SHIPPING MARKET REVIEW – NOVEMBER 2021

DANISH SHIP FINANCE

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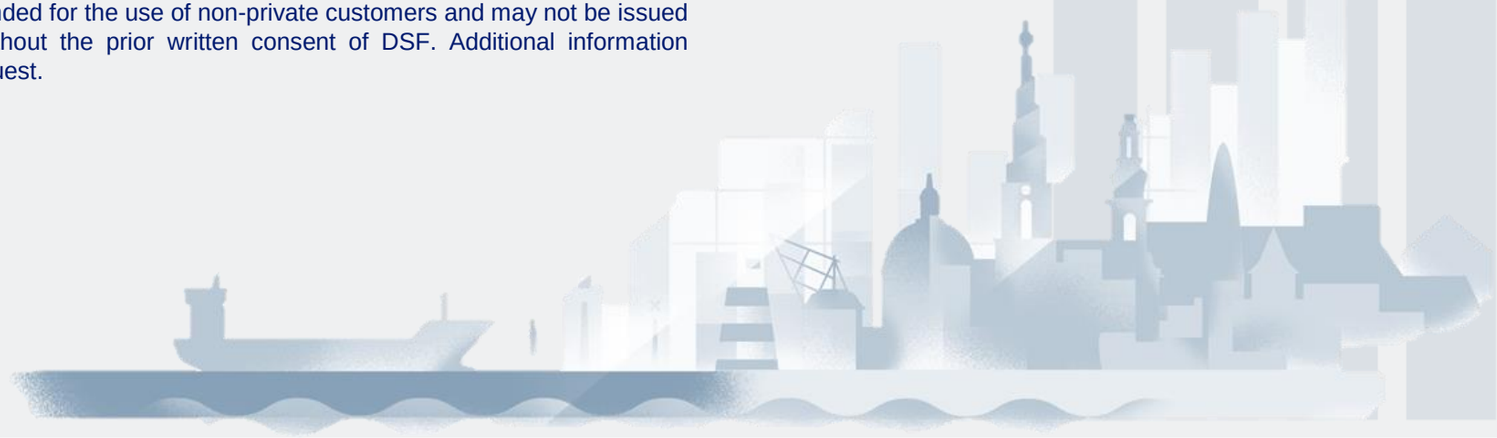

HEAD OF INNOVATION & RESEARCH

Christopher Rex, rex@skibskredit.dk

ANALYTICAL TEAM

Jonas Hoffmann, Senior Analyst
Sebastian Müllertz, Analyst
Pardeep Singh, Analyst
Lucas Andersen, Junior Analyst
Louise Legart, Junior Analyst

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Addressing climate change requires a wide variety of innovations. The shipping industry will play its part, but the industry may look radically different by the time the global economy has decarbonised. We will still need ships, but seaborne demand volumes could be substantially lower and the composition of world trade could be significantly changed. The transformation will not be propelled by new fuels but by leadership in energy efficiency. New fuels will be introduced, but they may not play first fiddle.

The global economy is raising its climate ambitions towards 2050. The call to decarbonise large parts of the economy is likely to bring significant changes to entire industries, sectors and business landscapes.

For the shipping industry, the transition is not only about vessels transporting cargo while emitting less CO_2; it is first and foremost about changing the tectonic plates underlying the global economy. These ambitions could reverse the demand outlooks for entire vessel segments. Think along the lines of renewable energy working to substitute oil, coal and gas towards 2030 and 2050. This will clearly not happen overnight, but we could soon begin to see some adverse industry dynamics gaining pace and increasingly shaping earning outlooks.

Navigating the changing tides will not be easy. The energy transition will be a global balancing act. Periods of great volatility in vessel demand are likely to become more frequent. We have identified two key factors to monitor outside the shipping industry: the regional adoption of renewable energy and relocation of basic materials industries (for example, solar-powered smelters turning bauxite into green aluminium, co-locating steel production with iron ore in areas with abundant renewable energy). These factors signal not only important changes in trading routes for some segments but equally importantly the erosion of virgin material flows.

The production of alternative fuels (i.e. zero-carbon) is currently low. However, the production of hydrogen and hydrogen-based fuels is likely to scale up when renewable energy sources become dominant suppliers of energy in a region, since the need to balance the grid for long-duration seasonal conditions or unexpected renewable droughts will increase. Still, in most places the shift in balance towards renewable energy sources is some years into the future. We may not begin to see a utility-scale production of hydrogen or hydrogen-based fuels until the 2030s, although small-scale local production is likely to appear in the meantime.

The shipping industry is flirting with a scenario where not all vessels transition to the same future fuel. However, an industry guided by fragmented decarbonisation strategies may see not only increased costs but reduced attractiveness of vessels as an asset class for both equity investors and debt providers. This will be particularly the case until the industry finds a way to improve the balance between the energy density of hydrogen-based fuels and the energy needs of deep-sea vessels.

The first steps towards vessel decarbonisation are about energy efficiency. It is generally accepted throughout the industry that there are a wide range of potential energy efficiency improvements that can be implemented. But the abatement potential has been difficult to implement on account of split incentives among stakeholders: for instance, customers taking on the risk of delays while shipowners benefit from lower fuel costs (spot market), or shipowners being required to invest while customers reap many of the fuel benefits (timecharter).

Navigating a pathway to zero-carbon shipping may entail significant business model innovation (e.g. servitisation) to align incentives and ensure long-term collaboration between stakeholders, including shipyards and OEMS.

RAISING AMBITIONS WHILE GEARING UP FOR BIG CHANGES

The global coalition for net zero emissions is growing

The shipping industry is working hard to set out a path to decarbonisation. Visibility is currently low, but the ambition is clear. Pressure to reduce shipping's environmental footprint has increased sharply and continues to grow. Public and private actors are driving decarbonisation efforts through various initiatives and mechanisms. Industry players may need to navigate the decarbonisation journey facing declining freight volumes and higher costs. Complexity is on the rise.

The shipping industry transports nearly 80% of global cargo volumes while emitting 3% of global emissions. Ships remain by far the most energy-efficient form of freight transport, producing 20 to 25 grams of CO_2 per tonne-kilometre, compared to up to 600 grams for aviation and between 50 and 150 grams for road-based transportation.

Seaborne trade volumes have historically expanded alongside the world economy. This could be about to change with the global push for decarbonisation. Transportation of fossil fuels currently accounts for almost 40% of seaborne trade volumes. These volumes are increasingly likely to wane towards 2050 as the global economy decarbonises. This is not to say that they will disappear imminently, but cargo volumes could shrink in large volumes when new renewable energy installations come online.

There is no doubt that a major shift is underway in global energy markets, with the pace and scale of the energy transition now outstripping even the most optimistic projections. In 2020, renewable energy provided 90% of the world’s new electric power-generating capacity and produced almost a third of the world’s electricity. This trend is only expected to accelerate towards 2050.

The decarbonisation of the global economy reaches beyond the energy sector. Many of the world’s biggest industries and sectors have adopted targets for net zero emissions by 2050. McKinsey (August 2021) estimates that as much as 65% of global GDP, representing 40% of the global population, is now under a 2050 net zero commitment.

The call to decarbonise close to two-thirds of the global economy is likely to bring significant changes to entire industries, sectors and business landscapes. It will create second- and third-order effects that generate a host of extraordinary emergent benefits and opportunities that cascade throughout the economy. But it may also destroy value, redefine markets and alter global trade.

The shipping industry is a service provider to the industries and sectors of the global economy. As these sectors – including the hard-to-abate sectors like steel, aluminium, cement, plastics and aviation – work to cut carbon emissions, their products, spare parts and services could take new forms, be used more sparingly, and be made in new ways, in unexpected places and under novel business models (e.g. servitisation).

We are approaching a period of great change that will have a significant impact on costs, asset values and earnings capacity. The reallocation of capital is expected to be massive. The redistribution of cargo volumes, trade flows and parcel sizes will introduce changes at scale. For some players, this will present a great business opportunity, while others will see their markets shrink.

Many industry observers seem to be focusing mostly on the fuel challenge. There is frequent discussion of how to transition towards fuels that are more costly, complex and less efficient. These are valid topics, about which there are still unanswered questions, but addressing them in isolation will not help establish a clear pathway to the future.

Industry players may need to navigate the decarbonisation journey facing declining freight volumes and higher costs. Experience from previous disruptions indicates that markets could be significantly changed by the mid-2030s. The ownership landscape could become more consolidated and new business models are likely to mature.

MAKING IT HAPPEN: OUTPACED AND OUTCOMPETED

The benefits of renewable energy-led systems are self-reinforcing – the more there are, the greater the value

There is a viable pathway towards a global net zero energy sector by 2050. It is narrow and requires a transformation in how energy is produced, transported and used globally. It holds the key to decarbonising many of the hard-to-abate sectors: by developing sustainable fuels for long-term energy storage, power plants can balance energy needs in periods of inadequate renewable power supply. It also provides the scale needed to produce low-priced zero-carbon fuels for the hard-to-abate industries.

Power generation is undergoing a rapid transformation towards cleaner energy sources due to low-cost renewables. New renewable capacity is not only increasingly cheaper than new fossil fuel-fired capacity but also increasingly undercutting the operating costs alone of existing coal-fired power plants (IRENA, June 2021).

The average price for utility-scale solar PV is now 27% lower than its cheapest coal alternative (USD 0.04/kWh vs. USD 0.055/kWh). The last 18 months have seen record-low bids for solar of only USD 0.0104/kWh in Saudi Arabia. The declining cost trajectory for producing renewable energy is expected to continue, which could even result in lower electricity prices on the way towards a 100% carbon-neutral system.

Utilities are shifting away from a costly operational expenditure model, where capital is continually drawn into fuelling and maintaining inflexible legacy coal, oil and gas plants – to a new model where upfront capital expenditure is invested in predictable, low-maintenance, renewable energy technology. Investing in renewable baseload is now viewed as buying "unlimited" power upfront, as opposed to betting against fluctuating oil prices and narrowing environmental regulation.

Getting energy prices right is critical for efficiently allocating resources and investment across industries and sectors. Fossil fuels are heavily subsidised. The IMF estimates that USD 5.9 trillion (or 6.8% of global GDP) was spent globally on subsidising fossil fuels in 2020.

Carbon prices are rising steadily around the world, approximately EUR 50 per tonne in Europe. All 191 parties to the Paris Agreement are submitting revised mitigation pledges ahead of COP26. Many are predicted to instigate carbon pricing schemes towards 2030. The IMF estimates that efficient fuel pricing by 2025 would bring global warming caused by carbon dioxide emissions "well below" 2 degrees and nearer 1.5 degrees.

Rapidly maturing energy storage technologies, together with sector coupling, are for the first time creating a route towards zero-emission electricity generation. The missing piece of the puzzle is viable long-term storage, which will be needed to provide megawatts of capacity and megawatt hours of energy during long-duration seasonal conditions or unexpected renewable droughts.

Recent studies show that decarbonisation of the energy system is not just possible – it is technically and commercially feasible with technologies that are already available at scale. In simplified terms, the capital needed for new renewable generation output and for balancing power to deal with its intermittency is more than offset by savings in fossil fuel use.

Short-duration battery energy storage is clearly part of the plan, but hydrogen or hydrogen-based fuels, such as ammonia, methanol and synthetic methane, can be stored in large quantities and for extended periods at power plants for long periods of use, enabling clean capacity to be cost effectively scaled up according to the needs of grids.

Prices of hydrogen and hydrogen-based fuels are expected to decline massively when production begins to reach utility scale and supply not only the energy system but also many of the hard-to-abate industries and sectors, including the shipping industry, with low-priced zero-carbon fuel.

DECARBONISATION LOWERS TRADE VOLUMES

Access to low-priced renewable energy may lead entire industries to relocate

It is often the case that the economic lifetimes of existing assets are intended to largely match their remaining technical lifetimes. For some, the reality may turn out to be very different. The price of renewable energy and its ability, when scaled sufficiently, to decarbonise and disrupt some of the shipping industry's largest cargo categories may bring massive changes that cause assets to be stranded across multiple industries and sectors.

The decarbonisation of the global power sector is being driven by lower renewable energy costs. Cheaper renewable energy is paving the way for low-priced hydrogen and hydrogen-based fuels that will allow heavy transportation (i.e. big trucks, ships, airplanes, trains and buses) and industrial heat – the thermal energy needed to make steel, cement and other basic materials – to decarbonise towards the middle of the century. The impact on seaborne trade from decarbonising industrial heat could be radical.

Basic materials industries may relocate when industrial heat has been decarbonised. Think of how the United Arab Emirates' solar-powered smelter has turned parts of Guinean bauxite into green aluminium for the German car industry. The low price of the energy has determined the smelter location. Renewable electricity can efficiently deliver any desired temperature directly or via infrared, microwaves, plasmas or hydrogen.

In today's markets, ore is often transported long distance by Dry Bulk carriers. Australia and Brazil, for example, ship iron ore to Chinese coal-fired blast furnaces, which make half the world's steel. Such dirty process heat is likely to give way to clean heat generated by renewables — elsewhere in China or imported — or clean-heat processes will shift abroad altogether.

Australia's Fortescue Metals is planning to build a green steel pilot plant this year that taps the country's abundant sun and wind resources to produce hydrogen. It plans to build a commercial plant in Western Australia's Pilbara region, co-locating steel production with iron ore and locally abundant renewable energy rather than shipping ore to dirty steel mills far away.

A pilot will clearly not change a global industry, and not all existing manufacturing plants will switch to renewable heat. Many will, though, over the next few decades, or will be replaced by purpose-built plants in regions with cheap renewable electricity. The point is that the decarbonisation of industrial heat may not only cause onshore assets to be stranded but could also significantly change the demand outlook for vessels currently serving coal-fired blast furnaces for steel production, coal- or gas-fired cement kilns, ethylene plants, chemical plants and aluminium production plants.

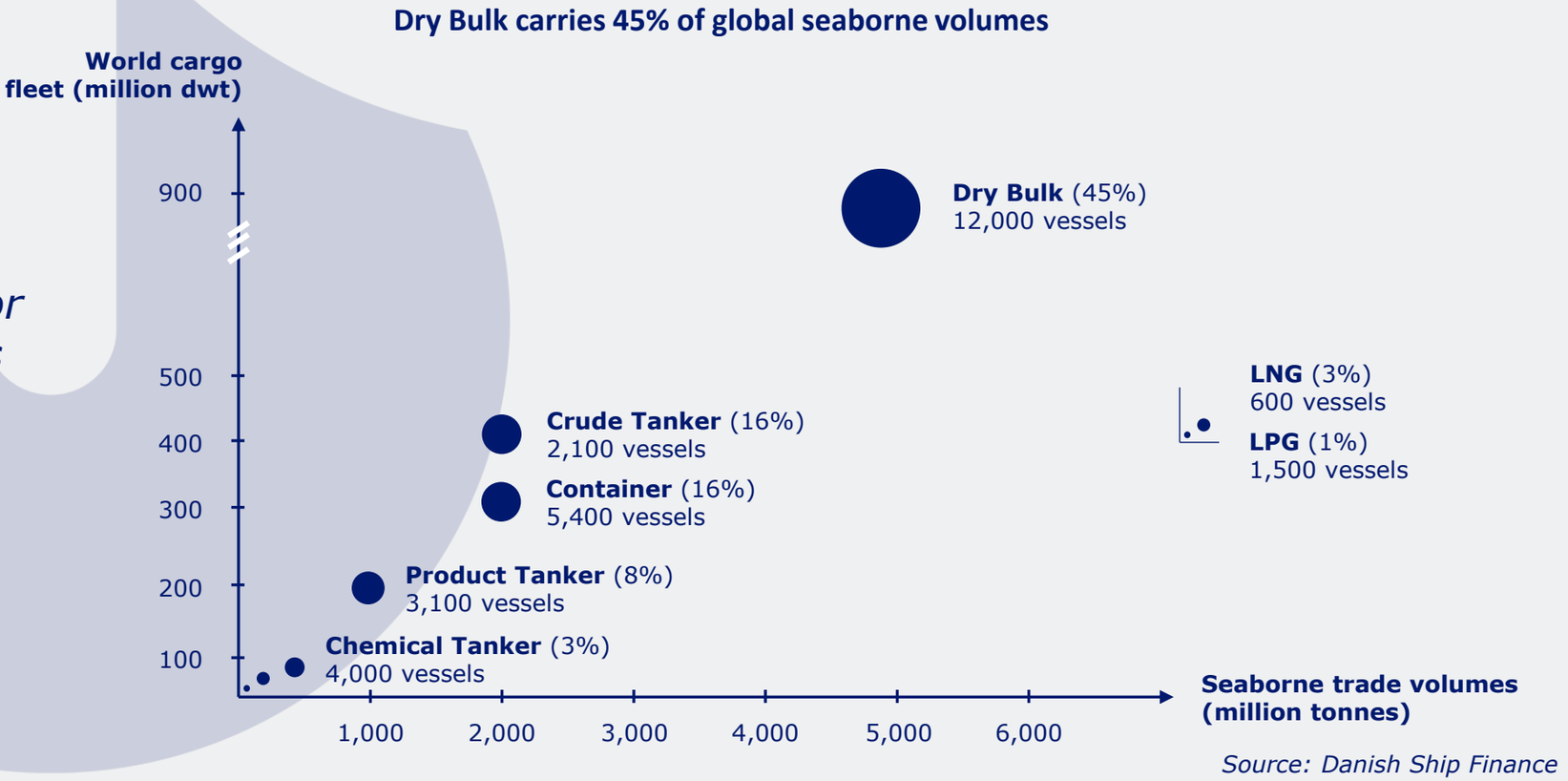
Seaborne trade volumes are likely to shrink for some of the shipping industry's largest cargo categories including crude oil, oil products, coal, and natural gas towards 2050. That could also be the case for some of the largest Container vessels, albeit for different reasons. When the narrative for the Container market shifts from labour costs to emissions, we may begin to see the long-awaited push towards regionalisation, with highly automated manufacturing powered by renewable energy.

On the other hand, other seaborne commodity classes could see massive increases in trade volumes towards 2050. Take hydrogen-based fuels as an example. BloombergNEF predicts that green hydrogen will beat natural-gas-based hydrogen this decade and become competitively cheap towards 2050. Other examples include recycled materials, which may create new trades for vessels smaller than those transporting virgin materials.

If these predictions prove fairly accurate, emissions from shipping will improve not only with the introduction of new fuels but also owing to a massive reduction in seaborne commodity demand.

80% OF GLOBAL CARGO VOLUMES ARE CARRIED BY SEA

***Fossil fuels** account for 40% of cargo volumes carried by sea*



Source: Danish Ship Finance

EXPLORE MORE

New business models that reward emission savings alongside sales will be established

Putting a price on carbon may reveal that some companies will need to introduce fundamental changes to their strategy and capital allocation. Take an oil major as an example. In 2020, it released 112 million metric tonnes of CO_2 equivalent. Assuming a carbon price of USD 100 per tonne, that would cost it USD 11 billion annually. Over the past five years, it has reported average annual earnings of around USD 8 billion. This example illustrates how setting a price on carbon increases the need for business model innovation.

The global push towards decarbonisation and sustainability will lead to a transformational shift across industries and sectors over the next five to ten years. Outside energy markets, there is great abatement potential from cutting emissions in the materials production process. Reducing demand for virgin materials (e.g. steel, aluminium, plastics) through design and process optimisation will be another major driver. Shifting from commonly used materials to more innovative alternatives may allow makers to save materials and reduce their energy needs. Process optimisation includes squeezing waste out of the system, limiting overspecification and increasingly implementing closed-loop circularity for materials and components while reducing recycling yield losses.

Take the BMW i3 electric car (September 2013) as an example. The car is made from carbon-fibre composites. Carbon fibre is far stronger and lighter than steel but also more expensive. The additional cost of the carbon fibre is largely offset by the reduced need for batteries owing to the lower weight. Furthermore, its radically simplified manufacturing process requires less capital, energy, materials and time. The car, which has achieved quadrupled efficiency, has significantly reduced BMW's environmental footprint and has been profitable from the first unit made. BMW has reduced emissions in the materials production process by manufacturing the carbon strands (the material that forms the basis for the i3's carbon-fibre reinforced plastic bodywork) in an area with low-priced hydroelectric power to further minimise the car's carbon dioxide emissions.

But the potential reaches further. BMW has unveiled a new sustainable electric concept car, the *i Vision Circular* (September 2021), in which almost all materials and resources are recycled and reused, keeping waste to an absolute minimum. This has been achieved with a mix of "secondary" (i.e. recycled) materials, as well as renewable "bio-based" raw materials. Even the car's battery is said to be 100% recyclable and manufactured using materials "almost entirely sourced from the recycling loop". The company has worked extensively on reducing the number of components, parts, materials and surface finishes. There is no exterior paintwork, leather or chrome. The bodywork is made of a mixture of recycled aluminium and heat-treated steel. The traditional "double kidney" grille has been reimagined as a digital surface – technology that could be used to give different looks to the lights and bumpers of different models in its range without the need for different parts. The tyres are made from certified, sustainably cultivated natural rubber.

The examples from BMW show us how the combination of carbon accounting and new technologies, materials, design methods and aggressive investments could revitalise, relocate or displace some of the world's most powerful industries, even this decade. Steel, aluminium, plastics (and cement) could take new forms, made in new ways and in unexpected places under novel business models. All these emergent transformations build on the ongoing revolution in clean electricity.

The impacts on the shipping industry could be profound. Regional shipment requirements may increase strongly, but smart logistics may not only introduce potential intermodal shifts but also create new trading routes with smaller parcel sizes. We could be heading for a period of strong demand growth for Ro-Ro, smaller Container and Dry Bulk carriers.

CLIMATE RISK IS FINANCIAL RISK

Leadership in energy efficiency provides a cost advantage

Energy efficiency and the introduction of new fuels may reshape the competitive landscape – but not necessarily at the same time. Take an airline as an example. It aims to develop a competitive advantage due to its fuel-efficient fleet and focus on operational efficiency. It claims that any passenger who flies with it instead of a legacy carrier is lowering his or her environmental footprint by "50%". So, as the price of carbon rises, the company believes it will gain market share through price competition and branding. It is managing its climate risk as financial risk.

The shipping industry is dominated by small and medium-sized shipowners. Most struggle to earn a risk-adjusted return on invested capital from trading their vessels, outside the occasional freight rate super cycle. The highly volatile nature of the industry has led to an abnormal but firmly embedded market practice where owners hope to sell their vessels at a premium to their purchase prices. The nature of this asset game disincentivises large-scale upgrades of existing vessels and prevents more innovative thinking, also on newbuilding programmes. Investments with longer repayment periods are almost impossible to fully capitalise prematurely.

Improving operational efficiency will not become any easier until charter rates begin to reflect vessels' energy efficiency. In today's charter market, it is uncommon for the vessel owner to bear the burden of a vessel's inefficient fuel consumption, since it is the charterer that pays for the fuel. This could begin to change with the introduction of CII ratings – or the charter model could lose competitiveness with owners operating their own vessels (potentially in pools).

These dynamics have created portfolios of vessels that are facing increased risk of stranding if or when the shipping industry enforces a price on carbon or simply if a better alternative materialises.

Many transition strategies centre around regulatory compliance, the expectations of cargo owners and customers, and continued access to investors and capital. Few seem to be experimenting with initiatives that could expand market sizes, create new business models, or generate entirely new markets. This misalignment of interests between not only OEMs and vessel owners but also between vessel owners and charterers seems to be accepted without much hope that these relationships could change for the better.

Most owners are striving to identify a pathway towards decarbonisation. Short-sea shipping and vessels trading on fixed routes can reduce emissions, but zero-carbon fuels for deep sea tramp operators seems to be some years into the future. Advances in the production and distribution of zero-carbon fuels are still required before a business case can be made. The short-term challenge for owners (maybe even up to 2030) is all about leadership in energy efficiency.

Still, the industry is preparing for the transition towards zero-carbon fuels. Many of today's pilot projects involve dual-fuel solutions where future retrofit requirements are built in to allow a switch to a zero-carbon fuel. The alternative fuels are currently still mainly fossil-based and are dominated by LNG. Demonstration projects for onboard use of hydrogen and ammonia are expected from 2024. Methanol technologies are more mature and have already seen first commercial use, while fuel cells are far less mature than internal combustion engines, for all fuels.

How will the industry progress? Should we expect to see the climate agenda working to promote some business models over others? If the airline example proves typical, we should expect to see owners that operate their own vessels gain the upper hand in upgrading fleet efficiency. This is not to say that cash flow stability and fleet efficiency are mutually exclusive, but achieving both may require some changes to the regulatory framework guiding the relationship between owners and charterers.

IN NEED OF A BUSINESS CASE

Decarbonisation is complex and costly; an imminent switch to zero-carbon fuels seems premature

The transition to zero-carbon fuels is costly and complex. It could even be argued that it is premature, since the little innovation in new ship designs or materials that has been seen so far has not managed to balance the low energy density of the new fuels with vessels' energy needs. Pilot projects tend to involve multi-fuel scenarios for vessels trading in green corridors. It is difficult to identify a scalable business case for tramp operators that do not operate on long-term cargo contracts for specific cargo owners.

It is widely believed that the shipping industry's large-scale transition towards net zero will only be possible when the cost gap between fossil and zero-carbon fuels closes. Many industry observers argue that we need to put a price on carbon (in one form or another) to close the gap. This could work alongside the scaling of green hydrogen and hydrogen-based fuels (e.g. ammonia, methanol, synthetic methane) to allow the industry a gradual descent towards net zero. Still, leadership in energy efficiency – independent of fuel type – will distinguish top performers from laggards. However, energy efficiency leadership is not only about fuels or energy-saving devices.

Similar to the BMW i3 example, energy efficiency leadership is also about ship design and process optimisation. Innovative airplane designs and technologies from NASA and Boeing (and others) explore advanced aerodynamics and lightweighting, allowing planes to consume significantly (+60%) less fuel than the 2005 best-in-class models.

Weight is clearly of less importance for ships, but that is not to say alternative designs or materials cannot be implemented to improve the energy efficiency and ease the switch to fuels with lower volumetric energy density. Today's discussions of decarbonisation pathways largely focus on the fuel switch without significantly exploring some of the main drivers behind successful decarbonisation pathways in other industries. Without substantial innovation, the switch to alternative fuels means these would take up valuable cargo space onboard ships. The volumetric energy density of ammonia, for example, is broadly similar to that of methanol and higher than for hydrogen, but ammonia will require 2.9 times more space to store the same amount of energy than the heavy fuel oil used today.

The industry currently seems to be accepting a scenario where not all vessels transition to the same future fuel. However, an industry guided by fragmented decarbonisation strategies may see not only increased costs but reduced attractiveness of vessels as an asset class for both institutional equity investors and debt providers.

The establishment of green corridors makes perfect sense in pilot projects and feasibility studies where, for example, technology or bunkering facilities are testing virgin territory. Commercial green corridors, however, present some adverse dynamics for individual owners that are not operating on long-term contracts. Vessels built (or retrofitted) for specific trades are less likely to be sold and reduce their owners' ability to manage risks through the charter market. Green corridors effectively close vessels' access to the main market's asset game until a point where they become part of a larger ecosystem. The risk of stranded assets is higher for vessels trading in green corridors, particularly in a multi-fuel environment.

A coordinated industry approach, with energy efficiency leadership guiding medium-term transition strategies (towards the 2030s), seems likely to reduce the risk of stranded assets. When the production of hydrogen-based fuels – primarily used to balance the global energy sector – has been scaled up significantly and becomes available in more locations at prices that allow a fuel switch, the transition towards zero carbon looks possible. If fossil fuels become more expensive, for example reflecting lower investments and their continued high usage, the switch to zero-carbon alternatives will only become less expensive and more scalable. Traditionally designed vessels may risk stranding even in this scenario if a new and more efficient ship design is introduced.

ENERGY EFFICIENCY WILL DRIVE THE FIRST ROUND OF DECARBONISATION

Shipping companies that do not proactively reduce their emissions stand to lose out

A fragmented approach to decarbonisation and fleet renewal may increase costs without bringing significant opportunities for additional value creation from standardisation, digitalisation and business model innovation. With the introduction of servitisation models, vessels can be improved regularly without asset owners being asked to invest in upgrades with long repayment profiles. We need a race to the top, led by pioneering companies. This will spur all stakeholders to take bolder action.

The large-scale transition towards net zero by 2050 will, at some point (presumably nearer 2030), require a full switch to zero-carbon fuels. Medium-term measures may, for some, include blend-in of carbon-neutral fuels, while most short-term measures are largely about increased fuel and energy efficiency.

The fragmented ownership landscape, combined with business models that currently foster incentives with adverse consequences for emissions, increases the need for global regulation and/or significant business model innovation. Both are likely to accelerate changes to how value is created in the industry: from the asset game to the operation of vessels.

There are several technical and operational measures that could improve vessel efficiency but have yet to be implemented despite known cost advantages. It seems to be widely accepted that individual ships could be optimised further to reduce fuel consumption by as much as 30-50%.

Technical strategies that are independent of the propulsion system include improvements in weight, in hull via slender design and bulbous bow, rudder and propeller design and other propulsion improvements, as well as air lubrification and automated underwater monitoring and maintenance. Further technical strategies for increasing energy efficiency are closely related to conventional propulsion and auxiliary power systems. They are focused on upgrading either through entirely new designs or retrofitting components of existing designs.

Speed remains a key operational driver of emissions. The deployment of new technologies and sensors combined with big data analytics and machine-learning helps measure emissions and spark actions to reduce individual vessels' fuel consumption. Still, it should be noted that parts of current fleets are operating at reduced levels of productivity (i.e. slow steaming) and that these sectors of the industry represent latent emission increases in periods when additional demand can only be served by increased speeds.

The abatement potential has been difficult to implement on account of split incentives among stakeholders: for instance customers taking on the risk of delays while shipowners benefit from lower fuel costs (spot market), or shipowners being required to invest while customers reap much of the fuel benefits (timecharter). Incentives may need to be aligned, or alternative business models developed, while ensuring collaboration between stakeholders, including shipyards (and their OEM makers' lists).

The future of ship owning could be defined by large and standardised fleets of vessels that are offered as a premium product to the market (i.e. digital, circular and, eventually, decarbonised) but priced as a utility. These vessels could be built and operated using long-term servitisation models that allow regular efficiency upgrades to be implemented without the need for additional investments from the asset owner. Cost leadership is achieved by analysing and leveraging real-time data to increase vessel utilisation while enabling predictive actions that introduce a new level of fuel and energy efficiency. ▪

SHIPPING MARKETS AT A GLANCE

SHIPPING MARKETS AT A GLANCE

High earnings and infrastructural bottlenecks

Seaborne trade volumes have largely regained their lost territory. A combination of healthy growth in distance-adjusted seaborne demand and widespread logistical disruption has managed to outweigh the expansion of the world fleet. Freight rates have increased strongly. However, the recovery profile varies; Container, Gas and Dry Bulk volumes have seen the strongest trends, while oil trade volumes remain down 10% and may not return to pre-Covid levels until late 2022. There is plenty of risk to the outlook, which may cause freight rates to come down from the current high levels, but seaborne trade volumes are expected to increase by around 3% in 2022, which could maintain healthy utilisation across ship segments, although additional demolition may be needed.

CLARKSEA INDEX AND SECONDHAND PRICES

The ClarkSea Index was anchored around USD 15,000 per day for large parts of 2020 but surged to almost USD 42,200 per day in October 2021. Current earning levels are among the highest observed since 2010. Crude, Product and Chemical Tankers are still experiencing low rates. The average secondhand price dropped to its lowest level in 3.5 years in October 2020 but has since gained 109% and reached index 181 in October 2021. Secondhand prices are currently in the top 20% seen since 2000.

Strong contracting activity, especially among Container and Gas Carriers, have filled capacity at first-tier yards until well into 2024. Newbuilding prices have increased 18% accordingly.

This has created a situation where owners in other segments have limited access to fleet renewal. The combination of high earnings and low availability of new tonnage has spurred strong activity in the sale and purchase market.

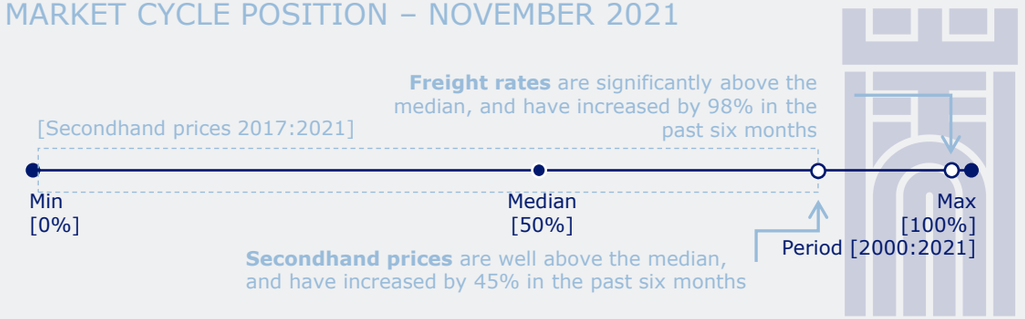
S&P activity reached 6% of the fleet during the first ten months of the year, with older vessels in particular (ten years or older) having been transacted. Greek buyers have been the most active.

The average secondhand price index for a ten-year-old vessel increased by 80% during the period, while the price for a five-year-old vessel rose 59%. This illustrates that immediate access to vessels is highly valued even if there are some concerns related to future earnings.

Scrap prices increased by 40% during the first ten months of 2021 and are now approaching levels not seen since 2008.

DS:FUNDAMENTALS

MARKET CYCLE POSITION – NOVEMBER 2021



Distance-adjusted seaborne demand has increased by 4.5% in 2021, with global demand up by 4% and longer distances adding another 0.7 percentage points. The world fleet has expanded by 3%, while higher speeds have boosted capacity by another 0.7%. Infrastructural bottlenecks have reduced fleet productivity, in particular for Container and Dry Bulk vessels. Freight rates and secondhand prices have been supported by an improvement in fleet utilisation of around 1%.

Deliveries seem to be levelling off slightly in 2021, with 66 million dwt delivered during the first ten months compared to 87 million dwt added to the fleet in 2020.

Scrapping decreased to 13 million dwt in the first ten months of 2021 (15% lower than in the same period last year). The average scrapping age increased by five months to 28.1 years.

Contracting activity soared during the first ten months, with 96 million dwt contracted compared to 54 million dwt in 2020.

The **orderbook** is up by 28 million dwt (since January 2021) and now represents 9.6% of the fleet.

Seaborne trade volumes are expected to increase by 4% and thereby recover the territory lost in 2020 during 2021. Trade volumes are up by 0.4% compared to 2019 levels.

Distance-adjusted demand: Longer distances have added 0.7 percentage points to seaborne trade volumes in 2021. Only Crude Tankers and Chemicals have traded shorter distances.

THE ORDERBOOK IS RUNNING OUT RAPIDLY

But Container and Gas Carriers may face a difficult period from 2023

Pent-up demand, major stimulus programmes, vaccination progress and economic improvements have lifted seaborne demand volumes and utilised larger parts of the world fleet – outside the tanker segments – in 2021. Seaborne trade volumes are now roughly back at 2019 levels. Infrastructural bottlenecks have reduced the productivity of the fleets to a level that balances the fleet expansion this year.

The expansion of the world fleet is expected to level off in the years to come. The orderbook represents 10% of the fleet. More than half of the orderbook is scheduled to be delivered by year-end 2022. This is especially the case outside Containers and Gas Carriers.

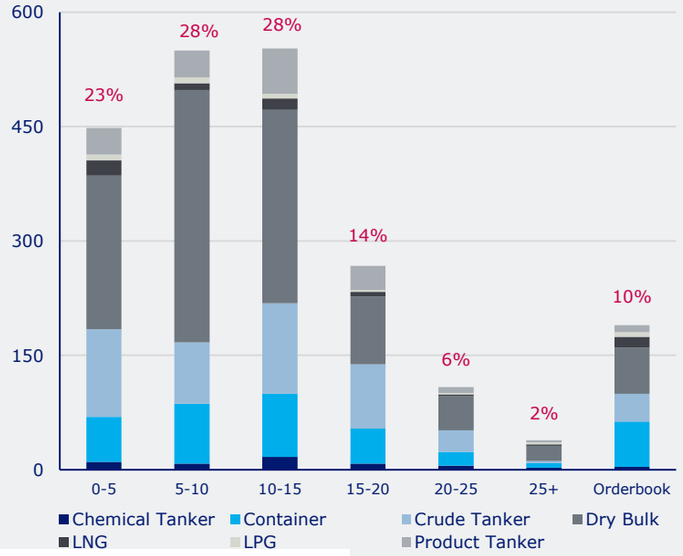
Crude, Product, Chemical and Dry Bulk vessels are due to take delivery of more than two-thirds of their orderbooks by year-end 2022, while Container and Gas Carriers will take most of their deliveries in 2023 and 2024.

Gas Carriers, and to a lesser extent Container vessels, are positioned for strong growth in cargo volumes, while the other segments can largely balance a period of demand shortage by demolishing older vessels. Premature scrapping or very low freight rates seem inevitable if global gas demand fails to keep pace with the strong inflow of new vessels in 2023 and 2024. Similar market dynamics can be expected for the largest Container vessels, while the smaller segments are more favourably positioned.

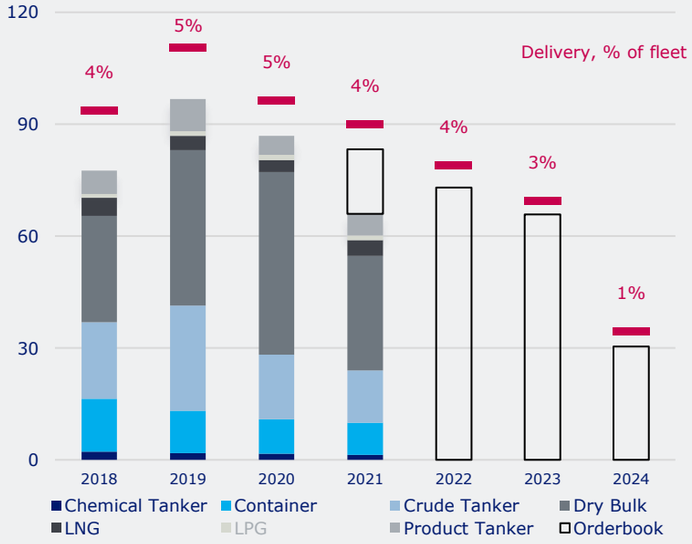
Growth in seaborne trade volumes is predicted to slow in 2022 to 3%, with no support expected from longer travel distances. Container, Dry Bulk, Product Tanker and Gas volumes are those that are expected to grow more slowly, while Crude and Chemical Tanker volumes are expected to experience higher growth in 2022.

The imbalance between supply and demand is raising expectations for scrapping of older, less efficient vessels across segments. Freight rates may deleverage in periods when demand fails to employ the entering vessels but are, on average, expected to stay at healthy levels.

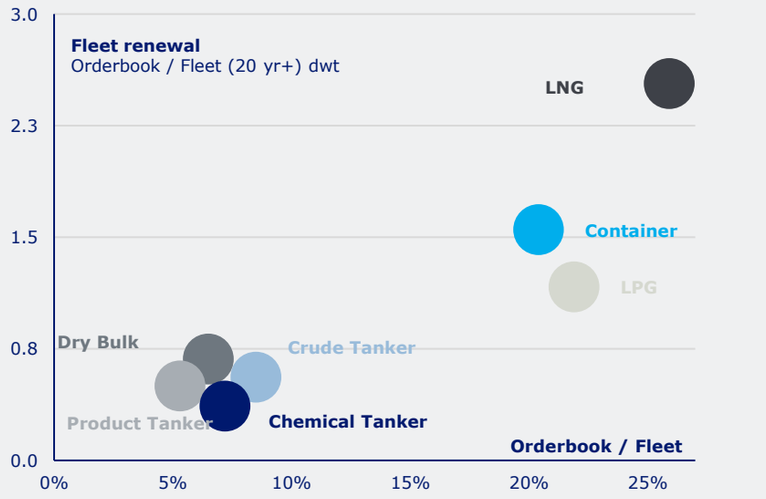
AGE DISTRIBUTION (MILLION DWT)



ACTUAL AND EXPECTED DELIVERIES (MILLION DWT)



FLEET RENEWAL POTENTIAL (DWT)



Source: Clarksons, Drewry, Danish Ship Finance

THE ENERGY TRANSITION MAY LEAD TO A PERIOD OF GREAT VOLATILITY

It is becoming increasingly difficult to handle the need for fleet renewal

The energy transition is driving a major shift in the primary energy mix away from carbon-intensive fuels towards low-carbon energy sources. Fossil fuels are expected to shrink from today's 80% of the fuel mix to around 20% by 2050. For the shipping industry, this translates into massive cargo reductions in a sector that currently represents almost 40% of seaborne trade volumes. These volumes are carried by almost 10,000 vessels (representing 30% of the deep-sea fleet's cargo capacity). The phase-out of fossil fuels is likely to result in periods of extraordinary volatility in not only commodity prices but also seaborne trade volumes.

The push to decarbonise the global economy combined with the uneven economic recovery is putting major strain on parts of the energy system. Despite all the advances being made by renewables, there has been a large rebound in coal, gas and oil use in 2021 that has not been supported by increased storage and production. Prices have been rising sharply, while inventories have run dangerously low. Oil inventories are only 94% of their usual level, European gas storage 86%, and Indian and Chinese coal storage below 50%. This is overshadowing signs of more structural changes, such as the continuing rapid rise of renewables and electric vehicles.

The energy transition is a global balancing act. A reduction in oil and gas investment requires a substantial increase in capital spending on renewable energy. Bans on fossil fuels only work if there are low-carbon alternatives that can deliver the same energy services, ideally at a similar or lower cost to consumers.

Energy investments are running at half the level needed to meet the ambition to achieve net zero by 2050. Spending on renewables needs to rise, and the supply and demand of fossil fuels needs to be wound down in tandem, without dangerous mismatches arising.

At the same time, investor pressure and fears of regulation have caused investment in fossil fuels to slump since 2015. These investment imbalances could well herald a period of greater volatility in both commodity markets and vessel demand.

The demand outlook for individual vessel segments is clearly shaped by long-term global trends, but these trends may easily be eclipsed by short-term regional energy imbalances. Transition strategies could aim to capitalise on regional energy imbalances while navigating long-term trends through the age profile of fleets.

Take OECD refineries as an example. What would happen if the adoption of electric vehicles and trucks took longer than anticipated while refinery capacity was retired? This is clearly a puzzle with many elements, but for simplicity let us simply conclude that it would create strong regional demand for Product Tankers. The point is that imbalances in the energy transition may create periods of extraordinary changes in commodity prices and global seaborne trade volumes. Freight rates are likely to experience periods of extraordinary earnings but may likewise face periods of low demand. It remains to be seen whether periods of high volatility will drive more players towards long-term contracts, causing spot markets to shrink.

More global trade in electricity is required so that regions with abundant access to low-priced solar and wind energy can export it. Today, only 4% of electricity in rich countries is traded across borders, compared with 24% of global gas and 46% of oil. If clean energy is converted into hydrogen and hydrogen-based fuels, renewable energy can be traded and transported across borders, either by ship or with the use of existing gas infrastructures. In time, the shipping industry could see a new market develop.

TRANSITION STRATEGY

Energy efficiency first, then new zero-carbon fuels – but "then" could be as late as the 2030s.

There is little doubt that the route to decarbonisation will – at some point – involve the adoption of alternative fuels. For existing fleets, much of the challenge is about reaching the targets for 2030; the 2050 net zero ambitions are largely a quest for vessels not yet designed or built.

Many players have already begun the process, but others have yet to start. Some have initiated pilots, while fewer have found ways to commercialise the transition, albeit on a small scale. Important learnings are being collected across the industry, with more still to come.

The route to 2030 could, for many vessels, largely be a question of fuel and energy efficiency improvements carved out not only from retrofits but also from the application of new technologies, sensors and data events. By digitalising all aspects of vessels and their operations, crews and managers are leveraged to take data-driven decisions and actions while experiencing vast improvements in fuel and energy efficiency.

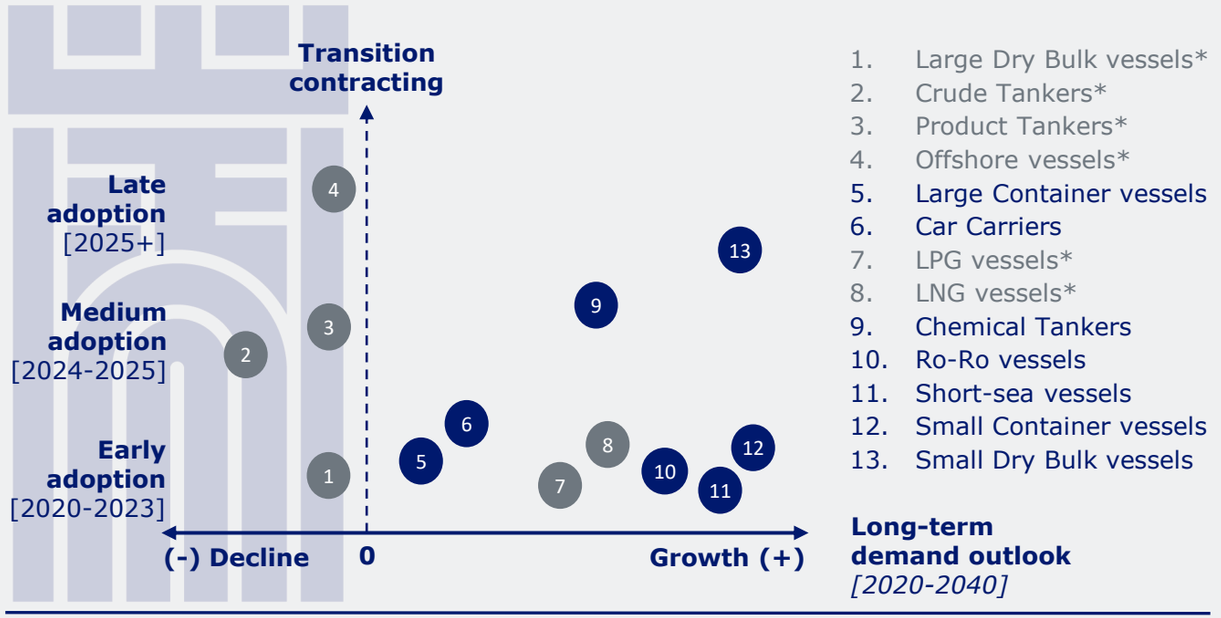
For vessel owners to act, some may need to see changes in their business models or renegotiate terms with cargo owners, charterers or even with their OEMs. Undoubtedly, some may simply call for others to pave the way for them, but that seems unlikely to be a successful long-term strategy.

It is clear that owners are preparing their fleets for 2050, judging by the recent ordering activity. We can see that many of the early adopters have vessels trading on specific, or short-sea, routes, since these often have easier access to alternative fuels, including LNG.

Some of the larger vessel segments, including tankers, Gas Carriers and Offshore Supply vessels are facing challenged demand outlooks that may reduce the need for significant fleet renewal after 2030 (figure: 1-4).

Transition strategies entail difficult choices. Many of the early initiatives may become subject to expensive future retrofits, while players that wait to adopt alternative fuels may lose out on customers who aim to be at the forefront of the climate agenda. However, all strategies involve technology risk. Today's strategies for achieving zero-carbon fuel acknowledge that these fuels require significantly more space than their fossil fuel counterparts. The risk of stranded assets will rise if or when a new vessel design that can deliver a better balance between energy storage requirements and range can be presented.▪

FLEET RENEWAL TOWARDS ZERO-CARBON FUELS



Source: Danish Ship Finance

**Fossil fuel-related cargo*

SHIPBUILDING

SHIPBUILDING

Relief for the industry after some sluggish years

Contracting activity has increased significantly in 2021, with primarily Container and Gas Carriers ordered. Still, in relation to the fleet's size, the overall contracting level is not considered to be at a structural high. The shipbuilding industry has continued to consolidate capacity, at fewer but bigger yards. There are currently 275 active yards, of which 71 are classified as first-tier, accounting for around 85% of the global orderbook and 60% of global yard capacity. Most of these yards have secured employment until 2024, while the second-tier group are still struggling to attract new orders. However, some of the bigger yards have started to report limited availability, which could benefit second-tier yards in the near term.

NEWBUILDING PRICES

Newbuilding prices have risen by 12% in just six months. They have not been this high since 2008-2009, when contracting hit record levels. The recent increases have been driven by a combination of high contracting activity, limited yard availability and higher steel prices.

Dry Bulk: Contracting levels in the Dry Bulk segment have been low in 2021 with only 2% of the fleet (287 vessels) contracted. The orders are scattered between 132 yards, of which the ten largest are building 52% of the Dry Bulk orderbook (693 vessels).

Container: 2021 has seen a surge in orders for Container vessels with around 7% of the fleet (470 vessels) contracted in 2021. Orders are concentrated at very few and large yards in China and South Korea. The top ten yards account for around 80% of all Container orders.

Tankers: Contracting for Tankers has been very low in 2021 with 191 vessels ordered (2% of the current fleet). Vessels have primarily been ordered in China and South Korea.

Gas Carriers: Ordering for Gas Carriers has increased significantly with higher contracting for both LNG and LPG Carriers (317 vessels in the orderbook). Only 25 yards are building the orders, with the five largest accounting for 80% of the orderbook.

DS:FUNDAMENTALS

MARKET CYCLE POSITION – November 2021

Yards delivered 21.5 million cgt from January to September 2021, which consisted of both scheduled orders and orders that had been due for later delivery in 2021. First-tier yards delivered around 70% of these orders while also accounting for most of the early deliveries. South Korean yards delivered on average more orders than scheduled, while Chinese and Japanese yards on average delivered fewer orders than scheduled. Higher contracting activity increased the orderbook by 14% from January to September, to 87 million cgt.

Yard capacity has so far decreased by 3.3 million cgt (6%) in 2021 to 53 million cgt. The number of active yards has shrunk by 12 to 275, compared to 287 active yards in 2020. The number of active yards declined primarily in Europe and China.

Yard utilisation has increased from 50% in 2020 to 63% in 2021. Both first- and second-tier yards have experienced higher utilisation rates. Yard utilisation in first-tier yards has increased from 64% in 2020 to 75% in 2021, with second-tier yards going from 35% to 46%.

Deliveries are expected to increase by 19% compared to 2020 levels. First-tier yards are expected to deliver 29% more in 2021 than in 2020, while second-tier yards are expected to deliver the same vessel capacity as in 2020, but from fewer of them.

Contracting increased by 47% in the first nine months of 2021. 1,388 vessels have been ordered in 2021 amounting to 37.8 million cgt. The large increase is a result of the sharp decline in 2020. Compared to 2019 levels, contracting activity has so far increased by 13%.

MARKET DYNAMICS IN THE LAST SIX MONTHS

Increasing contracting activity has benefited some shipbuilding nations more than others

Increasing contracting activity combined with low yard availability and high steel prices has pushed newbuilding prices up. Chinese and South Korean yards have seized the opportunity and secured work for the years to come.

INCREASING NEWBUILDING PRICES

The newbuilding price index has reached a 12-year high, rising by 12% in the past six months. The increase in newbuilding prices is being propelled by the higher contracting activity and limited availability at the bigger yards. Furthermore, construction costs have also increased. Steel prices have soared by 50% since December 2020, and as a result shipyards' profit margins have come under pressure.

FEWER ACTIVE YARDS BUT HIGHER PERFORMANCE

The shipbuilding industry has continued its consolidation into fewer and bigger yards. For instance, two of South Korea's biggest yards (HHI and DSME) are set for a merger at the end of 2021, subject to approval by competition authorities in the EU. Today, there are 275 active yards (divided between 195 yard groups) with an estimated capacity of 53 million cgt. This is a decline of 6% since 2020, when the active yard capacity amounted to 57 million cgt. The number of first-tier yards has risen from 58 to 71.

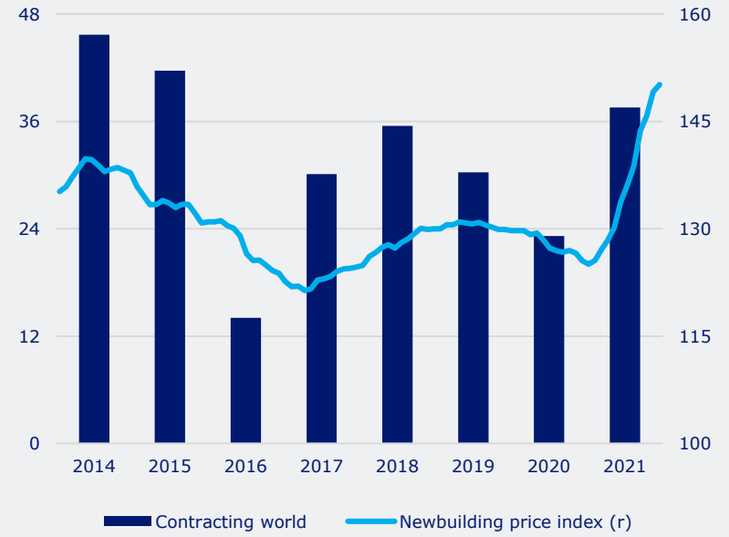
CONTAINER AND BULK ORDERS HAVE BENEFITED SOME YARDS

The increase in the number of first-tier yards has mainly been driven by Chinese and Japanese yards, which have filled spare capacity with Container and Bulk orders. For instance, some Japanese yards have had a few sluggish years but have now started to receive more orders. Some yards that have moved to the first tier have mainly experienced growth in orders due to limited availability at the other first-tier yards. The number of first-tier yards will most likely fall again when contracting activity decreases.

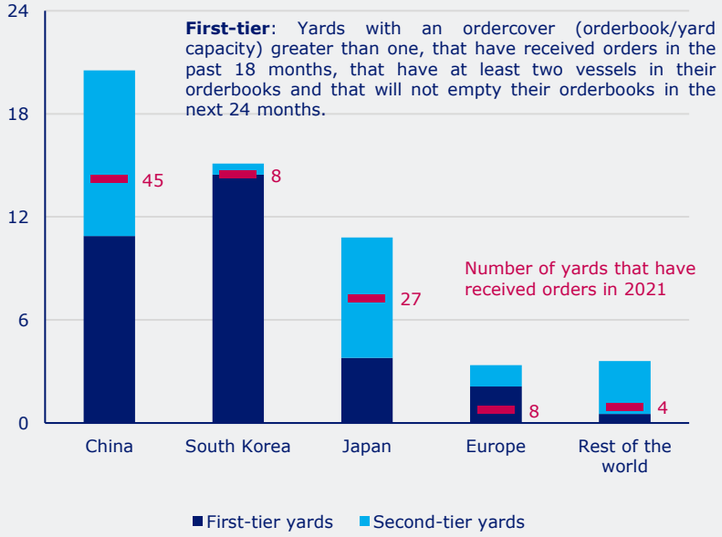
SOUTH KOREAN AND CHINESE YARDS ARE GAINING GROUND

Around 88% of new orders in 2021 have been won by either Chinese or South Korean shipyards. South Korean yards have been gaining momentum in 2021, securing nearly all Gas Carrier orders. Japanese yards have continued to lose market share, as they have struggled to compete with Chinese and South Korean yards.

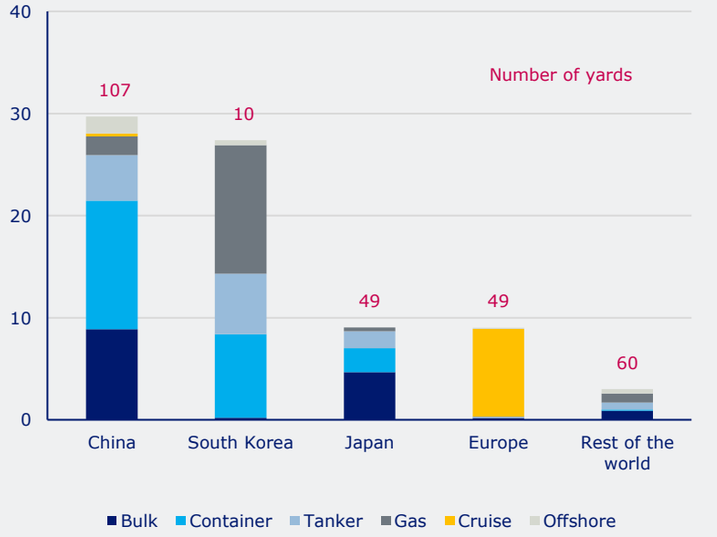
CONTRACTING (MILLION CGT) AND NEWBUILDING PRICE INDEX



ACTIVE YARD CAPACITY (MILLION CGT)



ORDERBOOK BY SEGMENT AND REGION (MILLION CGT)



Source: Clarksons, Danish Ship Finance

DYNAMICS AT THE TOP TEN YARDS

The top ten yards dominate the shipbuilding market, with the rest still struggling to attract new orders

The shipbuilding market is highly concentrated, which is evident by looking at the orderbooks of the top ten yards: they account for 70% of the global orderbook.

CONTRACTING IS NOT AT A STRUCTURAL HIGH

Contracting activity in 2021 has increased, with 1,388 vessels contracted so far, compared to 1,360 for the whole of 2020. The appetite for new vessels is not equally high across all segments, but mainly a story for Container and Gas Carriers. As such, 470 Container vessels (7% of the fleet) and 143 Gas Carriers (7% of the fleet) have been contracted in 2021. Although contracting might have increased from 2020 levels, it is still low from a historical perspective. Historically, global contracting activity has been around 4% of the fleet per year on average, but it currently stands at 1.4%, as Bulkers and Tankers have not been invited to the party. What we are seeing, though, is that orders are being placed at fewer yards and are dominated by larger vessels (the average vessel capacity in the orderbook has increased by 15% over the past ten years).

TOP TEN YARDS REPRESENT 70% OF THE ORDERBOOK

Ten yard groups currently account for nearly 70% of all orders, while 30% are divided among the remaining 185 yard groups. It is primarily Container orders that have filled yard capacity, with around 88% of the Container orderbook concentrated at these yards. The state-owned China State Shipbuilding Corporation alone has secured 22% of Container vessel orders. While the South Korean yards (HHI, SHI and DSME) have likewise attracted many of the Container orders, their yard capacity has also been allocated to a large number of orders for LNG and LPG vessels. Imabari Shipbuilding has seen a surge in orders for Container vessels and Bulk Carriers, which has moved the yard group from the second tier to the first tier, as defined by their order cover.

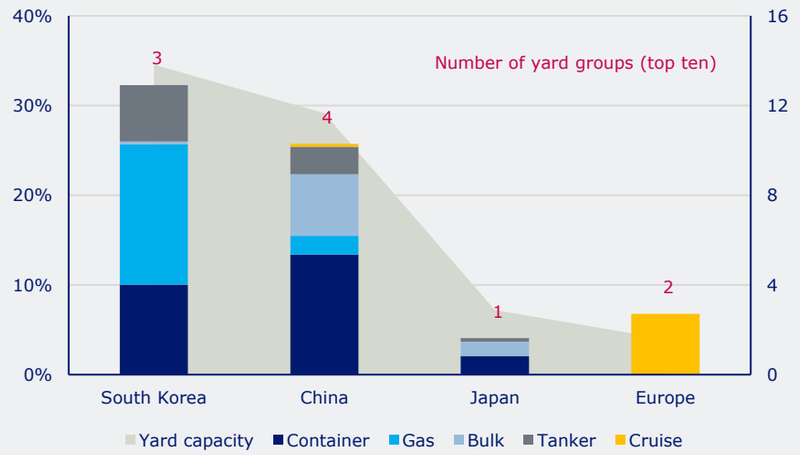
DELIVERY TIME HAS INCREASED

The average delivery time has increased across the top ten yards by 22% compared to the contracted orders in 2020. The increase has been driven by the Chinese yard groups; the South Korean yards already had relatively long delivery times.

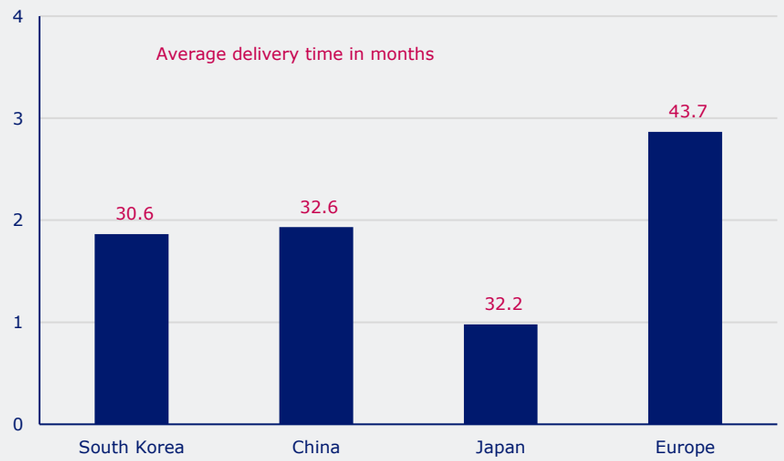
NOT ALL YARDS ARE FULLY BOOKED UNTIL 2024

Increased contracting activity has clearly improved the market situation for the top ten first-tier yards, but their capacity does not seem to be fully utilised. The ten yard groups with the largest orderbooks only have orders that could be built within two years, although their actual delivery schedules extend beyond 2024. This could indicate a lopsided orderbook with very large vessels facing construction constraints at individual yards. Some of the largest yards (for instance, HHI and CSSC) seem more exposed than the rest given their large capacity. Newbuilding prices will not increase in earnest until yard capacity becomes more limited.

SHARE OF GLOBAL ORDERBOOK (%) AND YARD CAPACITY (MILLION CGT)



ORDERCOVER AND AVERAGE DELIVERY TIMES



Source: Clarksons, Danish Ship Finance

SHIPBUILDING MARKET OUTLOOK

Employment secured in the short to medium term

The outlook for the shipbuilding market is more positive than it was last year. Growing orderbooks have lifted employment for the biggest first-tier yards in the short term, while the low-performing yards are still struggling to keep up.

WORK SECURED AT FIRST-TIER YARDS IN THE SHORT TERM

The utilisation rate at first-tier yards has gone from 63% to 75% in 2021, while it has improved from 29% last year to 46% for second-tier yards. We believe the 204 second-tier yards will already start to see orderbooks thin out from next year and will completely run out of orders by 2024 if no new orders are placed. As such, 76 yards (amounting to 4.3 million cgt) will run out of orders from next year. From 2023, 164 yards (amounting to around 13 million cgt) will run out of orders. This also underlines the fact that the recent order spree is mainly concentrated among the largest first-tier yards.

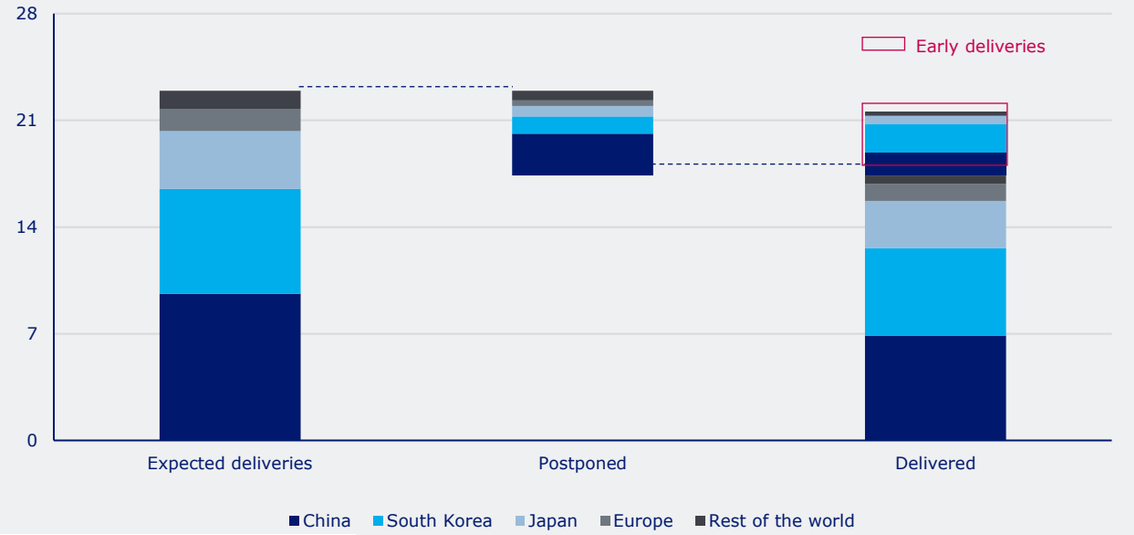
LIMITED YARD AVAILABILITY MAY PUSH ORDERS TO SECOND-TIER YARDS

Yards have so far delivered around 75% of scheduled orders, on average. The remainder have either been postponed or delivered a couple of months early. There is a growing risk of limited yard availability at the biggest first-tier yards due to fewer vacant slots to build the larger vessels. Many of the biggest yards (HHI, Daewoo, SHI, etc.) are reporting that they only have limited slots available in 2024 for very large vessels. This may push owners to look for open slots at second-tier yards that have the capability to build very large vessels.

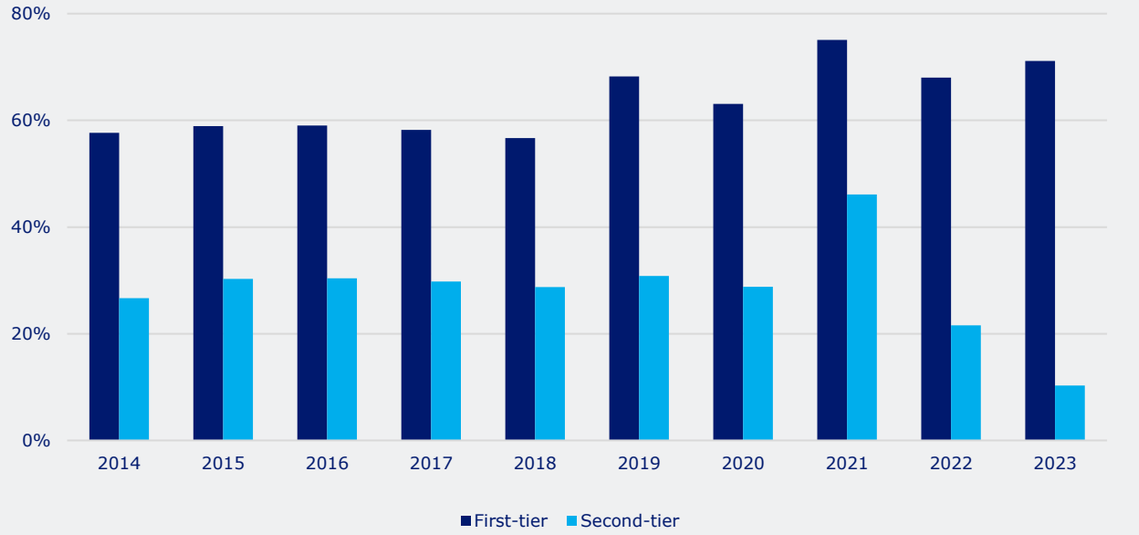
SOME YARDS MAY BENEFIT NOW, WHILE OTHERS MUST WAIT

Fleet renewal will hit different segments at different times. Some segments such as LPG, LNG and Container have had orders for vessels that can also be powered by LPG and LNG. In other segments such as Dry Bulk and Oil Tankers, the orderbooks are relatively low, as the route to zero-carbon fuels is more uncertain due to trade patterns. As such, we may see some yards taking on many orders now, while other yards may only see orders increase when the pathway towards zero-carbon fuels becomes clearer.

DELIVERY PERFORMANCE (MILLION CGT)



YARD UTILISATION RATES (%)



Source: Clarksons, Danish Ship Finance

SHIPBUILDING DEEP DIVE: ESTIMATED TIME TO RENEW FLEET

It could take 15-20 years to renew the 100,000 vessels in the world fleet

The journey to net zero will involve the introduction of zero-carbon vessels. Many of the existing vessels will be retrofitted and retired before a critical juncture is reached. But how quickly can the existing fleet be renewed?

IT WILL TAKE 15-20 YEARS TO RENEW THE FLEET

The world fleet's 100,000 vessels are estimated to have a combined capacity of approximately 900 million cgt. Active global yard capacity is estimated to be around 53 million cgt. If all vessels were to be renewed in sequence, the current yard capacity suggests this could be done within a period of 15-20 years.

SPECIALISED SHIPYARD CAPACITY

The shipyard industry has been consolidating on a large scale during the past decade and individual yards have increasingly concentrated their capacity on specific ship types. This means that shipyard capacity is not a uniform figure across vessel segments. Dry Bulk has by far the largest fleet by number of vessels, but these vessels are also among the most simple to build, while the opposite is the case for the LNG segment.

CONTAINER FLEET COULD BE RENEWED IN JUST FIVE YEARS

Take the Container fleet as an example. The Container fleet carries 16% of seaborne trade volumes and numbers 5,500 vessels with a combined capacity of 142 million cgt. 94 yards with a combined capacity of 39 million cgt have historically built Container vessels. The Container fleet could, in theory, be renewed in just five years, if all yards devoted their entire capacity to this segment. The reality is likely to be different and it may take somewhere between ten and 15 years to renew the fleet.

LINER SEGMENTS ARE LIKELY TO BE EARLY ADOPTERS

Container vessels trade on fixed routes, which allows them to plan and secure their bunkering requirements in advance, while many other segments trade tram, which means that they do not call at the same ports on a regular schedule. The fleet renewal of vessels trading fixed routes – including Containers, Car Carriers, Ro-Ro and Ferries – is likely to be faster than for tramp trading segments like Tankers and Dry Bulk vessels.

A GLOBAL DISTRIBUTION NETWORK WILL TAKE TIME

For tramp trading vessels, the transition to zero-carbon fuels will require a global distribution network of the future fuels in question. Such a network is unlikely to be established in the short term, which mean that many vessels could be late adopters of new fuels.

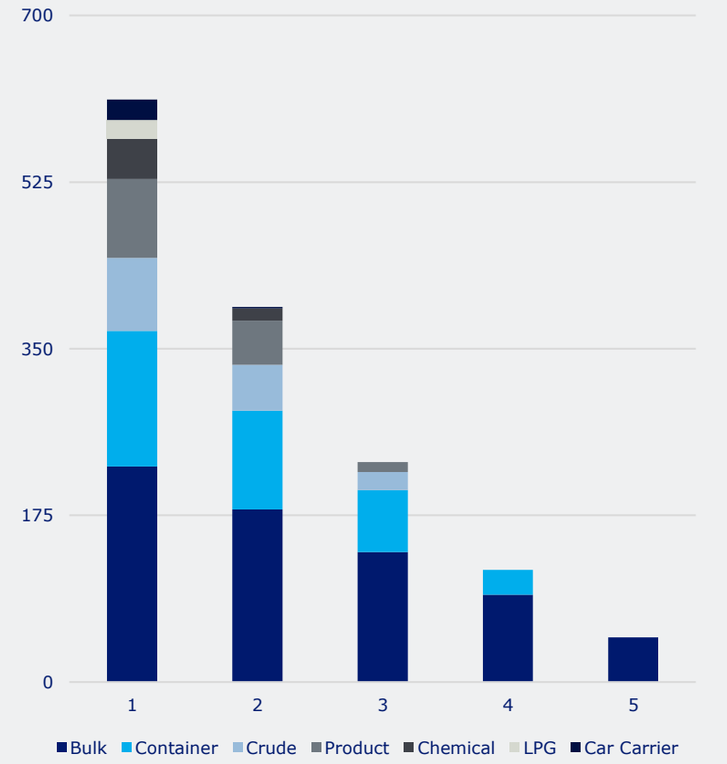
DRY BULK MAY NOT BEGIN TO RENEW UNTIL THE 2030S

Dry Bulk vessels carry 45% of seaborne trade volumes distributed between more than 12,000 vessels with a combined capacity of 226 million cgt. Most yards are able to build Dry Bulk vessels. 140 yards with a combined capacity of 45 million cgt (85% of global capacity) could renew the entire Dry Bulk fleet in just five years. This is again a very simplified approach to fleet renewal; the actual renewal is likely to take place over the course of ten to 15 years beginning as late as the 2030s. That said, somewhere between 1,500 and 2,000 vessels (representing close to 15% of the fleet) are trading on fixed routes. These vessels could be early adopters (some have already switched to LNG).

NOT ALL FLEETS WILL BE RENEWED COMPLETELY

The risk of shrinking seaborne trade volumes is likely to reduce the demand for fleet renewal in some of the main vessel segments, including Crude Tankers, Product Tankers and Offshore Supply vessels. These fleets may not be renewed completely.

ESTIMATED YEARS TO RENEW FLEET (MILLION CGT)



Source: Clarksons, Danish Ship Finance

CONTAINER

CONTAINER

A record-high market with a more challenged long-term outlook

The Container market continues to break new records. Increased spending on retail goods combined with low fleet growth and port congestion has paved the way for an extremely positive environment, taking freight rates to new highs. The firm market has created an urgent need for vessels, propelling secondhand prices to levels not seen since before the financial crisis in 2008. The favourable conditions are set to continue in the coming months, due to restocking and further port congestion reducing the active fleet. We believe the risk of surplus capacity is rising from a medium-term perspective. The fleet will expand massively in 2023 and 2024, driven by an inflow of 15,000+ teu vessels, while we expect demand growth to level out. The need for scrapping will increase markedly.

FREIGHT RATES AND SECONDHAND PRICES

Since our last report in May, both box rates and timecharter rates have reached historically high levels. The high employment of Container vessels has been supported by manageable fleet growth, a decrease in the active fleet due to severe port congestion, and a shift in consumer patterns benefiting containerised goods. Secondhand prices have followed suit and are up by 143% in 2021.

8,000+ teu vessels: Strong retail consumption combined with supply chain disruptions has created extremely positive market conditions. On average, the box rates are up 112% in 2021. The three-year timecharter rate has followed the same trajectory and has increased by 123%, reaching USD 89,000 per day for a 9,000 teu vessel in October. The average timecharter length has now passed four years. The five-year-old secondhand price for a 11,000 teu vessel rose 85% in the first three quarters of 2021, from USD 84 million to USD 155 million.

3-7,999 teu vessels: Regional trade has benefited from the redirection of trade caused by the supply chain disruptions, which has boosted the segment. As of October, the three-year timecharter rate stood at USD 73,200 per day, while the five-year-old secondhand price for a 6,800 teu vessel reached USD 135 million.

Feeder vessels: In October 2021, the one-year timecharter rate was USD 35,500 per day, while the five-year-old secondhand price for a 2,150 teu vessel stood at USD 38 million.

DS:FUNDAMENTALS

MARKET CYCLE POSITION – November 2021

Strong US retail consumption at the expense of leisure spending was the main driver of a 10% increase in global Container volumes in the first ten months of 2021 compared to the same period last year. Travel distances were relatively stable. In the same period, fleet utilisation strengthened, as the Container fleet expansion was limited to 3%, while the active fleet was reduced by port congestion caused by landside bottlenecks and supply chain disruptions.

Deliveries increased, with 0.8 million teu added to the fleet (3%) in the first ten months of 2021 compared to 0.9 million teu in 2020 (3.5% of the fleet).

Scrapping is close to non-existent. Only 15 vessels (all Feeders) were scrapped (12,000 teu) in the first ten months of 2021.

Contracting activity has sky-rocketed. Close to 4 million teu (16% of the fleet) has been contracted so far in 2021 compared to 1 million teu (4%) in the whole of 2020.

Orderbook: By October, the orderbook was up by 148% compared to the end of 2020. The orderbook represents a concerning 22% of the current fleet.

Demand: Seaborne Container volumes declined by 1% in 2020. In the first ten months of 2021, demand returned and volumes were up 10% compared to the same period in 2020, driven by strong US retail consumption.

MARKET DYNAMICS IN THE LAST SIX MONTHS

The perfect storm

Extraordinary movements on both the demand and supply side have led to historically high freight rates. The strong market seems to have sparked a surge in ordering of new vessels.

HIGH US CONSUMER SPENDING IS DRIVING DEMAND

Strong consumption of containerised goods in the US has continued to boost demand. Covid-19 restrictions have forced a shift in spending towards goods instead of services. In the second and third quarters of 2021, US goods spending was up 21% compared to the same period last year. This led to an average increase in global Container throughput of 25% – well above 2019 levels

VESSELS HAVE BEEN CAUGHT UP IN CONGESTION

The Container market and land-based infrastructure has struggled to keep up with the surging demand. US ports and warehouses filled with containers waiting for available trucks, the shutdown of the Meishan terminal at China's Ningbo port and the Suez blockage have crippled liners' ability to operate and resulted in vessels piled up in port congestion. The active fleet is down by around 5% due to supply chain disruptions.

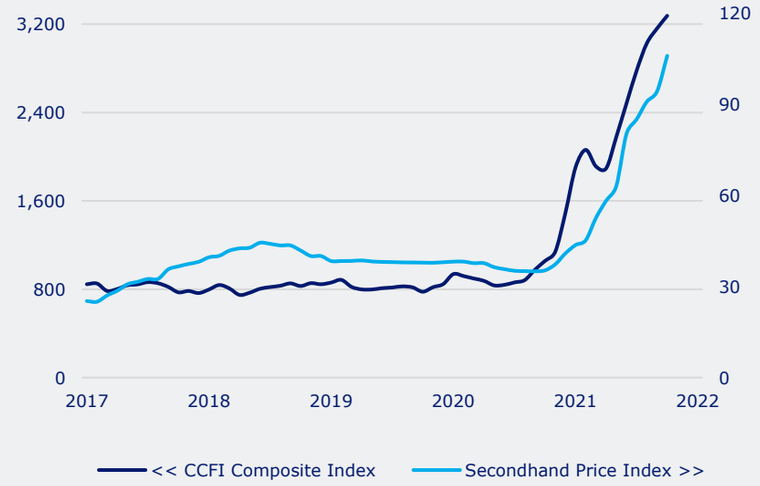
HISTORICALLY HIGH TIMECHARTER AND BOX RATES

As demand has risen and the active fleet has declined, box rates have gone through the roof. The shipment cost of a 20-foot container to Europe from China is closing in on USD 8,000, up from USD 1,000 a year ago. In order to keep up, liners have increased their number of operating vessels, which has driven timecharter rates and secondhand prices up by around 130% and 68%, respectively, since May. Both box rates and timecharter rates are at record-high levels.

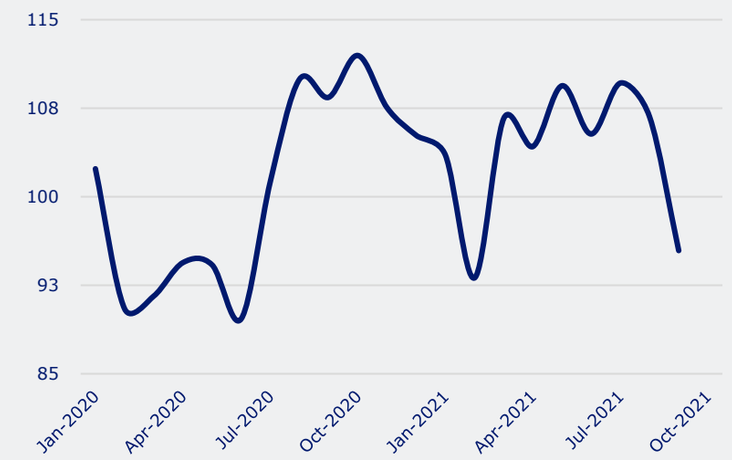
OPTIMISM HAS RESULTED IN HIGH CONTRACTING ACTIVITY

The extremely favourable market conditions have tempted owners to contract new vessels. In the last six months, newbuilding orders corresponding to no less than 8% of the current fleet have been placed. These have mainly been for vessels larger than 15,000 teu set to serve the China-Europe lane; smaller vessels operating on this lane today will most likely be moved to the transpacific lane. The need for new vessels is urgent right now, but these vessels will not reach the water until 2023 and 2024 and will be late for the party.

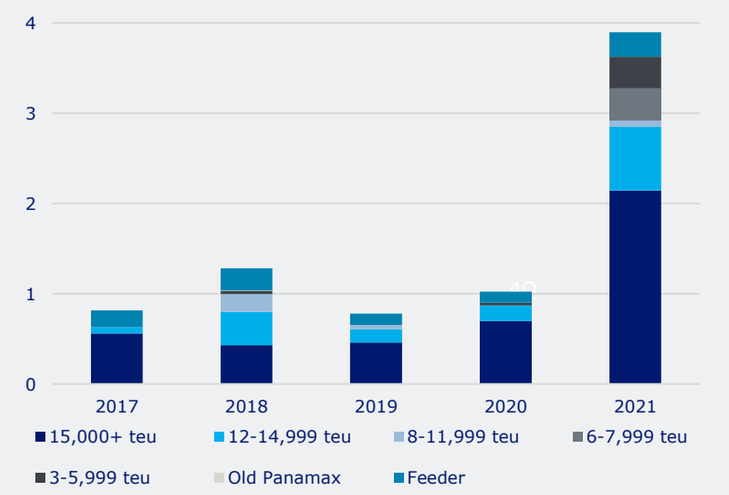
BOX RATES AND SECONDHAND PRICES (INDEX)



CONTAINER PORT THROUGHPUT IN THE US (2019=INDEX 100)



CONTRACTING ACTIVITY (MILLION TEU)



Source: AXS Marine, Clarksons, Danish Ship Finance

SUMMARY: CONTAINER MARKET OUTLOOK

The strong market could continue for a short period but will not last, as challenges await

The short-term outlook for the Container market appears strong. Restocking of retail goods will drive demand, while excessive port congestion will continue to reduce the active fleet. The market is set to deteriorate in the long term with a massive inflow of 15,000+ teu vessels and an expected decline in demand growth putting significant pressure on most of the Container market. Tonnage providers' earnings will then be most exposed.

Market fundamentals indicate that earnings and secondhand prices will remain high in the coming months. We expect fundamentals to gradually deteriorate next year before heading for a possibly severe downturn in 2023. This could create market challenges not seen for many years.

FUNDAMENTALS INDICATE THAT THE STRONG MARKET WILL CONTINUE IN THE COMING MONTHS

The firm Container market is set to continue in the short term. US consumption is expected to shift away from containerised goods towards services, but low US retail inventories will compensate for the decreasing consumer spending and drive demand growth, although this could be limited by declining Chinese factory activity. The large 12,000+ teu fleet growth will continue, but the total fleet expansion seems manageable. As long as demand is driven by US imports, we expect the massive congestion around the western US ports, which absorb around 4-5% of the active fleet, to persist. The 8,000-14,999 teu vessels are best positioned to benefit from the strong fundamentals, but most of the Container fleet are likely to see spillover effects.

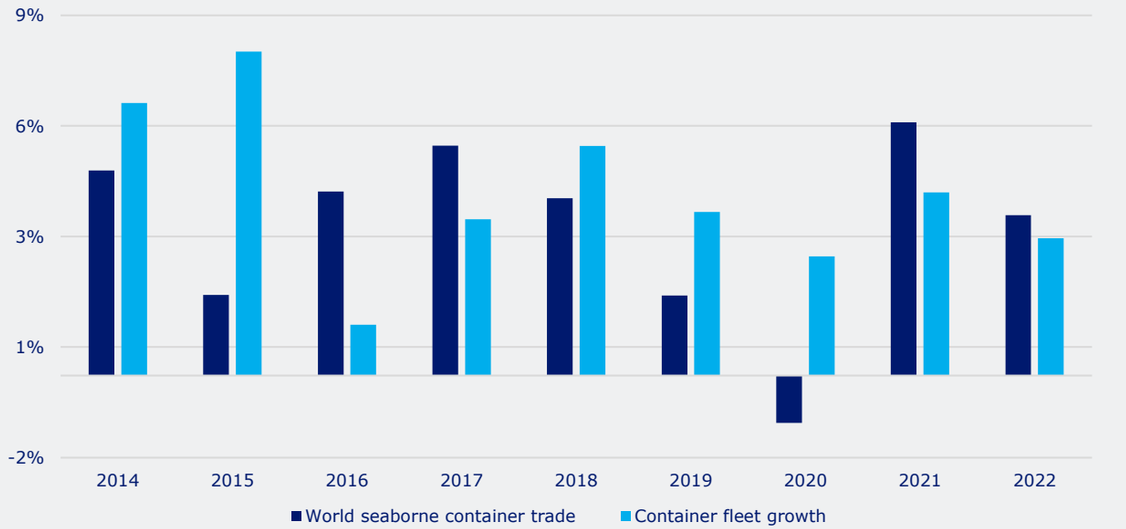
THE BEGINNING OF THE END OF THE SURGE

In the second half of 2022, we expect fundamentals to slowly deteriorate. Higher inventory levels and lower growth in consumption of containerised goods will ease the pressure at US ports. Consequently, the active fleet will gradually expand, while demand growth will level off. This is likely to send box rates on a downward trajectory, with timecharter rates and secondhand prices following suit. Liner operators can manage the changing fundamentals by keeping a lid on chartered-in capacity. Consequently, the re-employment risk will increase for tonnage providers.

HUGE INFLOW OF NEW ULTRA LARGE CONTAINER VESSELS

In 2023 and 2024, a massive inflow of 15,000+ teu vessels is expected to hit the water, expanding the fleet at the highest rate since the financial crisis. Liner operators will redirect smaller vessels onto other routes in order to limit capacity growth on the mainlanes. Still, we expect capacity growth to be highest on routes from Asia to Europe and North America. We fail to identify any demand drivers strong enough to counterbalance the supply growth. On the contrary, the decarbonisation agenda and the current supply chain disruptions could accelerate nearshoring, which would hamper growth in long-haul trade. Vessels over 8,000 teu seem to be facing a range of challenges which are likely to pressure earnings for both tonnage providers and liner operators unless scrapping activity begins to take off noticeably.

SUPPLY AND DEMAND BALANCE (TEU)



Source: Clarksons, Danish Ship Finance

CONTAINER FLEET OUTLOOK

Slow fleet growth will be replaced by a massive inflow of large Container vessels

Fleet growth looks manageable for the next 12-18 months, but extremely high contracting activity is setting the stage for massive fleet expansion in 2023 and 2024.

THE INFLOW OF LARGE VESSELS WILL CONTINUE

For the rest of 2021, 40 new vessels will be added to the fleet, while 144 will join in 2022. This corresponds to 2% and 4% of the fleet, respectively. The inflow will be driven by 15,000 teu+ vessels, whose fleet is set to expand to the tune of 14% by the end of 2022. In contrast, the mid-sized fleet (3,000-12,000 teu vessel) will receive hardly any new vessels in the same period.

SKEW FLEET GROWTH

The current favourable market conditions are dampening the appetite for vessel demolition. When port congestion eases and the active fleet grows, scrapping activity might begin to pick up in order to rebalance available capacity. Due to the age composition, the fleets with the lowest inflow of new vessels are likely to see the highest demolition levels. Consequently, we expect asymmetric growth in the large and mid-sized fleets in the future.

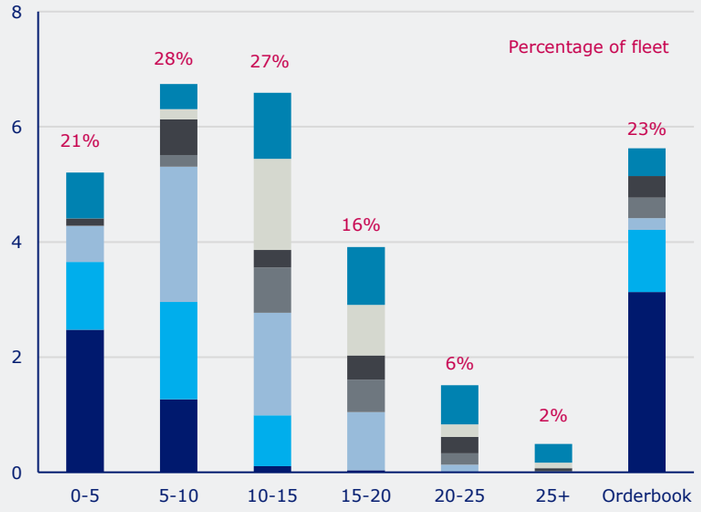
HIGH INVESTMENT APPETITE FOR LARGE VESSELS

Already by September, newbuilding orders in 2021 had surpassed the previously record for annual orders. Vessels equalling 3.9 million teu or 16% of the fleet have been contracted. We expect most of these vessels to be delivered in the second half of 2023 and in 2024. In this 18-month period, fleet capacity is set to grow by 12%, driven by an astonishing 40% expansion of the 15,000+ teu fleet. Investments in LNG as a transition fuel explain some of the orders, but the main driver of future capacity expansion seems to be shipowners' expectation of the current high demand for containerized goods continuing.

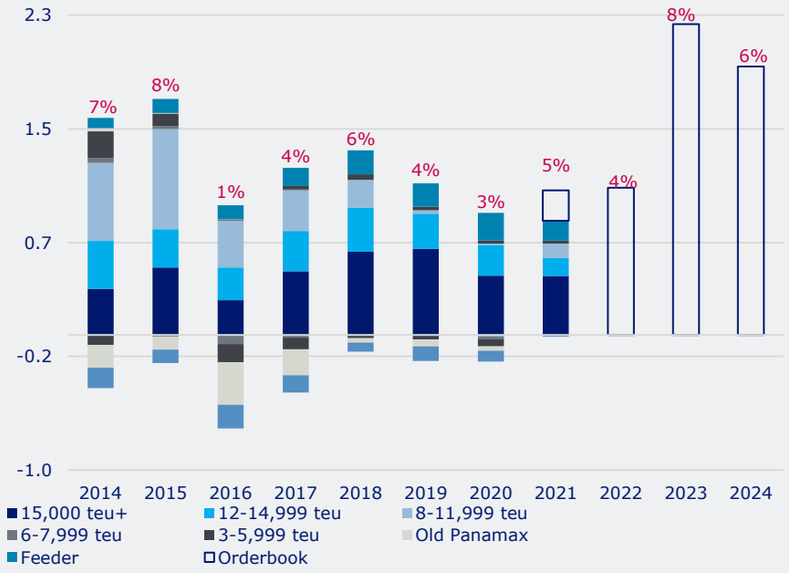
LARGE EXPANSION OF CAPACITY ON MAINLANES

The many new large vessels are likely to serve the Far East-Europe and transpacific routes. Liner operators will relocate smaller vessels onto other routes while some older vessels might be facing retirement. Nevertheless, we expect capacity expansion of around 20% on the Far East-Europe and transpacific routes by the end of 2024 (CAGR of 6.5%). Capacity on smaller vessel routes will expand noticeably as well, due to the relocation of larger vessels.

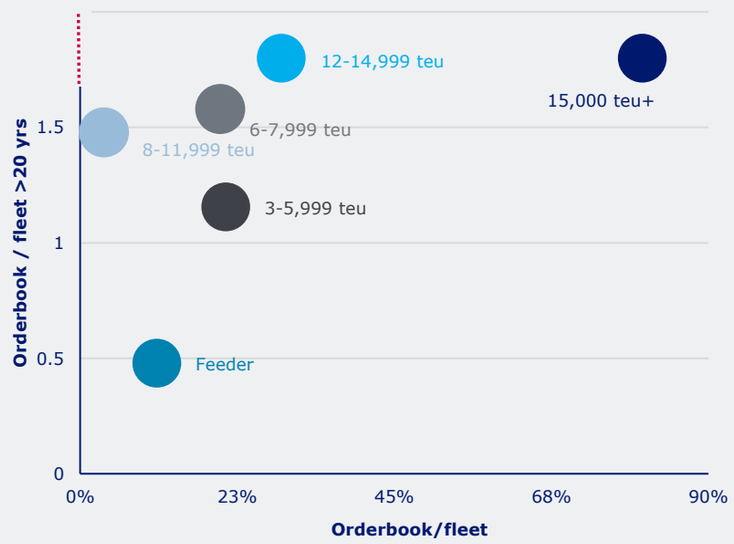
AGE DISTRIBUTION (MILLION TEU)



FLEET DEVELOPMENT (MILLION TEU)



FLEET RENEWAL POTENTIAL (TEU)



Sources: AXS Marine, Clarksons, Danish Ship Finance

FLEET DEEP DIVE: CONGESTION AT US PORTS

The active fleet is being hampered considerably by redirected vessels and logistical disruptions

Liner operators are increasing capacity between Asia and North America due to high demand. The inland infrastructure is failing to cope with the large number of vessels, causing congestion. The active fleet is set to grow as the bottlenecks clear.

LARGE VESSELS' MAINLANES

Networks of large Container vessels are designed for transporting goods from low labour cost countries to developed regions. The versatile 8,000-14,999 teu vessels sail on a broad range of routes, but most carry goods across the Pacific. Container vessels larger than 15,000 teu mainly serve Asia-Europe routes, due to draft constraints in other import regions such as North America.

VESSEL CONCENTRATION ON TRANSPACIFIC SERVICES

Prior to the Covid-19 pandemic, capacity deployed across the Pacific equalled that of the Far East-Europe routes, but in order to cope with the surprisingly high US demand for consumer goods, liner operators started allocating more vessels between Asia and the US during summer 2020. From April to September, the monthly deployed capacity rose by 35% to 5.2 million teu, driven by additional 8,000-14,999 teu vessels being moved from Far East-Europe and minor routes.

INCREASED NUMBER OF PORT CALLS FOLLOWED

The increased number of vessels on the transpacific routes has put massive pressure on US ports. The number of 8,000-14,999 teu vessels reaching the US west coast increased from 350 in January 2020 to 415 in July 2021.

INLAND LOGISTICAL DISRUPTIONS

The inland infrastructure has struggled to keep up with the fast-growing number of containers discharged at the ports. Filled storage facilities, wrongly placed containers and a lack of port workers and truckers are complicating vessel handling in ports.

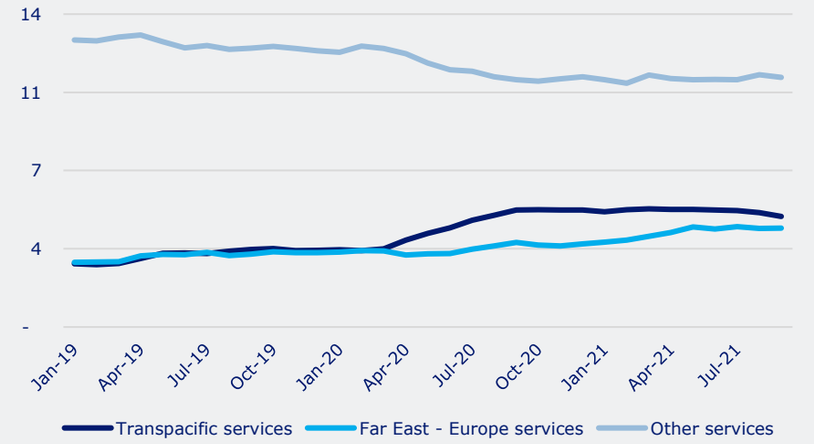
A MARKED REDUCTION IN THE ACTIVE FLEET

The extraordinary vessel traffic combined with the lack of inland capabilities drove congestion at US ports up from 4% to 8% of the total Container fleet from January 2020 to October 2021. Adding the correlated congestion in Eastern Asia, the active Container fleet has been reduced by approximately 5% compared to before the pandemic, absorbing more than one year's fleet growth.

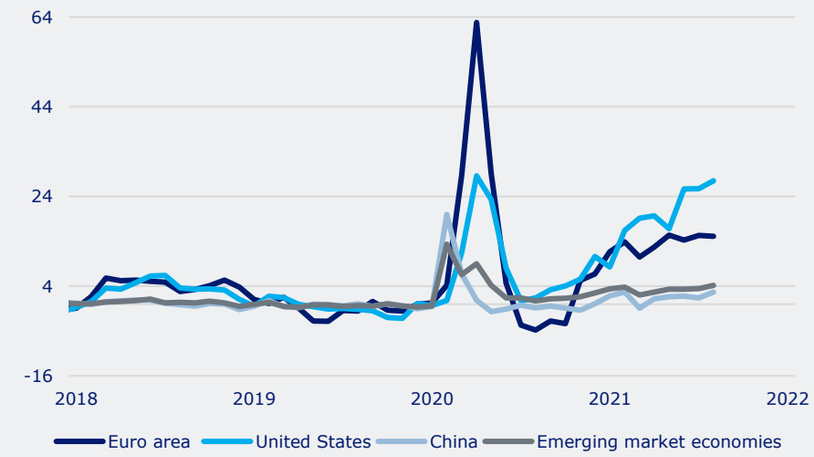
RISK OF AVAILABLE CAPACITY INCREASING

The current congestion on the transpacific route will take time to unravel, but deployed vessels and the number of port calls seem to be slowly declining, which could ease some of the pressure on the inland infrastructure. We expect these dynamics to accelerate during the first quarter of 2022, which will push 8,000-14,999 teu vessels back onto Far East-Europe and minor routes and increase the total available capacity. Liner operators will have to manage available capacity carefully and adjust gradually as the US congestion eases, while tonnage providers will face greater re-employment risk, as the demand outlook seems challenging.

VESSEL DEPLOYMENT (MILLION TEU)



SUPPLY CHAIN DISRUPTIONS* (INDEX)



*The difference between the supply delivery times subindex in the purchasing managers' index (PMI) and a counterfactual, cyclical measure of supply delivery times based on the manufacturing output subindex in the PMI.

Sources: AXS Marine, Clarksons, IMF, Danish Ship Finance

CONTAINER DEMAND OUTLOOK

US retail restocking is boosting short-term demand, but the risk of goods shortages is increasing as the Chinese manufacturing sector struggles to keep pace

Demand for containerised goods should be strong in the coming months, driven by restocking, but China's weakening manufacturing sector threatens the positive outlook.

FLYING HIGH INTO 2022

Container volumes are set to increase by 5-7% in 2021, due to excessive consumption of goods in the absence of service spending amid Covid-19 restrictions. In 2022, we expect Container volumes to grow by 3-4% as consumer spending swings back towards service consumption.

THE US WILL CONTINUE TO DRIVE DEMAND

Transpacific trade is the main demand driver for 8,000-14,999 teu vessels. These vessels are likely to benefit from high US demand for containerised goods in the coming six to 12 months, mainly due to inventory restocking. However, we expect growth in retail sales to level off as consumers turn back to service consumption. Consequently, we expect transpacific trade to grow by some 10-12% this year and 3-4% next year.

SLOWER DEMAND GROWTH ON ASIA-EUROPE ROUTES

Vessels larger than 14,999 teu are highly exposed to European consumption of goods. The direct demand push for ultra large Container vessels seems likely to be more subdued, as European retail sales in general are following the pre-pandemic trajectory. Nevertheless, low inventories due to decreasing imports in 2020 should lift demand volumes to approximately 5% in 2021. We expect demand growth to return to the long-term average of 3% in 2022.

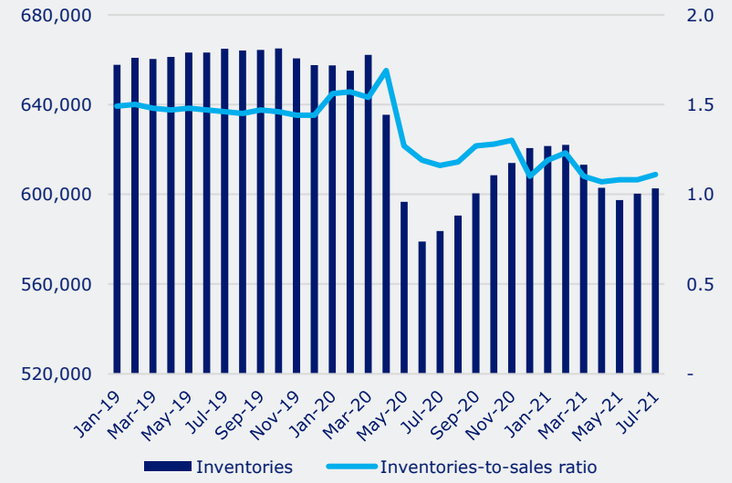
CAN CHINA KEEP UP WITH DEMAND?

The Chinese manufacturing sector's possible inability to serve the high demand in Europe and the US represents a significant risk to the outlook. China's manufacturing PMI figure dipped below 50 in September, indicating slowing future manufacturing activity. Production bottlenecks, energy shortages and rising raw material prices are hampering factory activity in China. The outlook for Container volumes is likely to be revised downwards if this trend continues.

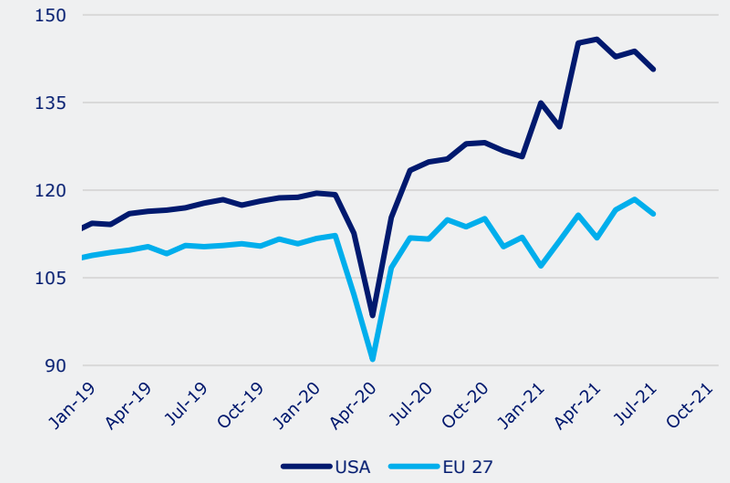
REGIONAL TRADE IS BENEFITING FROM REDIRECTION OF TRADE

The demand outlook for vessels smaller than 6,000 teu remains firm, as these vessels are benefiting from the extraordinary redirection of Container trade.

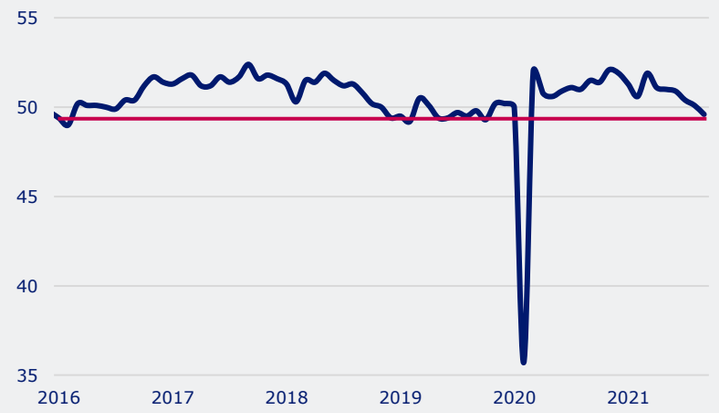
US RETAIL INVENTORIES (USD MILLIONS)



RETAIL SALES (INDEX=2015)



CHINESE MANUFACTURING PMI



Sources: AXS Marine, Bureau of Economic Analysis, Clarksons, Eurostat, National Bureau of Statistics, Danish Ship Finance

DEMAND DEEP DIVE: US CONSUMPTION OF CONTAINERISED GOODS

The excessive increase in US demand for containerised goods seems to be levelling off and long-term demand growth looks challenged

US spending on goods has been the main growth driver for the Container market, but consumption is slowly shifting towards services. Meanwhile, performance indicators show a potential weakening of the US economy. Both factors threaten to dampen long-term demand growth substantially.

INCREASED US CONSUMPTION OF GOODS DURING THE PANDEMIC

The surge in Container demand is mainly attributable to US imports. On average, monthly transpacific Container trade has increased by 18% year-on-year since January 2020. The same figure for Far East-Europe trade is 3%. The main driver of the high US imports is a redirection of consumer spending towards containerised goods and away from contact-intensive activities owing to social distancing. Fuelled by government stimulus cheques, US consumer spending on goods has increased by 20% compared to pre-pandemic levels.

SIGNS OF A REBOUND IN SERVICE SPENDING

US consumption of goods peaked in April 2021, when around 36% of spending was on goods, compared to 30% in January 2020, highlighting the shift from services to goods spending during the pandemic. However, while services spending has increased for six consecutive months, consumption of goods has stagnated. In other words, Americans are returning to restaurants and holiday resorts while keeping their budgets for clothing and household equipment steady.

GOODS CONSUMPTION WILL DECREASE AS THE VACCINATION RATE INCREASES

Still, only 57% of the US population has been fully vaccinated as of October 2021 and the number of new Covid-19 cases is only just starting to decline after a new wave of Covid-19 hit the country in August. The number of vaccinated people is still increasing (albeit at a slow pace), and as the number rises, contact-intensive services will be considered safer to enjoy. We expect this to propel spending back from goods to services and normalise the economy after the severe disruption by the pandemic.

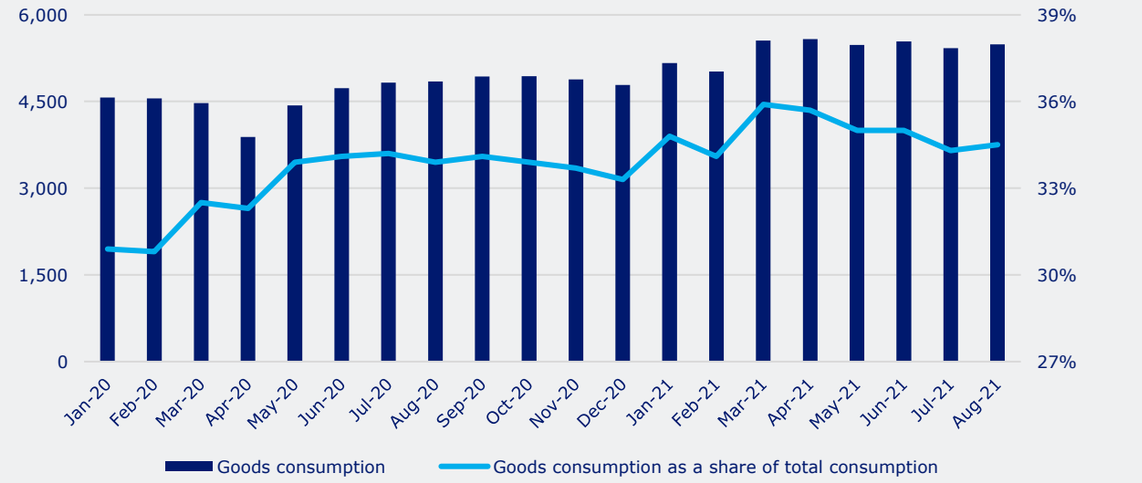
KEY PERFORMANCE INDICATORS IN US ECONOMY HIGHLIGHT FUTURE RISK

A range of risk factors are building up and threatening the economic recovery in the US, which could potentially reduce overall consumer spending. The US labour force is still down by 3.1 million people compared to pre-pandemic levels. The unemployment figure has remained steady despite the recent growth in service activity, indicating that the higher unemployment could be more entrenched than expected. If this proves the case, the inflation rate may not decrease from the current high levels. While fewer employed people mean a smaller consumer base, higher inflation reduces the purchasing power of the current consumer base if salary growth does not keep pace.

LOW LONG-TERM DEMAND GROWTH

Multiple factors point to a slowdown in US consumption of goods, and thereby hampering the main growth driver for the Container market. Consequently, we expect the Container demand boom to level off gradually during 2022. Beyond 2022, we see an increasing risk of a demand growth rate below the historical average of 3%. This raises the long-term unemployment risk for vessels larger than 12,000-14,999 teu (the preferred size on transpacific trades), which is likely to affect all vessels larger than 8,000 teu.

US CONSUMER SPENDING (USD BILLION)



Source: AXS Marine, IMF, USAFacts, U.S. Bureau of Economic Analysis, U.S. Census Bureau and Danish Ship Finance

DRY BULK

DRY BULK

The market is flying high, but risks are looming

The Dry Bulk market continues to show a robust recovery. Strong trade for grain, non-ferrous metals and coal, combined with low growth in the active fleet, is propelling freight rates across segments. The market optimism is reflected in the fact that secondhand prices are at their highest level for years. While the tailwind looks set to continue in the short term, risks are building. The Capesize segment is exposed to changing demand dynamics, with little rebalancing potential. In contrast, the future fleet growth seems manageable for the small and midsize vessels while trade of non-ferrous metals for renewable technologies provides demand growth opportunities. The expected decline in coal demand represents a significant risk to the outlook for midsize vessels.

FREIGHT RATES AND SECONDHAND PRICES

The Dry Bulk market has been characterized by sky-rocketing freight rates since our last report in May 2021. The surge has been seen in all segments but has been strongest among mid-sized and small vessels. Employment has risen, as low fleet growth, port congestion and infrastructure bottlenecks have constrained the active fleet, while strong global industrial output and grain trade have elevated volumes. Secondhand prices have followed suit and are up by 66% in 2021.

Capesize: Growing long-haul iron ore trade between Brazil and China have kept the market on a positive trajectory. The one-year timecharter rate is up 112% in 2021, reaching USD 37,000 per day in October. The five-year-old secondhand price rose 58% in the first three quarters, from USD 27 million to USD 43 million.

Panamax: A surge in grain and coal trade, drove freight rates up by 142%, while secondhand prices have increased by 50%. In October 2021, the one-year timecharter rate and the five-year-old secondhand price stood at USD 31,000 per day and USD 34 million, respectively.

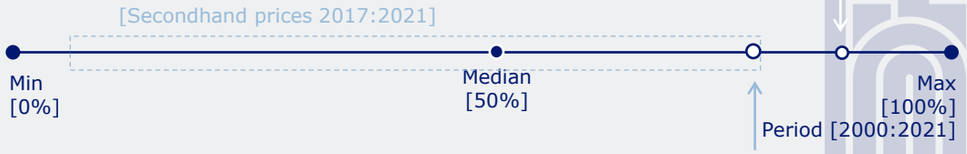
Handymax: Strong demand for minor bulk commodities lifted the segment, and prices and freight rates have increased markedly in 2021. As of October, the one-year timecharter rate stood at USD 29,800 per day, while the five-year-old secondhand price reached USD 31 million.

Handysize: In October 2021, the one-year timecharter rate was USD 29,000 per day, while the five-year-old secondhand price stood at USD 25 million.

DS:FUNDAMENTALS

MARKET CYCLE POSITION – November 2021

Freight rates are well above the median, and have increased by 105% in the past six months



Secondhand prices are well above the median and have increased 31% in the past six months

Growing coal demand, strong grain trade and financial stimulus packages caused global seaborne demand for Dry Bulk commodities to increase by 8% in the first three quarters of 2021 compared to the same period last year, while travel distances added 1.5% to demand growth. In the same period, fleet utilisation strengthened, as the Dry Bulk fleet expansion was limited to 3%, driven by a decrease in deliveries of new vessels.

Deliveries slowed, with 31 million dwt added to the fleet (3% of the fleet) in the first ten months of 2021 compared to 49 million dwt in 2020 (5% of the fleet).

Scrapping activity is on a downward trajectory, dropping from 16 million dwt in 2020 to 5 million dwt in the first ten months of 2021.

Contracting: After a 49% drop in 2020, the number of new orders is rising again. So far in 2021, 26 million dwt has been contracted compared to 21 million dwt in all of 2020. Investments in larger vessels are driving the upward trend.

Orderbook: The drop in the orderbook continues regardless of the uptick in ordering. The orderbook shrank by 10% in the first three quarters of 2021 and represents a modest 6% of the fleet.

Demand: Seaborne trade volumes declined by 2% in 2020. In the first ten months of 2021, demand returned and volumes were up 8% compared to the same period in 2020, driven by a rebound in coal and minor bulk commodities.

Travel distances increased by 1.5%, due to increased long-haul iron ore trade due to the China-Australia dispute.

MARKET DYNAMICS IN THE LAST SIX MONTHS

Freight rates are surging

Recovering market fundamentals and tailwind created by a range of temporary factors have paved the way for high Dry Bulk rates at levels not seen for years.

SKY-HIGH SPOT RATES

The Baltic Dry Index passed index 3,500 in August, entering territory not seen since 2009. The growth in spot rates has been highest on coal trade routes. Timecharter rates have followed the same trajectory. The average one-year timecharter rate is up by 37% on average since our last report in May.

COAL VOLUMES HAVE RETURNED

Increased coal trade has been the single most significant driver for the strong growth in freight rates. Compared to last year, the monthly average intake is up by 5.3% – close to 2019 levels – driven by growing energy demand and high gas prices in regions like Europe and Southeast Asia. The Panamax vessels have benefited the most from the surge in coal demand. Thus, Panamax volumes have increased by 22% since our May report.

LOW SCRAPPING ACTIVITY

The market recovery has kept scrapping activity low across segments. However, a slow inflow of new vessels has kept fleet growth in check. The fleet has expanded by 0.9% since May – the same as in the previous six months.

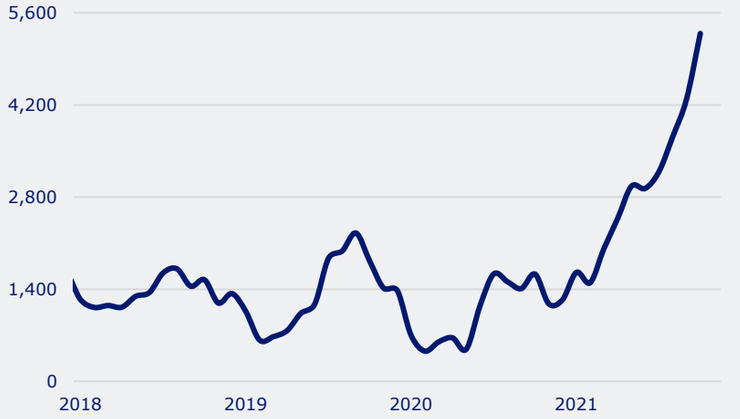
NUMBER OF DAYS IN PORT HAS INCREASED

The active fleet has been reduced by higher port congestion. In October, about 4% of the fleet was occupied in congestion, caused by vessels queueing up for discharge outside Chinese ports. Thus, the average waiting time for discharge in Chinese ports has increased from 2.9 days to 4.7 days since May – well above the five-year average of 2.1 days. Pandemic restrictions in Chinese ports are the main reason for the accumulation of vessel days in port.

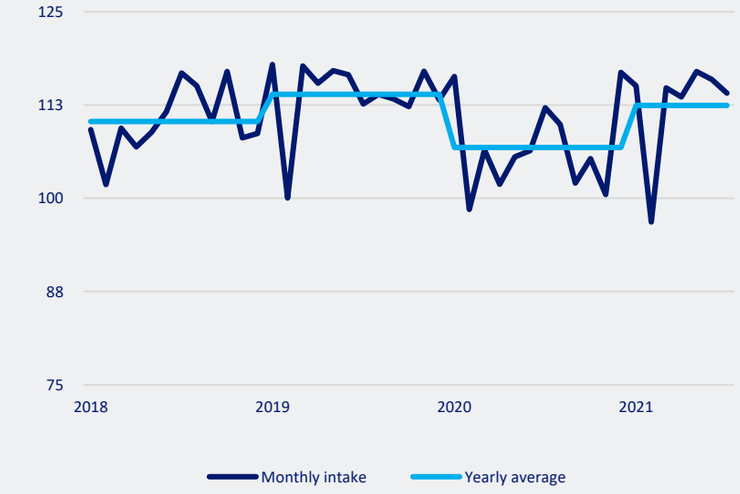
SECONDHAND PRICES INDICATE STRONG MARKET OPTIMISM

Even though the value of a one-year timecharter agreement for mid-sized vessels has increased markedly since May, it has not kept up with secondhand prices, indicating market expectations of either a long period of similarly high earnings or a shorter period of even higher earnings.

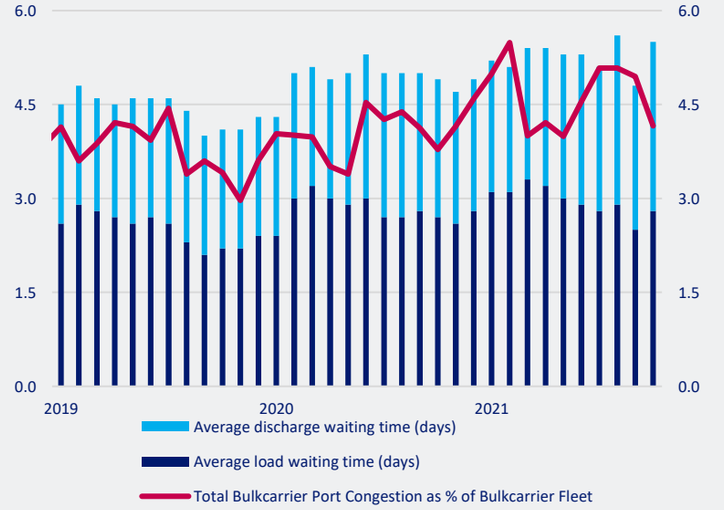
BALTIC EXCHANGE DRY INDEX (INDEX)



SEABORNE COAL VOLUMES (MILLION TONNES)



WAITING TIME IN PORT (DAYS AND PERCENTAGE OF FLEET)



Source: AXS Marine, Clarksons, Danish Ship Finance

SUMMARY: DRY BULK MARKET OUTLOOK

Strong fundamentals pave the way for a positive outlook, but demand risks are building

The short-term outlook appears promising across segments in Dry Bulk market, driven by low fleet growth and strong demand for most Dry Bulk commodities. The larger vessels face structural challenges which are dampening long-term expectations. The growth potential is being hampered by a shift away from coal and a possible stagnation in Chinese iron ore demand. Low fleet balancing potential exposes the larger vessels to risk, while a small orderbook provides opportunities for the small and mid-sized vessels.

The current strong market has the potential to continue in the short term. The inflow of new vessels is manageable, while the demand drivers appear strong. This overshadows the growing long-term demand risk, to which larger vessels in particular are exposed.

CONSTRAINS ON DEMAND KEEP A LID ON FREIGHT RATE GROWTH FOR THE CAPESIZE SEGMENT

While fleet growth before scrapping will slow in the Capesize segment in the coming years, the demand drivers seem fragile. With few scrapping candidates among mature vessels, there is little room for manoeuvre to rebalance available capacity without reducing the economic lifetimes of existing vessels. We expect demand to be hampered by a levelling-off of Chinese iron ore imports. Globally, post-Covid-19 financial stimulus programmes and longer distances could offset some of this, but not enough to prevent further pressure on market utilisation and earnings. Some of the pressure could be alleviated by increased demolition of younger vessels, shortening their economic lifetimes.

A BLURRED DEMAND OUTLOOK FOR PANAMAX VESSELS

Underlying the current high market, structural challenges are appearing for the Panamax segment. Contracting of Panamax vessels is growing on the back of a positive outlook for trade of grain and non-ferrous metals. However, coal demand is set to decline markedly over the coming decade. It is highly uncertain whether grain and non-ferrous volumes can compensate for this, and the rising contracting could tip the scales towards oversupply.

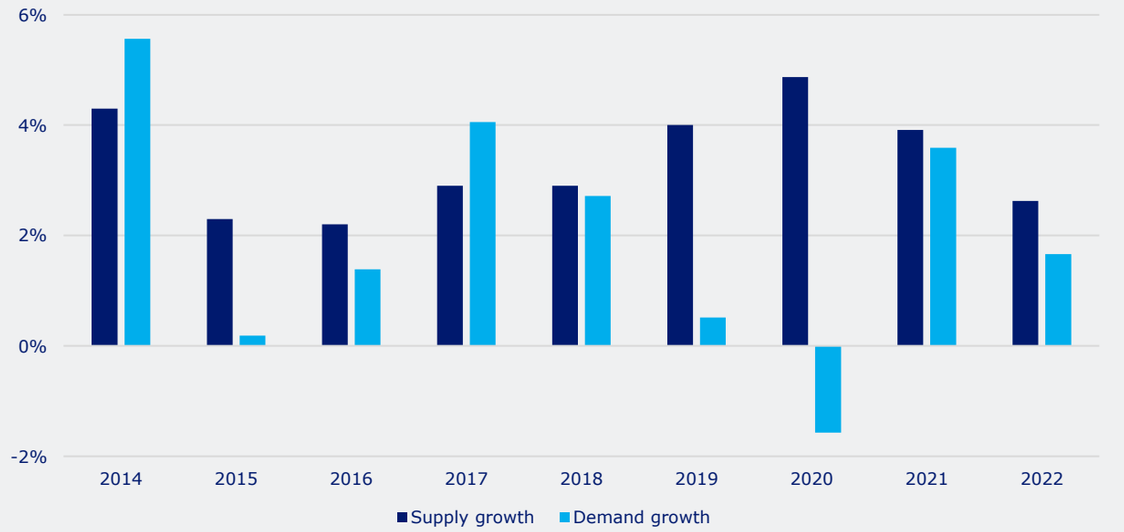
STRONG FUNDAMENTALS FOR SMALL AND MID-SIZED VESSELS

The Handysize and Handymax segments will benefit from slow fleet expansion in the coming years, combined with promising demand potential. Increasing investments in renewable technology will lead to growing demand for non-ferrous metals and strong grain trade, which will more than offset the lost coal volumes. We therefore expect demand to run ahead of supply if contracting activity is kept at a modest level.

RISING INVESTMENTS IN LNG AS A TRANSITION FUEL

The key to zero-carbon shipping is yet to be found, which has dampened investors' appetite for new vessels and led to an orderbook-to-fleet ratio at historically low levels. Now, Capesize owners are starting to invest in LNG as a transition fuel. Thus, we expect fleet growth to increase again for larger vessels by the end of 2023. For the majority of the Dry Bulk market, operating tramp shipping, LNG or other transition fuels seems unfavourable. This should keep new investments in small and mid-sized vessels low during the coming years.

SUPPLY AND DEMAND BALANCE (DWT AND TONNES)



Source: Clarksons, Danish Ship Finance

DRY BULK FLEET OUTLOOK

Low fleet growth will shape the segment in the coming years

A small orderbook will keep fleet growth low in the next 12-18 months, but a renewed appetite for investing in newbuildings could increase long-term fleet growth.

LOW FLEET GROWTH IN THE SHORT TERM

A historically low orderbook means fleet growth will be manageable in most parts of the Dry Bulk market in the coming years. In 2021 and 2022, the fleet is set to grow by 4% and 3%, respectively, before scrapping. In 2022, we expect the active fleet to grow by an additional 3% as port congestion eases.

A LACK OF SCRAPPING POTENTIAL IN THE CAPESIZE FLEET

The inflow of new vessels to the Capesize fleet will slow in the coming months, but a lack of scrapping candidates will keep fleet growth at a moderate level. Only 39 Capesize vessels are older than 20 years – of these, 14 are due for special survey next year. These vessels represent 0.7% of the existing fleet capacity. Scrapping these will only reduce Capesize fleet growth to 3.7% by the end of 2022. In addition, we expect Capesize scrapping activity to be even less, as the current high market makes it less attractive for owners to scrap their vessels. This exposes the Capesize vessels to increased risk of unemployment if future demand growth fails to materialise.

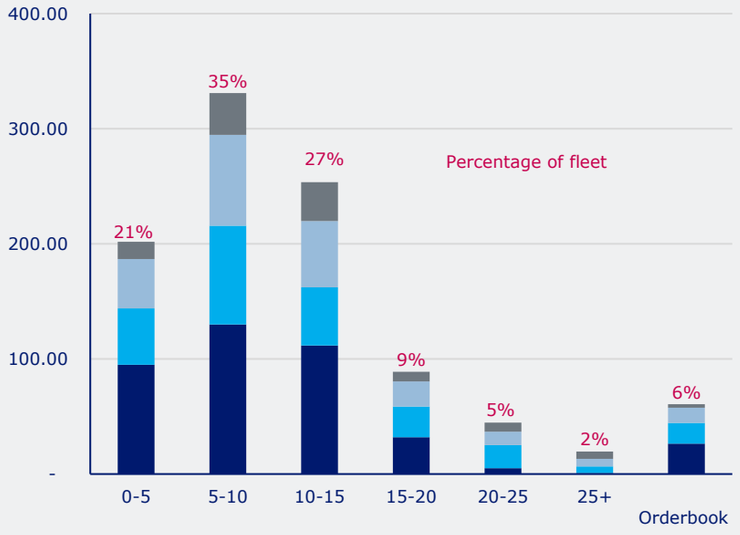
A CONSTANT INFLOW OF MID-SIZED VESSELS

In contrast to the Capesize fleet, the inflow of new Panamax and Handymax vessels will remain stable over the coming 14 months. By 2022, 145 and 178 vessels (corresponding to 3% and 4% of the fleet) will enter the Panamax and Handymax fleets, respectively. The rebalancing potential is promising, but this is likely to be neutralised by 2-4% growth in the active fleet as waiting time in ports normalises. Thus, we expect the mid-sized fleet to continue expanding by 3-4% in the coming years.

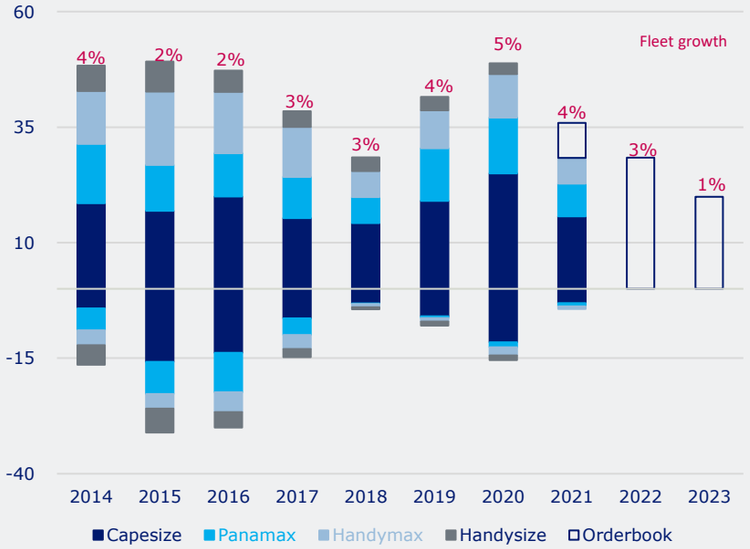
AN INCREASE IN LONG-TERM FLEET GROWTH

Some of the unusually high Dry Bulk earnings currently are being reinvested in newbuilding contracts. By October, contracting activity was up 55% versus the same period last year, driven by the Capesize and Panamax segments. The orderbook will grow by approximately 2 percentage points if this trend continues until year-end. We believe this trend will continue in 2022. Consequently, we expect fleet growth to increase from 2024 onwards.

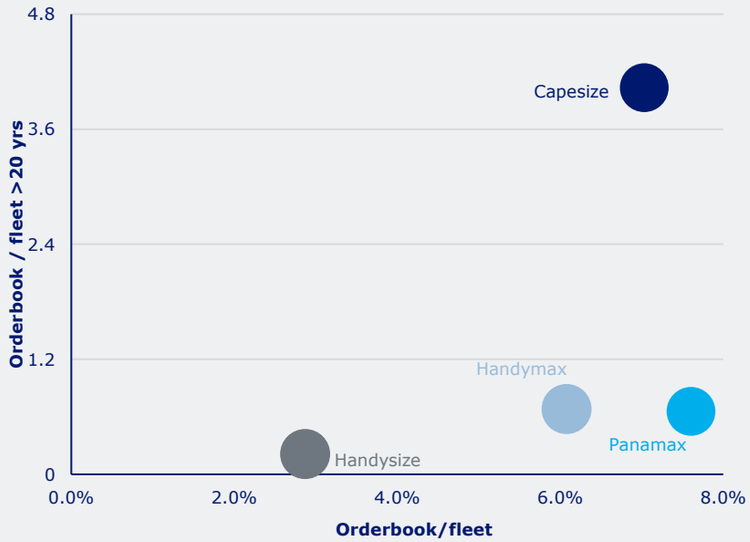
AGE DISTRIBUTION OF FLEET (MILLION DWT)



FLEET DEVELOPMENT (MILLION DWT)



FLEET RENEWAL POTENTIAL (DWT)



Source: Clarksons, Danish Ship Finance

FLEET DEEP DIVE: RENEWED INVESTMENT APPETITE

A new increase in contracting of large vessels

The Capesize and Panamax segments drives the rising contracting activity. While the Panamax contracts can be explained by demand optimism, Capesize contracts can be attributed to the appetite for investing in LNG-fuelled vessels.

HISTORICALLY LOW ORDERBOOK-TO-FLEET RATIO

The investment appetite in the Dry Bulk market has been low since 2019, owing to uncertainty over future zero-carbon fuels and vessel design. This caused the orderbook-to-fleet ratio to reach a historical low of 6.2% in October. However, rising contracting activity indicates that the appetite is slowly returning.

INCREASING CONTRACTING ACTIVITY

Contracting activity bottomed out at the beginning of the year, when the annualised contracting-to-fleet ratio dropped to 2.3%. Since then, the ratio has regained momentum and increased to 3.1%, driven by the Capesize and Panamax segments. For both segments, annualised contracting activity reached around 4% of the fleet in October 2021 – the highest level since the start of 2020.

LARGE VESSELS DOMINATE PANAMAX CONTRACTS

Kamsarmax vessels account for some 84% of all vessels contracted in the Panamax segment over the past year. These vessels are favoured due to their large size and trading versatility, as well as the strong outlook for grain and non-ferrous metals.

GROWING DEMAND FOR LNG-DRIVEN CAPESIZE VESSELS

In the Capesize segment, contracting activity is primarily being driven by investments in LNG-powered vessels. LNG can be attractive as a transition fuel for some Capesize owners operating on long contracts at destinations where LNG bunkering supply is available.

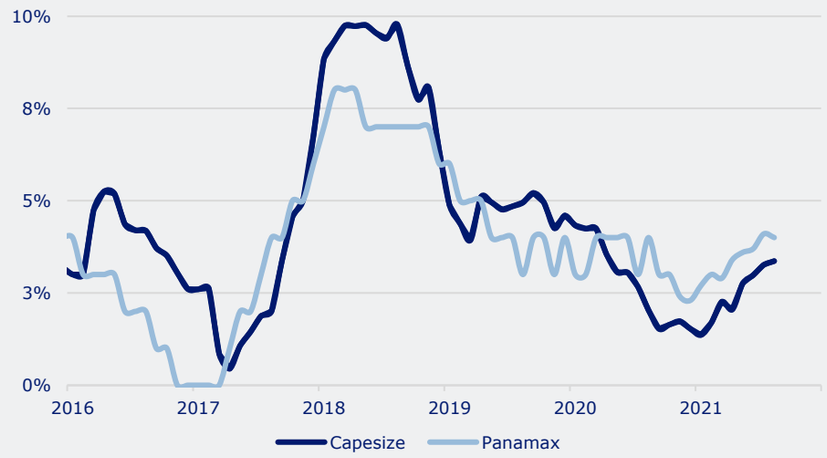
UNEQUAL REBALANCING POTENTIAL

If contracting maintains its current momentum, the Capesize and Panamax fleets may see capacity expand by an average of 3-5% in 2023 and 2024. In the absence of future demand growth, the Panamax segment could rebalance available capacity by scrapping older vessels. In contrast, the Capesize segment is quickly running out of older vessels, which may force premature scrapping.

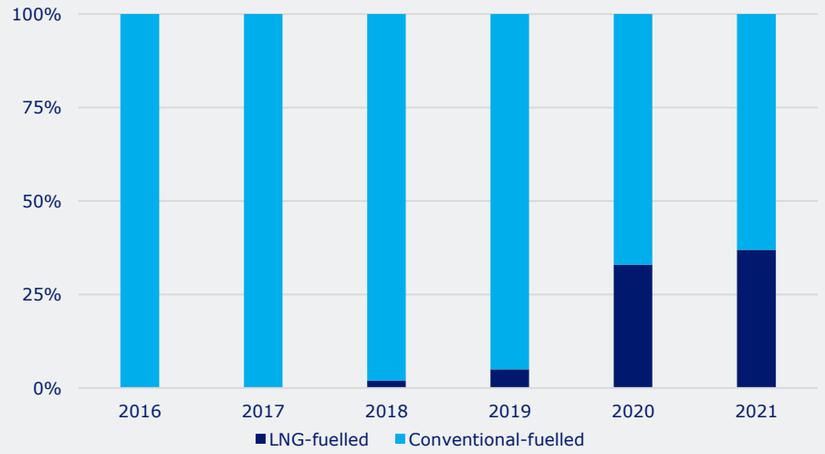
AN EXPENSIVE INVESTMENT

When the Carbon Intensity Indicator regime is implemented in 2023, LNG-fuelled vessels could reduce their CII rating by approximately 20%. However, conventional-fuelled vessels obtaining a lower rating could be compliant by reducing speeds, optimising technical performance or blending with biofuels. This could devalue the business case for LNG-driven vessels. The premium for an LNG Capesize vessel is up to 30%, while bunker costs for LNG and VLSFO vessels are at similar levels. In addition, the risk of a new and less polluting fuel emerging is increasing. The development and scaling-up of green methane fuel suitable for LNG engines could enhance the business case, but investing in LNG-fuelled vessels seems expensive for owners currently, and also increases the available capacity in the long term, when the demand outlook is rather bleak.

CAPESIZE AND PANAMAX CONTRACTING-TO-FLEET RATIO (DWT)



ENGINE FUEL TYPES IN NEW CAPESIZE CONTRACTS



Source: DNV GL, Clarksons, Danish Ship Finance

DRY BULK DEMAND OUTLOOK

Demand is growing fast in the short term, but risks are accruing

The structural challenges for larger vessels remain, despite the short-term peak in demand. The demand drivers for mid-sized vessels look more robust.

A SLOWDOWN IN VOLUME GROWTH

In 2021, demand volumes are set to grow by around 3.5%, boosted by a rebound in industrial activity and energy consumption. We expect the rebound effect to fade at the beginning of 2022. Consequently, growth in demand volumes is set to increase by 1-2% in 2022, although longer distances could add around 0.5 percentage points.

FUTURE DROP IN ASIAN DEMAND GROWTH FOR COAL

The current boom in coal volumes is likely to be short-lived and we expect growth rates to slow within the next six months. Volumes could increase slightly in the coming years, but closures of old coal-fired power plants in Europe and China's pledge to stop building new coal-fired plant will lead to a gradual reduction in coal demand by mid-20s. This long-term risk is largest for Panamaxes, where coal accounts for 50-60% of trades.

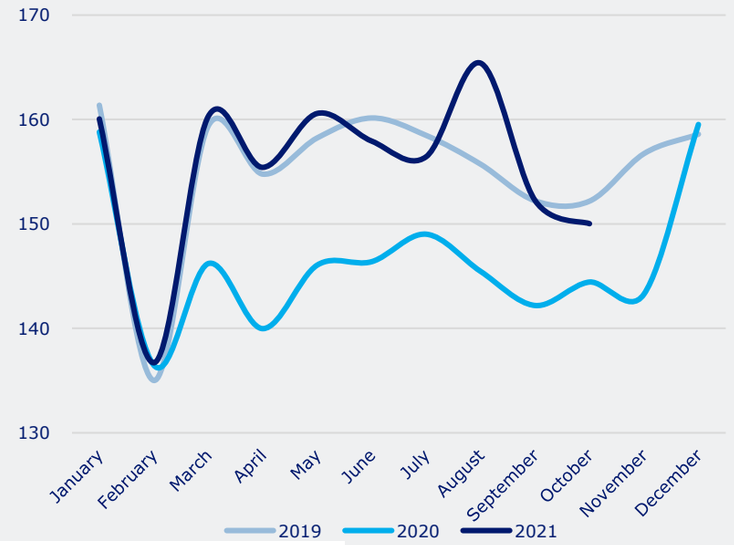
GROWTH OPPORTUNITIES FOR MID-SIZED VESSELS

Non-ferrous metals and grain trade provides opportunities for the mid-sized segments. In the coming years, strong grain supply and growing Chinese demand for feedstock are set to boost grain trade, while rising investments in renewable technologies are likely to propel demand for non-ferrous metals. We expect demand for Panamax and Handymax vessels to grow by 3-4% in the coming years, driven by grain and non-ferrous metals trade.

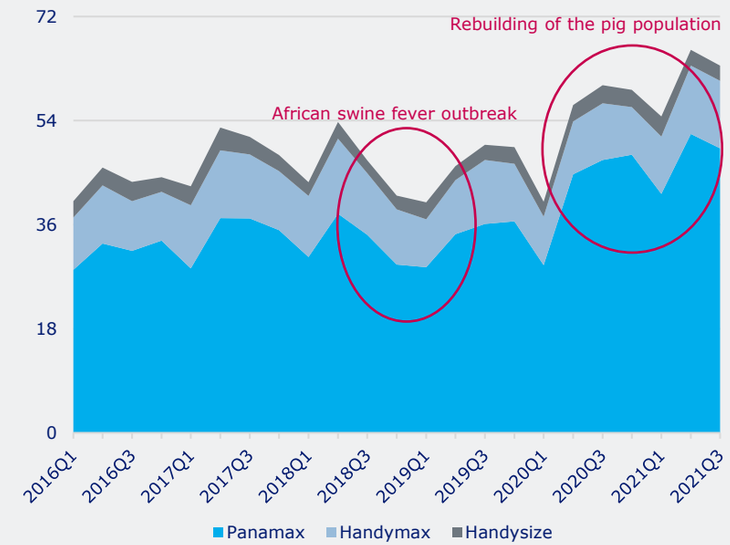
THE INCREASE IN CAPESIZE DEMAND IS SET TO SLOW

Iron ore and coking coal for steel production account for around 75-80% of Capesize demand – most is discharged in China. However, China is set to increase its use of scrap steel in the steel-making process, while the Chinese economy is becoming less steel-intensive and construction activity is slowing. This indicates that future growth in Chinese iron imports will level off in the coming years. We expect India and Southeast Asian countries to increase imports of Capesize commodities due to economic stimulus, but not enough to drive future growth. Consequently, Capesize volumes are set to increase by 1-2% this year and next and by 0-1% in 2023.

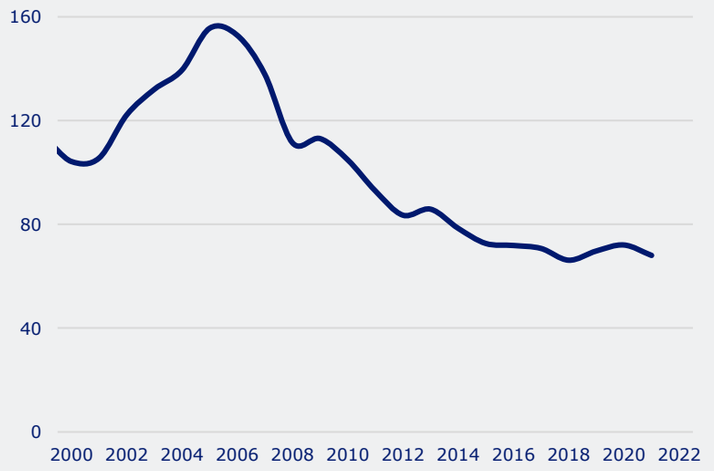
SEABORNE COAL VOLUMES (MILLION TONNES)



GRAIN TO CHINA AND SOUTHEAST ASIA (MILLION TONNES)



CHINA GDP STEEL INTENSITY (TONNES STEEL PER USD MM)



Source: AXS Marine, Clarksons, World Steel Organisation, National Bureau of Statistics of China, Danish Ship Finance

DEMAND DEEP DIVE: CHANGING CHINESE SOURCING OF DRY BULK COMMODITIES

The relationship between Australia and China is vital to the Dry Bulk market

The busiest Dry Bulk trade route is being hit by a trade dispute. In the immediate future, this could hamper demand growth for Panamax vessels. The conflict could spread to the Capesize market, but in the event of this demand could be boosted via longer distances.

CHINESE AND AUSTRALIAN TRADE IS A MAJOR DRIVER FOR THE DRY BULK MARKET

Nowhere else in the world is Dry Bulk cargo moved more than between Australia and China. Australia has been the largest supplier of coal, iron ore and bauxite to China. To support free trade, the China-Australia Free Trade Agreement was introduced in December 2015. From 2016 to 2021, Dry Bulk trade flows between the two countries increased at a CAGR of 3%, primarily driven by iron ore, coal and bauxite volumes. In 2020, Capesize and Panamax vessels moved 750 million tonnes (primarily iron ore) and 92 million tonnes (primarily coal and bauxite) from Australia to China, respectively. This corresponds to 43% of the Capesize market and 8% of the Panamax market.

CHINESE EMBARGO ON AUSTRALIAN COAL

The political relationship between the two countries deteriorated severely at the end of 2020, when Australia called for an independent investigation into the origin of the coronavirus in China. This resulted in a Chinese embargo on a range of Australian products, including coal. Consequently, Australian Dry Bulk exports to China dropped by 14% in the first eight months of 2021 compared to the same period last year.

DECREASING SEABORNE COAL VOLUMES

Instead of reaching Chinese shores, Australian coal has been diverted to India, where demand for coal is high due to skyrocketing gas prices. This has increased the average travel distances for vessels carrying Australian coal. On the other hand, China is ramping up imports of coal from Indonesia, which offsets the distance gains from the Indian imports of Australian coal. The real damage to the Dry Bulk market is being done by increased Chinese imports of Mongolian coal – transported by inland waterways and rail. The actual demand effect on seaborne coal volumes is masked by the global rebound in coal demand, but the increased coal volumes from Mongolia to China could reach 1% of all seaborne coal volumes. Once global coal demand normalises, we believe Mongolian coal exports will increase their market shares in China at the expense of seaborne volumes and the heavily coal-exposed Panamax segment.

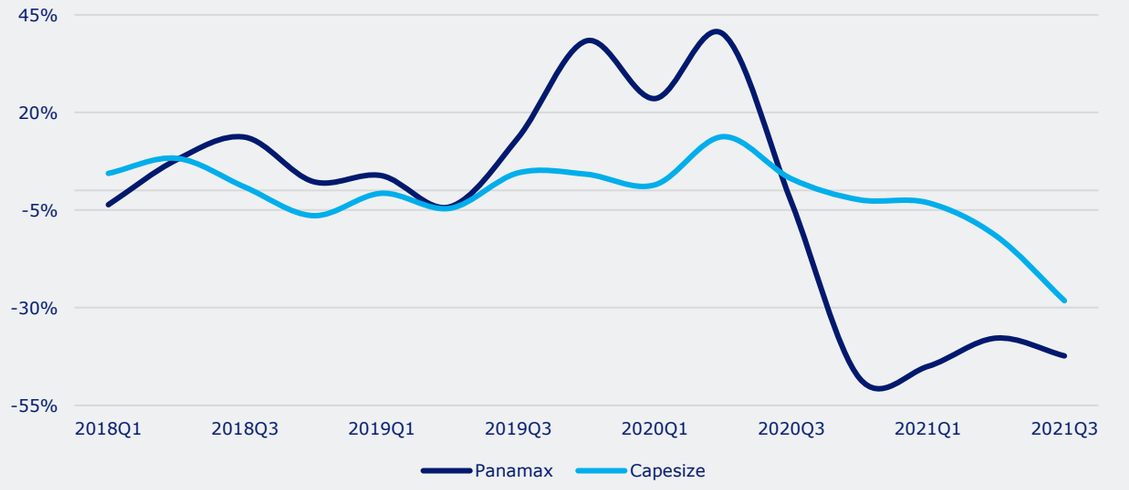
IS IRON ORE TRADE NEXT?

China is currently dependent on Australian iron ore to serve its growing steel production, but this may not last. Already, we are seeing declining Australian iron ore volumes to China. Unexploited reserves of iron ore in Guinea and an expansion of Brazilian iron ore production could substitute up to 40% of Australian iron ore exports to China, given our expectation of zero growth in Chinese iron ore demand from a long-term perspective. In contrast to the coal embargo, the Dry Bulk market will benefit from this. It will lead to longer travel distances, which could increase tonne-mile demand for Capesize vessels by approximately 4% compared to 2020 levels.

THE DRY BULK MARKET IS EXTREMELY EXPOSED TO CHANGES IN CHINESE POLICY

The decline in Dry Bulk volumes as a result of the trade dispute between China and Australia, highlights the market risk of being highly exposed to a single country. Around 40% of all Dry Bulk commodities are shipped to China. The country's foreign policy is therefore vital to the Dry Bulk market and shipowners should continue to monitor it closely in the coming years.

DRY BULK VOLUME GROWTH BETWEEN CHINA AND AUSTRALIA, YEAR-ON-YEAR (TONNES)



Source: AXS, Marine, Australian Department of Foreign Affairs, MIIT Wood Mackenzie, Danish Ship Finance

CRUDE TANKER

CRUDE TANKER

A slow recovery following the initial rebound

In the first ten months of 2021, global oil demand was 4.5% lower than in the same period in 2019, still suppressed by cross-border travel restrictions and regional lockdowns. The overflow to Crude Tanker demand was more severe with a 7% fall, as long-haul seaborne exporters continued to take on the majority of the production cuts to keep prices from falling. Looking ahead, we expect demand to increase steadily during the winter, but the increased vessel supply looks set to prevent any extended rise in prices. We see little potential for a sustainable rise in freight rates until late 2022. Between 2023 and 2026, we expect oil demand to increase steadily, but in the Crude Tanker markets most of this will be met by expanding refinery capacity in oil-exporting countries.

FREIGHT RATES AND SECONDHAND PRICES

Since our last report in May, spot earnings have remained soft, with short periods of above-median rates seen mainly for small and fuel-efficient vessels. Secondhand prices have been rising due to positive sentiment in the wake of vaccine rollouts and rising replacement costs. Low timecharter rates indicates that the market will be unbalanced during the next 12 months.

VLCC: Long-haul trades have been weighed down by OPEC exports having been 20% lower in the first ten months of 2021 than in the same period in 2019. Since our May report, the slow reversion of OPEC's production has caused the one-year timecharter rate to drop 16% to USD 19,000 per day, while high replacement costs have kept the price of a five-year-old vessel constant at USD 70 million.

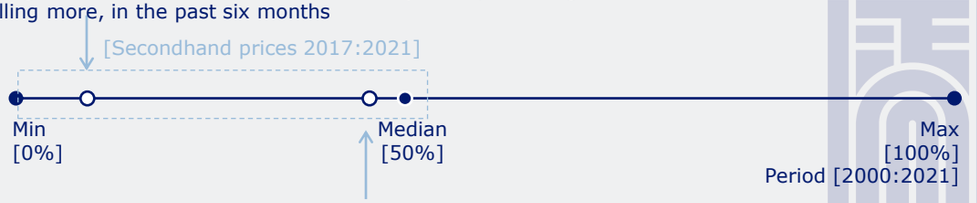
Suezmax vessels have been enjoying rising volumes and surpassed 2019 levels by the third quarter of 2021. However, a growing fleet and cascading effects from VLCCs have curbed freight rates. The one-year timecharter rate has declined by 7% to USD 16,250 per day, while the secondhand price for a five-year-old vessel has been stable at USD 48 million.

Aframax vessels have seen the strongest demand growth on key routes, but cascading effects from larger vessels have curbed freight rates. The one-year timecharter rate is down 7% to USD 14,900 per day, while the price of a five-year-vessel was stable at USD 40 million.

DS:FUNDAMENTALS

MARKET CYCLE POSITION – November 2021

Freight rates are low and have declined by 2-8%, with large vessels falling more, in the past six months



Secondhand prices are close to the median and have remained stable in the past six months

Tonne-mile demand for seaborne crude oil dropped by 1% in the first ten months of 2021. This was primarily driven by a reduction in long-haul trade, which meant that Tanker demand declined by 3%. Despite support from a slightly better CPP market, utilisation weakened further, as the fleet expanded by 2%. Utilisation improved sightly towards the end of the period in anticipation of winter, but remained well below 2019 levels.

Deliveries: 14 million dwt was delivered in the first ten months of 2021, with three million expected during the final two months, implying a total on a par with the 17 million delivered in 2020. Deliveries look set to soar in 2022.

Scrapping: Scrapping activity more than doubled in the first ten months compared to the level seen for the whole of 2020. Scrapping may increase further due to low earnings.

Contracting: New orders soared in the first quarter, but have since then been muted due to rising newbuilding prices caused by low yard availability.

Orderbook: 37 million dwt is currently on order, a 7% decline since the start of the year. This represents 8.5% of the fleet, with 40% to be delivered by the second half of 2022.

Demand: Seaborne crude oil volumes have increased throughout the year as oil demand has returned. Volumes in the third quarter almost reached those in the same period in 2019.

Travel distances: Long-haul trades suffered greatly in the second and third quarters due to OPEC cuts, but also as Asian demand was low relative to last year. This has caused distances to be 4% lower than in 2020.

MARKET DYNAMICS IN THE LAST SIX MONTHS

The market has recovered unevenly across regions

Tanker demand has increased slightly, but growth has switched from Asian to OECD imports – increasing short-haul trade. Asian fuel demand has been low, as the Covid-19 Delta variant has spread fast. Vessel supply has risen despite a pick-up in demolitions.

SUPPLY-SIDE CONTRACTIONS ARE NOT ENOUGH

Despite demolition activity in the first six months topping the 2019 and 2020 levels combined, the vessel oversupply is still massive. Deliveries have declined but still outnumber scrapping by a factor of two in 2021. This led the fleet to grow by 2% in the first ten months of 2021.

CONTRADICTORY PRICES AND EARNINGS MUTE NEW ORDERS

Freight rates have dwindled and secondhand prices have stagnated, while newbuilding prices have soared in the last six months. This has been caused by rising construction costs and low yard availability. As a result, new orders have come almost to a complete standstill, with just 3.5 million dwt ordered in the past seven months compared to 10 million dwt in the first quarter.

WEAK ECONOMIC GROWTH IN ASIA HAS KEPT OIL DEMAND LOW

Asian oil imports have been steadily declining over the last six months, with the third quarter seeing the lowest levels since 2018. This was caused by a mix of high inventories and a rapid spread of the Delta variant resulting in strict lockdown policies in many regions. Despite demand for Asian goods from the US and Europe supporting oil demand, Asia's seaborne imports in the last six months were 8% lower than in the same period in 2020.

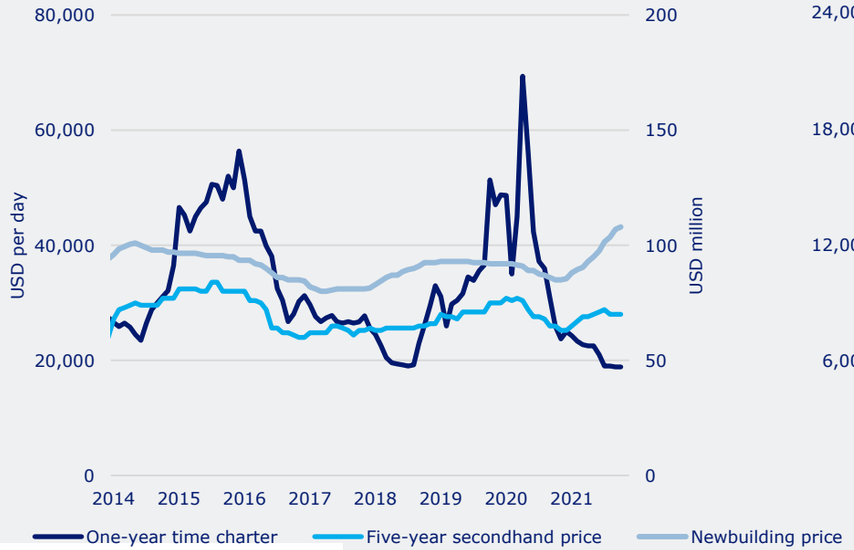
US SUMMER DRIVING SEASON FOLLOWED BY DELTA VARIANT

US crude oil imports reached the highest level in two years between May and June, but after a summer with few restrictions, only domestic holidays permitted and low oil production, the Delta variant took hold and many states reintroduced restrictions to curb mobility.

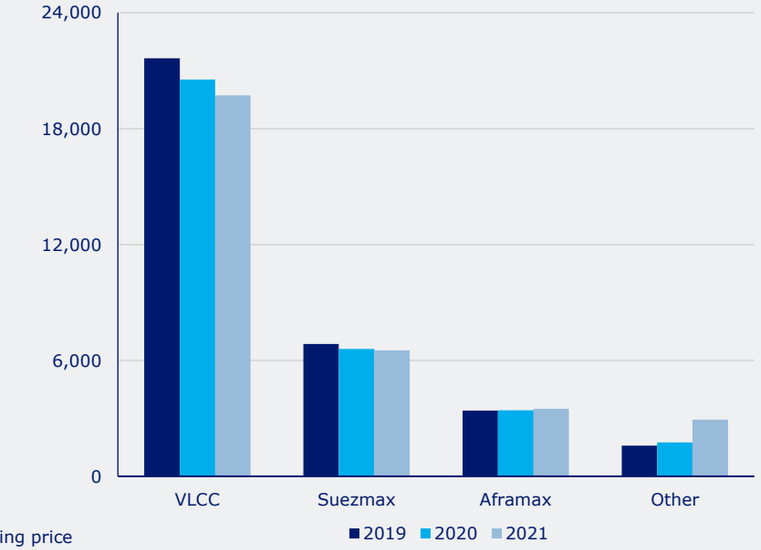
VLCCS ARE WEIGHING SMALLER VESSELS DOWN

VLCC volumes have been steadily rising, but from low levels as OPEC export cuts have translated almost directly to VLCC trades. Aframax and Suezmax routes have been steadier, but internal competition and cascading have kept earnings low on these trades as well.

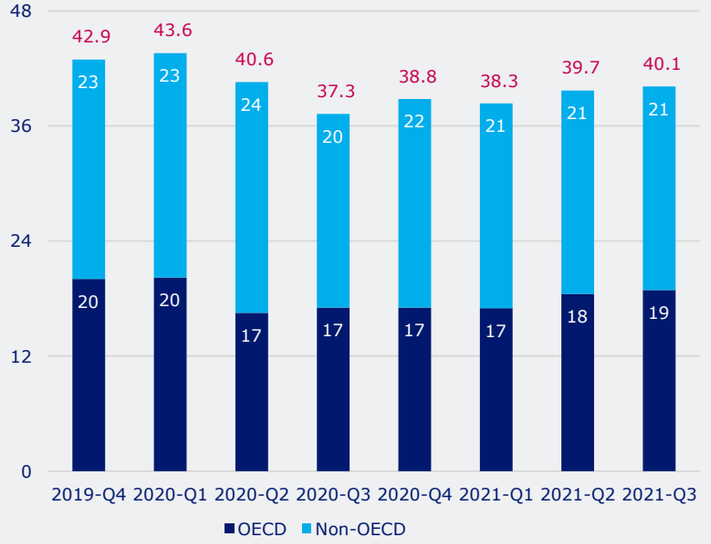
VLCC TIMECHARTER AND VESSEL PRICES



TANKER DEMAND (THOUSAND TONNE-MILES PER DAY)



SEABORNE CRUDE TANKER IMPORTS (MILLION BPD)



Sources: Clarksons, Alphatanker, Danish Ship Finance

SUMMARY: CRUDE TANKER MARKET OUTLOOK

A sustainable recovery still seems a year away

The recovery in demand for Crude Tankers will continue throughout the winter, with an extra boost from high natural gas and coal prices, but we expect the continuous expansion in the fleet to prevent any extended rise in freight rates. Following a seasonal downturn in the spring, expectations for the second half of 2022 are positive, with oil demand surpassing pre-Covid levels, but a much larger fleet awaits.

TANKER DEMAND WILL CONTINUE TO TREND UPWARDS THROUGHOUT THE WINTER

80% of oil demand comes from countries that have yet to achieve any kind of herd immunity. The vaccine rollout continues to accelerate in developing countries and countries unable to obtain herd immunity have found ways to return to a semblance of normal life. Still, uncertainty looms regarding further lockdowns as people spend more time inside. However, we expect the trend of rising tonne-miles in the last six months to continue throughout the winter, especially as gasoil will be used to replace insufficient amounts of natural gas in some areas, followed by a seasonal downturn in the spring.

AN EXTREMELY FRONT-LOADED ORDERBOOK WILL BE REPLACED BY A STABLE SUPPLY OUTLOOK

Extreme levels of ordering of Containerships and LNG Carriers has reduced available shipyard capacity at preferred Crude Tanker shipyards until late 2024. Up to the end of 2022, vessels corresponding to 6% of the fleet are due to be delivered. We have also identified scrapping candidates equal to 6% of the fleet. Still, demolition of these vessels would provide little support for freight rates, since only half of them are actively trading. In 2023, the orderbook will deteriorate sharply, while we expect demand to breach 2019 levels by a few percent. Freight rates are therefore likely to increase from 2023 (if owners refrain from ordering vessels at second-tier yards and continue to scrap older vessels).

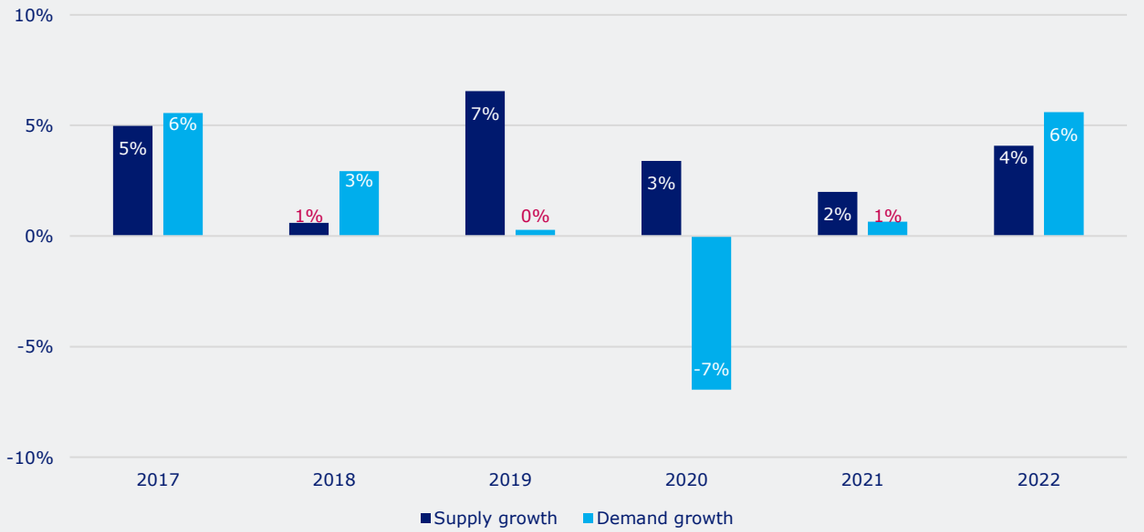
CHINESE SEABORNE OIL IMPORTS COULD BE CLOSE TO PEAKING

Recent restrictive actions taken against private Chinese refineries seem to be a first step in trimming excess capacity in the industry. It seems unlikely that China will strengthen its position as a regional refining hub. The initial impact on tankers may be small, as we expect state entities to fill the gap, but steps towards reducing refined oil product exports seem inevitable. Chinese oil consumption is expected to grow by just one million bpd before peaking in 2026. China exports around the same amount of CPP. Therefore, actions taken to eliminate these could bring Chinese seaborne oil imports close to a peak.

TANKERS RELY ON OIL DEMAND RISING AS REFINERY EXPANSION WILL HAVE NEGATIVE EFFECT

Refineries in export countries are designed to run largely on domestic oil, and with state interests involved we do not expect large amounts of alternative grades to be imported. The refinery expansion countries could therefore lower seaborne crude oil volumes by two million bpd in the next three years (5% of 2019 volumes). This means that growth in seaborne crude demand from import countries seem to be less than one million bpd. However, whereas the expansion in import countries will mainly affect VLCCs, half the contraction in export countries will impact smaller Tankers. This indicates a stronger outlook for long-haul trade than short-haul for both Crude and Product Tankers.

SUPPLY AND DEMAND BALANCE (DWT AND TONNE-MILE)



Sources: Clarksons, Danish Ship Finance

CRUDE TANKER FLEET OUTLOOK

Short-term pain, medium-term gain

The orderbook is dwindling rapidly and low yard availability is postponing potential fleet renewal. The fleet is likely to expand ahead of demand this year and in 2022, but fleet utilisation is expected to improve from 2023.

THE ORDERBOOK OUTWEIGHS SCRAPPING POTENTIAL

The orderbook is currently low, representing 9% of the fleet, but will add to the excess capacity in the market. The fleet is scheduled to expand by 6% by year-end 2022. We have identified scrapping candidates also representing 6% of the fleet for this period.

CONTRACTING IS EXPECTED TO STAY LOW

Just six yards have delivered 90% of VLCCs during the last five years. These yards are currently occupied with building Container and LNG Carriers until 2024. Hence, there is little room for new VLCCs to enter service from these yards in that period. This has further inflated newbuilding prices and may lead to owners holding on to existing tonnage or seeking out the secondhand market.

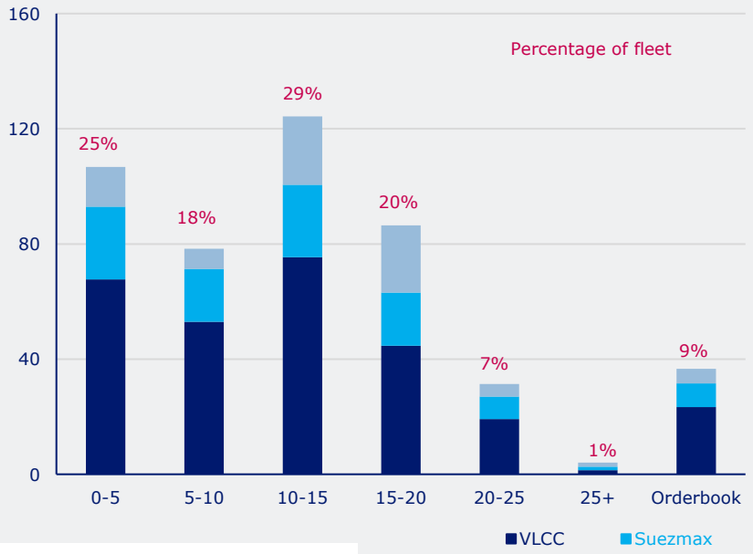
DEMOLITION ACTIVITY MAY HAVE LIMITED IMPACT ON RATES

Some of the identified scrapping candidates have been employed as floating storage and others to handle sanctioned oil. These factors are expected to level off, exposing vessels to demolition, but the effect on utilisation from scrapping these vessels will be small. In addition, the remaining scrapping candidates travel less than half as much as young vessels in terms of tonne-miles. We therefore estimate that demolition may only reduce the fleet by around 3% before end-year 2022. For freight rates to increase before the end of 2022, demand will have to outpace current expectations, or more (and younger) vessels will need to be scrapped.

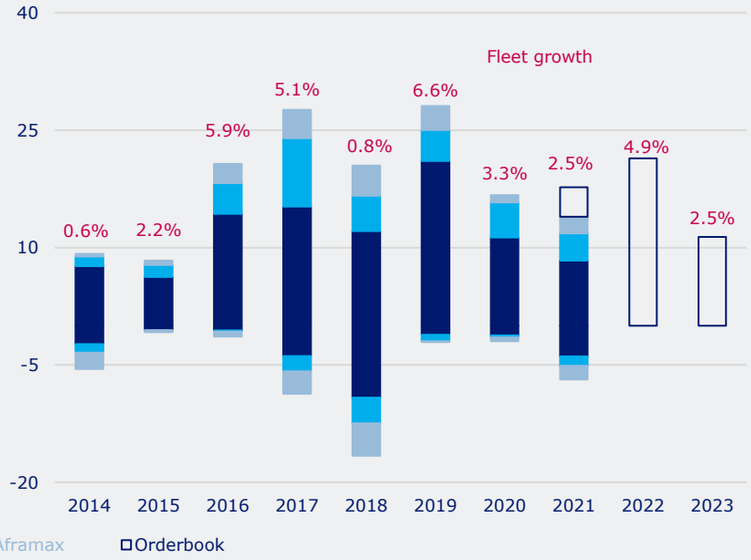
DUAL-FUEL ENGINES WITH LNG ARE POPULAR AMONG VLCCS

The energy transition creates a bleak long-term outlook for fossil fuels in general and vessels transporting fossil fuels in particular. Still, some owners are aiming to help the transition by ordering LNG-fuelled VLCCs. This is a relatively new occurrence: 12 months ago, only three vessels, representing 5% of the orderbook, were LNG fuelled, while this number has grown to 21 vessels representing 30% of the orderbook. LNG has been tested among Aframaxes for a few years, while Suezmaxes have not gone in that direction yet to any large degree.

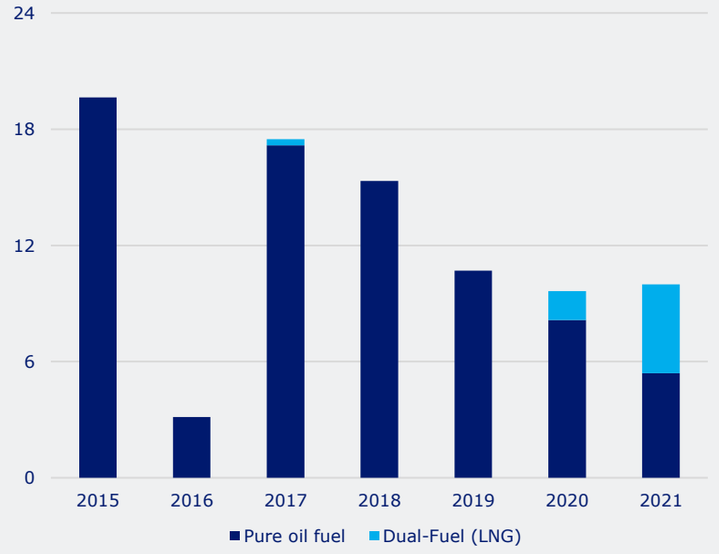
AGE DISTRIBUTION (MILLION DWT)



FLEET DEVELOPMENT (MILLION DWT)



CONTRACTING ACTIVITY BY ENGINE TYPE (MILLION DWT)



Sources: Clarksons, Danish Ship Finance

FLEET DEEP DIVE: SHIPYARD OUTLOOK

Container and LNG orders are limiting VLCC yard capacity, which may support future earnings when demand returns

The combination of a front-loaded orderbook and a lack of available yard capacity is creating an abnormal situation where prices are rising despite low earnings. The low yard availability is pushing newbuilding prices upwards, while the market's strong preference for young and fuel-efficient fleets is supporting secondhand prices through increased replacement costs.

PREFERRED YARDS ARE FULL FOR LARGER VESSELS

Six yards representing 25% of global yard capacity have built 90% of all VLCCs since 2015. Their orderbooks reveal close to fully booked capacity until mid-2024, longer if remaining purchase options are exercised. Large LNG Carriers and Containerships are taking up 75% of capacity at these yards. Similar trends can be seen for Suezmaxes, while Aframaxes are less affected.

SHIPYARDS WILL NOT EXPAND CAPACITY

Shipyards have been struggling to handle surplus capacity during the past decade. A group of first-tier yards, including the six yards building VLCCs, have been growing via horizontal integration to obtain economies of scale but also to reduce capacity in the market. The yard industry is becoming less fragmented and individual yards are becoming more specialised. Most owners seem reluctant to order vessels at less specialised yards. There are few signs of yard capacity expanding, but some second-tier yards could be employed to support production at first-tier yards.

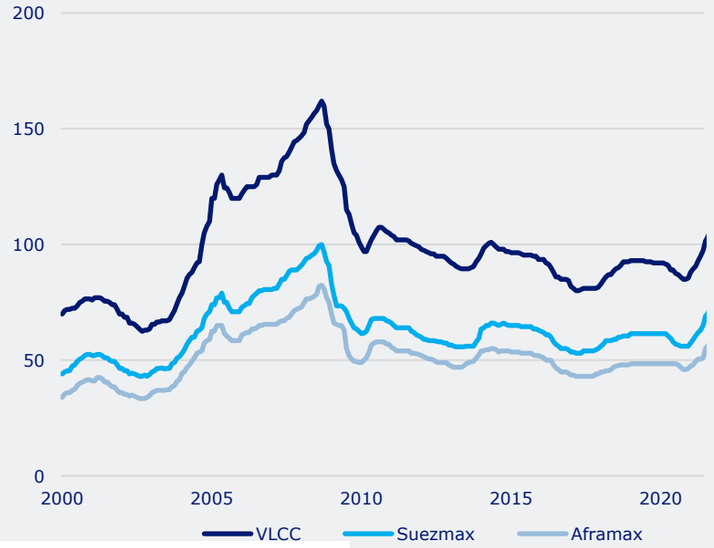
REVERTED RELATIONSHIP BETWEEN SHIP PRICES

The combination of low availability and increasing construction costs have sent newbuilding prices for all Crude Tankers to a twelve year high. The high replacement costs have trickled through to secondhand prices for young vessels to some degree, despite the current low earnings environment.

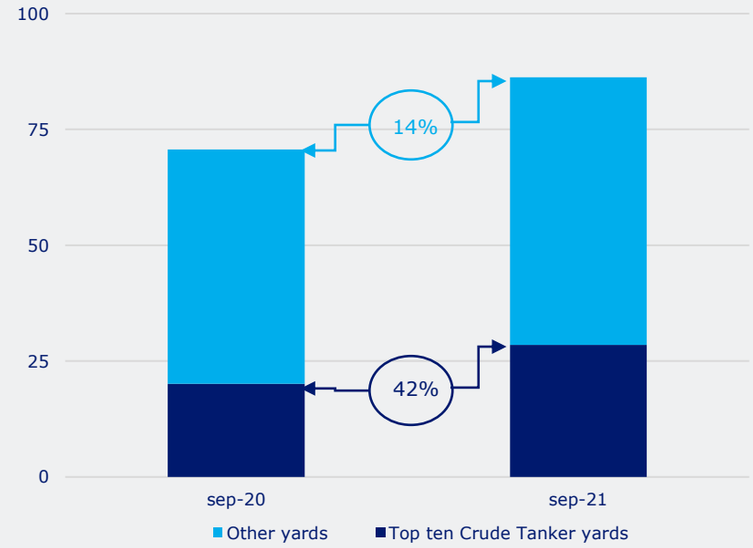
THE OUTCOME SEEM TO BE VERY SUPPORTIVE OF EARNINGS

The low yard availability is creating some adverse short-term dynamics where secondhand prices are disconnected from earnings but could be sowing the seeds for a period of strong earnings starting as early as the second half of 2023 and onwards if owners refrain from ordering vessels at second-tier yards with available capacity.

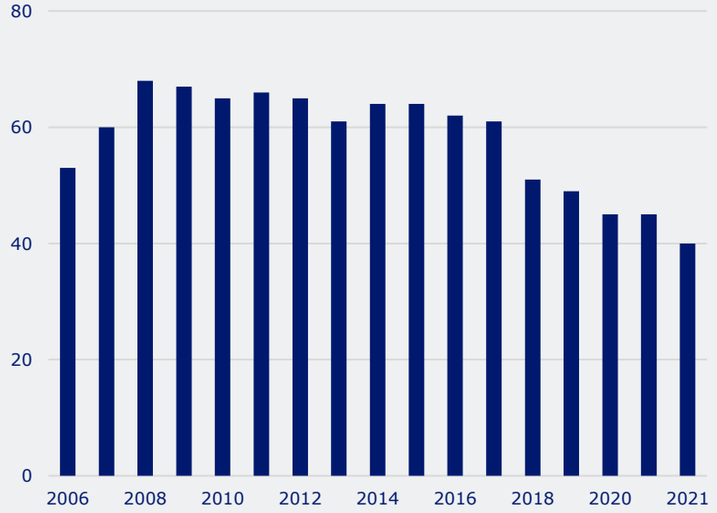
NEWBUILDING PRICES (USD MILLION)



GLOBAL ORDERBOOK (MILLION CGT)



ACTIVE SHIPYARDS WITH CRUDE TANKER EXPERIENCE



Sources: Clarksons, IEA, Alphatanker, Danish Ship Finance

CRUDE TANKER DEMAND OUTLOOK

Production, refining and consumption locations are more important than ever

Global oil demand is expected to grow towards 2025, driven by non-OECD countries, but a reduction in OECD demand and the relocation of refinery capacity closer to crude production may limit the impact on Crude Tankers.

OIL SUPPLY MAY EXCEED DEMAND IN THE NEXT SIX MONTHS

The short-term outlook is largely determined by an expected output increase from OPEC+. Global oil supply is estimated to grow by 2.5-3 mbpd in the next six months. The outlook for global oil demand is highly exposed to any worsening in the global pandemic, since 80% of demand comes from countries where less than two-thirds of the population is vaccinated. Oil demand could clearly fall short of expectations, but should this drive oil prices low, oil inventories could be restocked.

REFINERY EXPANSION WILL REDUCE SEABORNE VOLUMES

New refineries in crude oil-exporting countries may reduce seaborne crude volumes massively in the next few years. Nigerian exports could be reduced by 300,000-600,000 bpd, creating headwinds for European refineries, while a 320,000 bpd refinery in Mexico will do the same for the US. In the Middle East, more than one million bpd may be LR2 trades instead of VLCC trades in the next three years.

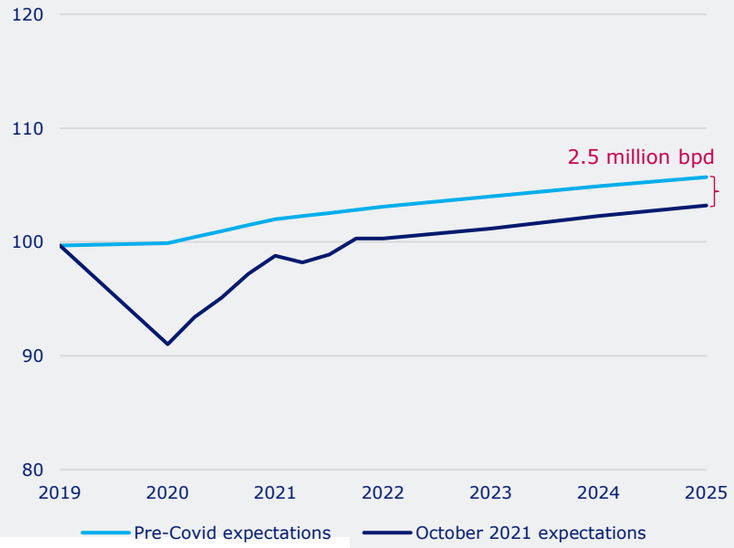
CHINESE OIL IMPORTS COULD BE NEARING PEAK VOLUMES

Crude Tanker demand seems likely to benefit from new Chinese petrochemical facilities, which will reduce the country's reliance on naphtha imports, but this effect could be offset by a scaling back of export capacity for refined oil products, as China has imposed further regulations on its private refining industry. This would mean that Chinese oil imports could be nearing peak volumes. (For further information, see the demand deep dive on the next page.)

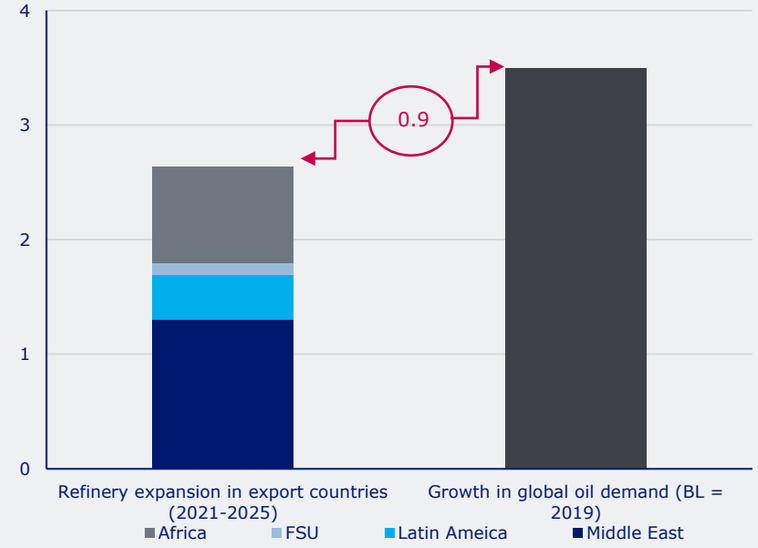
CRUDE OIL VOLUMES WILL CONTINUE TO INCREASE

Seaborne oil demand is expected to grow towards 2025, but trade patterns are likely to change. OECD oil demand is estimated to decline by 1.75 mbpd from 2019 levels by 2025, offsetting around a third of the expected growth in non-OECD demand. However, we expect less than 60% of growth in non-OECD demand to be seaborne crude oil due to domestic oil production and local refineries, whereas more of the OECD decline will be felt in a reduction of seaborne volumes. In addition, investments are shifting away from oil, creating a major risk for supply and prices.

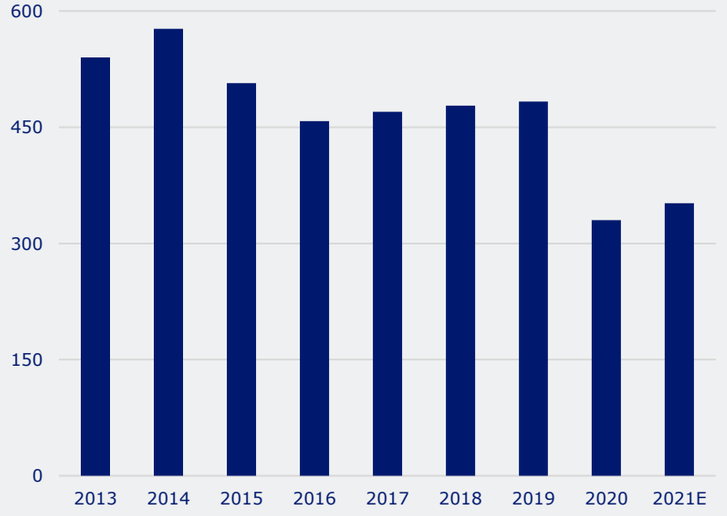
EXPECTED OIL DEMAND (MBPD)



REFINERY CAPACITY AND OIL DEMAND CHANGE (MBPD)



UPSTREAM OIL AND GAS INVESTMENT (USD BILLION)



Sources: Clarksons, IEA, Alphatanker, Danish Ship Finance

DEMAND DEEP DIVE: CHINESE SEABORNE IMPORTS

Could Chinese seaborne oil imports be close to peaking?

Peak oil demand was not talked about in China just a few years ago. But the 14th Five-Year Plan has set a new pace for decarbonisation with the goal of reaching peak emissions by 2030 and talk of peak oil consumption by 2026. This puts pressure on the growing national refinery industry.

PUTTING PRESSURE ON INDEPENDENT "TEAPOT" REFINERIES

Following initial crude oil import quotas from 2015, the Chinese private refineries or "teapot" refineries contributed significantly to the annual growth of 10-12% in Chinese seaborne crude oil imports between 2015 and 2020. Teapots represent around a quarter of China's refinery capacity and have been recipients of a large amount of oil in times of global excess supply. Although they are not granted export quotas, they sell oil to state-owned refineries, which then export. However, this summer, headwinds hit some of these refineries: their CO_2 footprint is significantly bigger than that of larger refineries, and they have also been suspected of tax evasion, neither issue fitting well with the political agenda. The immediate result has been implementation of tax on traditional teapot feedstock (light cycle oil, or LCO, mixed aromatics and bitumen blend) and a ban on state-owned refineries trading import quotas with teapots – making them solely reliant on government allocations. So far, quota allocations have been much like last year, but the long-term prospects for quota allocations intended to refine oil in excess of domestic demand are dimming. Meanwhile, increased competition from new refineries in Asia and the Middle East will make it increasingly hard for small teapot refineries to turn a profit.

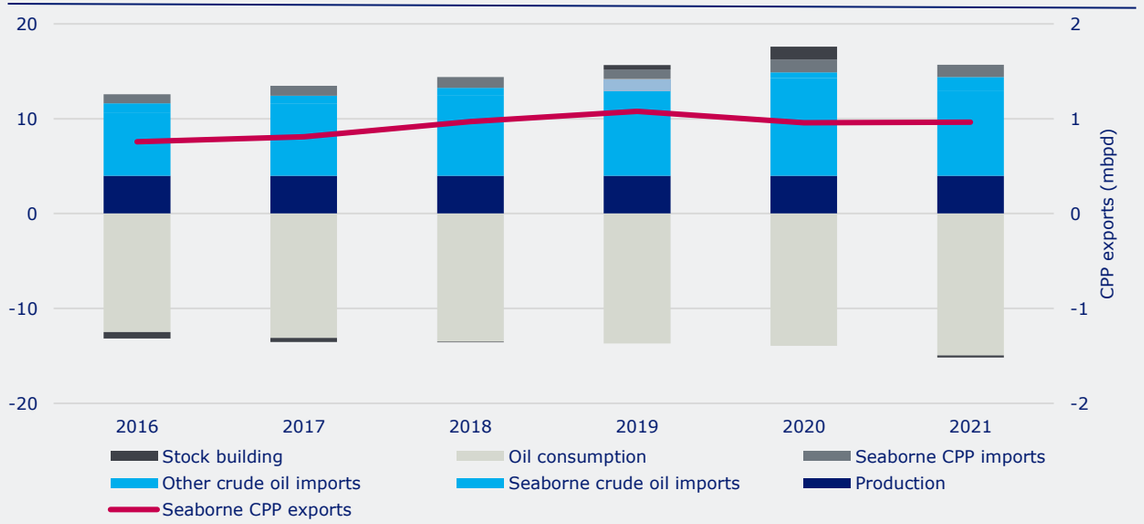
THE PRODUCTION SWITCH FROM ROAD FUELS TO CHEMICALS WILL NOT MEAN A TIGHT MARKET

Traditional teapot refineries typically yield 80-90% transportation fuels, which has led to a glut of diesel and gasoline in China. The oversupply lifted Chinese oil product exports to a peak of one million bpd in 2019. This will increase further if Chinese oil demand peaks at 16 million bpd in 2026 while domestic refinery capacity increases by the scheduled 1.3 million bpd to 18 million bpd. Most of the refinery additions are independent refineries but with petrochemical add-ons, as the vast majority of incremental Chinese oil demand will come from chemical production. However, the yield of petrochemical feedstock from crude oil is unlikely to exceed 50%. Therefore, with road transport consumption possibly peaking by 2023, the remaining state-owned refineries will be more than able to meet future demand.

IMPLICATIONS FOR CRUDE TANKERS SEEM SEVERE IN THE LONG TERM

In the short term, we expect state oil companies to increase imports and offset the decline in teapot imports. There may be a small uptick for Crude Tankers if LCO and mixed aromatics are switched to heavy crude grades. In addition, we expect trades from sanctioned countries to be reduced, as much of the bitumen blend comes from Iran and Venezuela. This is carried on old tankers taking a detour so as to be categorised as another type of oil product. This will improve fleet efficiency but is also likely to lead to a rise in scrapping. In the long term, the Chinese strategy does not indicate any plans to obtain a position as a regional refining hub. The set goals of reducing emissions and increasing energy independence are only to be achieved via a strict focus on renewables and by keeping other CO_2 emissions to a minimum. We expect the long-term effect to be a 1-1.5 million bpd cut to Chinese imports, which would offset growth in consumption and lead recipients of Chinese clean oil products to look to the Middle East and perhaps India instead. This will not happen overnight, and some teapot refineries will continue to find new tax loopholes or consolidate, but the tone from Beijing is unlikely to soften.

CHINESE OIL LANDSCAPE (MILLION BPD)



Sources: Clarksons, IEA, Alphatanker, Danish Ship Finance

PRODUCT TANKER

PRODUCT TANKER

Short-term demand growth will be held back by expanding supply

In the first ten months of 2021, the Product Tanker market experienced a significant improvement in demand, but this has not translated to higher freight rates. This is explained by a notable expansion in the effective fleet and shorter travel distances. Going forward, demand will continue to recover as vaccination rates in developing countries rise. The short-term supply outlook will require demand to surpass 2019 levels by more than a few percent, but the fleet is ageing and most yards able to build Product Tankers look to be occupied until mid-2024. This may cause freight rates to see a sustainable recovery towards the end of 2022 and between 2023 and 2025, especially for long-haul trade, as a result of the changing refinery landscape.

FREIGHT RATES AND SECONDHAND PRICES

Since our last report in May, spot earnings have remained soft, with brief periods of above-median rates seen mainly for small and fuel-efficient vessels. Secondhand prices have been increasing due to positive sentiment in the wake of vaccine rollouts and rising replacement costs. Low timecharter rates indicate that the market will be unbalanced in the next 12 months, in line with our May predictions.

LR2 Tankers have been enjoying strong growth in demand from CPP trade, but freight rates have been held back by a weak crude oil market and the expanding fleet. This has caused the one-year timecharter rate to drop 6% to USD 15,750 per day, while high replacement costs have kept the price of a five-year-old vessel constant at USD 42 million.

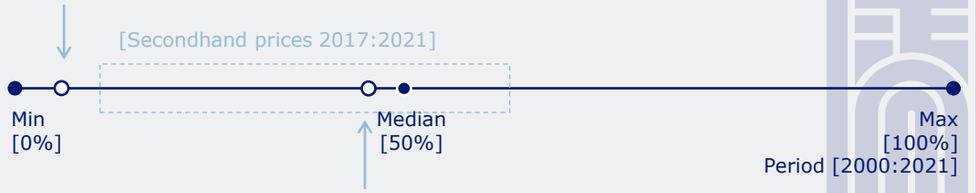
LR1 Tankers continue on a path to becoming a niche segment. They are struggling to compete both with LR2 and large MR Tankers. This has caused the one-year timecharter rate to fall by 10% to USD 13,250 per day, while the price of a five-year-old vessel has decreased by 9% to USD 31 million.

MR Tankers have also enjoyed steadily rising volumes throughout the year, but oversupply across segments has made it difficult for them to compete for long-haul trades. The resulting reduction in distances has caused the one-year timecharter rate to drop by 8%, while the price of a five-year-old vessel has risen by 2% due to high replacement costs.

DS:FUNDAMENTALS

MARKET CYCLE POSITION – November 2021

Freight rates are low and have declined by 6-9% in the past six months



Secondhand prices are close to the median and have remained stable in the past six months

Distance-adjusted seaborne demand for CPP has increased by 3.5% in 2021 Volumes are up by 7% but shorter distances means a reduction of 3.5 percentage points. The fleet has expanded by 2%. Surplus vessel capacity in the Crude Tanker market has pushed more Crude Tanker vessels into the Product Tanker market and thereby reduced fleet utilisation.

Deliveries: Six million dwt was delivered in the first nine months of 2021, with expectations of another two million during the remainder of the year – a steep increase from the five million dwt delivered in 2020.

Scrapping: Scrapping activity has already reached 2.75 million dwt, which is the highest level in nine years, but scrapping may increase even further due to the low earnings.

Contracting: New orders soared in the first half of the year, but have since been muted due to high newbuilding prices and low yard availability.

Orderbook: Nine million dwt is currently on order, a 10% drop since the start of the year. This represents just 5.3% of the fleet, with 40% expected to be delivered by the second half of 2022.

Demand: Seaborne CPP volumes have grown steadily throughout the year as oil demand has returned in many regions. Volumes in the third quarter of 2021 were on a par with the same period in 2019.

Travel distances: Long-haul trade has suffered greatly, as Asian imports have fallen throughout the year, offsetting some of the rise in volumes.

MARKET DYNAMICS IN THE LAST SIX MONTHS

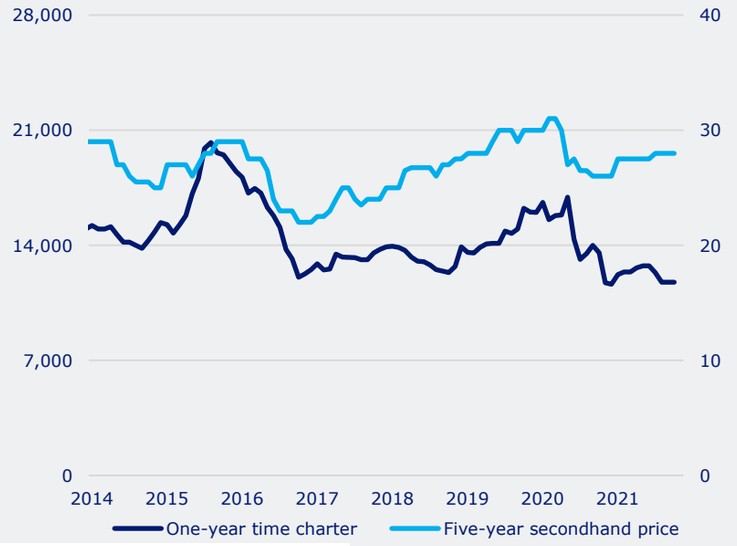
The market has recovered unevenly across regions

Product Tanker volumes in the third quarter were higher than in the same period of 2019, but the ongoing fleet expansion in the past 18 months and a reduction in travel distances throughout the year have kept freight rates at their lowest level in more than 20 years.

DEMOLITION HAS SOARED BUT CONTRACTING HAS BEEN MUTED

The prolonged period of soft freight rates and rising scrap prices has resulted in a surge in demolition activity. More than 60 vessels or 2.6 million dwt, primarily MR Tankers, were demolished in the first ten months of the year – the most in a ten-month period since 2010. However, due to the exorbitant amount of orders in recent years, the number of deliveries was more than twice that, resulting in fleet growth of 1.5% since the start of the year.

MR2 TIMECHARTER RATE AND SECONDHAND PRICE



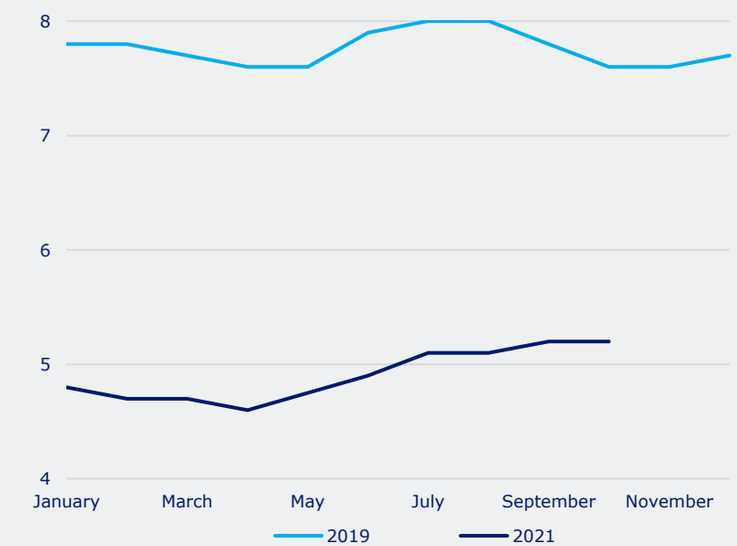
RISING VOLUMES DID NOT INFLICT ON FREIGHT RATES

The third quarter saw close to the same number of seaborne CPP barrels as in the same period in 2019, but freight rates remained exceptionally depressed. The reason for this was that the Product Tanker fleet was 5% larger and the number of VLCCs carrying CPP on maiden voyages and Aframax Tankers trading as LR2s doubled, thereby covering 4% of seaborne CPP demand, compared to 2% in 2019.

OECD DEMAND OUTGREW NON-OECD DEMAND

Seaborne OECD imports rose 8% between the first and third quarters, while non-OECD Asian and African imports fell by more than 15%. The main reason was differences in vaccination rates, which restricted mobility and led to lower-than-expected economic growth in Asia and Africa. The OECD had vaccinated 61% of the population by October, versus 30% in non-OECD countries. US and European aviation demand has picked up but is still well below 2019 levels, especially in Europe. Asian demand rebounded towards the end of the period with September indicating that the worst lockdown effects are over.

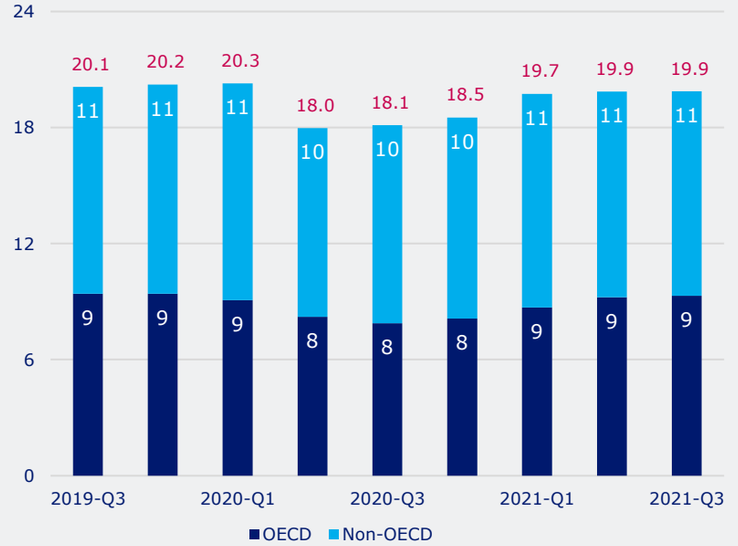
GLOBAL JET FUEL/KEROSENE DEMAND



EUROPEAN GASOLINE DEMAND HAS RISEN STEADILY

Refinery throughputs in Europe have risen significantly in the last six months, as reflected in refinery margins reaching pre-Covid levels for road fuels; in particular, gasoline margins have soared. However, European refineries have not been able to meet demand, which has caused a 12% rise in seaborne CPP imports in the period.

SEABORNE OIL PRODUCT IMPORTS (MILLION BPD)



Sources: Clarksons, Alphatanker, Danish Ship Finance

SUMMARY: PRODUCT TANKER MARKET OUTLOOK

The inflated fleet will make it hard for Product Tankers to enjoy a sustainable elevation in freight rates until late 2022

Demand for Product Tankers is likely to grow, both in the short and long term, but we expect freight rates to remain at low levels throughout most of 2022, as the fleet is significantly larger than before the Covid-19 pandemic, while demand seems to be just a few percent higher. Beyond 2022, the orderbook is thinning out and demand is likely to rise due to a changing refinery landscape that seems set to benefit large Product Tankers the most.

SHORT-TERM VOLATILITY IN THE ENERGY MARKET MAY BENEFIT PRODUCT TANKERS

Demand for Product Tankers will rise as global oil demand continues to rebound. The current energy crisis will support oil demand of around 500,000 bpd in the form of electricity production in areas with spare capacity at oil-fired power plants. The spillover into Product Tanker demand will be small, however, as the majority of these are located in areas with excess refinery capacity. However, the elevated coal and gas prices have also inflated the cost of refining by three to ten times the normal share of 1% per barrel, depending on the area and specifics of the refinery. European gas prices and Chinese coal prices having the largest impact. It remains to be seen how significant this will be, but it will reduce refinery margins substantially, which may lead to reduced throughputs and an increase in CPP trade from areas with cheaper energy.

THE LARGE FLEET MAY CAP ANY PROLONGED SURGE IN FREIGHT RATES

We have identified candidates for scrapping until 2022, that would almost offset the number of expected deliveries. However, the fewer tonne-miles travelled by vessels older than 15 years means that the effect on utilisation would still be negative. This may leave the effective fleet more than 7% larger than at the start of 2020, meaning that demand must prove stronger than expected for there to be any long surge in freight rates in 2022.

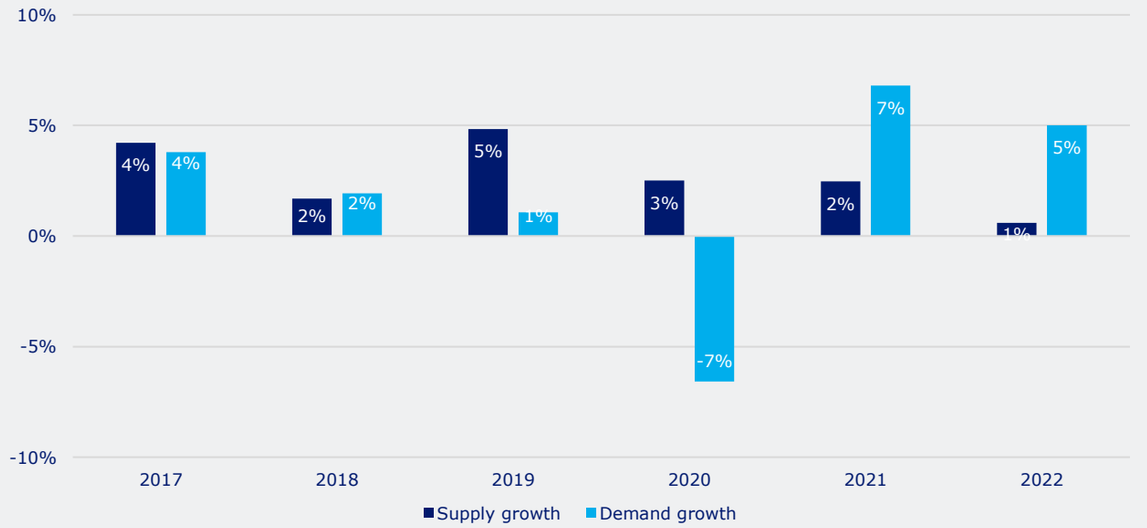
BEYOND 2022, THE MARKET COULD START TO TIGHTEN

Reduced shipyard availability, inflated construction costs and uncertainty over demand and future fuel mix are keeping Product Tanker orders at a minimum for the time being. We expect this to continue in the next 12 months. This may tighten the market, especially for long-haul trade, as more large export-oriented refineries come online in the Middle East. The outlook is less positive for short-haul trade. The Middle Eastern refineries may close smaller refineries in Asia, and new large refineries in Mexico and Nigeria will cause imports to these regions to decline around mid-2023.

CONVERSION TO BIOFUEL PLANTS MAY BE A WAY FORWARD FOR STRUGGLING REFINERIES

The future of oil refining in the OECD region is hanging by a thread. The constantly expanding overcapacity will exacerbate the situation further as oil demand declines and export markets tighten towards 2025. Some refineries have already decided to convert existing facilities to production of more biofuels, but the economics behind this are still lacking, primarily due to a shortage of sustainable feedstock. However, we expect more refineries to go down this path, as costs are much lower than for a shutdown. The impact on shipping seems to be positive, as the energy intensity of refineries' output will be lower from biofuel, which could boost imports in some regions.

SUPPLY AND DEMAND BALANCE (DWT AND SEABORNE VOLUMES)



Sources: Clarksons, Danish Ship Finance

PRODUCT TANKER FLEET OUTLOOK

Short-term pain, medium-term gain

The fleet will continue to expand but at a slower rate than vessels turning 15 years old. This may provide a boost to young fuel-efficient vessels but could also put a cap on any surge in freight rates if the older vessels stay in the fleet.

TOO FEW DEMOLITION CANDIDATES WILL IMPACT RATES

We have identified scrapping candidates before year-end 2022 corresponding to 4% of the fleet, which would offset much of the 4.5% that is expected to be delivered. However, the tonne-miles travelled for the scrapping candidates are only around half those of newly built vessels, limiting the impact on freight rates substantially.

CRUDE TANKER DEMAND UNLIKELY TO SUPPORT FREIGHT RATES

A seemingly weaker crude oil market in the next 18 months is unlikely to offer much support for LR Tankers. On the contrary, we expect a continuing trend of VLCCs carrying CPP on maiden voyages and dirty tankers being washed clean. The chemical market may offer some respite, but the impact would be relatively small.

CONTRACTING ACTIVITY IS UNLIKELY TO EXPERIENCE GROWTH

Six yards have built 90% of LR2 Tankers in the last five years, while two yards have built over 50% of all MR vessels. These yards will be occupied with Container and Gas Carrier orders until mid-2024. We expect this to reduce contracting significantly in the next 12-18 months, as yards are likely to keep prices high for now, and most owners are unwilling to place orders at second-tier yards.

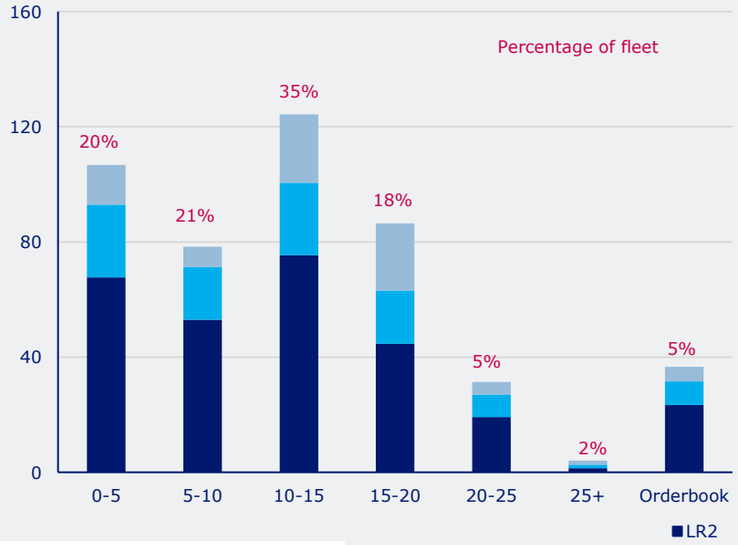
THE REDUCTION IN ECONOMIC LIFETIMES SEEMS BRIEF

Since 2017, the share of tonne-miles travelled for vessels older than 15 has grown from 3% to 12% because ship capacity has risen from 12% to 23%. We expect this trend to continue in the next five years, due to low contracting, many vessels turning 15 and upcoming regulations that are more likely to reduce speeds than economic lifetimes. Tonne-mile demand drops sharply after vessels turn 15, but the many ships in this age group will cap freight rates.

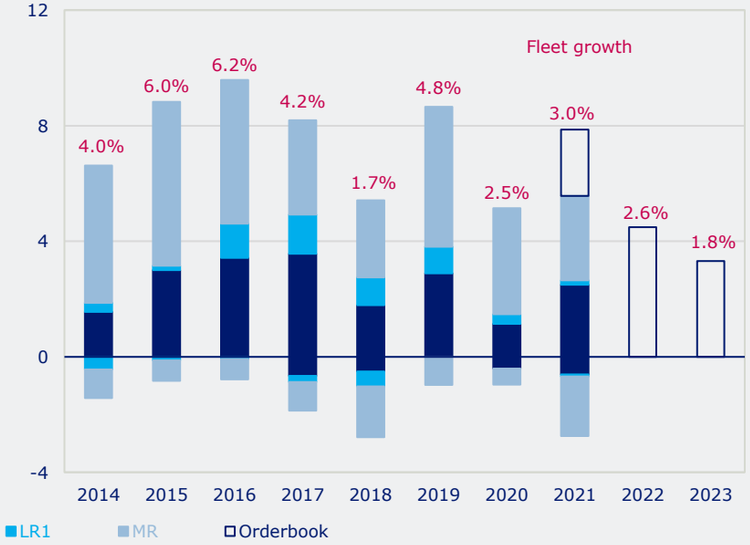
EXTREMELY OPAQUE PATH TO REDUCING EMISSIONS

The high concentration of small vessels with diverse trade routes makes Product Tankers one of the hardest shipping segments to decarbonise. Existing solutions seem unviable, but the impending CII ratings may prove to be more than just a licence to operate, as transparency will make it easier for cargo owners to demand certain vessels.

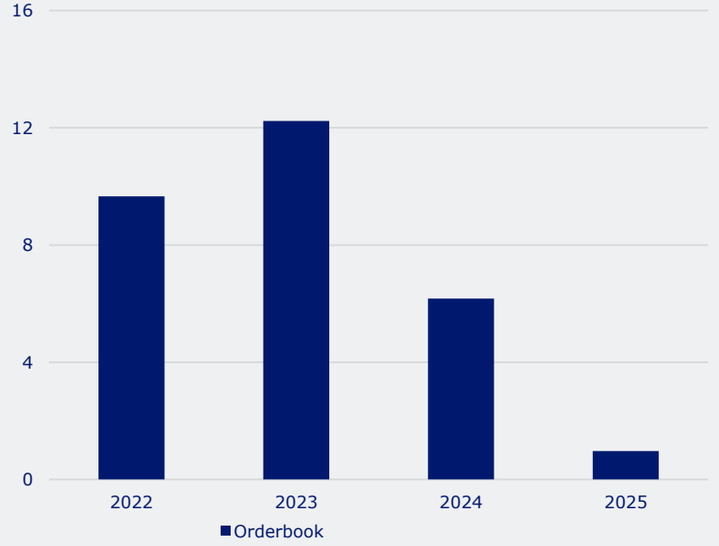
AGE DISTRIBUTION (MILLION DWT)



FLEET DEVELOPMENT (MILLION DWT)



TOP 10 PRODUCT TANKER YARDS (MILLION CGT)



Sources: Clarksons, Danish Ship Finance

PRODUCT TANKER DEMAND OUTLOOK

Production, refining and consumption locations are more important than ever

Product Tanker demand looks set to continue growing ahead of global oil demand, as the net effect from refinery expansion seems to be positive for exports, but if OECD refineries do not continue to close, this may change.

LOW ENERGY COULD BOOST PRODUCT TANKER TRADE

The global energy shortage is expected to raise demand for oil by around 500,000 bpd in the next five months, but half will be for residual fuel oil, which is mainly carried Crude Tankers, and most will stem from areas with excess refinery capacity. Therefore, we expect less than 100,000 bpd to be reflected in seaborne CPP trade. Furthermore, the high energy prices have inflated production costs from around 1% to more than 5% per barrel in some regions. Europe is worst hit, but Chinese refineries are also suffering from high coal prices. The effect remains uncertain, but it could reduce refinery runs and boost CPP trade in some regions over the winter.

ASIAN DEMAND GROWTH WILL EXCEED REFINERY GROWTH

Asian oil demand is expected to grow by three million bpd up to 2025, while refinery capacity expansions will only increase by two million. In addition, recent actions against China's private refining industry may reduce refinery capacity by up to 1-1.5 million bpd in the period. This would boost global seaborne CPP volumes by 5-12%, mainly carried on LR Tankers out of the Middle East.

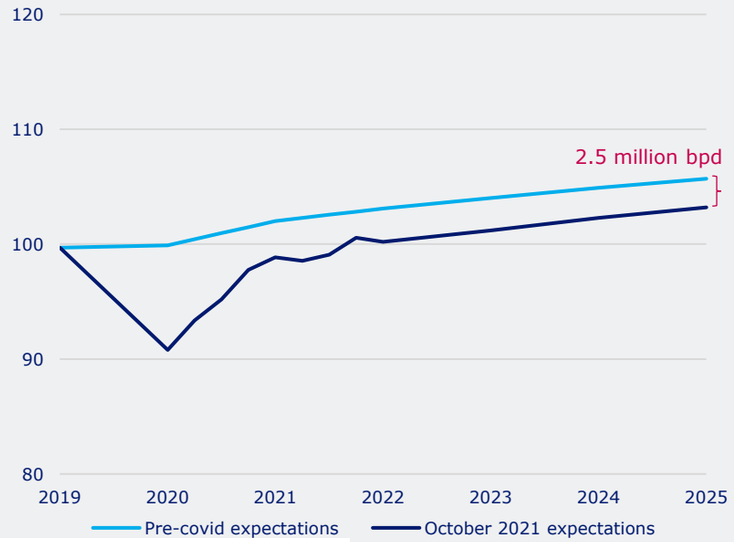
REFINERY EXPANSION WILL RAISE TONNE-MILES SLIGHTLY

We expect the reduction of seaborne CPP volumes from refinery expansions in Nigeria and Mexico to be around 75% of the combined 970,000 bpd new capacity by mid-2023. However, Middle Eastern expansions may contribute more than one million bpd in that period. Few European and US refineries have announced closures. However, we expect this to rise due to local oil consumption dropping 1.5 million bpd, while export markets are tightening. This could boost seaborne CPP volumes if imports start to grow.

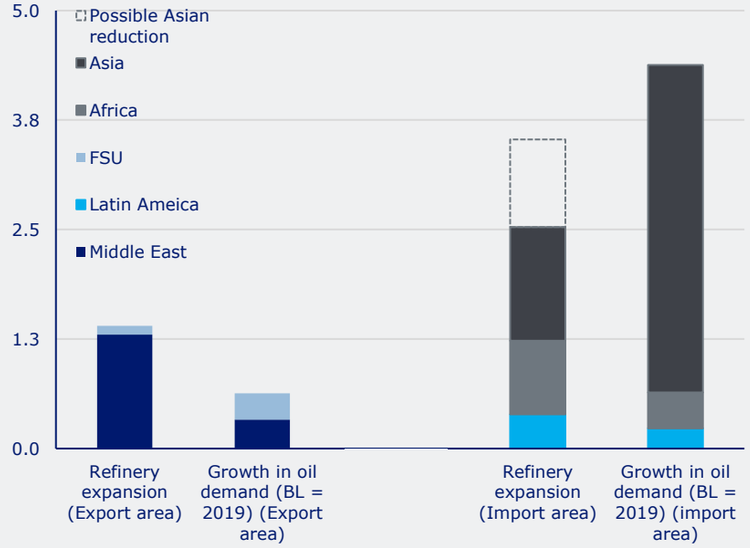
DEMAND WILL BE STRONGEST FOR LR2 TANKERS

The Middle Eastern refineries are likely to replace older and less efficient Asian refineries. This will switch crude oil trades and short-haul (MR) trades to long-haul trades (LR). Mexican and Nigerian refinery expansions will also reduce demand for MR Tankers. MR Tankers could prosper if OECD refinery capacity declines ahead of demand.

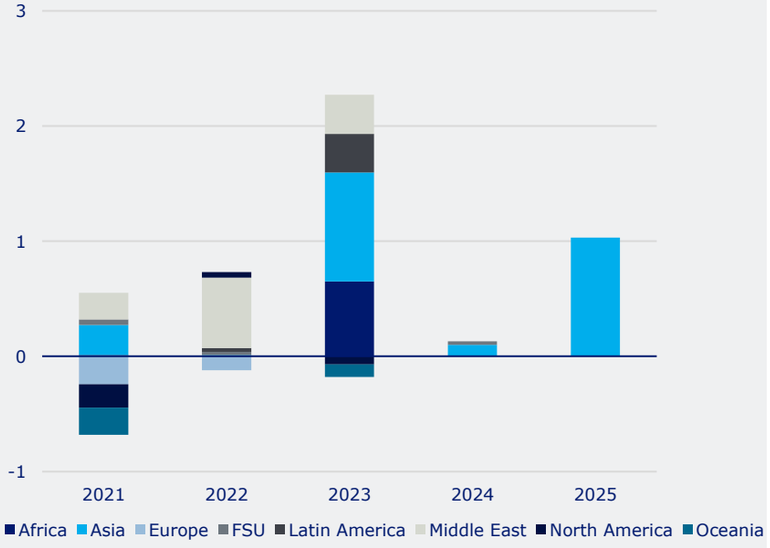
EXPECTED OIL DEMAND (MILLION BPD)



DEVELOPMENT UNTIL 2025 (MILLION BPD)



REFINERY EXPANSIONS 2021-2025 (MILLION BPD)



Sources: Clarksons, IEA, Alphatanker, Danish Ship Finance

DEMAND DEEP DIVE: BIOFUEL REFINERIES

Will biofuels have a role to play and how will they impact refineries and Product Tankers?

The ongoing uptick in OECD refinery runs is expected to be short-lived and is a result of the rebound in demand after Covid-19. The prospects for refineries, especially in Europe but also the US and other developed countries, are dimming. This is attributable to a combination of declining domestic oil demand, slowing global demand growth and shrinking export markets due to expanding refinery capacity in Africa and Latin America.

THE GLOBAL MARKET IS SUFFERING FROM OVERCAPACITY

The low oil demand in the wake of the Covid-19 pandemic has been the catalyst for the largest number of refinery closures announced since 2009. Capacity closures of two million bpd have been announced, mostly in the US, Europe and Oceania. Old refineries are starting to prepare for declining demand for road fuels. Transportation fuel has historically been the main pillar for refinery margins, but two-thirds of future growth in oil demand is expected to come from chemical demand. Adjusting refinery configurations to yield more petrochemical feedstock is an easy way forward, but profits from producing feedstock without an integrated petrochemical plant have historically been negative. It is technically possible to upgrade legacy plants to accommodate integrated petrochemical plants, but in today's environment, with new refinery capacity of some 5.5 million bpd scheduled to come online by 2025, the risk of overcapacity already seems to be rising, as demand from the petrochemical industry is only expected to expand by 2.5-3 million bpd.

ALTERNATIVE OPTIONS ARE RISKY AND EXPENSIVE BUT COULD TURN OUT TO BE PROFITABLE

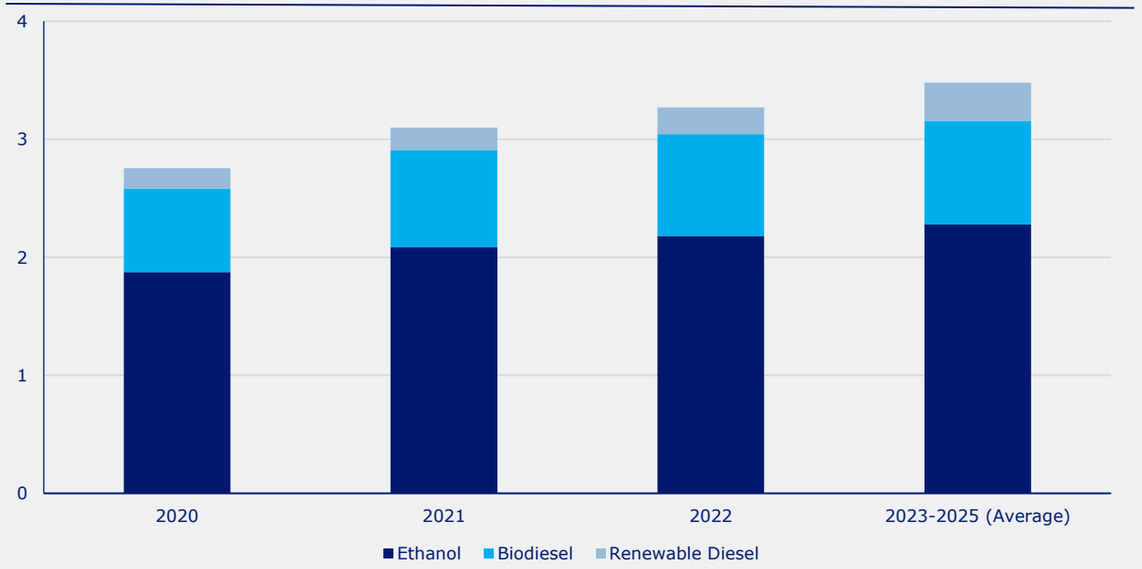
Legacy refineries may seek refuge by converting to produce advanced biofuels (including renewable diesel) or e-fuels. Around 400,000 bpd have already been converted and plans have been announced to convert around a further one million bpd to specialised biofuel plants. However, despite a potentially massive market, the viability of prospective conversions is still highly uncertain. A transition towards biofuels could help bridge the transition to low- or zero-carbon fuels while extending the lifetimes of older and less efficient refineries. Still, refinery economics are currently unfavourable, due to a shortage of sustainable and cheap feedstock. The energy density of biofuels is also lower than for oil. Demand for biofuels as transportation is currently forecast to expand from one million bpd in 2021 to 2-3 million by 2030. The following factors may improve the outlook for biofuels: lower investments in oil, tax on carbon, obstacles to the supply of e-fuel, and batteries or breakthroughs in scalability.

THE INITIAL IMPACT WILL STILL BE SMALL

The conversion of legacy refineries is expected to have a modest short-term impact on Product Tankers, but the potential could increase in tandem with the call to decarbonise the global economy. Initially, it will primarily be refiners with strong capital converting small US and European facilities to advanced biofuel plants, creating a combined capacity of around one million bpd.

The conversion of US refineries will result in a switch between domestic production and consumption, meaning a limited impact on seaborne volumes. The European refineries may increase demand for Product Tankers, as the output from the biofuel plants will not offset the reduction in oil supply, due to the significantly lower energy density of biofuels. In the longer term, global propagation of biofuels could support the outlook for Product Tankers as more volumes are needed to create the same amount of energy. Biofuels will be carried on coated tankers, and any development in scaling and trading vegetable oil and waste would further benefit Product Tankers.

EXISTING BIOFUEL PRODUCTION FORECAST TO 2025 (MILLION BPD)



Sources: Clarksons, IEA, Alphatanker, Danish Ship Finance

LPG CARRIER

LPG CARRIER

The market is set for a further push towards LPG-powered vessels

Growth in the LPG market is currently being driven by long-haul LPG trade from North America to Asia. The petrochemical sector in particular has propelled much of the growth, as demand for plastics, synthetic rubbers, fibres etc. continues to increase. The long-haul trade has fuelled investors' appetite for dual-fuel engined VLGCs and MGCs that can also run on LPG. However, production shortages have shrunk inventories and sent LPG prices soaring, which could hurt trade in the short-term. Long-term demand growth is also likely to be driven by the petrochemical sector, but increase in plastic recycling could limit growth. The market seems to be balanced for now, but additional scrapping may be needed for larger vessels if demand fails to meet the expected fleet growth.

FREIGHT RATES AND SECONDHAND PRICES

Since our last report in May 2021, VLGC timecharter rates have decreased by 6% but are still trading in the top 30%. For the MGC and SGC segments, freight rates have decreased to the tune of 6-9%. The average secondhand price of a five-year-old vessel has remained steady during the period, while high contracting has pushed newbuilding prices up by 3% on average.

VLGC: This segment primarily ships LPG from North America and the Middle East to Asia. Supply chain disruptions and arbitrage windows have a large impact on freight rates. VLGC spot earnings declined by 66% from May to July but later recovered. Timecharter rates have stayed relatively high, however. Secondhand prices have remained quite stable and above the median, signalling market optimism. The recent increases in steel prices have also pushed scrap prices up to a nine-year high.

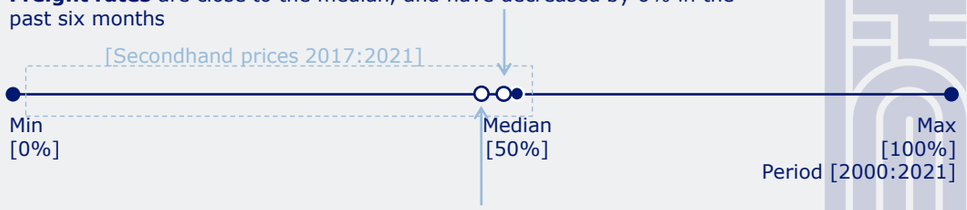
MGC: Secondhand prices for newer vessels have remained stable at around the median level. The price of a 20-year-old vessel is still well below the median, reflecting a greater appetite for newer vessels. Newbuilding prices have risen by 5%. Timecharter rates have declined by 7% and remain below the median.

SGC: Secondhand values remain well below the median level. Newbuilding prices are only marginally higher than the price of a five-year-old vessel. This reflects the market's preference for larger vessels. Timecharter rates are down 10% since our last report.

DS:FUNDAMENTALS

MARKET CYCLE POSITION – November 2021

Freight rates are close to the median, and have decreased by 6% in the past six months



Secondhand prices are close to the median, and have remained steady in the past six months

Global demand for seaborne LPG increased by 4.5% in the first ten months of 2021 compared to the same period last year. Travel distances followed suit and added 5.1% to demand, increasing distance-adjusted demand by 9.6%. Supply increased by 7.8% in the same period, which can be decomposed into higher fleet growth (+4.2%), higher speeds (+0.8%) and more vessels returning from docking (+2.8%). As a result, net fleet utilisation strengthened by 1.8%.

Deliveries have increased by 9.5% so far in 2021 compared to 2020, with the fleet also expanding by 5%. Another 2% of the fleet is due to be delivered by 2021.

Scrapping activity has picked up slightly but continues to be low with only 95,000 cbm scrapped so far compared to 69,000 cbm in 2020. The average age of scrapped vessels has been 29 years.

Contracting activity has reached an all-time high with 5.8 million cbm contracted in the first ten months of 2021. The contracting activity has been dominated by VLGCs and MGCs.

The **orderbook-to-fleet ratio** is up by 9.2 percentage points (since January 2021) and now represents 23.5% of the fleet. Around 80% of the orderbook consists of VLGCs.

Demand: Seaborne trade volumes have increased by 4.5% so far in 2021, primarily driven by a rebound in Chinese LPG imports since 2020 of 24%. Bangladesh and Vietnam have also seen a significant increase during this period.

Travel distances have increased by 5.1% so far in 2021, driven by growing LPG trade between the US and Asia. This has increased tonne-miles by 9.6%.

MARKET DYNAMICS IN THE LAST SIX MONTHS

The orderbook-to-fleet ratio has reached a five-year high

Since our last report, contracting activity has continued to soar with 5.8 million cbm having now been contracted in 2021. We are seeing a greater appetite for larger vessels powered by LPG.

SPOT RATES CONTINUE THEIR BUMPY RIDE

The spot rate market for the VLGC segment has remained volatile since our last report in May. Spot earnings from Houston to Chiba, which is often used as a spot price reference for the LPG trade between North America and Asia, declined by 33% from May to July, only to rebound a month later. The high volatility in the spot market has been caused by increasing gas prices, which led to some cargo cancellations in July due to a narrowing LPG price arbitrage between the US and Asia. Gas prices have risen sharply over the past year due to increasing demand and steady production levels, which has caused LPG prices to reach a six-year high. This highlights how large an effect short-term disruptions in demand can have on VLGC freight rates.

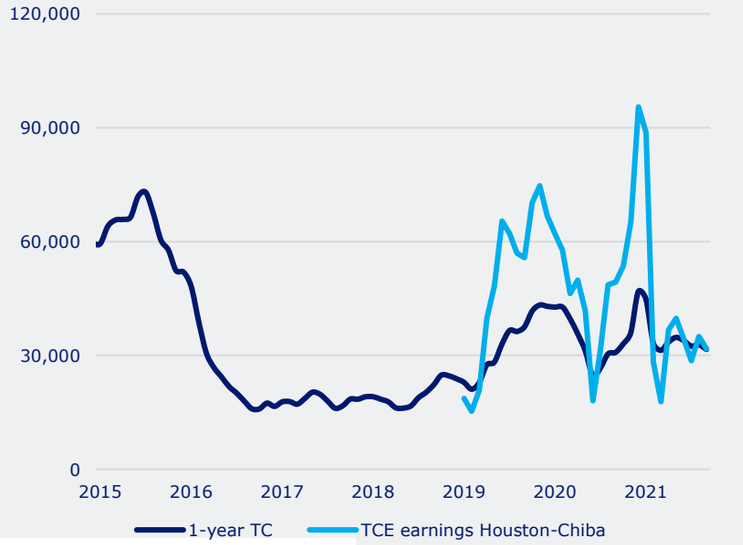
HIGH CONTRACTING ACTIVITY FOR LARGER VESSELS

Contracting activity in 2021 has reached an all-time high with levels equivalent to 16% of the current fleet. A large part of the contracting activity concerns VLGC and MGC vessels with dual-fuel engines that can also be powered by LPG. Generally, dual-fuel engined vessels are more expensive than those powered by conventional fuel. This has resulted in an increase in the general newbuilding price index. From the first to the second quarter, we saw an average increase in newbuilding prices of 3%, which was also partly explained by higher steel prices.

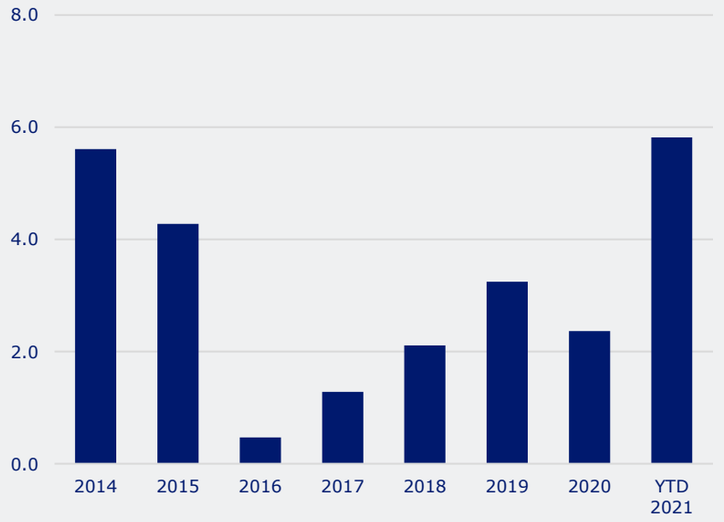
INCREASING EXPORTS FROM THE US

Seaborne LPG trade increased by 9% in third quarter compared to the same period last year. US exports to China were the primary driver of this growth. However, seaborne import volumes also rose in other key import markets such as South Korea, Japan, Southeast Asia and Europe. Exports increased significantly despite only a modest increase in US production levels – the increase in exports was primarily sourced from inventories.

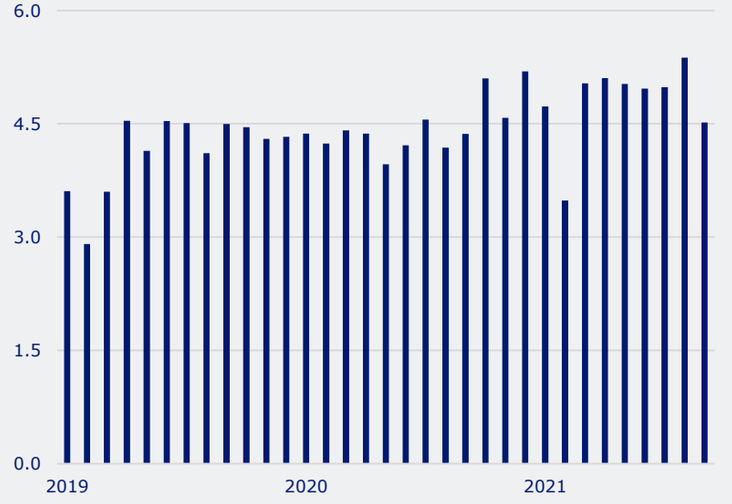
ONE-YEAR TIMECHARTER AND SPOT RATES (USD PER DAY)



CONTRACTING ACTIVITY (MILLION CBM)



EXPORTS FROM THE US (MILLION MT)



Source: AXS Marine, Clarksons, Danish Ship Finance

LPG OUTLOOK SUMMARY

The market faces risks of overcapacity in the short term, which could persist for some time

The LPG fleet is set for a structural change as investor appetite for new dual-fuel vessels continues to grow. This has pushed expected fleet growth up significantly for the coming years, which may disrupt the supply-demand balance both in short and long term. LPG demand is expected to increase in the long run, driven by the petrochemical sector, but uncertainties persist.

THE FLEET IS SET TO EXPAND RAPIDLY IN THE SHORT TERM

Contracting activity has reached record levels in 2021, driven by orders for new and modern dual-fuel vessels. Both existing and new owners have put in orders for primarily larger vessels, as the appetite for long-haul LPG trade grows. The fleet is due to increase by 7% in 2022 and 14% in 2023.

HIGH DEMAND GROWTH IN THE SHORT TERM BUT UNCERTAINTIES LOOM

In 2021, demand from the residential sector has rebounded, while demand from the petrochemical sector has continued to strengthen. Moreover, Asian and European economies are working to build up inventories ahead of the winter season. This has so far led to tightened inventories in exporting countries, as LPG production has not managed to keep pace. With gas prices now skyrocketing, there are fears that in the short term countries will switch from gas to coal to meet heating demand during the winter. Furthermore, if gas prices continue to rise, the naphtha-LPG spread could come under pressure, with more petrochemical plants switching to naphtha as a feedstock. The market seems to be balanced in the short term, but additional scrapping may be needed if the market fails to rebalance, and demand fails to meet current expected fleet growth.

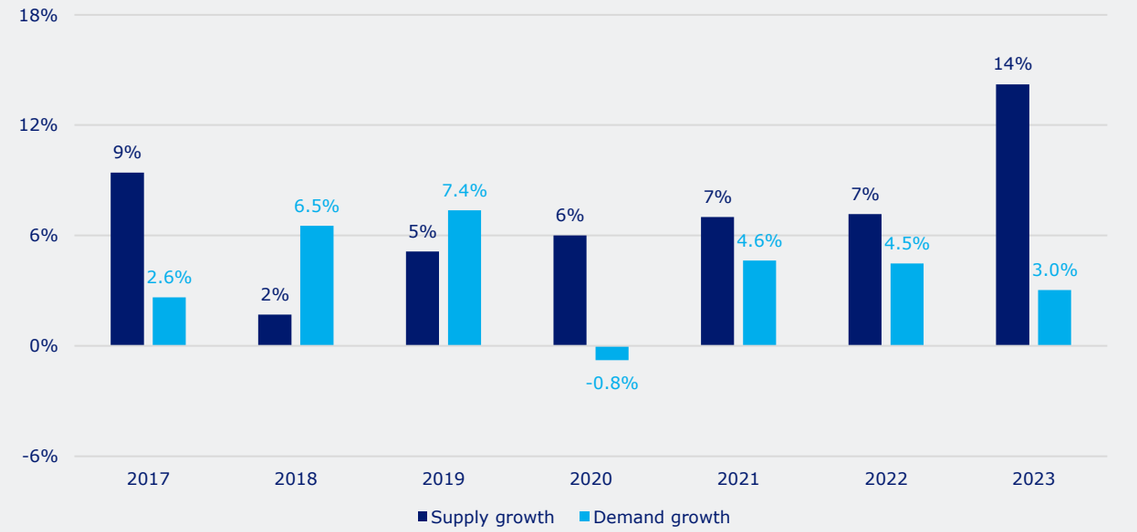
LONG-TERM DEMAND GROWTH EXPECTED TO BE DRIVEN BY PETROCHEMICAL SECTOR

The expanding petrochemical sector in Asia will most likely propel demand growth in the medium to long term, as demand for plastics is projected to increase. The development of new export facilities in North America is set to source some of the growth and thereby increase travel distances. Furthermore, the gradual easing of production cuts from OPEC may shift some of the LPG sourcing from the US to the Middle East, which could shorten average travel distances. Stricter regulation and changed consumer behaviour regarding plastic recycling may limit demand growth in the long run.

CONTINUED APPETITE FOR DUAL-FUEL VESSELS

The investment appetite for dual-fuel vessels is expected to remain high – especially for the larger vessels. The fleet growth may be temporarily offset by a potentially large number of vessels undergoing retrofitting for dual-fuel engines, as it is more attractive cost-wise to retrofit younger vessels. Nevertheless, fleet growth is still expected to remain high in the long term, which may put pressure on freight rates if demand does not keep up.

SUPPLY AND DEMAND BALANCE (CBM AND TONNES)



Source: Clarksons, Drewry, Danish Ship Finance

LPG FLEET OUTLOOK

Risks of overcapacity caused by high fleet growth and limited potential for scrapping

The optimism over increasing demand from Asia is resulting in strong contracting activity for larger vessels. However, with a limited number of scrapping candidates, there is a growing risk of overcapacity in the market.

HIGH INFLOW OF VESSELS IN THE SHORT TERM

Since our last report, the orderbook-to-fleet ratio has increased significantly to reach a five-year high of 24%. In the short term, the fleet is set to expand by 7% in 2021-2022 and 14% in 2023 before scrapping. The high fleet growth will be countered slightly by less availability due to upcoming hull surveys and scrubber retrofitting. These factors may offset fleet growth by 2 percentage points in the rest of 2021 and by half of this in the next two years.

THE HIGH ORDERBOOK MAY FORCE PREMATURE SCRAPPING

Around 80% of LPG vessels in the orderbook are powered by LPG or ethane, as they are compliant with the EEXI and CII rules that will be introduced in 2023. The LPG-powered vessels are also more efficient in terms of fuel costs and consumption. In the unlikely event of no future growth in seaborne LPG trade, the orderbook implies that the economic lifetimes for VLGCs and MGCs would have to drop to around 13 years to balance the market.

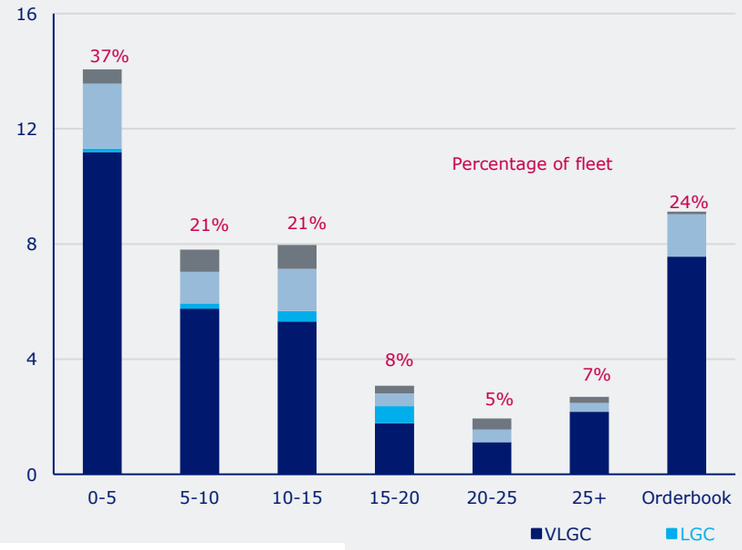
SHORT-TERM BALANCE BUT LONG-TERM ADJUSTMENTS NEEDED

Around 5% of the VLGC fleet is over 20 years old and scheduled for a hull survey before 2023. These vessels may be potential scrapping candidates in the short term. However, given the expected short-term growth in seaborne LPG trade, we may not see any increase in scrapping activity until 2023, when the large inflow of vessels is expected to hit the market. From 2023 onwards, vessels older than 15 years of age and not fitted with an ME-C engine (which MAN retrofits to run on LPG) could be potential scrapping candidates. Around 18% of the VLGC fleet could thus potentially be demolished in the long run.

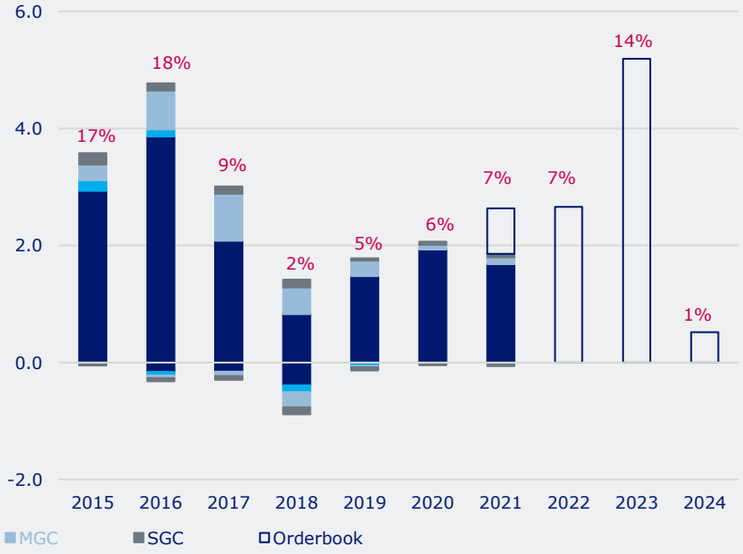
LIMITED YARD CAPACITY MAY DAMPEN FLEET GROWTH

Over 60% of the orderbook has been contracted at the largest first-tier yards in South Korea, while almost 30% has been contracted in China. However, container and LNG vessels will fill much of the capacity at these yards in 2021-2023. The limited availability at these yards may put a damper on further fleet growth in the long term.

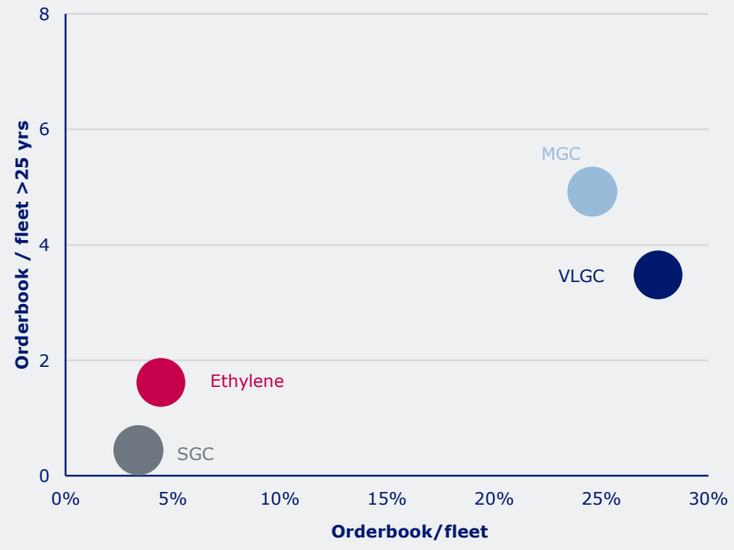
AGE DISTRIBUTION OF FLEET (MILLION CBM)



FLEET DEVELOPMENT (MILLION CBM)



FLEET RENEWAL POTENTIAL (DWT)



Source: Clarksons, Danish Ship Finance

FLEET OUTLOOK DEEP DIVE – NEW OWNERS ENTERING THE MARKET

The large orderbook is partly attributable to new owners entering the VLGC and MGC segments

A growing number of new owners are entering the LPG market with new and modern vessels. This may put pressure on existing owners to act by either contracting new vessels or retrofitting older vessels.

NEW OWNERS ATTRACTED TO THE LPG MARKET

35% of the VLGC orders have been ordered by companies that are either new to owning VLGC vessels or have only owned VLGCs in the past two years. The proportion is even higher for MGCs, for which 42% of orders are from new or relatively new owners. The new owners are chartering firms and vessel owners from other segments, but we are also seeing completely new owners, with LPG production/trading firms having started to insource the logistics part of the supply chain.

GROWING PRESSURE ON EXISTING SHIPOWNERS

Nearly all vessels ordered by new owners are fitted with dual-fuel engines. The inflow of new vessels is putting increasing pressure on existing owners, as there are concerns that they will not be able to compete in terms of costs on long-haul voyages. This broadly leaves existing owners with the choice of either retrofitting existing vessels or renewing their fleets by contracting new vessels.

STILL LARGE POTENTIAL FOR FLEET RENEWAL

Existing owners that have placed orders for new vessels have – so far – expanded their fleets instead of renewing them. The average owner has reduced its fleet by 10% while placing new orders that add 60% to its fleet. Moreover, there are many existing owners that have not placed any orders or retrofitted for dual-fuel engines. When the entire orderbook has been delivered, dual-fuel engined vessels will account for around 26% of the VLGC segment and 16% of the MGCs. Although existing owners are expected to reduce their older tonnage in the long term, there are still many existing VLGCs and MGCs that are at risk of being outperformed.

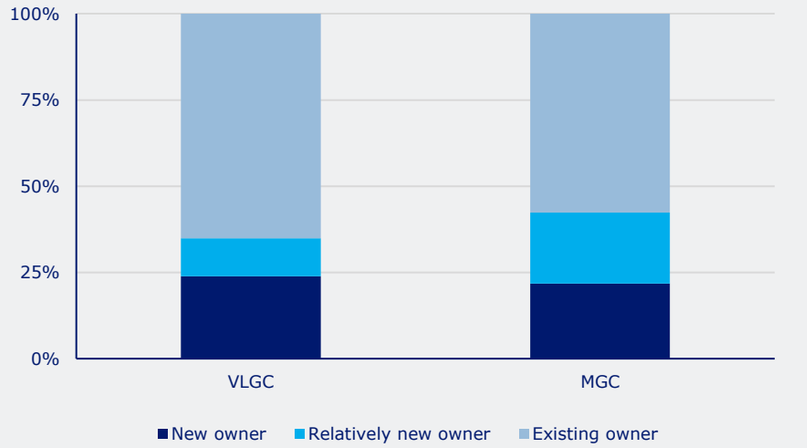
LARGE POTENTIAL TO RETROFIT VLGCS

Some existing owners are also looking into retrofitting their existing fleets with dual-fuel engines. The business case depends on many factors such as costs, fuel consumption and prices. The VLGCs that have recently been retrofitted have reported retrofitting costs of around USD 8-9 million, which as a perspective, is three times higher than a scrubber retrofit cost. Furthermore, an LPG-powered VLGC on average consumes 10% less fuel. The fuel price spread between LPG and VLSFO is estimated to be around USD 75 per toe. Thus, assuming an economic lifetime of 25 years and a constant fuel spread, it would be profitable to retrofit a VLGC vessel up to the age of 15-16 years. Around 20% of the VLGCs are therefore not potential candidates for retrofitting.

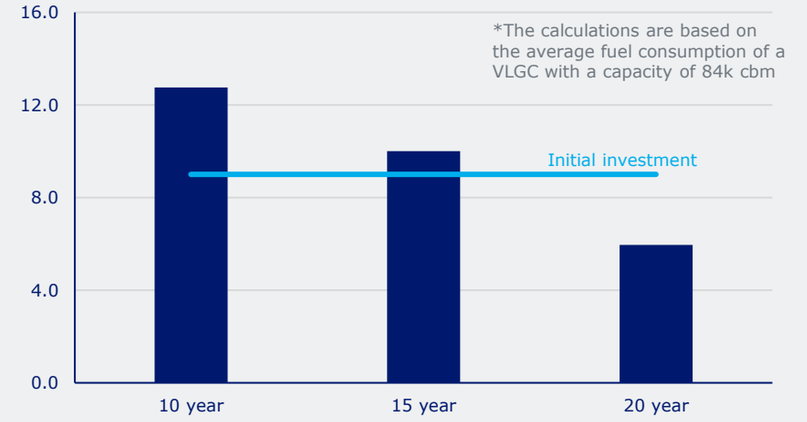
LESS POLLUTION FROM RETROFITTING

Retrofitting not only brings benefits in terms of lower voyage emissions; some estimates show that the retrofitting process also emits 35 times less CO_2 than building a new vessel.

ORDERBOOK BY OWNER TYPE (SHARE OF VESSELS ON ORDER)



DISCOUNTED FUEL SAVINGS BY VESSEL* AGE (USD MILLIONS)



Source: Clarksons, DNV, MAN Energy, Danish Ship Finance

LPG DEMAND OUTLOOK

Short-term uncertainties but positive outlook in the long term

LPG trade is expected to increase in the long term, primarily driven by the Asian petrochemical industry. However, there are some uncertainties in the short term.

PLASTICS DEMAND SET TO DRIVE LONG-TERM GROWTH IN LPG

LPG demand is expected to increase in the long term. The growth in demand is set to be driven by the petrochemical industry, as plastic consumption is projected to quadruple by 2050. However, a greater focus on plastic recycling may put a damper on this growth (cf. deep dive).

US EXPORTS CONTINUE TO GROW BUT AT A LOWER PACE

US exports are continuing to source a large part of the increasing demand for LPG. In the short term, US exports are projected to grow by around 4-5% in 2021 and 2022. However, there are some uncertainties over the short-term outlook owing to the unusually low inventory levels right before the winter season. If the winter season is as cold as last year, then more LPG could be sourced for domestic heating purposes. This could potentially lead to some cargo cancellations in the long-haul LPG trade from North America. In the long run, US exports are expected to pick up again due to new and expanding LPG production and export capacity. Exports are expected to grow at a CAGR of 7% in the period 2021-2026.

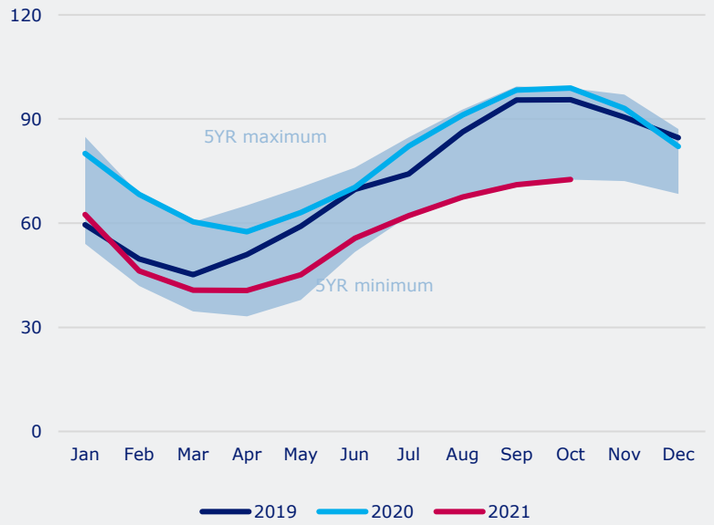
EXPORTS FROM MIDDLE EAST MAY REDUCE TRAVEL DISTANCES

The Middle East mainly exports LPG to China and India. With the Chinese petrochemical sector expanding, we may see increased sourcing from the Middle East, also as OPEC gradually eases production cuts. In the long run, Middle Eastern exports are expected to grow at a CAGR of 2.6% up to 2026. This may shorten average travel distances, if some LPG trade shifts from the US to the Middle East.

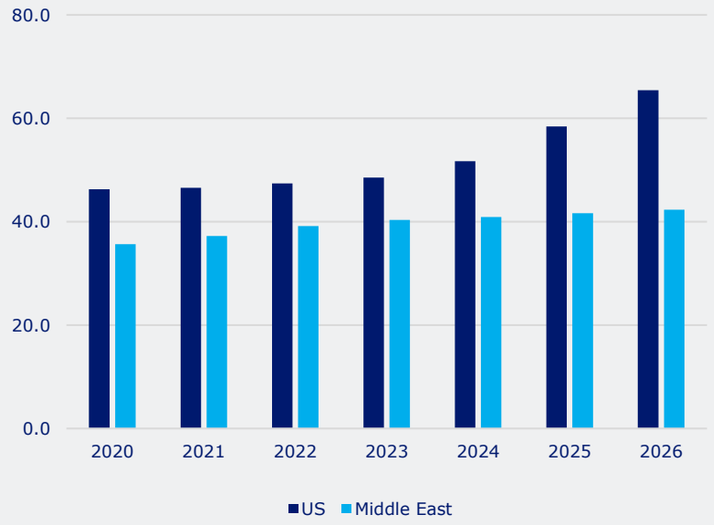
FORWARD PRICES MAY PROVIDE SOME UPBEAT NEWS

The arbitrage between Asia and US has narrowed due to increasing LNG and LPG prices (up around 57% since May). However, the current forward curves for propane prices show that the spread between the Asian and Mont Belvieu propane prices will increase by 50% up until 2023, while the Asia-Saudi spread will double. This may indicate that the market expects LPG production to pick up in the US and the Middle East in future and make LPG imports more attractive for East Asian countries.

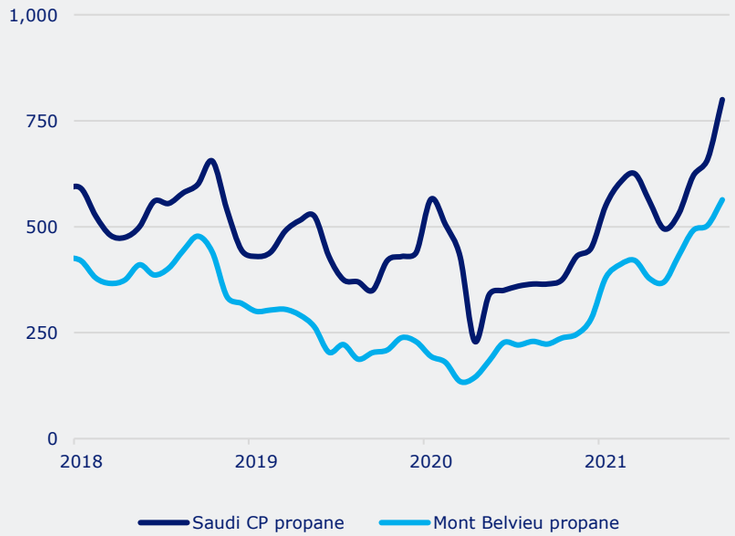
US LPG INVENTORY LEVELS (MILLION BARRELS)



US AND MIDDLE EAST LPG TRADE (MILLION TONNES)



PROPANE PRICES, US AND SAUDI ARABIA (USD PER TONNE)



Source: AXS Marine, Clarksons, Drewry, EIA, IEA, Danish Ship Finance

DEMAND OUTLOOK DEEP DIVE – THE EFFECT ON LPG DEMAND FROM PLASTIC RECYCLING

Long-term growth in seaborne LPG trade is likely to be limited by changing attitudes towards plastic recycling

The high growth in LPG demand from the petrochemical sector could be constrained by changing attitudes towards more plastic recycling. However, new technologies such as converting plastics into feedstocks could increase vessel demand while reducing the demand for new feedstocks.

INCREASING SHARE OF LPG IN THE PETROCHEMICAL SECTOR

LPG has many applications within the residential, industrial and petrochemical sectors, with the latter taking in almost a fifth of the total LPG supply. LPG is used as a chemical feedstock in the petrochemical sector to produce plastics, synthetic rubber, packaging, etc. The recent growth in LPG trade has been driven by the rising demand for plastics in the developing world as populations and middle-income groups continue to expand.

PLASTICS DEMAND SET TO INCREASE SIGNIFICANTLY

Plastics demand is projected by the EPRS to double by 2036 and quadruple by 2050. The developing world will be the primary driver of this growth, as increasing populations will demand more electronics, food and beverage packaging, and cars, etc. Demand is also growing in the transport sector, as plastic is a key element in increasing fuel efficiency by reducing the weight of cars and planes. Thus, the increasing demand for plastics implies higher demand for virgin feedstocks (including LPG) in the petrochemical sector.

LARGE POTENTIAL FOR RECYCLED PLASTIC

The projections for high plastic demand will also have an environmental impact if recycling rates around the world remain constant. Around 12% of all plastics produced today are recycled back into the polymer production chain, while the rest are either incinerated or go to landfills and unmanaged dumps. Even recycled plastics have a limited economic lifetime, as the material deteriorates with each round of recycling. Thus, there is still large potential to recycle more plastics – especially single-use plastics.

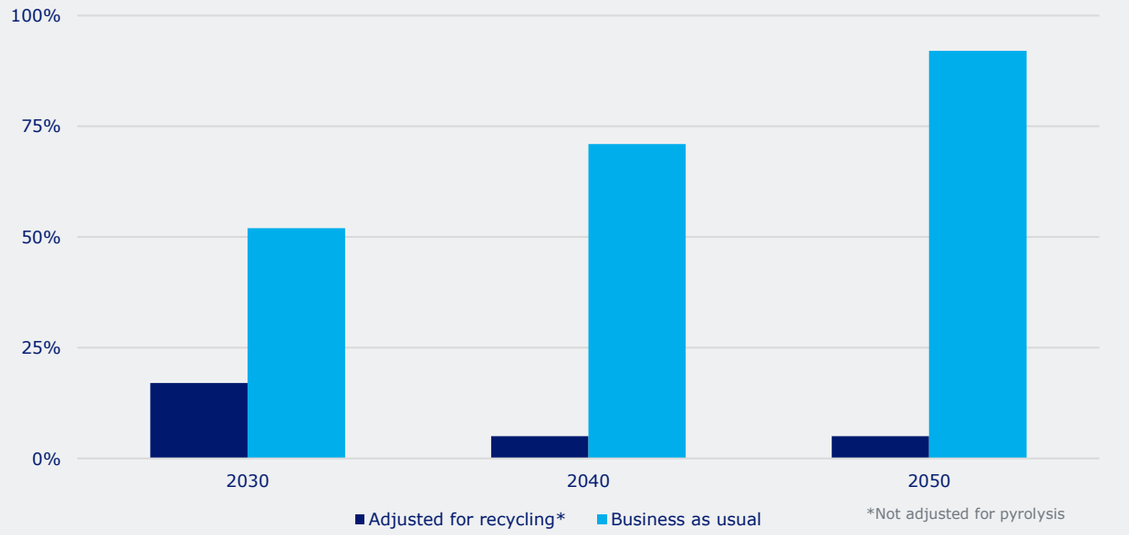
HIGHER RECYCLING RATES LIKELY TO PUT A LID ON LPG GROWTH

An increasing number of countries have started to ban certain single-use plastics in recent years. For instance, in the EU single-use plastics such as straws, forks, knives, etc. have been banned, while single-use plastics are also increasingly being prohibited in developing countries. The growing attitude among governments and populations towards reducing plastic use and recycling more may limit the growth potential of LPG. Assuming per capita consumption rates for plastics decline in OECD countries and increase modestly in developing countries, S&P Global estimates that LPG demand as a virgin feedstock in the petrochemical sector could increase at a CAGR of 0.4-0.5% between 2026 and 2050. This implies that there will most likely still be higher demand for larger vessels in the very long term, but just lower than previously assumed.

CHEMICAL RECYCLING COULD OFFSET THE LOWER GROWTH RATE

Chemical recycling (pyrolysis) is a relatively new method for converting waste plastics into feedstocks that could displace naphtha or LPG demand. This would lower growth in demand for new LPG. Nevertheless, LPG vessel demand could still increase if the pyrolysis plants are located far away from the plastic production plants. Some recycling plants have opened in the US and Europe. However, converting plastics into feedstocks is currently very expensive and therefore less attractive for plastics producers. It is estimated that in 2030 pyrolysis could account for 13% of plastic waste.

LPG DEMAND GROWTH FROM THE PETROCHEMICAL SECTOR (%)



Source: S&P Global, EPRS, Drewry, McKinsey, Danish Ship Finance

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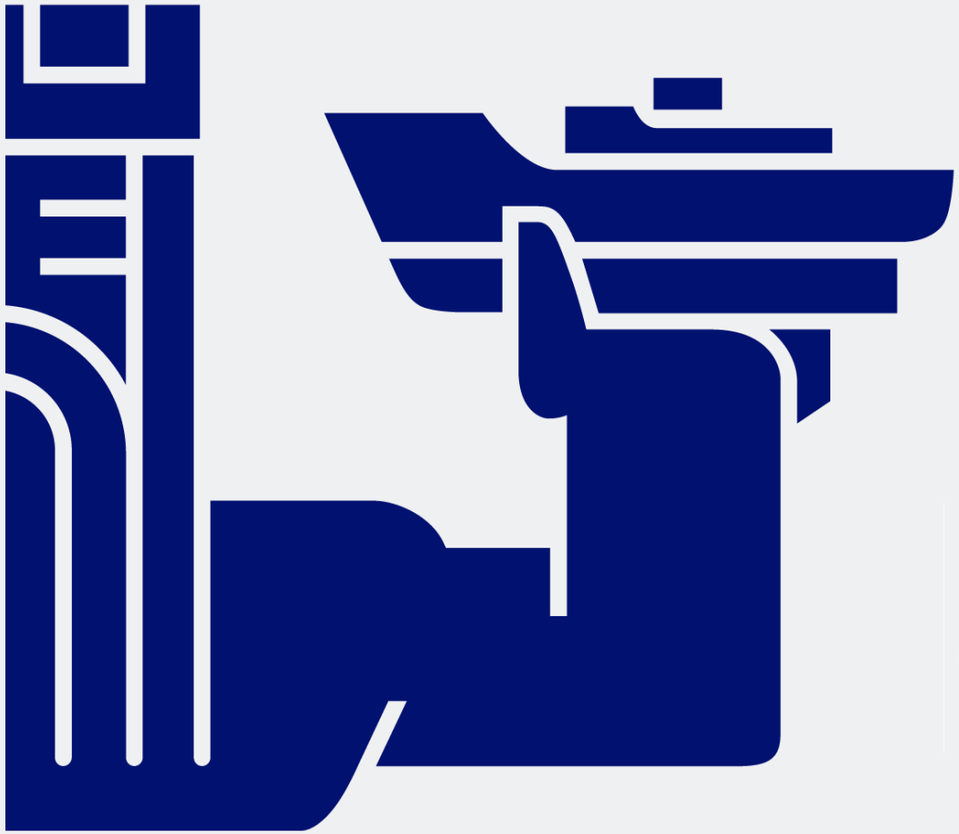

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