SHIPPING MARKET REVIEW

NOVEMBER 2017

DANISH
SHIP FINANCE

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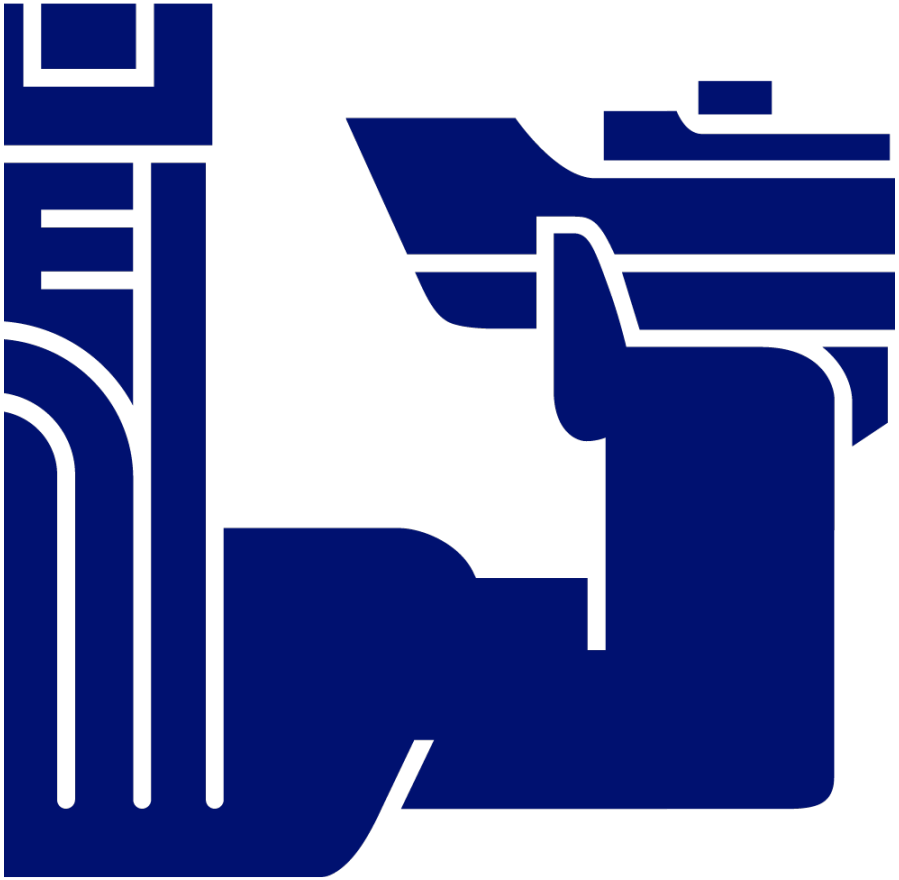

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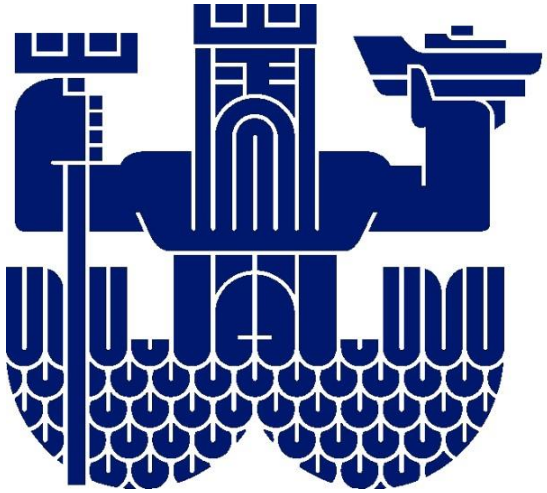

STRATEGIC DIALOGUE

Shipping Market Review by Danish Ship Finance

Danish Ship Finance is actively working to engage with industry leaders to explore the types of innovation best-suited to **UNLOCK THE NEXT LEVEL OF VALUE IN THE SHIPPING INDUSTRY**.

Danish Ship Finance runs strategic dialogues with our business partners to help them prepare for the changing business landscape.

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HEAD OF RESEARCH
Christopher Rex, research@shipfinance.dk

ANALYTICAL TEAM
Ninna Kristensen, Senior Analyst
Jonas Munch, Analyst
Sara Møller, Analyst
Caspar Wergeland, Analyst

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FOREWORD

We present a discussion of the potential long-term developments that may shape the outlook for the shipping industry up to 2030 and beyond. We strive to provide a clear-eyed view on what to look out for when navigating the changing demand landscape. We explore and develop our long-term outlook for the global shipping industry from the perspectives of technological innovation and labour market dynamics. For the past three years, we have discussed in our previous reports how the fourth industrial revolution is impacting the underlying industries that shipping serves.

The essence is that the long-term outlook for seaborne trade volumes will be structurally reduced unless the growing populations in Asia and Africa are employed. Advances within robotics, advanced manufacturing and artificial intelligence are depressing the labour market outlook in developing economies and will continue to do so until a new growth paradigm is introduced. These forces are not yet being factored into various forecasts for economic growth to any great extent, but we apply them to our long-term forecast for seaborne trade volumes. We continue to argue that seaborne trade volumes will grow by approximately 1% per annum up to 2030.

The implications for the shipping industry could be severe, since the world fleet is young and poorly utilised and more vessels are on order. The individual ship segments have few old vessels left that could be scrapped if demand fails to employ the incoming vessels. These forces influence our long-term outlook for freight rates and secondhand prices. We continue to expect that freight rates in general will stay low for longer, albeit short-lived spikes will occur. Some segments may be able to exchange equity for cash via premature scrapping and hence support freight rates, but this will be at the expense of the economic lifetimes of vessels. A continuing reduction of the economic lifetimes of vessels will maintain the downward pressure on older vessels' secondhand prices until a balance between supply and demand is established.

These predictions call for an updated value proposition in the shipping industry, where value is created beyond the existing business models. We need to ask ourselves: **HOW DO WE UNLOCK THE NEXT LEVEL OF VALUE IN THE SHIPPING INDUSTRY?**

We hope to spark a discussion on how to add additional layers of revenue to the existing business model. We invite our readers to discuss not only how the industry can become digitalised but also how we can create value from it.

The shipping industry is essentially the veins of the global economy, connecting buyers with sellers across various asset classes. By doing so, it effectively becomes a leading indicator for various industries. In the right context, these insights can become highly valuable if properly combined with other sources. This is about digitalisation. The next layer of revenue has significant potential.

Promising pockets of excellence already exist across the industry, demonstrating that the potential is real, yet there is still enormous untapped potential. In time, digitalisation may transform the way the shipping industry functions and unleash global opportunities for value creation. Digitalisation is not only a means of optimising a company's existing operations; it gives both disrupters and traditional shipowners the power to fundamentally alter existing value chains, enter new sectors and create innovative business models.

Enjoy reading!
Danish Ship Finance, November 2017

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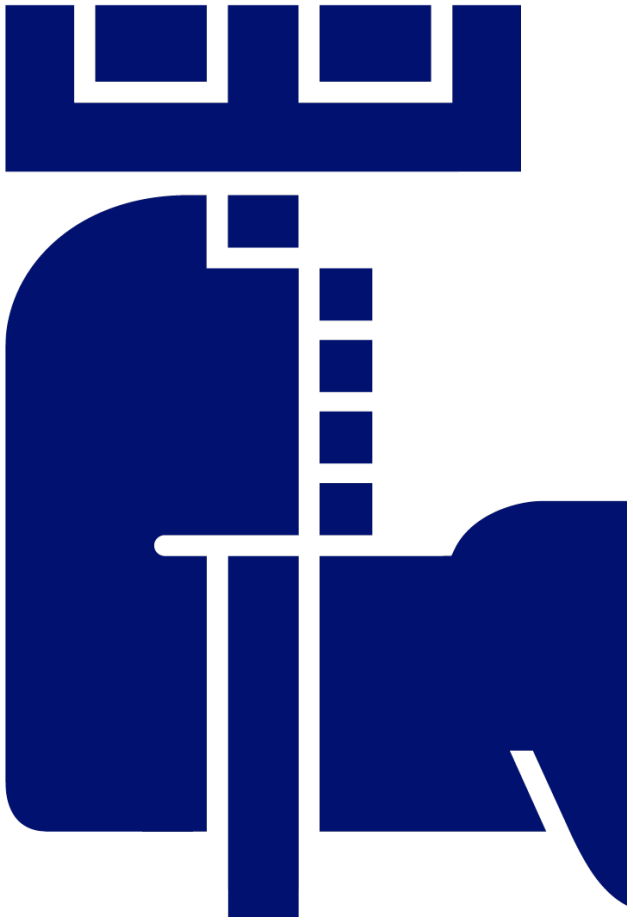

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EXECUTIVE SUMMARY

This report reviews key developments in the shipping market and the main shipping segments during the period May 2017 to November 2017 and indicates possible future market directions. Please read the disclaimer at the beginning of this report carefully.

The shipping industry has struggled to deliver a proper risk-adjusted return on invested capital for almost a decade. Surplus capacity is the central issue in markets in which investors continue to expect asset values to recover in time.

The problem is that the dynamics we are facing do not solely reflect the cyclical nature of the industry. A structural shift is also taking place; the global economy is in the midst of a transition. Yet many players in the shipping industry continue to operate as if the economy will return to familiar territory within a year or two. We continue to argue that the world economy is not about to return to familiar growth patterns; it is about to transition towards a digital future in which technologies like artificial intelligence, robotics, 3D printers and renewable energy gradually change the underlying demand landscape of the shipping industry.

The shipping industry needs to adapt to these changes. The challenge is that many shipping investors seem to be adhering to the traditional strategy that has served the industry well for decades: buy low and sell high; and be close to the customers and have access to cargo. The opposite clearly seems unwise, but we question whether it will be sufficient to return the industry to profitability. We argue that shipping companies should work to digitalise their operations to prepare themselves for a new and enhanced value proposition in the industry.

Few shipping companies are currently well-positioned to harvest the value from digitalisation. We believe that shipping data can deliver value across the industry and between industries. To us, it appears that many traditional players so far have focussed on the potential for cost savings relating to predictive maintenance of the vessels. But with investments in digital resources, technologies and smarter assets, it will be possible to obtain a competitive edge that unlocks greater and more sustainable value.

The impending changes represent an opportunity to rethink value creation in the industry: the role of the assets, the types of competitor and the borders of industries. The future of the shipping industry will depend on adaptation. While moving cargo from A to B will remain a key operational issue, value may likewise be created from the operational data. Players that succeed will be well-positioned to capture growth and improve profitability. But this opportunity will not necessarily be available to all players in the industry.

To realise this potential, it will be critical for shipping companies to build their capabilities around digital strategies that can enable them to meet the changing and growing competition from both existing and emerging competitors. Shipping companies must reimagine how they deliver value, not just to their customers but also to their customers' customers.

The shift toward ecosystem-driven value creation has considerable implications for the dynamics of the shipping industry. We believe the shipping industry could be entirely reshaped within the next five to ten years, but the competitive landscape could be very different across the various segments. Innovators are not only seizing growth, they are redefining it. By tapping into platform ecosystems, innovators can access resources and create value from assets that they do not have to own. The ownership of the data is vital for future value creation, but data without context carries very little worth; data needs to be shared, used and

combined to extract value. The more it is used, shared and combined, the larger the profit pools potentially unlocked.

SHIPBUILDING

Global active yard capacity has remained relatively stable in 2017 at around 45 million cgt, distributed among close to 600 yards. But the industry is seeing order covers decline rapidly and more yards are beginning to feel the pressure from a thinning orderbook. Deliveries of vessels exceeded new contracting by a wide margin in the first three quarters of 2017. 360 yards, representing around one-quarter of active capacity, have not received any new orders during the last 18 months, and 120 yards are due to deliver their last orders in the fourth quarter of 2017. Consequently, more yards are expected to run out of orders within the next 12 months. In 2017, ten yards representing one-fifth of global capacity have received a little more than half of all orders placed.

We expect that many yards will be left without orders and forced to close, if not permanently then temporarily, until the market regains balance. However, even if contracting remains low in the coming years, consolidation of the industry could lead to higher newbuilding prices in some segments, with prices being settled between fewer parties.

The next upswing for the industry might be sparked by the introduction of new standards for digital ships (e.g. smart, connected or autonomous ships). But it remains to be seen how quickly the next generation of ships will be introduced, as there is no segment in dire need of more capacity. The question is, though, if such an upswing would be inclusive or simply accelerate the consolidation of the industry.

CONTAINER

The Container market continues to struggle to handle surplus capacity among the larger vessels. Liner companies are working to consolidate their positions through mergers, acquisitions and alliances. Within the next 12 months, we expect to see many larger vessels returned to the tonnage providers as the liner companies and their alliance partners optimise their new trading networks. This strategy is aimed at increasing box rates, which is likely to be at the expense of tonnage providers. Timecharter rates and secondhand prices for larger ships are expected to decline even though box rates are improving, since Container demand is increasing more slowly than the fleet and more vessels are coming off-hire.

Despite the overcapacity issues, some liner companies continue to order super-large Container vessels. To us, this is a bold strategy, since it is basically a long-term bet on manufacturing location. In a growing number of industries, we are seeing zero-labour factories taking over manufacturing production. Many of these factories are currently located in India and China, but they could easily be relocated closer to consumers. The advances we are seeing within robotics, artificial intelligence, 3D printing and material science all point towards a future in which regionalised manufacturing seems likely. This may very well happen within the lifetime of the super-large ships.

The smaller vessels (i.e. those below 8,000 teu) could begin to benefit from a shrinking fleet, since it appears that some owners are considering reversing the cascading effect by deploying leaner and smaller vessels on some trade lanes, pushing some larger ships out, in a reversal of the prevailing practice of reducing the marginal cost per teu moved. It may be too early to call it a trend, but even without this, the smaller vessels could begin to benefit from the shrinking fleet.

The route to a market recovery for the larger vessels seems long and costly. A new value proposition is emerging, but it might not be for all. Additional value could be created through digitalisation of the industry. The established players are centrally positioned to benefit from this but could become marginalised if they fail to move into the digital space. The champions of disruption are the

ones that are creating a new and significantly enhanced value proposition for customers. Such a new value chain holds the potential to redefine the ecosystem of Container trading.

DRY BULK

The Dry Bulk segment has maintained the positive momentum in 2017 and freight rates and secondhand prices have continued to strengthen, though at a much slower rate than in the first quarter of the year. The stronger market sentiment has led to an increase in ordering and a slowdown in order deferrals and scrapping. This resulted in relatively high fleet growth of 3% in the first three quarters of 2017, but fortunately, demand also grew strongly, driven by a strong rebound in Chinese demand.

The market has come a long way since hitting the bottom in 2016, but despite this significant improvement, we have yet to see a reduction in the underlying oversupply and many owners are still struggling to return to profit in the current freight rate environment. This indicates that the market should maintain its cautious approach to new ordering in the coming years.

The Dry Bulk segment has reached a point where a market recovery could be within reach. The orderbook-to-fleet ratio has come down to only 8%, and if the industry refrains from embarking on a new round of excessive ordering, freight rates and secondhand prices could return to much more sustainable levels within the next couple of years.

The uncertainty related to the medium-term demand outlook underlines the importance of keeping new ordering at a minimum. The transition process of the Chinese economy towards a more service-driven growth model is expected to be long and complex and it will go back and forth. One of the consequences is expected to be periods of lower Dry Bulk demand, as we saw in 2015 and 2016. Hence, considering the oversupply still present in the market, this is not the time for buying new vessels. The Capesize segment in particular is vulnerable to new ordering, since the scrapping potential in the segment is very limited.

OFFSHORE SUPPLY VESSELS (OSV)

The market for Offshore Supply Vessels (OSV) remains oversupplied. Many vessels are laid up or simply unemployed, while few vessels have been scrapped. Freight rates and secondhand values are low across the board.

The offshore market supplies almost one-third of global oil production, but E&P spending is currently favouring onshore projects. Most new offshore projects are tie-backs to existing infrastructures, which has structurally reduced demand for Offshore Supply Vessels.

The low fleet utilisation (below 50%) is shaping the outlook for Offshore Supply Vessels. There are currently almost 2,500 vessels (44% of the OSV fleet) either in lay-up or without active class certificates (28% for the largest vessels). Many of these vessels are unlikely to re-enter service and become an active part of the fleet unless owners get a contract in place to cover the reactivation costs.

The larger ship segments (i.e. AHTS >12,000 BHP and PSV >3,000 dwt) seem to be somewhat better-positioned for a recovery in freight rates than the smaller ones. Still, some of the larger vessels could turn out to be overequipped for the needs of the future. Moreover, the size of the orderbook, if it is delivered, clouds the outlook.

Secondhand prices are low but may not yet have come down far enough to reflect the vessels' current earnings potential. Bid-ask spreads remain wide, which explains the relatively illiquid sale and purchase market. Old vessels seem most exposed to sharp depreciations in their secondhand prices.

SUBSEA VESSELS

The low offshore E&P spending that is lowering demand for Offshore Supply Vessels is likewise reducing demand for Subsea vessels. Market activity is low and new projects are primarily related to (smaller) tie-back projects. The low market activity has caused competition to intensify and forced larger companies to bid for smaller contracts (i.e. below USD 100 million), leaving smaller vessel owners in a very difficult position. Many have been forced to exit the market.

Charter rates have more than halved, from GBP 195,000 per day in 2014 to GBP 97,500 per day in August 2017. This drop reflects the poor utilisation of the fleet. The low demand for Subsea vessels is visible in the low but growing number of new subsea tree contracts and installations.

Secondhand prices are under pressure. The sale and purchase market is characterised by illiquidity and many sales are considered distressed. This makes it harder to assess the actual market value of vessels, but the young, modern vessels are holding up the best.

The Subsea market could be past the bottom of the cycle. Still, a recovery may take some years and it may not be for everyone.

CRUDE TANKER

Market fundamentals have worsened in the Crude Tanker segments in 2017, as the fleet has expanded rapidly and outstripped otherwise strong growth in distance-adjusted demand. This has led to steep declines in freight rates. The VLCC segment has experienced the most severe downturn.

Spot earnings have declined rapidly this year, and by the end of October were down 49% from their most recent peak in December 2016. In October 2017, timecharter rates were on average down by 17% from the December 2016 level.

The bearish market has reduced secondhand prices for older vessels to some of the lowest levels since the beginning of the 2000s. Higher scrap prices and low freight rates seem to have led owners to increase demolition in 2017. Still, investors seem to have high expectations for future earnings, which is why some younger vessels have seen small increases in their secondhand values despite declining freight rates.

We see little to indicate that market fundamentals will improve significantly within the next year or two. The fleet is scheduled for further growth and demand for Crude Tankers looks unlikely to be able to secure a high utilisation of the fleet, even though global oil demand continues to grow at a healthy rate.

The temporary factors that are currently supporting Crude Tanker demand will fade when OPEC terminates the production cut. When that happens, freight rates and secondhand prices are likely to face additional pressure from shorter travel distances. Still, the long-term factor that has yet to be priced into younger vessels' secondhand prices is 'peak oil demand' which looks likely to occur within the lifetime of some vessels currently trading. Industry executives argue that global oil demand will peak within the next ten to 15 years.

We argue that younger vessels could be overvalued compared with their actual future earnings potential.

PRODUCT TANKER

The Product Tanker fleet is expanding strongly, for the third consecutive year, and is now struggling to handle surplus capacity. Demand for Product Tankers has been relatively robust, but trading activity has been capped by high inventories which are hampering arbitrage trading. Freight rates are low across the sector, but LR2 are struggling the most.

MR and LR1 timecharter rates increased slightly in the first ten months of 2017, but worsening market conditions caused LR2 timecharter rates to decline by 7%. MR and LR1 rates have been

supported by strong growth in product exports from the US to Latin America, increased European exports to West Africa and growth in intra-Asia trades. On average, Product Tanker timecharter rates remain near historical lows. Secondhand prices are generally low, but MRs have seen their prices recover slightly in 2017. LR secondhand prices are largely unchanged.

The short-term outlook for Product Tankers is characterised by modest growth in demand and a front-loaded orderbook. We do not believe that demand growth will be adequate to employ the many new vessels entering the fleet. For freight rates to stay stable or increase, a large number of vessels will need to be demolished. Premature scrapping is expected in the LR segments, since few old vessels remain. This may cause a shortening of older vessels' economic lifetimes and hence lower these vessels' secondhand prices. MRs are better-positioned to absorb the orderbook through scrapping, but low demand growth means that continued optimism for MRs requires owners to step up demolition of older vessels.

The medium-term outlook for Product Tankers is highly sensitive to Asian demand and very modest contracting activity. We argue that it would be judicious to hold back ordering in the years to come.

LPG

The LPG market is oversupplied. VLGC and MGC freight rates and secondhand prices are near all-time lows. Supply is expected to increase ahead of demand in 2017, as the fleet is expected to grow by around 9% and demand around 5%. In 2018, demand should begin to outpace supply, but freight rate improvements might be limited due to the current oversupply.

The demand outlook remains robust, but demand is only expected to grow by single-digit percentages in the next five years. The amount of new orders placed in 2017 may postpone the expected recovery in freight rates by a year. If orders are delivered according to schedule, supply growth could be on a par with demand growth in 2019. Hence, from 2020 onwards freight rates and secondhand prices could start to recover if no new orders are placed.

The weak market has so far not led to an increase in scrapping activity. The young age profile of the fleet seems to be keeping a lid on demolition. When owners begin to scrap, the average age of vessels scrapped could start to lower the secondhand prices of older vessels through a reduction in their economic lifetimes.

LNG

The LNG shipping industry has been oversupplied since 2013, as many liquefaction facilities have been significantly delayed in coming online. Nonetheless, the seaborne LNG market continues to expand. Growing global demand for natural gas combined with depleting gas field production in Asia is increasing regional demand for seaborne LNG imports. Seaborne LNG supply appears to have moved firmly into a phase of rapid expansion as major new liquefaction projects ramp up output, particularly in Australia and the US. While the low oil and gas price environment continues to exert significant pressure on new liquefaction project sanctioning, the supply and demand balance in the LNG shipping industry is projected to improve gradually in the coming years.

After five years of declining freight rates, the past year has seen rates increasing somewhat and the LNG shipping industry could have passed its cyclical bottom. However, the current upswing may be over before many of the current newbuilding orders have yielded a proper return on invested capital. Still, indications are that we will see increased fleet utilisation in the next three years. This will be driven by Asian and European demand, while increased US exports are expected to add to tonne-miles. Vessel supply could still run ahead of demand for short periods.

The long-term outlook is weakening, as risk is building up. First, the market is veering more towards spot trades and vessels are being fixed on shorter contracts. Second, the global energy landscape is changing. The outlook for the oil and gas industry is

highly uncertain. New sources of energy supply are being added to the global energy mix. The role of renewable energy in the global energy mix seems to be increasing faster than previously anticipated. Early large-scale penetration of batteries for electricity storage (e.g. via electric cars) would facilitate a shift towards renewable energy more quickly than currently expected. In the event of this, gas-fired power plants could eventually be turned into peak capacity instead of providing baseload capacity for the energy grid. This would clearly reduce growth in the demand for gas and may eventually lead to a decline. ▪

GENERAL REVIEW AND OUTLOOK

SHIPPING MARKET REVIEW – NOVEMBER 2017

DANISH SHIP FINANCE

GENERAL REVIEW AND OUTLOOK

THE WORLD ECONOMY IS ABOUT TO TRANSITION TOWARDS A DIGITAL FUTURE IN WHICH TECHNOLOGIES LIKE ARTIFICIAL INTELLIGENCE, ROBOTICS, 3D PRINTERS AND RENEWABLE ENERGY ARE GRADUALLY CHANGING THE UNDERLYING DEMAND LANDSCAPE OF THE SHIPPING INDUSTRY. WE EXPECT THAT SEABORNE DEMAND VOLUMES WILL STAY FAIRLY FLAT OR INCREASE SLIGHTLY IN THE MEDIUM TO LONG TERM. THIS COULD CREATE STRUCTURAL OVERSUPPLY IN SEVERAL SHIP SEGMENTS. THESE PREDICTIONS CALL FOR AN UPDATED VALUE PROPOSITION, WHERE VALUE IS CREATED BEYOND THE EXISTING BUSINESS MODELS. WE NEED TO DISCOVER HOW WE UNLOCK THE NEXT LEVEL OF VALUE IN THE SHIPPING INDUSTRY.

In previous editions of this report, we have discussed the macroeconomic perspectives from which we analyse the long-term outlook for the individual ship segments. We continue to expect that the global economy will grow at an annual rate of 2-4%, but that the engines driving growth will shift towards the service sector. Demand for energy, food, water and building materials will continue to rise, but the resource intensity of global GDP will decline in tandem with the increasing use of technology (e.g. renewable energy sources) and circular economic principles (e.g. recycling and reuse of resources). We believe that seaborne demand will stay fairly flat or increase slightly in the medium to long term, depending on the specific ship segment. We forecast that from now until 2030 seaborne trade volumes will only increase at an annual average rate of 1%. Where our long-term outlook differs from the consensus is our interpretation of two fundamental dynamics: the future role of people and the future role of technology. Let us begin with the role of people.

WILL A GROWING POPULATION POWER THE GLOBAL ECONOMY?

In most long-term forecasts, it is often argued that the projected global population growth up until 2050 is the single most important driver of future growth in almost any asset class that is seaborne. It is assumed that the road to increased prosperity will be facilitated by a continued urbanisation process that will ripple through Asia and Africa, creating jobs and economic growth and expanding the global middle class further.

THE DRIVERS OF ECONOMIC GROWTH ARE CHANGING

This is a compelling argument and the logic is straightforward, since it is based on the unprecedented urbanisation push seen in large parts of Asia in recent decades, particularly in China. However, we believe it is incorrect and misleading. The underlying fundamentals have changed. The flaw in the argument relates to the very basic nature of economic growth: people need money to spend to become consumers, and to earn money they need jobs. When we assume that people turn into urban consumers the minute they migrate to urban hubs, we implicitly assume that they will find employment. However, this is becoming less and less likely.

FEWER JOBS PER DOLLAR GROWTH

The technological advances we are seeing within robotics, artificial intelligence and advanced manufacturing are driving an increasing degree of automation throughout production lines across various industries. Combined with an ageing consumer base (i.e. the global buy-side), this is making it increasingly difficult to employ the millions of people that are entering the global workforce in Asia and Africa and hence to create an export-driven growth model.

CONSUMER SPENDING IS BECOMING DOMESTIC ORIENTED

Ageing consumers continue to spend, even though their disposable income generally shrinks upon retirement, but we are seeing a gradual but persistent shift in their spending towards services that often are domestically produced (e.g. health care and leisure spending). We therefore argue that an export-driven growth model (like the Chinese manufacturing approach or the

Indian IT service sector-driven model) that has traditionally created millions of jobs is less likely to be repeated in the future, not least because a large proportion of global consumers are about to retire.

URBANISATION WITHOUT JOBS GENERATES SLUMS

It is still the case that many farmers will move to urban centres hoping for a brighter future. But urbanisation without job creation simply creates slums and slums can easily prove GDP negative. Today, income inequality continues to increase on a global level and we are seeing huge migration flows driven by a deteriorating employment outlook in many emerging economies. The projected population growth may represent a drag on many of the emerging economies rather than a route to prosperity. It all comes down to the individual economies' ability to employ the growing populations.

UPSKILLING THE LABOUR FORCE

The World Economic Forum has recently concluded that nations' ability to equip their labour forces with the right human capital could be one of the most important determinants of their long-term economic outlooks. Take India as an example.

NEW SKILLS FOR NEW JOBS

The Indian workforce is growing by about one million people every month, but the economy is struggling to create enough new jobs. The dominant IT services sector is losing steam fast due to increasing wages and the rise of automation, robotics, artificial intelligence, machine learning, 3D printing and data processing. We have seen massive layoffs in the last few years. These new technologies are creating new jobs but at the same time are eliminating others. The problem is that an increasing share of Indians are now finding themselves back on the job market, with skills many employers do not need. The challenge is to upskill the workforce and prepare future generations with the skillsets needed to be part of the industries of the future.

STAFFING LEVELS CAN BE REDUCED BY 30-50%

The Indian government's vision for 'Make in India' is a positive step towards helping the country in its transition from an IT services-powered economy to a more diverse economy that continues to target inclusive economic growth. The Indian government has a bold target of creating 100 million new jobs by 2022. The challenge is that it may be easier to create economic growth than jobs, since an increasing use of robots enables more production being done with fewer workers. A recent McKinsey study suggests that by introducing low-cost automation in, for example, the production line of an automotive supplier, it is possible to reduce staffing levels by between 30% and 50%. Similar findings are applicable to other industries and countries.

A GROWING WORKFORCE MAY BE DIFFICULT TO EMPLOY

The long-term implications for the global economic outlook vary greatly between regions. For economies with ageing workforces (i.e. most developed economies and China), automation may enable economic growth for longer, but for those with large and growing workforces (e.g. large parts of Asia and Africa), it may represent a threat. From a shipping perspective, this means that much of the current demand impetus could be facing some challenges in the medium to long term.

REDEFINING THE COMPETITIVE LANDSCAPE

The ageing consumer base and technological advances are changing the architecture of the global economy. Many of the technologies that are characterising the fourth industrial revolution (e.g. electric autonomous cars, robots, artificial intelligence, the internet of things and green energy technologies) are graduating from being emerging technologies to activities that are redefining the competitive landscape across industries and economies. We are seeing significant changes to the way not only energy but also good and services are produced, supplied and consumed.

AN INTERLINKED STRUCTURE OF REGIONAL ECOSYSTEMS

The infrastructures and business models of the industries that serve the global economy, including the shipping industry, need to adapt to this new reality. We expect to see large parts of the global economy shift towards the service sector and become interlinked structures of regional ecosystems – ecosystems that will likely demand fewer long-haul trades than currently. These trends will emerge when production moves closer to consumers (i.e. reshoring), the energy system electrifies and turn towards renewables, and when the circular economic principles (i.e. recycle, reuse, remanufacture) penetrate larger parts of the global economy.

ENERGY INTENSITY IS EXPECTED TO DECLINE MORE QUICKLY

The long-term energy outlook is highly sensitive to these changes. On the supply side, new technologies are enabling new sources of energy (ranging from solar PV to multi-stage fracturing and seismic imaging), as well as extremely flexible production operations. Meanwhile, the demand outlook is being structurally reduced as the global economy shifts towards services and as solutions for improved energy efficiency are adopted. The ongoing electrification of the global energy system is reducing the energy intensity through a significant reduction in heat loss compared with fossil fuels. The rate of decline in the world's energy intensity (units of energy per units of GDP) is expected to almost double from 1.4% per year for the last two decades to an annual average of 2.5% for the next two decades.

IMPROVED EFFICIENCY IS LOWERING THE RESOURCE INTENSITY

In many industries, the production of one unit is already becoming less labour and resource-intensive. This development is expected to continue in the years to come. The transition will be dramatic, although it will be felt unevenly across industries and regions. It seems clear, though, that these trends will reduce the emerging economies' long-term demand for seaborne trade volumes as their economies de-industrialise and become more service-oriented.

DE-INDUSTRIALISED GROWTH CREATES FEWER SEABORNE VOLUMES

The potential impact on the shipping industry is likely to be important, since these forces could significantly streamline large parts of the underlying industries that shipping currently serves. Some of these industries (e.g. automotive, mining, utilities, and oil and gas) are already in transition and are seeing their market outlooks change rapidly, while other industries (e.g. petrochemicals and manufacturing) seem to be approaching the tipping point, whereafter the potential consequences of new technologies could change their market dynamics significantly. Thus, the long-term potential for growth in seaborne trade volumes is gradually being eroded despite the projected progress in the global economy and the rise in the global population.

1% GROWTH IN SEABORNE TRADE VOLUMES TOWARDS 2030

The shipping industry is expected to undergo a transformation during the next five to ten years, in terms of business models, the role of assets and the type of competitor. In some ship segments, we anticipate a gravitational shift towards different vessel sizes and we may even see fewer cargoes shipped. We still expect to see long-term growth in seaborne trade volumes averaging about 1% per annum until 2030. But this forecast may entail surprises in terms of commodity classes, trading routes, parcel sizes and distances, and could mask temporary drops in seaborne trade volumes that might leave fleet utilisation depressed for quite some years in several ship segments.

SIGNIFICANT CHANGES WITHIN THE NEXT DECADE OR TWO

Some will argue that these predictions are premature, since adoption of the emerging technologies (e.g. renewable energy, electric cars, car-sharing schemes, recycled materials) remains low on a global scale. But that is not the point. The overriding aspect to consider is the structural changes that ensue when these emerging technologies reach a certain degree of market penetration. We expect these changes to emerge within the lifetime of vessels currently trading and for sure for any new vessels contracted today.

SUPPLY-SIDE ADJUSTMENTS ARE REQUIRED

If the future market develops fairly in line with our predictions, the consequences could be significant for many shipping companies: freight rates are likely to stay low in underutilised ship segments for quite some time; secondhand prices will remain low for longer; and older vessels will continue to face downward pressure due to a shortening of their economic lifetimes.

LIMITED UPSIDE POTENTIAL IN CURRENT SECONDHAND PRICES

Secondhand prices could continue to depreciate in the medium term, even for younger vessels. In this respect, there are two issues to consider: the economic lifetime of the vessel and its future earnings potential. Thus, a decline in secondhand prices from today's levels could be caused either by a temporary reduction in the vessel's expected economic lifetime or by a reduction in its earnings potential.

PREMATURE SCRAPPING IS EXPECTED TO CONTINUE

The mean-reverting nature of the shipping industry may remain a distant hope until the supply-side has adjusted to the new and lower demand picture. In some segments, it may not be enough to scrap older vessels if trading routes or travel distances change dramatically. In addition, it may be necessary to build smaller ships and scrap younger and larger ships. This could be the case in some parts of the Container industry if regional manufacturing hubs are established closer to consumers.

INVESTOR APPETITE IS CHANGING

Large parts of the shipping industry have failed to deliver a proper risk-adjusted return on invested capital over the last five to eight years, although promising pockets of excellence do exist across the industry. Many outside investors currently seem to regard ships as unscalable and highly depreciating assets. In the past, we have seen institutional investors buy distressed debt or distressed assets at significant discounts, but today we are seeing more sellers than buyers for these types of transaction.

THE DIGITALISATION OF THE SHIPPING INDUSTRY

In today's market, the hardware of the industry is increasingly becoming a commodity. Modern vessels offer little opportunity for differentiation. However, the data they generate may prove extremely valuable. The value of the data may not reach its full potential until it is turned into proper intelligence by combining it with other sources (i.e. its context). The next generation of ships are likely to be super-connected assets whose real-time data has the power not just to predict when maintenance might be necessary but also trading decisions. The industry essentially needs to digitalise and develop an additional layer of revenue that is powered by the data generated by trading the vessels.

VESSEL DATA MAY BECOME AS VALUABLE AS THE SHIP

In a digital world, data may easily be as valuable as the underlying assets. Trade data fuels the algorithms that provide insights into markets, customers and business processes. The shipping industry should increasingly treat data as a competitive advantage. But data without a context carries very little worth; data needs to be shared, used and combined to unlock value. The more it is used, shared and combined, the larger are the profit pools potentially unlocked from various sources. Vessels' trading data can be an early indicator for the underlying global economy, which can be used in multiple contexts not just related to the shipping industry. The vessels remain a central component, but value may be created beyond the potential of the underlying assets.

A CHANGED PLAYING FIELD FOR INVESTORS

In many industries, we are seeing traditional players challenged by changes in consumer preferences (e.g. green energy, car sharing rather than car ownership) or by new players often from other sectors (e.g. IKEA selling solar PVs and batteries, and oil majors selling electricity in competition with local utility companies). In some cases, the new players are introducing new capacity to the market, while in others they are simply introducing algorithms or trading facilities (e.g. platforms) that enable existing capacity to be utilised better. What can be learnt from these

examples is that in many industries the existing assets are becoming the established players' passport to value creation but may not actually create the main value themselves. Controlling the data and the infrastructures that deliver this data could become an important source of revenue, although we acknowledge it may not be for everyone.

SOURCES OF REVENUE ARE CHANGING

In some industries, we are seeing new players create overcapacity, because additional capacity is being introduced faster than existing capacity is being retired (e.g. utility-scale solar versus the existing utility supply). The new players are changing the rules of the game: they may profit even though they are driving down prices; they are changing the borders of industries; and they are profiting from multiple, deeper and larger pools of revenue than the traditional players. The value of existing assets is being reduced through lower earnings and a shortening of the assets' economic lifetimes. This could be a precursor for what will happen in the shipping industry when new smart and super-connected ships are introduced, not to mention real-time trading platforms, which are expected to generate a lot of value, albeit only for the few.

EXTEND THE BUSINESS MODEL BY DIVERSIFYING REVENUE STREAMS

Innovators may be able to extend the business models of the shipping industry by adding value from digitalisation and data monetisation. Trade and performance data can work together to unlock new opportunities to grow and deliver value in a low freight rate environment where asset values mainly depreciate (i.e. opposite to super volatile asset values). This potential is significantly enhanced if the data can be combined with external data to serve multiple customers in multiple industries simultaneously. It is then possible to build on the domain knowledge of the shipping industry and hence create an offering for customers' customers that enhances the value of the products they buy (i.e. multisided platforms).

LARGER POOLS OF PROFITS MAY BE EXPLORED

Take the car industry as an example. In the past, it was all about building cars and selling spare parts. Then it turned into a game about mobility on demand. Today, an additional layer of revenue has been introduced: utility solutions, with electricity being bought and sold to the market. In other words, a car manufacturer can be competing in three different markets when supplying cars to the global markets: with its traditional rivals, with mobility providers, and, last but not least, with local utility companies, profiting from buying and selling electricity. In short, a single asset is driving down prices in all three markets, but it is likewise expanding its potential revenue pool to more than one market.

BUSINESS MODELS NEED TO ADAPT

The new element to this well-known market dynamic is that new projects are likely to compete on very different parameters than existing assets in case they have access to multiple streams of revenue. Traditional players may be marginalised when prices are driven down to marginal costs and all players become price takers. The asset game becomes almost obsolete in a competitive environment of price takers.

ENTIRE ECOSYSTEMS OF INDUSTRIES ARE BEING REDEFINED

Entire ecosystems of industries are being redefined. The role of assets, the type of competitors and the borders of industries are rapidly transcending in the age of digitalisation. Value creation is expected to shift from the assets towards the data that is created by trading the assets.

THE SHIPPING INDUSTRY IS IN TRANSITION

The shipping industry is in a period of significant change. Price dynamics, innovation, a diversifying demand outlook and fragmented competition are driving creative destruction. New business models and markets are causing many of the existing structures to mutate or be terminated. The industry has never had more reason to contemplate the long term, but it is also under pressure to take swift, short-term measures to protect margins.

NOT ALL SHIP SEGMENTS ARE EQUALLY EXPOSED

Not all ship segments are equally exposed to the impending changes in market dynamics and they are not facing the same long-term demand outlook. Some ship segments are heavily reliant on one single source of demand, while others serve multiple industries. We provide a clear-eyed perspective on the long-term outlook for the individual ship segments on the following pages. ▪

SHIPPING MARKETS AT A GLANCE

SHIPPING MARKET REVIEW – NOVEMBER 2017

DANISH SHIP FINANCE

SHIPPING MARKETS AT A GLANCE

IN PREVIOUS REPORTS, WE HAVE HIGHLIGHTED THE STRUCTURAL HEADWINDS THAT ARE CHALLENGING THE OUTLOOK FOR VARIOUS SHIPPING SEGMENTS. IN THIS EDITION, WE INITIATE A DISCUSSION ON HOW TO UNLOCK ADDITIONAL VALUE BEYOND THE ACTUAL SHIPS.

WORLD DEMAND INDICATORS

SEABORNE TRADE VOLUMES HAVE INCREASED MORE THAN EXPECTED DURING 2017. STILL, GLOBAL IMBALANCES CONTINUE TO WEIGH ON THE LONG-TERM OUTLOOK.

TRADE IS REBOUNDING STRONGLY

Seaborne trade volumes increased much more strongly during the first half of 2017 than we expected. The WTO has issued a marked upward revision to its forecast for 2017 following a sharp acceleration in global trade growth in the first half of the year, and now estimates growth in trade volumes of 3.6% for 2017 compared with 1.3% in 2016. The Dry Bulk industries powered almost half of the increase in seaborne trade volumes, of which Chinese imports generated close to 60%.

SOLID GROWTH IN INVESTMENTS

Stronger economic growth, particularly in China and the US, has boosted demand for imports, which has spurred intra-Asia trade, as demand has been transmitted through regional supply chains. In both countries, demand has been driven by solid growth in investments. The import content of investments tends to be higher than other components of GDP, so a recovery of expenditure in this area has a disproportionate impact on import demand.

CHINA'S REBALANCING EFFORTS WERE ALMOST PAUSED

China's growth reflects a slowdown in its efforts to rebalance activity toward services and consumption, a higher projected debt trajectory, and diminished fiscal space. These factors imply a heightened probability of a sharp growth slowdown in China at some point in the future, with adverse international repercussions, especially for seaborne trade. Following a period of abundant credit supply, a sudden tightening of global financial conditions (and an associated US dollar appreciation) could expose financial fragilities in some emerging markets, imposing strains on economies with US dollar pegs, high leverage, and balance sheet mismatches. These risks are closely interconnected and could be mutually reinforcing.

SHORT-TERM RECOVERY, LONG-TERM CHALLENGES

The rapid pace of trade growth in 2017 is unlikely to be sustained next year (and beyond), for several reasons. First, trade growth in 2018 will not be measured against a weak base year, as is the case this year. Second, monetary policy is expected to tighten in developed countries as the Federal Reserve gradually raises interest rates in the United States and the European Central Bank considers how to phase out quantitative easing in the euro area. Third, fiscal expansion and easy credit in China are likely to be reined in to prevent the economy from overheating. These factors should contribute to a moderation of trade growth in 2018 and beyond.

LITTLE GROWTH IN SEABORNE TRADE VOLUMES UP TO 2030

To our understanding, 2017 has been a deviation from the ongoing rebalancing of global GDP towards services. We argue that the relationship between seaborne trade volumes and world GDP will continue to weaken. We expect that seaborne trade will grow by an annual average of 1% per year up to 2030. We discuss the underlying mechanisms that determine our outlook for the global economy and the shipping industry in the 'General Review and Outlook' chapter of this report.

FREIGHT RATES MAY STAY LOW FOR LONGER, SINCE SUPPLY CONTINUES TO INCREASE WHILE ECONOMIC GROWTH IS DEMANDING FEWER UNITS SHIPPED PER DOLLAR GROWTH.

FREIGHT RATES REMAIN LOW BUT ARE INCREASING

The shipping markets continue to struggle with overcapacity. Freight rates remain low across the board, indicating that utilisation is poor in most ship segments. The ClarkSea Index stood at USD 13,000 per day in October 2017, up approximately USD 5,500 per day from its all-time low in August 2016 (fig. 1). The leading freight rate indices for Crude and Product Tankers, LPG Carriers and Container vessels are only USD 3-7,000 per day above their all-time lows. Offshore-related vessels are likewise facing very difficult times. The Dry Bulk segment has regained some lost ground during the past 18 months and is now approximately USD 10,000 per day above the all-time low from February 2016.

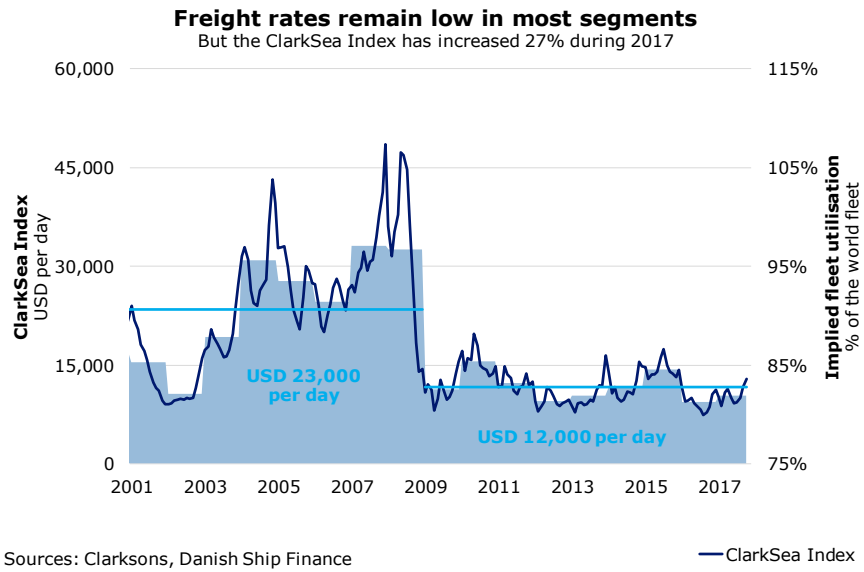
SECONDHAND PRICES HAVE GAINED 21% IN 2017

Secondhand prices remain low in all segments, but the average secondhand price index has increased 21% since it bottomed out in November 2016 (fig. 2). The increase has primarily been driven by the Dry Bulk and Container segments. This may signal that some investors are afraid of missing the bottom of the cycle and strongly believe that a market recovery is imminent.

HIGHER MARKET ACTIVITY

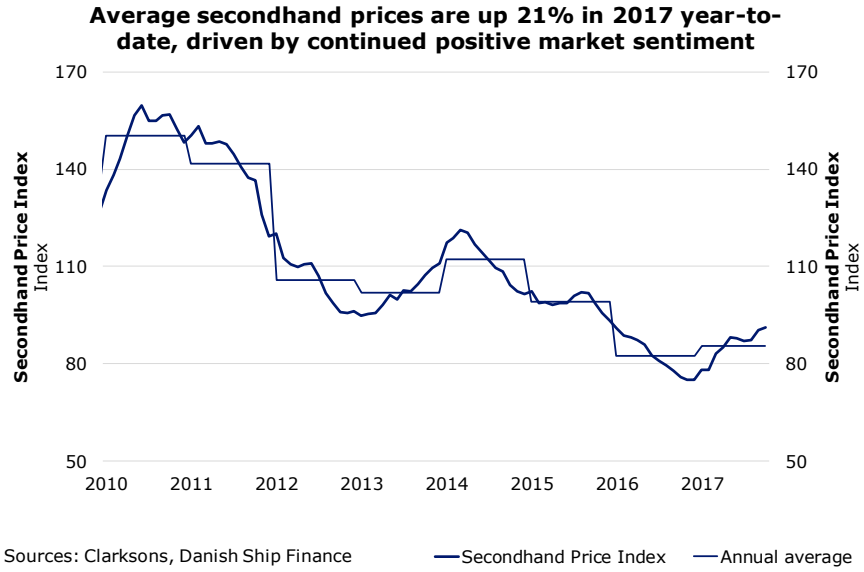
The growing optimism facilitated an increase in sale and purchase activity of almost 30% during the first nine months of 2017 compared with the same period last year, with 1,300 vessels traded. The appetite for ordering new vessels has also increased in 2017, although it remains at a low level. The number of vessels ordered during the first nine months increased by approximately 30% year-on-year. Crude and Product Tankers together with Dry Bulk drove most of the increase (fig. 3).

Figure SM.1



Sources: Clarksons, Danish Ship Finance

Figure SM.2



Sources: Clarksons, Danish Ship Finance

MANY SHIPYARDS ARE RUNNING OUT OF ORDERS

The orderbook has shrunk significantly compared with past years, but there are still 3,000 vessels on order globally. More than 1,200 vessels were delivered during the first nine months of 2017, while fewer than 600 vessels were ordered. Global active yard capacity has remained relatively stable in 2017 at around 45 million cgt, distributed among around 600 yards. However, approximately 360 yards, representing around one-quarter of active capacity, have not received any new orders during the last 18 months. We label these yards second-tier. These yards are running out of orders in less than 12 months. The first-tier yards have order cover of 2.2 years.

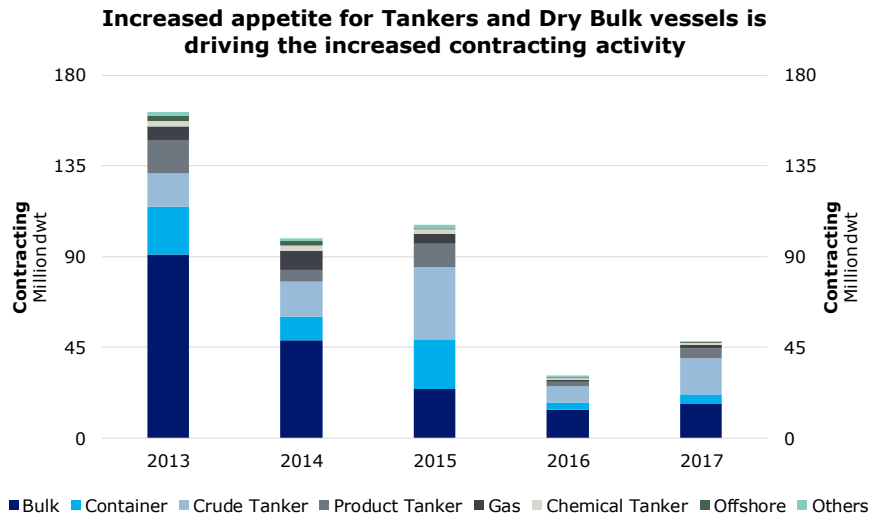
PREMATURE SCRAPPING WILL CONTINUE

The orderbook represents just below 10% of the global fleet. The challenge is that most ship segments are struggling to handle surplus capacity in an environment with low demand growth and few obvious scrapping candidates. It is hard to tell which segments will order new vessels and hence continue to employ some of the global yard capacity. Only 9% of the fleet is currently 20 years or older, which means that surplus capacity will most likely persist for some time unless young vessels are scrapped prematurely (fig. 4).

SECONDHAND PRICES ARE DECLINING AMID PREMATURE SCRAPPING

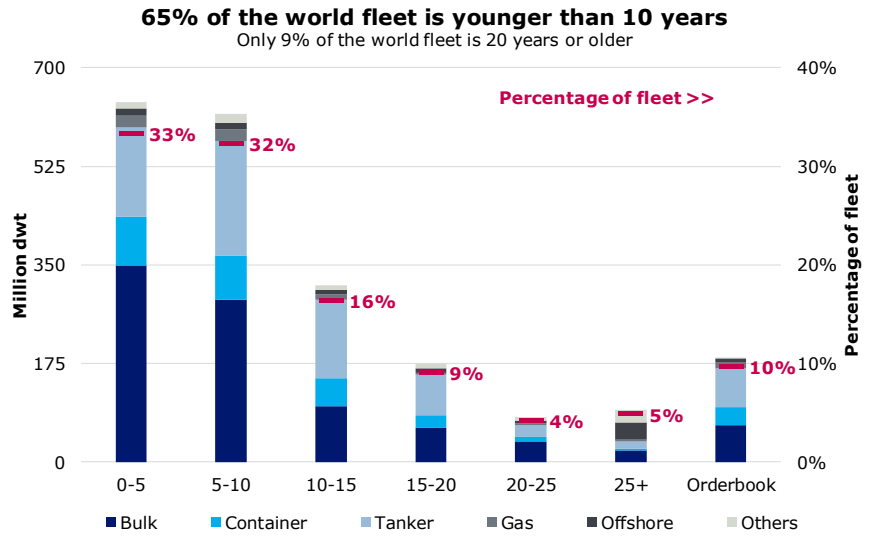
The average age of vessels scrapped has been declining since 2012, when the average scrapping candidate was 30 years old. Today, most old vessels have already been scrapped in the main ship segments, and consequently the average age of vessels scrapped has come down to 24 years (fig. 5). This means that in many ship segments older vessels' secondhand values are facing some structural headwind from a shortening of their economic lifetimes. In most of the main ship segments, the average age of vessels scrapped is between 20 and 25 years, meaning that their secondhand prices are reduced by an amount that equals the net

Figure SM.3



Sources: Clarksons, Danish Ship Finance

Figure SM.4



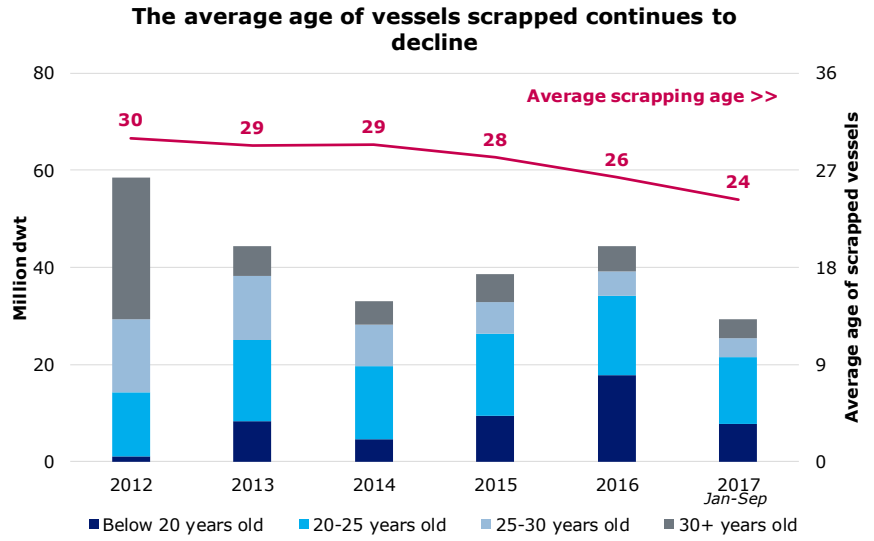
Sources: Clarksons, Danish Ship Finance

present value of up to five years of cash flow. In the Container segment, for ships between 3,000 and 6,000 teu in size, the average age of vessels scrapped has come down to just 15 years.

FREIGHT RATES MAY STAY LOW FOR LONGER

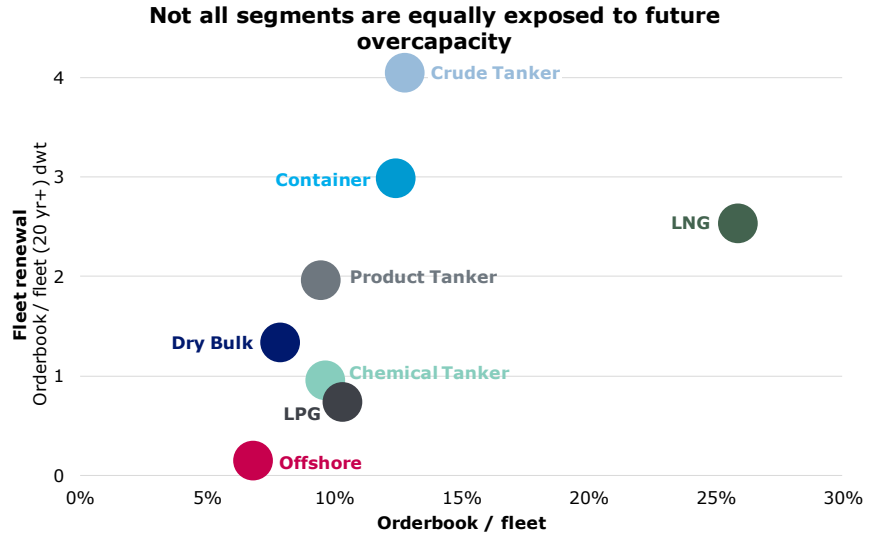
The outlook for most ship segments is currently dominated by the fact that demand is not expected to be strong enough to employ the front-loaded orderbook and that the age distribution of the fleet is such that surplus capacity will not be balanced by scrapping of older vessels. We therefore expect freight rates to stay low for longer, although some spikes may be seen. In some segments, we may begin to see equity being exchanged for cash through the scrapping of younger vessels. This may provide some respite for freight rates, but it may not be enough to maintain current freight rates in all ship segments. Large Container ships, larger Product Tankers and LNG Carriers appear to be most exposed (fig. 6). ▪

Figure SM.5



Sources: Clarksons, Danish Ship Finance

Figure SM.6



Sources: Clarksons, Danish Ship Finance

SHIPBUILDING

SHIPPING MARKET REVIEW – NOVEMBER 2017

DANISH SHIP FINANCE

SHIPBUILDING

THE NEXT GENERATION OF SHIPS WILL LIKELY BE SIGNIFICANTLY MORE ADVANCED THAN THOSE CURRENTLY BEING BUILT. FEW YARDS ARE EXPECTED TO BE CAPABLE OF BUILDING THESE VESSELS AT PRESENT. CONSEQUENTLY, MANY YARDS MAY HAVE TO EXIT THE MARKET, WHILE OTHERS WORK TO UPGRADE THEIR CAPABILITIES. THE CURRENT ORDERBOOK IS RUNNING OUT QUICKLY, BUT IT REMAINS TO BE SEEN HOW FAST THE NEXT GENERATION OF SHIPS WILL BE INTRODUCED.

THE SHIPBUILDING MARKET AT A GLANCE

SURPLUS CAPACITY CONTINUES TO BURDEN THE GLOBAL SHIPBUILDING INDUSTRY. MORE THAN HALF OF ACTIVE YARDS HAVE NOT RECEIVED ANY NEW ORDERS IN THE PAST 18 MONTHS. THESE YARDS, REPRESENTING 24% OF GLOBAL YARD CAPACITY, ARE RUNNING OUT OF ORDERS SHORTLY.

Despite an increase in new ordering in the first three quarters of 2017, the global orderbook continues to decline. Order covers in all regions but Europe are falling fast, and South Korea in particular has struggled to attract enough new orders to employ its domestic yard capacity (fig. 1). More yards have been closed, or idled, and more workers have been laid off.

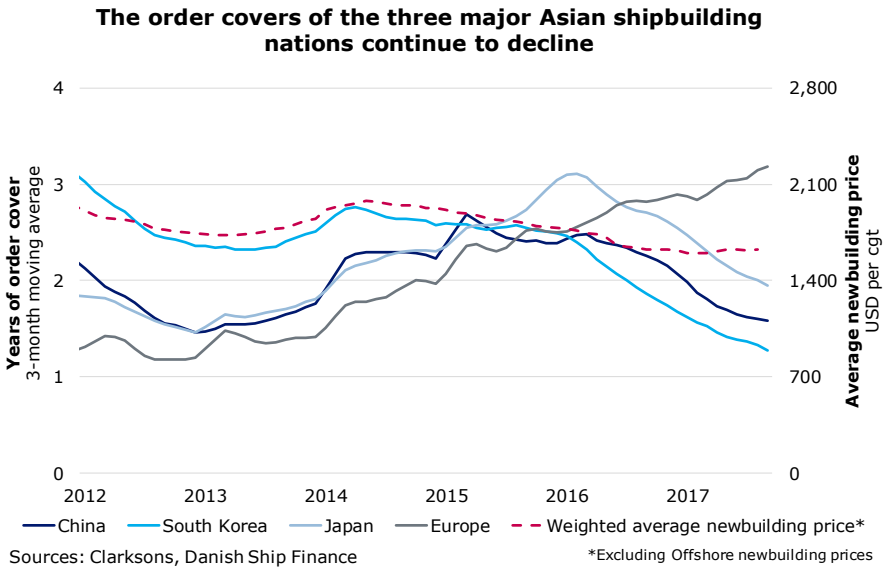
THE SHARE OF CAPACITY NOT ATTRACTING NEW ORDERS IS GROWING

Global active yard capacity has remained relatively stable in 2017 at around 45 million cgt, distributed among close to 600 yards. However, approximately 360 yards, representing one-quarter of active capacity, have not received any new orders during the last 18 months. We label these yards second-tier. The average order cover at these yards has dropped to only 0.8 years (fig. 2), whereas the first-tier yards have order cover of 2.2 years.

THE ORDERBOOK DECLINED BY 15% IN THE FIRST THREE QUARTERS

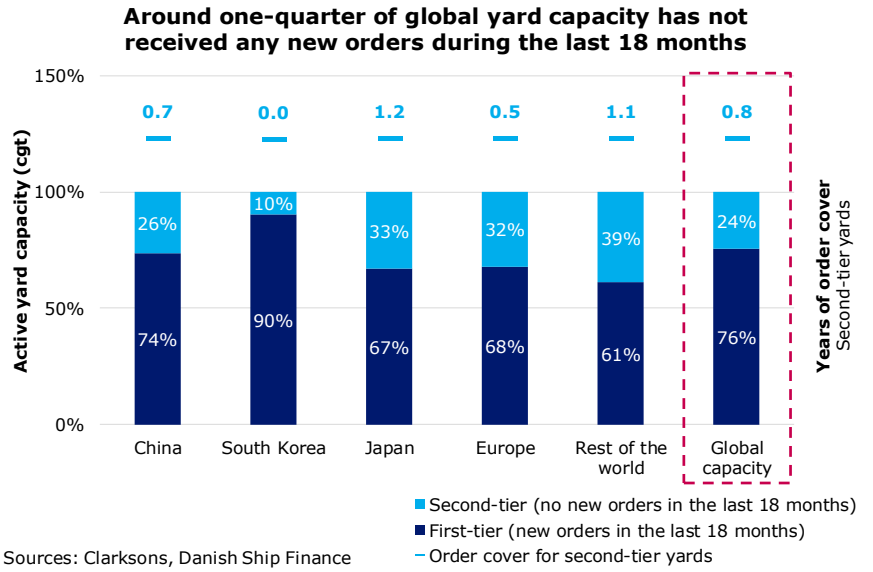
The global orderbook declined by 15% during the first three quarters of 2017, and by the start of October was down to 76 million cgt, or approximately 3,000 vessels - the lowest number of ves-

Figure SB.1



Sources: Clarksons, Danish Ship Finance

Figure SB.2



Sources: Clarksons, Danish Ship Finance

sels on order since 2003. In this period, contracting amounted to 16 million cgt, a small increase from the very low levels contracted in 2016, while 28 million cgt was delivered. The orderbook thus experienced a net outflow of 12 million cgt (fig. 3).

TANKER ORDERING SUPPORTED SOME SOUTH KOREAN YARDS

Tanker vessels were accountable for much of the increase in contracting. One-third of new orders in the first three quarters of 2017 were for Tankers, while the Cruise and Bulk segments also represented a sizeable share (fig. 4). South Korean yards in particular benefited from the uptick in Tanker ordering, but the country's orderbook still fell by 20% during the period. As of October, the South Korean orderbook was only slightly larger than Japan's, which would have been unheard of just a year ago. Hence, even though all shipbuilding regions except Europe are struggling in the low demand environment, South Korea has experienced the most dramatic decline from its former levels.

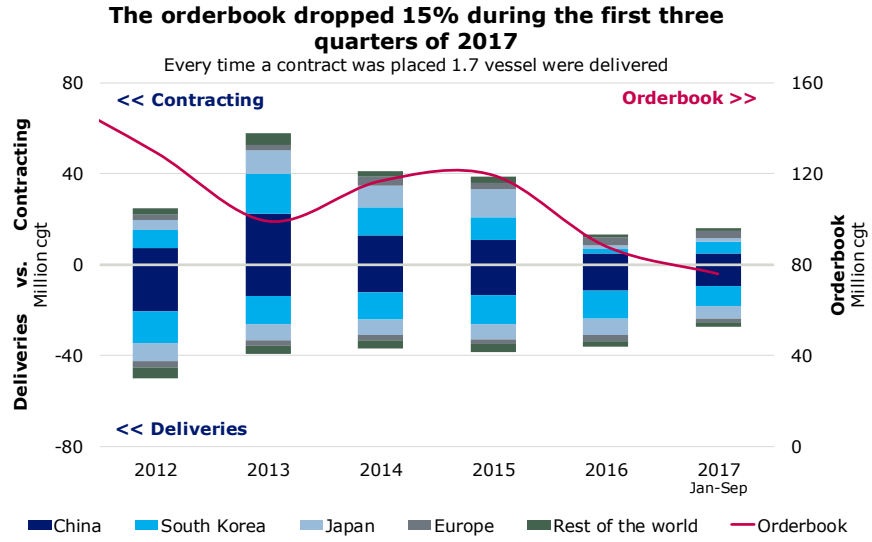
THE AVERAGE NEWBUILDING PRICE HAS GONE UP BY 2%

After a couple of years of the average weighted newbuilding price steadily declining, newbuilding prices in some segments seemed to reach the bottom in the first quarter of 2017. Since the second quarter, the average weighted newbuilding price has trended upwards slightly (fig. 1), driven by small increases in Bulk, Tanker and Container newbuilding prices. Gas Carrier prices have continued to decline.

FEWER YARDS ARE SETTING PRICES

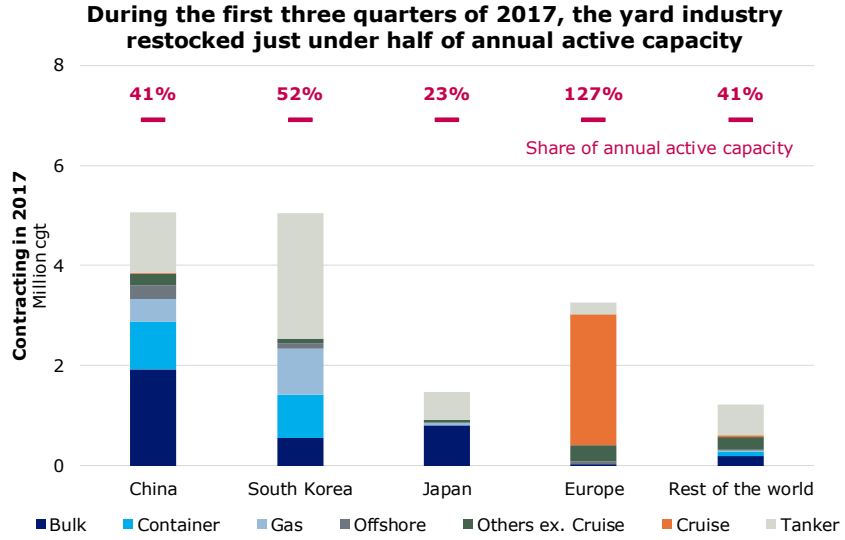
The higher prices indicate that with fewer and fewer yards attracting new orders, these yards have gained more bargaining power when setting prices. The 16 million cgt contracted in the first three quarters of 2017 was placed at 160 different yards, which on aggregate account for 65% of global active yard capacity. In 2016, contracting amounted to 13 million cgt and was split between 240 yards. Moreover, in 2017, ten yards representing one-fifth of global capacity have received a little more than half of all orders placed.

Figure SB.3



Sources: Clarksons, Danish Ship Finance

Figure SB.4



Sources: Clarksons, Danish Ship Finance

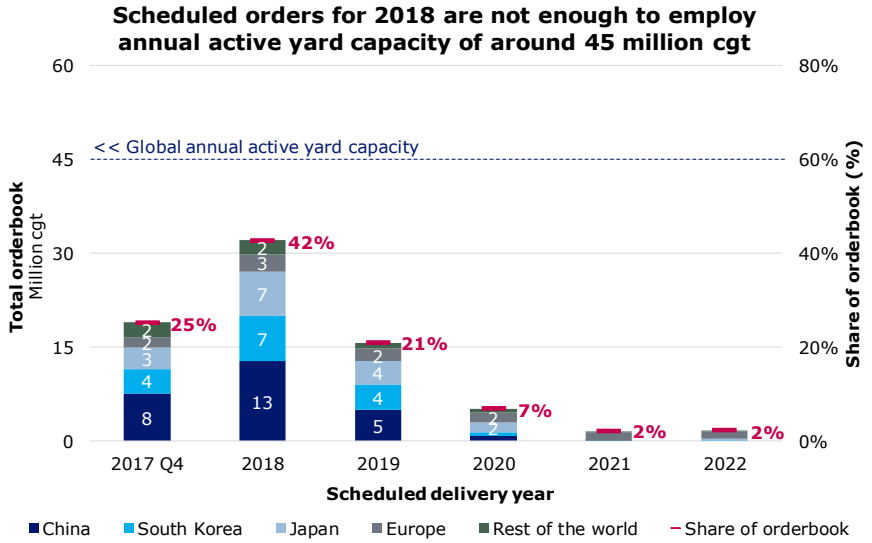
THE ORDERBOOK IS RUNNING OUT RAPIDLY AT MANY YARDS. THERE IS LITTLE TO INDICATE THAT FUTURE ORDERING WILL BE SUFFICIENT TO EMPLOY MORE THAN ONLY THE MOST COMPETITIVE YARDS. NEW DIGITAL SHIPS OR NEW BUSINESS MODELS MAY SHAPE THE SHIPBUILDING INDUSTRY IN THE NEXT FIVE TO TEN YEARS, BUT FEW SHIPYARDS ARE CURRENTLY EQUIPPED TO BUILD THE NEXT GENERATION OF SHIPS.

Despite some minor market improvements, such as the small rise in newbuilding prices and higher contracting, the global Shipbuilding industry is still facing major challenges. Some yards have reported better results during 2017, but large parts of the industry are still struggling to stay afloat. We expect the industry to continue to be challenged in the coming years. The next upswing for the industry might be sparked by the introduction of new standards for digital ships (e.g. smart or autonomous ships). The question is, though, if such an upswing would be inclusive or simply accelerate the consolidation of the industry.

250 YARDS HAVE LESS THAN ONE YEAR OF ORDER COVER

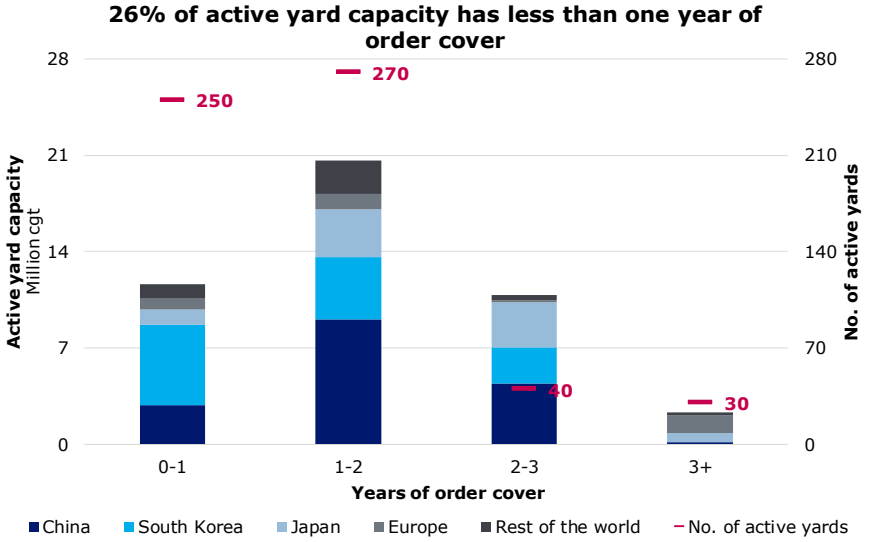
The overcapacity in many major shipping segments persists, and is still exerting a drag on demand for shipbuilding capacity. Consequently, the share of yards with less than one year of order cover continues to increase. By October, 250 yards, representing 26% of global yard capacity, had less than one year of order cover (fig. 6) – 90% of these were second-tier yards. There are only around 30 yards left with more than three years of order cover. This number includes a significant share of European yards that have received many new (cruise) orders over the past year. However, it also includes some yards building Offshore vessels that have not received any new orders since 2013. The poor conditions in the Offshore market have caused orders to be continuously postponed at these yards, keeping their order cover artificially high.

Figure SB.5



Sources: Clarksons, Danish Ship Finance

Figure SB.6



Sources: Clarksons, Danish Ship Finance

MORE ORDERS ARE BEING DELIVERED ON TIME

A year ago, the number of orders being postponed constituted a significant share of the orderbook, primarily owing to poor market conditions in Bulk, Container and Offshore. This helped slow down the run-off rate of the orderbook but also hurt yards' financial liquidity. The number of postponements has begun to drop, and a larger share of orders are being delivered on schedule today. In the first three quarters of 2017, 66% of scheduled orders were delivered, up from 61% in the same period in 2016. From a liquidity standpoint, this is good for the shipyards, but from an employment perspective it means that the need to attract new orders is becoming more urgent.

MANY YARDS ARE RUNNING OUT OF ORDERS IN 2017...

In the May 2017 edition of this report, we highlighted that more than 200 yards were scheduled to deliver their last orders in 2017. Taking stock of the situation as we approach the end of the year, it is clear that the majority of these yards have not been able to turn the situation around. The number has actually risen to 250 yards. Of these, 130 yards have already delivered their last orders and the remaining 120 are due to deliver their last orders in the fourth quarter of 2017.

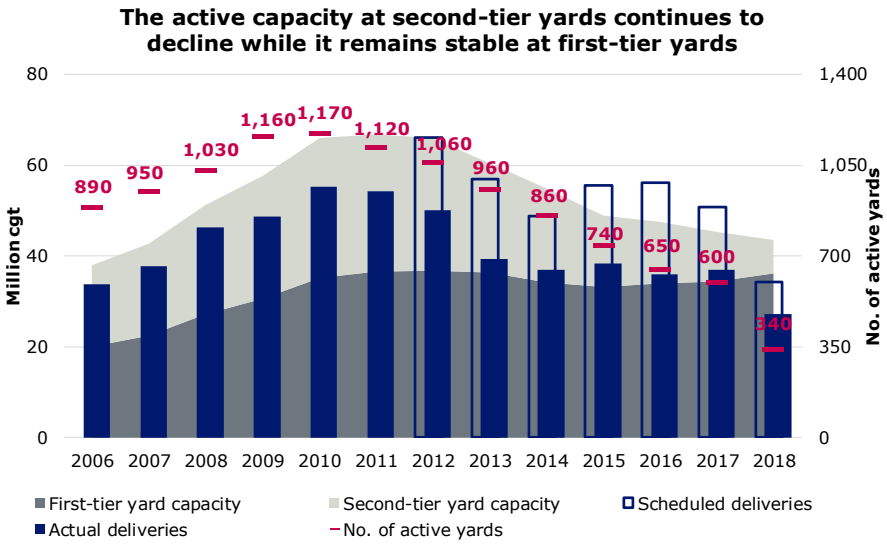
...WHICH COULD LOWER THE NUMBER OF ACTIVE YARDS DRAMATICALLY

Consequently, if orders are delivered on schedule and no new orders are placed at these yards, there will only be 340 active newbuilding yards left by the start of 2018 (fig. 7). These yards have estimated active capacity of around 41 million cgt, which would imply a reduction of 10% in global active yard capacity compared with the 2017 level. Hence, the consolidation seems to be progressing, and we continue to expect the number of active newbuilding yards to be drastically reduced in the coming years.

THERE ARE STILL AROUND 600 ACTIVE YARDS IN THE INDUSTRY

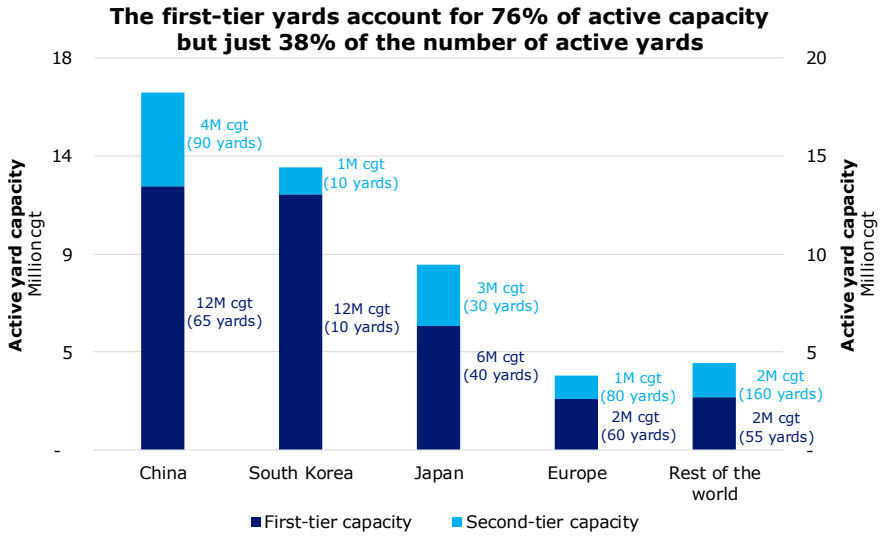
Experience has taught us, however, that the number of active yards drops much more slowly than the numbers indicate. In the

Figure SB.7



Sources: Clarksons, Danish Ship Finance

Figure SB.8



Sources: Clarksons, Danish Ship Finance

NB: The numbers might not add up due to rounding

last couple of reports, we stated that the number of active newbuilding yards could fall below 400 yards by 2017. In October 2017, the status is that there are still around 600 active newbuilding yards in the industry (fig. 7).

ORDERBOOK BLIPS ARE HOLDING UP THE NUMBER OF ACTIVE YARDS...

Let us briefly run through our methodology for assessing whether a yard is active or not: a yard is considered active when it has an orderbook or has delivered newbuildings within the current year. Hence, our forecasts are based on orderbook developments, and if orders are postponed, the number of active yards stays higher for longer. This mechanism can be seen when looking at the number of different yards with orders at a given point over the last five years, which has remained relatively stable. However, the number of different yards that have received new orders each year has dropped from around 600 yards in 2012 to 160 in 2017.

...AS ARE ORDERS ABANDONED BY SHIPOWNERS

On top of the order postponements that have characterised the industry over the last couple of years, there could still be a sizeable share of 'abandoned' orders keeping up the number of active yards. There continues to be some uncertainty over how many of the orders in the orderbook still exist and how many have been 'abandoned' by shipowners, either because of poor market conditions or because they were contracted at high prices compared with current market levels. Some of these orders may still be registered in the orderbook, blurring the overall picture. This is primarily a concern for the Chinese orderbook. These temporary factors holding up the number of active yards are bound to subside at some point, and if ordering stays at its current low, we expect to see a permanent correction in the number of active yards in the short to medium term.

A WAVE OF NEW TECHNOLOGIES COULD RESHAPE THE INDUSTRY

The next upswing in newbuilding demand could still be some years away. The shipping industry is undergoing a period of transition, trying to navigate its way through the myriad of new technologies and business models being introduced across the industry. The characteristics of future vessels play an important role in this transition. Will the next generation of vessels become even more standardised, will they be fuelled by LNG, will they be autonomous, and will vessel components to a greater extent be sold as service contracts rather than actual components? The jury is still out, but when it becomes clear which technologies and business models will prevail, it could have a major impact on the Shipbuilding industry.

THE RACE TO DEVELOP THE VESSELS OF TOMORROW

Many industry players, from shipyards and shipowners to component suppliers and third-party players, are entering into partnerships with the aim of developing the vessels of tomorrow. We expect these partnerships to start to bear fruit within the next five to ten years. Not only do we expect new vessel standards to emerge, we also believe that the new forces driving seaborne demand could call for more smaller-sized vessels to be built (please see the *General Review and Outlook* section for more details).

NOT ALL YARDS WILL HAVE THE NECESSARY EXPERTISE IN THE FUTURE

Not all yards active today will have the expertise required to build the next generation of vessels. Thus, it could be that yards with a certain minimum size and high technical standards will be better-equipped to meet future newbuilding demand than less sophisticated yards. Some will argue that shipowners just want vessels at the cheapest possible price – and few currently seem willing to pay for technology if it does not contribute to a vessel's cash flow. But this might change if, five or ten years down the road, a ship's connectivity and the real-time data it generates becomes a vital component of value creation.

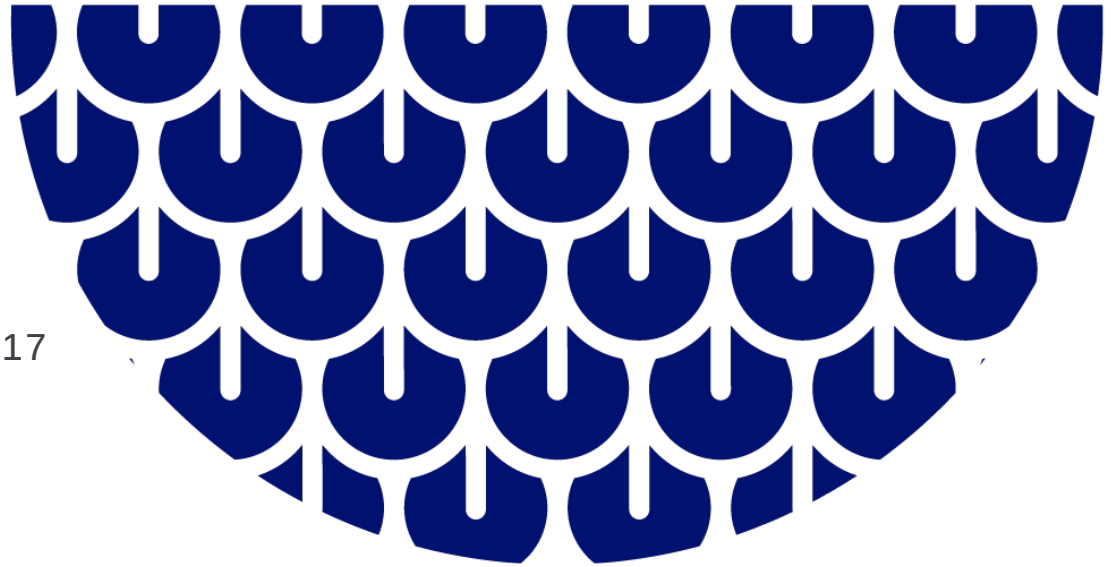
YARDS WITH THE RIGHT CAPABILITIES WILL CONTROL FUTURE DEMAND

Not only does the low contracting environment indicate a smaller Shipbuilding industry in the future, the emergence of digital ships

will add to this development. Hence, a future upswing in ordering is likely only to be available for the few yards with the right capabilities. This should in turn result in these yards being able to charge higher newbuilding prices and in time create a more sustainable industry. ▪

CONTAINER

SHIPPING MARKET REVIEW ï NOVEMBER 2017



DANISH
SHIP FINANCE

CONTAINER

THE CONTAINER SEGMENT IS OVERSUPPLIED. LINERS ARE CONSOLIDATING THEIR CAPACITY, WHILE TONNAGE PROVIDERS ARE FINDING IT INCREASINGLY DIFFICULT TO FIND ATTRACTIVE EMPLOYMENT. MANUFACTURING MAY BECOME REGIONALISED, WHICH MAY LOWER THE LONG-TERM OUTLOOK FOR LARGER VESSELS. A NEW VALUE PROPOSITION IS EMERGING, BUT IT MIGHT NOT BE FOR EVERYONE.

THE CONTAINER MARKET AT A GLANCE

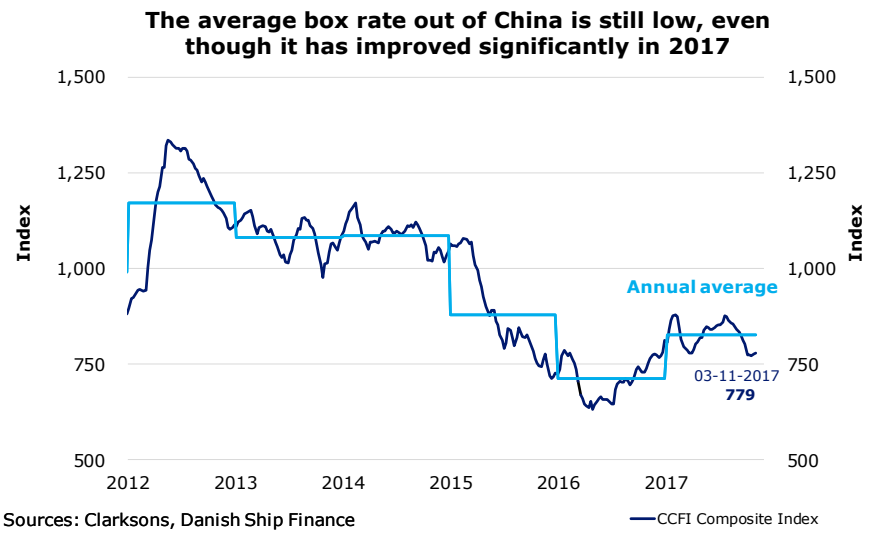
A SIGNIFICANT NUMBER OF LARGE SHIPS (+12,000 TEU) CONTINUES TO FLOOD THE MARKET. HOWEVER, BOX RATES HAVE IMPROVED, SINCE SUPPLY GROWTH HAS BEEN ABSORBED BY RISING DEMAND. CHARTERED-IN VESSELS ARE BEING RETURNED TO THEIR OWNERS.

The Container market remains oversupplied, but fundamentals are improving, albeit from a low base. The Container fleet expanded by less than 1% in the first three quarters of 2017, while demand grew by close to 5%, almost twice as much as in 2016. However, these numbers fail to reflect the lopsided nature of the current fleet. The fleet of smaller vessels (i.e. below 8,000 teu) declined by 2% in the period, whereas the fleet of larger vessels (i.e. above 8,000 teu) grew by 4%, measured in teu. Within these structures, we distinguish between liner operators, which have direct access to cargo, and tonnage providers, which charter out vessels. Liners are reducing their operational oversupply by engaging in alliances that enable each of them to return excess capacity.

THE AVERAGE BOX RATE IN 2017 UP BY AROUND 17% ON 2016

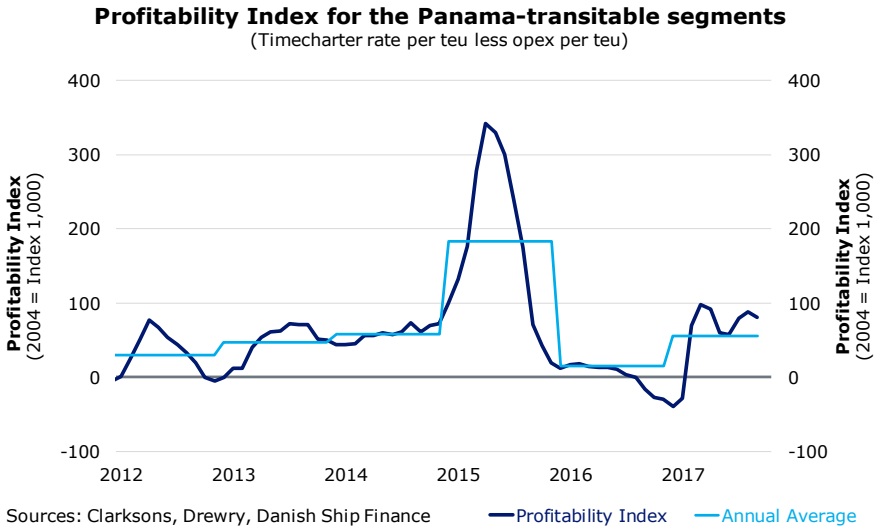
Box rates have increased, as demand has continued to improve and liner companies have returned excess vessels to the tonnage providers. Hence, the average box rate out of China in 2017 is up by 17% on the 2016 average (fig. 1).

Figure C.1



Sources: Clarksons, Danish Ship Finance

Figure C.2



Sources: Clarksons, Drewry, Danish Ship Finance

TIMECHARTER RATES STARTED TO RECOVER IN MARCH 2017

The return of vessels to the tonnage providers has not lowered timecharter rates, since the fleets have contracted in many of the smaller segments. Timecharter rates have generally improved during 2017, although levels are still low (fig. 2).

THE SALE AND PURCHASE MARKET IS STILL LIQUID

The sale and purchase market has been more active in 2017 than last year. Approximately 4% of the fleet below 8,000 teu was traded during the first nine months of 2017, while only 2% of the fleet in the larger segments was traded.

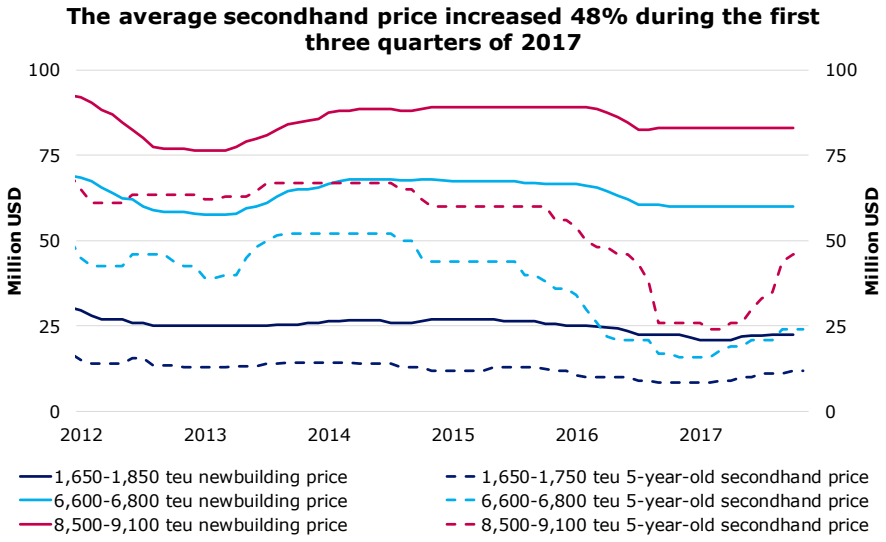
SCRAPPING ACTIVITY REMAINS HIGH AND SCRAPPING AGES LOW

Scrapping activity remains high, even though it has softened during 2017. More than 110 vessels, or close to 300,000 teu, were scrapped during the first nine months of 2017. This is a reduction of approximately 30% compared with the same period last year. Only vessels smaller than 8,000 teu were scrapped. The average age of vessels scrapped remained at 20 years, which means that smaller vessels' secondhand prices continue to be structurally reduced by the equivalent value of five years of cash flow.

SECONDHAND PRICES FOR SMALLER VESSELS HAVE INCREASED

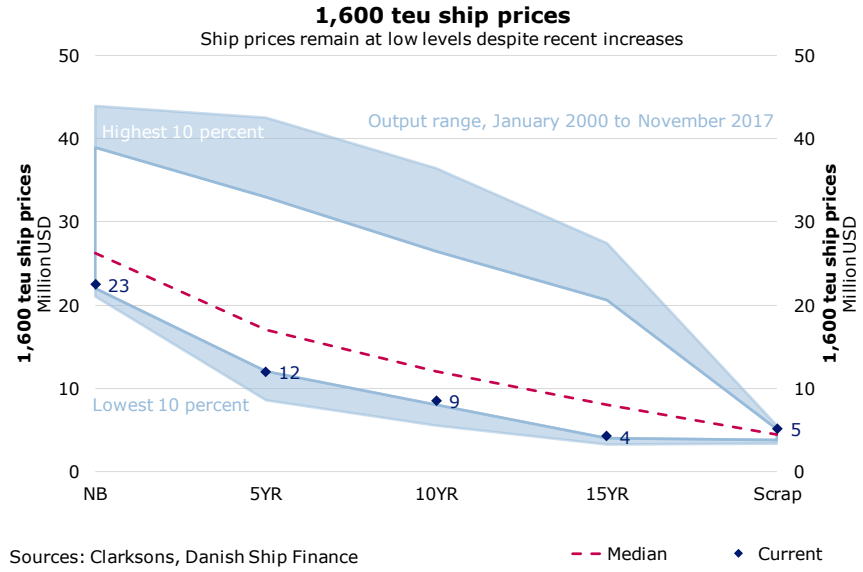
Secondhand prices remain low across the board, although secondhand prices of vessels smaller than 8,000 teu rose significantly during the first nine months of 2017 (fig. 3). Larger vessels continued to experience declining prices. The valuations of larger vessels continue to be anchored to their newbuilding prices. The earnings potential of these vessels may, however, be significantly below current values. Few new orders have been placed during the year, and most orders have been for vessels smaller than 8,000 teu. Some of the larger liner companies did, however, start to place sizable orders for super-large vessels towards the end of the third quarter.

Figure C.3



Sources: Clarksons, Danish Ship Finance

Figure C.4



Sources: Clarksons, Danish Ship Finance

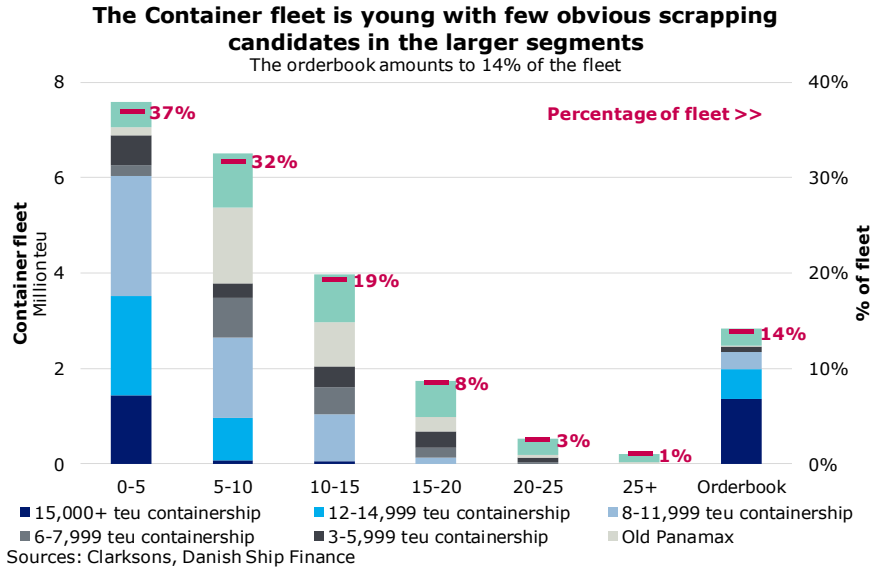
CONTAINER TRANSPORT IS INCREASINGLY BECOMING A COMMODITY, WHICH AMPLIFIES PRICE COMPETITION, EVEN IN A MARKET WITH BALANCED SUPPLY AND DEMAND. THIS ENTAILS PERMANENTLY LOW BOX RATES AND PUTS PRESSURE ON LONG-TERM ASSET VALUES. THE NEED FOR NEW REVENUE STREAMS AND COST CUTTING IS BECOMING INCREASINGLY IMPORTANT FOR THE LINERS, WHICH IN TURN IS PUTTING DOWNWARD PRESSURE ON CHARTER RATES.

Container transportation is increasingly becoming a commodity, with limited product differentiation. Box rates are structurally expected to be driven down closer to the marginal cost per moved unit, and the industry is expected to continue its consolidation push to maximise economies of scale. The successful liners will be those that are best at driving down costs and finding new sources of revenue. The tonnage providers will continue to find it difficult to secure long-term employment for their vessels that ensures adequate returns on invested capital throughout the lifetime of the vessels. All market participants are exposed to the potential changes in trading routes and vessel sizes in the event that the global manufacturing network becomes more regionalised.

ENTERING UNCHARTED TERRITORY

The Container industry is entering uncharted territory rapidly, and there are few exit strategies available. The age profile of the fleet of larger vessels leaves no room for premature scrapping to balance the market at a reasonable cost. Still, liner companies continue to favour the economies of scale from their super-large ships. However, the global demographic profile is telling us that the global buy side – consumers in North America, Europe, Japan and China – are about to retire. These consumers will continue to spend in their old age, but their spending behaviour will trend towards services that are not transported by sea. Container import volumes could begin to plateau or even decline within the next five to ten years. We argue that future Container demand is transitioning towards fewer units shipped per dollar growth.

Figure C.5



ZERO-LABOUR FACTORIES ARE ENABLING REGIONALISATION

The introduction of zero-labour factories in multiple industries indicates that manufacturing may become more regionalised in the years to come. Many of these factories are currently located in India and China, but they could easily be relocated closer to consumers. The advances we are seeing within robotics, artificial intelligence, 3D printing and material science all point towards a future in which regionalised manufacturing seems likely.

TAKE THE TEXTILE INDUSTRY AS AN EXAMPLE

A prime example is the textile industry. For decades, it has been argued that the textile industry will not be automated, because the variations and movements in garments during the production process are too difficult for robots to handle. Today, however, prototype robots have recently sewn the first pairs of jeans, and automated production lines for T-shirts are being built in North America.

THE LABOUR MARKET OUTLOOK IS DETERIORATING

The implications of these recent developments are massive for future job creation in Asia and Africa. Some of the sectors on the frontline of the next wave of automation (such as textiles, or call centres using AI and voice recognition software) have been important for job creation and expanding economic growth in China and India in past decades. Thus, for all the countries in Asia and Africa with burgeoning cohorts of young people entering the workforce, the prospect of not being able to capitalise on low-cost labour to attract manufacturing investment is a particular concern and may lower the medium to long-term outlook for economic growth in these countries.

THE CONTAINER INDUSTRY IS IN TRANSITION

The demand outlook for the Container industry is being shaped by forces that point towards more regionalised trading networks, while the supply side continues to focus on larger ships with low marginal costs. This could turn out to be a toxic cocktail, since it may lower not just head-haul volumes but also back-haul volumes. The extensive networks of component trades (often powering volumes on the back-haul routes) may be shortened and simplified by the new technologies.

LARGER VESSELS MAY BECOME INEFFICIENT

The strategy of introducing super-large container vessels is essentially a long-term bet on a centralised manufacturing base. The super-large ships are at risk of becoming inefficient if manufacturing becomes more regionalised within the next five to ten years.

THE FUTURE MAY LOOK BRIGHTER FOR SMALLER VESSELS

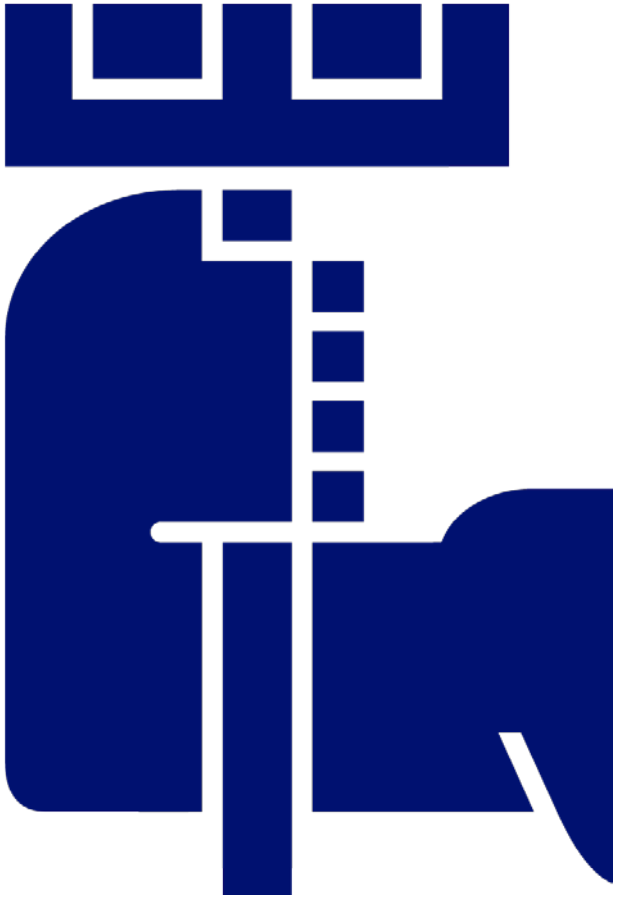
We expect the need for super-large container vessels to decrease in the medium to long term. On the contrary, demand for smaller vessels (up to 8,000 teu) could begin to increase. It is true that liner operators could continue to use larger vessels on smaller vessels' trading routes, but that does not improve utilisation (not to mention the effect on port facilities and inland infrastructure, which would have to be upgraded).

BOX RATES MAY STAY LOW FOR LONGER

We envisage a scenario where box rates could stay low for a prolonged period and secondhand prices of larger vessels stay under pressure. To prosper, liner companies need to identify and grow additional lines of revenue. This process has already begun and several liner companies seem to be working on multiple frontiers: from platforms to blockchain to trade financing. In the future, owning and trading vessels could go from being the core business to just one of several prerequisites for value creation. The liners that are best at identifying and extracting value from their entire ecosystem will be the ones that drive the consolidation process. ▪

DRY BULK

SHIPPING MARKET REVIEW – NOVEMBER 2017



DANISH SHIP FINANCE

DRY BULK

THE DRY BULK MARKET HAS COME A LONG WAY SINCE HITTING THE BOTTOM IN 2016. THE MARKET COULD CONTINUE TO IMPROVE IF THE DILIGENT APPROACH TO ORDERING IS UPHELD. IF NOT, WE COULD SEE THE START OF ANOTHER DOWNTURN, SINCE THE RISK OF PROLONGED PERIODS WITH UNSTABLE DEMAND IS MATERIAL DUE TO THE RELIANCE ON CHINA.

THE DRY BULK MARKET AT A GLANCE

AFTER A SIGNIFICANT MARKET UPSWING DURING THE FIRST QUARTER OF 2017, MOMENTUM WEAKENED SOMEWHAT. HOWEVER, THE MARKET HAS CONTINUED TO IMPROVE ON THE BACK OF STRONG CHINESE DEMAND.

The Dry fleet grew strongly in the first three quarters of 2017, by close to 3%, due to weaker scrapping activity. Fortunately, demand growth also showed strength, primarily driven by strong Chinese demand. The market has come a long way since hitting the bottom in 2016, but despite a significant improvement, we have yet to see a reduction in the underlying oversupply and many owners are still struggling to return to profit in the current freight rate environment.

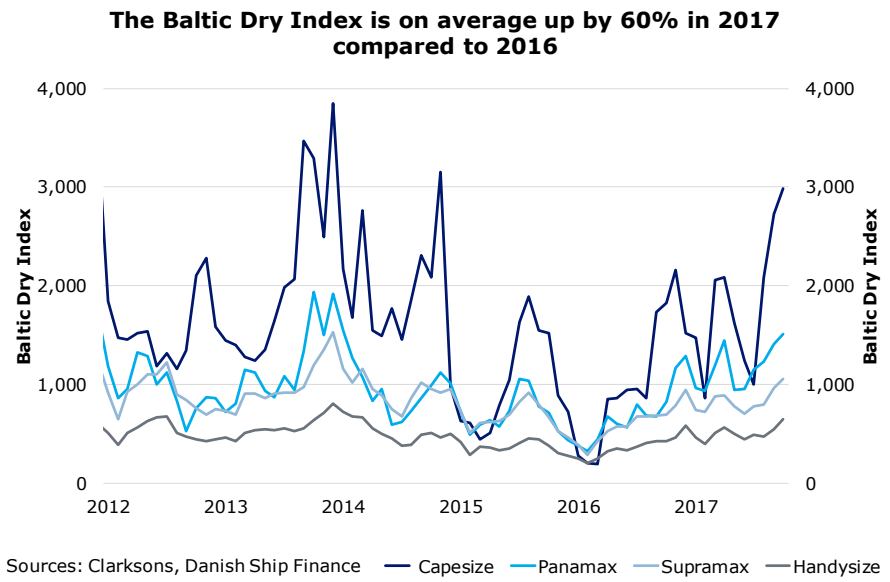
DESPITE FLUCTUATIONS, FREIGHT RATES HAVE GROWN STRONGER

By the end of March 2017, stronger Capesize and Panamax activity drove the Baltic Dry Index to the highest level for almost three years. Going into the summer months, activity started to wind down and market sentiment weakened. However, Chinese demand for coal and iron ore continued to show strength, which quickly pulled the market out of its summer slumber. The timecharter market followed the same pattern, and by October, the territory lost during the summer had been regained. In October, the 1-year timecharter rate stood at USD 15,700 per day for a Capesize vessel, USD 13,544 per day for a Panamax, USD 11,250 per day for a Supramax and USD 9,438 per day for a Handysize (fig. 2).

PANAMAX ORDERS HIKED UP ACTIVITY IN THE NEWBUILDING MARKET

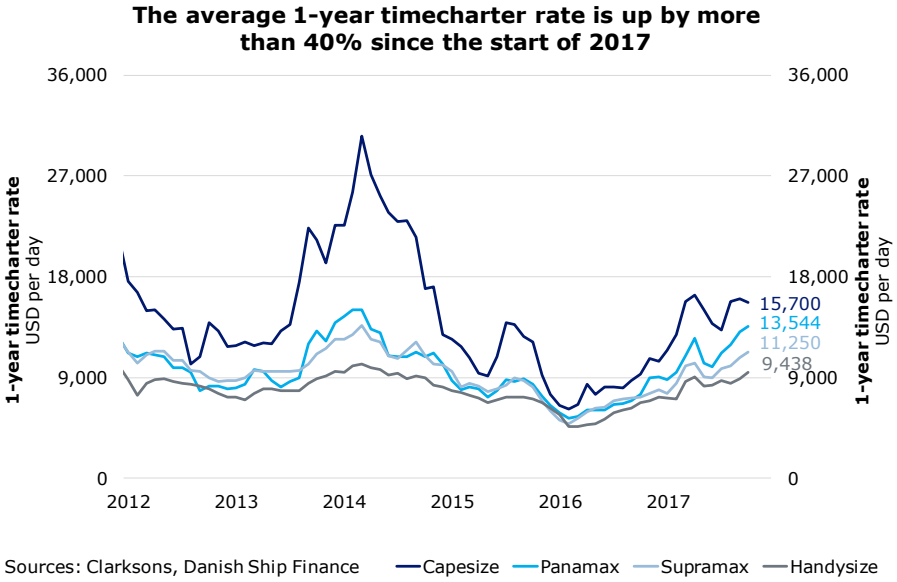
The more positive market sentiment led to increased activity in the

Figure DB.1



Sources: Clarksons, Danish Ship Finance

Figure DB.2



Sources: Clarksons, Danish Ship Finance

newbuilding market and a marginal rise in newbuilding prices. In the first three quarters of 2017, 12 million dwt was contracted, only 2 million dwt less than contracting in the whole of 2016. The main driver was an uptick in Panamax ordering (65,000-99,999 dwt), or more specifically Kamsarmax ordering (80,000-89,999 dwt), which has become the preferred Panamax vessel size, because of growing parcel sizes and high expectations for coal trade. In 2016, total contracting for Panamax vessels amounted to only 0.24 million dwt, while it reached 5.5 million dwt during the first three quarters of 2017.

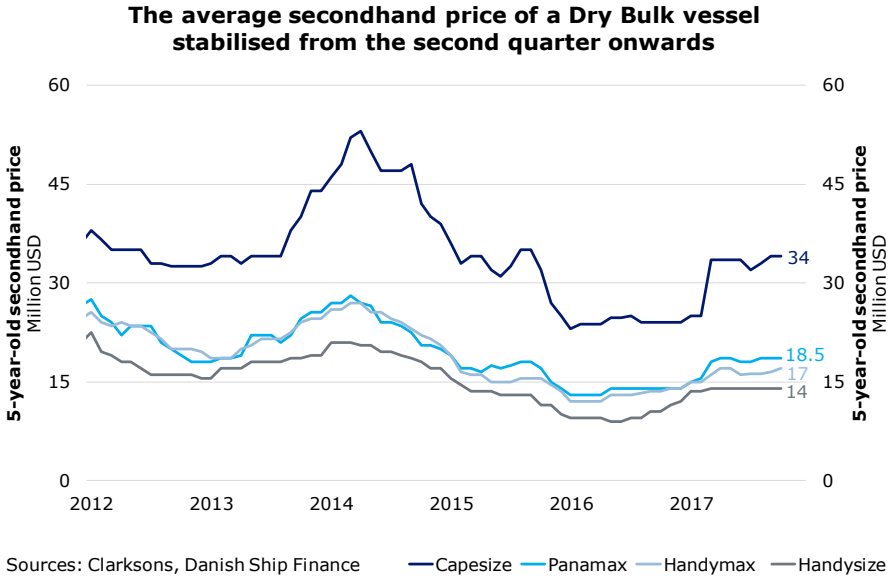
THE SECONDHAND MARKET COOLED DOWN AS SENTIMENT WEAKENED

Sales activity in the secondhand market picked up significantly towards the end of the first quarter, which sparked a much larger increase in secondhand prices than freight rates suggested. Activity slowed down during the second quarter, causing secondhand prices to plateau. By October, the price of an average five-year-old Dry Bulk vessel was up 30% compared with at the start of the year. The average price for a five-year-old vessel stood at USD 34 million for a Capesize, up from USD 25 million at the start of the year, and USD 14 million for a Handysize, up from USD 12 million (fig. 3).

SCRAPPING AND ORDER DEFERRALS HAVE SLOWED DOWN

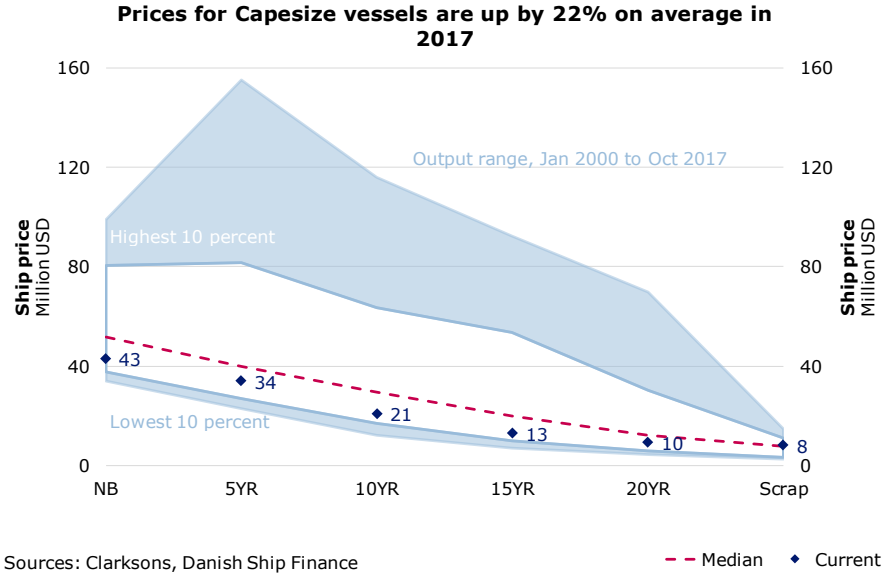
Scrapping activity decreased markedly in the first three quarters of 2017, with only 10.5 million dwt scrapped during the period – less than half the tonnage scrapped in the same period in 2016. This led to an increase in the average scrapping age from around 23 years in 2016 to 24 years. The slowdown was primarily caused by general expectations of an increasingly strong market, and to a lesser extent by the IMO's decision to delay the implementation of the ballast water regulations by two years. The more optimistic market outlook could also be discerned in the delivery performance in the period. Around 65% of scheduled orders were delivered, up from 50% in the same period in 2016.

Figure DB.3



Sources: Clarksons, Danish Ship Finance

Figure DB.4



Sources: Clarksons, Danish Ship Finance

TWO IMPORTANT FACTORS ARE EXPECTED TO SHAPE THE OUTLOOK FOR THE DRY BULK MARKET: FUTURE ORDERING AND CHINESE DEMAND. THE ORDERBOOK HAS DECLINED SUBSTANTIALLY AND IF CONTRACTING IS KEPT LOW, IT COULD SUPPORT A MARKET RECOVERY OVER THE NEXT COUPLE OF YEARS. HOWEVER, CHINESE DEMAND IS EXPECTED TO BE UNSTABLE OVER THE NEXT FIVE YEARS, AND THE RISK OF EXTENDED PERIODS OF LOWER DEMAND IS MATERIAL.

The Dry Bulk market continues to move in the right direction with strong support from Chinese imports. Nonetheless, at current freight rate levels, many owners are still struggling to make a profit. This indicates that the market oversupply is still significant and that a cautious approach to new ordering should be maintained in the coming years.

MACROECONOMIC DRIVERS LAY THE FOUNDATION FOR OUR ANALYSIS

We have had a cautious long-term outlook for the Dry Bulk market since 2007, primarily due to our concerns over the market's dependence on the Chinese economy. In our outlook, we strive to identify fundamental trends and changes that may affect medium to long-term market behaviour, an approach that sometimes fails to predict the shorter-term market opportunities that may arise. Despite our caution, our long-term demand outlook for the Dry Bulk segment is one of the most promising across the major shipping segments. The future need for transporting building materials, food and feedstocks of different kinds is expected to remain robust over the coming decades, which will keep Dry Bulk demand relatively strong.

EMERGING TRENDS COULD REDUCE DRY BULK DEMAND SOMEWHAT...

That said, there are forces that have the potential to impact demand for raw materials negatively going forward. Emerging trends related to the circular economy, whereby materials are increasingly recycled and remanufactured, could curb demand for raw materials somewhat. Moreover, the gradual push to reduce the role of fossil fuels in the energy mix is expected to erode some of the demand for transporting coal over time.

...BUT CLEAN ENERGY TECHNOLOGIES SHOULD SUPPORT THE MARKET

At the other end of the spectrum, the fight against climate change and pollution is driving a push towards clean energy technologies which could create additional Dry Bulk demand. At present, these are mostly related to wind turbines, solar panels and batteries, which all require large amounts of different metals (e.g. copper, aluminium, lithium and steel). Imagine a future where the majority of the car fleet is battery-driven and most homes have a solar panel on the roof and a home battery in the garage. During the build-up phase, this would boost the consumption of metals significantly, whereafter consumption would begin to decline as the market matured and a larger share of materials were recycled. These trends indicate that Dry Bulk could be one of the most resilient shipping segments in the transition towards a new and less resource-intensive energy regime.

CHINESE DELEVERAGING COULD CAUSE CORRECTION IN VOLUMES

Even though we are relatively optimistic about the long-term outlook for Dry Bulk, we believe the market could see a correction in transported volumes in the medium term. Our stance on the sustainability of Chinese Dry Bulk demand is unchanged: the country is in dire need of reforms related to its industrial overcapacity, state-owned enterprises, banking system, social security system, etc. We expect China to continue to play a vital role for the Dry Bulk market in the future, but the deleveraging cycle that might be about to commence could cause extended periods of lower demand.

CHINESE LEADERSHIP CHANGE CREATES DRY BULK UNCERTAINTY

In late October, the 19th National Congress of the Communist Party of China took place and President Xi revealed his new leadership team of the Politburo Standing Committee for his second five-year term. It has been said to be one of the last steps in the process of establishing himself as one of the most powerful leaders in Chinese

history. Consequently, 2018 could mark the beginning of a deleveraging cycle in the Chinese economy with the focus on implementing tough but necessary reforms. The process will be long and complex and it will go back and forth. One of the consequences could be periods of lower Dry Bulk imports.

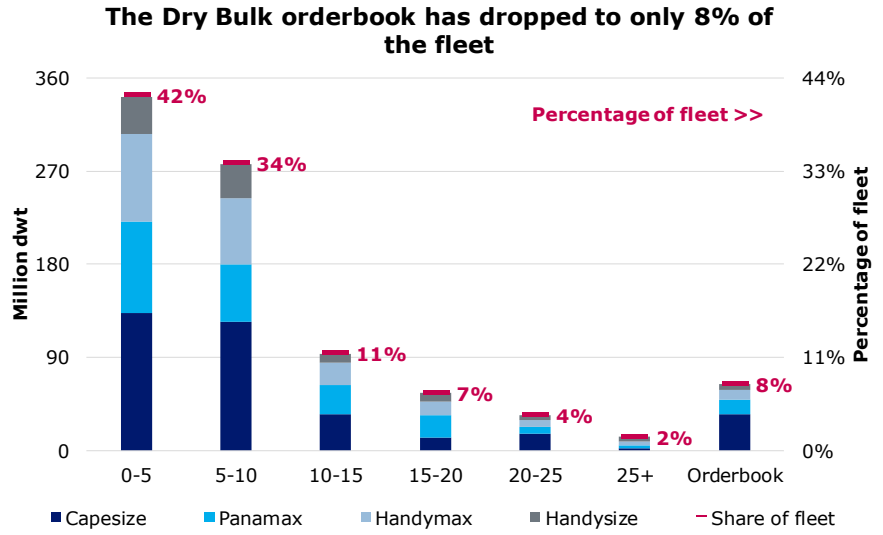
BELT AND ROAD INITIATIVE A DRIVER OF DRY BULK DEMAND?

It is essential for the Chinese government that the deleveraging efforts do not result in massive job losses and social unrest. However, lowering the country's industrial overcapacity will require many blue-collar workers to be reskilled and moved into the service sector where most new jobs are expected to be created going forward. In an attempt to minimise this effect, the government is introducing different initiatives, one of them being the Belt and Road Initiative (BRI) – formerly called 'One Belt One Road'. The objectives of the BRI are manifold, ranging from increasing China's global influence to securing an outlet for Chinese goods and utilising its expertise and capacity within infrastructure development. The ambitions are high and the amount of capital being allocated to the initiative is enormous. It can in many ways be compared with the Marshall Plan launched in the aftermath of the Second World War, though on a much grander scale.

GREAT POTENTIAL BUT HIGH EXECUTION RISK

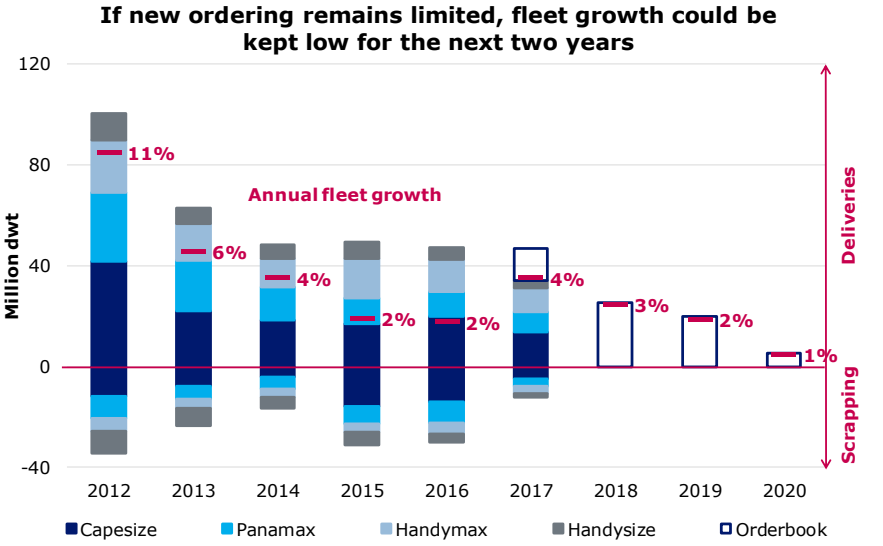
The BRI has the potential to trigger economic growth, create jobs in China and abroad, and support Dry Bulk demand in the medium term, counterbalancing some of the effects of the expected reform efforts. However, for BRI to be a success, many obstacles must be overcome. Several of China's neighbouring countries are very reluctant to give it more influence in the region, and many projects are being implemented in countries with high geopolitical risk and low credit ratings. Some argue that these risks will not hamper the execution of the initiative, since China is primarily concerned with domestic job creation. That might be true, but if too many projects fail or turn out to be underutilised, they will end up adding to

Figure DB.5



Sources: Clarksons, Danish Ship Finance

Figure DB.6



Sources: Clarksons, Danish Ship Finance

China's already fast-growing debt burden, not to mention its share of non-performing loans in the banking sector.

NEXT 24 MONTHS WILL DETERMINE THE OUTLOOK FOR THE INDUSTRY

We expect the medium-term Dry Bulk outlook to be characterised by opposing forces, and we see a material risk of longer periods with lower Chinese demand. Hence, the next 24 months will be paramount in determining the outlook for the Dry Bulk industry.

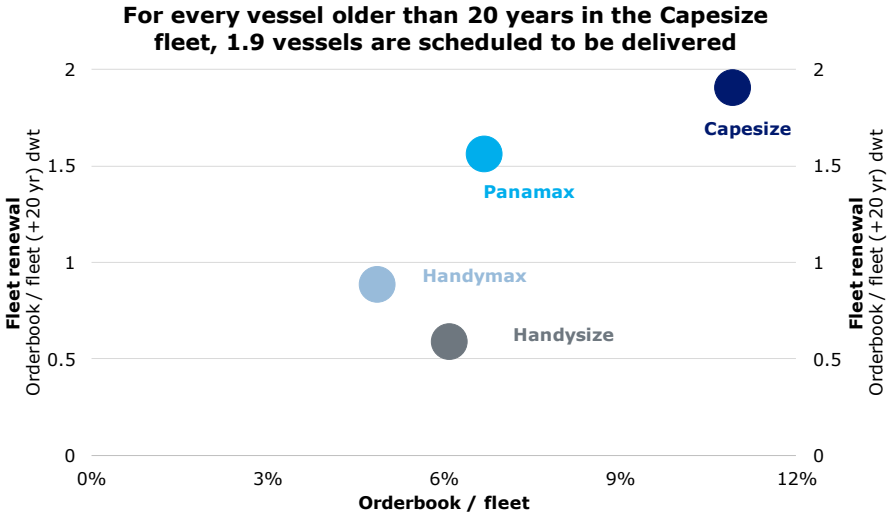
A MARKET RECOVERY IS WITHIN REACH FOR MOST SEGMENTS

If the industry refrains from a new round of excessive ordering, freight rates and secondhand prices could increase to much more sustainable levels within the next two years. The orderbook has dropped to just 64 million dwt, equal to 8% of the fleet – the lowest level since early 2004. Hence, fleet growth could approach zero over the next couple of years, even if scrapping activity remains moderate (fig. 5 and 6). The balance is fragile, though, and if contracting activity starts to pick up, the industry could find itself back where it was 15 months ago. The current market improvement has primarily been driven by stronger Chinese demand; hence, the underlying oversupply still exists and could resurface if Chinese demand falls away.

DOWNWARD PRESSURE ON SECONDHAND PRICES COULD START TO EASE

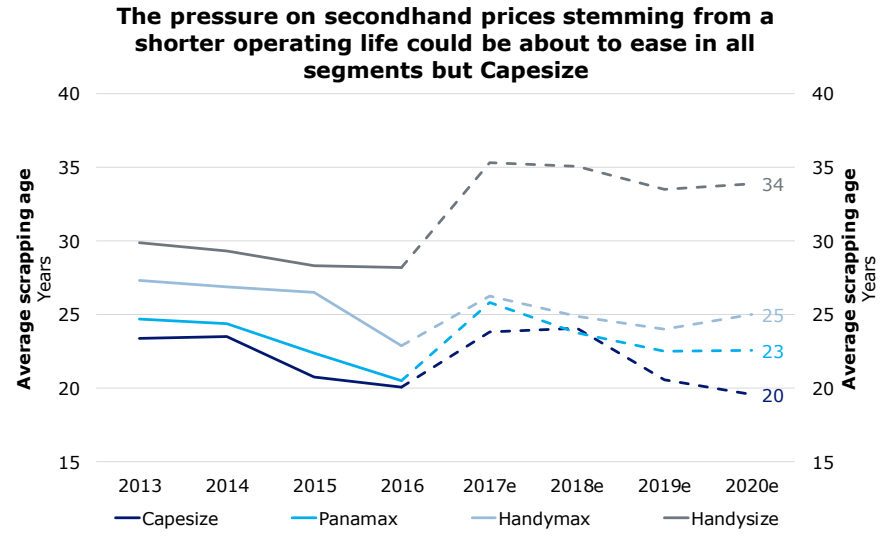
The Capesize segment is especially vulnerable to additional contracting, as it has the fewest natural scrapping candidates in the fleet and the highest orderbook-to-fleet ratio of the four major segments (fig. 7). In contrast, the other segments have reached a point where their orderbooks can be absorbed into their fleets by means of scrapping alone, without putting further pressure on average scrapping ages. This means that the downward pressure on secondhand prices stemming from a shorter operating life could begin to ease. Assuming orderbooks are delivered on schedule, no new orders are placed and that every time a vessel is delivered the oldest vessel in the fleet is scrapped, all segments except for Capesize would have higher average scrapping ages when the last

Figure DB.7



Sources: Clarksons, Danish Ship Finance

Figure DB.8



Sources: Clarksons, Danish Ship Finance

e: the estimated average scrapping age if each time a vessel is delivered, the oldest vessel in the fleet is scrapped.

orders are delivered in 2020 than they have today (fig. 8). The Capesize segment, on the other hand, would see the average scrapping age approach 20 years again by 2020, illustrating how sensitive this segment is to higher contracting or periods with low demand.

THE ORDERBOOK AND FLEET ARE BETTER BALANCED THAN TWO YEARS AGO

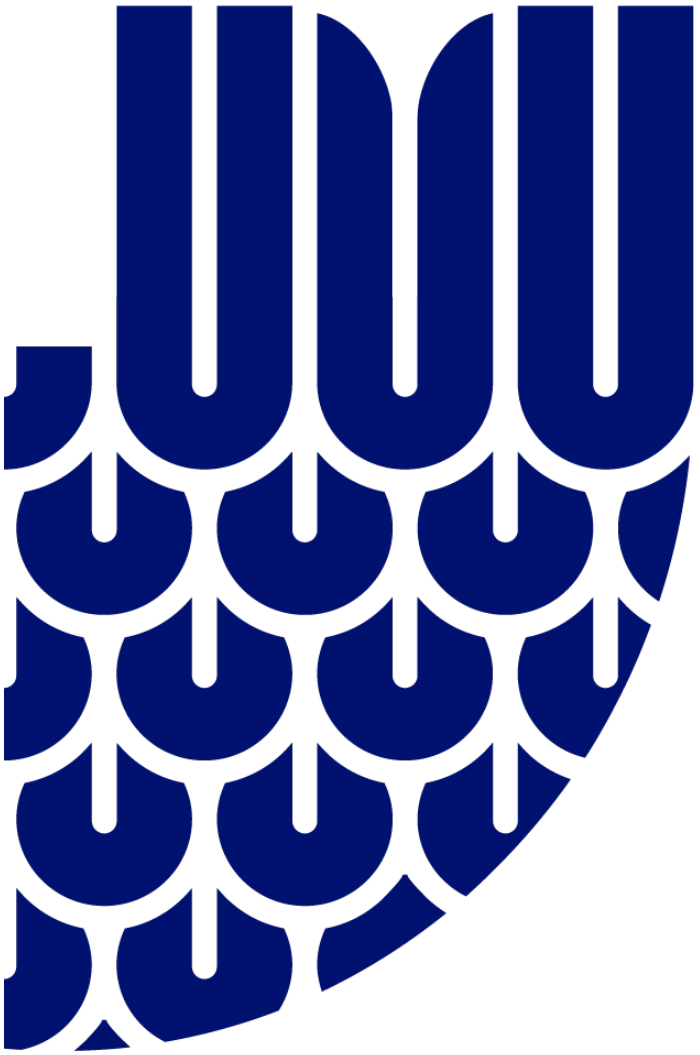
It should be stressed that such a scenario will never play out, since many older vessels serve a specific purpose, such as cabotage trading, but it does illustrate that the fleet in its current form is more capable of absorbing the orderbook than previously. Going back to the start of 2015, applying the same approach would have resulted in average scrapping ages of no more than 16 years for Capesize and Handymax, 20 years for Panamax and 27 years for Handysize.

ORDERING MAKES SENSE FOR SOME BUT NOT FOR ALL

Despite our concerns about future ordering and demand, we recognise that some shipowners need to order new vessels from a replacement point of view, and that it is currently cheap to place new orders. However, we have learnt from experience that when some shipowners start ordering new vessels, large parts of the industry follow suit, creating the foundations for overcapacity. The big difference this time around could be that there are fewer players with the required resources for placing orders today than three years ago, and financing has become harder to obtain. We hope this will ensure a more organic fleet development going forward. ▪

OFFSHORE SUPPLY VESSELS

SHIPPING MARKET REVIEW – NOVEMBER 2017



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OFFSHORE SUPPLY VESSELS

THE MARKET FOR OFFSHORE SUPPLY VESSELS (OSV) IS STRUGGLING WITH SEVERE OVERCAPACITY, WITH IDLED VESSELS BEING LAID UP BUT NOT SCRAPPED. THERE IS LITTLE TO INDICATE THAT DEMAND WILL RETURN TO SUFFICIENT LEVELS TO EMPLOY LARGER PARTS OF THE FLEET IN THE SHORT TO MEDIUM TERM. SECONDHAND PRICES ARE DECLINING BUT MAY NOT YET HAVE COME DOWN FAR ENOUGH TO REFLECT THE VESSELS' CURRENT EARNINGS POTENTIAL.

THE OFFSHORE SUPPLY MARKET AT A GLANCE

THE FLEET IS BEING POORLY UTILISED, MANY VESSELS ARE IN SOME DEGREE OF LAY-UP, FEW VESSELS ARE BEING SCRAPPED AND CHARTER RATES AND SECONDHAND PRICES ARE LOW.

In our previous report, we discussed how technological advances in renewable energy have lowered the long-term outlook for global oil demand. Offshore oil production remains a significant contributor to the global oil supply, but the short- to medium-term outlook for offshore oil exploration seems significantly reduced following the low oil price and the advances made within oil drilling techniques and alternative energy sources.

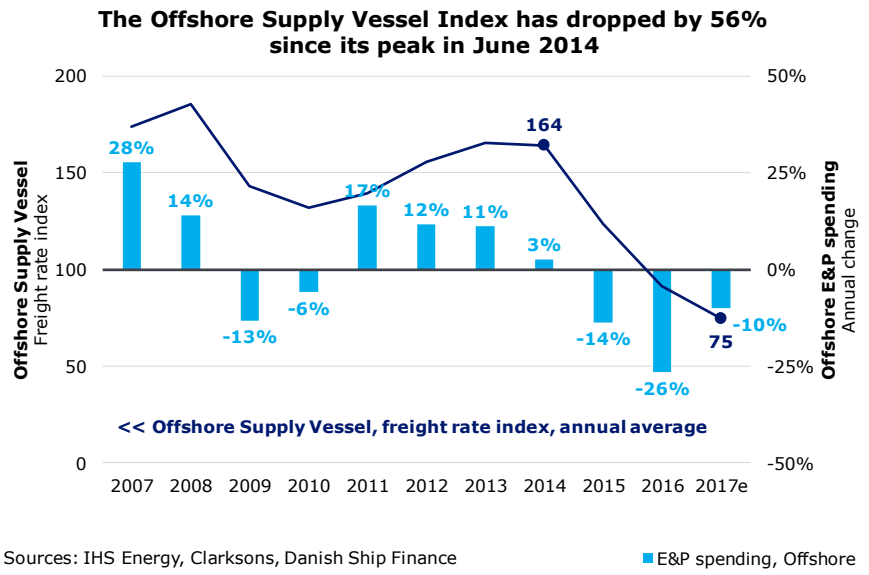
SECONDHAND PRICES CONTINUE TO DECLINE

The market for offshore supply vessels is in dire straits: the fleet is being poorly utilised, many vessels are in some degree of lay-up, few vessels are being scrapped and charter rates are low. Secondhand prices are low but may not yet have come down far enough to reflect the vessels' current earnings potential (fig. 2). Bid-ask spreads remain wide, which explains the relatively illiquid sale and purchase market.

ONLY SHORT-TERM MARKET IMPROVEMENTS

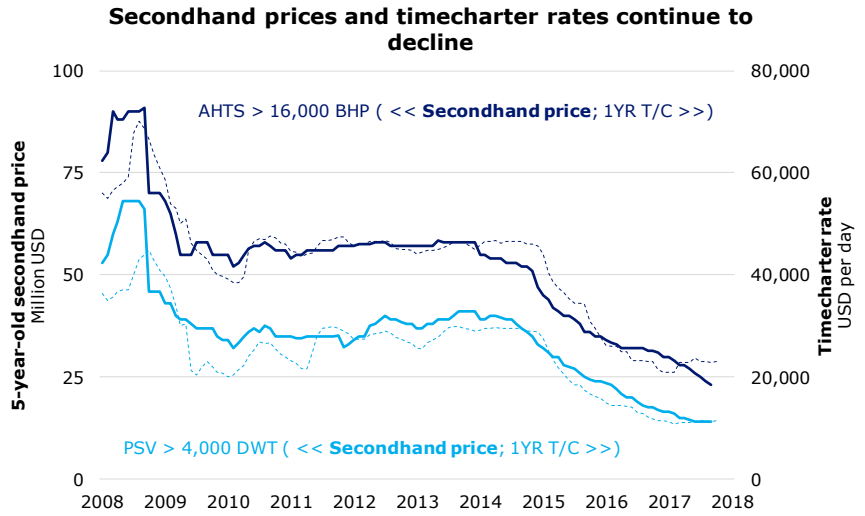
Market activity improved over the summer months, but most new contracts were for the maintenance of existing fields or tie-backs to existing fields rather than entirely new projects. Tie-back projects are typically short-term, requiring only a couple of wells to

Figure OSV.1



Sources: IHS Energy, Clarksons, Danish Ship Finance

Figure OSV.2



Sources: Clarksons, Danish Ship Finance

be drilled. This has significant implications for the entire offshore market: from drilling rigs and construction vessels all the way to supply vessels. Demand for these assets has become short-term by design. In this market, most vessels are traded spot or are on short-term contracts, since the oversupply of vessels and the types of new projects coming online give oil companies little incentive to pay premiums for longer-term contracts.

SOME VESSELS HAVE FOUND NEW EMPLOYMENT

Still, the increased activity has supported spot rates and pulled some vessels out of lay-up, but not enough to lift charter rates significantly. Charter rates have plateaued, however, since the start of 2017. We expect that many of the vessels that won short-term contracts during the summer period will go back into lay-up when their contracts expire. Approximately one-quarter of the fleet of larger supply vessels (PSVs larger than 3,000 dwt and AHTSs larger than 12,000 bhp) remain in lay-up. Younger vessels are less exposed than older ones (fig. 3).

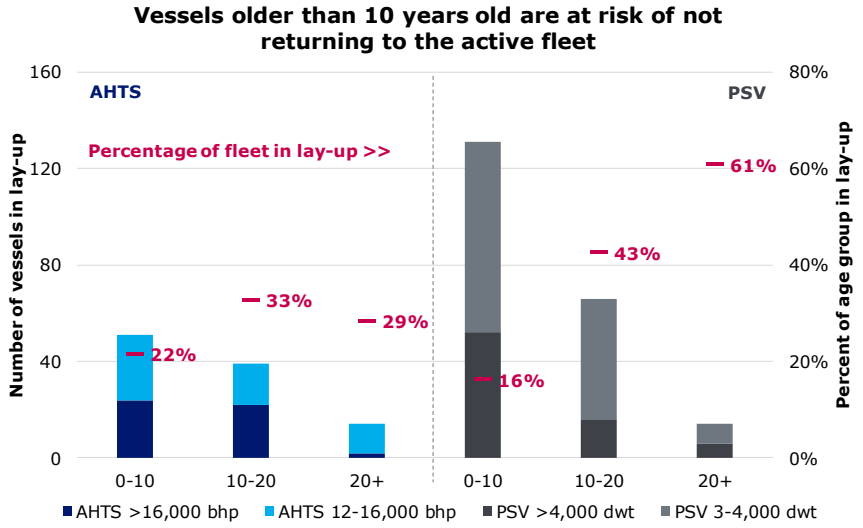
SOME OWNERS MAY FIND IT DIFFICULT TO SECURE EMPLOYMENT

The fleet of larger PSV vessels grew by approximately 2% during the first nine months of 2017, while the fleet of larger AHTS vessels remained more or less stable. Still, the availability of vessels may not have matched the nominal size of the fleets, since many market participants are struggling with debt restructuring and an ongoing consolidation process. Oil majors tend to prefer to do business with the shipowners that have the strongest balance sheets. Shipowners that have not yet restructured their financials may find it more difficult to employ their vessels on contracts with the oil majors.

A REDUCTION IN SUPPLY IS REQUIRED FOR THE MARKET TO BALANCE

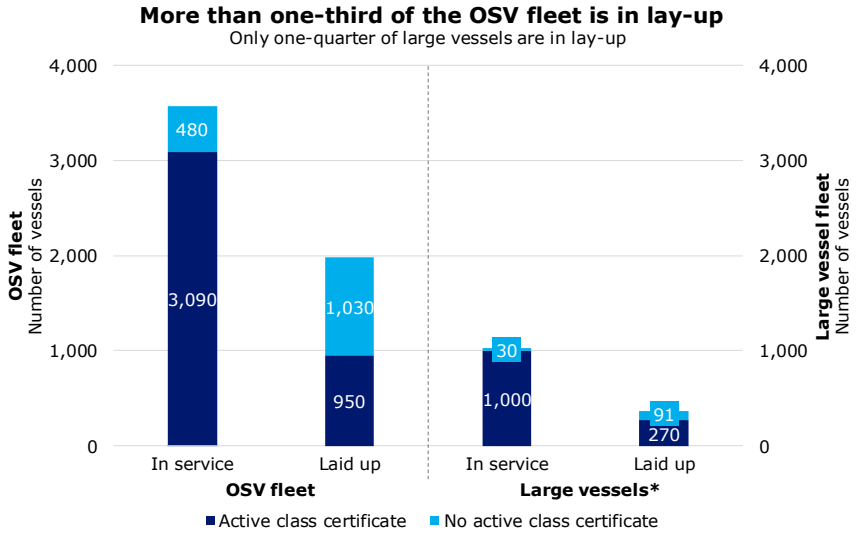
When E&P spending was at its peak in late 2013 the OSV market was seeing signs of an oversupply. Therefore, the road to a more balanced market will require many vessels to be scrapped and exploration activity to resume. There are currently almost 2,500

Figure OSV.3



Sources: Clarksons, Danish Ship Finance

Figure OSV.4



Sources: Clarksons, Danish Ship Finance

*Large vessels: AHTS >12,000 bhp and PSV >3,000 dwt

vessels (44% of the OSV fleet) either in lay-up or without active class certificates (28% for the largest vessels) (fig. 4). And more vessels are on order, although few are being delivered. Only 22% of the orders scheduled to be delivered during the first nine months of 2017 were delivered. As to be expected, no new orders have been placed for a number of years.

THE OUTLOOK FOR OFFSHORE SUPPLY VESSELS IS HIGHLY UNCERTAIN. NEW ONSHORE OIL PRODUCTION APPEARS MORE ATTRACTIVE THAN GREENFIELD OFFSHORE PROJECTS. THE FLEET OF OFFSHORE SUPPLY VESSELS IS SEVERELY UNDERUTILISED AND MORE VESSELS ARE GOING INTO LAY-UP. THERE IS LITTLE SIGN OF DEMAND STRENGTHENING ENOUGH TO EMPLOY THE VAST MAJORITY OF THE FLEET IN THE SHORT TO MEDIUM TERM.

The global energy landscape is changing. The outlook for the oil and gas industry is shrouded in uncertainty. New sources of energy supply are being added to the global energy mix and existing production methodologies are being upgraded by new technologies that increase the recovery potential of existing resources.

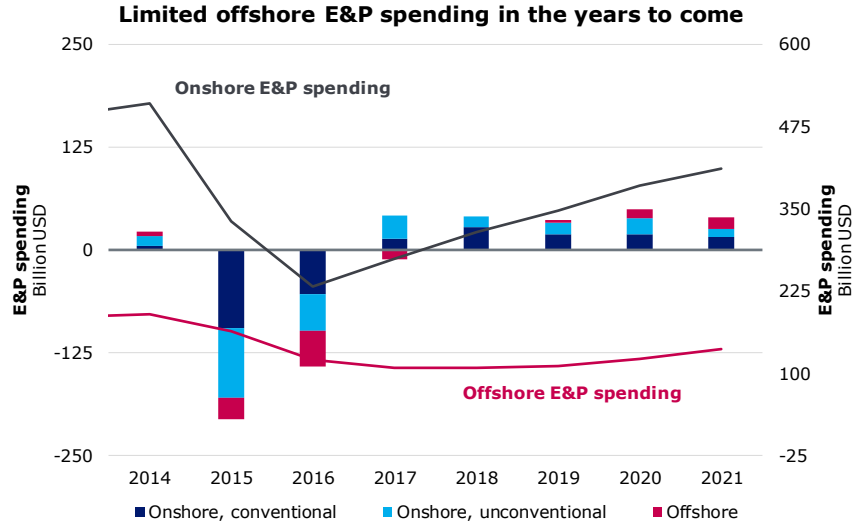
RESILIENT OIL SUPPLY

Global oil supply seems to have surprised on the upside in recent years and continues to be running ahead of demand. OPEC is holding back production in order to stabilise the market and maintain an oil price in the region of USD 50 per barrel. This is clearly a short-term strategy, though it may be extended, but it is important to understand that it is currently supporting US shale production. By acting as the global swing producer, OPEC, or at least Saudi Arabia, is not only supporting US shale production but perhaps more importantly protecting the value of Saudi Aramco prior to the public listing. The speculative but relevant perspective to consider is what will happen to global oil supply after Saudi Aramco is listed? Could global oil supply continue to grow ahead of global oil demand in the years to come? Maybe not, based on current developed oil fields, but there is no shortage of oil reserves in the world that could be drilled.

PEAK OIL DEMAND WITHIN TEN TO 15 YEARS

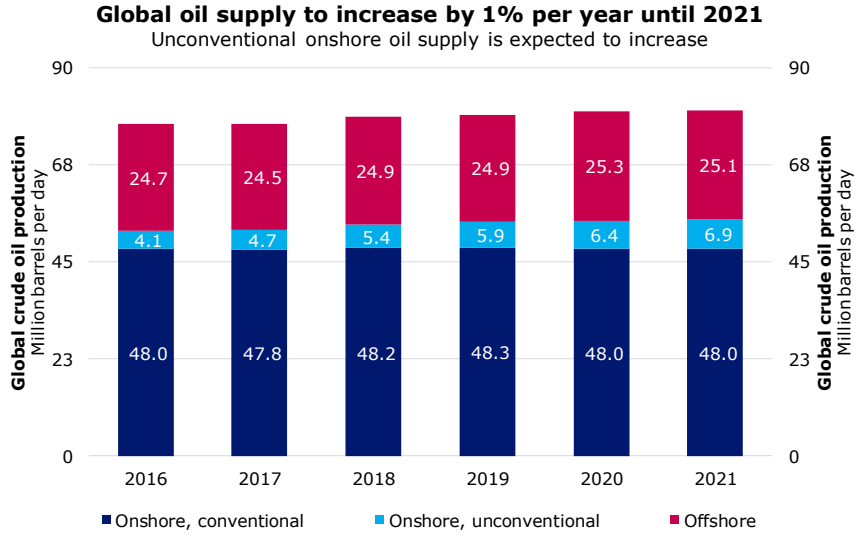
The long-term demand outlook for oil is being shaped by the global economy's transition towards a less fossil fuel-intensive growth model and gains in energy efficiency. This is a long-term play, structural by design and irreversible when new technologies

Figure OSV.5



Sources: IHS Energy, Danish Ship Finance

Figure OSV.6



Sources: IHS Energy, Danish Ship Finance

(e.g. solar PV, wind or electric vehicles) break the price parity with existing technologies. The penetration period for new technologies is highly uncertain. Estimates vary greatly, but it appears that most industry players are expecting earlier adoption than previously. Today, many experts are warning that global oil demand could peak within the next ten to 15 years.

SHORT-CYCLE BROWNFIELD OPPORTUNITIES ARE IN FAVOUR

In the oil and gas industry, we are continuing to see interest in large investments in greenfield mega-projects both onshore and offshore, but the trend appears to be cooling somewhat, with more investments going into shorter-cycle brownfield opportunities. This includes investments in various techniques for improving the recovery rates of existing oil fields. McKinsey argues that there are significant opportunities in subsurface optimisation. It estimates that an analytical approach to production could improve the global average underground recovery factor by up to 10%, equivalent to unlocking an additional 1 trillion barrels of oil equivalents from existing fields. While it may not currently be economically viable to realise all reservoirs, it is clear that the potential is significant.

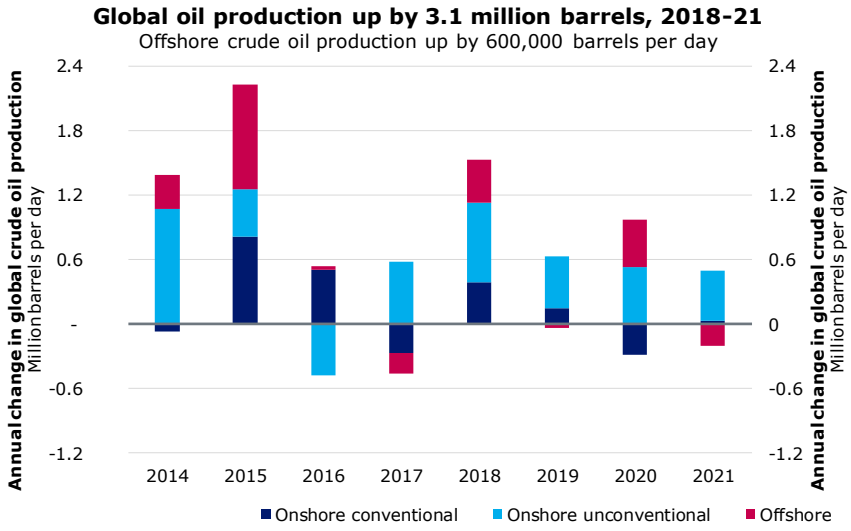
THREE-QUARTERS OF EACH DOLLAR INVESTED GOES TO ONSHORE

Global E&P spending currently favours onshore oil projects. Low break-even rates and short-cycle projects are giving both conventional and unconventional onshore oil production a competitive advantage over offshore projects in the current market. The unconventional onshore oil sector in the US has proved very responsive and resilient in recent years. It is currently expected that for every dollar invested in global E&P up to 2021, onshore projects will receive approximately three-quarters (fig. 5).

OFFSHORE OIL PRODUCTION EXPECTED TO INCREASE UNTIL 2021

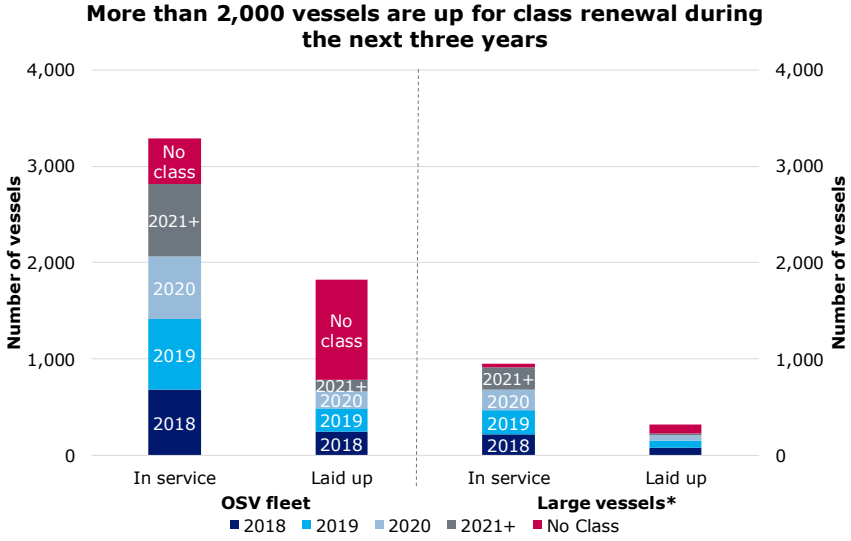
Global oil production is expected to continue to increase. Onshore oil production, both conventional and unconventional, has added strongly to the global oil supply in 2016 and 2017 and is currently

Figure OSV.7



Sources: IHS Energy, Danish Ship Finance

Figure OSV.8



Sources: Clarksons, Danish Ship Finance

Large vessels: AHTS >12,000 bhp and PSV >4,000 dwt

expected to continue to grow until at least 2021. Offshore oil production is projected to increase by approximately 400,000 barrels per day (+1.6%) in 2018 and by the same amount in 2020 but is expected to decline marginally in 2019 and by 200,000 barrels per day (-0.8%) in 2021 (fig. 7).

OFFSHORE DEPLETION IS NOT BEING REPLACED...

The offshore oil industry accounts for almost one-third of global oil supply. Oil markets looks well supplied until 2020, but this is mainly because of projects that received FID prior the oil price collapse. This means that offshore FIDs need to pick up significantly to offset depletion rates in the future. Offshore projects typically need three to five years to reach material production and seven to eight years to reach peak production. Offshore oil supply could begin to decline in the medium term unless new large-scale projects are sanctioned.

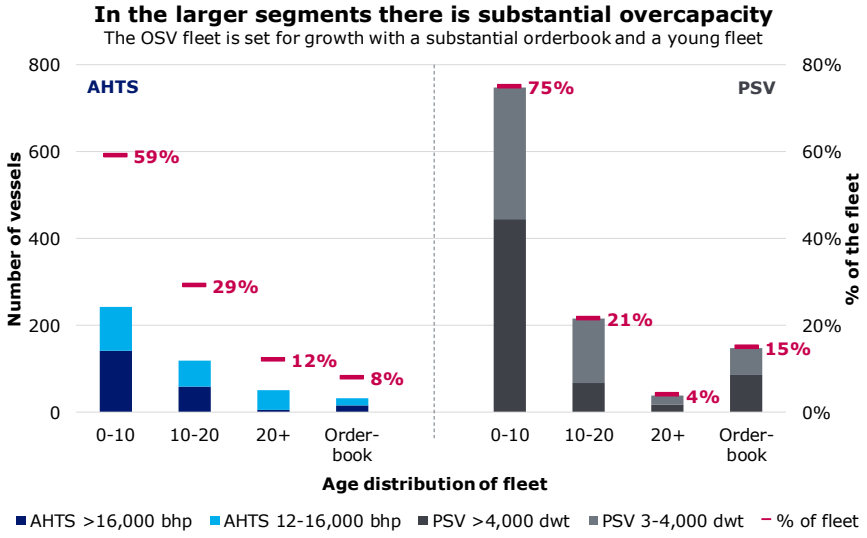
...BUT OFFSHORE PRODUCTION COULD START RAMPING UP

While offshore sanctioning remains well below the replacement level, the trend has turned in 2017. Capex commitments directed towards new offshore developments indicate that the offshore market might have passed the bottom. Deepwater sanctioning has increased from the low volumes seen in 2016, when only 150,000 barrels per day were approved, to around 350,000 barrels per day in September 2017. Moreover, indications are that two additional projects will be sanctioned in Brazil during the fourth quarter of 2017 (i.e. Vito and the pilot phase of Libra) which could bring this year's total sanctioned deepwater projects up to 600,000 barrels per day (+2.5% of current production). These new projects are not expected to begin producing before 2021.

VESSEL DEMAND COULD SLOWLY BEGIN TO RECOVER

The rise in spending commitments reflects the fact that more than half of offshore oil resources that have been discovered but not developed now break even at an oil price below USD 50 per barrel. In this environment, offshore supply vessel activity could begin to recover as early as the second half of 2018, albeit from a very low

Figure OSV.9



Sources: Clarksons, Danish Ship Finance

level. It may be too early to conclude that deepwater activity is out of the woods, but there is reason to believe the worst could be over. Still, it should be kept in mind that many of the sanctioned projects (outside Brazil) are brownfield projects that connect to existing infrastructure and therefore create little long-term demand for OSV vessels.

IMPROVING SHORT TO MEDIUM-TERM OUTLOOK

The short to medium-term outlook (2017-21) for the offshore supply vessel industry is better than in the past two years. Still, shallow water drilling is expected to return more quickly than deepwater drilling due to the lower breakeven level and shorter-cycle investment environment. The shorter times between discovery and sanctioning of two recently approved deepwater projects underline the importance of compressing cycle times to stay com petitive. We expect Brazil to be the main driver for increased deepwater drilling activity (and large AHTS demand) in the short to medium term.

MANY VESSELS WILL NOT BE REACTIVATED

Still, there needs to be a significant reduction in the future supply of vessels for charter rates and secondhand prices to improve in the current market. Currently, there are more than 2,500 vessels (44% of the OSV fleet) either in lay-up or without active class certificates (28%, or fewer than 400 vessels in the larger segments) (fig. 4). For many of these vessels, significant reactivation costs would be required before they were ready for new short-term employment. This number could increase in the next three years, as an additional 2,000 vessels are due for class renewal (680 vessels in the larger segments) between 2018 and 2020.

SUPPLY NEEDS TO SHRINK

It is uncertain how many of these vessels will stay active in the market, but to us it seems clear that the supply side will need to shrink significantly before charter rates and secondhand prices can start to recover. There are more vessels on order still, although it remains to be seen how many of these will be delivered (fig. 9). In other shipping segments, many of the out-of-work and elderly vessels would be prime candidates to be sold for scrap. But OSVs tend to fetch relatively low scrap prices: the largest AHTS would struggle to command a scrap price over USD 1 million, which might not even be enough to cover the cost of transporting the vessel to a breaking location. Still, many of the older laid-up vessels appear to have been effectively written off by owners via a lack of investment in maintenance. More action will still be required to reduce vessel supply to address the current imbalance in the market.

THE LARGER SEGMENTS ARE BETTER POSITIONED

The larger segments may be less exposed to the overcapacity, but it is yet to be seen whether the market will recover sufficiently to carry a yield on these assets. We expect the larger vessels to remain under pressure in the short to medium term. Although we could see the start of a rebalancing between supply and demand, there is still a considerable way to go. For a more balanced market to be achieved, older and smaller vessels will have to be scrapped and exploration activity will need to resume.

A LONG-TERM RECOVERY REMAINS DISTANT

The long-term outlook for the offshore supply vessel industry is subject to significant uncertainty, due to potential factors ranging from significant increases in the onshore oil supply to the timing of peak oil demand. In general, the OSV industry prospers when new fields and infrastructures are being built and maintained. Oil majors have more than 120 projects that are being recycled or postponed in their portfolios. Many of these projects received final investment decisions in the period from 2012 to 2014. Several major projects are in Brazil. And if the current drilling campaign in the Barents Sea proves successful, this could also create significant demand for large OSV vessels. If these projects are sanctioned and oil demand continues to increase, our hopes for a better OSV long-term outlook would be bolstered. ▪

SUBSEA VESSELS

SHIPPING MARKET REVIEW – NOVEMBER 2017

DANISH SHIP FINANCE

SUBSEA VESSELS

THE MARKET FOR SUBSEA VESSELS IS SUFFERING FROM OVER-CAPACITY. SECONDHAND PRICES AND CHARTER RATES REMAIN LOW. A CONSOLIDATION PROCESS HAS STARTED, AND MANY SHIPOWNERS HAVE EXITED THE INDUSTRY, WITH MORE EXPECTED TO FOLLOW SUIT. A SLOW RECOVERY IS EXPECTED FROM LATE 2018 ONWARDS, BUT IT MAY NOT BE FOR EVERYONE.

THE SUBSEA MARKET AT A GLANCE

THE SUBSEA MARKET IS STILL OVERSUPPLIED. SECONDHAND PRICES AND CHARTER RATES REMAIN LOW BUT HAVE SEEN MARGINAL IMPROVEMENTS SINCE NOVEMBER 2016.

The low offshore E&P spending that is lowering demand for offshore supply vessels is likewise reducing demand for Subsea vessels. Market activity is low and new projects are primarily related to (smaller) tie-back projects and seasonal maintenance. The low market activity has caused competition to intensify and forced larger companies to bid for smaller contracts (i.e. below USD 100 million), leaving smaller vessel owners in a very difficult position. Many have been forced to exit the market.

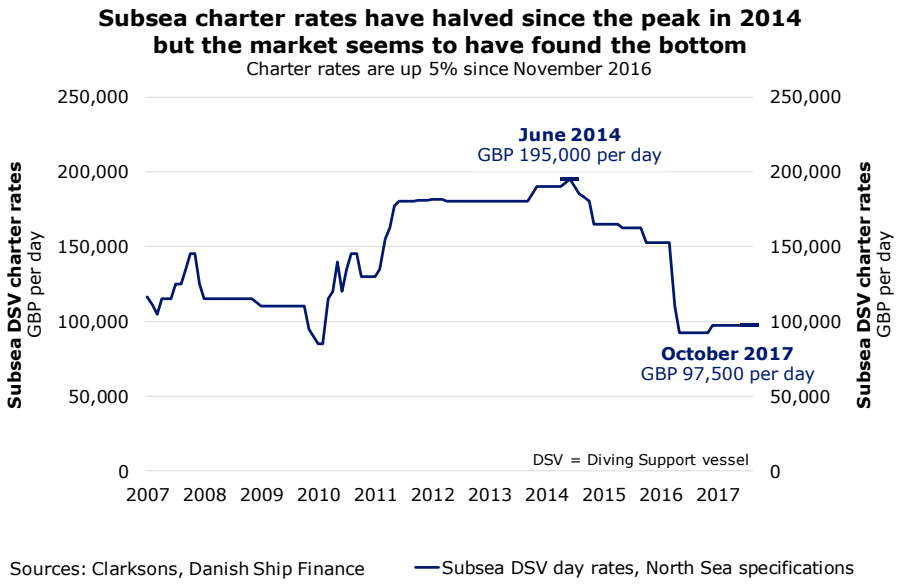
MARKET FUNDAMENTALS REMAIN CHALLENGING

Charter rates have more than halved, from GBP 195,000 per day in 2014 to GBP 97,500 per day in August 2017 (fig.1). This drop clearly reflects the poor utilisation of the fleet. The low demand for Subsea vessels is clearly visible if we use the number of new subsea tree contracts as a proxy for Subsea vessel demand. These declined by 16% in 2017 compared with 2016 and are now 80% below their peak in 2013. Installations of subsea trees are also down, by approximately one-third compared with last year (fig. 2).

FEW VESSELS HAVE BEEN LAID UP

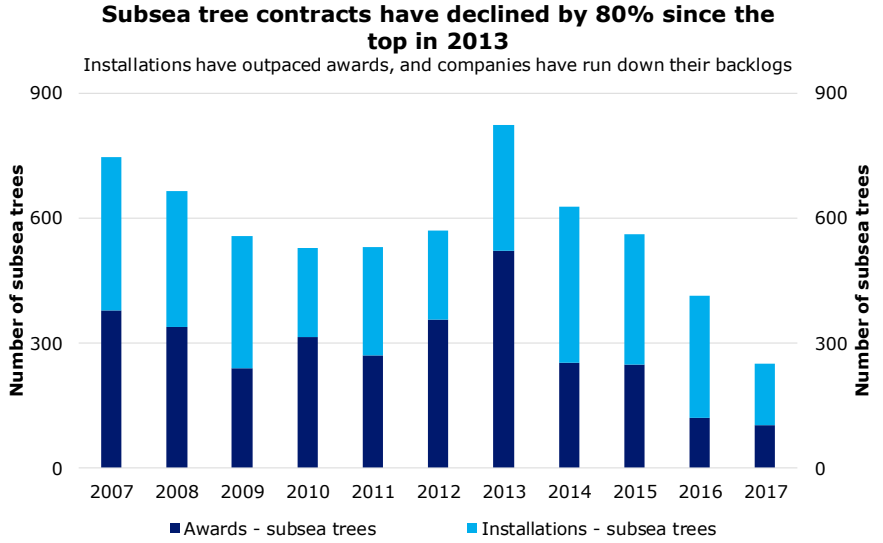
Contrary to what we have seen in the market for offshore supply vessels, few Subsea vessels have been laid up despite the weak demand. Only 6% of the fleet is in lay-up and few vessels (six) have been scrapped in 2017. The fleet continues to increase with

Figure SS.1



Sources: Clarksons, Danish Ship Finance

Figure SS.2



Sources: Clarksons, Danish Ship Finance

28 vessels (4% of fleet) delivered in the first ten months of 2017. The orderbook is heavily front-loaded and stands at 11% of the fleet. The fleet generally has a significant share of older vessels that could be scrapped to absorb the delivery of new vessels without putting too much downward pressure on charter rates and secondhand prices. Subsea vessels are typically larger than OSVs and therefore have a marginally higher steel value. Few new vessels have been ordered in 2017.

THE SALE AND PURCHASE MARKET REMAINS ILLIQUID

Secondhand prices are clearly under significant pressure. There are relatively few owners that have the financial capacity to buy and few owners that are willing to sell their vessels in the current market. The price mechanism is therefore characterised by illiquidity and many sales are considered distressed. This makes it harder to assess the actual market value of vessels, but the young and modern vessels are holding up the best.

THE MARKET OUTLOOK FOR SUBSEA VESSELS REMAINS CHALLENGING, BUT LARGER OWNERS SEEM BETTER-POSITIONED TO BENEFIT FROM THE EXPECTED DEMAND RECOVERY. STILL, THERE SEEMS TO BE LITTLE TO INDICATE THAT THE SITUATION WILL BEGIN TO IMPROVE BEFORE THE END OF 2018.

Global E&P spending currently seems to favour onshore oil projects. Low break-even rates and short-cycle projects are giving both conventional and unconventional onshore oil production a competitive advantage over new large-scale offshore projects. This development is clearly sensitive to the oil price. If the oil price stays at current levels for a prolonged period, the demand outlook for both Offshore Supply vessels and Subsea vessels will be structurally reduced. In the event of this, smaller players would likely continue to be forced out of the market.

A RECOVERY MAY NOT BE FOR EVERYONE

These forces are driving a transition process in the subsea industry whereby larger vessel owners are entering into strategic alliances with oil companies to lower costs and enhance their capabilities. However, strategic alliances with oil companies may not be for everyone. Smaller vessel owners are at risk of becoming tonnage providers to an oversupplied market. Still, national oil companies (NOCs) have a history of awarding contracts to smaller shipowners, partially due to national interests, but also to keep their supply chains competitive.

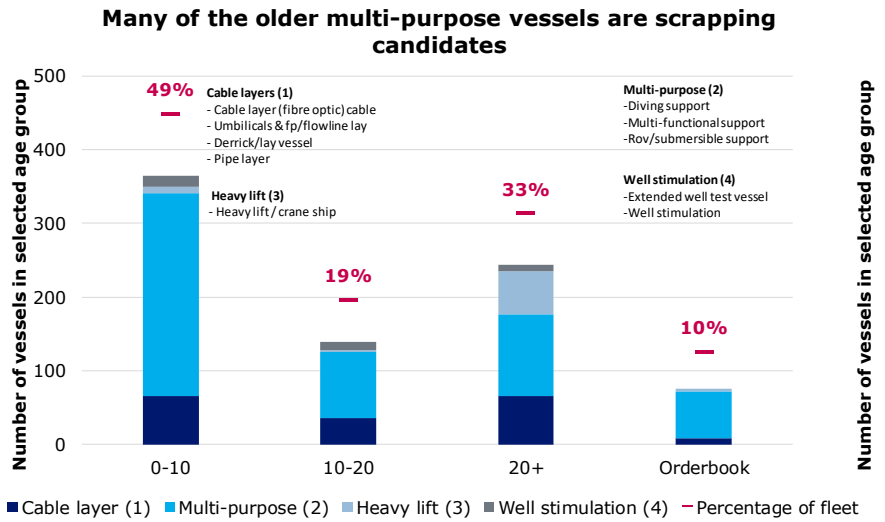
THE LARGEST PLAYERS SEEM BEST-POSITIONED

The combined backlog of the three largest Subsea players seem to have bottomed out (fig. 4). The smaller players may find it harder to secure employment, and therefore their order backlogs may stay low for longer.

SHORT TO MEDIUM-TERM DEMAND IS GROWING

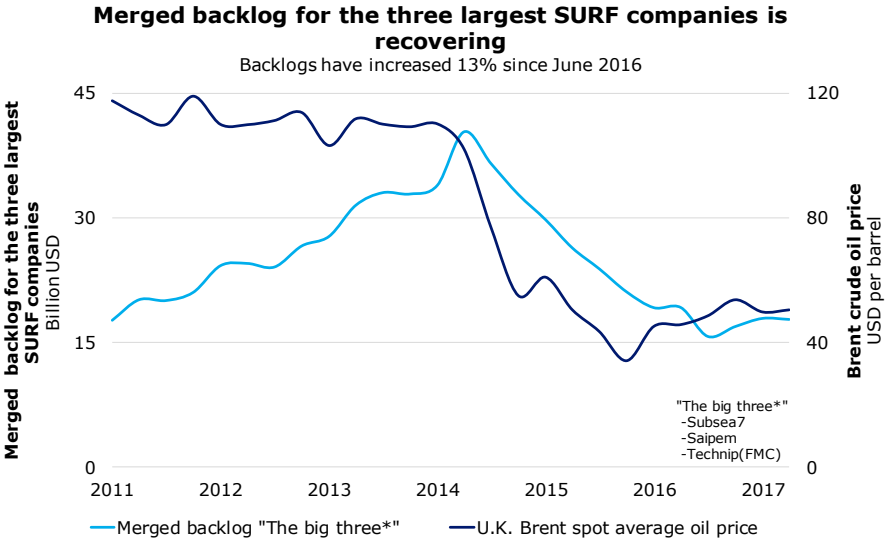
Demand for Subsea vessels could be on its way out of the bottom

Figure SS.3



Sources: Clarksons, Danish Ship Finance

Figure SS.4



Sources: Clarksons, Danish Ship Finance

of the current cycle. Spending on subsea production systems has already increased this year, albeit from a very low level, and is expected to continue to grow up to 2021 (fig. 5). Statoil alone is expected to award more subsea trees in the next 12-18 months than were awarded globally in 2016. Several projects are awaiting final investment decisions (FIDs) at the end of 2017 or at the beginning of 2018. These include Snorre 2040, the Yme redevelopment and Pil & Bue, which are all projects on the Norwegian Continental Shelf. However, the vast majority of new projects are tie-back projects which mean less vessel employment than new projects that require installation of new production infrastructure.

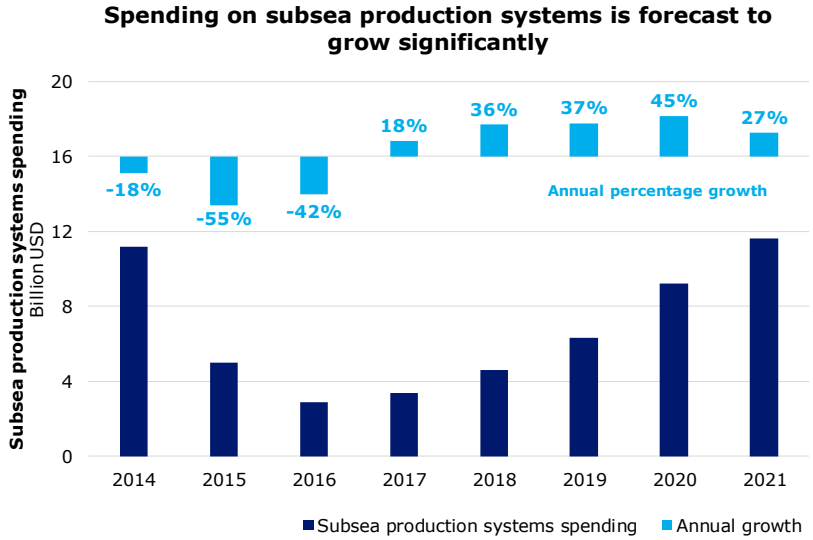
THE LONG-TERM DEMAND OUTLOOK IS IMPROVING

Conventional projects awaiting FIDs are dominated by large deep and ultra-deep water projects in Brazil which will probably start production in the early 2020s if sanctioned. Companies are also experiencing an upsurge in front-end engineering design (FEED) studies this year (fig. 6). This is not a guarantee of future projects but a good indicator of long-term demand. Opportunities outside the oil and gas sector are also increasing. Offshore wind is becoming increasingly attractive to Subsea companies, since they can leverage on their knowledge and experience.

FEW OWNERS WILL BENEFIT FROM THE RECOVERY

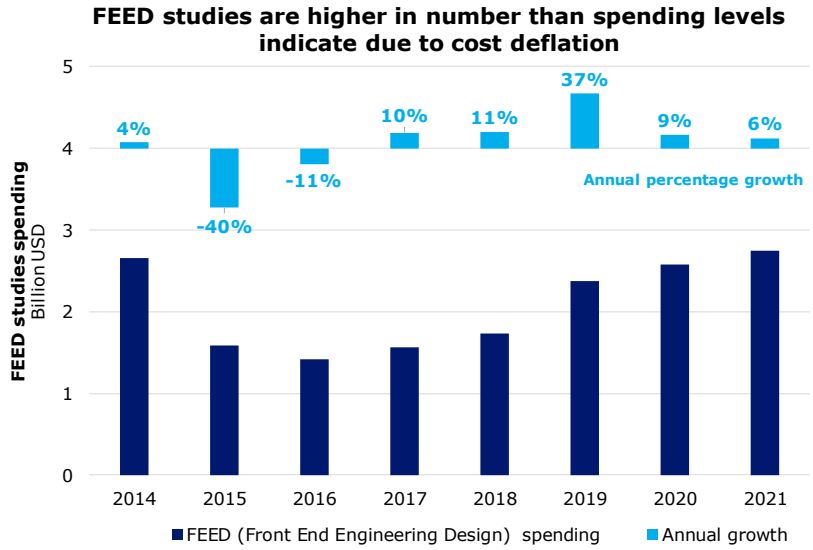
The Subsea market is heading for a recovery, but it may take some years and it may not be for everyone. We recognise that this is a good time for owners to acquire vessels at discounted prices, but few players have the financial capacity to do so. Some smaller players are expected to exit the market and more vessels need to be scrapped. Those in a position to acquire attractive assets now will likely reap the benefit in a couple of years. ▪

Figure SS.5



Sources: IHS Energy, Danish Ship Finance

Figure SS.6



Sources: IHS Energy, Danish Ship Finance

CRUDE TANKER

SHIPPING MARKET REVIEW – NOVEMBER 2017

DANISH SHIP FINANCE

CRUDE TANKER

TOO MANY NEW DELIVERIES HAVE EXACERBATED THE OVERCAPACITY IN THE CRUDE TANKER MARKET IN 2017. ALTHOUGH FUTURE OIL DEMAND IS EXPECTED TO BE HEALTHY, THIS WILL NOT BE ENOUGH TO EASE THE PRESSURE ON FREIGHT RATES AND SECONDHAND PRICES IN THE NEXT TWO YEARS, AS THE FLEET IS SCHEDULED TO GROW FURTHER.

THE CRUDE TANKER MARKET AT A GLANCE

THE CRUDE TANKER MARKET HAS DETERIORATED SIGNIFICANTLY IN 2017 AS THE NEGATIVE FREIGHT RATE TREND HAS BECOME FIRMLY ENTRENCHED.

Market fundamentals in the Crude Tanker segment have worsened during the course of 2017. Excessive fleet growth (+5%) continues to weigh down the already oversupplied market and postpone the recovery despite relatively strong demand growth.

ACUTE OVERSUPPLY RENDERS GOOD DEMAND CONDITIONS IRRELEVANT

A number of factors appear to have kept Crude Tanker demand healthy in 2017, despite the OPEC production cut. Overall, global demand for crude oil continues to grow. Increased trading activity on new long-haul trading routes has extended average travel distances. Spot VLCC liftings from the Middle East have been largely unchanged in 2017 compared with 2016, and drawdowns from global oil stocks are still scant, indicating that Crude Tanker demand has not been adversely impacted by OPEC's production cut. But in spite of this, freight rates have continued to decline, simply because too many new vessels are being delivered too quickly to be employed. As a result, the oversupply continues to build, increasing the pressure on freight rates.

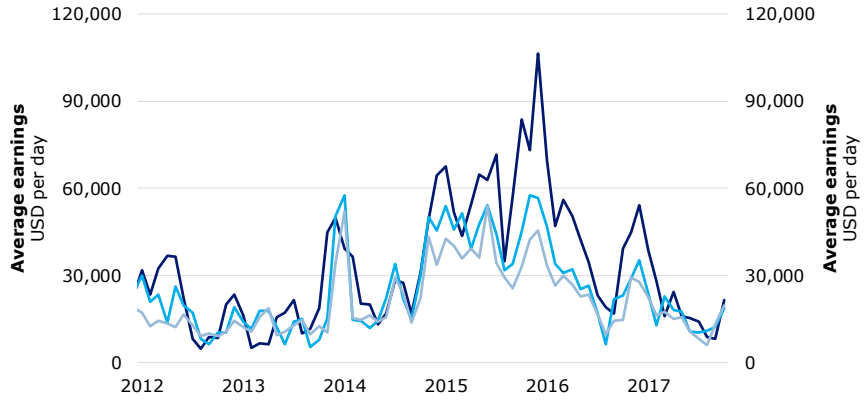
DESPITE SEASONALITY SPOT EARNINGS TREND DOWNWARDS

Spot earnings have declined rapidly this year, and are so far down 49% from their most recent peak in December 2016. At the end of August, average earnings sank to USD 8,400 per day – the lowest level seen since September 2012 (fig. 1). The VLCC market

Figure T.1

The Crude Tanker spot market has experienced strong downward pressure on freight rates in 2017

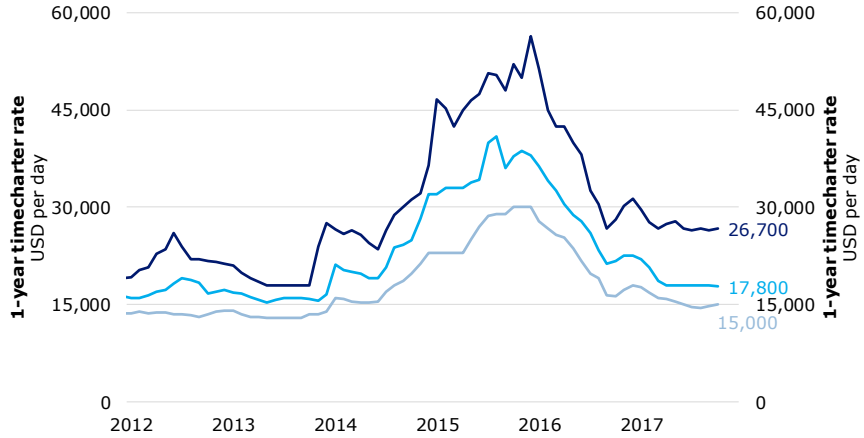
Average spot earnings are down 49% year-to-date, and VLCC earnings are worst hit with a 60% decline year-to-date



Sources: Clarksons, Danish Ship Finance

Figure T.2

Timecharter rates continue to trend downwards and have declined by 17% year-to-date



Sources: Clarksons, Danish Ship Finance

experienced the steepest downturn, largely due to the delivery of 41 new VLCCs and only nine demolitions in the first nine months of 2017. By the end of October, the 1-year timecharter rate stood at USD 26,700 per day for a VLCC, USD 17,800 per day for a Suezmax and USD 15,000 per day for an Aframax – an average decline of 17% from the December 2016 level (fig. 2). VLCC and Suezmax rates have been kept afloat by increased long-haul exports out of the US, Brazil and West Africa bound for Asia. Further, Suezmax rates have been helped by a doubling of US imports from Brazil, counterbalancing falling imports from Venezuela.

INCREASED DEMOLITION BUT FLEET GROWTH REMAINS HIGH

Higher scrap prices (fig. 4) seem to have led owners to increase demolition in 2017. Scrapping in the first nine months of 2017 reached 6.2 million dwt – nearly three times the amount in all of 2016. Still, new vessels have continued to pour into the fleet with 26.3 million dwt delivered so far in 2017, compared with 25.6 million dwt in the whole of 2016.

ACTIVITY IN THE NEWBUILDING MARKET HAS INCREASED IN 2017

The newbuilding and secondhand markets have rebounded in 2017 after a slow 2016. In the newbuilding market, new vessels with a capacity of 17.5 million dwt were ordered in the nine months of 2017, compared with 7.9 million dwt in all of 2016. In the secondhand market, 14.2 million dwt, or about 4% of the fleet, changed hands during the first nine months of 2017, compared with 8.9 million dwt sold in the whole of 2016.

THE SECONDHAND MARKET INCREASINGLY FAVOURS YOUNG VESSELS

Poor market fundamentals are keeping secondhand prices low. Secondhand prices have risen 3% for five-year-old vessels and dropped 3% for ten-year-old vessels year-to-date. Increased interest in buying modern tonnage and a lack of sales candidates have helped stabilise the price development in 2017 (fig. 3). The interest in younger vessels has pushed prices of older tonnage down to some of the lowest levels since 2000 (fig. 4), perhaps reflecting a shortening of economic life as pointed out previously.

Figure T.3

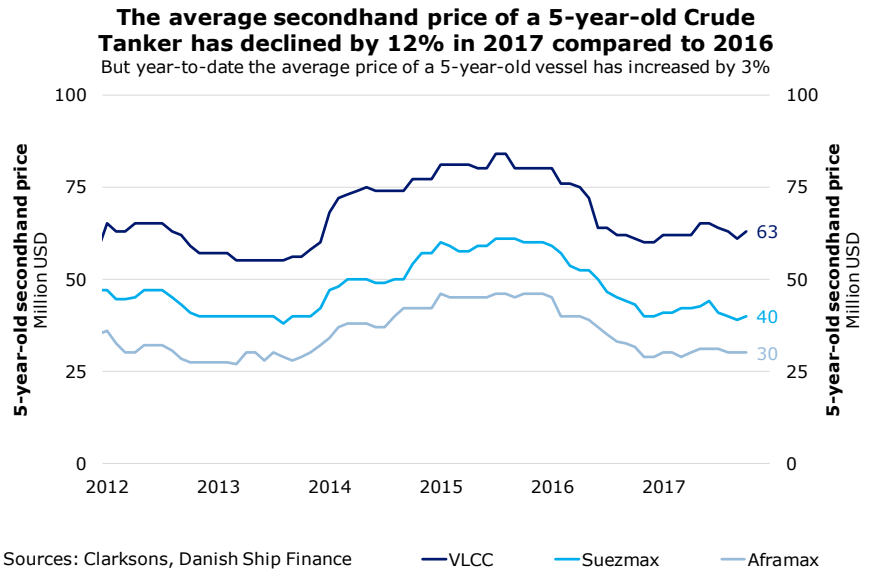
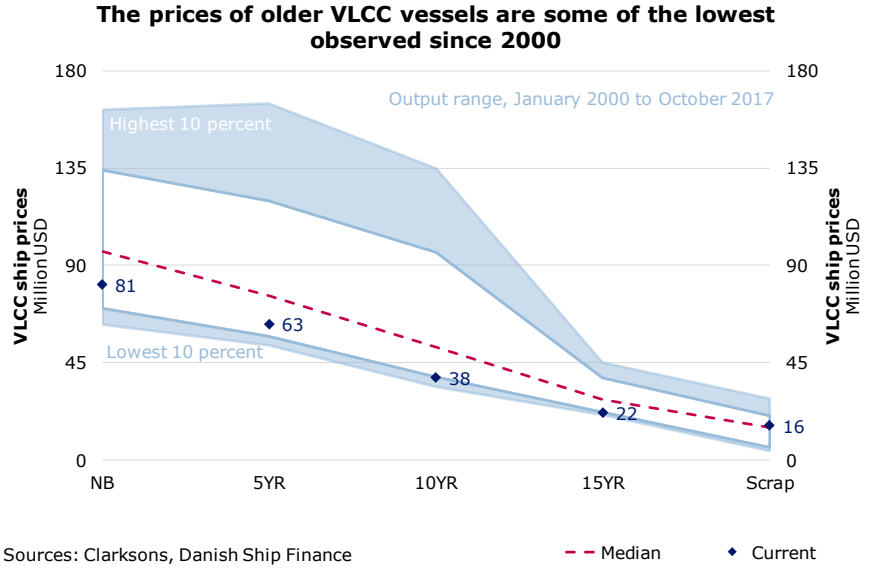


Figure T.4



OUTLOOK

HIGH FLEET GROWTH DAMPENS THE OUTLOOK FOR THE CRUDE TANKER MARKET IN THE COMING YEARS, DESPITE POSTIVE EXPECTATIONS FOR OIL DEMAND GROWTH. NEW LONG-HAUL TRADES ARE SPARKING OPTIMISM IN THE INDUSTRY, BUT WE ARE CAUTIOUS ABOUT THE EFFECT AND SUSTAINABILITY OF THESE. THE MAIN THREAT TO THE LONG-TERM OUTLOOK IS THE EXPECTATION THAT 'PEAK OIL DEMAND' IS LURKING.

OPEC's decision to lower production is currently supporting the Crude Tanker market by increasing travel distances and reducing fleet availability due to inadequate US export facilities. Still, the Crude Tanker market is oversupplied. Freight rates and secondhand prices are low. Freight rates continue to decline, whereas it seems that vessels' secondhand prices are being supported by high expectations for future earnings. We see little to indicate that market fundamentals will improve significantly within the next year or two. The fleet is scheduled for further growth, while demand for Crude Tankers looks unlikely to be able to employ the new deliveries, even though global oil demand continues to grow at a healthy rate.

THE LONG-TERM OUTLOOK IS BLEAK

The temporary factors that are currently supporting Crude Tanker demand will fade when OPEC terminates the production cut. When that happens, freight rates and secondhand values are likely to face additional pressure. Still, the long-term factor that has yet to be priced into younger vessels' secondhand prices is 'peak oil demand' which looks likely to occur within the lifetime of most vessels currently trading. Industry executives argue that global oil demand will peak within the next ten to 15 years.

YOUNGER VESSELS' SECONDHAND VALUES MAY DECLINE

Looking at the market's current pricing of secondhand vessels, it appears to us that expectations for younger vessels' potential future earnings are high. Older vessels are priced at a relatively

Figure T.5

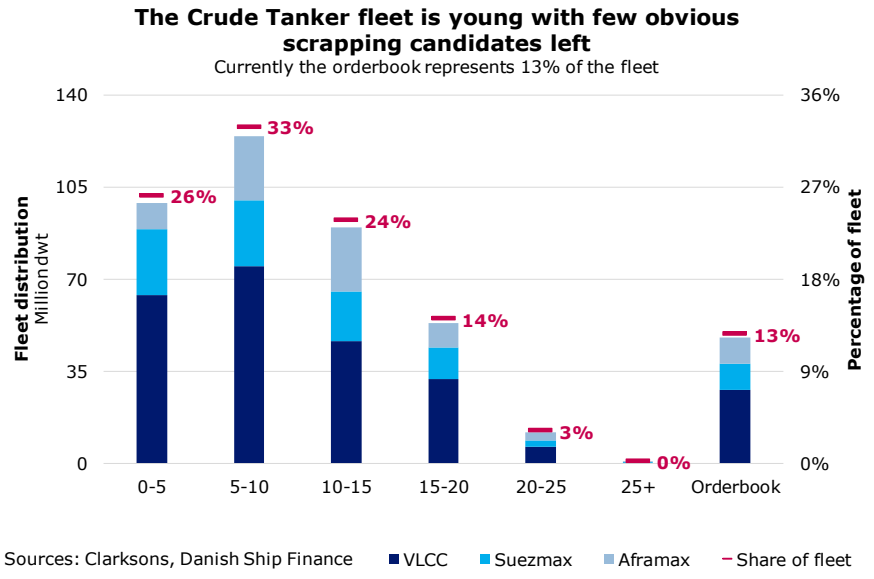
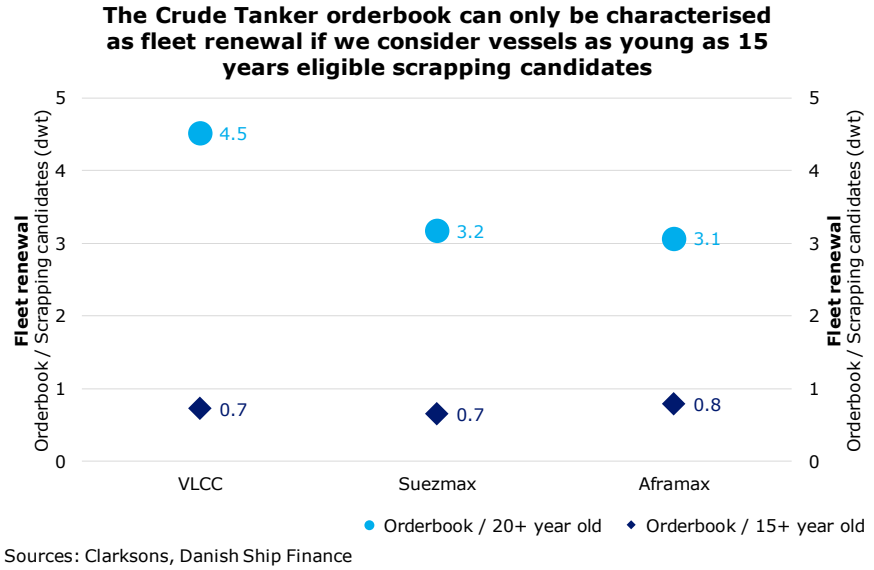


Figure T.6



modest premium to their scrap values – the spread between the price of a 15-year-old VLCC and its scrap value is USD 6 million – but the price for an additional five years' cash flow is significantly higher (fig. 7). Thus, if the high expectations for younger vessels are not fulfilled secondhand prices may see a reduction.

A FLEET RENEWAL EXERCISE OR SURPLUS CAPACITY BUILDING UP?

The low premium for a 15-year-old VLCC relative to its scrap price may reflect the market's expectation that a significant share of older vessels (i.e. older than 15 years) will be scrapped. This hypothesis is supported to some extent by the size of the orderbook in relation to the number of scrapping candidates in the fleet (fig. 5). The orderbook is so large that it almost looks like a fleet renewal exercise aimed at replacing most vessels older than 15 years (fig. 6). In the event of this, we would expect further downward pressure on older vessels' secondhand prices in the years to come, but prompt demolition of older vessels may improve freight rates.

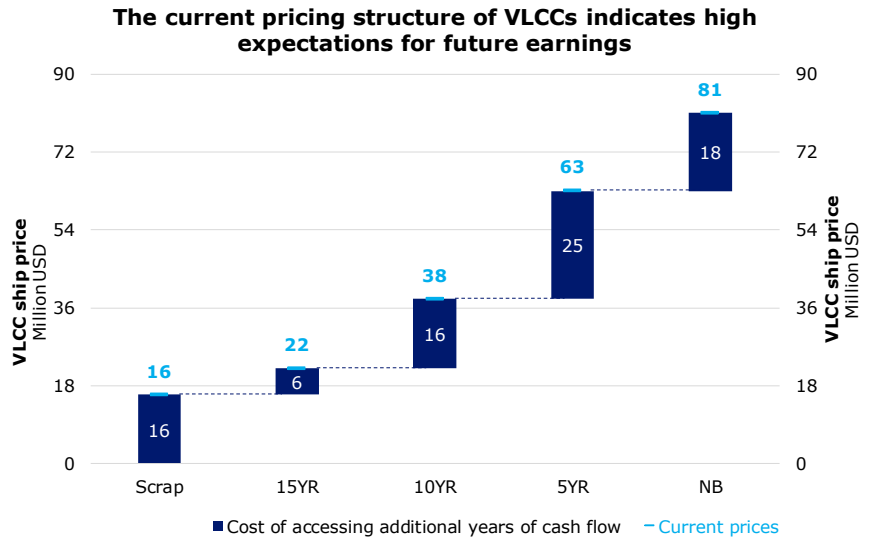
HIGH EXPECTATIONS ATTACHED TO FUTURE EARNINGS

The prices of younger assets imply that the market expects freight rates to be mean-reverting (i.e. to increase in the future). Investors are currently paying approximately USD 11 to access USD 1 of cash flow for a five-year-old VLCC compared with USD 8 to access USD 1 of cash for a ten-year-old VLCC. While price/earnings ratios look more in line with the historical averages calculated on a gross (excluding opex) rather than a net basis, we believe the free cash flow equivalent is more relevant for determining an investor's reservation price than gross earnings. We therefore argue that younger vessels could be overvalued compared with their actual future earnings potential.

PEAK OIL DEMAND BEING REACHED REPRESENTS A RISK

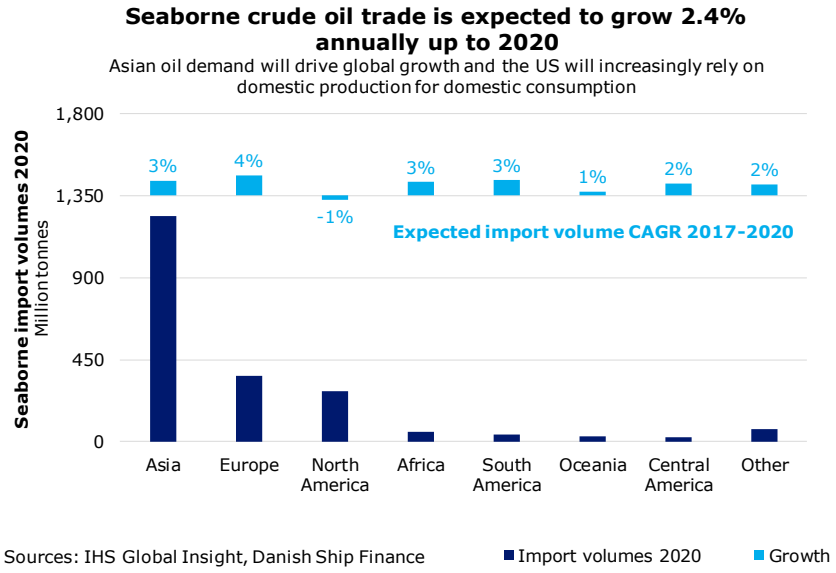
The long-term earnings potential of Crude Tankers is closely linked to future demand for crude oil. If global oil demand peaks within the next ten to 15 years, this may begin to be reflected in the pricing of younger vessels. Crude Tanker demand is expected

Figure T.7



Sources: Clarksons, Danish Ship Finance

Figure T.8



Sources: IHS Global Insight, Danish Ship Finance

to grow slowly as global oil demand moves towards the peak, then to start declining. This trend is expected to be irreversible, although global oil demand may drift back and forth near the peak. Now, let us focus on the short- to medium-term outlook.

CRUDE TANKER DEMAND SET TO RISE 2.4% ANNUALLY UP TO 2020

We expect nominal Crude Tanker demand to grow by approximately 2.4% annually up to 2020 (fig.8). The Crude Tanker fleet is expected to grow at a gross rate of 7% in 2017 and 6% in 2018 (fig. 9). Longer travelling distances are currently supporting distance-adjusted demand, but we consider the OPEC production cut a short-term event that will not add much additional demand to the market and hence will not absorb the front-loaded orderbook in the short to medium term. Travel distances are likely to decline when OPEC ends the production cut.

ADDITIONAL STOCK BUILDING MAY SUPPORT SHORT-TERM DEMAND

Global oil stocks remain high and will continue to represent a limiting factor for Crude Tanker demand in the near future. It remains to be seen whether additional stocks will be built. This could represent a short-term demand impetus for Crude Tankers, although it would simply be taking from future demand.

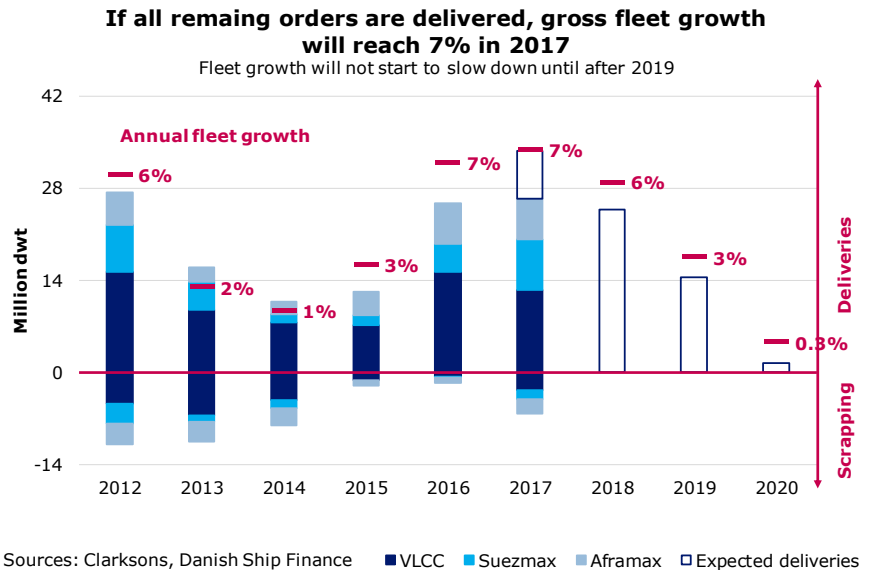
ASIAN DEMAND IS DRIVING TRADE VOLUMES

Global oil demand is primarily growing due to the Asian economies, although OECD demand has surprised positively in 2017. India and China alone are predicted to account for about 45% of the growth in global oil demand up to 2020. Indian oil demand showed some weakness in 2017, caused by the government's demonetisation policy, but strong expectations for future Indian car sales and air travel are positive for the long-term outlook. It is a similar story for Chinese demand growth, although shrinking domestic oil production is another contributing factor.

THE INCENTIVE TO SCRAP VESSELS IS INCREASING

Scrapping of older vessels is likely to increase if demand fails to employ the large number of vessels being delivered during the next two years, as we expect more owners to take advantage of

Figure T.9



relatively high demolition prices. Further encouragement may be provided by the impending new sulphur cap and ballast water regulations. Freight rates seem unlikely to recover to any great extent during this period, unless tonnes-miles demand increases. It remains to be seen, though, how quickly younger vessels will be scrapped and thus how quickly surplus capacity will be reduced.

NO IMMINENT IMPROVEMENT IN CRUDE TANKER MARKET LIKELY

We continue to argue that the Crude Tanker fleet is in little need of new additions. Oversupply is likely to remain a challenge during the next two years. Freight rates could decline further and younger vessels' secondhand prices could continue to fall. The scarcity of old demolition candidates suggests that vessels will not be scrapped soon enough for freight rates to recover during the next two years (fig. 5).

THE OIL SUPPLY OUTLOOK REMAINS HIGHLY UNCERTAIN

The state of the oil market is always highly uncertain. Global oil demand continues to grow, but the global oil supply outlook remains shrouded in uncertainty. Much of the uncertainty centres on

the duration of the OPEC production cut. When OPEC increases production, oil prices could start to decline again, bringing the oil markets back into contango. This could support the Crude Tanker market by encouraging oil storage but would at the same time shorten average travel distances. The impact on US shale production of an OPEC production increase remains uncertain, but in previous cycles we have seen that US shale production is highly responsive to changes in the oil price. Still, we find it unlikely that Crude Tanker utilisation will see sustainable improvements from these effects.

VESSEL SUBSTITUTION MAY CHANGE SOME SHORT-TERM DYNAMICS

VLCC demand could improve at the expense of Suezmax demand when US export facilities are upgraded. Today, few American ports can handle a fully-laden VLCC. The Louisiana Offshore Oil Port, offshore Louisiana, is one of the few ports capable of receiving VLCCs, but it is primarily used as an import facility. However, the port of Corpus Christi, which handles around 70% of all US crude exports, has received funding to start a project that would allow fully-laden VLCCs to call at the port. The project has no set completion date, but when finished it will significantly reduce freight costs and turnaround time for vessels, and is likely to make the use of VLCCs much more attractive for US exports, possibly at the expense of Suezmaxes. However, a counter effect of decreased turnaround time is also reduced fleet utilisation.

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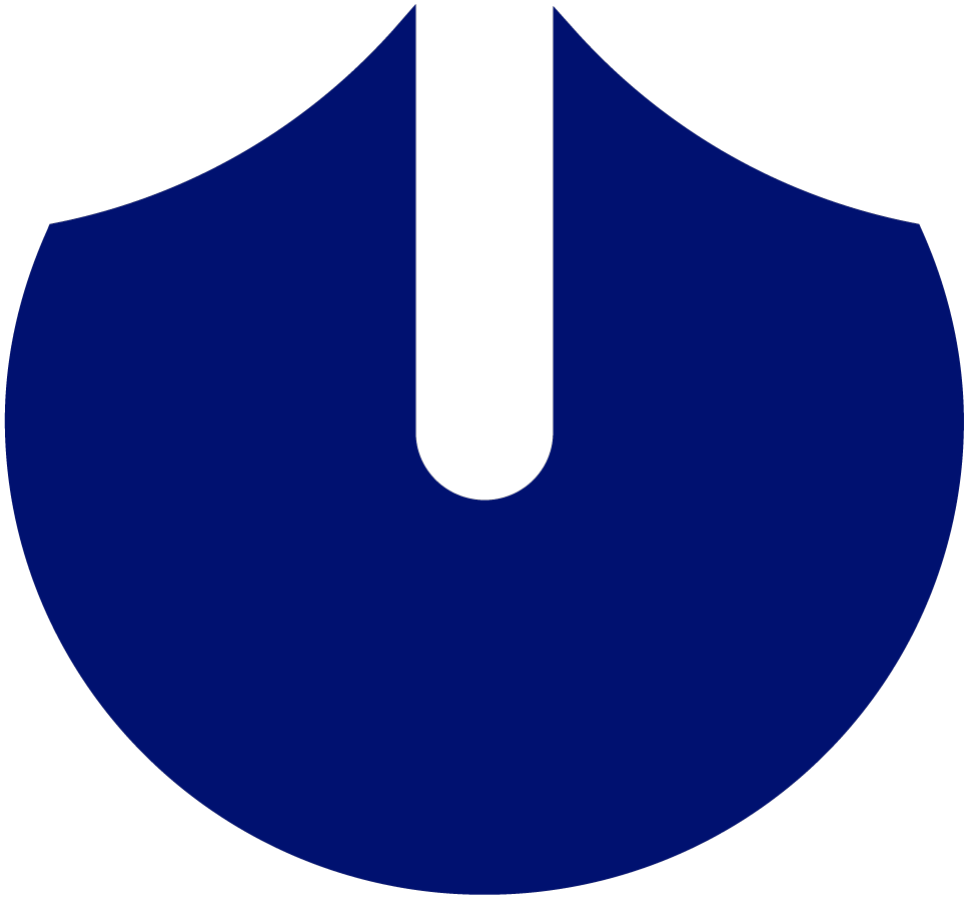
In short, the overriding factor affecting the Crude Tanker outlook is high fleet growth. A shortening of average travel distances when OPEC oil production increases again will only deteriorate the outlook further. We expect the Crude Tanker market to stay challenging at least until the end of next year. ▪

PRODUCT TANKER

SHIPPING MARKET REVIEW – NOVEMBER 2017



DANISH SHIP FINANCE

PRODUCT TANKER

THE PRODUCT TANKER MARKET IS OVERSUPPLIED, AND THE LR SEGMENTS ARE AT RISK OF ADDING FURTHER TO THE OVERCAPACITY. THE HIGH FLEET GROWTH IS OUTPACING DEMAND GROWTH, AND DEMAND IS EXPECTED TO GROW SLOWLY IN THE COMING YEARS. FREIGHT RATES AND SECONDHAND PRICES ARE LOW, ALBEIT INCREASING.

THE PRODUCT TANKER MARKET AT A GLANCE

SURPLUS CAPACITY CONTINUES TO WEIGH ON PRODUCT TANKERS. FREIGHT RATES AND SECONDHAND PRICES REMAIN LOW BUT ARE SHOWING SLIGHT SIGNS OF IMPROVEMENT.

Oversupply is keeping the Product Tanker market subdued. After two years of strong growth, the Product Tanker fleet has expanded further in 2017, growing by 3.9% in the first nine months. Demand for Product Tankers has been relatively robust, but is growing too slowly to employ all the new vessels. This has kept freight rates at very low levels in 2017 (fig. 1).

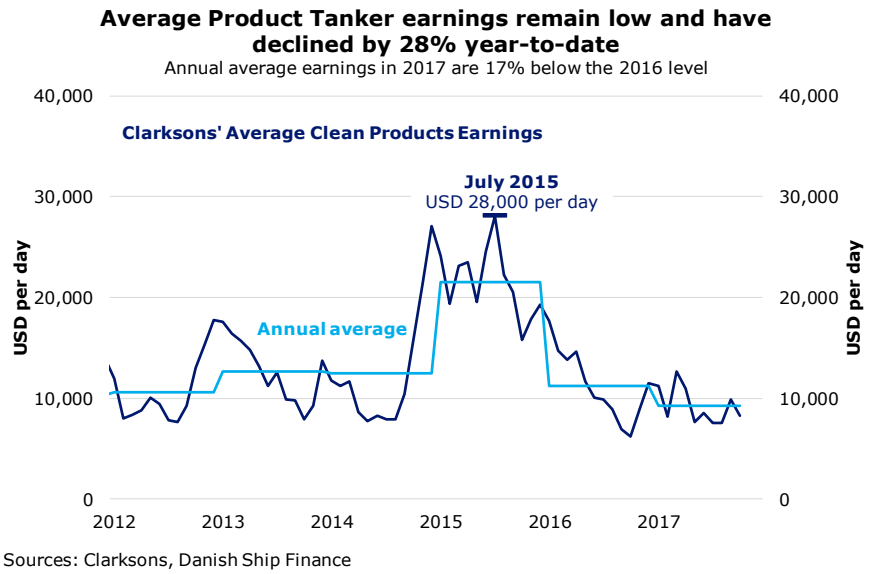
HIGH INVENTORIES ARE KEEPING THE MARKET SUBDUED

Strengthening demand for petroleum products and continued low oil prices have lifted refinery margins in 2017 compared with 2016 levels, leading refiners to ramp up production. But despite growth in consumption of petroleum products, the increase in production of petroleum products means that drawdowns of global product inventories have been limited. The high inventories have curbed trade in petroleum products by reducing the need for imports, and have held back arbitrage trade in 2017 by capping the potential for temporary regional imbalances to emerge.

CLEAN TANKER EARNINGS HAVE FLUCTUATED AROUND A LOW BASE

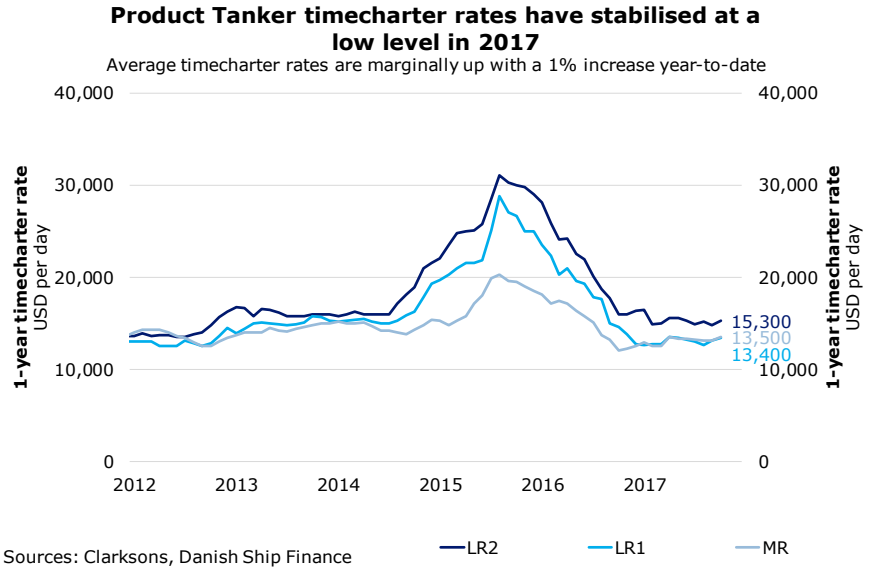
In the third quarter, Clean Tanker spot earnings saw a short-lived spike. Hurricane Harvey in the US Gulf Coast forced refineries to shut down, causing the Product Tanker market in the Atlantic Basin to tighten in early September. But despite temporary increases over the first nine months, average spot earnings have

Figure P.1



Sources: Clarksons, Danish Ship Finance

Figure P.2



Sources: Clarksons, Danish Ship Finance

been low and by the beginning of October had declined by 24% year-to-date. Timecharter rates were up by 8% for MRs and 5% for LR1s in the first nine months. LR1s are now trading below MRs. LR2 timecharter rates declined by 7% in the same period, most likely due to excessive fleet growth of 11% overwhelming the market (fig. 2). MR and LR1 rates have been supported by strong growth in exports from the US to Latin America, especially to Mexico and Brazil, and increased European exports to West Africa. Additionally, MR rates have been supported by growth in intra-Asian petroleum products trade. But Product Tanker timecharter rates remain near historical lows. By end-October, the 1-year timecharter rate stood at USD 13,500 per day for MRs, USD 13,400 per day for LR1s and USD 15,300 per day for LR2s.

INCREASED DEMOLITION AND SLOWDOWN IN DELIVERIES

Product Tanker demolition picked up from the low level in 2016, reaching 1.1 million dwt in the first nine months – a 47% increase compared with the whole of 2016. At the same time, deliveries lost some pace with 6.8 million dwt entering the fleet, versus 7.3 million dwt in the same period in 2016. The slowdown was caused by 30% fewer MR deliveries, both in terms of dwt and number of vessels, while LR2 deliveries increased by 17% in 2017.

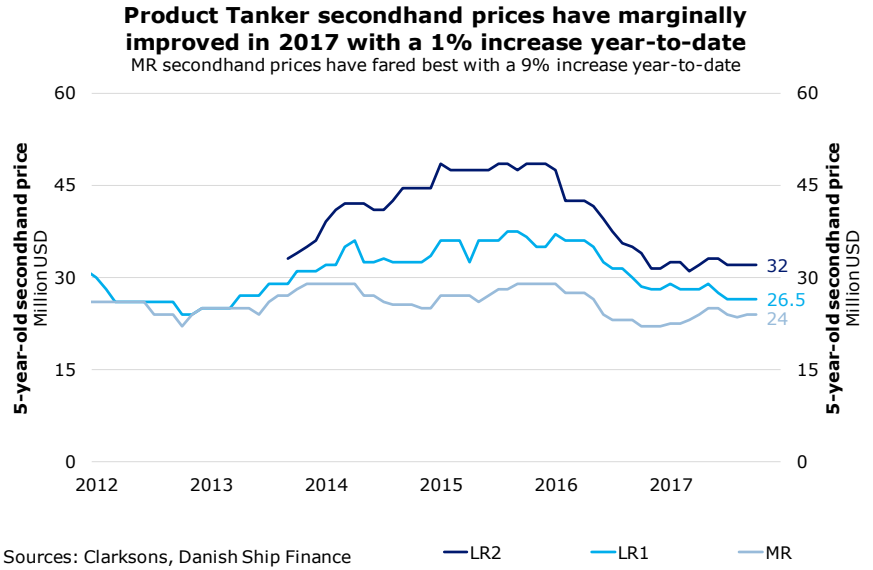
CONTRACTING ACTIVITY HAS MORE THAN DOUBLED IN 2017

Contracting activity has grown sharply in 2017 with 5.1 million dwt ordered in the first nine months, up from a historical low of 1.5 million dwt in the whole of 2016. Activity in the secondhand market has also increased, with 4.8 million dwt changing hands in the first nine months of 2017, up from 2.9 million dwt in 2016.

ASSET PRICES ARE IMPROVING SLOWLY

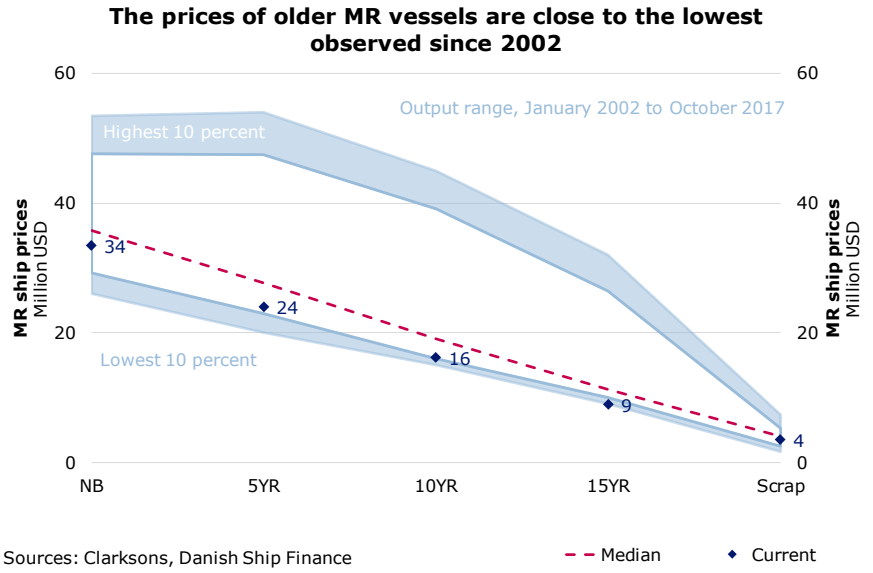
On average, Product Tanker asset prices have been lower in 2017 than in 2016. But, year-to-date all Product Tanker secondhand prices have risen, with the exception of five-year-old LR1 vessels (fig. 3). MR asset prices have fared best in 2017 and are up 9% and 5% for five-year-old and ten-year-old vessels, respectively, year-to-date, although this is from a very low base (fig. 4).

Figure P.3



Sources: Clarksons, Danish Ship Finance

Figure P.4



Sources: Clarksons, Danish Ship Finance

OUTLOOK

THE OUTLOOK FOR THE PRODUCT TANKER MARKET IS FOR SLOW DEMAND GROWTH AND THERE ARE SIGNIFICANT DOWNSIDE RISKS. HIGH SCHEDULED FLEET GROWTH AND A SCARCITY OF OLD VESSELS FOR SCRAPPING TARNISH THE OUTLOOK FOR THE LR SEGMENTS. IN CONTRAST, MANY OLDER VESSELS IMPROVE THE OUTLOOK FOR THE MR SEGMENT, BUT THESE NEED TO BE DEMOLISHED FOR NEW DELIVERIES TO BE ABSORBED.

The short-term outlook is characterised by modest growth in demand and a front-loaded orderbook (fig. 5 and 7). Inventory drawdowns could pave the way for regional imbalances again and strengthen arbitrage trade. Still, we do not believe demand growth will be adequate to employ the new vessels, and thus we assume many vessels will have to be scrapped to keep freight rates and secondhand values stable, especially younger LR vessels. Premature scrapping could reduce the economic lifetime of vessels by up to five years, which could lower the value of older vessels. The medium-term outlook is highly sensitive to Asian demand and few new orders being placed.

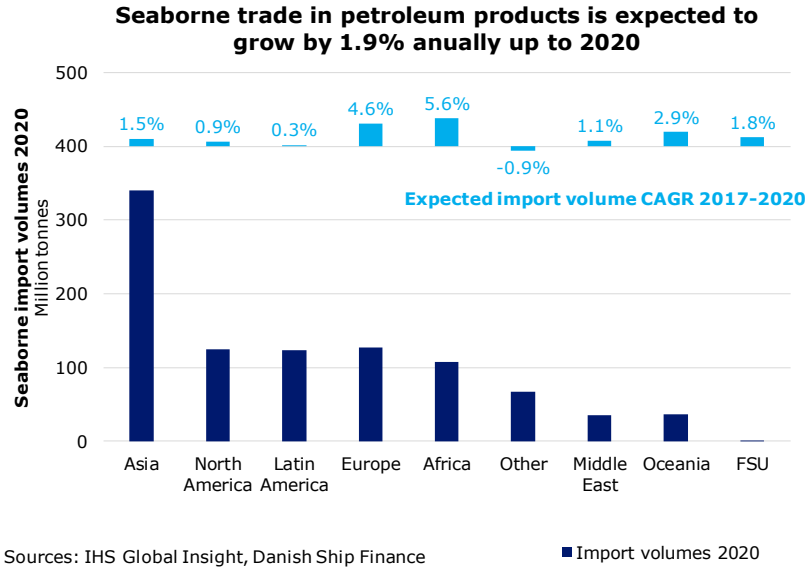
YOUNG VESSELS SENSITIVE TO TIMING OF 'PEAK OIL DEMAND'

Product Tanker demand is expected to grow by an annual average of less than 2% up to 2030 (fig. 6). If oil demand peaks before 2030, vessels that are currently young may find it hard to generate suitable risk-adjusted returns on invested capital. The jury is still out, but from a long-term investor's perspective we argue it seems reasonable to hold back ordering in the coming years.

GEOGRAPHICAL DIVERGENCE IN FUTURE DEMAND EXPECTATIONS

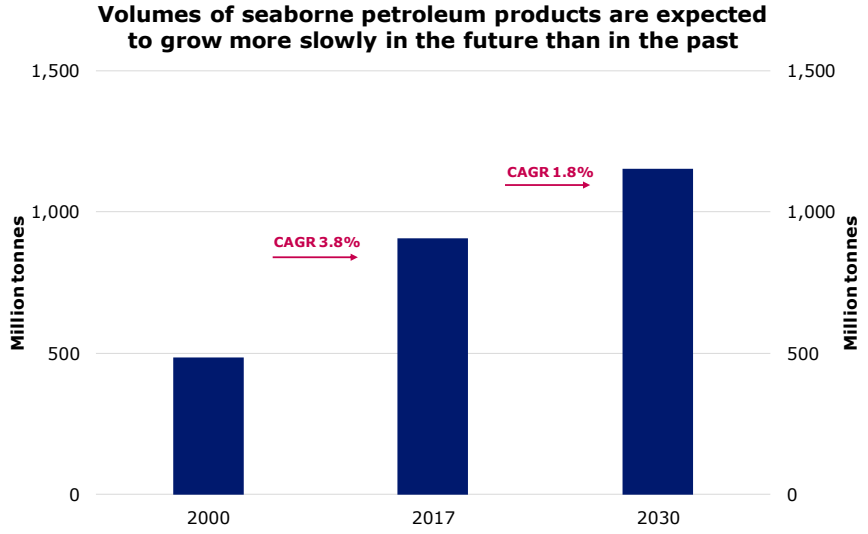
From 2020, oil demand and thus demand for petroleum products is expected to peak in the OECD countries, due to a retiring workforce, a mature transport sector, fuel efficiency gains and aggressive public policies. Non-OECD demand for petroleum products is expected to continue to grow over the next 10-15 years until the peak, as a growing middle-class will increase demand for transport fuels and consumer goods (e.g. plastics products).

Figure P.5



Sources: IHS Global Insight, Danish Ship Finance

Figure P.6



Sources: IHS Global Insight, Danish Ship Finance

DIESEL DEMAND IS EXPECTED TO INCREASE, BUT ONLY SLOWLY

The outlook for diesel demand is positive, but growth is expected to grow slowly by around 1% per year up to 2025. This will be driven by increased demand for road freight (i.e. heavy-duty vehicles), particularly in China.

GASOLINE DEMAND CAUGHT BETWEEN A ROCK AND A HARD PLACE

In the OECD region, low oil prices have led to a brief resurgence of gasoline demand in the past few years, but a structural decline is expected to set in from 2018. Globally, gasoline demand is expected to peak any time from 2025. In the short term, fuel efficiency gains will hold back demand growth, while electric vehicle penetration will cause a deceleration in the long term.

ELECTRIC VEHICLES MOVING FRONT AND CENTRE

The approaching electric vehicle revolution seems to be gaining traction among car manufacturers and regulators. Volvo has pledged to sell no new cars without electric engines from 2019. Other car manufacturers have similarly ambitious plans for 'going electric'. Regulators are advancing the agenda, with France and the UK joining, among others, Norway, the Netherlands and India in setting deadlines for when sales of light-duty vehicles with internal combustion engines will no longer be allowed. Chinese regulators are also planning to ban internal combustion engine vehicles, but the timing remains uncertain. As we have discussed in previous reports, forecasters have continuously underestimated the rate of adoption of electric vehicles. With the recent announcements and China signalling its intention to jump on the bandwagon, forecasts could be set for major revisions and 'peak gasoline demand' could come much sooner than we currently anticipate.

CHINA IS THE BIGGEST RISK TO GASOLINE DEMAND GROWTH

China is pushing aggressively for electrification of its car fleet, and has at least three reasons for doing so. Electric vehicles do not aggravate air pollution and neither do they add to demand for oil imports. Thirdly, they present an opportunity for China to globally dominate an emerging industry in contrast to the 'old' internal combustion engine car industry. Chinese car manufacturers are producing the largest number of electric vehicles globally and Chinese consumers are buying the most electric vehicles in the world. However, both the electric vehicle industry and consumers in China are aided by aggressive subsidies – for consumers, the subsidies are second only to those in Norway. Six Chinese cities account for approximately 70% of electric vehicle sales, and in these cities licence plates for internal combustion engine cars are available only by lottery. It could be that the ease with which a licence plate can be obtained has been the main incentive for purchasing an electric vehicle rather than any other considerations. Either way, this illustrates the power of policy. Exactly how soon the government wants the Chinese only to drive electric vehicles is the single biggest uncertainty for gasoline demand going forward.

AIR TRAFFIC GROWTH AND PETROCHEMICALS ARE BRIGHT SPOTS

Rising living standards, especially in non-OECD countries, are set to boost global demand for air travel and consumer products strongly and thereby feedstock for the petrochemical sector beyond the peak as demand for other petroleum products decline. This will support jet fuel and naphtha demand. The increase in naphtha demand will primarily be seen east of Suez. However, jet fuel and naphtha account for only a small share of total oil demand compared with diesel and gasoline, and thus despite their good growth prospects, they are unlikely to compensate for declines in demand elsewhere.

ATLANTIC BASIN REFINERIES FACE STRONG COMPETITION

Due to the expected slowdown in demand growth, only half the historical rates of refinery capacity additions in Asia are needed. New Asian refineries tend to be globally competitive, which threatens the Atlantic Basin refineries' ability to export petroleum products competitively to distant growth markets. US refineries' primary export market is Latin America, but exports to Asia have increased sharply over the past two years. If Asian refinery capa-

city outgrows domestic demand, the weakest Atlantic Basin refineries could be at risk of closure. Less refining capacity in the Atlantic Basin could mean reduced travelling distances, as trade of petroleum products would be increasingly centred east of Suez. In particular, this could affect LR2s which are preferred on the long-haul West to East trades. However, in terms of volumes this trade is still not very big.

PRODUCT TANKER SUPPLY TO CONTINUE TO OUTGROW DEMAND...

With little growth in demand expected and further fleet growth scheduled, supply will continue to outpace demand in the Product Tanker market for at least another year. Gross fleet growth is expected to reach 6% in 2017 (fig. 8), and more is scheduled.

...AND THERE IS MORE FLEET GROWTH SCHEDULED FOR 2018

The orderbook currently consists of 234 vessels with a combined capacity of 14.5 million dwt (fig. 8). Of these orders, 65% are scheduled to be delivered by the end of 2018. By that time, gross fleet growth could have risen to 7.5% from September 2017 levels. Yet another year of rapid fleet expansion is likely to sustain the downward pressure on timecharter rates and secondhand prices as supply outstrips underlying demand and high inventories keep arbitrage trade subdued. Further, fleet growth will continue to be an issue in the Product Tanker market beyond 2018, since most of the vessels ordered in 2017 are not scheduled to be delivered until 2019 (fig. 8).

ONLY 225 PRODUCT TANKERS ARE 20 YEARS OR OLDER

More than 90% of obvious scrapping candidates in the Product Tanker fleet (i.e. vessels 20 years or older) are MRs, and for every MR vessel 20 years or older in the fleet there are 1.1 vessels in the orderbook (fig. 7 and 9). Therefore, we maintain our opinion that the MR segment is well-positioned to withstand fleet growth despite the oversupply. Increased demolition of older vessels should mean that the MR orderbook is absorbed into the fleet without putting much downward pressure on timecharter rates and ship prices.

Figure P.7

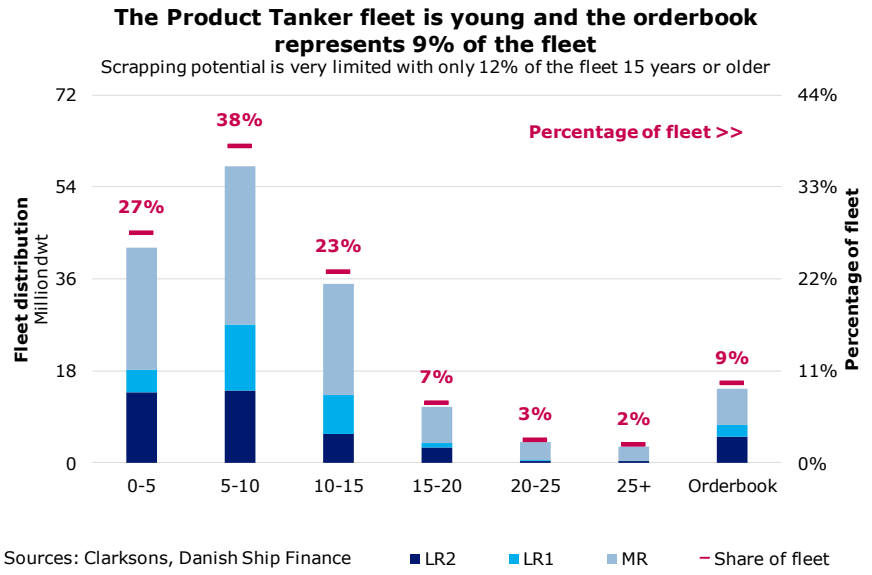
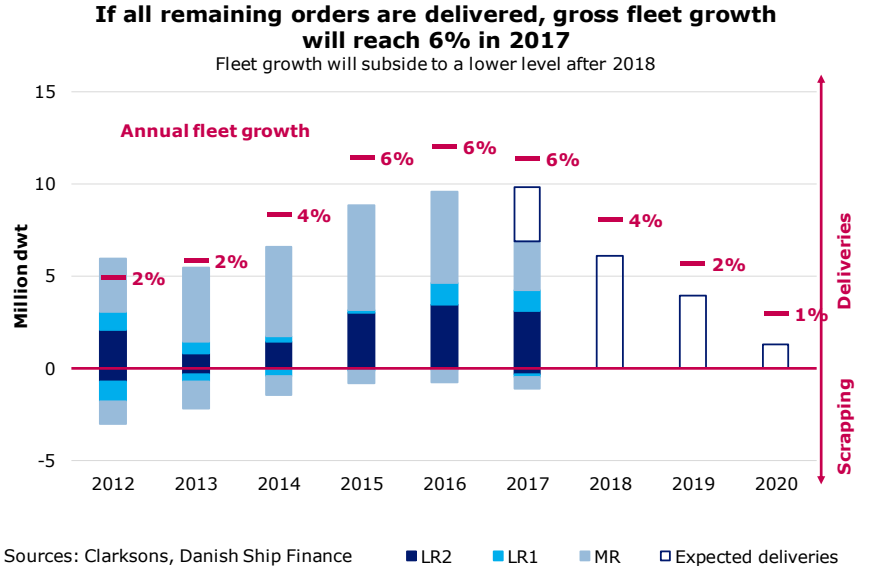


Figure P.8



LR SCRAPPING UNLIKELY TO ABSORB THE ORDERBOOK

There are more than six times as many LR2s on order as there are obvious scrapping candidates in the fleet, and 12 times as many LR1s (fig 9). Shipowners are unlikely to scrap enough vessels to ease the oversupply and we do not anticipate any let-up in the pressure on freight rates and secondhand prices in the short term. Further, if demolition of LRs picks up to reduce fleet growth, even more pressure could be added to secondhand prices due to a shortening of the vessels average operating life (fig. 10).

LR1 SEGMENT INCREASINGLY MARGINALISED

On several parameters, the LR1 segment seems to have become increasingly marginalised in recent years. Since 2011, just 9% of all Product Tanker orders have been for LR1s. And of the 72 Product Tanker orders placed in 2017 only two were for LR1s. LR1 vessels have also traded at a discount to MR vessels in terms of timecharter rates for most of 2017, and five-year-old LR1 vessels are the only benchmark to have shown a price drop in 2017 (fig. 2 and 3). Traders' main consideration when chartering vessels is flexibility versus USD per tonne of cargo. Typically, MRs offer greater flexibility (e.g. many US ports only take MRs) and LR2s are cheaper in terms of USD per tonne. For now, some may prefer LR1s due their greater flexibility than for LR2s, but as infrastructure is upgraded to fit larger vessels, LR2s may squeeze LR1s out of the market further.

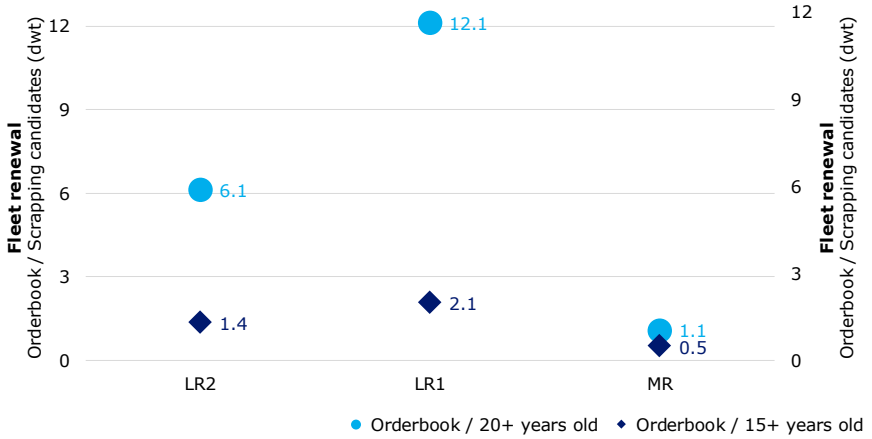
OVERSUPPLY IN THE CRUDE TANKER MARKET MAY SPILL OVER

Oversupply and strong fleet growth in the Crude Tanker market during the next two years could have repercussions for the Product Tanker market. Many Crude Tankers could be competing with Product Tankers on their first East to West voyages as they are delivered from the yards, since earnings are close to parity and fewer crude oil cargoes are available. This could become an issue particularly for LR2s, with new Aframax and Suezmax vessels potentially encroaching on their market.

Figure P.9

The LR orderbook is excessively large compared to the number of available scrapping candidates in the fleet

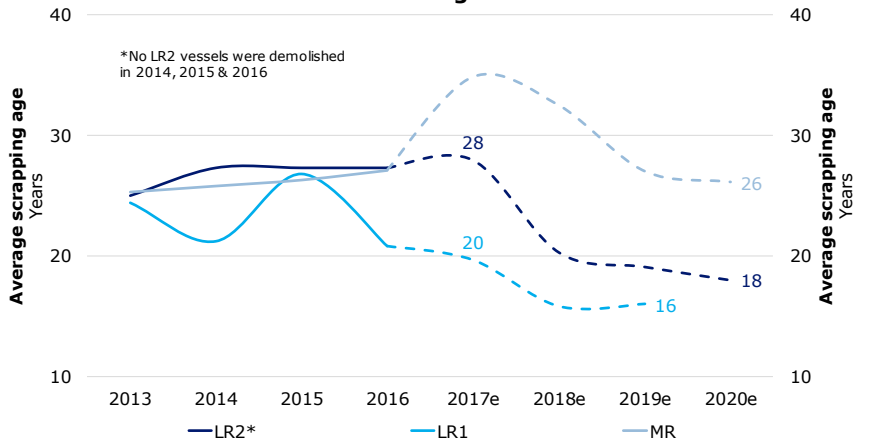
The MR segment is much better-positioned in terms of the number of scrapping candidates available



Sources: Clarksons, Danish Ship Finance

Figure P.10

The pressure on secondhand prices stemming from shorter operating lifetimes could be about to intensify in the LR segments



Sources: Clarksons, Danish Ship Finance

e: the estimated average scrapping age if each time a vessel is delivered, the oldest vessel in the fleet is scrapped.

OVERSUPPLY AND LOW DEMAND GROWTH ARE CLOUDING THE OUTLOOK

Annual demand for petroleum products and thus for Product Tankers is projected to grow slowly each year until 'peak oil demand'. We expect oversupply to continue to put pressure on the LR segments and they are likely to become increasingly challenged in the next year or two. Further, we see significant downside risk to LR secondhand prices if demolition activity picks up and average operating lifetimes shorten. MRs are better-positioned to absorb the orderbook through scrapping, but low demand growth means that owners may have to increase demolition of older vessels. ▪

LPG TANKER

SHIPPING MARKET REVIEW – NOVEMBER 2017

DANISH SHIP FINANCE

LPG TANKER

THE LPG MARKET IS STILL DOMINATED BY OVERSUPPLY. FREIGHT RATES AND SHIP VALUES ARE NEAR ALL-TIME LOWS. THE OVERCAPACITY COULD SHRINK DURING THE NEXT 12-18 MONTHS, BUT LOW FLEET UTILISATION MAY KEEP FREIGHT RATES LOW IN THE YEARS TO COME.

THE LPG MARKET AT A GLANCE

THERE HAS BEEN NO LET-UP IN VESSEL OVERSUPPLY FOR THE LPG MARKET IN 2017. THE BRISK PACE OF DELIVERIES HAS CONTINUED.

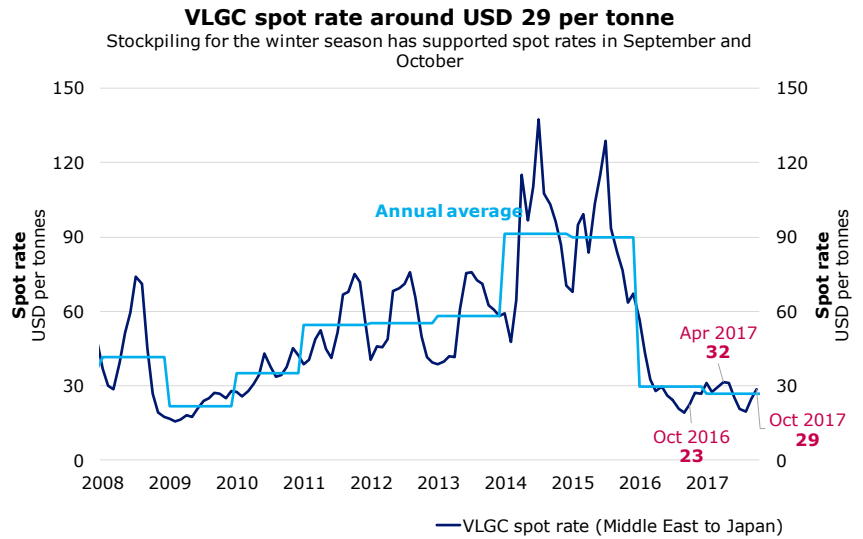
VLGC FREIGHT RATES HAVE DECLINED SINCE APRIL

After marginal freight rate improvements in the first four months of the year, pressure started to mount on the VLGC segment (>65,000 cb.m.). In the second quarter, the northern hemisphere's summer season weakened LPG demand and unfavourable arbitrage conditions between the US and Asia led to cargo cancellations, resulting in ample vessel supply and declining freight rates (fig. 1 and 2). However, stockpiling for the northern hemisphere's winter season started to support rates from September onwards. By October, the VLGC spot and timecharter rate were around USD 29 per tonne and USD 18,500 per day, respectively.

THE MGC TIMECHARTER RATE HAS HIT A NEW ALL-TIME LOW IN 2017

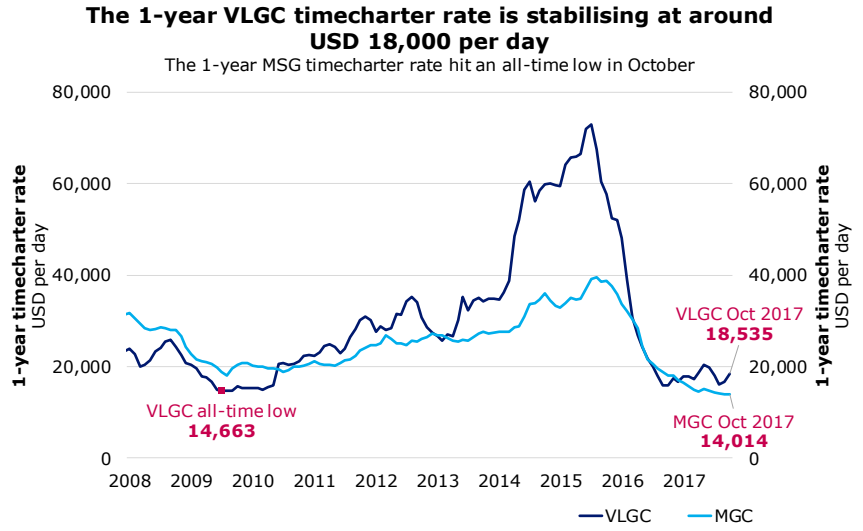
The MGC segment (20-45,000 cb.m.) saw market conditions deteriorate in the first ten months of 2017. Record-high fleet growth combined with disappointing demand has made it harder for vessels to secure employment at decent rates. The ammonia trade has declined on the back of increased domestic production from the US, the world's largest importer. The low VLGC freight rates leave little room for MGCs to broaden their LPG trades. Since January, the MGC timecharter rate has fallen by around 15%, reaching a new all-time low of around USD 14,000 per day in October (fig. 2).

Figure LPG.1



Sources: Clarksons, Danish Ship Finance

Figure LPG.2



Sources: Clarksons, Danish Ship Finance

POSITIVE DEVELOPMENT IN COASTAL LPG CARRIERS

Market fundamentals are improving for coastal LPG carriers (<5,000 cb.m.). The yearly average timecharter rate has increased by around 12% in 2017. Only three newbuilding orders have been placed in the last 12 months and the orderbook is expected to run out at the end of 2018. Note that we do not normally include coastal LPG carriers in this report and we exclude the segment from the rest of the chapter.

NEWBUILDING AND SECONDHAND ACTIVITY IS INCHING UP

Eleven newbuilding orders were placed during the second and third quarters of the year. A total of 14 vessels (seven VLGCs, four MGCs and three SGCs (5-20,000 cb.m.)) have been ordered in 2017 – six more than in all of 2016. Ten of the vessels are scheduled for delivery in 2019. In the secondhand market, four VLGCs, five MGCs and nine SGCs have changed hands – five more than in the whole of 2016. Five sales were newbuild contracts, two were resales and the other 11 were eight years or older (average age of 15 years).

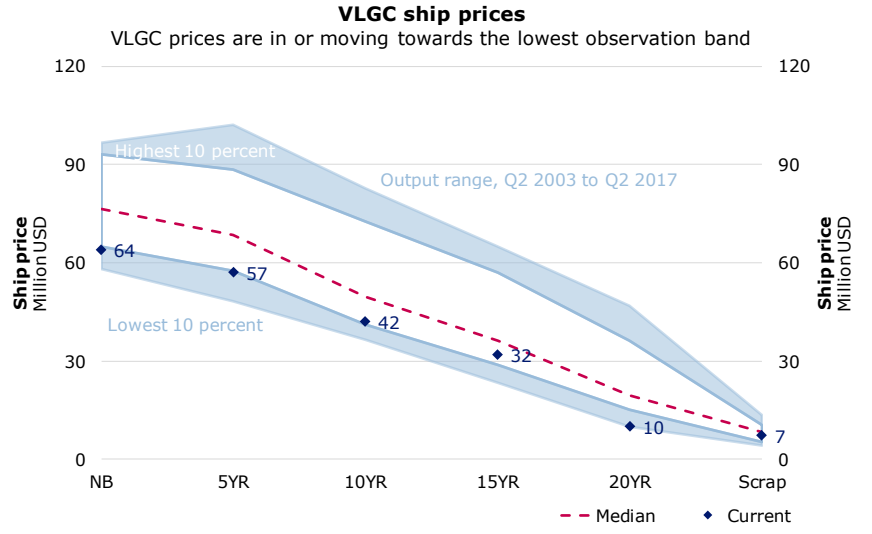
ASSET PRICES REMAIN UNDER PRESSURE

Despite the slight rise in newbuilding activity, the total number of newbuilding orders is still low and prices remain under pressure. Both VLGC and MGC newbuilding prices have declined by USD 1 million since the start of the year. In the same period, average secondhand prices for VLGC and MGC vessels have fallen by 8% and 14%, respectively. In the MGC segment, only the 15-year-old secondhand price and the scrap price are not at all-time lows.

SCRAPPING REMAINS LOW

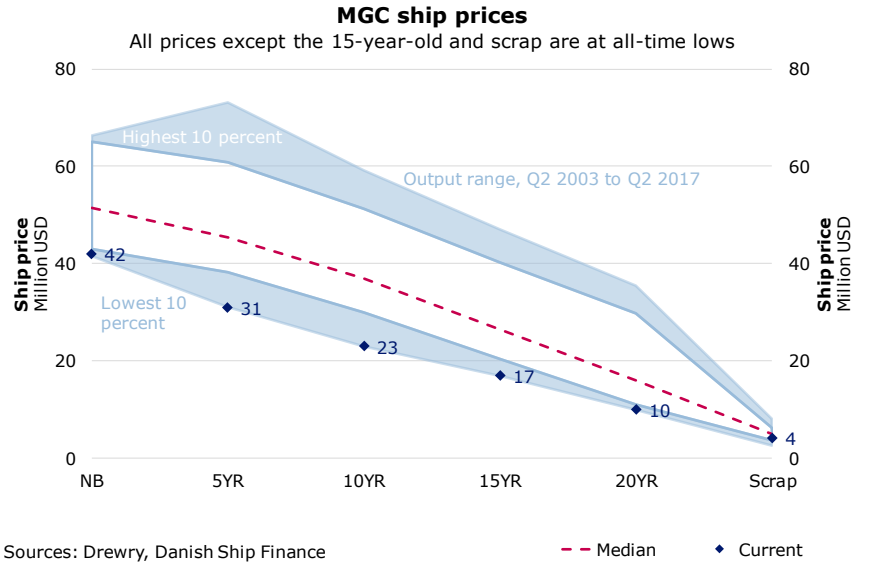
The depressed market conditions have not yet led to any meaningful scrapping. In the first ten months of 2017, one VLGC, three MGCs and seven SGCs were scrapped, far from sufficient to counterbalance the 54 vessels (21 VLGCs, 24 MGCs and 9 SGCs) entering the fleet during the period.

Figure LPG.3



Sources: Drewry, Danish Ship Finance

Figure LPG.4



Sources: Drewry, Danish Ship Finance

MARKET FUNDAMENTALS SHOULD IMPROVE SLIGTHLY IN 2018. HOWEVER, OVERSUPPLY IS NOT LIKELY TO SUBSIDE MUCH UNTIL 2020. DEMAND IS EXPECTED TO REMAIN RELATIVELY STRONG, ALTHOUGH DOUBLE-DIGIT GROWTH IS UNLIKELY.

Increased volumes of low-cost LPG from the US are changing the LPG markets. Most suppliers are defending market shares by pushing exports. This has saturated the global market with LPG, with the surplus being directed to Asia. The market is now at a point where demand growth could decline to single digits due to structural barriers. Increased demand from households will continue to be the backbone of the market, particularly in Asia. However, additional demand as a result of lower LPG prices seems unlikely, since much of the potential has already materialised.

THE ORDERBOOK WILL CONTINUE TO PRESSURE RATES AND VALUES

The orderbook is equivalent to 11% of the fleet, with one-fifth scheduled for delivery before the end of the year (fig. 5 and 6). The LPG market is already oversupplied and expected fleet growth of 9% in 2017 will maintain the downward pressure on freight rates and secondhand values. Only 2% of the fleet is older than 30 years and it is therefore not possible for the incoming vessels to be absorbed without vessels being scrapped prematurely or laid-up. We expect freight rates and secondhand values could remain under pressure until 2020.

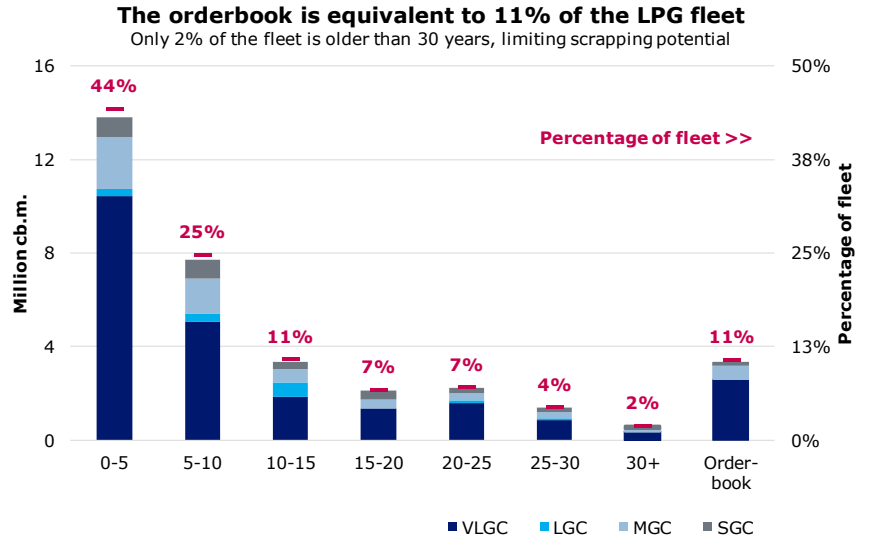
OVERSUPPLY IS NOT EXPECTED TO SUBSIDE MUCH UNTIL 2020

Demand is expected to outpace supply in 2018, only to fall short again in 2019. The short-lived potential we see for improved market fundamentals over the next year may not be enough to raise freight rates substantially due to the current oversupply. The supply surplus may dominate the market until 2020 (fig. 6 and 7).

SUPPLY AND DEMAND BALANCE WILL BE FRAGILE IN 2019

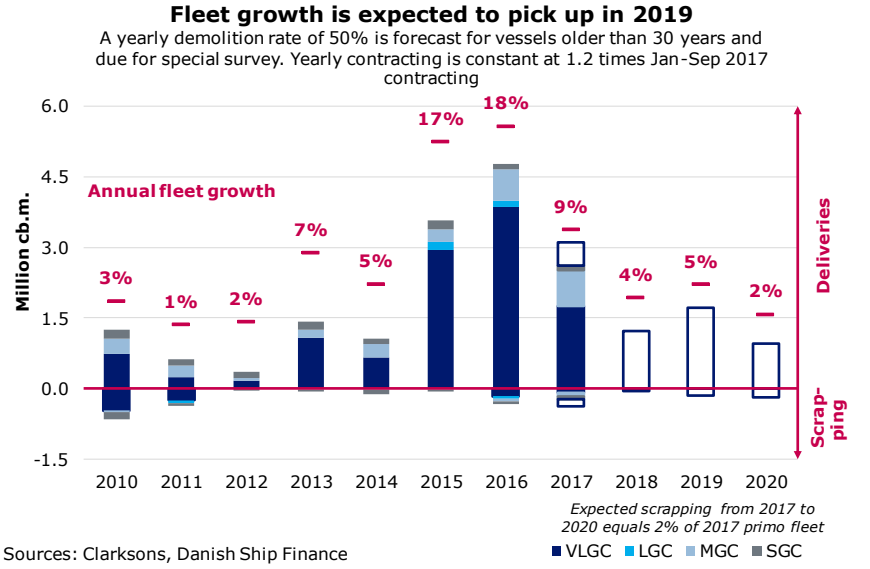
Orders placed in 2017 scheduled for delivery in 2019 will increase

Figure LPG.5



Sources: Clarksons, Danish Ship Finance

Figure LPG.6



Sources: Clarksons, Danish Ship Finance

2019 fleet growth from 2% to 5%. Thus, the expected market recovery will be postponed further if additional orders are placed with scheduled delivery in 2019 or 2020 (fig. 6 and 7).

SURPLUS PRODUCTION DRIVES GROWTH IN SEABORNE VOLUMES

The large surplus of LPG in the Middle East and North America will continue to drive exports in the seaborne market (fig. 8). The two exporters should grow at roughly the same rate over the next five years. However, US LPG production could start to become unattractive if oil prices decline significantly. This could happen if OPEC oil production increases. If US LPG production slows relative to domestic demand prices should increase and US LPG could become too expensive to export.

TRAVEL DISTANCES ARE EXPECTED TO CONTINUE TO INCREASE

Asia will continue to drive seaborne LPG demand and is expected to be the fastest-growing import market. This should increase travel distances as more LPG is transported from the US to Asia.

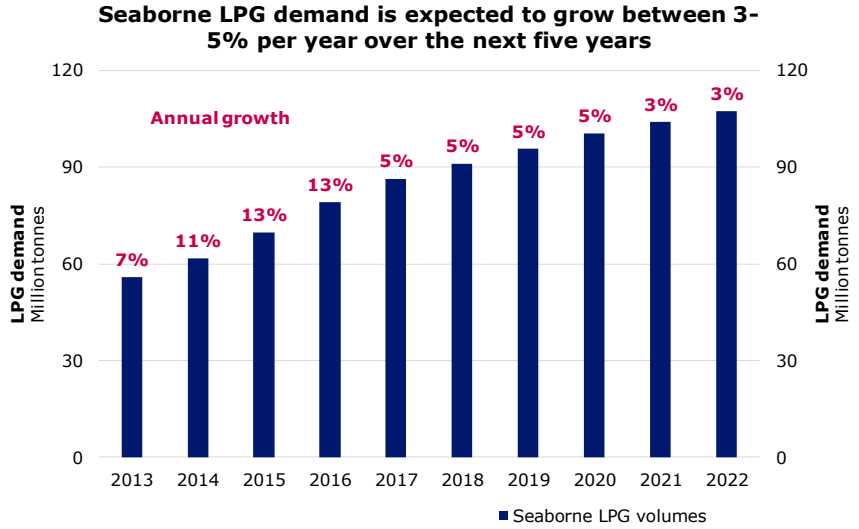
BUT DOUBLE-DIGIT DEMAND GROWTH COULD BE A THING OF THE PAST

Compared with the past four years, the 3-5% forecast annual growth could seem conservative (fig. 7). However, several changes in the Asian markets are expected to lower the growth rate to single digits. In the next five-year period, Asian imports will be sensitive to a lower growth rate in the Chinese petrochemical and industrial sectors. In Japan, continuing competition from natural gas (citygas) will most likely cause LPG imports to contract. A reversal in price-sensitive demand from South Korea's petrochemical sector could cause negative growth in the country's LPG imports. However, strong demand growth from the Asian household sector, except for Japan, is expected to continue. The overall result should be relatively strong and stable, but single-digit, LPG demand growth. We will now discuss these trends in more details.

SLOWING GROWTH IN THE CHINESE PETROCHEMICAL SECTOR

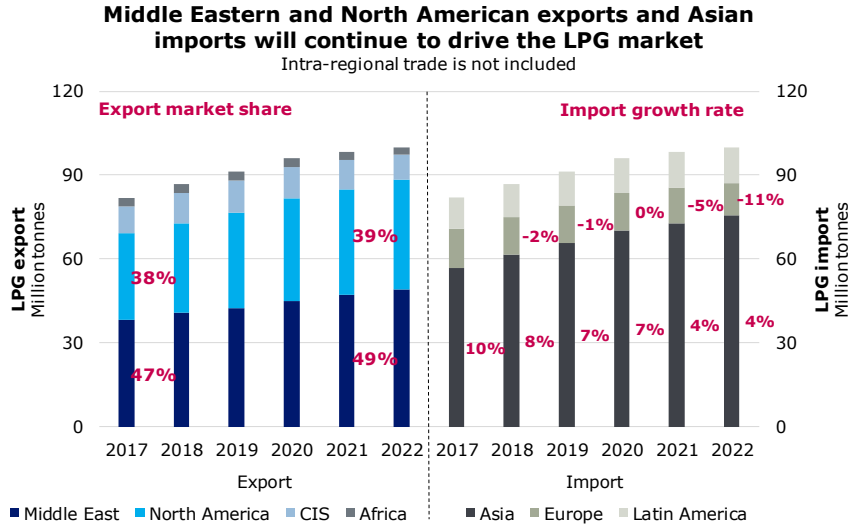
For reasons of product purity, Chinese propane dehydrogenation

Figure LPG.7



Sources: IHS Global Insight, IHS Energy and Danish Ship Finance

Figure LPG.8



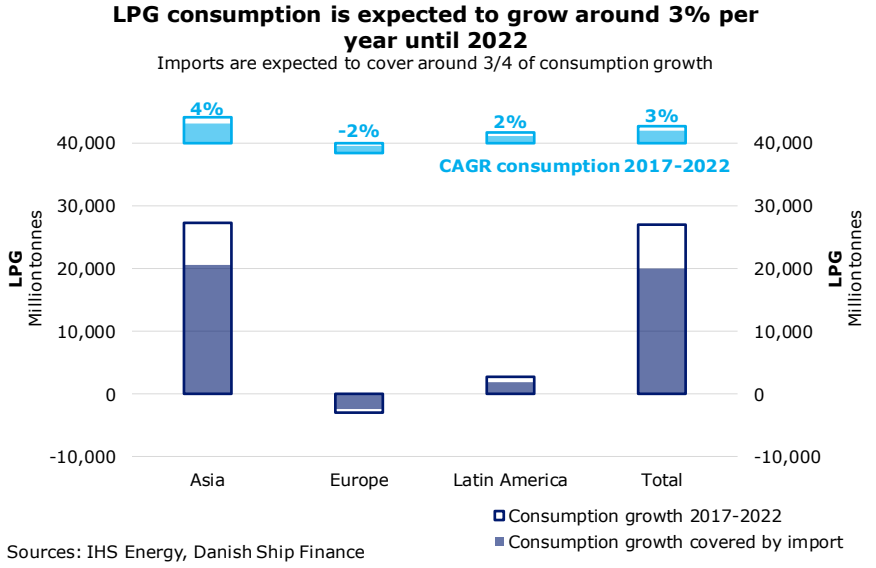
Sources: IHS Energy, Danish Ship Finance

plants (PDH plants) prefer imported LPG over domestic. Chinese PDH plants are therefore an important driver for Asian LPG imports. If Chinese PDH capacity is run at an 85% utilisation rate, around 4,5 million tonnes of LPG in feedstock is required annually, which is roughly 10% of total Asian LPG imports. In 2017, Chinese PDH plants are expected to have increased utilisation rates, driven by relatively favourable production margins. This makes future LPG demand growth unlikely to originate from a production increase at existing plants. Demand growth driven by new PDH plants is also expected to be limited. A conservative estimate is that over the next four years an average of one new plant per year is expected to come online and growth in PDH capacity during the period could decline compared with the last four years. If this happens, Chinese LPG imports will be affected, and the import growth rate is likely to slow.

FUEL SWITCHING COULD LOWER CHINESE DEMAND GROWTH

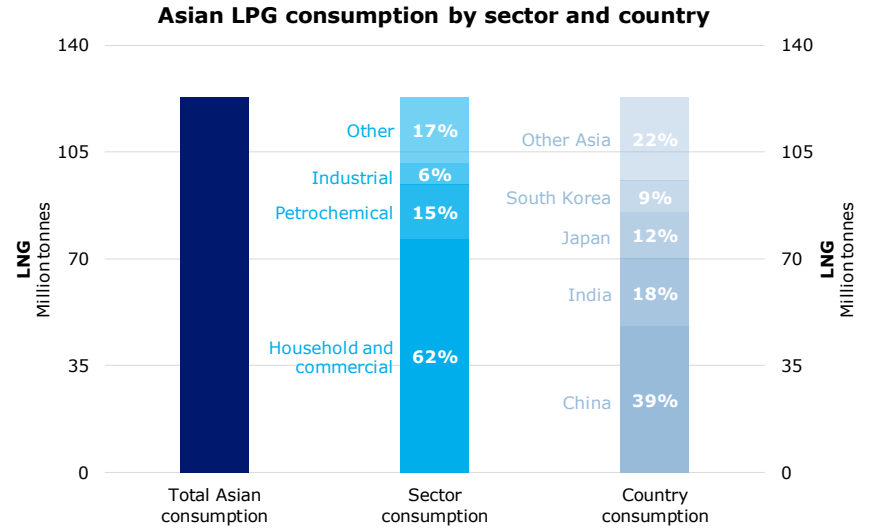
At the start of 2015, the combination of increasing supply and a freely moving market price drove the price of LPG below the regulated price of industrial natural gas in China's south-eastern provinces. This stimulated a switch from natural gas (NG) to LPG in heat-creating processes throughout the industrial sector. In the two-year period from 2015 to 2016, fuel switching is estimated to have doubled Chinese incremental LPG demand. Since the end of 2016, however, rising LPG prices have caused the price differential to decrease or become negative in many of the south-eastern provinces. A large part of the industry is expected to have switched back to natural gas this year, and in provinces where the price differential remains in favour of LPG added growth from switching is limited, as most companies are already using LPG. Fuel switching is therefore unlikely to generate any growth in the near term. It is more likely that the effect of back-switching (LPG to NG) will dominate. If this happens, LPG demand from the industrial sector is likely to decrease, which could also dampen growth in Chinese LPG imports.

Figure LPG.9



Sources: IHS Energy, Danish Ship Finance

Figure LPG.10



Sources: IHS Energy, Danish Ship Finance

NEW REGULATIONS SHOULD MAKE FUTURE SWITCHING LESS LIKELY

The Chinese government has issued new regulations for natural gas distribution in 2017. Once implemented, the regulations should lower the price of industrial natural gas. This will make switching from natural gas to LPG less likely to happen, as LPG prices will need to decline further for the price differential to be favourable.

JAPANESE LPG IMPORTS ARE EXPECTED TO DECLINE

Japanese LPG imports have been on a downward trajectory for more than a decade and the negative development is expected to continue. The Japanese household sector accounts for more than half of the country's LPG demand, but competition from natural gas has steadily increased. In densely populated areas (i.e. cities and large towns), natural gas (citygas) is fulfilling an increasing share of household demand. Potential LPG demand growth is thereby being shifted from cities to rural areas, where consumers are more dispersed and LPG usage is usually lower. In 2016, Japanese LPG imports are estimated to have accounted for around 20% of all Asian LPG imports – roughly 10% of global LPG trade. It is expected that Japanese LPG imports could decline around 10% in 2017 and the trend could continue in 2018.

SOUTH KOREAN IMPORT GROWTH IS UNCERTAIN

In 2016, South Korean LPG imports increased by around 30%, reaching a record high and accounting for around 10% of Asian LPG imports. This growth was driven by the petrochemical sector and was due to a combination of new PDH capacity coming online and price-sensitive demand. Low LPG prices relative to naphtha prices sparked increasing use of LPG as feedstock in petrochemical plants. Asian plants generally allow 10-15% of feedstock to be LPG and plants are quick to substitute naphtha with LPG up to this limit when prices are favourable, and demand is therefore unlikely to increase further even if the LPG-naphtha price spread remains favourable. However, if the price spread becomes unfavourable, price-sensitive LPG demand is likely to decline, although there might be some mitigating effect as the new PDH plants reach optimal utilisation. Therefore, it is uncertain whether South Korean LPG demand will generate additional imports in the next five years.

THE INDIAN HOUSEHOLD SECTOR CONTINUES TO GROW

India is expected to overtake Japan as the world's second-largest LPG importer in 2017. India's LPG imports are primarily driven by demand from the household sector, and in 2016 accounted for 15-20% of Asia's LPG imports. The Indian government has encouraged a switch from dirty-burning fuels, like wood and charcoal, to cleaner-burning LPG in the household sector through fuel subsidising reforms and massive investments in infrastructure, which have brought LPG coverage to over 70% of the nation. The aim is to increase coverage to over 90% within a two-year period. This could contribute to overall growth in India's LPG demand of around 9% per year in 2018 and 2019. In this period, India's domestic LPG production is expected to remain stable and demand growth is therefore likely to be met through increased imports. If these assumptions hold true, Indian LPG imports could increase by more than 15% per year over the next two years.

DEMAND MAY TEMPORARILY BE BETTER FOR THE REMAINDER OF 2017

The 2020 outlook remains challenging, since single-digit demand growth is unlikely to be able to employ the incoming vessels. Still, the short-term prospects may be better, since stockpiling for the winter season in the northern hemisphere may temporarily employ an increasing share of the fleet. ▪

LNG TANKER

SHIPPING MARKET REVIEW – NOVEMBER 2017

DANISH SHIP FINANCE

LNG TANKER

THE LNG SEGMENT IS SLOWLY ON ITS WAY OUT OF A FREIGHT RATE RECESSION. FLEET UTILISATION IS EXPECTED TO IMPROVE OVER THE NEXT THREE YEARS, BUT THE LONG-TERM DEMAND OUTLOOK IS DIMINISHED BY THE ADVANCES WE ARE SEEING WITHIN RENEWABLE ENERGY.

THE LNG MARKET AT A GLANCE

THE LNG MARKET IS STILL OVERSUPPLIED, BUT FREIGHT RATES WERE SUPPORTED BY STRONG DEMAND AND DELAYED NEWBUILDING DELIVERIES IN THE FIRST NINE MONTHS OF 2017.

The LNG shipping industry has been oversupplied since 2013, since many liquefaction facilities have been significantly delayed. Nonetheless, the seaborne LNG market continues to expand. Growing global demand for natural gas combined with depleting gas field production in Asia is increasing regional demand for seaborne LNG imports. Seaborne LNG supply appears to have moved firmly into a phase of rapid expansion as major new liquefaction projects ramp up output, particularly in Australia and the US. While the low oil and gas price environment continues to exert significant pressure on new liquefaction project sanctioning, the supply and demand balance in the LNG shipping industry is projected to improve gradually in the coming years.

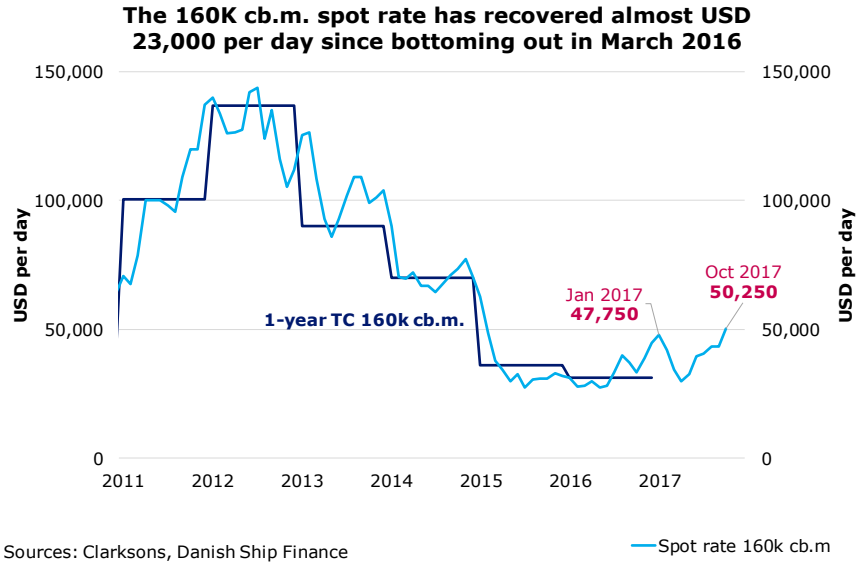
SPOT RATES ARE UP BY USD 16,000 PER DAY

Spot rates declined from their peak at USD 143,750 per day in July 2012 until they bottomed out in March 2016 at USD 27,500 per day. Rates have since recovered almost USD 23,000 per day to USD 50,250 per day (October 2017), reflecting improved utilisation of the fleet (fig. 1).

SPOT RATES SUPPORTED BY STRONG DEMAND IN 2017

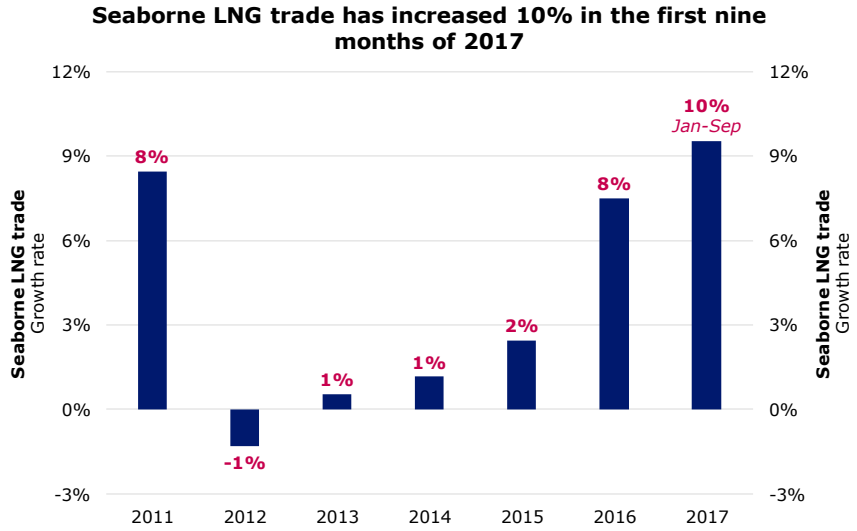
Spot rates have been supported by strong import growth from Asia. Strong Chinese demand and an unexpected outage of South Korean nuclear power plant capacity account for most of the in-

Figure LNG.1



Sources: Clarksons, Danish Ship Finance

Figure LNG.2



Sources: IHS Energy, Danish Ship Finance

crease in LNG import volumes. Rising exports from Australia, the US and Angola have been more than sufficient to offset declining LNG exports from Qatar, the world's largest exporter. LNG trading volumes are up by approximately 10% in 2017.

LIQUEFACTION CAPACITY CONTINUES TO GROW

Australia has delivered 65% (46 million tonnes per annum (Mtpa)) of new liquefaction capacity since 2015. This has shortened average travel distances, since Asian imports have become more regional. In the first nine months of 2017, global liquefaction capacity increased by 5% to 355 Mtpa. The incremental capacity was added in Australia, Malaysia and the US. However, start-up difficulties in both Australia and Malaysia have limited the new capacity contribution to incremental exports, although US exports have extended average travel distances a little.

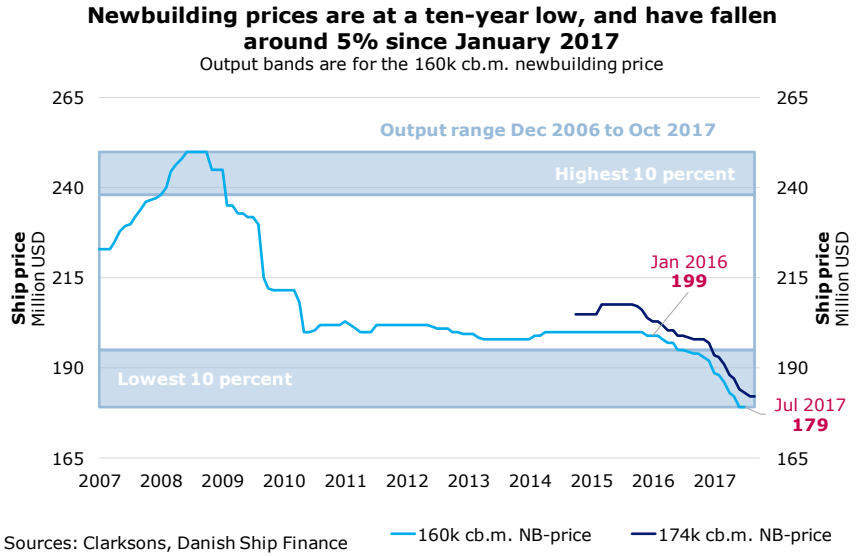
DELAYED DELIVERIES MAY HAVE STARTED A MARKET RECOVERY

Delayed deliveries have also supported freight rates. A record high of 36 LNG carriers (LNGC >100,000 cb.m.) were expected to enter the fleet in the first nine months of 2017. However, only 20 vessels were delivered, limiting fleet growth to 5%. This meant that fleet utilisation improved, since demand growth outpaced supply growth by a factor of two.

CONTRACTING IS INCREASING

Orders for new LNG vessels are closely related to the final investment decisions (FID) for new liquefaction capacity. From 2011 to 2015, an average of 44 new vessels were ordered per year, even when freight rates started to decline from 2013. Final investment decisions for new liquefaction capacity declined markedly in 2016 and contracting declined to six vessels. A total of 13 LNGC newbuilding orders were placed during the first nine months of 2017. Three of the vessels are equipped with regasification units and can function as floating import terminals. All but one of the 13 vessels are scheduled for delivery during 2019.

Figure LNG.3



Sources: Clarksons, Danish Ship Finance

NEWBUILDING PRICES ARE AT A TEN-YEAR LOW

The LNGC orderbook peaked in November 2015 with 164 vessels on order and has now come down to 123 vessels. The newbuilding price for a 160,000 cb.m. vessel has declined by around USD 20 million and is currently at a ten-year low (fig. 3).

SCRAPPING REMAINS LIMITED

Few older LNGC vessels are being scrapped, even though 28 of the 499 vessels (>100,000 cb.m.) in the fleet are older than 30 years and could qualify as scrapping candidates (fig. 4). Of these older vessels, 21 are either idle or in lay-up. Many of these older vessels are essentially waiting for an opportunity to be converted into floating storage and regasification units (FSRU), rather than being scrapped. In 2017, only two vessels (100-140,000 cb.m.) have been demolished. Both vessels were around 40 years old and were put up for sale due to fleet renewal, but no buyers were found.

THE LNG SHIPPING INDUSTRY COULD BE HEADING FOR A RECOVERY. HOWEVER, THE ADVANCES WE ARE SEEING WITHIN RENEWABLE ENERGY MAY REDUCE THE LONG-TERM DEMAND POTENTIAL FOR GAS.

The LNG shipping industry could have passed its cyclical bottom. However, the current upswing may be over before many of the current newbuilding orders have yielded a proper return on invested capital. Still, indications are that we will see increased fleet utilisation in the next three years. This will be driven by Asian and European demand, while increased US exports are expected to add tonne-miles. Vessel supply could run ahead of demand for short periods, though.

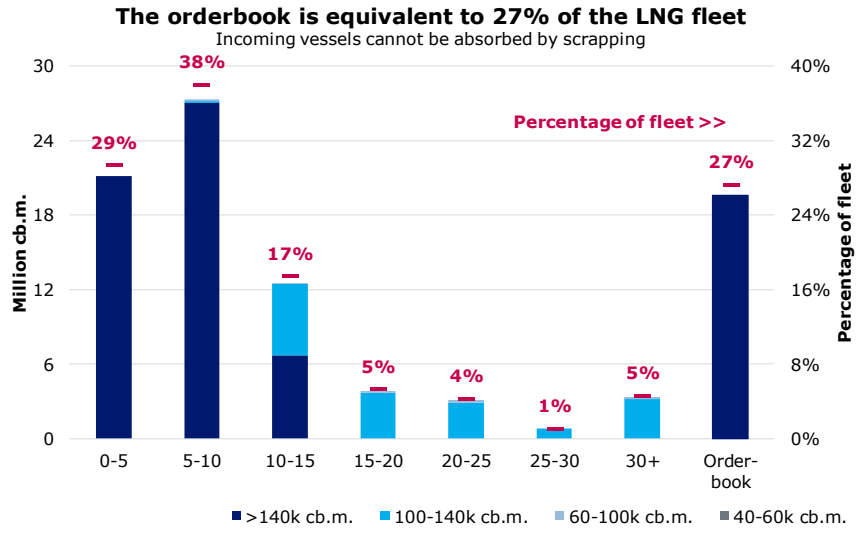
RISK IS BUILDING UP

The long-term outlook is weakening, as risk is building up. First, the market is veering more towards spot trades and vessels are being fixed on shorter contracts. Second, the global energy landscape is changing. The outlook for the oil and gas industry is highly uncertain. New sources of energy supply are being added to the global energy mix. The role of renewable energy in the global energy mix seems to be increasing faster than previously anticipated. Early large-scale penetration of batteries for electricity storage (e.g. via electric cars) would facilitate a shift towards renewable energy more quickly than currently expected. In the event of this, gas-fired power plants could eventually be turned into peak capacity instead of providing baseload capacity for the energy grid. This would clearly reduce long-term demand for gas.

THE ORDERBOOK IS EXPECTED TO BE DELIVERED BY 2020

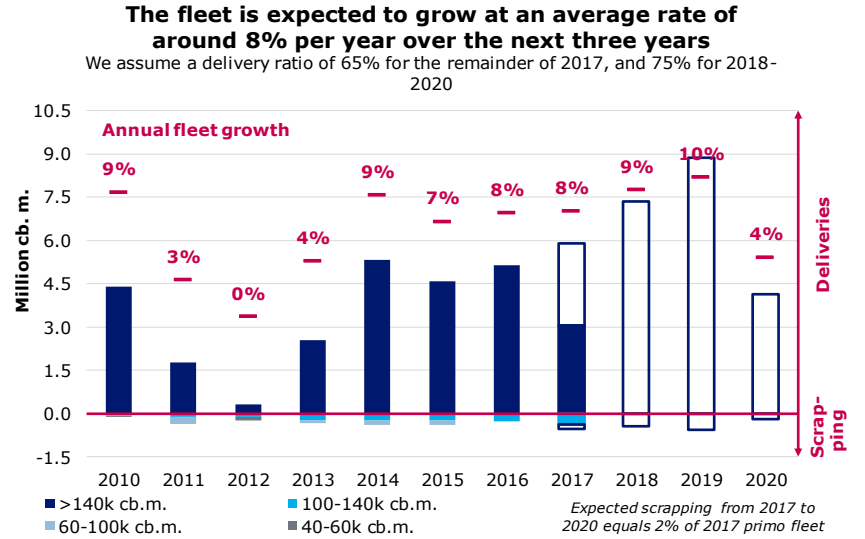
The orderbook currently represents 27% of the fleet and is expected to be delivered within the next three years. Most of the vessels on order are linked to long-term contracts, but some 10-15% have been ordered without long-term import contracts. The scrapping potential is limited, as only 5% of the fleet is older than

Figure LNG.4



Sources: Clarksons, Danish Ship Finance

Figure LNG.5



Sources: Clarksons, Danish Ship Finance

30 years. The fleet's ability to absorb surplus capacity through scrapping is therefore limited (fig. 4).

FREIGHT RATES ARE EXPECTED TO INCREASE

Strong demand and longer travel distances are expected to result in increasing freight rates during the next three years. The fleet is set to expand at an average rate of 8% per year over the next three years (fig. 5), while demand is expected to increase by around 7% per year (fig. 6). This will not, per se, improve the balance between supply and demand but longer travel distances (i.e. US exports to Asia) should reduce vessel availability and hence improve the balance between supply and demand.

THE BALANCE BETWEEN SUPPLY AND DEMAND WILL BE DELICATE

The balance between supply and demand will be highly sensitive to short-term fluctuations in vessel availability. The orderbook is more front-loaded than we illustrate in fig. 5, since we assume that a number of orders will be postponed from one year to the next. If that is not the case, freight rates may experience periods of decline until demand absorbs the surplus capacity.

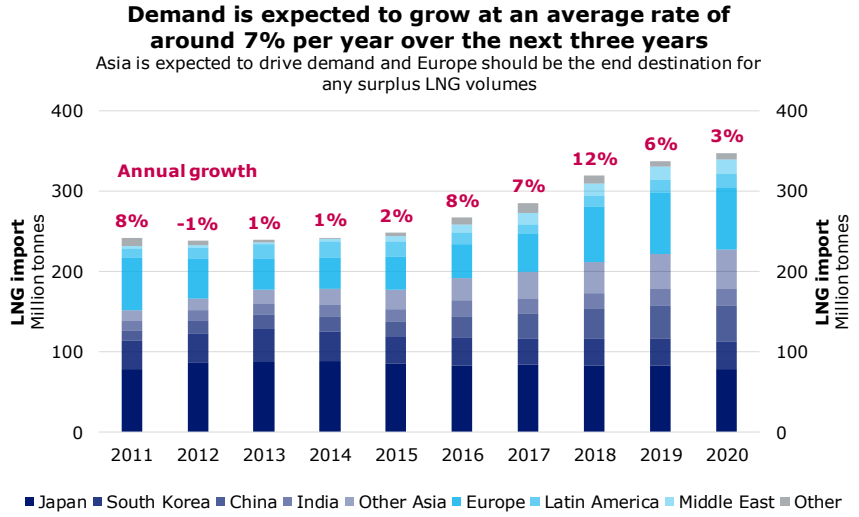
NEW LIQUEFACTION CAPACITY SHOULD INCREASE TRAVEL DISTANCES

Liquefaction capacity is set to increase by 25% to 451 million tonnes (Mt) over the next three years (fig. 7). Growth will be driven by the US, Australia and Russia with a combined capacity increase of 83 Mt. The large expansion in liquefaction capacity is expected to change trading patterns. Over half (50 Mt) of the incremental capacity is expected to be added in the US (Gulf of Mexico/Atlantic Basin). This is the basis for the expected increase in travel distances since US exports are expected to increase inter-regional trade, particularly between the US and Asia.

ASIA AND EUROPE ARE EXPECTED TO DRIVE DEMAND

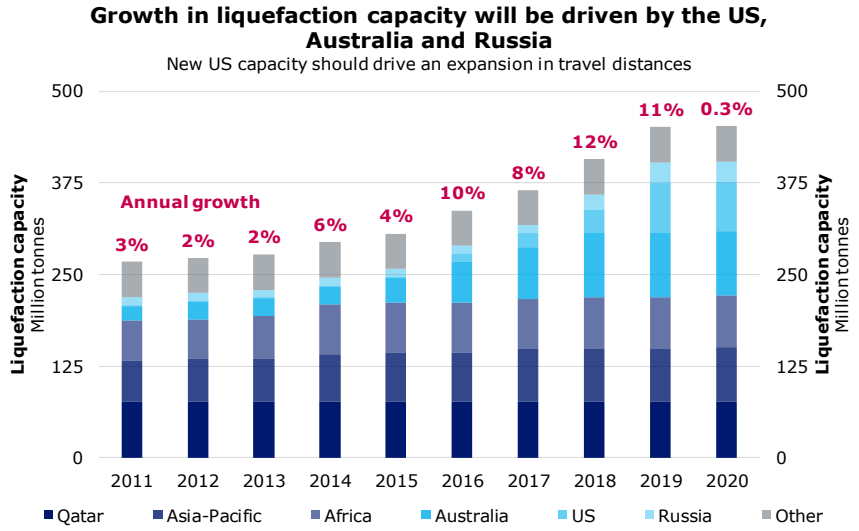
Asia is the end destination for almost three-quarters of all seaborne LNG volumes. The region is expected to increase imports by an average of around 7% per year over the next three years and should account for almost half of all growth in the LNG market.

Figure LNG.6



Sources: IHS Energy, Danish Ship Finance

Figure LNG.7



Sources: IHS Energy, Danish Ship Finance

Japan, South Korea, China and India are the largest importers in the Asian region and comprise 60% of the total LNG market. Japan and South Korea have limited domestic production and have no pipeline supply that could limit their LNG import volumes. Europe is expected to see a massive increase in LNG imports, driven by falling domestic production and a projected decline in pipeline supply from North Africa.

JAPANESE DEMAND IS EXPECTED TO DECLINE

Japan's LNG imports reached a record high in 2014, as the Fukushima disaster increased LNG demand in the power sector. Japan is planning a gradual restart of nuclear power, although the timescale for this is uncertain. The government's target is that nuclear power will account for around 20% of electricity generation by 2020, up from around 1% today. This plan is already behind schedule. If nuclear power accounts for around 12% of electricity generation by 2020, this would result in an average decline in LNG imports of 2% per year (fig. 6). Another factor making LNG imports uncertain is the rapid deployment of renewable energy. These demand uncertainties increase the need for flexibility in Japanese LNG imports.

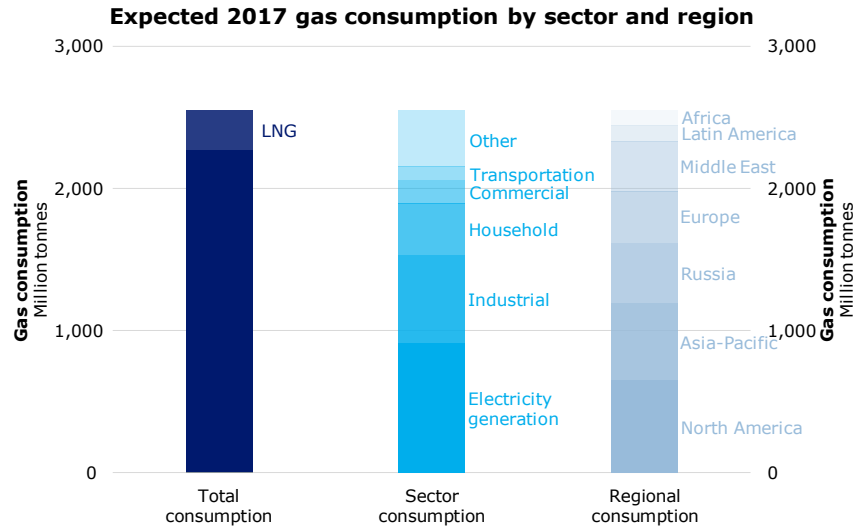
IMPORT GROWTH SHOULD RETURN TO SOUTH KOREA

South Korean LNG imports have been declining since 2013, when the country's electricity generation shifted towards nuclear power and coal due to favourable prices. Today, this trend is reversing. The country has signalled that it will halt new building of nuclear facilities and will replace coal with gas and renewable energy. This should result in an average increase in LNG imports of around 1% per year over the next three years (fig. 6).

CHINA AND INDIA WILL DRIVE ASIAN DEMAND GROWTH

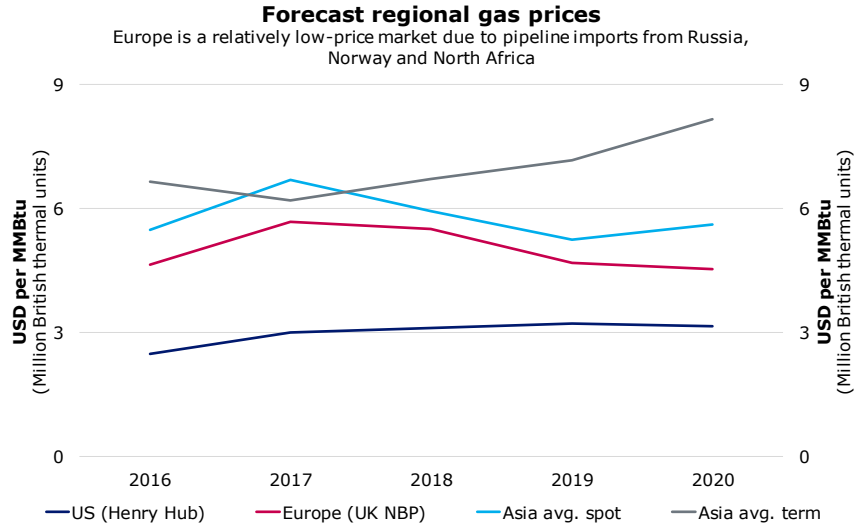
China and India are expected to increase LNG imports by average rates of 13% and 3% per year, respectively, over the next three years. The rising imports will be driven by increased use of LNG in electricity generation and to some extent household, commercial and industrial sector demand. Another equally important de-

Figure LNG.8



Sources: IHS Energy, Danish Ship Finance

Figure LNG.9



Sources: IHS Energy, Danish Ship Finance

mand driver is the group of other Asian countries (fig. 6). This includes Indonesia, Malaysia, Thailand, Singapore, and Pakistan. For most of these countries, demand will be driven by declining domestic production or falling pipeline imports. These countries are expected to add as much incremental demand as China and India during the period.

SURPLUS LNG VOLUMES ARE EXPECTED TO BE DIRECTED TO EUROPE

Europe is expected to be the end destination for surplus LNG not absorbed by higher-priced markets (fig. 9). Even though European gas demand is expected to increase by only around 2% until 2020, LNG imports are expected to increase by around 17% per year in the period (fig. 10). The increasing LNG imports are expected to replace declining domestic production and a projected reduction in pipeline supply from North Africa. However, to achieve the impressive growth rate LNG must outcompete Russian pipeline gas and this will depend on Russia's future gas strategy. Russia can either maximise prices or defend market share. In our scenario (fig. 10) Russia maximises prices, resulting in a higher market share for LNG.

RENEWABLE ENERGY MAY REDUCE THE LONG-TERM OUTLOOK

The long-term demand outlook is being shaped by the global economy's transition towards a less fossil fuel-intensive growth model and by gains in energy efficiency. This is a long-term play, structural by design and irreversible when new technologies (e.g. solar PV, wind or electric vehicles) break the price parity with existing technologies. The penetration rate for new technologies is highly uncertain, however.

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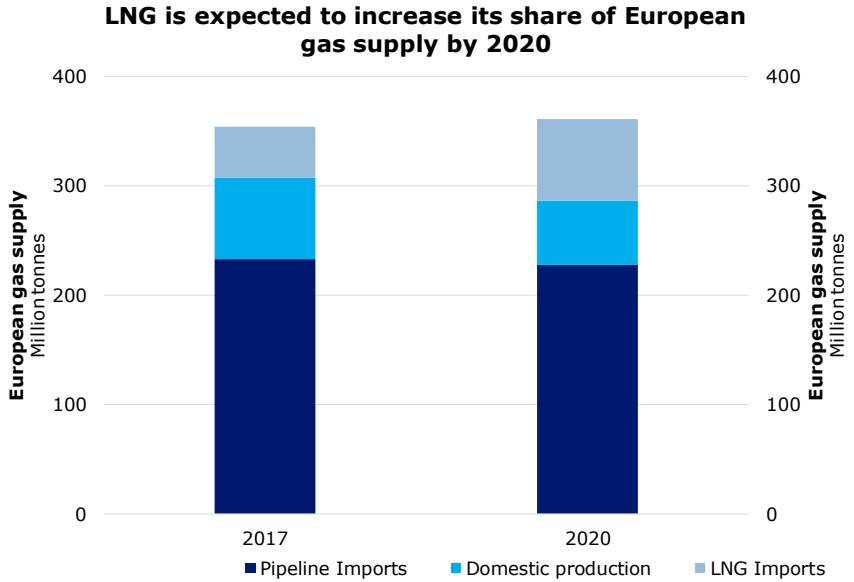
This is the first edition of our LNG Tanker report. The market is relatively small (approximately 500 vessels) and around two thirds of the volumes are moved on long-term contracts. But the underlying dynamics of the industry are changing. The volume of LNG cargo traded without a long-term contract has more than doubled from the amount traded a decade ago. Four factors stand

Figure LNG.10



Sources: IHS Energy, Danish Ship Finance

out. First, the decline in competitiveness of LNG relative to coal (Europe) and shale gas (North America) has freed up volumes to be re-directed elsewhere. Second, the growth in LNG contracts with destination flexibility has facilitated diversions to markets with higher prices (e.g. Asia). Third, the lower initial capital cost of 'Floating Storage and Regassification Units' (FSRUs) compared to onshore regasification has allowed new countries to enter the LNG market. Fourth, the large growth of the LNG fleet, especially vessels ordered without a long-term charter, has allowed low-cost LNG imports. The LNG market is expected to continue to move towards more destination flexibility and more short- and medium-term contracts. The expiration of older contracts will most likely reinforce this trend. The impact of these changes on the ships' future spot and charter dynamics is more uncertain to us. We do acknowledge that prices are only settled among available candidates, but whether that will shelter timecharter rates from potential pockets of supply surplus remains to be seen. ▪

GLOSSARY

SHIPPING MARKET REVIEW – NOVEMBER 2017

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GLOSSARY

Aframax:	Crude Tanker or Product Tanker too large to pass through the old locks of the Panama Canal and with a capacity of 80,000 to 120,000 dwt.
AHT:	Anchor Handling Tug. Towing and positioning of rigs.
AHTS:	Anchor Handling Tug Supply vessel. Mainly built to support offshore drilling activities in towing and positioning of rigs.
Average Crude Tanker Earnings:	'Average Crude Tanker Earnings' is an average of Clarksons Long Rung Historical VLCC, Suezmax and Aframax Earnings
Back-haul:	The leg of a trade route that has the lowest container volumes is often called 'back-haul, whereas the return leg is often referred to as 'head-haul'.
Backlog:	Accumulation of partially completed or uncompleted awarded contracts and their corresponding value.
Barrel:	A volumetric unit measure for crude oil and petroleum products equivalent to 42 U.S. gallons, or approximately 159 litres.
Bid-ask spread:	Difference between the price offered for a vessel and what owners are willing to sell for.
BP:	Bollard pull. A key feature of AHT and AHTS vessels indicating how much a vessel can tow, defined as the static force exerted by a ship on a fixed tow line at zero speed.
BHP:	Break Horse Power. The amount of engine horsepower.
Brent:	Term used for crude oil from the North Sea. Brent oil is traded on the International Petroleum Exchange in London, and the price of Brent is used as a benchmark for several other types of European oil.
Bulk vessel:	Description of vessels transporting large cargo quantities, including coal, iron ore, steel, corn, gravel, oil, gas, etc.
Bunker:	Fuel for vessels.
Butane:	Butane is a gas at room temperature and atmospheric pressure. Butane is an organic compound with the formula C_4H_{10} that is an alkane with four carbon atoms.
Cable Layer Vessels, Subsea:	Vessels used to lay cables, pipes, umbilicals, or flowlines etc. on the ocean floor.
Call on OPEC:	Defined as total global petroleum demand less non-OPEC supply less OPEC natural gas liquid supply.
Capesize:	Dry Bulk carrier of more than approximately 100,000 dwt; too large to pass through the Panama Canal.
Cascading:	The process of bigger vessels replacing smaller vessels across all ship sizes.
cb.M:	Cubic Meter.
CEU:	Car equivalent unit. Unit of measure indicating the car-carrying capacity of a vessel.
CGT:	Compensated Gross Tonnage. International unit of measure that facilitates a comparison of different shipyards' production regardless of the types of vessel produced.
Chemical Tanker:	DSF's definition: IMO I or IMO II tanker with stainless steel, zinc, epoxy or Marineline coated tanks.
Citygas:	Pipeline distribution of natural gas to households, commercial and industrial sectors.
Clarksons:	British ship brokering and research company. www.clarksons.net
Class certificate:	Ships involved in international trade must conform with the international regulations

	on safety and environmental protection set by IMO and ILO (International Labour Organization). Ship classification provides a point of reference for ship safety and reliability. Vessels without class certification typically cannot obtain insurance.
Clean products:	Refers to light, refined oil products such as jet fuel, gasoline and naphtha.
Coating:	The internal coatings applied to the tanks of a product or chemical tanker. Coated tanks enable the ship to transport corrosive refined oil or chemical products and it facilitates extensive cleaning of the tanks, which may be required in the transportation of certain product types.
Contango:	Contango is a situation where the forward price of a commodity is higher than the current price. In a contango situation it may be profitable to store a commodity depending on storage availability and storage costs.
Conventional oil:	A broad term used for oil extracted with traditional vertical drilling techniques.
Crude oil benchmark:	A benchmark crude is a crude oil that serves as a reference price for buyers and sellers of crude oil. There are three primary benchmarks, West Texas Intermediate (WTI), Brent, and Dubai Crude. Benchmarks are used because there are many different varieties and grades of crude oil. Brent is the reference for about two-thirds of the oil traded around the world, with WTI the dominant benchmark in the U.S. and Dubai influential in the Asian market.
Deep sea:	Refers to trading routes longer than 3,000 nautical miles.
Deep Sea, chemical:	A chemical tanker larger than or equal to 20,000 dwt.
Deepwater rigs:	Production or drilling rigs capable of drilling at water depths deeper than 350 meters.
Dirty products:	Refers to heavy oils such as crude oil or refined oil products such as fuel oil, diesel oil or bunker oil.
Distance-adjusted demand:	The amount of cargo shipped multiplied by the average distance over which it is transported in order to determine actual ship demand.
Dive & ROV Support Vessels, Subsea:	Vessels designed to support dive and Remotely Operated Vessel (ROV) operations. Dive support vessels include those equipped with a saturation diving system, and those equipped for air dive operations in shallow waters. ROV support vessels predominantly perform inspection, repair and maintenance, usually in areas where conditions are too hazardous or too deep to deploy divers.
Drewry:	Drewry Shipping Consultants Ltd. British shipping and transport research company. www.drewry.co.uk
Dwt:	Dead Weight Tonnes. Indication of a vessel's cargo carrying capacity (including bunkers, ballast, water and food supplies, crew and passengers).
Dynamic Positioning:	Special instruments on board that in conjunction with bow thrusters and main propellers enable a ship to position itself in a fixed position in relation to the seabed.
E&P:	Exploration and Production.
FEED (Front end engineering design):	Feasibility study for projects with focus on the technical requirements as well as investment cost for the project. The FEED can be divided into covering different por-

tions of the project, and is used as the basis for bidding for contracts. FEED studies are conducted onshore.

Feeders: Small container carrier with a capacity of less than 1,000 teu.

Fleet productivity: The productivity of a fleet depends opon four main factors: speed, port time, capacity utilization and loaded days at sea.

Ethylene: Ethylene is the key raw material for manufacturing many day-to-day items – two-thirds of global production is used to manufacture plastics and automobile parts and the remainder is used to producer antifreeze and various artificial fibers.

FPSO: Floating Production Storage Off-loading unit. Vessel used in the offshore industry to process and store oil from an underwater (sub-sea) installation.

Front-haul: The leg of a trade route that has the highest cargo volumes is often called 'front-haul' whereas the return leg is often referred to as 'back-haul'.

Geared/gearless: Indicates that a vessel is/not equipped with a crane or other lifting device.

Global order cover: Global order is the global orderbook divided by annual yard capacity.

Gt: Gross Tonnes. Unit of 100 cubic feet or 2,831 cubic meters, used in arriving at the calculation of gross tonnage.

Handy, Container: Container vessel of between 1,000-1,999 teu.

Handymax, Dry Bulk: Dry Bulk carrier of between approximately 40,000 and 65,000 dwt.

Handysize, Dry Bulk: Dry Bulk carrier of between approximately 10,000 and 40,000 dwt.

Head-haul: The leg of a trade route that has the highest container volumes is often called 'head-haul, whereas the return leg is often referred to as 'back-haul'. On routes where there is a great trading volume mismatch between head-haul and back-haul, the head-haul demand will most often determine the freight rate level.

Heavy distillates: This oil type includes fuel oils and lubes.

IEA: International Energy Agency. A subsidiary of the OECD. www.iea.org

IHS Global Insight: American economic consulting company. www.globalinsight.com

IMO: International Maritime Organization. An organisation under the UN.

IMO I-III: Quality grades for tankers for the permission to transport different chemical and oil products. IMO I are the most hazardous products, IMO III the least hazardous.

Inorganic chemicals: A combination of chemical elements not containing carbon. The three most common inorganic chemicals are phosporic acid, sulphuric acid and caustic soda. Phosphoric acid and sulphuric acid are used in the fertilizer industry, whilst caustic soda is used in the aluminium industry. As these chemicals are corrosive to many metals, they are transported in stainless steel tanks.

Intermediate: Medium-sized chemical carrier with a capacity of between 10,000 and 20,000 dwt.

LGC: Large Gas Carrier. LPG ship with a capacity of between 40,000 and 60,000 cb.M.

Light distillates: This oil type includes gasoline, naphtha and solvents.

Liquefaction facilities: Seaborne export facilities where natural gas is liquefied.

LNG vessels: Liquefied Natural Gas. Vessels used to transport liquefied methane at a temperature of -160 °C.

LPG vessels: Liquefied Petroleum Gas. Vessels used to transport ammonia and liquid gases (ethane, ethylene, propane, propylene,

butane, butylenes, isobutene and isobutylene). The gases are transported under pressure and/or refrigerated.

LR1, Product Tanker: Long Range 1. Product tanker too large to pass through the old locks of the Panama Canal l prior to its expansion of approximately 60,000-79,999 dwt.

LR2, Product Tanker: Long Range 2. Product tanker capable of passing through the panama canal, but too large prior to its expansion, with a capacity of 80,000 to 120,000 dwt.

MR, Product Tanker: Medium Range. Product tanker of between 10,000 and 60,000 dwt.

MGC: Medium Gas Carrier. LPG ship with a capacity of between 20,000 and 40,000 cb.M.

Middle distillates: This oil type includes diesel, kerosene and gasoil.

Mtpa: Million tonnes per annum

Nautical Mile: Distance unit measure of 1,852 meters, or 6,076.12 ft.

NGL: Natural Gas Liquids – which, put simply, consists of all gaseous products except methane which is also known as LNG.

OSV: Offshore Supply Vessel. AHTS vessels and PSVs.

Offshore Supply Vessel Index: An index of average dayrate levels across all of the major deployment regions, weighted by deployment of each vessel class by region.

OPEC: Organisation of Petroleum Exporting Countries.

Organic chemicals: Contain carbon and are also referred to as petrochemicals. Are used to produce virtually all products made from plastics or artificial fibres.

Panamax, Container: Container carrier with the maximum dimensions for passing through the Panama Canal (width of 32.21 metres, length of 291 metres) of approximately 3,000—5,100 teu.

Panamax, Tanker: Crude oil tanker or product tanker too large to pass through the old locks of the Panama Canal (width of 32.21 metres and length of 289.5 metres) of approximately 60,000—79,999 dwt.

Panamax, Dry Bulk: Dry Bulk vessel too large to pass through the old locks of the Panama Canal (width of 32.21 metres and length of 289.5 metres) of around 65,000—100,000 dwt.

PDH plants: Propane dehydrogenation plants.

Peak oil demand: The time when global oil demand is expected to plateau and subsequently begin to decline.

Post-Panamax: Container vessel of approximately 3,000+ teu that is too large to pass through the old locks of the Panama Canal.

Product Tanker: Tanker vessel with coated tanks used to transport refined oil products.

Propane: Propane is a three-carbon alkane with the molecular formula C_3H_8, a gas at standard temperature and pressure, but compressible to a transportable liquid.

Propylene: Propylene is used to manufacture polyurethane foam, fibers and moulded plastics for use in manufacturing items such as car parts, plastic pipes and household articles.

PSV: Platform Supply Vessel. Offshore vessel serving offshore oil installations.

Refinery margin: The refinery margin is the difference between the wholesale value of the petroleum products a refinery produces and the value of the crude oil from which they were refined.

Refinery turnarounds: A planned, periodic shut down (total or partial) of a refinery process unit or plant

	to perform maintenance, overhaul and repair operations and to inspect, test and replace process materials and equipment.
Regasification units (incl. FSRUs):	Unit for converting LNG at -160°C back to natural gas at atmospheric temperature. An LNG regasification unit can be located on land and on vessels (FSRUs).
ROV:	Remotely operated vehicles. Used for installation, and maintenance of subsea structures. Remotely operated and fitted with cameras and other optional equipment.
Rig count:	The count of active rigs, typically refers to the count of active onshore rigs in North America.
Short sea:	Refers to trading routes shorter than 3,000 nautical miles.
Short Sea, chemical:	Chemical tanker smaller than 10,000 dwt.
Small gas carrier:	LPG ship smaller than 20,000 cb.M.
Speed-adjusted fleet growth:	The amount of tonnage multiplied by the average speed at which is sails in order to determine real fleet growth.
Sub-Panamax:	Container vessel of approximately 2,000-2,999 teu.
Subsea equipment:	Fully submerged ocean equipment, operations or applications, for deep ocean waters, or on the seabed.
Subsea Multi-purpose vessel:	Vessels with cranes aimed at the inspection, repair and maintenance market in the subsea sector. Includes Diving support, Multi-functional Support, and ROV vessels.
Subsea production systems:	The infrastructure and equipment used to produce oil and gas below the seabed. This includes well cables and related infrastructure.
Subsea segment:	Refers to the part of the oil and gas industry taking place on the seabed. This includes flexible and fix-lay vessels, diving, and multi-support vessels. A highly specialized and varied segment, whereas Subsea is a collective term used to cover all the offshore related segments.
Subsea tree:	Configuration of valves and other components installed at the wellhead to monitor and control production flow, and manage gas or fluids injection.
Subsea tree contract:	A contract awarded for the construction of a Subsea tree. Subsea trees as important for vessel demand as they need to be installed on the seabed.
Subsea Vessels:	Vessels able to work below the seabed. This includes many different vessel types.
Suezmax:	Crude Tanker with the maximum dimensions for passing through the Suez Canal (approximately 120,000—199,999 dwt.).
Super Post-Panamax:	Newest type of container vessel of approximately +12,000 teu.
TCE:	Time Charter Equivalent.
Teu:	Twenty Foot Equivalent Unit. Container with a length of 20 feet (about 6 metres) which forms the basis of describing the capacity of a container vessel.
Teu-knots:	Unit of measure that takes account of the speed of ships when estimating the actual supply of ships within a segment.
Teu-nautical mile:	Unit of measure indicating the volume of cargo, measured in teu, and how far it has been transported, measured in nautical miles.
Tie-back:	Connection of a satellite subsea development to an existing infrastructure. Less capital intensive than a full development with a production facility.
Tight oil:	Tight oil (also known as light tight oil) is a petroleum play that consists of light crude

	oil contained in petroleum-bearing formations of relatively low porosity and permeability.
Tonnes-mile:	Unit of measure indicating the volume of cargo, measured in tonne, and how far it has been transported, measured in nautical miles.
Tonnage:	Synonymous with "vessel".
Triangulation:	Minimise ballast time by identifying cargoes in the area. This tends to improve earnings.
Town gas:	A mixture of gases produced by the distillation of bituminous coal and used for heating and lighting: consists mainly of hydrogen, methane, and carbon monoxide.
ULCC:	Ultra Large Crude Carrier. Crude oil tanker of more than 320,000 dwt.
Unconventional oil:	Oil reserves that cannot be accessed using conventional drilling techniques.
Ultra-deepwater rigs:	Production or drilling rigs capable of drilling at ultra-deep water. This is water depths deeper than 1500 meters.
Vegetable oils:	Oils derived from seeds of plants and used for both edible and industrial purposes.
VLCC:	Very Large Crude Carrier. Crude oil tanker of between approximately 200,000 and 320,000 dwt.
VLGC:	Very Large Gas Carrier. LPG ship with a capacity of more than 60,000 cb.M.
Well stimulation vessels, Subsea:	Vessels to used perform well intervention on an oil or gas wells to increase production by improving the flow of hydrocarbons from the drainage area into the well bore. Also includes Extended Well Test Vessels.

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