion of Ukraine, European manufacturers and retailers may increase levels of 'safety inventory', **worsening the global pallets shortage crisis**.

We also note that carrier consolidation (discussed above in detail) means that the elevated costs (container, pallet costs and other fees) and change to dehire terms (e.g. substantial reduction in 'free days') are unlikely to return to pre-pandemic levels even if international supply chains normalise.

Producer Price Index for Wood Container and Pallet Manufacturing

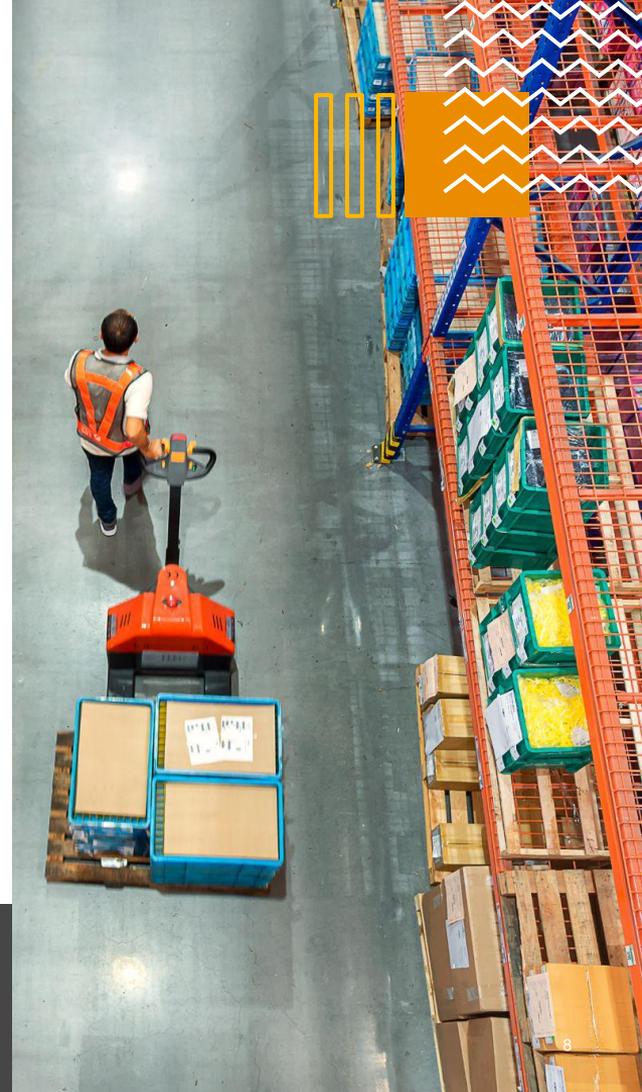


This graph illustrates the Producer Price Index, or the average changes in price received, for US domestic manufacturers of wood containers and pallets over the period May 2020 to Jan 2022 using a base period of 100 in Dec 2003.

Source: US Bureau of Labor Statistics.¹⁶



Recommendation: Perform a detailed review of all of contractual terms and conditions of your carriers and forwarders to understand any material changes and their impact to your international operations.





As demand continues to exceed supply post-covid, the so-called 'bullwhip' effect reveals ongoing shortages of materials and equipment across a range of industries.

Whilst this will slowly diminish, ahead of increasing capacity, manufacturers are demanding certainty, requiring customers to commit to orders and provide upfront payments well in advance of typical milestone requirements.

Increased order lead-times continue to impact the responsiveness of supply chains, which leads to unplanned out-of-stocks, as consumers saw when demand for toilet paper, PPE and Rapid Antigen Tests outstripped supply.

Linda Venables
PwC's Chief Supply Chain Officer





Lack of Supplier Visibility

When operating a global supply chain, businesses look to optimise delivery time from suppliers and maintain high levels of service while keeping inventory holdings low. As the world we live in becomes more volatile, uncertain, complex and ambiguous (VUCA) achieving optimal cost and service is becoming increasingly difficult. In the new equation, we need to balance cost, service, capital, capacity, risk and now, carbon.

The surge in demand for ocean freight at a time when the capacity of the industry was declining has caused supply chains to breach; supply chain breaches in infrastructure capacity, such as ports and intermodal terminals, coupled with shortages of internationally sourced products, has resulted in short supply, which inevitably impacts companies' sales. Key in any business continuity effort is the ability to plan, thus issues are further exacerbated if businesses do not have visibility of orders fulfilled, shipment milestones and are unable to accurately determine the arrival dates of sea-bourne shipments.

Businesses with complex international supply chains that include multiple origins, numerous vendors and intermediaries are open to more risk. Issues such as lack of visibility in upstream supply chains can mean that companies are not aware of ESG risks in their sourcing; masked underlying issues such as concentrated supply bases, inelastic supply of critical inputs and intermediary products and unauthorised factory subcontracting can expose companies to significant risk. Greater visibility across the end-to-end supply chain is essential to ensure businesses are aware of the risks potential geopolitical issues may pose. As can be seen with the various new sanctions due to the Ukraine - Russia War, it is also important to know your customer in the context of the proliferation and complexity of sanctions and export controls, in order to identify, assess and understand risks.

Visibility is also important in regard to trade concessions that may potentially impact the cost of goods hidden within the supply chain (e.g. China's anti-dumping duties of 212% on Australian Beverages¹⁶ - which led to a sharp decline in the export of wine from Australia to China) and also supports the identification and mitigation of potential ESG issues (e.g. modern slavery) throughout the supply chain (discussed in further detail below).

Recommendation: Develop a visibility strategy over your suppliers to identify the range of potential threats or opportunities, in relation to your supply chain or supplier in your value chain. For example, improved accuracy of freight forecasts will be critical when seeking to secure contracted volumes and mitigate exposure to volatile and elevated spot markets.



Recommendation: Undertake a review of your international supply chain to identify key risks such as supplier concentration, capacity constraints, increasing lead times and opportunities (e.g. Trade Facilitation Programs with Government Agencies/Regulators), digitisation of trade processes and visibility tools to enable insight.



Shipping-specific ESG Considerations



Supply Chain Emissions

An important, long term trend impacting freight transport are the increased efforts to reduce the environmental footprint of container freight. The International Maritime Organisation (IMO) introduced a new limit on sulphur content in fuels from January 2020 which limited fuel oil to a **maximum of 0.5% m/m sulphur**, down from the previous level of 3.5%. Market participants informed the ACCC that these low sulphur fuels have increased costs for shipping lines and subsequently cargo owners. Industry observers noted that there are limited alternative fuels available and the movement to cleaner fuels could substantially add to costs, from **\$400 - \$600 a tonne** more compared to today.

In addition to the above, there is currently a global shortage of urea due to supply issues of urea exported from China. Urea is vital to the freight industry as it is added to diesel engines to reduce emissions of nitric oxide exhaust fumes.

Moving forward carriers may be less likely to rely upon old diesel powered vessels, thus require vessels that are gas fueled, new (i.e. relying on cleaner fuels) or have scrubbers installed which are used to remove particulate matter and harmful components (however note that certain scrubbers still require urea) due to the limits on sulphur content but this is problematic to implement given global urea shortage. Understanding how carriers will manage emission-reduction obligations in the medium-to-long term, will allow shippers to identify potential risks/opportunities as well as ensure service providers are aligned to emission-reduction goals and strategies of the shipper.



Recommendation: In identifying carriers for future trade, it is important to understand their strategy for responding to emissions regulations (e.g. IMO 2020), other potential risks (e.g. pulling of vessels off their network) and whether port access will be an issue moving forward.

The above photographed bulk carrier is the MV Mt. Tourmaline which is BHP's first LNG-fuelled Newcastlemax bulk carrier. MV Mt. Tourmaline will transport iron ore between Western Australia and Asia and is a part of the growing trend of traders making the switch for vessels which use gas as fuel.



Shipping-specific ESG Considerations (Continued)

Modern Slavery within the Supply Chain

International supply chains are particularly susceptible to modern slavery given its fragmented system of regulatory oversight and its diverse number of actors. Across the world, there has been an increased regulatory action by certain countries on labour rights violations and modern slavery within international supply chains which has introduced additional risks for shipping lines and businesses to manage.

In line with the increased regulatory action that has been completed globally, Australia has introduced a Modern Slavery framework which acts as the legal mechanism for targeting modern slavery in supply chains. The framework is relevant to Australian entities that undertake business in Australia with a total consolidated revenue of \$100 million, to report on an annual basis their efforts to address modern slavery in their operations and supply chains against a list of criteria outlined under the appropriate legislation.

Nations around the world (including Australia) have outlined that the global shipping industry is an industry particularly susceptible to the risk of modern slavery issues given seafarers are from a range of nations, the fragmentation of regulation in flag states and the practical limitations of enforcement regulations on board sea vessels.

We note that there are a number of other high risk industries which include agriculture, construction and manufacturing which deal in various high risk products (e.g. bricks, cobalt, cotton and rubber). Given there are also various countries which are also deemed as having a high risk of modern slavery (e.g. India, China and Pakistan), it is imperative of Australian businesses to be aware of any modern slavery within its supply chain including at its suppliers' locations (please above refer to "Lack of Supplier Visibility" for further information in relation to visibility of suppliers).

Recommendation: You should continue to build capability and readiness for identifying and addressing modern slavery risks throughout your supply chain. Ensure that there are processes and procedures in place across various parts of the business (e.g. Governance, Risk Assessments, Due Diligence, Remediation, Training and Monitoring) with respect to modern slavery within your business and supply chain.





The State of Ocean Freight



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