

# SHIPPING MARKET REVIEW

NOVEMBER 2015

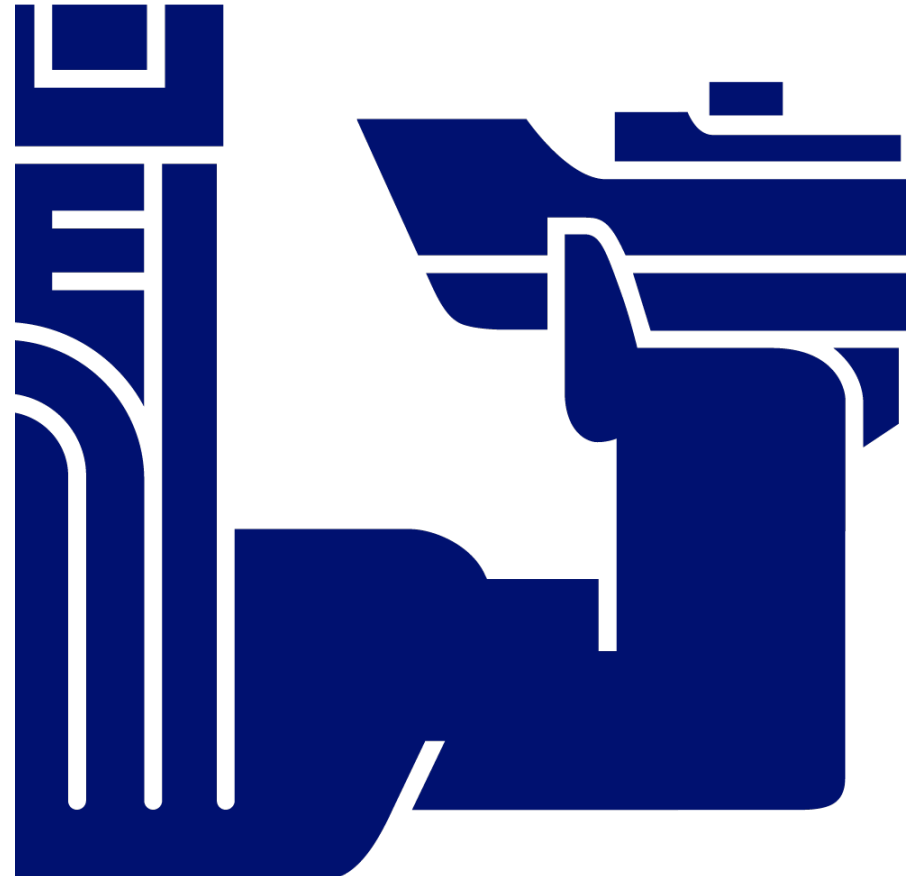


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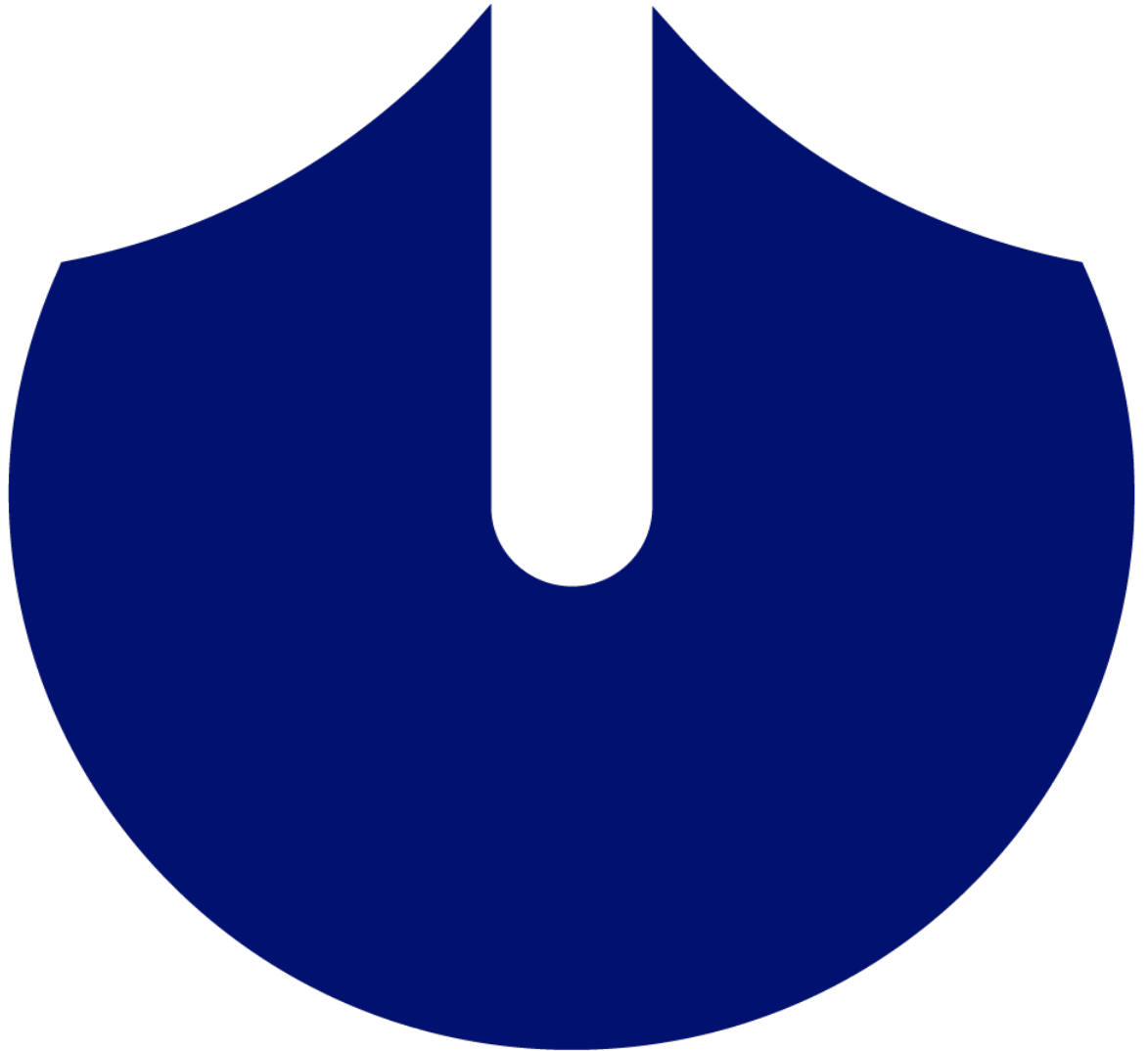
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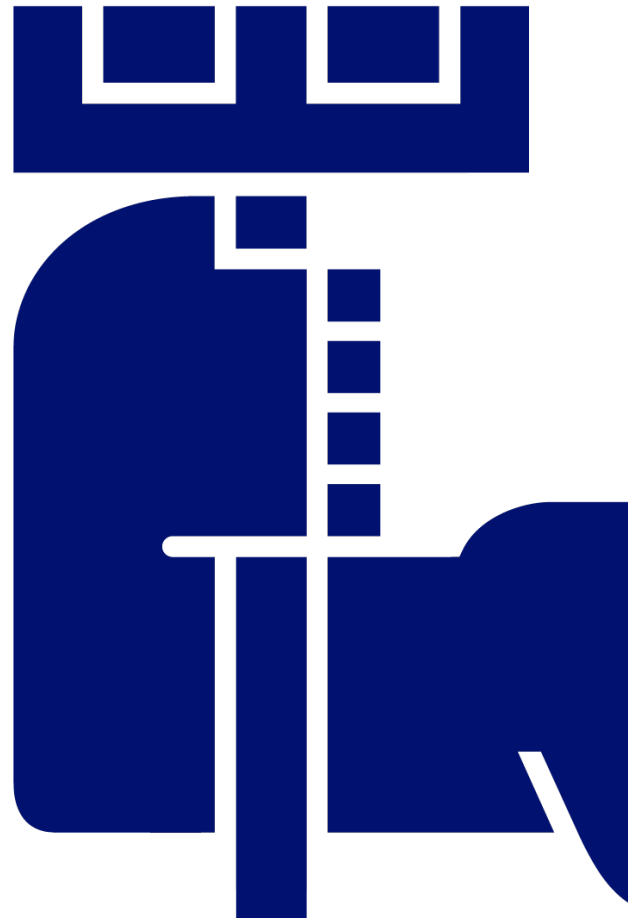
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# EXECUTIVE SUMMARY

SHIPPING MARKET REVIEW – NOVEMBER 2015



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## EXECUTIVE SUMMARY

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*Please read the disclaimer at the beginning of this report carefully. The report reviews key developments in shipping markets and the main shipping segments during the period May 2015 to November 2015 and indicates possible future market directions.*

The report is intended to promote discussion of the medium to long-term challenges facing the shipping industry and to highlight some global perspectives that might serve as an outlook. We present a discussion of the potential issues that may or may not come into play within the lifetime of vessels recently ordered. Throughout this report we apply a macroeconomic perspective to the shipping industry. This methodology allows us to analyse the main long-term trends, rather than to focus on the short-term industrial outlook. Accordingly, our approach is not intended to identify all short-term opportunities for sudden market improvements.

Still, our latest analysis of the factors influencing the outlook for seaborne trade volumes highlights in particular our concern that many ship segments are highly dependent on China and current technologies. But the future may not necessarily mirror the past. In fact, we argue that fundamental changes are about to reshape the world economy. In the past decades, the world economy has evolved linearly. It is possible that this will continue to be the case, but we would like to try to challenge the industry by orchestrating an alternative discussion. We will be presenting prospective trends that may or may not have a major impact on the shipping industry: some of these will play out, while others will be overtaken by alternative scenarios or the present will prevail.

We urge you to read the report and apply the long-term trends discussed to the various shipping segments to determine the impact they could or will have. Clearly, we cannot ignore the potential positive effects from a growing world population and a continued urbanisation process. But if the factors we discuss do materialise, the world economy – and the shipping industry – of tomorrow will be hugely different from the one we know today.

Many will oppose the ideas presented or perceive them as fas-

cinating but relevant only in the distant future. They might very well be surprised to see how quickly industries are being reshaped by technological innovation. In most industries the future is already here or is just about to arrive. We are seeing an increasing trend of robots replacing traditional workers in manufacturing and buildings, bridges and cars being 3D-printed on location. Renewable energy is developing fast alongside the development of batteries. Technological innovation is driving massive changes in industries: from fossil fuels to construction to manufacturing. The disruptive nature of these innovations is sending ripples all the way through the connected and connecting industries as well as the raw material suppliers in between.

### **GDP GROWTH WILL NOT, PER SE, GENERATE SEABORNE DEMAND**

Many shipowners are focusing on GDP creation and the historical correlation between GDP and trade growth. However, GDP growth is, per se, not a guarantee for trade growth. Future economic growth in China, for example, is expected to be driven by the service sector, but since services are rarely transported by sea, the growth will generate little seaborne trade growth. We are, to a certain extent, looking at a future where technological innovation offers local or regional solutions to demand that previously generated seaborne trade. This will clearly be disruptive for many parts of the shipping industry.

### **A NEW STRATEGY IS REQUIRED**

Consequently, we argue that the shipping industry is on the brink of a structural slowdown in seaborne transport volumes. Continuing to lower the cost per moved unit no longer seems the only way to go. The counter-cyclical investments in new and large ships when newbuilding prices appear to be low seem only to have created a system-wide overcapacity that is prolonging the current down-cycle and accelerating the deflationary trend.

### **AN 'UBER OF THE SEA'**

Other industries have been through similar transitions in the past. The way forward is beset with dilemmas, but it seems obvious that the shipping industry still contains value that can

be further exploited. The success of platforms such as Uber, Airbnb and the like, all examples of third-party solutions disrupting existing industries, clearly shows that collecting data and utilising it properly may prove very valuable. The idea is not new; many companies have tried to tap into this value proposition in the shipping industry in recent years. To our knowledge, they have so far only had limited success. But that does not prove that the value is not there. It simply shows that the right solution has not been applied. Many will oppose the idea. But to maintain the status quo hardly seems a long-term profitable business strategy if our concern about lower future seaborne demand proves accurate. The new tactics that this shift will engender have the power to eliminate the trade-off between economies of scale and profitability, and to reshape entire industries. The opportunities and risks it presents will change over time and vary between segments. Competitive advantage will be claimed by the businesses that see and act on this shift first.

#### **GENERAL REVIEW AND OUTLOOK**

Today, the shipping industry is largely split down the middle. Most tanker segments have done fairly well or even very well during 2015, whereas Containers, Dry Bulk and Offshore-related vessels are struggling to balance a large inflow of new vessels at a time when demand is waning. Crude and Product Tankers are currently benefitting from an excessively high level of trading activity that reflects a variety of different factors (i.e. low oil prices, arbitrage trading, new refineries ramping up production, inventory build-ups, and regional mismatches in refinery configurations), but not strong underlying end-user demand. Energy efficiencies and, more generally, technological innovation are developing exponentially despite the low oil price and the low economic growth in many debt-burdened countries. It is vital to understand these factors, because the outlook for the two tanker segments is to a large extent being defined by the emergence of new technologies rather than the temporary factors that are currently enabling a high level of oil trading activity. It will not only be parts of the tanker industry that are disrupted, however. Technological innovation seems to have come to a point where its exponential nature is beginning to reveal its actual potential for entire industries and thereby its

potential to reshape entire economies as well as the shipping industry within the lifetime of vessels currently trading.

#### **TO DO MORE WITH LESS**

In essence, technological innovation is about efficiency improvements: to do something in a smarter way, using fewer resources and producing less waste. It is about making buildings, transport, manufacturing and infrastructure both more energy-efficient and environmentally-friendly. Trade patterns and transport distances will change in tandem with the transformation of the global economy.

#### **SEABORNE TRADE VOLUMES COULD DECLINE IN THE FUTURE**

Trade volumes seem about to plateau in the short- to medium-term and could even embark on a structural declining trend. For the tanker segments, we argue that it would be a mistake to place new orders for ships on the expectation that the current trading activity will continue in the medium- to long-term. The demand outlook for fossil fuels is being threatened by the astonishing technological progress made within solar, wind and energy efficiency and the improved ability to store the energy for later use (e.g. batteries). Fossil fuels will remain a major source of energy for at least a few decades, but a more efficient use of energy and the potential for new technologies to decarbonise the energy supply will reduce the medium- to long-term demand outlook for Crude Tankers, Product Tankers, Gas Carriers and, in terms of coal supply, also Dry Bulk vessels. The long-term outlook for steel and other building materials seems relatively promising in light of the expected urbanisation process, not just in China but in most emerging countries. The manufacturing industry is being disrupted by the introduction of advanced robotics and 3D printers. For large-scale and low-cost production we have recently begun to see examples of large-scale automation and robots replacing workers. For smaller quantities and higher-value production 3D printers offer local on-site production. These developments are gradually expected to reduce the demand outlook for larger Container vessels significantly. On balance, by 2030, total seaborne trade volumes could be substantially lower than currently.

#### **SECONDHAND VALUES MAY FACE STRUCTURAL HEADWINDS**

Few ship types, in any segment, have an age profile that can

address the risk of stagnating trade volumes through regular demolition of older vessels. Premature scrapping and lay-ups of vessels seem almost inevitable if future demand fails to improve the balance between supply and demand. Most ship segments, if not all, are positioned for continued growth in transport volumes. Still, we argue that some improvements in freight rates may be achieved through systematic premature scrapping until the point where a new balance between supply and demand has been established. This mechanism seems to be the industry's only option to transform equity into cash gradually without impacting the value of the younger vessels any more than the low freight rate market is.

#### **SHIPBUILDING**

The Shipbuilding industry is in the midst of an adjustment process. The industry is consolidating rapidly, as relatively low order covers are putting downward pressure on newbuilding prices. Some yards are strengthening their positions, while a large and growing number of yards are unable to attract new orders and are struggling to stay in business. In total, yards representing around 20% of global capacity are currently expected to run out of orders within a year. Most of these yards are Chinese. By year-end 2016, Chinese yards will have delivered 74% of their current orders. Therefore, we expect the Shipbuilding industry to be in for a bumpy ride in the coming years. By the end of 2017, we predict that the number of active newbuilding yards could be reduced to around 200, down from around 900 yards five years ago. If that is the case, global yard capacity will decline to roughly 42 million cgt (a 20-25% reduction from current levels) within the next few years. We expect newbuilding prices to remain under pressure for the foreseeable future.

#### **CONTAINER**

The Container industry is struggling to employ the growing number of large vessels that are being delivered. Box rates remain low and under pressure, while the lower bunker prices have been transferred to customers to some extent. Large and young vessels have been laid idle but none of the larger vessels have been scrapped. Almost 5% of the container fleet is currently idle. Still, supply continues to grow at an unprecedented pace: additional capacity of more than 1.8 million teu was or-

dered during the first three quarters of the year and the number of vessels in the super-large Post-Panamax fleet is set to triple in the next three years. There is little to indicate that demand will be able to employ the Post-Panamax fleet within the foreseeable future.

Looking further ahead, technological innovations could disrupt the market. The manufacturing industry is being reshaped by the introduction of advanced robotics and 3D printers. For large-scale and low-cost production, we are increasingly seeing examples of large-scale automation and robots replacing workers. For smaller-scale and higher-value production, 3D printers offer local on-site production.

If these trends mature within the lifetime of the vessels currently trading, the long-term outlook for the Post-Panamax vessels could be very challenging. Trade patterns and travel distances could begin to be affected even within the next five to ten years, and by 2030, Container trade patterns could have shifted such that the majority of trades are regional and relatively few are long-haul overseas trades. Such a development would put significant pressure on the very young fleet of super-large Post-Panamax vessels.

#### **DRY BULK**

The Dry Bulk market has recovered slightly since reaching a historical low back in February 2015, but freight rates remain low and the oversupply is still significant. The depressed market conditions have led shipowners to postpone or cancel orders and demolish vessels, which has kept fleet growth in check, limiting it to 2% during the first nine months of 2015. By year-end, fleet growth is expected to end up around 4%. The rebalancing of the Chinese economy has, however, reduced growth in Dry Bulk demand to a modest 1%. This is the lowest demand growth seen since 1999, aside from the post-financial crisis figure of 2009.

The short-term outlook is clouded by an orderbook-to-fleet ratio of 17% and the ongoing rebalancing of the Chinese economy. In the short term, the rebalancing effort is expected to lower Dry Bulk demand further, since the heavy investments in construction and infrastructure have lost steam. Freight rates



and secondhand values are expected to remain at low levels for the next two to three years.

The medium- to long-term outlook is shrouded in uncertainty, since the long-term demand outlook for fossil fuels is being threatened by the astonishing technological progress being made within solar, wind and energy efficiency and the improved ability to store the energy for later use (e.g. batteries). Fossil fuels will remain a major source of energy for at least a few decades, but a more efficient use of energy and the potential for new technologies to decarbonise the energy supply will reduce the medium- to long-term demand outlook for coal. The long-term outlook for steel and other building materials seems relatively promising in light of the expected urbanisation process, not just in China but in most emerging countries.

In short, Dry Bulk vessels may experience a reduction in transport volumes in the short term before volumes stabilise at a lower level.

#### **CRUDE TANKER**

The Crude Tanker market is characterised by having very few potential scrapping candidates and a fairly large orderbook. While demand for Crude Tankers has been robust in 2015, this is not a reflection of fundamental end-user demand – rather, it has been reinforced by longer travelling distances and temporary factors such as floating storage and port congestion. Low crude oil prices and surplus volumes have also boosted transport requirements, as a combination of onshore and off-shore storage build-ups have occurred around the world. In addition, the ramp-up of refinery utilisation rates has increased transported volumes throughout the year. There are, however, several factors indicating that refinery throughput exceeds end-used demand, and therefore the boost to Crude Tanker demand from these additional crude oil volumes may not continue.

In the short term, Crude Tanker demand may strengthen, for seasonal reasons and due to weather-related disruptions prone to occur during the winter in the Northern Hemisphere, but in the medium term, it remains highly vulnerable. True, refinery consolidation could create longer travelling distances and reduce fleet productivity if more Asian imports are sourced long-

haul from the Atlantic Basin rather than short-haul from the Middle East. But for seaborne crude oil volumes, the ongoing rebalancing of the Chinese economy is a major cause for concern, not to mention the expansion of the ESPO (Eastern Siberia-Pacific Ocean) pipeline – which moves Russian crude oil to China – by 2020. Besides that, geopolitical tensions seem to be building up, not only in the Middle East, but also in the South China Sea and elsewhere.

Overall, the outlook for Crude Tanker demand may turn out to be lower than investors currently seem to expect. Freight rates and secondhand values may suffer if demand is insufficient to employ the fleet, because there are virtually no scrapping candidates left to counterbalance a potential decline in demand.

#### **PRODUCT TANKER**

The last three quarters have seen an upturn in sentiment, as the high inflow of new vessels has been counterbalanced by temporary factors such as increased arbitrage-driven trade and weather-related disruptions. The upsurge in refinery utilisation rates has also boosted transported volumes. Surplus volumes, in turn, have tightened vessel availability, as insufficient on-shore storage capacity has forced cargoes to stay offshore for longer. These surplus volumes are unlikely to last for long, but increasing demand in 2016, especially in the next six months, due to higher seasonal demand and weather-related disruptions that frequently occur during the winter in the Northern Hemisphere, could mitigate the downturn.

In the medium term, however, the Product Tanker market remains highly vulnerable to the large inflow of new vessels. While tightening regulations across countries (e.g. emission and fuel standards) could create more trading activity, fleet productivity is expected to remain high, diluting the effect somewhat. For seaborne volumes of petroleum products, the continuing rebalancing of the Chinese economy is a major cause for concern, in particular for diesel demand. Not to mention the Product Tanker market's dependence on arbitrage-driven trade.

The long-term outlook for Product Tanker demand is being threatened by increased energy efficiency and astonishing technological advances being made within renewable energies

and energy storage. By 2030, total seaborne volumes of petroleum products could be lower than their current level. All in all, the outlook for Product Tanker demand may be more subdued than current investors seem to expect. Freight rates and secondhand values may suffer if demand fails to employ the fleet.

#### **LPG TANKER**

The current LPG market, in particular the VLGC market, showed exceptional strength during the first three quarters of 2015 despite double-digit fleet growth. Demand for LPG Tankers was supported by a combination of strong end-user demand and temporary disruptions to the vessels' availability. The expansion of both the petrochemical industry in Asia and export facilities in the US continued to benefit distance-adjusted demand.

In the short term, freight rates may remain fairly robust, but it seems unlikely that sufficient demand will materialise in time to meet the large influx of new LPG Tankers indicated by the orderbook, and consequently demand could fall below the expected fleet expansion at some point. Furthermore, the rebalancing of the Chinese economy along with the impending expansion of the Panama Canal, which could shorten average travelling distances, is a cause for concern. LPG demand from the residential sector, however, could soften the blow from temporary blips in petrochemical LPG demand.

The long-term outlook is, on the one hand, supported by the residential sector, but on the other hand, is significantly threatened by the expansion of the sharing economy as well as a move towards a more circular economy. Freight rates and asset prices may suffer accordingly. In the short to medium term, secondhand prices may be hit hardest, as they rose more than newbuilding prices did during the upswing. In some cases, secondhand prices even exceed newbuilding prices.

# GENERAL REVIEW AND OUTLOOK

SHIPPING MARKET REVIEW – NOVEMBER 2015



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## GENERAL REVIEW AND OUTLOOK

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IN ITS NATIVE FORM, THE SHIPPING INDUSTRY FULFILLS A BUYER'S WISH TO PURCHASE A CERTAIN PRODUCT AT A PRICE THAT CANNOT BE OFFERED BY LOCAL SUPPLIERS. IN A SCENARIO WHERE TECHNOLOGICAL INNOVATION ABRUPTLY CHANGES THIS RELATIONSHIP, BY MAKING LOCALLY-PRODUCED PRODUCTS AVAILABLE AT COMPETITIVE PRICES, THE OUTLOOK FOR THE SHIPPING INDUSTRY DETERIORATES CONSIDERABLY. THIS CHANGE IN ITS BASIC FORM DESCRIBES OUR LONG-TERM OUTLOOK FOR THE SHIPPING INDUSTRY ACROSS SEGMENTS.

The report is intended to promote discussion of the medium to long-term challenges facing the shipping industry and to highlight some global perspectives that might serve as an outlook. We present a discussion of the potential issues that may or may not come into play within the lifetime of vessels recently ordered. Throughout this report we apply a macroeconomic perspective to the shipping industry. This methodology allows us to analyse the main long-term trends, rather than to focus on the short-term industrial outlook. Accordingly, our approach is not intended to identify all short-term opportunities for sudden market improvements.

Still, our latest analysis of the factors influencing the outlook for seaborne trade volumes highlights in particular our concern that many ship segments are highly dependent on China and current technologies. But the future may not necessarily mirror the past. In fact, we argue that fundamental changes are about to reshape the world economy. In the past decades, the world economy has evolved linearly. It is possible that this will continue to be the case, but we would like to try to challenge the industry by orchestrating an alternative discussion. We will be presenting prospective trends that may or may not have a major impact on the shipping industry: some of these will play out, while others will be overtaken by alternative scenarios or the present will prevail.

We urge you to read the report and apply the long-term trends discussed to the various shipping segments to determine the

impact they could or will have. Clearly, we cannot ignore the potential positive effects from a growing world population and a continued urbanisation process. But if the factors we discuss do materialise, the world economy – and the shipping industry – of tomorrow will be hugely different from the one we know today.

### **THE WORLD ECONOMY IS IN TRANSITION**

The world economy has embarked on a slow-moving recovery, with uneven growth in developed economies and a slowdown in developing economies. These are more than just bumps in the road: the world economy is in transition. The engines driving global growth are sputtering and there is little to indicate that new and effective alternatives are about to emerge.

### **CHINA'S REBALANCING IS CAUSING VOLATILE COMMODITY PRICES...**

With growing debt burdens, ageing consumers, low investments and the risk of deflation in several of the major economies, the outlook for seaborne trade remains bleak. In essence, the seemingly insatiable demand for resources in China and other emerging economies, which has fuelled the global commodity price boom, appears to be slowing as efforts to rebalance the Chinese economy reduce the growth momentum. Industrial commodity prices have dropped sharply across the board. The highly variable effects of the price drops have bred both winners and losers: the most obvious group to have been hit hard are the commodity exporters which are heavily reliant on commodity revenues to fund their government expenditures, including social programmes and transfers. Many countries and industries, however, have benefitted. Commodity-importing economies such as Europe, Japan, China and India have gained from cost savings associated with lower import prices, but a large share of the developing economies are commodity exporters and are suffering accordingly.

### **...WHILE BOOSTING GLOBAL ACTIVITY**

More broadly speaking, lower commodity prices are feeding into already softening global inflationary pressures. This provides more scope to keep policy settings accommodative, ensuring that any recovery in activity can gain traction. Therefore, sus-

tained low commodity prices are predicted to provide a boost to global activity in the medium term. A recent study by the International Monetary Fund examined the impact on world GDP from the recent fall in oil prices and concluded that it should add between 0.3% and 0.7% to world GDP in 2015, compared with a scenario without such a drop in oil prices.

#### **COMMODITY PRICES ARE LIKELY TO STAY LOW IN THE NEAR FUTURE**

We do of course acknowledge that lower commodity prices are supporting economic conditions in import regions. But given the rather downbeat global environment in which this shock has occurred, it is difficult for us to accept the premise that a sudden reduction in global demand for many non-Asian emerging economies' primary source of income is anything other than just a partial positive effect. At the aggregate level, it is difficult to ignore the fact that a significant part of the momentum in the world economy and world trade, created by China and its Asian neighbours, has been substantially reduced as a consequence of the rebalancing efforts in China. On the basis that a global supply glut typically takes longer to correct itself than a demand-driven price cycle, we suspect that global industrial commodity prices (including oil) are likely to stay at low levels both this year and next.

#### **MODERATE EXPECTATIONS FOR FUTURE GDP GROWTH**

On balance, growth in world GDP is expected to continue at a moderate pace in 2015 and the coming years. The short- to medium-term outlook remains uncertain and subject to many downside risks, including continued moderate growth in global demand, the fragile recovery in Europe, geopolitical tensions, a potential faster slowdown in developing economies, and in particular the implications of the slowdown in China.

#### **THE COMPOSITION OF GLOBAL DEMAND IS SHIFTING**

The slowdown in global trade has been driven by both a cyclical and a structural component. The cyclical factor is the persistently weak import demand in developed economies. The structural component is largely the fact that existing global value chains are maturing while no significant new ones are being formed.

Besides, the composition of global demand has shifted away from trade-intensive goods towards services. In short, world trade has become less responsive to changes in world GDP because global supply chains are expanding more slowly and demand is shifting towards services. Consequently, the pre-crisis correlation between world trade growth and global GDP growth is not expected to be re-established. In the future, world trade will grow in parallel with world GDP or at a discount.

#### **SEABORNE TRADE VOLUMES ARE LIKELY TO PLATEAU**

Actually, we consider it likely that seaborne trade volumes could plateau or even decline in the short to medium term. The absence of any obvious replacement for China's previous import demand is the single most important explanation for our scepticism. While this concern is supported by the modest increase in recent import volumes for both Container and Dry Bulk vessels, it may be more difficult to recognise for tanker owners, as a period of relatively strong trading activity within several of the segments supported both freight rates and secondhand values throughout most of the first three quarters of 2015. Many will argue that tanker demand has returned, but we do not agree. Crude and Product Tankers are benefitting from unusually high trading activity, which reflects a variety of different factors (i.e. low oil prices, arbitrage trading, new refineries ramping up production, inventory build-ups and regional mismatches in refinery configurations), but not strong global underlying end-user demand.

#### **CURRENT MARKET DOES NOT REFLECT STRONG UNDERLYING DEMAND**

For Crude and Product Tankers, the opening of new refineries and changes in the regulation of regional emission standards (e.g. China 5, Bharat 3) may stimulate and prolong the high level of trading activity well into next year or for even longer. But it should be borne in mind that just because something is transported from one place to another, it does not necessarily mean there is underlying demand. Price movements and regional imbalances may create arbitrage windows for some commodities and therefore provide a boost to seaborne trade

volumes. In some cases, a sudden change in regional activity may lead to port congestion and create the illusion of strong underlying demand. The duration of these effects varies, but all are temporary in nature. Investors should not place new orders for tanker vessels in the hope that the current market will prevail.

#### **LONG-TERM OUTLOOK FOR GLOBAL TRADE**

The long-term outlook for seaborne trade volumes is shrouded in uncertainty, since the tectonic plates underneath global trade are shifting. The fundamental long-term driver of trade remains an increasing world population that continues to push for improved living standards. In past decades, the ongoing integration of developing and emerging regions into the world economy has facilitated continued growth in seaborne trade volumes. The Chinese membership of the WTO in November 2001 in particular accelerated growth in seaborne trade volumes for more than a decade. The second force that is expected to add volumes to seaborne demand is the continuing global urbanisation process. According to a recent report by the International Organisation for Migration, over 54% of people across the globe were living in urban areas in 2014. The current urban population of 3.9 billion is expected to grow to some 6.4 billion by 2050. It is estimated that 3 million people around the world move to cities every week.

#### **THE DEMAND FOR BUILDING MATERIALS WILL BE SUSTAINED**

The long-term outlook for steel and other building materials seems relatively promising in light of the expected urbanisation process, not just in China but in most emerging countries. In China, for example, we have seen tremendous activity throughout the past three decades. According to the research firm GK Dragonomics, China dismantled more than 16% of its housing stock between 2005 and 2010 alone. And the development is not expected to level off. According to the Ministry of Housing and Urban-Rural Development, almost every structure built before 1999, roughly half of the current housing supply, is set to be demolished and rebuilt at some point over the next 20 years.

However, it would be a mistake to think that China is simply upgrading its housing stock to meet modern standards, and will stop once this is done. Even the buildings that are being built today will hardly last out this generation. Qiu Baoxing, the former vice-minister of China's Housing and Urban-Rural Development ministry, estimates that new buildings going up in China today will only stand for 25 to 30 years before being demolished. Li Dexiang of Tsinghua University told the China Daily that "what we see nowadays is the blind demolition of relatively new buildings, some of which have only been standing for less than ten years". Many relatively young and stable buildings across China are being torn down, not because they need to be, but because the government wants them to be. The explanation is to be found in the relatively immature Chinese tax system. There is no annual residential property tax in China; all taxes are paid upon purchase. This means that local governments have a great (tax) incentive to facilitate a high real estate turnover. The result is that masses of otherwise adequate houses throughout the country are being bought back by the government, and then torn down so the land can be sold to developers for a profit and a new round of property taxes subsequently collected.

#### **CHINESE DEMAND FOR SERVICES IS REDUCING SEABORNE DEMAND**

While both the construction and the demolition activities contribute positively to GDP creation, this behaviour hardly seems a good use of either resources or capital. In our previous edition of this report, Shipping Market Review – May 2015, we highlighted the lurking issues related to the massive build-up of debt that took place between 2008 and 2014. Half of the debt is somehow related to the real estate sector. However, in general we do not share some observers' pessimistic outlook for the Chinese economy, since the government seems prepared for handling issues related to the build-up of non-performing loans, should they occur. But we do expect that the Chinese economy will generate much less seaborne demand in the future as the service sector gains speed.



### CHINESE GDP IS BEING SUPPORTED BY GROWTH IN SERVICES

China's GDP growth of 6.9% in the third quarter of 2015 was the slowest since the height of the global financial crisis. This is not, however, the harbinger of a prospective economic melt-down. Rather, the third-quarter slowdown reflects the rebalancing trends evident since the beginning of 2010, whereby trade and capital-intensive industries are being replaced by consumer spending. First, a massive deceleration in investment in housing has led to a marked slowdown in demand for steel and other building materials, slowing overall industrial growth by about three-fifths over the past five years. Second, China's service sector has slowed by far less, supporting GDP growth. Put another way, if the service sector was slowing proportionately with industry, China's current pace of expansion would be about 4%.

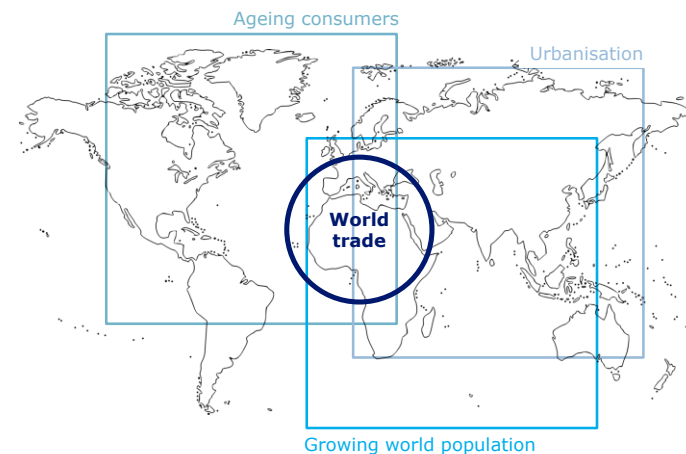
### CHANGING CONSUMPTION PATTERNS DRIVE FUNDAMENTAL CHANGES

To many it might be surprising that rising private consumption has resulted in the service sector becoming the most important driver of China's economic growth in recent years. Several factors have enabled the transformation. First, wage growth has been running well ahead of GDP growth for several years, in part because of demographic factors. The working age population expanded more slowly at first and more recently has begun to fall slightly. All else being equal, when wages rise, increased consumption growth follows. Second, the increased reach of the social safety net, particularly the significant progress in providing health insurance to over 90% of the population, has reduced the precautionary demand for savings. The corollary of a lower household savings rate is, of course, stronger consumption. Third, the World Bank now classifies China as an upper-level middle-income country. This is a level of per capita income at which basic needs of food, clothing, and so forth for the vast majority of China's population are reasonably well met, and the share of consumption on services, rather than goods, increases. The most obvious examples are rapidly rising outlays on entertainment, travel and education. Fourth, since the production of services is about twice as labour-intensive as industry, increased demand for services leads to more rapid growth in urban em-

Figure GRO.1

### SHIFTING TECTONIC PLATES UNDERNEATH GLOBAL TRADE

*The effects of urbanisation and ageing are tilting the global economy towards emerging markets.*



Source: Danish Ship Finance

ployment, which reinforces the underlying trend of rising wages and urbanisation.

### SERVICES DO NOT REQUIRE TRANSPORTATION BY SEA

Each of these factors reflects fundamental changes that are likely to be sustained. The service sector already accounts for almost half of GDP, compared with a combined share for industry and construction of around 40%. If the trend continues, and the Chinese economy becomes even more dependent on the service sector, the implications for seaborne trade could be profound. Not only are services rarely transported by sea, but they do not demand inputs that are trade-intensive either compared with the construction sector or industry. Last but not least, the service sector creates less demand for inland transportation, which may worsen the domestic demand outlook for diesel considerably over the next decade.

#### **AGEING LABOUR FORCES ARE THREATENING SEABORNE DEMAND**

An ageing and shrinking labour force, on which economic activity depends, is not only a Chinese problem. Europe and Japan face similar challenges. The growth potential in debt-laden economies facing ageing populations is expected to be structurally reduced, as we know that older people buy fewer things that require heavy investment – notably houses – and consume less energy. Last but not least, older people commute less but use more services, such as healthcare or tourism. The nature of private and public consumption is therefore expected to shift towards the service sector. Put simply, we are looking at a future where low-income consumers in Asia and elsewhere are becoming responsible for creating the demand for seaborne trade previously generated by consumers in Europe, Japan and China. And we need to keep the numbers in mind here. Europe, Japan and China currently account for 44% of world seaborne import volumes. The risk of a decline in world seaborne import volumes definitely seems within reach during the lifetime of vessels currently trading.

#### **CHANGING THE UNDERLYING DRIVERS OF GROWTH**

Still, the rising economies in Asia, Latin America, Africa and the Middle East are expected to lift billions of people out of poverty within the next few decades. The long-term outlook for world trade is bright if the integration of the growing world population follows a similar path to the integration of the Chinese economy into the world economy. But should we really expect not one but several Chinas to be integrated into the world economy without the underlying drivers of growth changing? The challenge is that the world's resources are not growing. The integration of the Chinese economy may have lifted 600-800 million people out of poverty, but it has also left a substantial footprint on the environment and has impacted commodity prices massively, both during the build-up phase and during the current rebalancing effort. The Chinese economy, like many others, has been growing according to a linear 'take-make-dispose' economic model, relying on large quantities of cheap, easily accessible materials and energy. This model seems ineffective to lift future genera-

tions out of poverty within the next few decades. We therefore argue that technological innovation in general and efficiency improvements in particular will play a vital role in creating long-term economic growth for a large proportion of the global population.

#### **TECHNOLOGICAL DISRUPTION**

Technological innovation is not just about performing a task in a smarter way by using fewer resources. It is also about applying new solutions to old problems. Technological innovation introduces new business models and enables growth, often at a lower cost. Today a variety of different innovations are maturing simultaneously. The combined impact of these new emerging trends is expected to transform the global economy massively, leaving a significant mark on the shipping industry. The manufacturing industry is being disrupted by the introduction of advanced robotics and 3D printers. For large-scale and low-cost production we have recently begun to see examples of large-scale automation and robots replacing workers. For smaller quantities and higher-value production 3D printers offer local on-site production. These developments are gradually expected to reduce the demand outlook for larger Container vessels significantly. The demand outlook for fossil fuels is being threatened by the astonishing technological progress made within solar, wind and energy efficiency and the improved ability to store the energy for later use (e.g. batteries). Fossil fuels will remain a major source of energy for at least a few decades, but a more efficient use of energy and the opportunities related to new technologies to decarbonise the energy supply will reduce the medium- to long-term demand outlook for Crude Tankers, Product Tankers, Gas Carriers and, in terms of coal supply, also Dry Bulk vessels. These developments will intersect multiple industries simultaneously and offer significant improvements and new alternatives to existing business models.

#### **WE NEED TO DO MORE WITH LESS**

To enable a sustainable enrolment of the millions of people that are expected to join the world economy within the next few



decades, we need to introduce additions to the existing growth paradigm. The sharing economy is the reinvention of old market behaviours – renting, lending, swapping, bartering, gifting – through new technology platforms that can identify and redistribute assets among people on an unparalleled scale. By focusing on access (to assets, services and information) rather than ownership and harnessing the power of new technologies, the sharing economy enables us to “do more with less” and spur dynamic innovation. Similar to how eBay revolutionised the marketplace more than a decade ago, Airbnb and the like have enabled thousands of local micro-entrepreneurs to create livelihoods and increase local investment – without tax hikes or spending cuts.

#### TRADE DATA MAY BECOME AS VALUABLE AS THE VESSELS

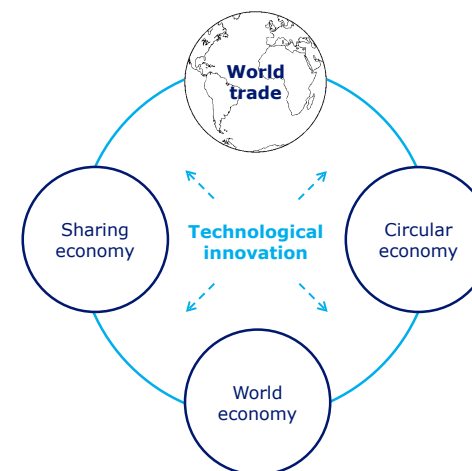
On a micro level, the sharing economy is about cost savings and increased accessibility for the users, but for the owners of the assets, it comes down to increased utilisation of the assets. When we pool our efforts, collect data and utilise it properly, we may end up creating a marketplace that is far more valuable than the sum of the individual parts. Consider traditional car manufacturers and Uber, which are both—in essence—in the business of moving people around. Car makers meet that need on the floors of factories and showrooms, using a century of manufacturing experience. Uber owns no vehicles and meets people’s transportation needs with data, matching individual journeys and vehicles via smartphones. Barely five years into its existence, Uber’s data, algorithms and enormous growth prospects have already made it more valuable than all of the physical assets, intellectual property, and brand names of some of the world’s biggest car manufacturers (e.g. Fiat Chrysler Automobiles).

#### TECHNOLOGICAL INNOVATION IS DISRUPTING SHIPPING

We must not miss the point here. The example above reveals two important lessons. First, the regional and sectoral expansion of the sharing economy is lowering the demand outlook not only for the industries directly involved (e.g. car manufacturers) but for entire supply chains. The lower end-user demand ripples all

Figure GRO.2

**TECHNOLOGICAL INNOVATION IS CHANGING TRADE**  
*Technological innovation is in the process of or has already driven significant structural changes to the world economy and is shifting world trade patterns.*



Source: Danish Ship Finance

the way back to, for example, the petrochemical industry, impacting all the connected industries and raw material suppliers in between. The demand outlook for the merchant fleet is therefore expected to be impacted through various channels. The message is clear: technological innovation represents a fundamental disruption to the shipping industry. Second, in a digital world, data may easily be as valuable as the underlying asset. Uber has mastered how to get data on local transportation patterns — who wants to go where, when and how. Now it is using that data to expand its service. For the shipping industry, alliances, pools and other capacity-sharing agreements is a start. The joint efforts of owners to reduce costs and increase the utilisation of vessels is clearly paying off, but the trade data that can be collected from the operation may turn out to be even more valuable. Imagine the value of shipping’s version of Uber scaled up to a global level covering all seaborne trade volumes for a segment or the entire world fleet. Such data, if extracted, could be extremely valuable.

#### **WATCH OUT FOR EXPONENTIAL TECHNOLOGIES**

While the magnitude of the emerging technologies may still appear a little weak, it should be kept in mind that many of these new technologies tend to be exponential in nature. Exponential technologies are deceptive because they move very slowly at first, but suddenly accelerate. For example, consider an emerging technology that doubles its market share each year. Starting at a low point of 0.01%, it will take seven years to reach a market share of 1%. But, in theory, it will only take another seven years to reach full market penetration (i.e. 100%). Accordingly, when an exponential technology, like for example solar energy, holds a market share of 1%, it might theoretically not be far from establishing a firm position within the industry it is disrupting.

#### **A PATH TOWARDS A MORE CIRCULAR ECONOMY IS ABOUT TO EMERGE**

Technological innovation's journey does not stop there. New technologies enable a new round of innovation that in turn may have the potential to impact entire industries. Composites that can be reconfigured in the presence of different stimuli are emerging and could dramatically extend the reach of, for example, 3D printing (i.e. 4D printing of adaptive materials). We are seeing great innovation taking place in material science involving the creation of materials with the desired micro- and nanostructures. Imagine, for example, an automobile coating that changes its structure to adapt to a humid environment or a salt-covered road, better protecting the car from corrosion. Or imagine materials that possess the ability to change their properties or shape multiple times, eliminating the need to build for a specific, one-time use. Achievements within the field of material science are paving the way for significant improvements in several industries, but for the shipping industry one of the most disruptive innovations will be the design of materials that are built for recycling, reuse and remanufacturing. When materials are designed to be recycled, reused or remanufactured, the step towards a more circular economy becomes both more feasible and profitable.

#### **A GLOBAL ECONOMY THAT BECOMES LESS DEPENDENT ON RESOURCES...**

The circular economy builds upon the concepts of the sharing economy and aims to eradicate waste through smart design — not just from manufacturing processes, as lean management aspires to do, but systematically, throughout the life cycles and uses of products and their components. Indeed, tight component and product cycles of use and reuse, aided by product design, help define the concept of a circular economy and distinguish it from the linear take-make-dispose economy, which wastes large amounts of embedded materials, energy and labour. In a circular economy, the goal for durable components, including metals and most plastics, is to reuse them or upgrade them for other productive applications through as many cycles as possible. This approach contrasts sharply with the linear mindset embedded in most of today's industrial operations.

#### **...DAMPENS THE OUTLOOK FOR SEABORNE TRADE**

The circular economy is gaining increasing attention in Europe and around the world as a potential way for the global economy to increase prosperity for the growing global population while reducing its dependence on primary materials and energy. The transition towards a more circular economy is at an early phase, but some of the larger players in, for example, the automotive industry (e.g. Renault, Jaguar, Land Rover, Nissan and Toyota) are driving the push forwards. According to Renault, one remanufactured part uses 80% less energy, 88% less water, 92% fewer chemical products and generates 70% less waste during production compared with a new part. In fact, 30% of all vehicles in Renault's line-up today are made from recycled materials and that figure is set to rise in the future.

#### **EUROPEAN CONSUMPTION COULD DECLINE BY 30% IN 15 YEARS**

In the recent report "Growth within: a circular economy vision for a competitive Europe (June 2015)", written by the Ellen MacArthur Foundation in collaboration with McKinsey, Sun (Stiftungsfonds für Umweltökonomie und Nachhaltigkeit) and

the new environmental economics branch of the Deutsche Post Foundation, the potential effects for Europe moving towards a more circular economy are addressed. The report found that the European economy is surprisingly wasteful in its model of value creation. In 2012, the average European used 16 tonnes of materials. 60% of discarded materials were either landfilled or incinerated, while only 40% were recycled or reused as materials. In value terms, Europe lost 95% of the material and energy value, while material recycling and waste-based energy recovery captured only 5% of the original raw material value. Even recycling success stories like steel, PET, and paper lose 30-75% of the material value in the first use cycle. On average, Europe uses materials only once. The report finds that shifting towards a more circular economy would deliver better outcomes for the European economy and yield annual benefits of up to €1.8 trillion by 2030. In this scenario, primary material consumption measured by car and construction materials, synthetic fertiliser, pesticides, agricultural water and land use, fuels and non-renewable electricity, and land for real estate could drop as much as 32% by 2030 and 53% by 2050. The modelling for 2030 suggests that the disposable income of European households could be as much as 11 percentage points higher in the circular scenario relative to the current development path, or 7 percentage points more in GDP terms.

#### **THE FUTURE IS ABOUT TO EMERGE**

Indeed, some resource waste is economically rational, but over the last decade technological development, consumer behaviour and new business models have provided new choices for consumers while changing the economics for mitigating this waste. For example, the huge drops in the transaction cost of the sharing and virtualisation business models enabled by smartphones (e.g. car-sharing and house-sharing) are just starting to permeate the market. The internet of things can keep track of valuable products and materials much more cheaply than in the past, radically increasing opportunities to recover them, and waste management technology is progressing quickly. Addressing the abundant market represents huge potential for economic growth but is very disruptive for the shipping industry in general.

#### **FUTURE GDP GROWTH MAY CREATE LITTLE NEW SEABORNE DEMAND**

The important point here is not the forecast numbers for Europe, but the proposed potential for the global economy and the implications for future global trade volumes if these trends gain speed. While a move towards a more circular global economy may provide tailwind for the global economy, its potential negative impact on global trade volumes could be significant, not least when combined with the potential of robotics, additive manufacturing (i.e. 3D printers), renewable energy and energy storage (i.e. batteries).

#### **THE CAR INDUSTRY SEEMS TO BE ADAPTING TO A NEW NORMAL**

Some industries seem to be grasping the changes about to emerge. Take the car industry, for example. There are a lot of experiments being carried out that are not to do with selling more cars. In fact, they are to do with selling fewer cars. Google is developing its self-driving cars, while Uber and the like are addressing the idea that people do not really need a car – many simply need affordable mobility on demand. It seems inevitable that car sales are likely to decline in the future. Some of the car manufacturers seem to be embracing the emerging trends that are about to transform their industry. For example, BMW and Mercedes, among others, are embracing the development by introducing their own car-sharing programmes, in an attempt to ensure that their cars are the ones providing the mobility. Instead of hoping that these new developments will not mature or be approved by regulators, the above-mentioned players are acting to improve their positions in a new market.

## SHIPPING MARKET AT A GLANCE

THE COMPOSITE FREIGHT RATE INDEX SIGNALS OVERCAPACITY, BUT THE TANKER SEGMENTS ARE DOING WELL THANKS TO TEMPORARY FACTORS. THE OUTLOOK IS CLOUDED BY AN ORDERBOOK THAT CONTAINS TOO MANY LARGE VESSELS BEING DELIVERED TOO QUICKLY TO BE ABSORBED. EXTENSIVE DEMOLITION ACTIVITY OF YOUNG VESSELS SEEMS NECESSARY IF FREIGHT RATES ARE TO BE SUPPORTED.

The impact of the emerging trends that are about to reshape future seaborne trade volumes seems somehow to have been lost in translation for large parts of the shipping industry. Most of the ship segments continue to be positioned for increasing demand, but there is little to indicate that future demand will meet ship investors' hopes for the future. Many of the larger ship segments are likely to suffer from overcapacity in the medium to long term, and some of the smaller ship segments could perform better than their larger peers.

### THE WORLD FLEET REMAINS UNDERUTILISED

Measured by the average performance of the composite freight rate index, the ClarkSea Index, the world fleet continues to be well ahead of demand. The average freight rate since 2009 has nearly halved compared with the corresponding level in the period 2000 to 2008 (fig. 3). This clearly illustrates that on average the world fleet is not being adequately utilised.

### IMPROVED CASH FLOW AND SECONDHAND VALUES

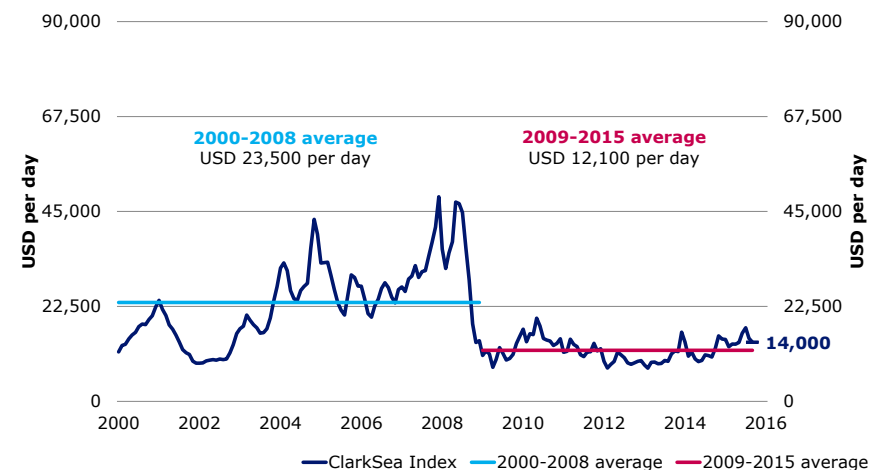
The ClarkSea index has increased by 24% in 2015 on average, while bunker costs have roughly halved compared with the average levels of 2014. These trends have significantly improved shipowners' ability to generate positive cash flow from operations. The average secondhand value has increased by 4% during 2015 (fig. 4).

### THERE ARE VARIATIONS BETWEEN SEGMENTS

But the shipping industry is currently split down the middle. Most tanker segments have done fairly well or even very well during 2015, whereas Containers, Dry Bulk and Offshore-related vessels are struggling to balance a large inflow of new vessels at

Figure GRO.3

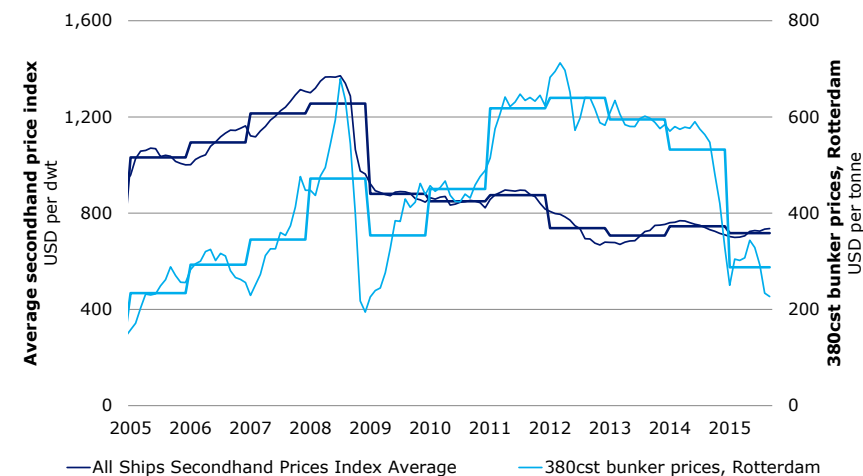
**The freight rate environment is improving but remains at a low level**



Sources: Clarksons, Danish Ship Finance

Figure GRO.4

**The bunker price has declined on average by 57% during 2015**



Sources: Clarksons, Danish Ship Finance

a time when demand is waning. Crude and Product Tankers are currently benefitting from an excessively high level of trading activity that reflects a variety of different factors (i.e. low oil prices, arbitrage trading, new refineries ramping up production, inventory build-ups, and regional mismatches in refinery configurations) but not strong underlying end-user demand (fig. 5). Dark clouds are gathering on the horizon for most ship segments, since the demand outlook remains fragile, the orderbook is large and few obvious scrapping candidates remain.

#### BUT VESSELS AS YOUNG AS 15 YEARS OLD COULD BE SCRAPPED

Today, only 9% of the world fleet is 20 years or older, while the orderbook currently stands at 17% of the fleet (more than 4,700 vessels). The use of premature scrapping continues to intensify in segments where demand is insufficient to employ the vessels entering the market. If demand remains at current levels, capacity equal to almost all vessels older than 15 years would need to be scrapped within the next two to three years (fig. 6). Clearly, the situation differs between segments, since the age distribution of their fleets, the delivery schedule of their orderbooks and their demand outlooks vary, but as a general illustration it holds true.

#### MASSIVE INFLOW OF VESSELS BEFORE YEAR-END 2016

The delivery schedule of the orderbook is more troubling than its actual size. Were the orderbook expected to be delivered at an even pace over the next three years, it would be much more feasible for the new vessels to be enrolled. But the orderbook is heavily front-loaded. In essence, more than 70% of the orderbook is scheduled to be delivered before year-end 2016 (fig. 7). Over the past few years, we have seen an increase in orders not being delivered on schedule. On average, one out of five orders is being postponed for a year, while approximately 5% of registered orders appear to be leaving the records.

#### VESSELS ENTERING THE FLEET ARE 60% LARGER THAN 20 YEARS AGO

On average the vessels on order are currently about 60% larger than those built 20 years ago. Generally speaking, larger vessels lower the cost per moved unit and are preferred on long-haul trades (fig. 8). However, the economies of scale deteriorate if

Figure GRO.5

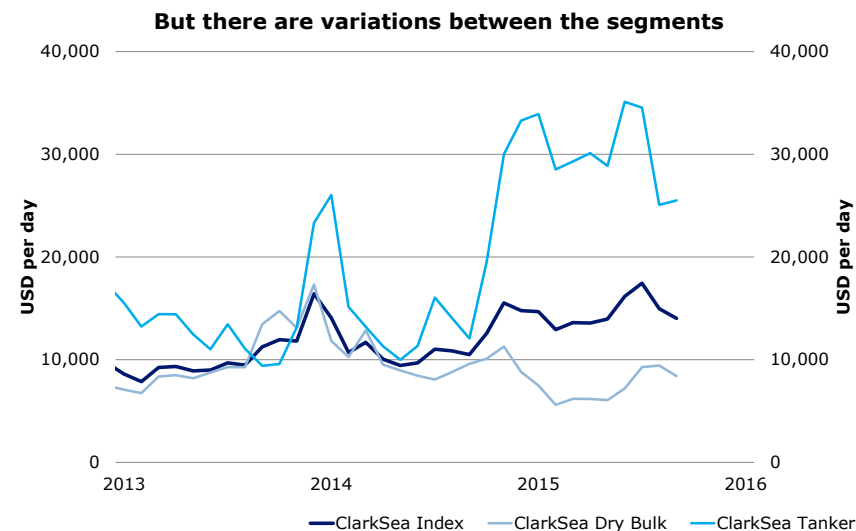
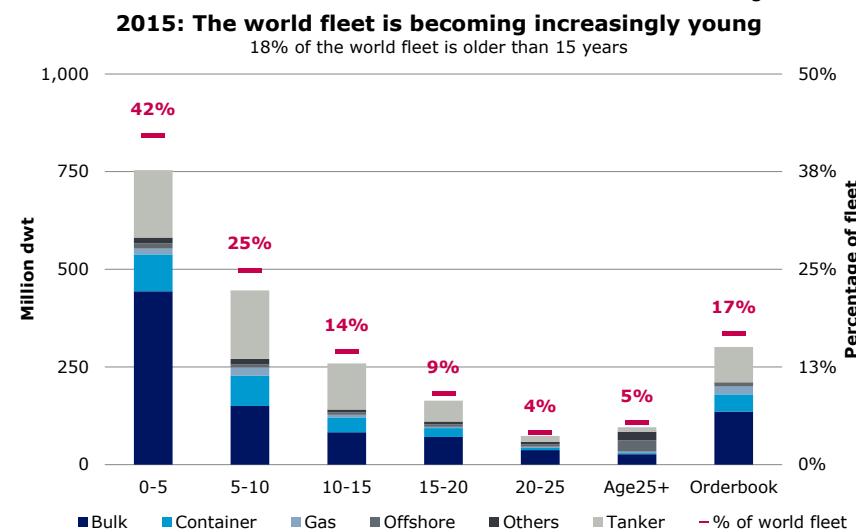


Figure GRO.6



the vessel is not full. It is therefore vital to maintain an average size of vessels trading that reflects the needs of global demand. With a global economic outlook where the old powerhouses of growth are gradually being replaced by emerging economies that have large populations but low disposable incomes, we are concerned that the size of the current fleet and vessels on order reflects the world of yesterday rather than the world of tomorrow. One of the key takeaways from our *World demand indicators* section above is that we expect to see stagnating or even declining seaborne trade volumes within the next five years.

#### LOWER DISTANCE-ADJUSTED DEMAND IN THE FUTURE

Still, there are few indications that trade patterns and travel distances will change significantly within the next five years for tankers and Dry Bulk vessels. But for Container vessels the change in trade patterns and travel distances could begin to take effect within the next five to ten years. We predict that Container trade patterns could resemble those of the Product Tanker market by 2030 (cf. the Container section). The majority of trades in the Product Tanker market are short-haul regional trades, with relatively few long-haul overseas trades. Dry Bulk vessels may experience a reduction in transport volumes in the short term before we start to see a change in travel distances and trading patterns within the next five to ten years. For tanker vessels (including LPG) much depends on the pace of technological innovation (i.e. within renewable energy, energy efficiency and storage of energy) and the transformation towards a more circular economy.

#### LITTLE ROOM FOR SCRAPPING IN THE LARGER SEGMENTS

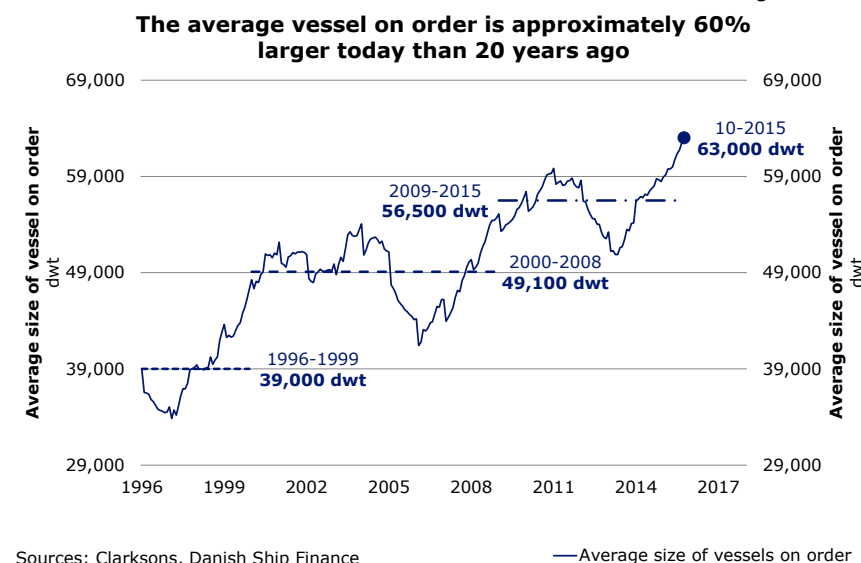
The Crude Tanker market is particularly vulnerable to inadequate future demand. For each vessel older than 20 years (i.e. scrapping candidates), there are seven vessels on order. This imbalance leaves freight rates and asset values very exposed to a looming shortage of demand (fig. 9). This challenge is basically being felt in most segments: the large vessel types are generally speaking subject to more downside risk than the smaller sizes, as they have few obvious scrapping candidates. However, this is not apparent in figure 9, since the aggregated numbers mask some of the ugly truth. Take VLCCs, for example: there

Figure GRO.7



Sources: Clarksons, Danish Ship Finance

Figure GRO.8



Sources: Clarksons, Danish Ship Finance



are more than 15 vessels on order for each vessel older than 20 years in the fleet! The situation is similar for the larger ship types in the other segments, albeit to a lesser extent for Dry Bulk.

#### THE AVERAGE AGE OF VESSELS SCRAPPED CONTINUES TO DECLINE

The demolition market has stayed high throughout 2015 despite the weak scrapping activity in the tanker segments. During the first ten months of this year 32 million dwt was scrapped. This indicates that annual scrapping for 2015 could surpass 2014 activity by a margin of 10-15% (fig. 10). The average demolition age continues to decline by roughly a year per annum, falling from 32 years in 2011 to 28 years in 2015.

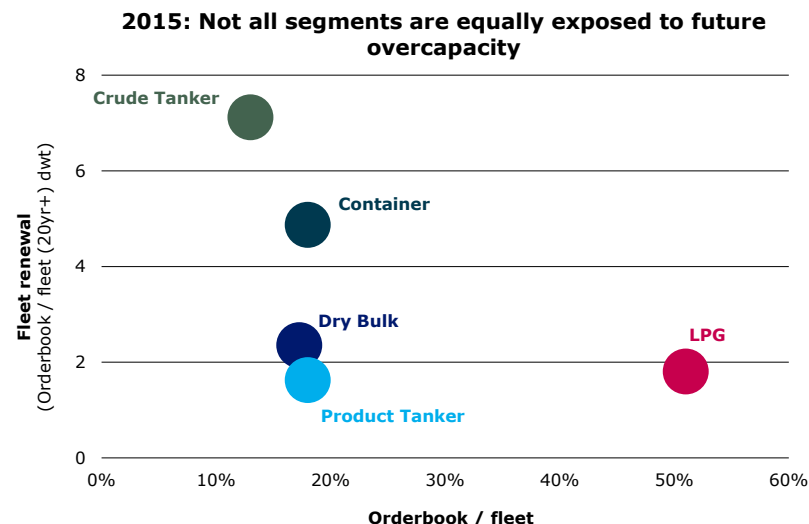
#### DECLINING LIFE EXPECTANCY IS DESTROYING SECONDHAND VALUES

The average age of vessels scrapped becomes a cause for concern if it drops below the vessels' expected technical operating life. In the event of this, premature scrapping is expected to become value-destroying for older vessels, as their expected remaining lifetime (i.e. remaining cash flow period) is reduced accordingly. The improved freight rate environment for both Crude and Product Tankers has increased the average age of vessels scrapped (i.e. lengthened the cash flow period). For both segments, secondhand values have risen throughout the year. The point is that the improved remaining lifetime of the vessels has resulted in an increase in secondhand values beyond the earnings increase, since a longer expected lifetime has been applied to recent valuations. The opposite trend has been seen in the Dry Bulk segment, where only the smaller sizes have maintained an average age of vessels scrapped above the expected technical operating life.

#### SECONDHAND VALUES MAY BECOME MORE VOLATILE

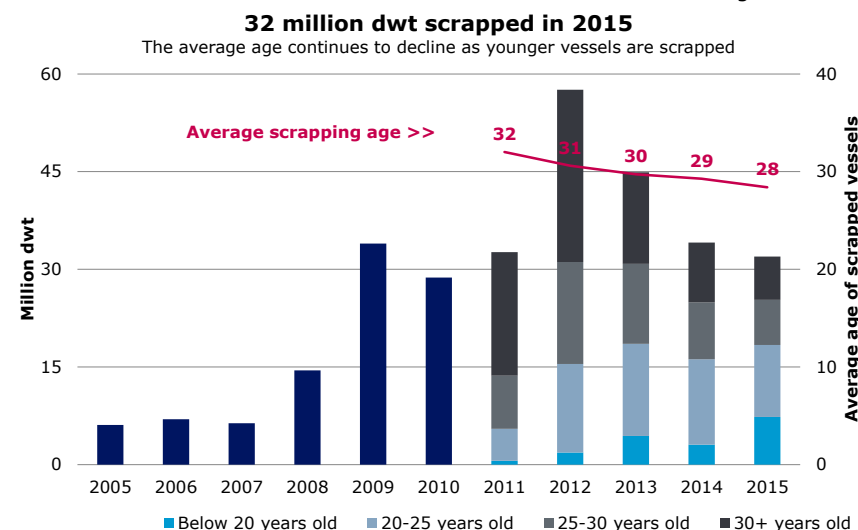
Secondhand values for segments with few obvious scrapping candidates become highly sensitive to changes in demolition activity, since increased activity may cause a significant change in older vessels' expected remaining lifetime. The expected remaining lifetime may fluctuate by as much as three to five years from one year to the next. If that happens, older vessels could, in theory, witness unexpected price changes even in a fairly stable freight rate environment.

Figure GRO.9



Sources: Clarksons, Danish Ship Finance

Figure GRO.10



Sources: Clarksons, Danish Ship Finance

### **THE OUTLOOK IS BLEAK**

On balance, we have an orderbook currently comprising 4,700 vessels, large in size and expected to be delivered within a relatively short period of time. The composite freight rate index clearly illustrates that most segments are already struggling with excessive supply. From our perspective, the demand outlook leaves little hope for a sustainable market recovery in the foreseeable future. True, tanker freight rates remain firm and are expected to remain strong in the next year or so, but it should be kept in mind that freight rate improvements that stem from temporary factors could evaporate as quickly as they appeared. The large inflow of tanker vessels is expected to put pressure on both freight rates and secondhand values in due course.

### **BUT FREIGHT RATE VOLATILITY IS EXPECTED TO PERSIST**

The road ahead is predicted to be bumpy, and we expect to see low, but persistently volatile, freight rates, since systematic demolition of premature vessels is expected to provide temporary relief for the market, but at the expense of secondhand values. This mechanism seems to be the industry's only option to transform equity into cash gradually without impacting the value of the younger vessels any more than the low freight rate market is.

\* \* \*

*Above we have summarised the essence of our market research carried out throughout the last six months. We find it difficult to be optimistic, although it should be borne in mind that changes in the market balance are not always caused by the foreseeable but also by the unknown. For example, increased geopolitical tensions could impact trade patterns and hence reduce fleet productivity. But geopolitical tensions could also increase oil prices and hence reduce the power of the temporary factors currently supporting the tanker segments.*





# SHIPBUILDING

SHIPPING MARKET REVIEW – NOVEMBER 2015



**DANISH  
SHIP FINANCE**

# SHIPBUILDING

LOW CONTRACTING IN THE SHIPPING SEGMENTS HAS ACCELERATED THE CONSOLIDATION PROCESS AMONG YARDS. THE NUMBER OF ACTIVE NEWBUILDING YARDS IS DECLINING RAPIDLY, WHILE CAPACITY REMAINS RELATIVELY STABLE.

## NEWBUILDING PRICES

NEWBUILDING PRICES HAVE COME UNDER INCREASING PRESSURE AS ORDER COVERS HAVE GRADUALLY DECLINED AT MANY YARDS. HOWEVER, SOME VESSEL SEGMENTS ARE MORE EXPOSED TO THE FALLING PRICES THAN OTHERS.

The yard industry is still struggling to approach a better balance between yard capacity and ordering. An increasing number of yards are reported to be in financial distress, which has intensified the consolidation process. The growing divide between first-tier yards, the yards that have received orders within the last 15 months, and second-tier yards, the yards that have not, is becoming even more apparent, with some yards reactivating capacity, some investing in capacity expansions and others closing down newbuilding operations.

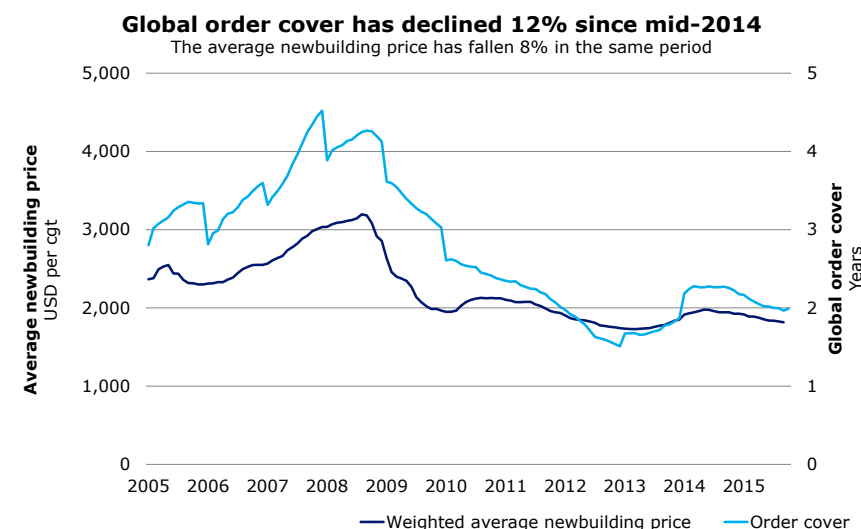
## NEWBUILDING PRICES ARE DOWN BY 8% SINCE MID-2014

Despite a significant slowdown in contracting so far in 2015, the relatively comfortable orderbooks built up during 2013-14 have kept newbuilding prices from falling significantly. Since mid-2014, the average newbuilding price has decreased by 8%, primarily due to falling Bulk and Offshore prices (fig. 1). Tanker newbuilding prices have declined by around 4% and Container prices by 2%. Gas Carriers, on the other hand, have increased by 4% since mid-2014.

## THE GLOBAL ORDER COVER HAS STARTED ITS DESCENT

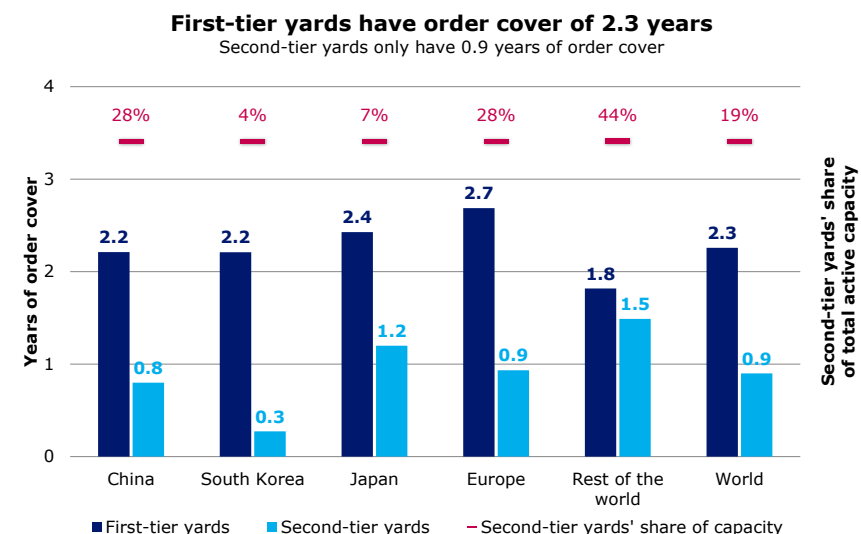
The effects of the contracting boom in 2013 and 2014 have begun to wear off and the orderbook is shrinking, leading to a declining order cover. Since mid-2014, the global order cover has dropped 12%, and as of October, it was just below two years. The first-tier yards have order cover of 2.3 years, whereas second-tier yards only have 0.9 years of order cover (fig. 1 and 2). Considering the current state of the shipping industry with massive overcapacity in several segments, two years of order cover is acceptable. However, if contracting remains low for much longer, some yards will start to get anxious.

Figure SB.1



Sources: Clarksons, Danish Ship Finance

Figure SB.2



Sources: Clarksons, Danish Ship Finance

YARDS REPRESENTING 19% OF GLOBAL YARD CAPACITY HAVE NOT RECEIVED ANY ORDERS DURING THE PAST 15 MONTHS; WE LABEL THESE YARDS SECOND-TIER YARDS. IN CONTRAST, THE FIRST-TIER YARDS RECEIVED ORDERS EQUAL TO 54% OF THEIR COMBINED ANNUAL CAPACITY DURING THE FIRST THREE QUARTERS OF 2015.

#### 24 MILLION CGT WAS CONTRACTED IN THE FIRST NINE MONTHS

Contracting activity slowed in the first three quarters of 2015. During the period, 24 million cgt was contracted, 30% less than in the same period in 2014 (fig. 4). The slump in the Dry Bulk and Offshore markets this year is one of the main reasons for the yard industry's woes. On average, over the last ten years, Bulk orders have accounted for one-third of total contracting measured in cgt. So far in 2015, though, the segment has accounted for only 12%. Tanker and especially Container orders have offset some of the decline, but nonetheless, contracting remains at a relatively low level.

#### THE NUMBER OF YARDS RECEIVING NEW ORDERS IS DECLINING

The consolidation process of the yard industry has been evident in the number of different yards receiving new orders. During the first three quarters of 2015, 174 yards received new orders, a decline from around 890 yards during the same period in 2007. In 2014, the number was 355 yards and in 2013 440 yards. Hence, we have seen a gradually declining trend since 2007.

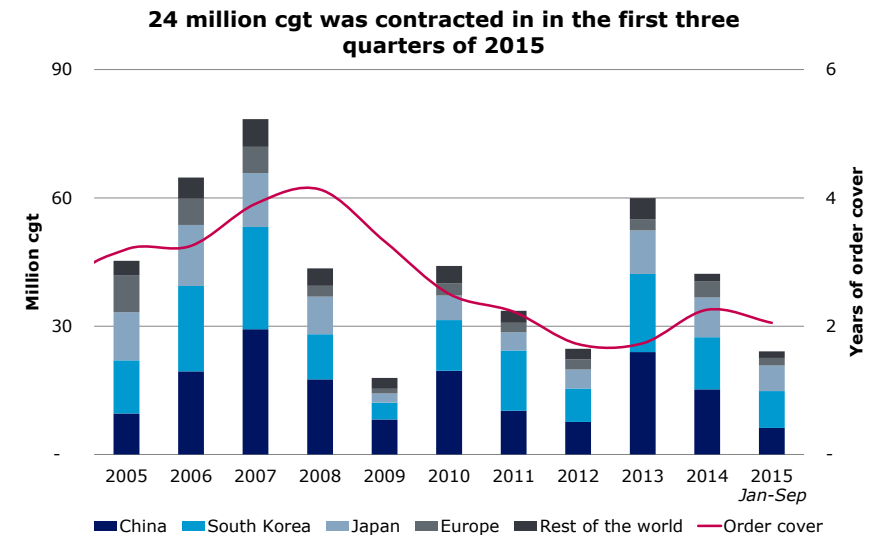
#### CONTRACTING PICKED UP THE PACE IN THE THIRD QUARTER

Towards the end of the third quarter, contracting activity started to increase a bit. The deadline for ordering vessels before the introduction of the new Tier III NOX regulations is approaching fast and might have motivated certain owners to rush some orders through. In order to remain bound by existing regulations, the keel of a vessel has to be laid before 1 January 2016.

#### SOUTH KOREA IS STILL THE FAVOURED SHIPBUILDING NATION

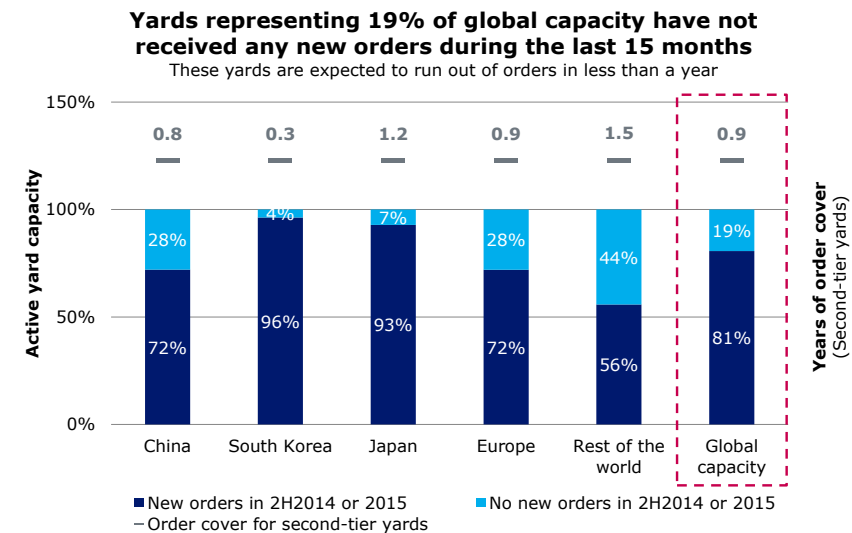
The South Korean yard industry managed to attract 36% of the orders placed during the first nine months of the year, equal to 8.6 million cgt. This was especially due to the country's expertise in building large Container vessels and Tankers. The first-

Figure SB.4



Sources: Clarksons, Danish Ship Finance

Figure SB.5



Sources: Clarksons, Danish Ship Finance

tier yards, representing 96% of the country's yard capacity (fig. 5), restocked 60% of the annual capacity. European owners accounted for 56% of the South Korean orders, measured in cgt (fig. 7).

#### CHINA SUFFERED DUE TO SLUGGISH BULK AND OFFSHORE MARKETS

China restocked only 39% of its annual first-tier capacity during the first three quarters of 2015, attracting 6.2 million cgt. Currently, first-tier capacity constitutes 72% of total capacity, down from around 81% in April this year. This indicates that 2015 has been a hard year for the Chinese yard industry, primarily due to the low level of Dry Bulk contracting. Since 2007, Dry Bulk orders have on average accounted for more than half of total contracting at Chinese yards, but in 2015, this figure has only been 11%. Consequently, only 54 of the country's active newbuilding yards have received new orders during the first nine months, and of the remaining 140 yards, 80 have now been left with order covers of less than one year.

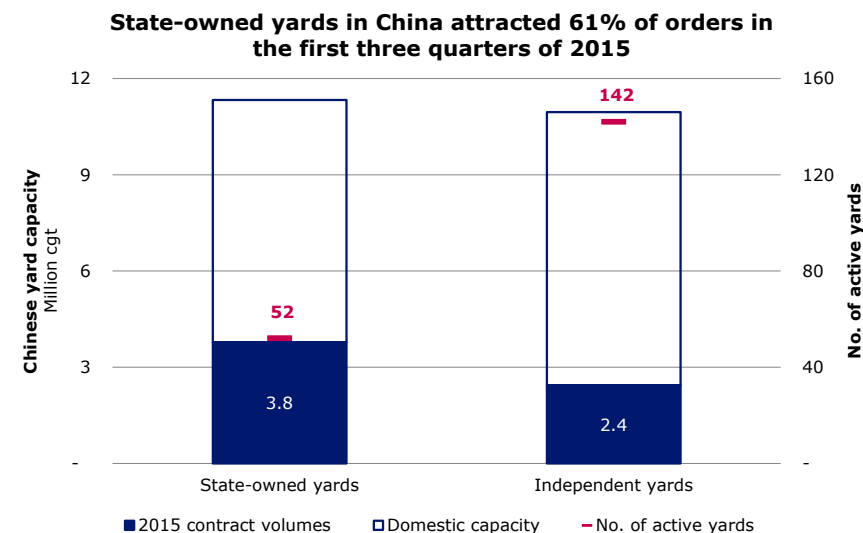
#### CHINA'S STATE-OWNED YARDS HAVE RECEIVED MOST OF THE ORDERS

Since 2010, we have seen a pattern emerge whereby an increasing share of contracting in China is being placed at state-owned yards. Of the 54 Chinese yards that received new orders during the first three quarters, 29 yards were state-owned yards and the remaining 25 were independent. There are currently around 50 active state-owned newbuilding yards in China and 140 independent ones. Hence, the vast majority of independent yards failed to receive any new orders, whereas less than half of the state-owned yards did not attract any orders. On aggregate, state-owned yards represent 50% of China's total domestic capacity, and as of October, were accountable for 58% of the total Chinese orderbook (fig. 6).

#### CHINESE SUBSIDIES ARE AFFECTING CONTRACTING PATTERNS

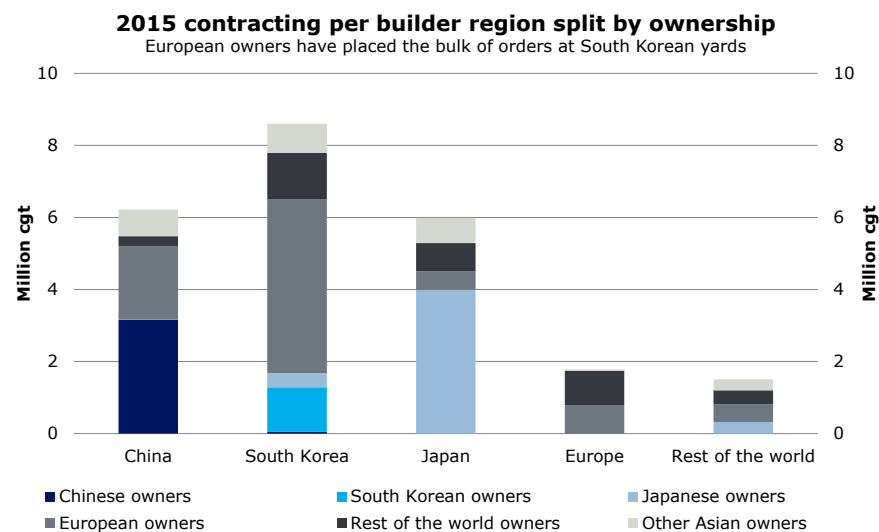
The Chinese government introduced a policy in late 2013 aimed at speeding up the process of scrapping old and polluting vessels while boosting its domestic yard industry. If a shipowner scrapped an old vessel and ordered a new Chinese-flagged replacement vessel at a Chinese yard, that shipowner would receive a subsidy. Since then, the share of Chinese owners placing orders at Chinese yards has increased: in 2015, 51% of all or-

Figure SB.6



Sources: Clarksons, Danish Ship Finance

Figure SB.7



Sources: Clarksons, Danish Ship Finance

ders at Chinese yards have been placed by Chinese owners, up from 28% in 2013. In fact, Chinese owners have only placed orders at Chinese yards this year, with the exception of two orders for LPG carriers placed in South Korea (fig. 7). Moreover, in cgt terms, 94% of the orders placed by Chinese owners have gone to state-owned yards. The policy was supposed to expire at the end of 2015, but the government has announced that it will be extended until the end of 2017.

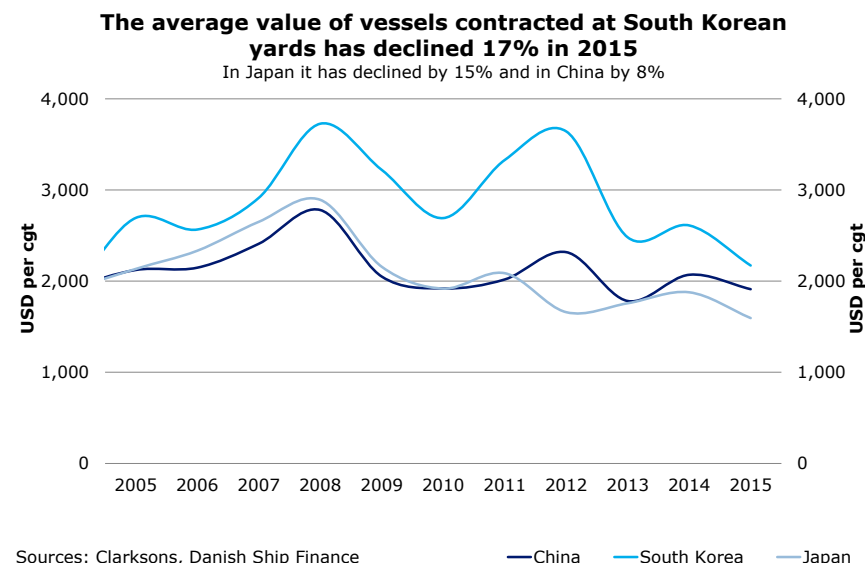
#### JAPANESE YARDS ARE DEPENDENT ON JAPANESE SHIPOWNERS

There are around 40 Japanese first-tier yards, constituting 93% of total domestic capacity. They attracted orders of 6 million cgt during the first three quarters, thereby restocking 71% of annual first-tier capacity. Almost one-third was Container orders and another third Bulk orders. Japanese yards are highly dependent on Japanese shipowners, which accounted for 67% of the orders placed in 2015. This share has increased significantly since 2013, primarily at the expense of orders from European owners.

#### THE VALUE OF THE AVERAGE VESSEL CONTRACTED HAS FALLEN IN 2015

South Korean yards attracted the lion's share of orders during the first three quarters of 2015. However, the average value of orders placed at South Korean yards during the period was 17% lower than in 2014. The value of the average order in Japan declined 15%, whereas it was only down by 8% in China (fig. 8). One of the primary reasons for the larger South Korean decline is that the share of high-value vessel types – in particular LNG, LPG, Offshore and Chemical Tankers – contracted at South Korean yards has gone down in 2015, whereas Containers and Crude Tankers have increased their share of contracting.

Figure SB.8



## GLOBAL DELIVERIES

**DURING THE FIRST THREE QUARTERS OF 2015, 68% OF SCHEDULED ORDERS WERE ACTUALLY DELIVERED. THE DELIVERY PERFORMANCE WAS LARGELY DRAGGED DOWN BY NON-DELIVERIES AT CHINESE YARDS.**

At the start of 2015, 42 million cgt was scheduled to be delivered during the first three quarters, but only 29 million cgt actually was, equal to a delivery ratio of 68% (fig. 9). This was roughly in line with the delivery performance in the same period in 2014. The first-tier yards delivered 75% of scheduled orders, whereas second-tier yards only delivered 40%, primarily due to a poor performance by Chinese yards.

### A GROWING SHARE OF ORDERS HAS BEEN CANCELLED OR POSTPONED

Orders amounting to 3.7 million cgt were cancelled during the first nine months, just over half of which was at Chinese yards. Another 10 million cgt was postponed for later delivery, of which 60% was at Chinese yards. Around 45% of postponements were in the Bulk segment and another 20% in the Offshore segment. Hence, the two markets suffering the most have caused both postponements and cancellations to increase this year compared with previous years.

### SOUTH KOREA HAS DELIVERED 85% OF SCHEDULED ORDERS

South Korean yards delivered 10 million cgt of the 11.8 million cgt scheduled to be delivered during the period, a delivery rate of 85% (fig. 10). The country's 13 first-tier yards delivered 84% of scheduled orders and the 14 second-tier yards 93%.

### CHINA HAS ONLY DELIVERED 54% OF SCHEDULED ORDERS

During the first three quarters of 2015, 18.3 million cgt was scheduled to be delivered at Chinese yards. By the end of September, only 9.9 million cgt had been delivered, corresponding to a delivery ratio of only 54%. The first-tier yards accounted for 84% of all Chinese deliveries in the period, delivering 62% of scheduled orders. The second-tier yards only delivered 33%.

### JAPAN HAS DELIVERED 86% OF SCHEDULED ORDERS

Japanese yards managed to deliver 5.3 million cgt of the scheduled 6.2 million cgt during the period. First-tier yards delivered 86% of orders on time and the second-tier yards 84%.

Figure SB.9

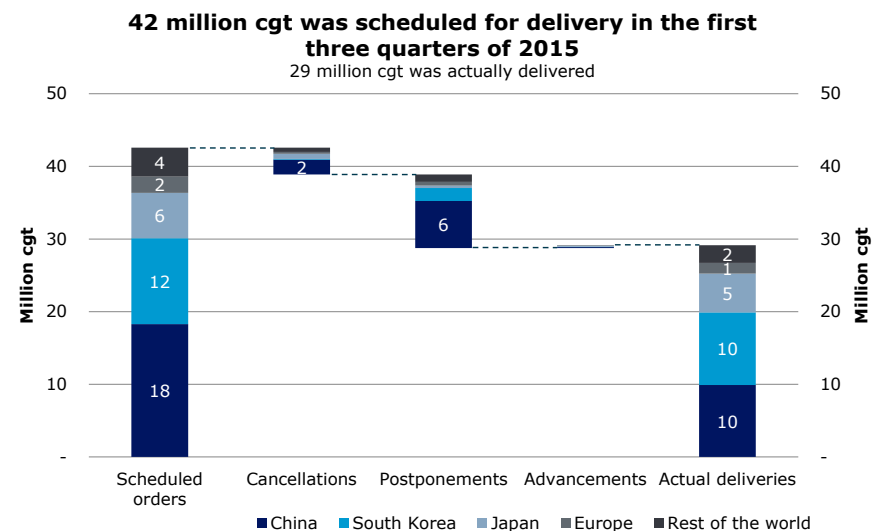
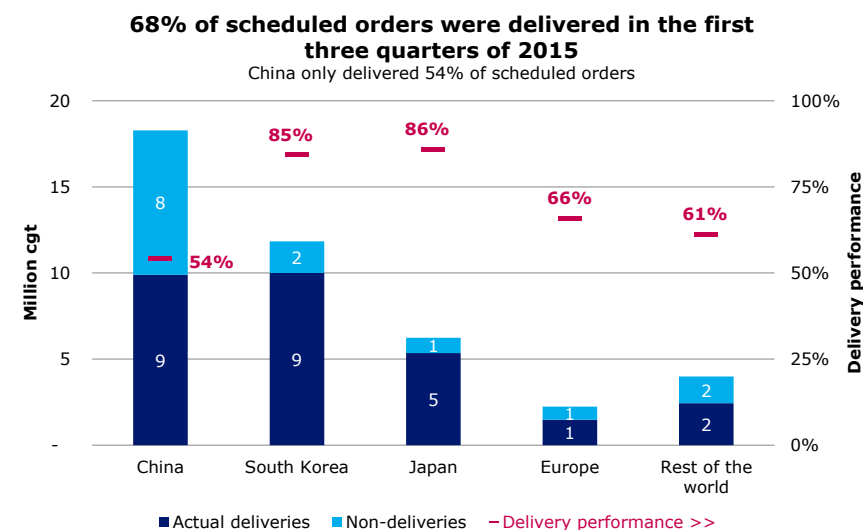


Figure SB.10



## YARD CAPACITY AND UTILISATION

FIRST-TIER YARDS ARE EXPECTED TO HAVE DECREASED ACTIVE CAPACITY IN 2015, WHEREAS SECOND-TIER YARDS SHOULD HAVE INCREASED CAPACITY. UTILISATION HAS CONTINUED TO STAY LOW AT AROUND 71%.

As we also touched upon in our report from May, yard capacity is a rather intangible concept and to get a better handle on it, we have chosen to distinguish between a yard's historical maximum capacity, capacity that has been idled and that can be re-activated if necessary, and active capacity, capacity that is currently being utilised. This approach clearly has its shortcomings, but it also allows us to gain some insight into the dynamics of the industry that would otherwise be difficult to grasp. Consequently, when we state that first-tier capacity has expanded, it does not necessarily mean that we believe that new capacity has been added to the industry. Rather, it could be because we have been too quick to assume that capacity has been idled at some of the bigger yards in the past. Consequently, the important points to note are not how much cgt capacity has declined or increased, but rather the direction capacity is trending and the number of yards involved in the game.

### GLOBAL YARD CAPACITY HAS MAINTAINED THE STATUS QUO

The relatively low contracting activity in 2015 is intensifying the speed at which the yard industry is consolidating. The number of yards receiving new orders is declining, but at the same time we are seeing orderbooks grow at some first-tier yards. Several yards, especially in Japan, have announced that they are investing in new capacity to accommodate the trend of larger and larger vessels being ordered. Hence, the divide in the industry is becoming more pronounced, even though global yard capacity remains more or less constant. We are seeing first-tier capacity expand in South Korea, Japan and Europe, while it is contracting in China. The opposite is the case for second-tier capacity. Chinese second-tier capacity is growing, while it is decreasing in South Korea, Japan and Europe (fig. 11). So even though we are seeing yards struggle in all regions of the world, it is the Chinese yards that are under the greatest pressure.

### SECOND-TIER YARDS' SHARE OF GLOBAL CAPACITY HAS INCREASED

Since the number of yards receiving new orders is declining, we

Figure SB.11

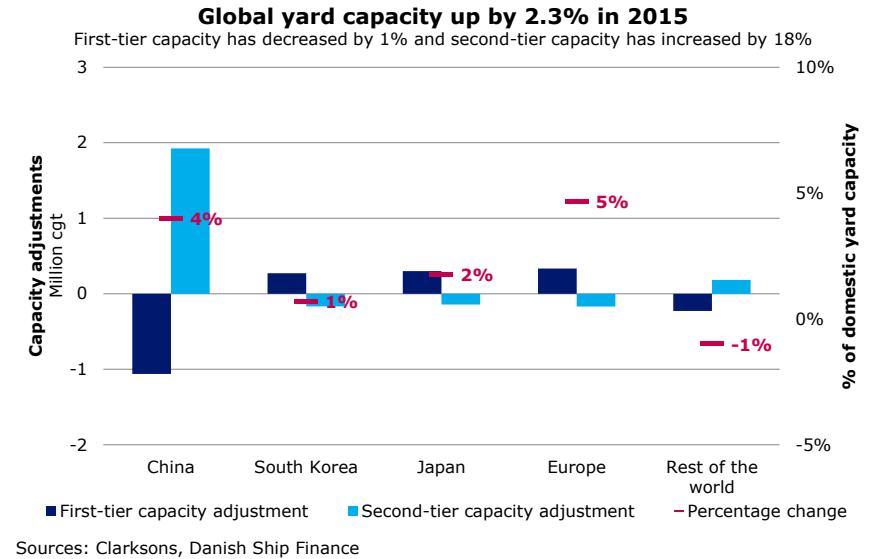
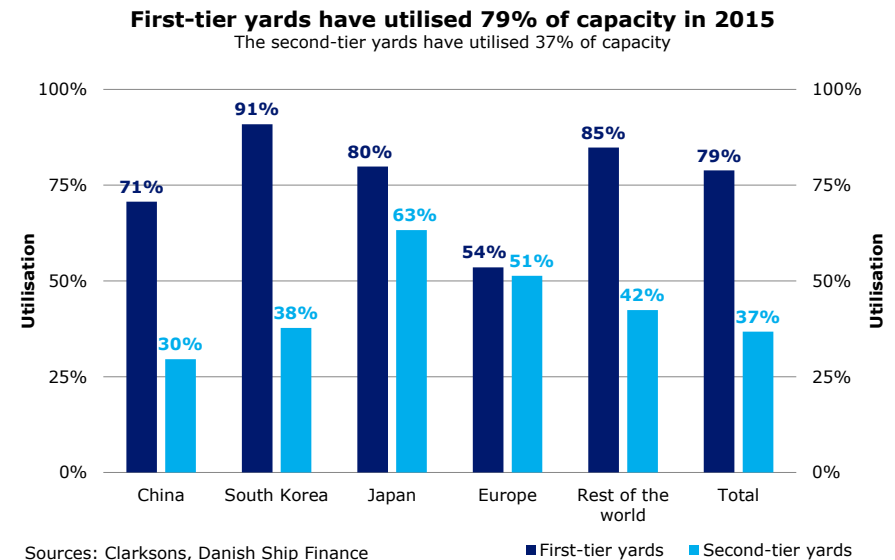


Figure SB.12





have seen some of the yards that we labelled first-tier yards back in May move into the second-tier group. This has led the second-tier yards' share of global yard capacity to increase. In 2014, second-tier yards constituted 16% of global yard capacity. In October 2015, they constituted 19%. China's share of second-tier yards has shown the strongest growth, increasing from 19% to 28% of domestic yard capacity. Overall, global yard capacity has remained at more or less the same level as we saw in 2014.

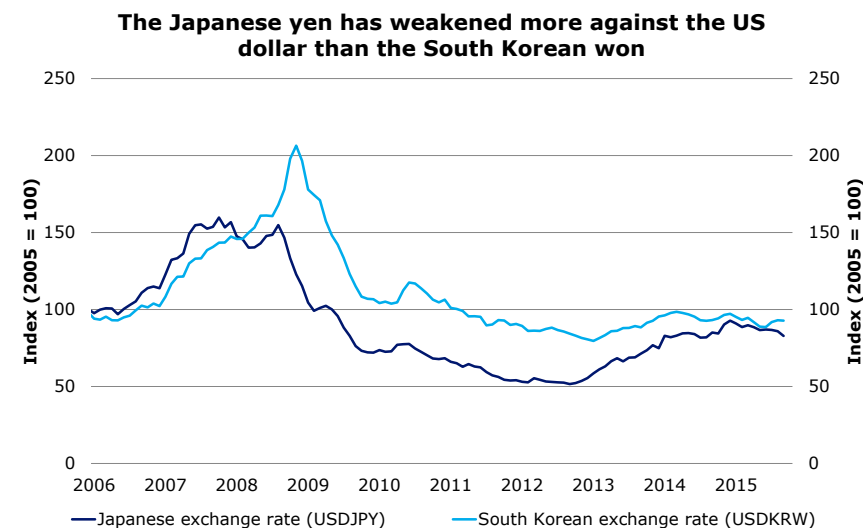
#### GLOBAL YARDS UTILISED 71% OF CAPACITY DURING Q1-Q3 2015

Yard utilisation during the first nine months of the year amounted to 71%, an improvement of 3 percentage points from 2014. However, due to the relatively low delivery ratio, this was not as high as the large orderbook had led us to believe. First-tier yard utilisation grew to 79%, up from 73% in 2014, whereas second-tier utilisation dropped to 37% from 43% in 2014 (fig. 12).

#### CURRENCY FLUCTUATIONS ARE SUPPORTING JAPANESE YARDS

The appreciation of the US dollar has played a vital role in the performance of the Shipbuilding industry. Ship prices are usually quoted in dollars and the depreciation of the Japanese yen, the South Korean won and the Chinese yuan have all provided shipbuilders with much-needed support. Despite weakening currencies in all countries, the Japanese Shipbuilding industry has benefitted the most, due to the country's sluggish economy (fig. 13). This has improved the Japanese yards' competitiveness against their South Korean neighbours, where a lot of yards are currently struggling with red numbers. As a result, we are seeing more Japanese yards investing in capacity expansions as well as engaging in mergers and acquisitions.

Figure SB.13



Sources: Clarksons, Danish Ship Finance



## OUTLOOK

GLOBAL YARD CAPACITY HAS ALREADY BEEN SIGNIFICANTLY CONSOLIDATED SINCE THE PEAK IN 2010-11. NONETHELESS, DUE TO THE OVERSUPPLY IN MANY SHIPPING SEGMENTS, WE EXPECT MORE YARDS TO BE CLOSED AND MORE CAPACITY TO BE IDLED IN THE YEARS TO COME IN ORDER TO ADJUST TO LOWER FUTURE DEMAND.

Little has changed for the better since our last report on the Shipbuilding market and contracting has continued at a subdued pace. The upcoming Tier III NOX regulations have not renewed owners' appetite for more vessels sufficiently, and the already strained Shipbuilding industry needs to deal with its overcapacity issues promptly. We have begun to see more mergers and acquisitions in the industry, as well as restructuring processes and bankruptcies, and we expect more to come.

### THE ORDERBOOK IS STILL HUGE, BUT DECLINING

The amount of orders scheduled for delivery in 2015 has been huge and looks set to be only marginally lower in 2016. That said, the global orderbook has declined by around 10% since the beginning of October 2014, and the effect of this decline will be felt in 2017 if contracting activity does not pick up. Scheduled orders for 2017 are currently half the amount expected in 2016. It is likely that more contracts can and will be placed for delivery in 2017, but in order for the same level to be reached as in 2016, an additional 20 million cgt has to be contracted within a short period of time. Historically, the bulk of contracts have been placed two years prior to delivery. Hence, there are still a few months for contracting activity to speed up, but currently there are no explicit trends supporting an acceleration of activity. The Tier III NOX regulations could add some new orders, but probably not to the extent that the amount of scheduled orders in 2017 matches that of 2016.

### CHINESE YARDS ARE MOST EXPOSED TO LOW CONTRACTING ACTIVITY

As of October, the Chinese yards are scheduled to deliver 74% of their combined orderbooks before year-end 2016 (fig. 15). Some of these orders will most likely be postponed for later delivery, but nevertheless, a lot of Chinese yards will be facing empty orderbooks if contracting activity does not pick up. The

Figure SB.14

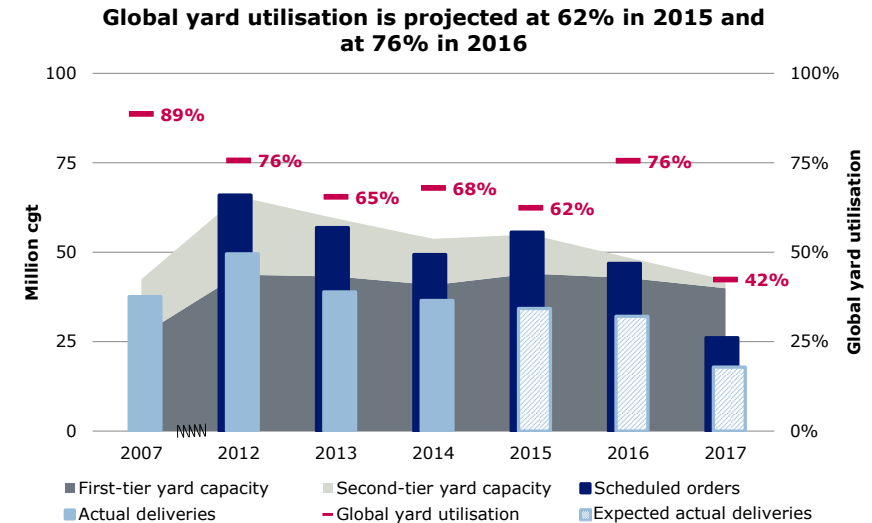
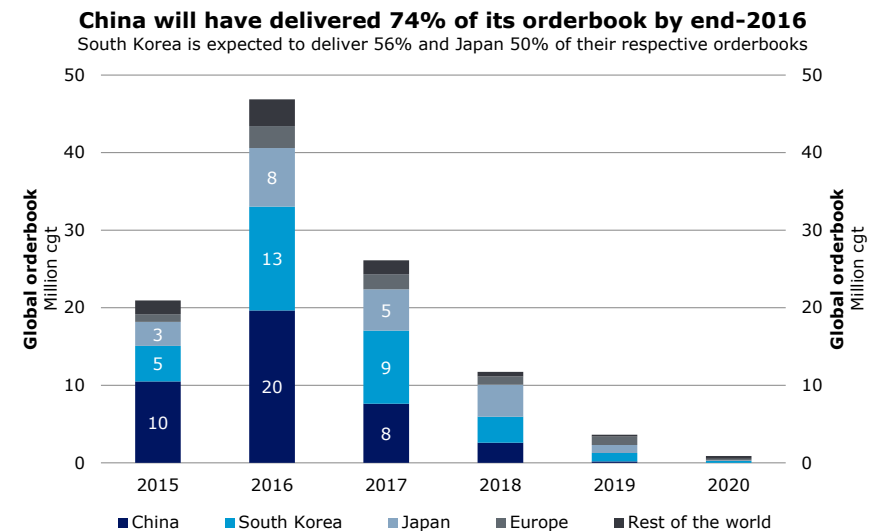


Figure SB.15



situation is not as dire in South Korea and Japan. By end-2016, they will have delivered 56% and 50% of their respective order-books.

#### LESS CONTRACTING NOT THE ONLY REASON FOR FALLING ORDERBOOK

Yards are not only struggling with lower order intake. We have seen a substantial amount of orders scheduled for delivery in 2016 ( $\approx 2.5$  million cgt) and 2017 ( $\approx 0.7$  million cgt) cancelled during 2015 – double the level of cancellations in the same period in 2014. Combined, these equal 3% of the current orderbook. If the Bulk and Offshore markets continue to struggle with overcapacity, cancellations could intensify and push order covers and utilisation down even further.

#### YARD UTILISATION FOR 2015 IS EXPECTED TO BE AROUND 62%

As mentioned, the orderbook for delivery in 2015 has been huge, boosting hopes that utilisation of global yard capacity in 2015 will be higher than the levels seen in the last couple of years. However, delivery ratios have been kept low. We expect total deliveries for 2015 to be around 35 million cgt, which is only 62% of scheduled orders at the beginning of the year. Consequently, despite a utilisation rate of 71% in the first three quarters, we expect yard utilisation to decline to around 62% for the whole year, compared with 68% in 2014. The main reasons for the decline are a weak Bulk market and an even weaker Offshore market (fig. 14).

#### GLOBAL YARD CAPACITY WILL CONTINUE DOWNWARDS

A utilisation rate of only 62% will increase the likelihood of more yards reducing active capacity or completely closing down newbuilding activities. If the industry continues down the current path, we expect a significant correction in global yard capacity in 2016. On aggregate, yard capacity could decline by 12%, with a 3% decrease in first-tier capacity and a 48% decline in second-tier capacity. That would imply global capacity falling from around 54 million cgt in 2015 to around 48 million cgt by year-end 2016.

#### THE NUMBER OF ACTIVE YARDS COULD DECREASE DRAMATICALLY

As the number of yards without any new orders increases, so does the number of yards at risk of closure. Adding to this is the growing number of acquisitions, which also reduces the number of independent market players. According to our estimates, the

Figure SB.16

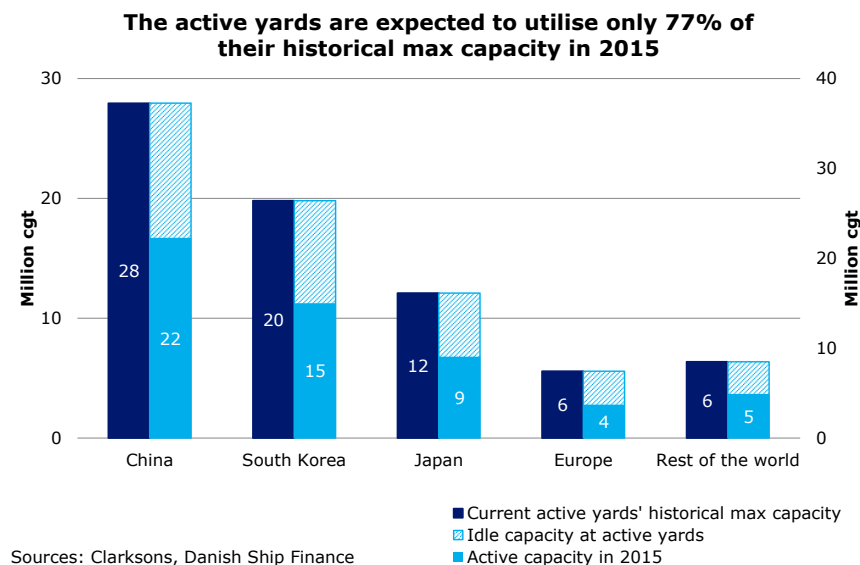
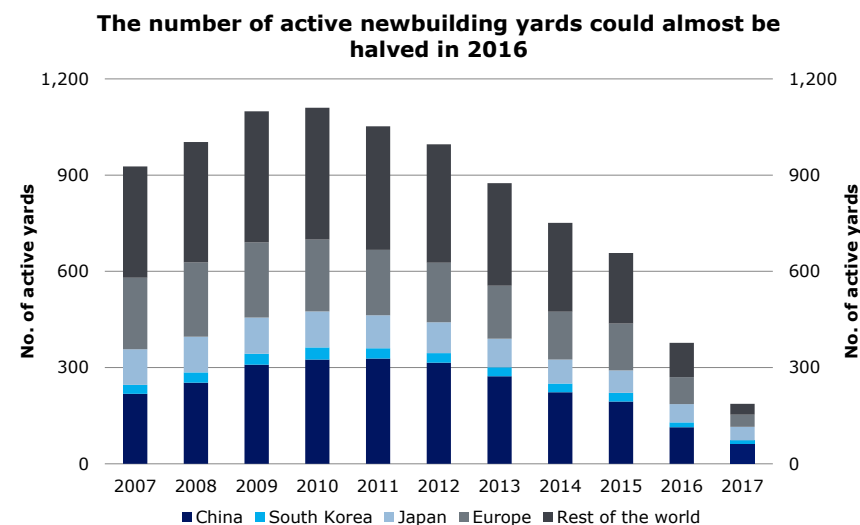


Figure SB.17



number of active newbuilding yards could be reduced to around 380 by year-end 2016, down from around 660 yards in 2015 (fig. 17). One of the main reasons we expect such a dramatic decline is that around half of active yards currently have less than one year of order cover (fig. 18). The actual decline might not happen as swiftly as that, but we are convinced that we will see a notable reduction within the next 12 to 15 months, primarily among Chinese independent yards.

#### BY 2017 YARD CAPACITY COULD RESEMBLE THAT OF 2007

By 2017, the number of active yards could be reduced to around 200 yards, compared with around 900 in 2007 (fig. 17). Despite this significant reduction, we expect 2017 capacity to be around the same level as in 2007 (fig. 14), indicating that the industry has already come a long way in terms of consolidation.

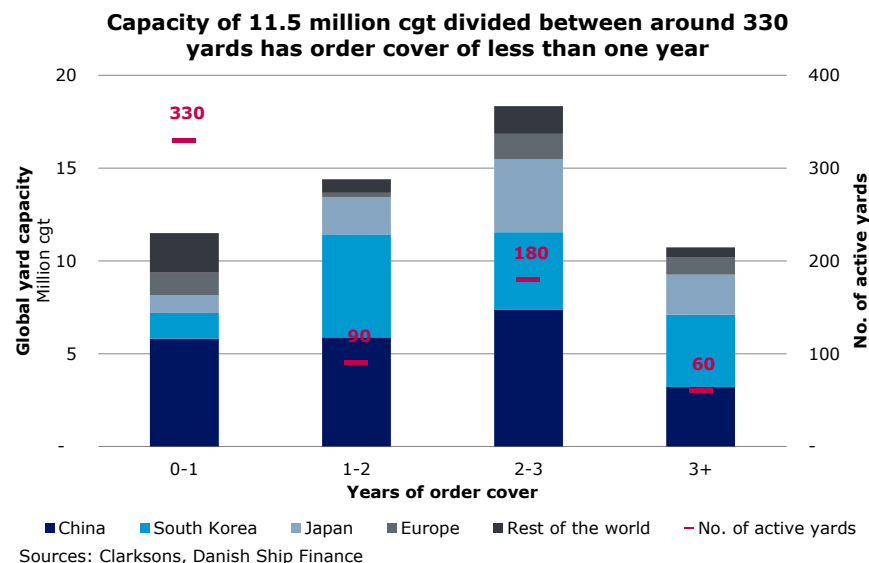
#### CHINESE YARDS WILL BEAR THE BRUNT

China has by far the highest number of active newbuilding yards, and is also expected to see the majority of the reduction of active yards. By the end of 2016, the number of active Chinese yards could decline from just below 200 to around 110 yards. Moreover, the vast majority of the expected reduction will be concentrated around independent yards. The state-owned yards are expected to be better positioned, partly because they have stronger order covers and partly because they are expected to have easier access to financing and refund guarantees through their state ownership. Yard closures and additional consolidation will also take place in South Korea and Japan; however, these two nations already have relatively consolidated industries and the capacity adjustments will therefore not be as extensive.

#### THE CURSE OF BUILDING OFFSHORE CONSTRUCTIONS

Shipbuilders naturally act in accordance with trends in the shipping industry. When merchant shipping ran into trouble in the wake of the financial crisis, shipbuilders gradually reduced their exposure to the various segments of the merchant fleet. Consequently, many yards began to look to the Offshore segment, which had not been affected by the crisis to the same extent. South Korean yards in particular started taking orders for Offshore vessels and units. They soon learned that building Off-

Figure SB.18



shore constructions was not like building merchant vessels. Unforeseen production costs and delays quickly turned into losses for many of the yards and some are now turning their focus back towards the merchant vessel segments.

#### CHINA'S ATTEMPT TO CLIMB THE COMPLEXITY LADDER

In the years following the financial crisis, Chinese shipbuilders also sought to advance their positions in the market and shed China's reputation as a low-quality and low-complexity builder nation. The Chinese government promoted this strategy and urged the nation's builders to focus more on Offshore construction. To accommodate this strategy, Chinese companies began acquiring several companies involved in producing Offshore and marine equipment. Moreover, to attract Offshore orders, Chinese yards began offering extremely favourable contracts that, for example, allowed owners to pay a minimal down payment. The strategy worked and a lot of Offshore contracts were placed at Chinese yards in 2013 and 2014. However, it was not long before the oil price plummeted, sending ripples through the oil

industry, from the oil majors all the way down to the shipbuilders. All of a sudden, the strategy of offering favourable contracts backfired on the Chinese yards, and in 2015 we are witnessing the consequences. Even though the yards are managing to build the vessels on time, some shipowners would rather sacrifice the down payment paid at the initiation of the contract than take delivery of a vessel that cannot find employment. In the end, the shipbuilders are left with the bill. This has put additional pressure on the already oversupplied Chinese Shipbuilding industry and is another factor pointing at yard closures in the next couple of years.

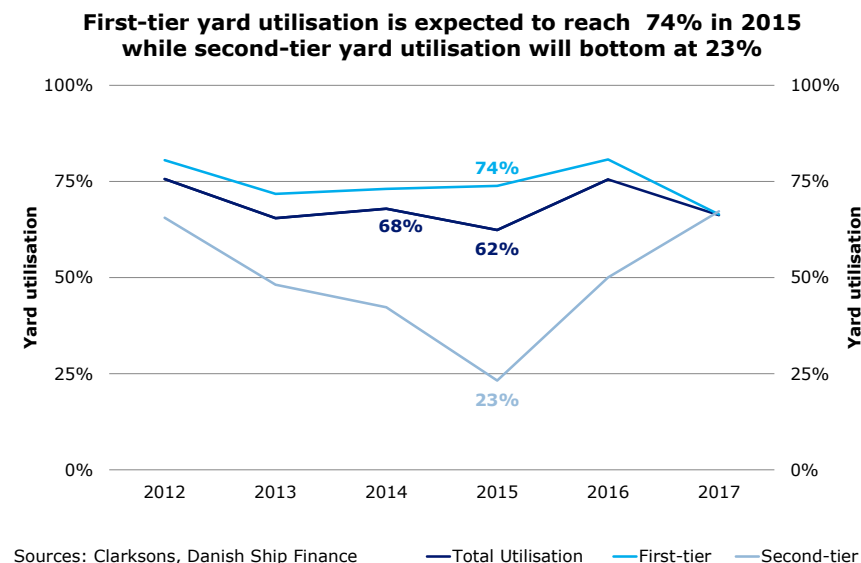
#### NEWBUILDING PRICES WILL REMAIN UNDER PRESSURE

There are a number of trends that indicate lower newbuilding prices in the short term. Even though capacity is expected to decline and thereby strengthen the bargaining power of yards, there are many factors that could put continuous pressure on prices. The downturn in Offshore will cause many yards to pull out of that market and return to the merchant vessel segments, creating even more competition for orders. However, many yards are now in such dire financial straits that they will struggle to survive for long under the current market conditions; all else being equal, this will surely speed up the consolidation process. Yards with some sort of state affiliation might be better positioned to survive the coming years, as financing in general is becoming harder for the industry to secure. All in all, we expect that the pressure on newbuilding prices will be maintained, especially in certain segments (e.g. Bulk), and create a harsh environment for the Shipbuilding industry in general in the short term. However, there might be some new opportunities for the industry in the medium to long term.

#### WILL TECHNOLOGICAL ADVANCES CHANGE THE INDUSTRY?

Although the short-term prospects for the yard industry seem bleak, there are different shifts taking place in the shipping industry and in the world economy in general that could favour shipbuilders in the medium to long term. We have already begun to see an increased focus on ways to improve operational efficiency in shipping. Some of the leading shipyards are entering into partnerships with third parties for the purpose of developing the vessel designs of tomorrow – for example a “smart”

Figure SB.19



vessel connected to the internet of things, allowing shipowners to optimise the performance of each vessel in real time. Given the tough market conditions, it makes a lot of sense for yards to try and differentiate themselves from the competition and engage in new innovative projects.

#### AUTOMATION IS GAINING GROUND

But why stop at connected smart vessels? Automation is gaining ground across various industries. Miners, such as Rio Tinto, are experimenting with autonomous vehicles for transporting mining output from the mines to the ports, and robots have taken over more or less the entire production process in the automotive industry. The future could very well bring about some degree of automation of vessels. Hence, even though several shipping segments are heavily oversupplied at present, there may be a point in time, maybe five to ten years down the line, when a new generation of vessels will need to be phased in and the Shipbuilding industry will once again see growing demand.

#### **ENVIRONMENTAL REGULATIONS AFFECT VESSEL DESIGNS**

The yard industry could also get help from a more unexpected quarter – the environment. Environmental regulations are being implemented at an even pace at the moment and a scenario with stricter legal requirements for vessel designs might not be that far off. Currently, the majority of regulations being implemented are not retroactive and are therefore of no concern to existing vessels. However, the focus on limiting pollution is intensifying and there might come a time where regulations apply to old vessels, requiring them to be replaced by new and more environmentally sound vessels.

#### **NEW VESSEL DESIGNS COULD SPARK ANOTHER NEWBUILDING BOOM**

So, is it unrealistic to imagine a scenario where the vessels ordered over the last couple of years, at the bottom of the market, become outdated within the near future – a future where “smart” or autonomous vessels are the new norm? We do not necessarily think so. In fact, we believe there could be a new wave of newbuilding where the vessel designs of tomorrow are implemented. In such a scenario, yards will play a crucial role in acquiring the right capabilities for building the new generation of efficient and eco-friendly vessels. The yards able to acquire these capabilities will benefit substantially, whereas low-complexity builders might find it difficult to compete. Hence, although new vessel designs and requirements might spark a newbuilding boom, it might not encompass all players. Rather, it might intensify the consolidation of the industry further.



# CONTAINER

SHIPPING MARKET REVIEW – NOVEMBER 2015



**DANISH  
SHIP FINANCE**

# CONTAINER

HAS THE BATTLE FOR MARKET SHARE BECOME MORE IMPORTANT THAN REVENUES? LOOKING AT THE CURRENT CONTAINER INDUSTRY, ONE WOULD THINK SO. ALL BETS ARE BEING PLACED ON BIGGER VESSELS, EVEN THOUGH THE VOLUMES TO JUSTIFY THESE VESSELS ARE NOWHERE TO BE SEEN. ACCORDING TO OUR 2030 SCENARIO, THE FUTURE COULD BRING BOTH LOWER VOLUMES AND SHORTER TRAVELLING DISTANCES.

## FREIGHT RATES

BOX RATES HAVE HAD A HARD YEAR SO FAR IN 2015, PRIMARILY ON THE TRADES OUT OF CHINA. THE TRADES OUT OF EUROPE, ON THE OTHER HAND, HAVE PERFORMED WELL DUE TO THE APPRECIATION OF THE US DOLLAR, WHICH HAS BOOSTED EXPORTS, ESPECIALLY TO NORTH AMERICA.

### THE AVERAGE BOX RATE OUT OF CHINA IS DOWN BY 15% IN 2015

As illustrated in the graph to the right, the average box rate out of China was under pressure during the first three quarters of 2015, falling by 15% on average compared with the 2014 average (fig. 1). By October, the average box rate had fallen to a level not seen since 2009. However, there are variations between the trade lanes: the biggest downturn has been on the Asia-Europe trade, where volumes have declined at the same time as capacity has expanded, pushing down freight rates. The westbound transatlantic head-haul trade, on the other hand, has benefitted from the appreciation of the US dollar and freight rates have increased, whereas the opposite is the case for the eastbound transatlantic trade.

### TIMECHARTER RATES HAVE BEEN BOOSTED BY TEMPORARY EFFECTS

During the first half of 2015, timecharter rates continued on the upward trajectory that commenced in late 2014. The third quarter, however, saw lower rates, and our Profitability Index is steadily approaching the low levels of 2013 and 2014. Timecharter rates are still up 18% on the 2014 average, but have been declining since their peak in May as the effects of temporary events have worn off – for example, the port congestion on the US west coast and the new intra-Asian services introduced at the start of the year that were later cancelled due to disappointing demand. A 4,400 teu Panamax peaked at around USD 15,350 per day in May, but fell to USD 10,000 per day in September.

Figure C.1

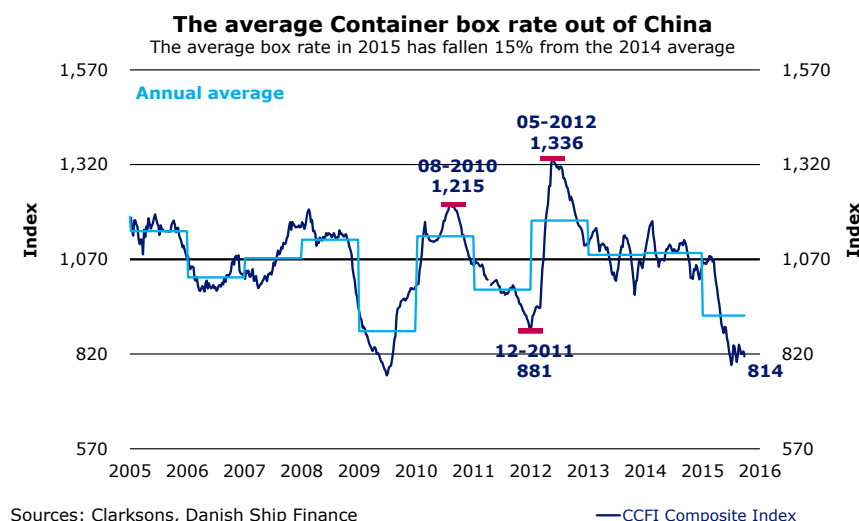
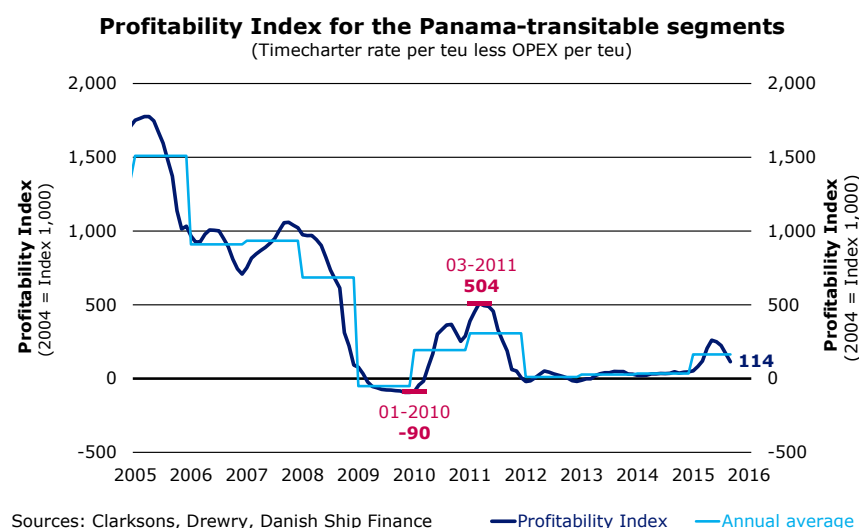


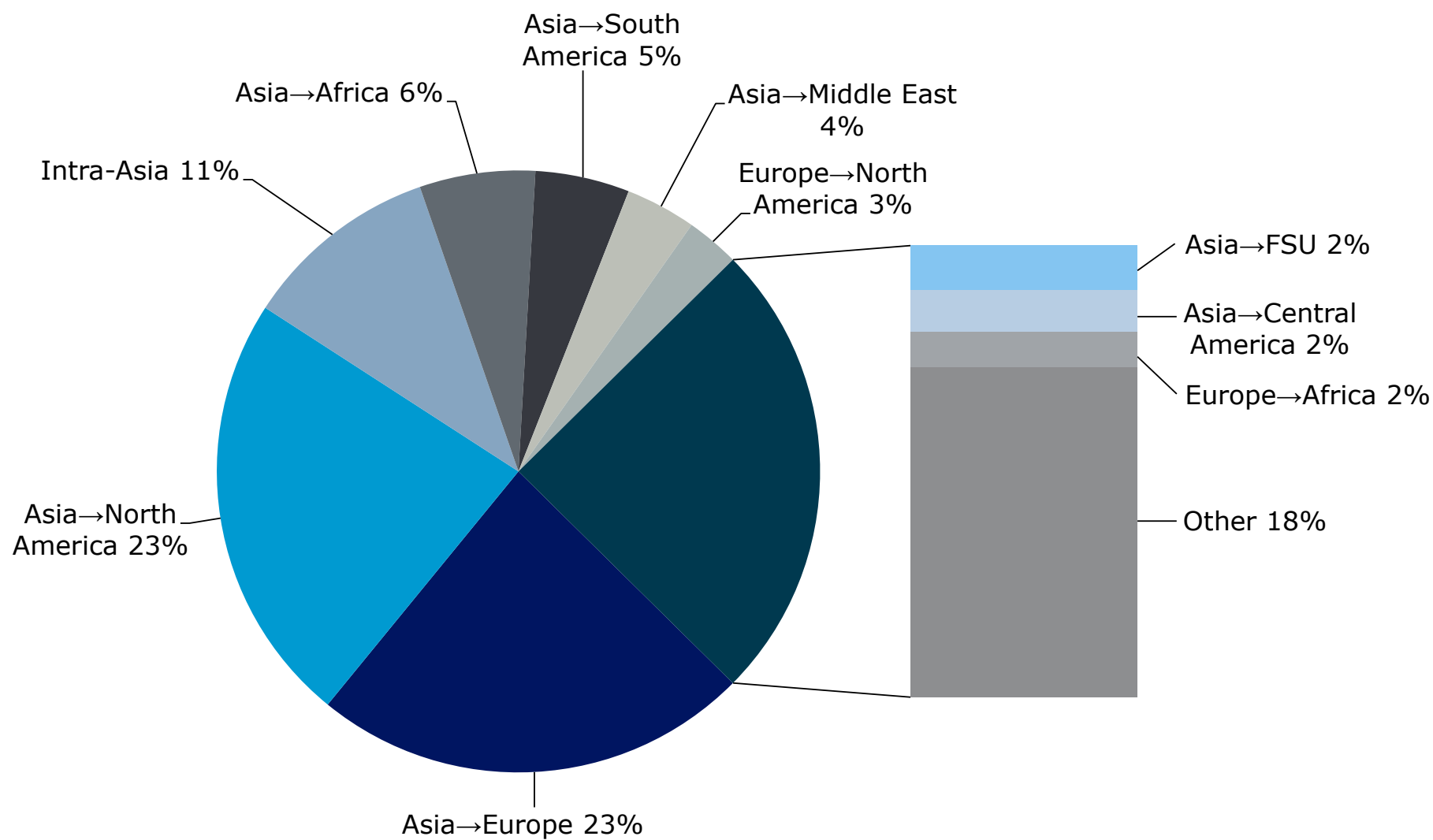
Figure C.2





## Top-ten head-haul Container trades 2015

Measured in teu-miles



Sources: IHS Global Insight, Danish Ship Finance



## SUPPLY & DEMAND

**SUPPLY HAS CONTINUED TO GROW AT A RAPID PACE, WHILE GROWTH IN SEABORNE CONTAINER DEMAND HAS SLOWED. THE OVERSUPPLY SITUATION HAS DETERIORATED FURTHER.**

Tensions are building up in the Container industry. The oversupply situation has worsened because tonnage continues to be delivered and the available measures for easing the downward pressure on box rates have almost been exhausted. Speeds have been reduced, cascading has been adopted, numerous rate increases have been attempted, and both void sailings and cancellations of services have been introduced – all to no avail. Moreover, demand has been weaker than projected, entrenching the Container market further in the negative spiral that it seems to be stuck in.

### 1.3 MILLION TEU WAS DELIVERED IN THE FIRST THREE QUARTERS

Delivery of new vessels into the Container fleet continued apace during the first three quarters of 2015. Of the 1.55 million teu that was scheduled to be delivered during the period, 1.3 million actually materialised, resulting in an 83% delivery ratio (fig. 5). Of the 250,000 teu that was not delivered, a small share was cancelled (50,000 teu), while 200,000 teu was postponed for later delivery. By October, the fleet had expanded by 6% since the start of the year, and the average size of a delivered vessel had grown from 7,500 teu in 2014 to 8,500. By year-end 2015, we expect fleet growth to reach 8%. The continuous inflow of very large vessels constitutes a growing concern, because, as mentioned, cascading is no longer effective. For market fundamentals to improve, more vessels need to be idled. Currently, around 3% of the Container fleet is lying idle.

### SCRAPPING ACTIVITY HAS BEEN SUBDUED IN 2015

The urgency of scrapping tonnage due to dramatic declines in freight rates has not been felt by the Container industry. The tonnage scrapped during the first three quarters of 2015 only amounted to 110,000 teu – one-third of the amount scrapped in the same period in 2014 (fig. 4). Panamax vessels were still the preferred scrapping candidates and the Panamax fleet contracted by 1% during the first nine months of 2015. The Feeder segment also saw a 2% decrease in fleet size, whereas the Handy segment grew by 1% and the Post-Panamax segment by 12%. The average scrapping age remained constant at 23.5 years. The improvement in the charter market during the first two quarters of

Figure C.4

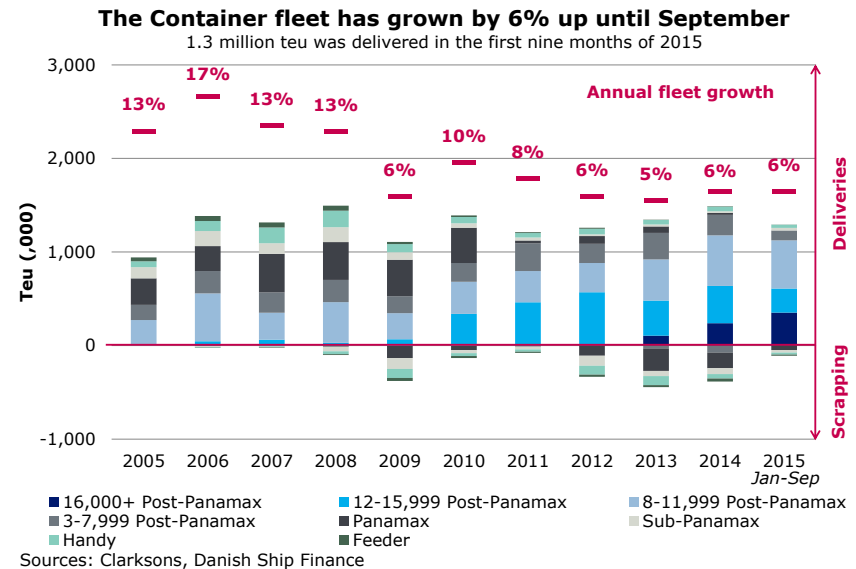
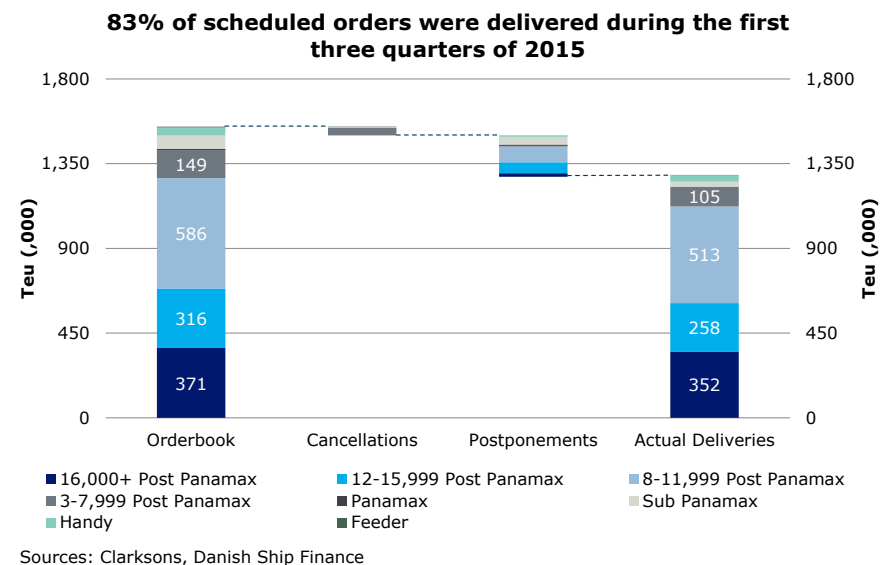


Figure C.5



the year might have given owners an incentive to postpone scrapping of some vessels; however, as rates are moving downwards, we could see scrapping activity pick up towards the end of the year.

#### SEABORNE CONTAINER DEMAND HAS BEEN REVISED DOWN

The world is currently facing a lot of geopolitical tensions, spanning the Russian sanctions, the turmoil in the Middle East, the debt crisis in Greece and the rebalancing in China – to name but a few. Being so closely correlated with macroeconomic events, sea-borne Container trade is unable to avoid being affected by such tensions. This became apparent in the first three quarters of 2015 and as a result, IHS Global Insight revised down its overall expectation for trade growth in 2015 from 4.4% in April to 2.2% in October (fig. 6). Distance-adjusted demand is expected to grow at the same pace as nominal demand.

#### THE ASIA-EUROPE TRADE IS UNDER PRESSURE

Growth in European Container demand in 2015 has so far been disappointing and is expected to decline by 1% this year, compared with a 6% increase in 2014. Combined with the turbulence in the Chinese economy, this has put an enormous strain on the Asia-Europe trade, and trade growth has been negative for much of the year (fig. 7). The slowdown in European demand has primarily been due to negative demand growth from Russia and Ukraine, but is also explained by slowing growth in many of the biggest import countries. Overall, the Eurozone showed weakness during the first three quarters of 2015, not least because of the debt issues in Greece, which have sent substantial ripples through the region as a whole.

#### MIXED PICTURE ON THE TRANSATLANTIC TRADE ROUTE

The North American economy has been doing well compared with the rest of the world, and the US dollar has strengthened significantly over the last two years. This has made imported goods cheaper for American consumers and boosted seaborne Container demand, which is expected to grow by 8% in 2015. As a consequence, volumes have strengthened on the westbound leg of the transatlantic trade lane but weakened on the eastbound leg. The Transpacific trade has shown a similar pattern.

#### ASIA'S INTRA-REGIONAL TRADE HAS BEEN DRAGGED DOWN BY CHINA

Intra-regional trade in Asia has also been affected by the slowdown in China and the weak European demand. IHS Global In-

Figure C.6

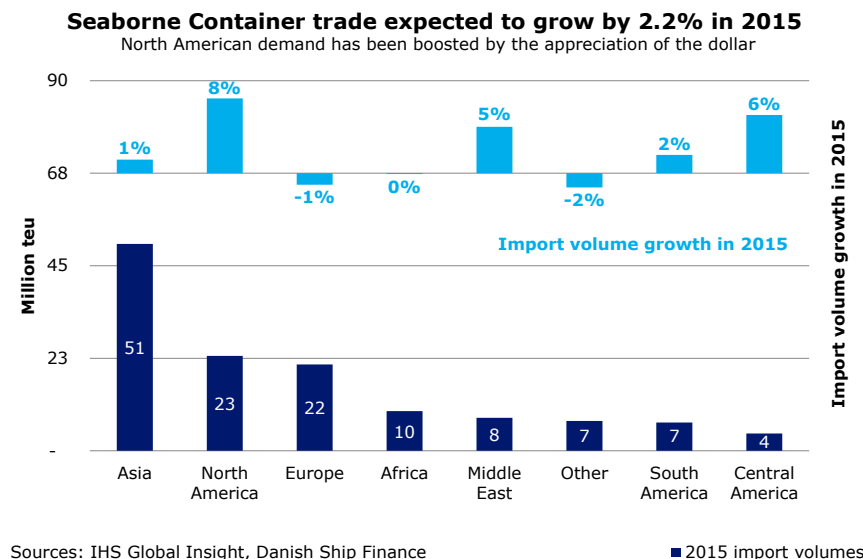
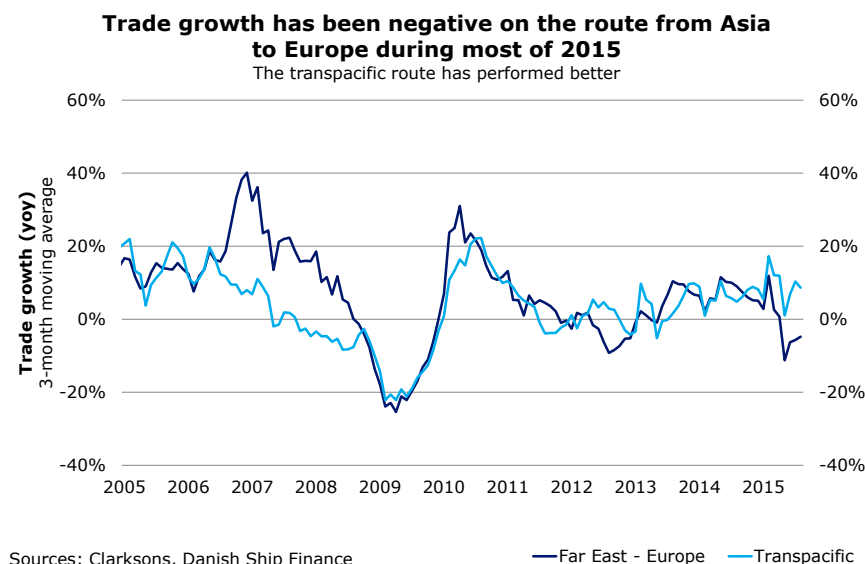


Figure C.7



sight downgraded their growth expectations for 2015 from 5.4% in April to 3.2% in October. In particular, expectations for China's demand for components from South Korea, Taiwan and Hong Kong have weakened. These three countries usually supply China with the high-value-added components for its manufacturing sector. However, we have begun to see a larger share of these components being sourced from the South East Asian countries, and more importantly, we have seen the manufacturing sector in China contract.

#### CHINA'S MANUFACTURING SECTOR IS CONTRACTING

Over the year we have seen the Purchasing Managers' Index (PMI) in China decline below the critical value of 50. The index is an indicator of how the manufacturing sector is performing. A value above 50 means that the sector is expanding, whereas a value below 50 means it is contracting. The official PMI has indicated slight growth for the sector for the majority of the year, and it only dipped a few decimal points below 50 in the third quarter. The index is heavily skewed towards the Chinese state-owned and/or large companies and therefore not representative of the industry as a whole. The Caixin PMI, which focuses more on small and medium private businesses, paints a different picture: this index has been below 50 since December 2014, and in September 2015 fell to 47.2, the lowest level since 2009 (fig. 8). Surely, these PMI results should be taken with a pinch of salt, as they are based on surveys and therefore the answers can be subjective.

#### WEAK ASIAN DEMAND HAS LED TO SERVICES BEING CANCELLED

The weaker performance of the intra-Asian trades played a crucial role in the decline in freight rates for the smaller vessels during the third quarter. In early 2015, some carriers chose to set up new intra-Asian routes to service what was thought to be a booming market. It soon became apparent that demand was not strong enough to justify the extra services, and many of the new services were cancelled in the third quarter, leaving more Panama-transitable vessels without employment.

#### SUPPLY AND DEMAND BALANCE SET TO WORSEN IN 2015

With slowing demand growth in all major regions except for the Americas, the market is unlikely to improve by year-end. With expected fleet growth of 8% and demand growth of 2.2% in 2015, overcapacity is set to worsen. We expect the nominal gap between supply and demand to increase to 30% by year-end. That is before accounting for the effects of slow-steaming (fig. 9).

Figure C.8

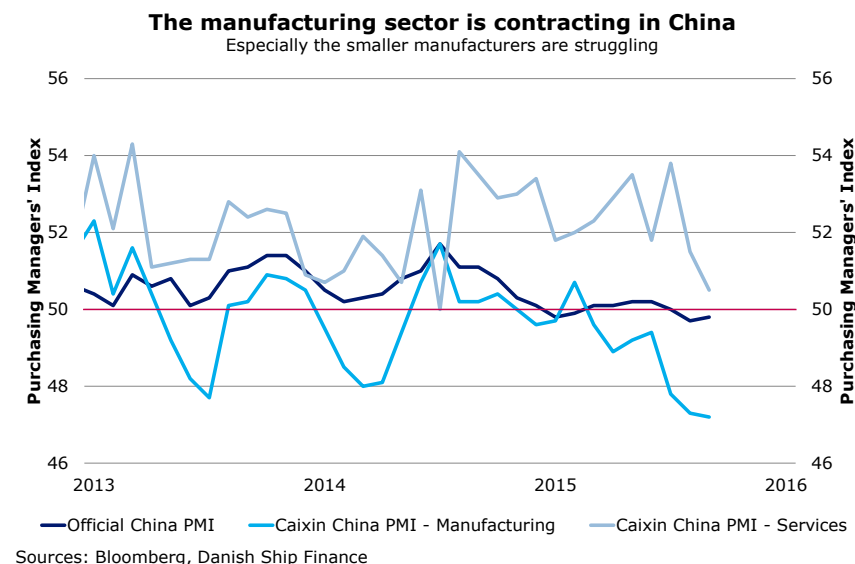
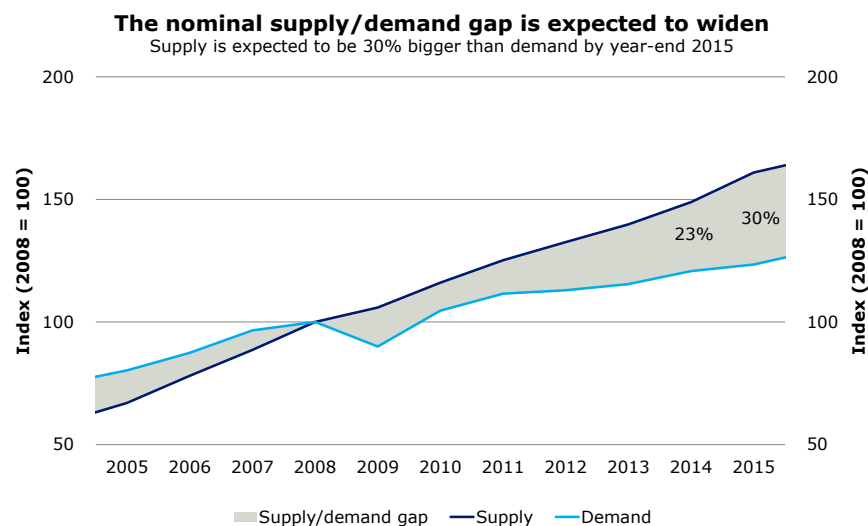


Figure C.9



DESPITE DISAPPOINTING DEMAND GROWTH AND TUMBLING BOX RATES ON MANY TRADES, SHIPOWNERS HAVE CONTINUED TO INVEST IN NEW VESSELS, KEEPING NEWBUILDING PRICES STABLE. SECONDHAND PRICES HAVE STRENGTHENED IN THE PANAMA-TRANSITABLE SEGMENT ON THE BACK OF THE STRONGER TIMECHARTER MARKET, WHEREAS POST-PANAMAX PRICES HAVE BEEN TRENDING SLIGHTLY DOWNWARDS.

In our report from May, our outlook for the Container market was not bright, but we did see some opportunities for an improved market in the not-too-distant future. However, this was dependent on contracting remaining at a reasonable level, which has been far from the case.

### 1.8 MILLION TEU WAS CONTRACTED DURING THE FIRST 3 QUARTERS

It would be reasonable to assume that such a rapid drop in box rates would be enough to hamper any further contracting activity. On the contrary, during the first three quarters of 2015 we saw a jump in contracts – especially for the mega vessels – that is unprecedented in the current freight rate environment. As much as 1.8 million teu was placed in the orderbook and 53% of this was for vessels of more than 16,000 teu (fig. 10). That is 71% more than total contracting in the whole of 2014. As we have said before: we are not convinced that all these mega vessels will be suited for future Container trade. Of course, there are plenty of reasonable arguments in favour of economies of scale, but these arguments diminish as soon as utilisation falls below a certain level. That level has already been reached on some trade lanes.

### NOX REGULATIONS COULD BE BEHIND THE CONTRACTING BOOM

We do not fully comprehend the motives behind the aggressive ordering this year, but we presume that a significant share of the orders have been rushed through ahead of the Tier III NOX regulations which come into force for all new vessels with their keel laid from 1 January 2016. Whatever the rationale, the high level of ordering seems fairly short-sighted and appears to fail to take into account the long-term health of the industry.

### NEWBUILDING PRICES HAVE MAINTAINED THE STATUS QUO

The high contracting activity has not had a significant effect on newbuilding prices. The average newbuilding price in 2015 remained around the 2014 level during the first three quarters.

Figure C.10

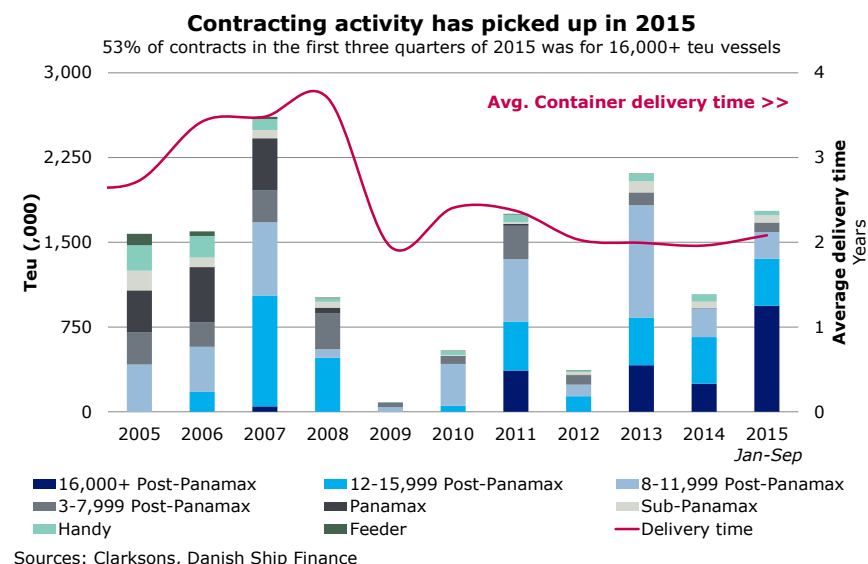
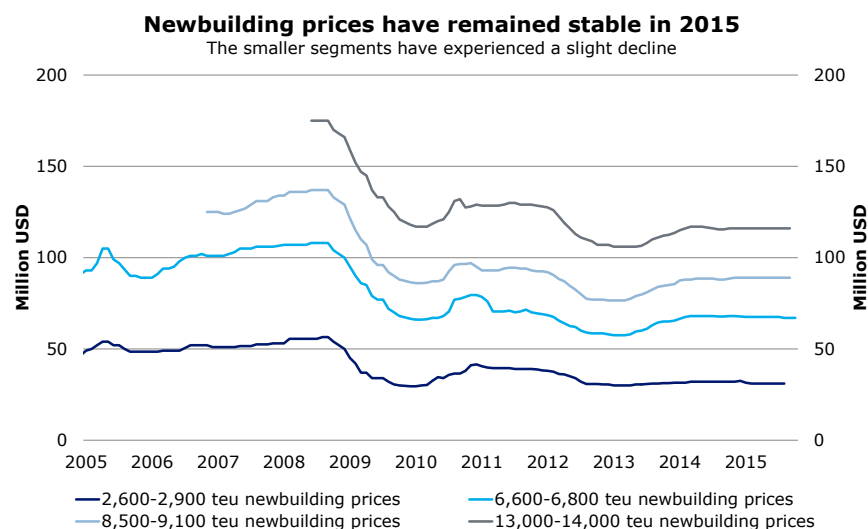


Figure C.11



Prices for the big Post-Panamax vessels remained steady, while prices for the Panama-transitable segments decreased marginally (fig. 11).

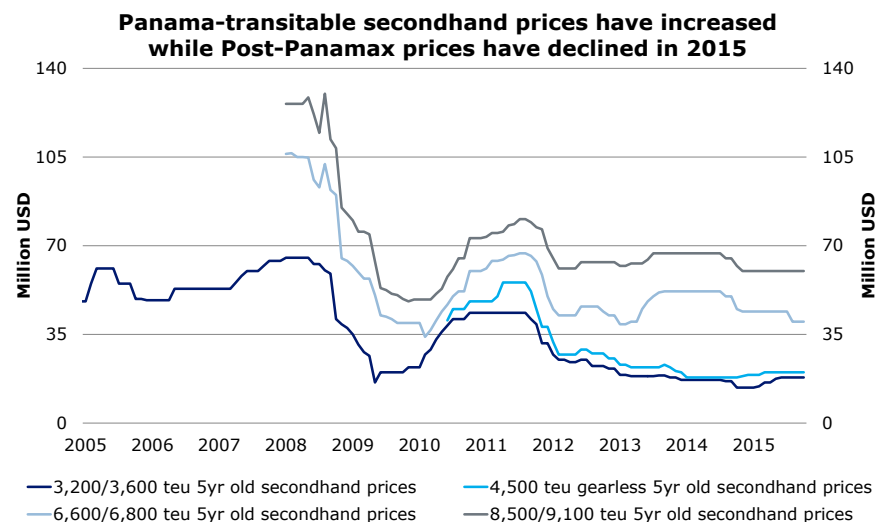
#### SECONDHAND PRICES HAVE VARIED BETWEEN SEGMENTS

The divide between the Panama-transitable segment and the Post-Panamax segment is widening, and we have begun to see them develop independently of each other. Secondhand prices for the Panama-transitable vessels bottomed out around the turn of the year and since then have been steadily increasing. By the start of October, the average Panama-transitable secondhand price had increased by 14% compared with at the start of the year. In contrast, secondhand prices for the Post-Panamax vessels have decreased, and the average price was down 4% by October (fig. 12).

#### SHIP VALUES AND EARNINGS HAVE BECOME MORE BALANCED

The relatively strong rates for the Panama-transitable segments have led to a significant improvement in price/earnings ratios. Secondhand prices have not increased as much as timecharter rates, and as a consequence, price/earnings ratios have come down to levels similar to those prior to the financial crisis (fig. 13). This indicates that we have reached a much better balance between the expectations for ship values and earnings in the Panama-transitable segments. This balance might, however, be short-lived, because timecharter rates have begun to head south. The reverse is expected to be the case in the Post-Panamax segment, where the very low box rates and relatively stable secondhand values have presumably pushed up price/earnings ratios.

Figure C.12



Sources: Clarksons, Danish Ship Finance

Figure C.13



Sources: Clarksons, Danish Ship Finance

## OUTLOOK

THE OUTLOOK FOR THE CONTAINER INDUSTRY WILL CONTINUE TO BE DOMINATED BY LOW FLEET UTILISATION IN THE COMING YEARS. ACCORDING TO OUR 2030 SCENARIO, LOWER VOLUMES AND SHORTER TRAVELLING DISTANCES COULD BE ON THE CARDS FOR THE CONTAINER MARKET WITHIN THE LIFETIME OF VESSELS CURRENTLY TRADING.

We argue that the Container market is witnessing a real-life prisoner's dilemma: orders are continuously being placed for super-large vessels even though market fundamentals indicate that current and future demand will fail to employ the capacity. Shipowners' priorities are to retain market shares and lower marginal costs, but the result is a deflationary market. Any short-term hopes that we had for an impending improvement in the Container market have evaporated in the wake of the massive contracting seen during the first three quarters of 2015. We now anticipate two to three years with only a negligible decrease in the oversupply, at best.

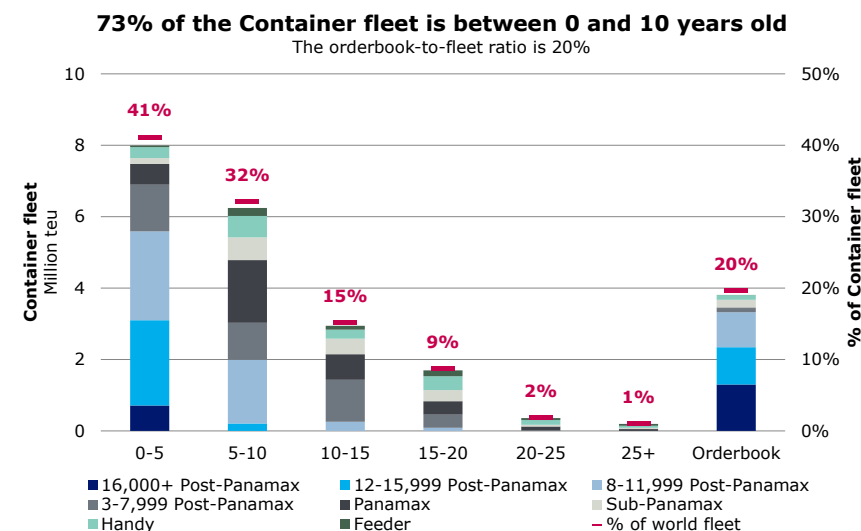
### THE ORDERBOOK CONSTITUTES 20% OF THE FLEET

Despite the constant inflow of new vessels to the fleet, the orderbook has continued to grow for most of 2015. As of October, the orderbook constituted 20% of the current fleet, equal to 3.8 million teu, up from around 3.3 million teu in January (fig. 14). One-third of orders are scheduled to be delivered in 2016 and another third in 2017. Over the next three years, the Post-Panamax fleet of vessels above 16,000 teu is expected almost to triple, measured by number of vessels. In the light of the currently very low utilisation on the Asia-Europe trade, this seems an overwhelming amount and the consequences are expected to be felt by the whole industry.

### LINER OPERATORS ARE JOINING THE CONTRACTING FRENZY

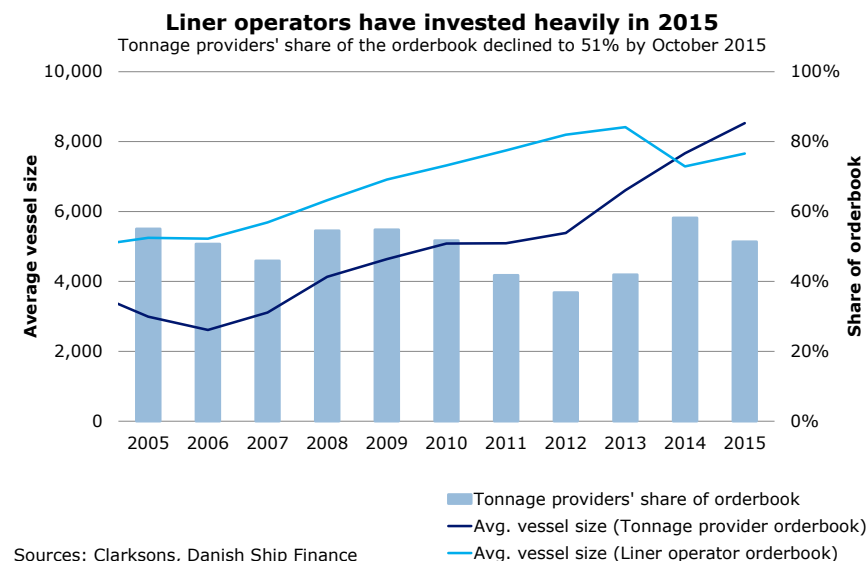
In April, it looked as though liner operators were holding back on contracting and to a large extent were letting the tonnage providers do the investing. However, the picture has changed dramatically since April and the liner operators' orderbook has increased by 81% over the last six months, while the tonnage providers' orderbook has declined by 18%. Consequently, whereas tonnage providers held 68% of the orderbook back in April, it is now evenly distributed between the two parties and both have considerable

Figure C.14



Sources: Clarksons, Danish Ship Finance

Figure C.15



Sources: Clarksons, Danish Ship Finance



exposure to the very large vessel types (fig. 15).

#### THE FLEET IS EXPECTED TO GROW BY 8% IN 2015

The orderbook still holds 0.5 million teu for the remainder of 2015 and we expect fleet growth to reach 8% by year-end (fig. 16). This is in spite of the expected surge in scrapping during the fourth quarter on the back of the current gradual decline in timecharter rates. According to our estimates, scrapping in the fourth quarter will be focused on the Panamax segment as well as the smaller Post-Panamax vessels of 3,000-8,000 teu. The vast majority of the larger Post-Panamax vessels are still very young (fig. 14).

#### SEABORNE CONTAINER DEMAND IS FORECAST TO GROW 5.2% ANNUALLY

Some demand forecasts for seaborne Container trade remain relatively optimistic about future demand growth. IHS Global Insight forecasts demand to grow at an average annual growth rate of 5.2% over the coming three years (fig. 17). We are a bit more sceptical, however. It has long been the norm to base forecasts for seaborne Container demand on a GDP multiplier, but since the financial crisis this multiplier has been declining. We expect Container demand to grow in line with world GDP growth in the coming years, around 2-4%.

#### DOWNSIDE RISKS FOR FUTURE CONTAINER DEMAND

One of the reasons we are more bearish on future seaborne container demand is that several of the major importing regions are burdened with debt, ageing consumers, low investments and the risk of deflation. Only North American imports are expected to prosper significantly in the foreseeable future, not least supported by the strong dollar. Secondly, many of the Asian emerging markets could be vulnerable to a potential tightening of the US monetary policy, because many of their banks and companies have sharply increased their borrowing in dollars over the past five years. Last but not least, the declining commodity prices are lowering the purchasing power of the commodity-exporting countries. On balance, these factors may result in slower or even negative Container demand growth from some of the major importing countries over the next couple of years.

#### THE SUPPLY-DEMAND BALANCE IS SENSITIVE TO THE DEMAND SCENARIO

The demand development is expected to have a significant impact

Figure C.16

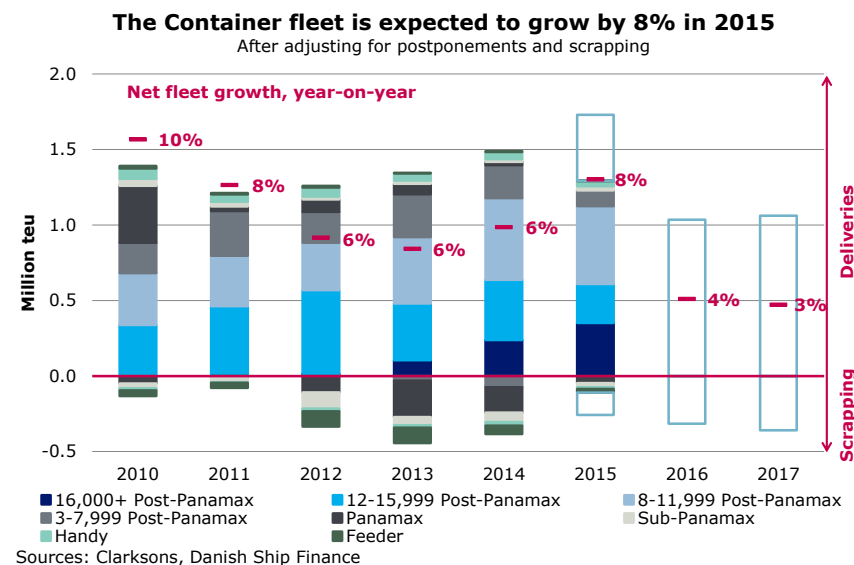
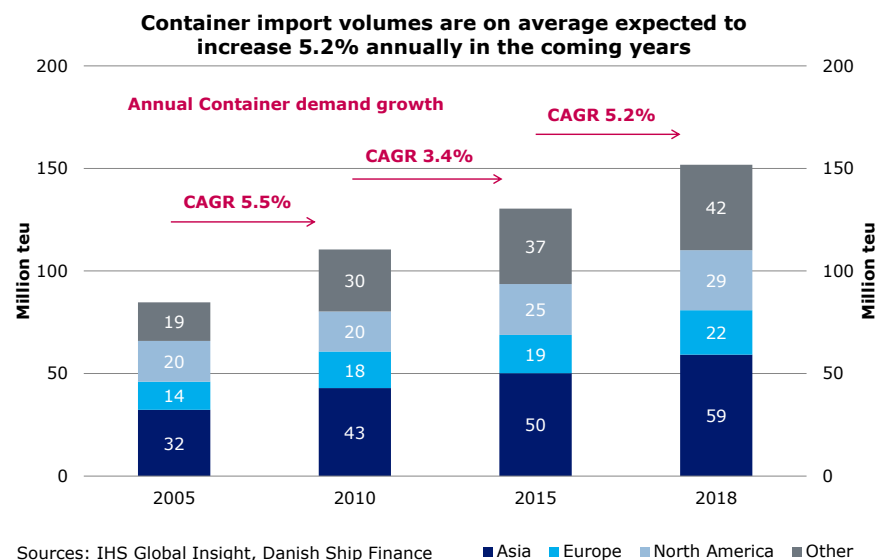


Figure C.17





on fleet utilisation in the coming years. To illustrate this sensitivity, we look at a number of different demand scenarios. It is now evident that the oversupply has increased in 2015 and that fleet utilisation has fallen. For 2016 and 2017, our fleet growth estimates are 4% and 3%, respectively (fig. 16). In a scenario where demand grows by 5.2% annually up until 2018, there will be a slight improvement in the oversupply each year (fig. 18), resulting in fleet utilisation similar to that of 2014 by year-end 2018 (fig. 19). However, should demand grow in line with GDP, oversupply could remain high and fleet utilisation low during the next three years. If demand grows by 4% annually, the oversupply and fleet utilisation will remain around the current depressed levels. Should demand instead fall to 2% annually during the next three years, there will be a significant deterioration in both the oversupply and fleet utilisation (figs. 18 and 19). Hence, the outlook for fleet utilisation is extremely sensitive to demand-related uncertainties. These estimates are based on the assumption that contracting remains relatively modest.

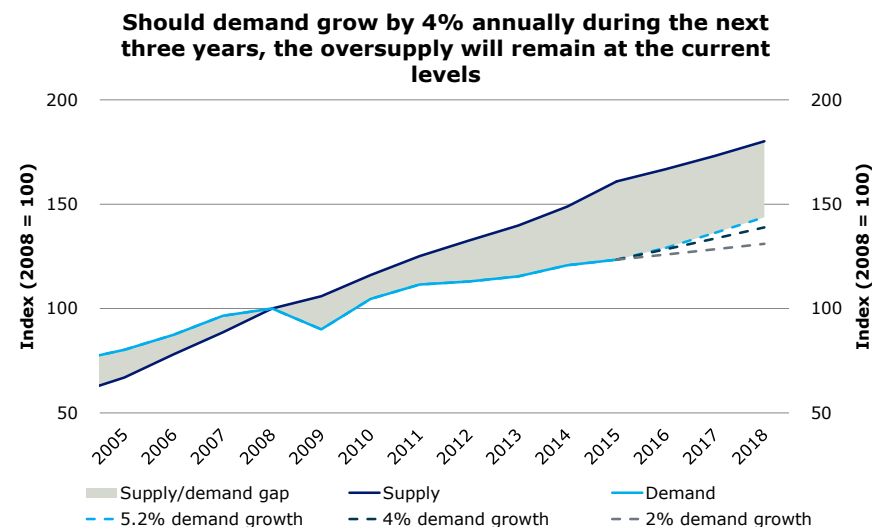
#### SKewed FLEET GROWTH EXACERBATES THE OUTLOOK

While fleet growth of around 3-4% over the next two years does not seem that excessive, it is important to bear in mind the composition of the fleet growth. Over the next two years, we expect the total Post-Panamax fleet to expand by 14% and the fleet of vessels above 16,000 teu to grow by 74%. In contrast, the Panama-transitable segment will decline by 5%. Hence, even though aggregate Container fleet growth seems manageable over the next two years, it is very unevenly distributed between the different segments. We believe the smaller Panama-transitable segments are better positioned to withstand the turbulence in the next couple of years, as negative fleet growth and port restrictions will shelter them from some of the pressure arising from the above factors.

#### MORE SHIPS NEED TO BE IDLED

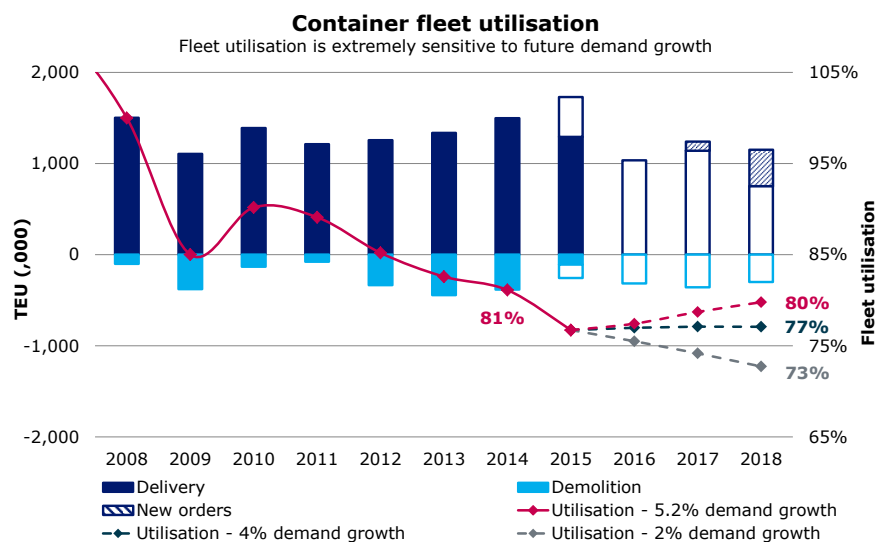
One of the traditional measures for balancing supply and demand is scrapping, but according to our forecasts, future scrapping will be nowhere near sufficient to make a difference. Around 22% of the Container fleet, or 4 million teu, would have to be scrapped to close the nominal gap between supply and demand – a highly unrealistic scenario in an industry where only 16% of the Post-

Figure C.18



Sources: Clarksons, IHS Global Insight, Danish Ship Finance

Figure C.19



Sources: Clarksons, IHS Global Insight and Danish Ship Finance

Panamax fleet is older than ten years. Instead, we expect the number of idled vessels to increase significantly over the coming year. According to Alphaliner, the highest number of idled vessels recorded was back in 2009, when around 10% of the fleet ( $\approx 1.4$  million teu) was idled. We could very well see the number of idled vessels in the last part of 2015 and first few months of 2016 resemble the levels of 2009, or even surpass them. That would alleviate some of the pressure on freight rates.

#### **SUEZ AND PANAMA CANALS BATTLING FOR MARKET SHARES**

In recent years, the two crucial transit points for Container shipping, the Panama Canal and the Suez Canal, have invested heavily in expansion projects to keep up with market developments and maintain market shares. In August 2015, the Suez Canal completed an expansion enabling larger and more vessels to transit the canal faster. The Panama Canal, meanwhile, is expected to complete its expansion in the second quarter of 2016, allowing vessels of up to 13-14,000 teu to pass through, compared with around 5,000 teu previously. The two canals primarily compete for the services between Asia and the North American East Coast (USEC). So, although we have argued that the effects of cascading have diminished, because most services already employ the largest possible vessels on the individual trade lanes, the expansions of the canals could spark more cascading. According to Drewry, the average vessel size on the trade between Asia and USEC going through the Panama Canal is 4,567 teu, whereas it is 7,771 teu on the route through the Suez Canal. When the expansion of the Panama Canal is complete, the average vessel size is expected to go up on and therefore the number of vessels needed to transport the same volumes will be reduced.

#### **THE PANAMA CANAL EXPANSION COULD SHORTEN DISTANCES**

Moreover, the weighted average travelling distance from Asia to USEC is around 500 nautical miles shorter via the Panama Canal compared with via the Suez Canal (approximately one day at 20 knots). Some carriers might choose to re-route some of their services from Asia to the USEC currently going through the Suez Canal. Consequently, the expansion of the Panama Canal could lead to both shorter distances and fewer vessels on the trade between Asia and USEC – a trade that only accounts for 4% of nominal seaborne Container volumes but around 11% of distance-adjusted head-haul demand.

#### **THE NEXT COUPLE OF YEARS WILL BE CHALLENGING**

The short-term outlook for the Container market is consequently expected to be challenging. With a growing orderbook and low expectations for demand growth, the market imbalances look set to continue and freight rates to be under continuous pressure. Going into the winter off-peak season, the fourth quarter of this year and the first quarter of 2016 could bring about lower volumes and thereby more idled vessels. This is expected to hit all vessel sizes, but primarily the Panamax and small Post-Panamax vessels. However, we have seen that not even the large vessels are able to avoid this threat and it will most likely be an industry-wide struggle.

#### **OUR 2030 SCENARIO**

There are several emerging trends that could reshape demand for seaborne Container services in the medium to long term. To address these trends and their possible implications for the Container industry, we have developed a 2030 scenario, which we outline below.

#### **NEAR-SHORING IS GAINING GROUND**

In our previous reports we have focused on trends related to re-shoring or near-shoring of previously off-shored production facilities. The main reasons for re-shoring and near-shoring are shifts in manufacturing costs and the potential shown by automation. In addition, near-shoring has the advantage of shortening time-to-market for products and lowering transportation costs, allowing companies to provide a faster and cheaper service to their customers while also being closer to their production. The near-shoring trend is especially apparent in the US, where a growing number of companies already have or are considering moving production to either Mexico or back to the US, but is also been seen in Europe.

#### **MANUFACTURING IS EXPECTED TO BECOME MORE REGIONALISED**

The manufacturing industry is in general expected to move closer to consumers. But that does not necessarily imply that it will be moved away from Asia entirely – on the contrary. The Chinese middle class is growing rapidly, and is in many ways one of the most promising markets for future consumer demand growth. According to Credit Suisse Research, the Chinese middle class has

grown by 38.5 million people since 2000. It has become the third-wealthiest middle class in the world in 2015, accounting for 2.9% of global wealth, and only surpassed by the US (6.7%) and Japan (3.9%). The European middle class combined accounts for 12.2% of global wealth. The expansion of the Chinese middle class seems far from over and we expect that production will stay in China, or at least in Asia, to cater for Asian consumer demand. Hence, near-shoring is not only a model applicable to US and Europe. The major difference for Container shipping is expected to be that regional manufacturing will increasingly service regional demand rather than overseas demand.

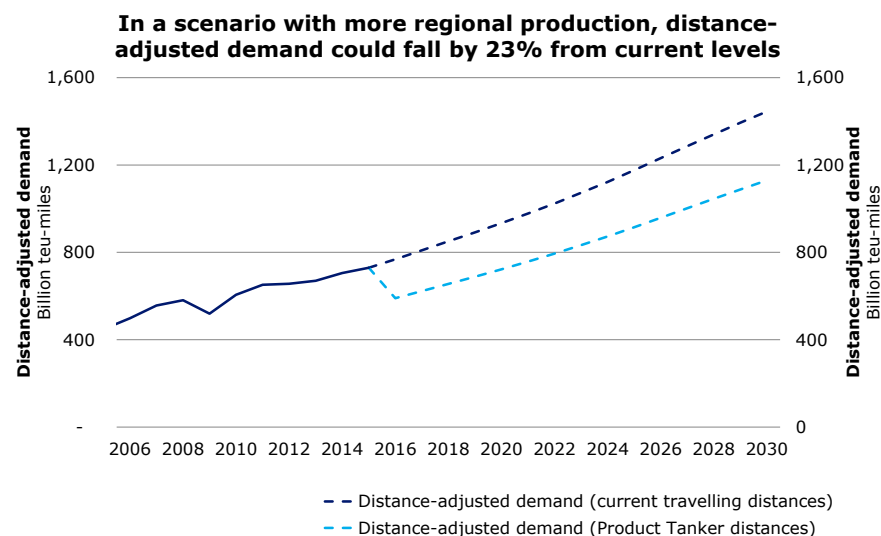
#### TECHNOLOGICAL INNOVATIONS ENABLE REGIONAL PRODUCTION

In the long term, we argue that the advantages of near-shoring manufacturing could become even bigger. Technological innovations, for example 3D printing, robotics and digital manufacturing, have the potential to increase the cost advantages of regionalised production by minimising the importance of labour costs and improving the efficiency of production. We are increasingly hearing of advances within robotics, such as ABB's Yumi and Rethink Robotics' Sawyer, where the fine motor skills of the robots have become so precise that they can perform even the most intricate tasks. And the most appealing aspect of robots is that they cost the same and consume the same amount of energy no matter where in the world they are producing. Thus, the potential in robotics is huge. The Guangdong province in China has started to construct the first "zero-labour" factory with the goal of scaling down the workforce by up to 90%. When fully developed, new technologies could streamline manufacturing processes in a way that enables lower inventories, fewer components and more efficient utilisation of energy and resources. Moreover, with time, new technologies could allow more reuse, remanufacturing and recycling of materials in manufacturing.

#### A CIRCULAR ECONOMY IS EMERGING

The trend towards better utilisation of energy and resources has been labelled the circular economy. Put simply, the circular economy seeks to put an end to the wasteful nature of human consumption while making a profit. Resources are becoming scarcer and need to be recycled, remanufactured and reused to a much higher degree – for the sake of both the environment and the

Figure C.20



Sources: IHS Global Insight, Danish Ship Finance

economy. By limiting their reliance on raw materials, companies can reap substantial benefits. The French car manufacturer Renault is one of the leading companies in implementing reuse and recycling into its production processes. In 2015, 30% of all Renault vehicles were made from recycled materials, and this share is growing. Moreover, Renault is collecting used units from its European network to repair and refurbish in order to offer its customers spare parts at lower prices. The case of Renault is just one early-stage example of the opportunities related to the transition towards a more circular economy. A circular economy is expected to trigger more regional manufacturing, because fewer inputs and feedstocks from outside the region will ultimately be required, lowering the need for seaborne transportation. For a more in-depth discussion of the implications of circular economies, please refer to the section "General Review and Outlook".

#### EMERGING TECHNOLOGIES WILL RESHAPE FUTURE CONTAINER TRADE

Consequently, within the next five to ten years, we expect manufacturing to become more regionalised, technological innova-

tions to overtake traditional methods of production, and a more circular economy to gradually take shape. Such a scenario would affect seaborne Container trade, not only through shorter travelling distances but also lower volumes.

#### **WHAT IMPACT WOULD THIS HAVE ON DISTANCE-ADJUSTED DEMAND?**

To make a very simplified approximation of how our 2030 scenario could affect distance-adjusted Container demand, we have looked at the Product Tanker market. Trade patterns in the Product Tanker segment are characterised by a majority of short-haul regional trades along with relatively few long-haul overseas trades. We expect similar patterns for Container shipping in the future, albeit without the element of arbitrage. We have applied the weighted average travelling distance for Product Tankers in 2015 as a proxy for how Container trade patterns could look in a scenario with more regional production hubs. According to our approximation, distance-adjusted demand could decline by around 23% relative to 2015 numbers (fig. 20).

#### **INTRA-REGIONAL TRADES WILL GROW IN IMPORTANCE**

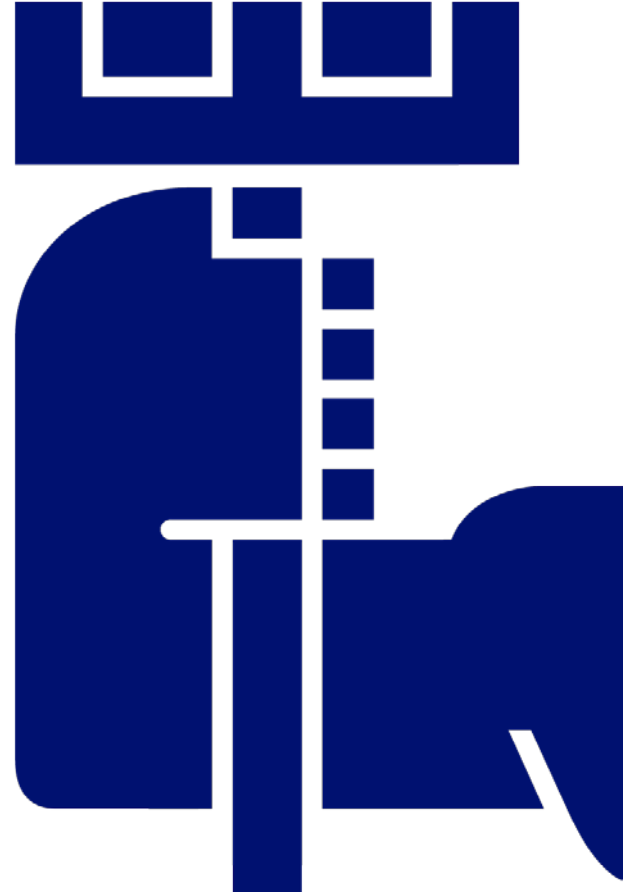
As its name implies, our 2030 scenario will not happen overnight; it will be a gradual process. The tipping point for 3D printing of manufactured goods, large-scale automation, robotics and the circular economy lies five to ten years ahead. Moreover, it is important to stress that these trends will not bring to an end the Container industry as we know it today. The trade patterns of today will persist to some extent, but we expect intra-regional trades to grow in importance at the expense of the main east-west trades.

#### **THE FUTURE MARKET CALLS FOR SMALLER VESSELS**

From our perspective, future vessel demand will not favour the super-large vessels but more likely the smaller sizes, including the smaller Post-Panamax vessels. Our 2030 scenario is expected to play out within the lifetime of vessels currently trading, and if the industry continues on its current course, the huge investments made in the very large segments could potentially lead to losses for some owners. To ensure that the current overcapacity problems do not persist for a prolonged period, shipowners need to stop ordering new large vessels. Otherwise, the deflationary trend of the market will continue and assets will be prone to considerable value destruction.

# DRY BULK

SHIPPING MARKET REVIEW – NOVEMBER 2015



**DANISH  
SHIP FINANCE**

# DRY BULK

THE DRY BULK MARKET IS STILL STRUGGLING AND THE OUTLOOK REMAINS BLEAK. HOWEVER, WHAT WE HAVE LEARNED FROM THE FIRST THREE QUARTERS OF 2015 IS THAT THE MARKET MECHANISMS WORK! WHEN TIMES GET TOUGH, VESSELS ARE SCRAPPED AND CONTRACTING IS BROUGHT TO A HALT. UNFORTUNATELY, THIS DOES NOT SEEM TO BE ENOUGH TO REBALANCE THE MARKET AS DEMAND CONTINUES TO DISAPPOINT.

## FREIGHT RATES

THIS YEAR GOT OFF TO A BAD START AND THE DRY BULK MARKET EMBARKED ON ONE OF THE WORST SLUMPS IN HISTORY. LUCKILY, WE HAVE SEEN AN IMPROVEMENT IN FREIGHT RATES SINCE THEN AND THEY REACHED A HIGHER LEVEL OVER THE SUMMER MONTHS, THOUGH THEY REMAIN LOW.

### THE BALTIC DRY INDEX IS 32% DOWN ON THE 2014 AVERAGE

The Baltic Dry Index (BDI) reached its historical low in February 2015 at 539. In the following months, it gradually increased before peaking in August at 1,066, after which it began to move slowly downwards. By October, the 2015 average index value was still 32% below the 2014 average (fig. 1). The collapse of the BDI was primarily caused by the oversupplied Capesize segment. Although the Capesize index has quadrupled since its low in February, the 2015 average index value for Capesize is still 44% below the 2014 average. The smaller segments have also been hit, and by October, the average Panamax and Supramax rates were around 25% below their 2014 averages and the Handysize segment was 28% below.

### TIMECHARTER RATES HAVE FALLEN 37% SINCE 2014

The sluggish market conditions have also been felt in the timecharter market. So far in 2015, the average 1-year timecharter rate has fallen by 37% compared with 2014. Despite showing a noticeable improvement since February – Capesize rates have increased by around 60%, Panamax rates only by around 10% and Handymax rates by some 18% – rates are still at very low levels, ranging from around USD 7,250 per day for a Handysize to USD 12,688 per day for a Capesize (fig. 2). By October the average timecharter rate was only 9% above the all-time low.

Figure DB.1

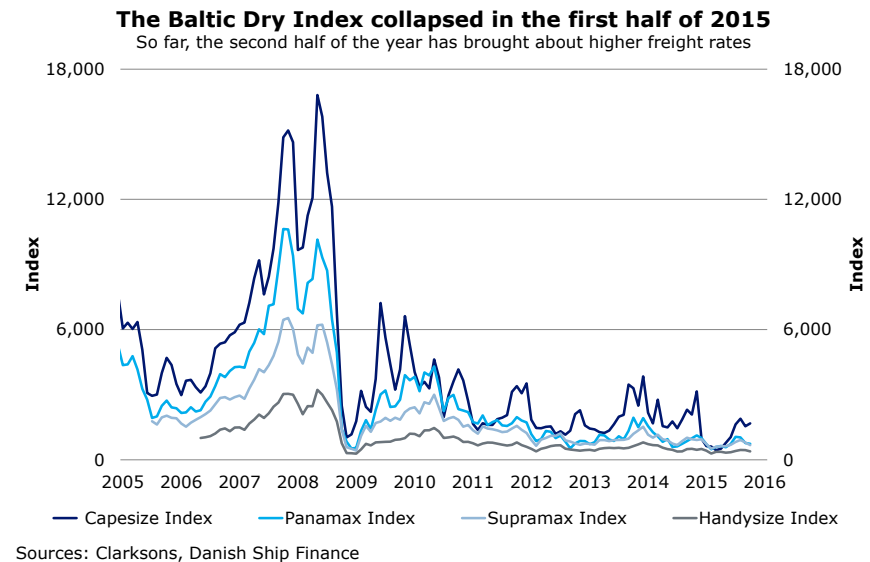
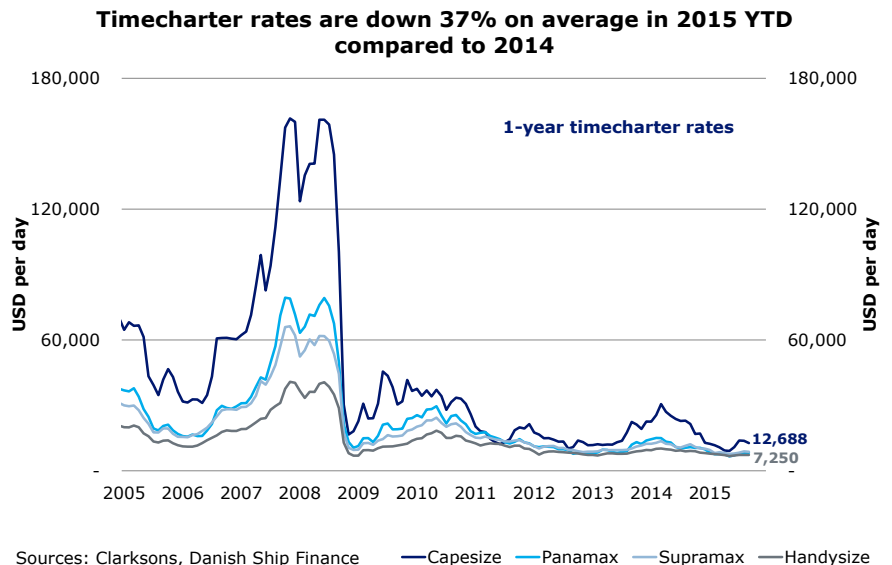
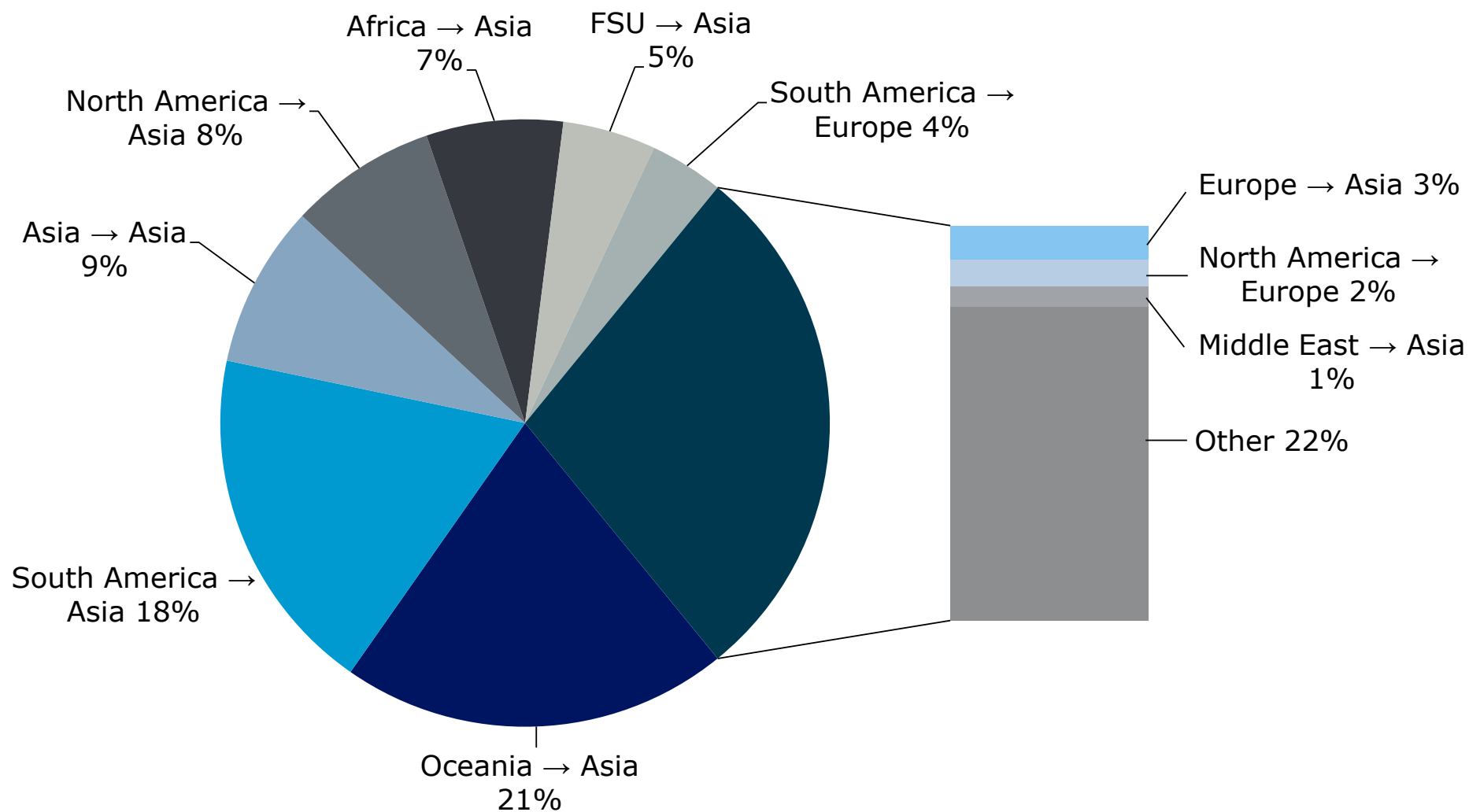


Figure DB.2



## Major Dry Bulk trades in 2015

Measured in tonne-miles



Sources: IHS Global Insight, Danish Ship Finance



THE SUPPLY SITUATION IMPROVED DURING THE FIRST THREE QUARTERS OF 2015, BUT DUE TO A DETERIORATION IN DEMAND, THE MARKET HAS MAINTAINED THE STATUS QUO AND CONTINUES TO BE HEAVILY OVERSUPPLIED.

The balance between supply and demand has over a long period of time become increasingly skewed, as the two have shown completely different developments. The market's current woes can be blamed on the unprecedented ordering spree sparked by the unquestioning faith in Chinese Dry Bulk demand. Luckily, the market has begun to take control of the situation and the traditional market mechanisms for balancing supply and demand have been used extensively. The joker, however, has been Chinese demand, which has been significantly weaker than usual.

### 39.5 MILLION DWT WAS DELIVERED IN THE FIRST THREE QUARTERS

The need to limit supply growth was evident in the delivery schedule of the first three quarters of 2015. 71.5 million dwt was scheduled to be delivered over the period, but by the start of October, only 55% had been delivered, equal to 39.5 million dwt (fig. 4).

### CANCELLATIONS AND POSTPONEMENTS HAVE INCREASED IN 2015

Of orders scheduled to be delivered during the first nine months of 2015, 10% were cancelled and 35% were postponed for later delivery (fig. 5). The Capesize segment was accountable for the majority of cancelled and postponed orders, followed by the Handymax segment. This trend is not surprising, since the Capesize segment has been hit hardest by the low freight rates and both segments have huge orderbooks waiting to be delivered. In addition to this, during the period around 7.5 million dwt of orders were cancelled that were originally scheduled for delivery in 2016 and another 2.5 million dwt that were scheduled for 2017. 86% of these were Capesize orders.

### 24 MILLION DWT WAS SCRAPPED UP UNTIL SEPTEMBER 2015

Scrapping activity intensified over the period compared with previous years, especially in the first half of the year when around 20 million dwt was scrapped. Up to the start of October, total scrapping amounted to 24 million dwt or 325 vessels. Measured in dwt, 55% of scrapping was in the Capesize seg-

Figure DB.4

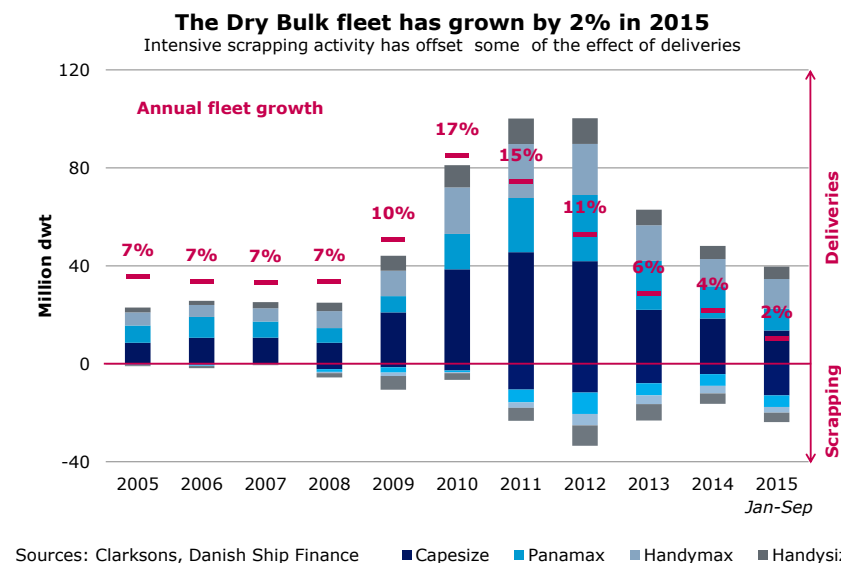
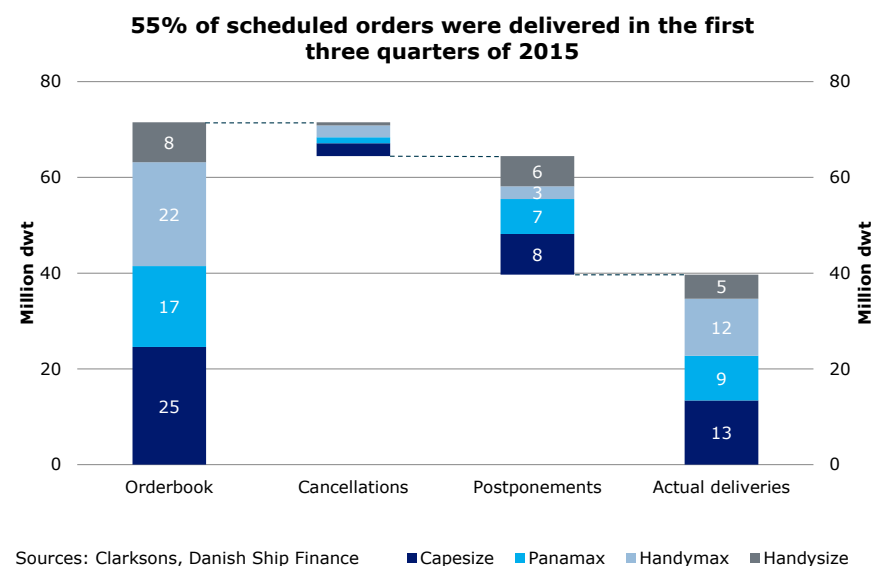


Figure DB.5



ment, 20% in the Panamax segment, 9% in Handymax and 17% in Handysize. Due to the low delivery ratio and high level of scrapping, fleet growth in the first three quarters was limited to only 2% (fig. 4).

#### NEGATIVE FLEET GROWTH IN THE CAPE SIZE SEGMENT

Measured in dwt and by the number of vessels, the Capesize fleet remained more or less stable during the first three quarters, with a slightly negative growth rate of around 0.5%. 78 vessels were demolished while 71 vessels were delivered. This illustrates that the market mechanisms do work when the fundamentals get too strained.

#### THE AVERAGE SCRAPPING AGE IS GOING DOWN

The average scrapping age has come under pressure on account of the massive scrapping activity in 2015, falling from 27.7 years in 2014 to 25.6 years in 2015. All segments have experienced a decline, but the most dramatic fall has been for Capesize vessels, which have fallen from 23.5 years in 2014 to 20.9 years in 2015. Handymax has experienced the smallest drop, going from 27 years to 26.5 years. Both Capesize and Panamax vessels are on average being scrapped before they reach their technical lifetimes of 25 years.

#### DRY BULK DEMAND IS EXPECTED TO GROW BY ONLY 1% IN 2015

So far in 2015, Dry Bulk demand has been sluggish, and this has been one of the main reasons for the extreme fall in freight rates. After having grown by 4.1% in 2014, seaborne Dry Bulk demand is expected to grow only by 1% in 2015. China is mainly responsible for the weak growth, but lower demand for Dry Bulk volumes in 2015 has also been seen in regions such as Europe, South America, Africa and the Middle East (fig. 6). When we wrote our last report, Shipping Market Review – May 2015, demand forecasts for the whole of 2015 were around 3.8%; hence, the speed of the slowdown in demand has come as a surprise to many, ourselves included.

#### DEMAND FOR IRON ORE IS ONLY UP 1% THIS YEAR

In 2015, seaborne iron ore demand is expected to grow by 1%, a considerable slowdown from the 13% growth rate seen in 2014. On average, iron ore demand has grown 10% annually since 2000. The weak growth this year is attributable to the steel industry which has become weaker by the month, damp-

Figure DB.6

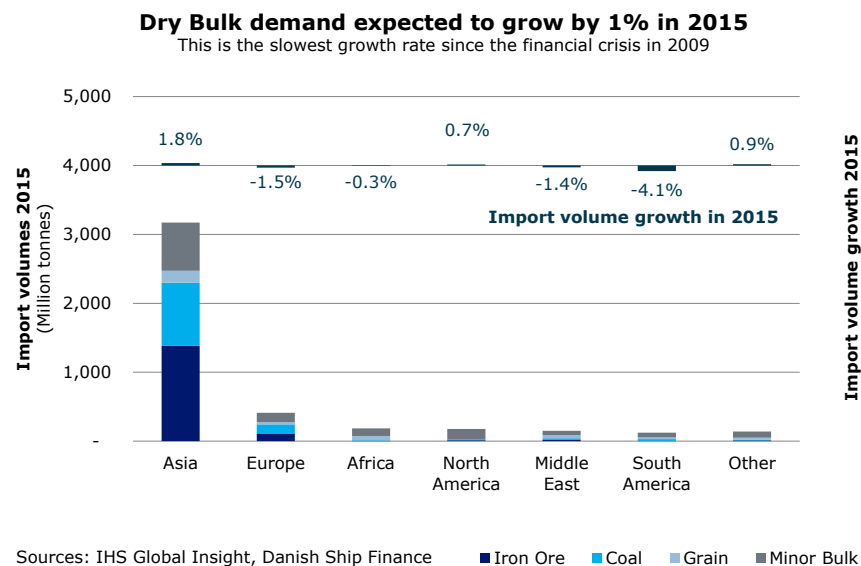
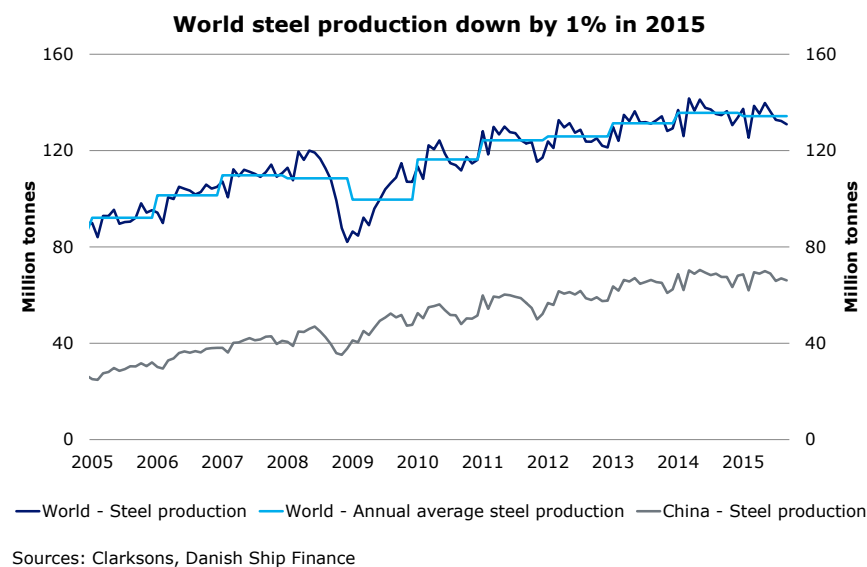


Figure DB.7



ening demand for iron ore. By the beginning of October, average world steel production in 2015 had declined by 1% (fig. 7). Steel production has been particularly weak in the US, Japan and South Korea, some of the world's biggest steel-producing countries after China. In contrast, India's steel production has been strong, growing 9%, and its seaborne iron ore imports are expected to grow by 11% in 2015, although this is from a low level. The disappointing steel production in many countries has largely been caused by the weak construction sector in China. Even though Chinese steel production also fell by 1% in the first three quarters of 2015, compared with the same period in 2014, large amounts of cheap Chinese steel have flooded the world market and pushed prices down to record-low levels. According to Platts, the share of the Chinese steel production that is being exported is forecast to grow from 7% in 2013 to 14% in 2015. Due to the lower steel production, Chinese seaborne iron ore imports are expected to grow by only 1% in 2015. However, the low demand growth also reflects the fact that China destocked some of its port inventories during the first three quarters.

#### THE IRON ORE INDUSTRY IS CONSOLIDATING

Iron ore prices continue to be under pressure as more supplies become available, pushing out some of the high-cost producers in the industry. That has led to increased consolidation, and only a couple of the major iron ore exporting countries are expected to see growing iron ore exports in 2015, namely Australia and Brazil, which are also the two countries that have the highest-quality ore. Other countries, such as South Africa and Canada, whose iron ore generally has a rather low iron content, are expected to see iron ore exports decline.

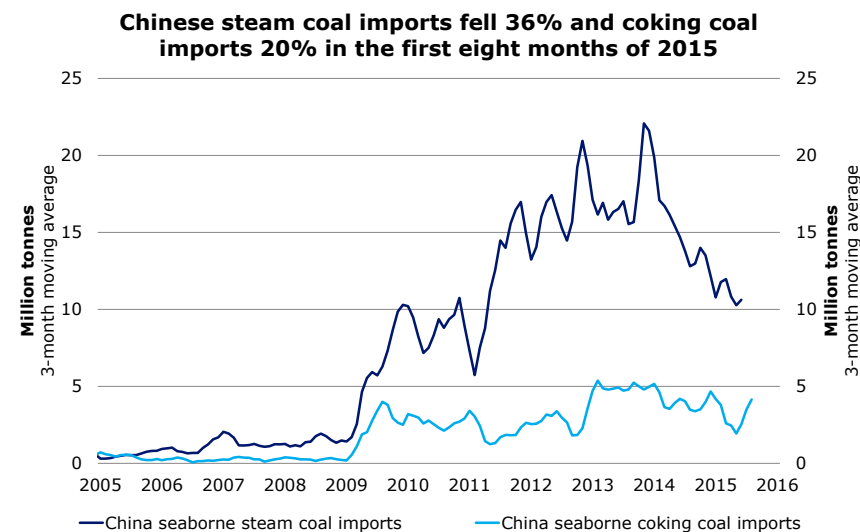
#### SEABORNE COAL DEMAND COULD DECLINE BY 3% IN 2015

The seaborne coal demand is expected to decline in 2015 by 3%. China has continued to scale back coal imports in 2015 and imports are expected to be 15% lower than in 2014. India's demand growth has continued unabated, and is expected to grow by 5% this year. Coal exports from the US have been hit hardest in 2015, due to a combination of the strong dollar and the sluggish demand.

#### CHINESE STEAM COAL IMPORTS ARE DOWN BY 36%

The Chinese government's attempts to lower coal imports

Figure DB.8



Sources: Clarksons, Danish Ship Finance

through various import restrictions and subsidies, partly to support domestic coal production and partly to reduce pollution, have been highly successful. Compared with the same period in 2014, Chinese imports of steam coal fell by 36% during the first eight months of 2015 and coking coal imports by 20% (fig. 8). The weak construction and manufacturing sectors also played a role in the slowdown of coal imports through lower energy consumption (steam coal) and lower steel demand (coking coal). Over the summer months, the Chinese coal industry endeavoured to address the oversupply by cutting production. That led to a boost in imports of foreign coal in July, but when the yuan was devalued in early August it minimised the incentive for importing coal, and coal imports fell once again.

#### SEABORNE GRAIN DEMAND IS EXPECTED TO GROW BY 1% IN 2015

Grain harvests have been strong in the 2015/16 crop year and there is plenty of supply on the market, which has put downward pressure on prices. Meanwhile, we have seen relatively modest demand from some of the major importers in Africa and the Middle East. Again, the US has been hit hard on exports due to the expensive dollar and strong harvests in other regions,

especially Europe, Australia, Russia and Ukraine, which have displaced some of the US harvest. Europe and Argentina have seen the biggest increases in exports.

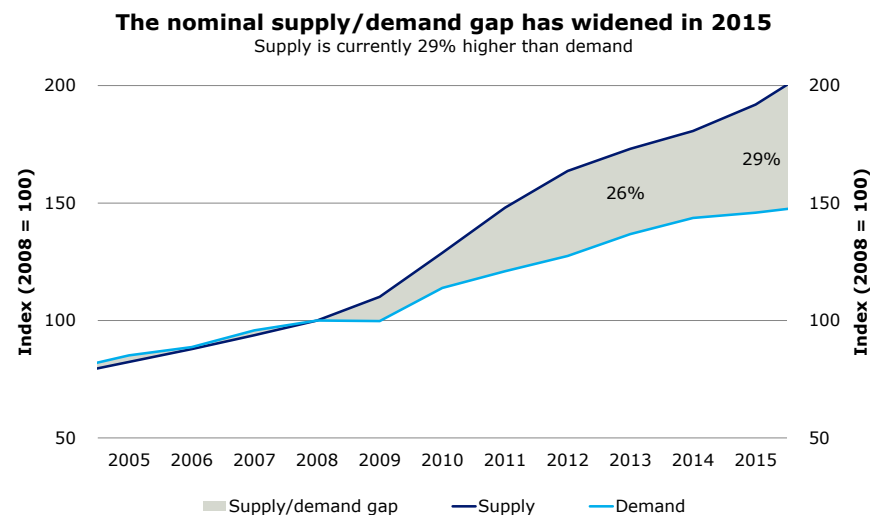
#### MINOR BULK DEMAND UP BY 1.5%

The minor bulk trade has been supported by the higher share of China's steel production being exported. Seaborne trade of steel products is expected to grow by 4% in 2015. Moreover, both fertilisers and agribulks have shown healthy growth rates of around 3-4%. However, the slowdown in the steel industry has also led to a decline in demand for commodities used in the production of steel and in the construction sector, for example nickel ore and cement.

#### THE MARKET BALANCE HAS NOT IMPROVED

Even though we saw relatively low fleet growth in the first three quarters of 2015, there is still 36 million dwt scheduled to be delivered in the fourth quarter. If we assume that only 60% of these orders are delivered, this will bring fleet growth for the whole year to just above 4% — significantly above expected demand growth of 1%. The fact that Dry Bulk supply has grown much faster than demand during the last ten years only exacerbates the situation. As we have argued before, at current levels, a 1% increase in demand is only capable of absorbing a 0.8% increase in supply, and demand needs to grow significantly faster than supply for a while before the two balance out. As a result, we expect the oversupply to grow in 2015, in spite of the extensive measures taken to prevent this happening (fig. 9). Naturally, not all segments have the same exposure to the oversupply. The Handysize and Handymax vessels have diversified trades focusing on the minor bulk commodities, grain and, to a lesser extent, coal. Panamax vessels focus more on the coal and grain trades and Capesize vessels on iron ore and coal. Hence, the demand weakness seen in 2015 has primarily affected the larger vessel segments.

Figure DB.9



Sources: Clarksons, IHS Global Insight, Danish Ship Finance

THE SLUGGISH MARKET CONDITIONS CAUSED CONTRACTING IN THE DRY BULK SEGMENT TO SLOW DOWN CONSIDERABLY AND PUSHED SHIP VALUES DOWN TO VERY LOW LEVELS.

#### 10 MILLION DWT WAS CONTRACTED DURING THE FIRST NINE MONTHS

Contracting saw a sharp decline during the first three quarters of 2015. Orders amounting to just 10 million dwt were placed, less than one-fifth of the amount contracted in the same period in 2014 (fig. 10). Apart from two Capesize orders placed in January, there were no contracts for Capesize vessels until September, when nine orders were placed by Japanese owners. If contracting continues at this muted pace in the fourth quarter, total contracting for 2015 will be even lower than in 2012. In fact, we would have to go back to 2001 to find a year with lower contracting activity. There has been talk of orders for ten Valemax vessels placed by Chinese interests. The terms of the orders have not been agreed yet, but this would add at least 4 million dwt to the orderbook in the fourth quarter.

#### THE AVERAGE NEWBUILDING PRICE IS DOWN BY 10% IN 2015

The very low contracting level has caused newbuilding prices to drop. Newbuilding prices peaked in May 2014 and since then have been on a gradual decline. By October, prices had fallen by 14% since the peak. Newbuilding prices have come down across all segments; however, the price paid for a 180,000 dwt Capesize has shown the steepest decline, falling from around USD 58 million in May 2014 to USD 47 million in October 2015.

#### SECONDHAND PRICES HAVE DROPPED 18% SINCE THE START OF 2015

The weak market fundamentals have caused the average secondhand price to decline by 18% since January and by 38% since the second quarter of 2014, when market sentiment was still strong. Older tonnage has been hit hardest and the biggest decline has been seen for vessels older than 15 years. Even though secondhand prices have come down substantially, the decline has been small relative to the drop in timecharter rates. Consequently, the relationship between earnings and values became increasingly skewed during the first three quarters of 2015, indicating that expectations for the future remain high despite the current market conditions (fig. 11).

Figure DB.10

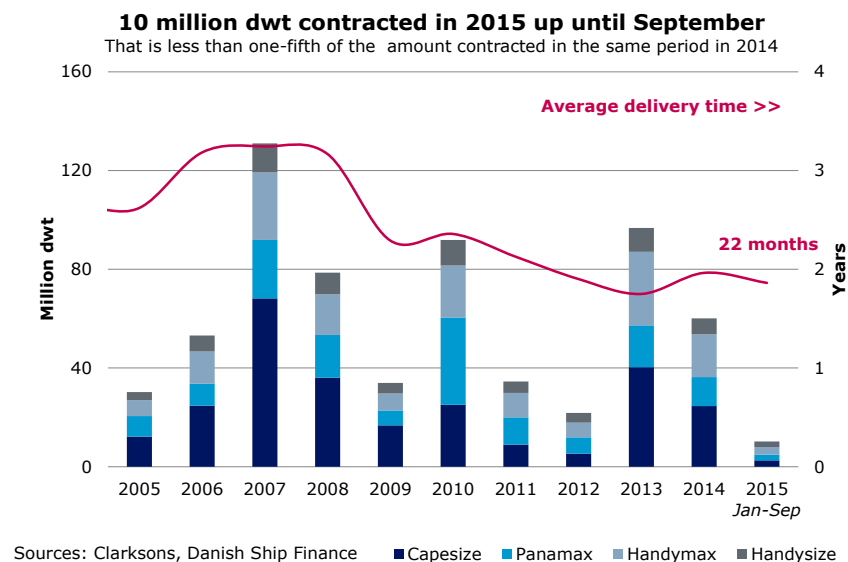
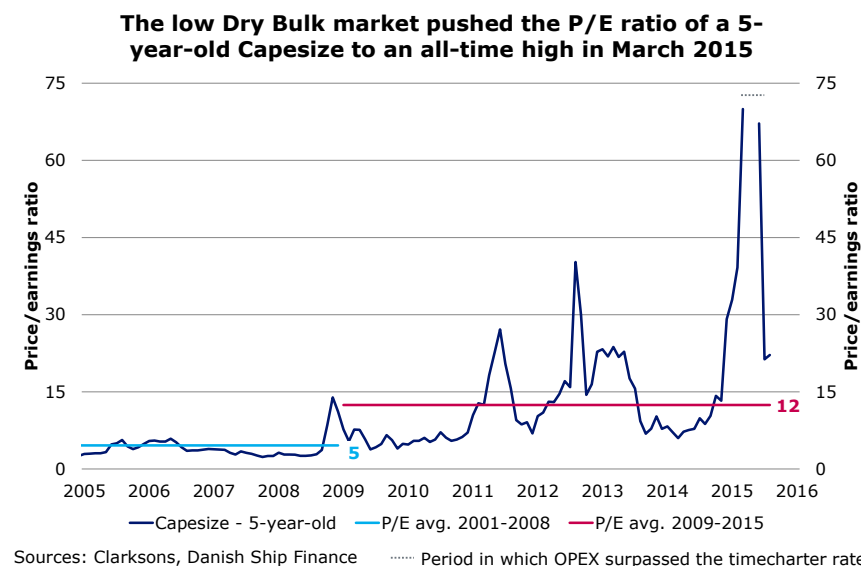


Figure DB.11



## OUTLOOK

THE LONG AND CLOSE RELATIONSHIP THAT HAS DEVELOPED BETWEEN CHINA AND THE DRY BULK INDUSTRY SINCE THE TURN OF THE MILLENNIUM IS STARTING TO SHOW CRACKS. CHINA IS REBALANCING ITS ECONOMY AND THE CONSEQUENCES FOR FUTURE DRY BULK DEMAND COULD BE DIRE. A DIP IN DRY BULK VOLUMES, FOLLOWED BY SLOWER GROWTH GOING FORWARD, COULD VERY WELL BE THE OUTCOME.

Despite extensive efforts to limit the oversupply in the Dry Bulk market, there are still storm clouds gathering ahead. The Dry Bulk industry, and shipping in general, is facing challenges from many sides. Seaborne demand from China is projected to be lower in the future and technological advancements within renewables are threatening to reduce long-term demand for seaborne Dry Bulk commodities. As the inflow of vessel looks set to continue, we expect the industry to be in for a rough ride.

### THE ORDERBOOK HAS DECLINED 24% SINCE THE START OF 2015

The massive Dry Bulk orderbook, with the help of low contracting and increased cancellations, was reduced significantly during the first three quarters of 2015. Between January and the beginning of October, the orderbook declined by 24% to around 134 million dwt, or 1,644 vessels. Consequently, it currently only constitutes 17% of the fleet, down from 20% in April (fig. 12). There is still an overweight of Capesize vessels in the orderbook in dwt terms and of Handymax vessels by number of vessels. 80% of the Dry Bulk orderbook is scheduled to be delivered before the end of 2016.

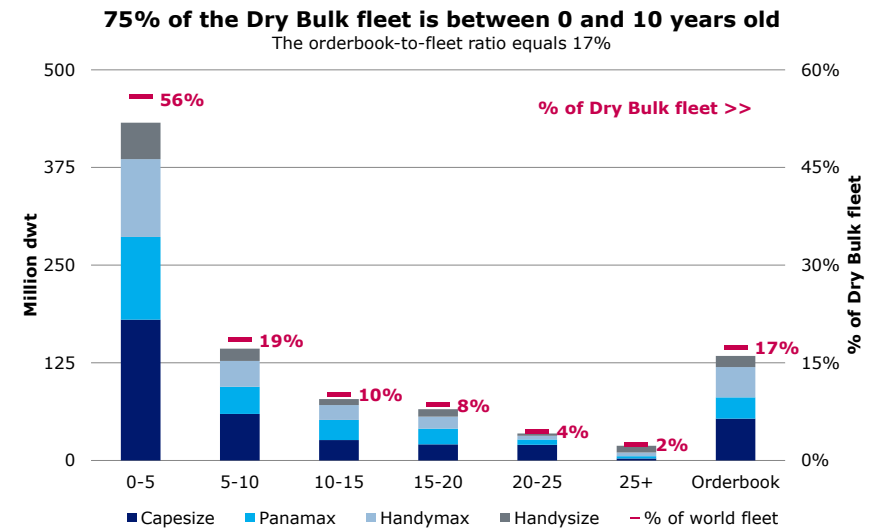
### THE DRY BULK FLEET IS EXPECTED TO GROW BY 4% IN 2015

During the fourth quarter of 2015, 36 million dwt is scheduled to be delivered, almost the same amount as was delivered in the first three quarters. Assuming that cancellations and postponements continue at the same pace, we estimate that around 22 million dwt will actually be delivered during the fourth quarter, bringing deliveries for the whole year to around 62 million dwt.

### SCRAPPING IS EXPECTED TO REACH 29 MILLION DWT IN 2015

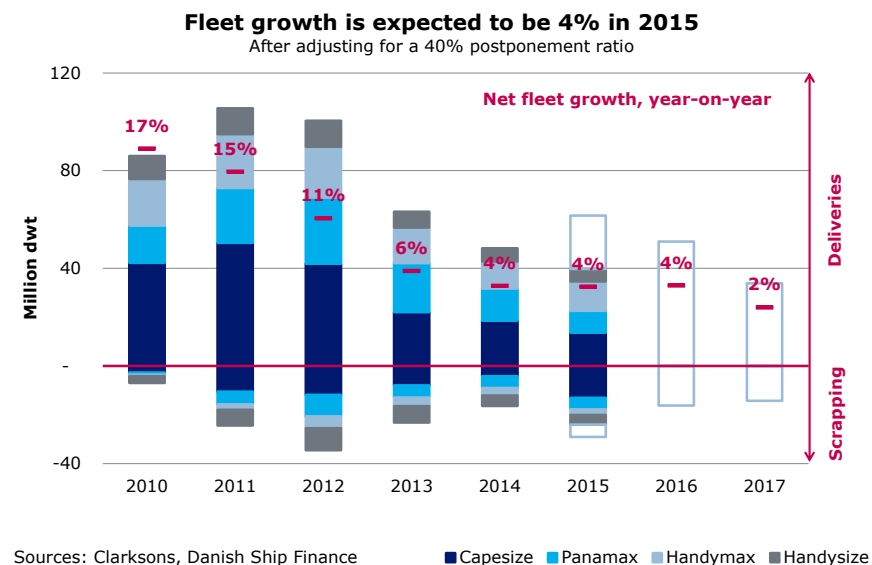
Even though scrapping activity has lost some of the intensity seen in the first six months of the year, we still expect that an-

Figure DB.12



Sources: Clarksons, Danish Ship Finance

Figure DB.13



Sources: Clarksons, Danish Ship Finance



other 5 million dwt could be demolished before year-end. That would take total scrapping in 2015 to around 29 million dwt, the largest amount since the historical high in 2012. That would bring fleet growth for 2015 to 4% (fig. 13).

#### SUPPLY GROWTH COULD SLOW BY 2017

Fleet growth will remain high in 2016, but thereafter the order-book shrinks considerably, and if contracting continues to be low, fleet growth could fall to around 2% in 2017 (fig. 13). Even though time is running out to place orders for delivery in 2017, many shipyards, primarily in China, are desperately looking for new Dry Bulk orders and they could rush some orders through should the opportunity arise.

#### SEABORNE DRY BULK DEMAND ESTIMATED TO GROW BY 3% ANNUALLY

The deteriorating market sentiment has also had an impact on expectations for seaborne Dry Bulk demand in the coming three years. Back in April, seaborne Dry Bulk demand was forecast to grow by an average annual growth rate of 3.7%, however, this estimate has been adjusted down to 3% annually by IHS Global Insight in the period from 2015 to 2018 (fig. 14) - primarily due to slower demand growth in coal but also in grain and minor bulk and to a lesser extent iron ore. We believe this number could possibly go lower.

#### TONNE-MILE DEMAND WILL GROW IN LINE WITH NOMINAL DEMAND

Distance-adjusted demand is forecast to grow at the same pace as nominal demand at around 3% annually in the period from 2015 to 2018 (fig. 15). Hence, we do not expect to see any significant changes in trade patterns.

#### THE SUPPLY GLUT REMAINS HUGE

Despite the efforts to lower the oversupply, there is little to suggest that the Dry Bulk market will become more balanced during the coming three years. In fact, the supply and demand outlook indicates that the oversupply could worsen (fig. 16) and that the utilisation of the Dry Bulk fleet will remain low.

#### FUTURE DRY BULK DEMAND IS DEPENDENT ON CHINA

As mentioned, clouds are hanging over the Dry Bulk industry. Since our last report, our concerns regarding future seaborne Dry Bulk demand have only increased. The primary reason for our concerns continues to be China and the ongoing rebalancing

Figure DB.14

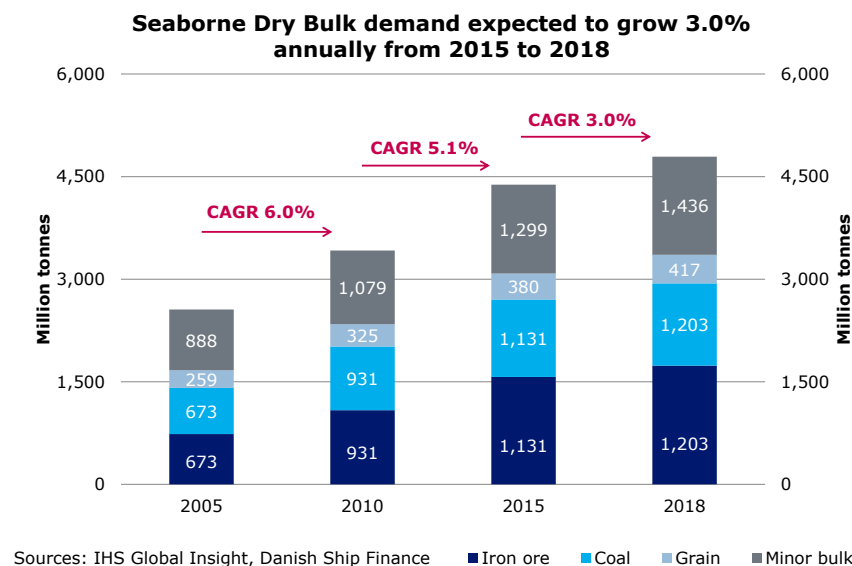
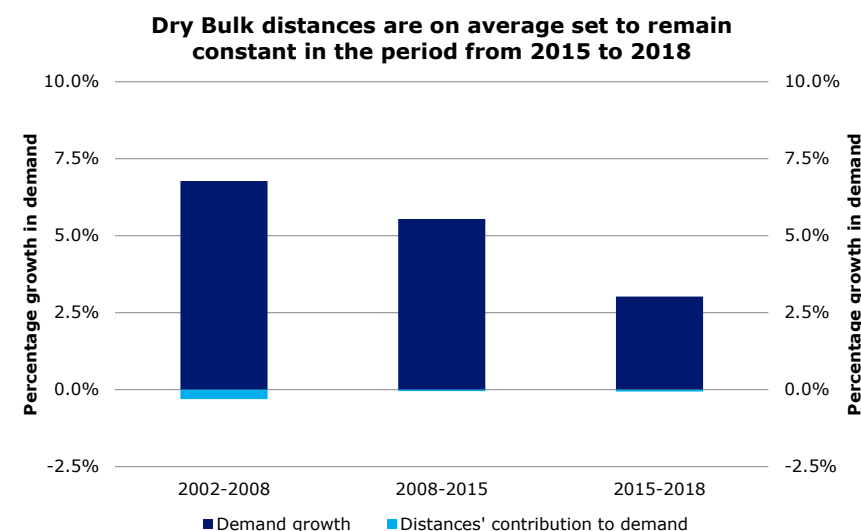


Figure DB.15





of its economy. China has reached a level of development where it needs to change the underlying drivers of growth in order to attain more sustainable economic growth in the future. That implies a need to focus more on consumption than investment. Consequently, in this section of this report, we look in more detail at the developments occurring in China today. To get a snapshot of why China is so immensely important for Dry Bulk demand, let us look at the numbers. In 2015, China is expected to account for 38% of global Dry Bulk demand: 73% of seaborne iron ore demand, 21% of seaborne coal demand (down from 23% in 2014), 24% of seaborne grain demand and 23% of minor bulk demand. Hence, any changes in Chinese demand will not go unnoticed in the Dry Bulk market. The decline in coal imports in 2015 and its effect on the market is a good example of this.

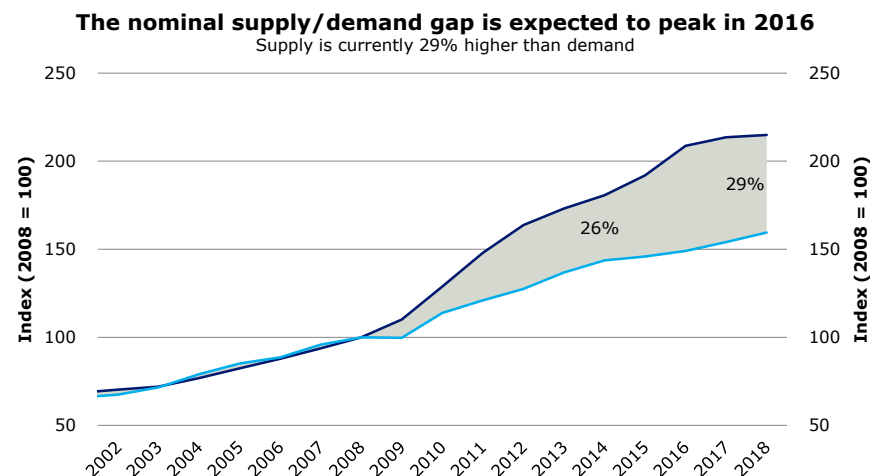
#### THE REBALANCING EXERCISE

The aim of the rebalancing exercise is to make the Chinese economy more consumption-driven and obtain a much better balance between the growth contributions from the three major sectors: the primary (agriculture and mining), secondary (manufacturing and construction) and tertiary (services). Until now, the Chinese economy has been heavily skewed towards the secondary industries compared with other developed and developing countries (fig. 17). Some of the effects of the rebalancing are already visible, and the secondary industries have been struggling in 2015. We have seen a slowdown in manufacturing, construction, the steel industry and therefore also in the energy sector. This slowdown is expected to continue over the coming years. The reason this is important is that the Dry Bulk market is the primary supplier of raw materials to the secondary industries. Hence, the transitioning of the Chinese economy does not necessarily bode well for Dry Bulk demand.

#### THE URBANISATION PROCESS WILL CONTINUE AT A SLOWER PACE

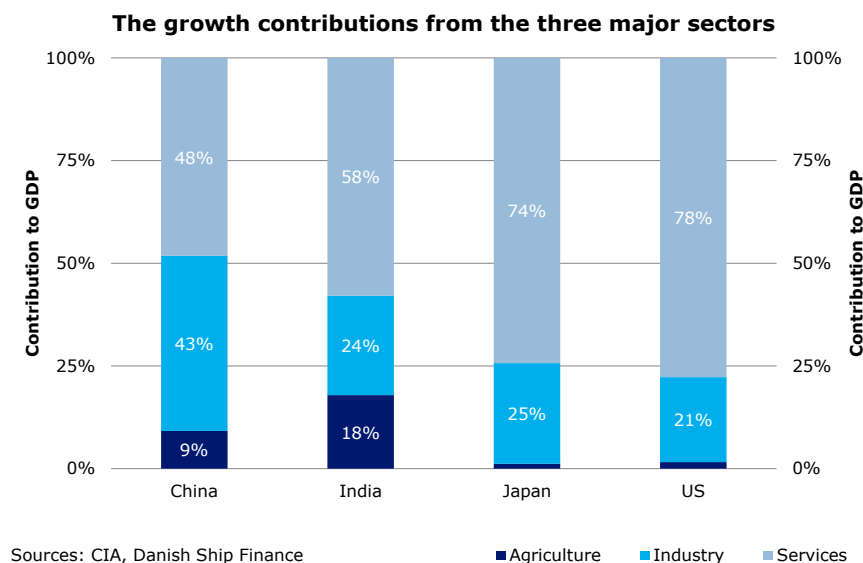
Urbanisation has been the overriding force driving the Chinese economy via heavy investments in construction and infrastructure, which has sparked a huge demand for dry bulk commodities. In 2015, around half the Chinese population lives in urban areas, an impressive accomplishment considering the speed at which this process has occurred. However, according to the World Bank, a country with an income per capita level such as

Figure DB.16



Sources: Clarksons, IHS Global Insight, Danish Ship Finance

Figure DB.17



China's is expected to have an urbanisation rate of around 70%. Hence, there could still be some way to go before the process peaks, but we have seen it lose some steam over the last couple of years. The current oversupply in the real estate sector, apart from in the tier 1 cities, has slowed down the urbanisation process significantly, and in 2015 growth in fixed asset investments in real estate has dropped to its lowest level since 2004, gradually falling from just under 40% in 2010 to a mere 4% in September 2015 (fig. 18). Consequently, there will be much more pressure on the steel industry and thereby also demand for iron ore in the coming years.

#### CHANGING FAMILY STRUCTURES SUPPORT A LARGER HOUSING STOCK

Despite the oversupply of real estate, which will affect construction activity in the short to medium run, and an ageing population, there are still trends supporting a continued need for housing and construction in the future, for example changing family structures. A side effect of the increased wealth of the Chinese population and better social security has been that the need for families to live together has diminished. Children are increasingly able to afford to buy their own place and the elderly are able to support themselves through their pension funds. This trend has gained traction over the last couple of years and is expected to strengthen going forward.

#### CONSTRUCTION REMAINS AN INTEGRAL PART OF CHINA'S ECONOMY

Another aspect supporting more construction is that the quality of the buildings that have gone up during the 2000s in general has been substandard, and many are expected to need replacing within one or two decades. Moreover, the system in China is set up in a way that encourages the local governments to demolish relatively young buildings: there is no property tax; all taxes are paid upon purchase. Hence, the government has an incentive to buy back properties, demolish the buildings and re-sell the land at a profit. It has been estimated that during the period from 2005 to 2010, China demolished 16% of its housing stock, and the Chinese Ministry of Housing and Urban-Rural Development has announced that most buildings constructed before 1999 should be demolished within the next 20 years. Hence, we see a number of reasons to believe there is still a need for construction, albeit at a slower pace of growth than previously.

Figure DB.18



Sources: Bloomberg, Danish Ship Finance

#### CHINA'S NEXT FIVE-YEAR PLAN DOES NOT FAVOUR DRY BULK DEMAND

There is nothing to indicate that the rebalancing exercise is just a temporary focus area for the Chinese government – on the contrary. At time of writing, the Chinese government is finalising its 13th five-year plan, which will outline the proposed course of economic and social development over the coming five years. Looking at the objectives high on the agenda in this plan, it becomes apparent that the Chinese government is dedicated to the transition. Its main objectives include fighting poverty and pollution, spurring innovation, improving social security, modernising the agricultural sector and so on. All these are to some extent related to strengthening the primary and tertiary sectors, but not the secondary (i.e. the one that affects Dry Bulk).

#### TOWARDS MORE CONSUMPTION AND MORE EFFICIENT INDUSTRIES

Hence, the course for the future seems clear: China wants to strengthen consumption by lifting more people out of poverty and assuring proper social security for all. Moreover, a shift away from resource consumption towards technological progress should enable its existing industries to maximise output at a lower cost.

### CHINA COULD RESTOCK IRON ORE PORT INVENTORIES

Let us take a look at the possible consequences that the rebalancing exercise will have on Chinese iron ore imports. In the short term, the global supply of iron ore is expected to grow as more production capacity comes online, which will keep prices down. As the iron ore inventories at Chinese ports came down significantly from around 100 million tonnes in December 2014 to 80 million tonnes in September 2015, we might continue to see strong imports of iron ore into China in the fourth quarter of 2015 and the first quarter of 2016 despite the weak underlying demand. However, in the medium term, as the rebalancing exercise continues, we expect to see a downward adjustment in iron ore demand as the country starts to address the oversupply in the real estate sector and in the steel industry. Although we believe that the urbanisation process will continue and more construction will be needed going forward, we think it will occur at a more normalised growth rate and thereby possibly lower the iron ore volumes needed somewhat.

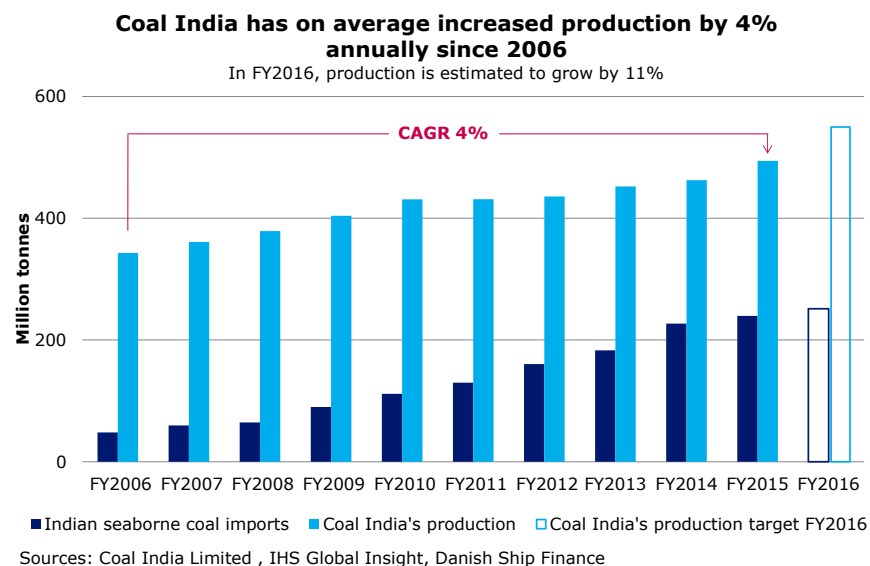
### CHINA WILL CONTINUE TO IMPORT IRON ORE IN THE LONG TERM

China is both the biggest importer and the biggest consumer of iron ore, while also being one of the biggest producers. It has the fourth-largest iron ore reserves in the world, but due to the low iron (Fe) content of its domestic iron ore, it still imports large quantities. Consequently, as urbanisation and construction are set to remain important parts of the Chinese economy in the long term, albeit to a smaller extent than previously, China is expected to continue to rely on imports to support some of its iron ore demand. This is underpinned by the recent deal made by Chinese interests with the Brazilian mining company Vale regarding a 25-year contract of affreightment for iron ore cargoes. Hence, even though we believe iron ore import volumes will drop over the next three to five years, we expect long-term demand to stabilise at an annual growth rate of around 3%, reflecting the gradual maturing of the Chinese economy.

### COAL HAS EMBARKED ON A DOWNWARD TRAJECTORY

The outlook for coal is not as bright as for iron ore. Coal is facing severe headwind from all around the world, not least from China. More or less all developed economies are in the process of phasing out thermal coal from the energy mix to lower carbon emissions and, moreover, coking coal is being hit by the weak

Figure DB.19



demand for steel. The World Bank has announced that it will no longer fund coal-related projects and the Norwegian sovereign fund will divest most of its assets related to coal. China is just as serious about curbing pollution as the advanced economies, and already in 2015 we have seen coal's share of the energy mix decline, while hydro, wind, solar and nuclear energy are all growing. On top of this, the Chinese government is determined to improve its domestic coal mining industry.

### INDIA WILL REPLACE CHINESE COAL DEMAND, BUT NOT FOR LONG

India is one of the only bright spots for the coal industry. India's demand for seaborne coal imports has grown significantly over the past decade, and there is still a long way to go before it is capable of supplying the whole population with reliable electricity. India has large domestic coal reserves, but due to the inefficiencies related to domestic production, it has been forced to import coal. However, reports on Indian coal production suggest that state-owned Coal India, which accounts for more than 80% of India's coal production, has improved its production notice-

ably in 2015 (+7%), and it is expected to keep up the momentum in the coming years and grow by 11% in 2016 (fig. 19). Consequently, according to a report by Goldman Sachs, India could reach a peak in seaborne coal imports before the end of this decade. Hence, even though Indian seaborne coal demand looks promising for the next couple of years, these levels are not expected to last more than three to five years.

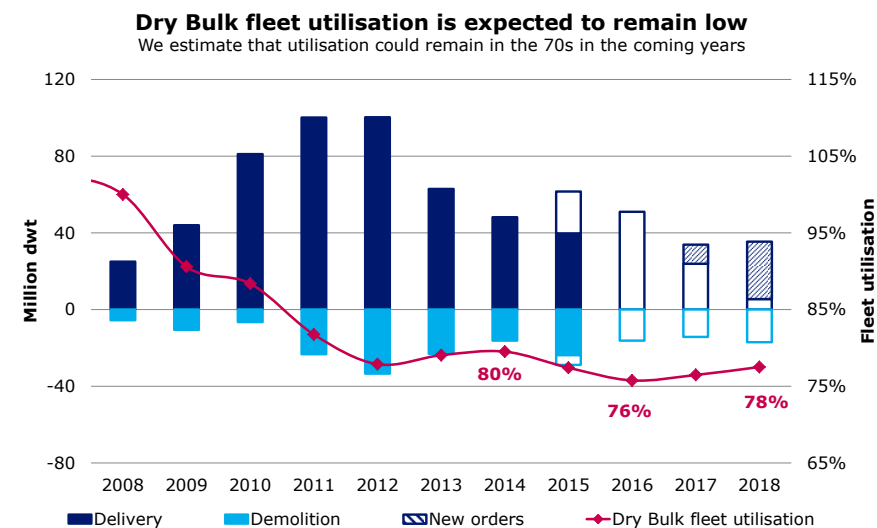
#### EMERGING TECHNOLOGIES COULD POWER EMERGING MARKETS

Earlier, we were expecting that emerging markets would replace some of the coal demand lost from the developed economies, as coal is a relatively easy and cheap way of supplying people with electricity. However, as new technologies gain ground, the prospects for renewable energies are growing. In particular, solar power has the potential to rival many of the advantages of burning coal – and other fuel types, for that matter. When the technologies related to solar power and energy storage have been fully developed, they are expected to provide the world with cheap and easily accessible energy. Imagine the effect it could have in Africa. The primary issue related to providing the whole of Africa with electricity is that it would require an exhaustive grid, which would involve huge investment. With the help of solar power, all that would be needed to supply Africa with electricity would be solar panels and power banks to store the energy. Considering the advances currently being made within these fields, we do not necessarily think this is that far off. Tesla is one of the best examples of how technologies related to energy storage and batteries are developing fast. Against this background, we expect that demand for seaborne coal will continue to decline going forward.

#### MINOR BULK VOLUMES WILL BE UNDER DOWNWARD PRESSURE

The outlook for minor bulk is not as dire as for the two largest commodity groups, as it is a much more diversified trade. Nonetheless, 23% of minor bulk demand stems from China, and the trade is not expected to escape being affected the developments being seen there. The minor bulk trades are dominated by inputs going into either the manufacturing or the construction sector. Around 40% of minor bulk trade is composed of metals and minerals and another 35% of steel and forest products. Given the outlook for the manufacturing and construction sectors, we expect growth in minor bulk trade to slow.

Figure DB.20



Sources: Clarksons, IHS Global Insight and Danish Ship Finance

#### GRAIN TRADE WILL BE SUPPORTED BY GROWING URBANISATION

Grain trade is also expected to be affected if China manages to rebalance its economy, modernise its agricultural sector and increase its domestic output – recall that China accounts for one-quarter of seaborne grain demand. On top of that, if iron ore and coal volumes fall, there will be pressure on the Panamax vessels, as the Capesize segment will try to intrude on some of their coal trades. However, in the long term we believe grain demand will continue to grow, especially in Africa and Asia, as the urbanisation process pulls more people out of poverty and increases demand for both food and feed. The United Nations estimates that the share of the global urban population will grow from around 54% in 2014 to around 66% in 2050.

#### RECYCLING COULD CHANGE THE LONG-TERM OUTLOOK

There might be other challenges ahead for the Dry Bulk industry in the long term, aside from lower Chinese demand and the attempt to lower carbon emissions. As technologies such as 3D printing evolve and concepts such as the circular economy gain

ground, we believe that there will be a tendency towards improving resource utilisation by reusing and remanufacturing materials to a larger degree – especially in the advanced economies. Basically, this would mean lower demand for raw materials as an input in manufacturing and in energy production. In its report on the circular economy, the Ellen McArthur Foundation writes that the circular economy has the potential to revolutionise construction via new technologies, such as 3D printing. It highlights an example of a Chinese construction company called WinSun, which in 2014 printed ten houses, each measuring 195 square metres, in just 24 hours, primarily using a mixture of dry cement and construction waste. WinSun plans to open up to 100 recycling factories in China, where it can transform waste into 3D printer ink. The effects of developments such as these could be substantial for Dry Bulk in the long term and reduce the size of the fleet needed to support demand. For a more in-depth discussion of the concept of circular economies, please refer to the section “General review and outlook”.

#### **THE DRY BULK FLEET NEEDS TO ADJUST TO A NEW DEMAND SCENARIO**

The massive build-up of the Dry Bulk fleet over the last ten years has been very much a response to the strong demand growth in China. With China’s demand gradually being reduced and a long-term outlook that indicates lower demand for raw materials, there is no longer any need for a massive fleet or new orders. We expect the next three to five years to be a constant struggle as the fleet adjusts to the new demand scenario. During this period, relatively young vessels will need to be scrapped, there will be continuous downwards pressure on prices (especially for older vessels), and freight rates will remain at low levels, except for some occasional seasonal spikes. We can only hope that ordering can be kept to a minimum, because buying cheap may end up proving costly for all.

# CRUDE TANKER

SHIPPING MARKET REVIEW – NOVEMBER 2015



**DANISH  
SHIP FINANCE**

# CRUDE TANKER

2015 HAS BEEN THE BEST YEAR FOR A LONG TIME FOR CRUDE TANKERS. FREIGHT RATES HAVE STAYED HIGH DURING MOST OF THE YEAR AS LOW CRUDE OIL PRICES HAVE PROPELLED DEMAND. WHETHER THE MARKET CAN REMAIN AT CURRENT LEVELS IS MORE UNCERTAIN AS SUPPLY GROWTH IS EXPECTED TO INCREASE.

## FREIGHT RATES

FREIGHT RATES CONTINUED TO GAIN MOMENTUM DURING THE FIRST HALF OF 2015, DRIVEN BY SEVERAL SUPPLY DISRUPTIONS ALONG WITH HIGHER DEMAND. AT THE START OF THE SECOND HALF OF THE YEAR, FREIGHT RATES DROPPED SHARPLY, BUT REBOUNDED SHORTLY AFTERWARDS.

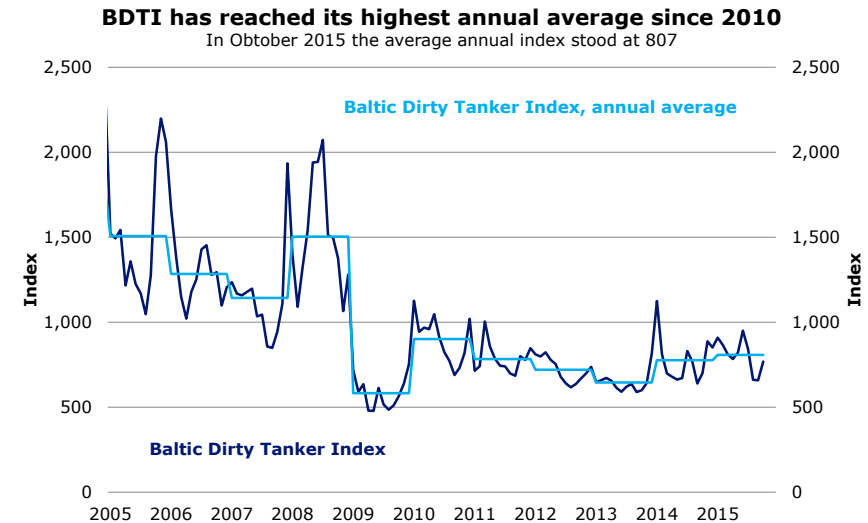
### LOWER CRUDE OIL PRICES HAVE BOOSTED DEMAND FOR TANKERS

Although the Baltic Dirty Tanker Index did not surpass the four-year high of 1,124 seen at the beginning of 2014, it continued to gain momentum throughout the first three quarters of 2015, as both refineries and extensive inventory build-ups required more seaborne crude oil volumes. The Baltic Dirty Tanker Index remained fairly stable at a level between 800 and 950 in the first half of 2015. Even the second quarter, when earnings usually decrease, saw an increase in 2015. This atypical situation was attributable to temporary factors such as port delays in China, South Korea and Iraq and a spike in floating storage. In August 2015, spot rates dropped and the Baltic Dirty Tanker Index lost around 25% in less than a month (fig. 1). However, the index quickly rebounded, especially for the larger vessel sizes, as floating storage once again became profitable.

### TIMECHARTER RATES ARE AT THEIR HIGHEST LEVEL SINCE 2008

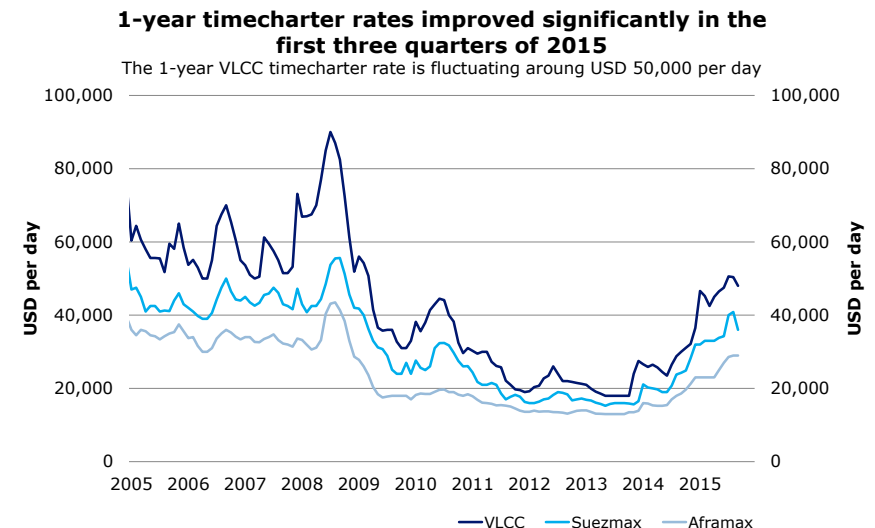
The much improved Crude Tanker spot market has also had an effect on the timecharter market. Timecharter rates slowly began climbing at the end of 2014, only to grow more strongly at the beginning of 2015. Following a few months of relative stability, timecharter rates began rising again in the second quarter of 2015, reaching their highest level since the start of the financial crisis in 2008 (fig. 2).

Figure T.1



Sources: Clarksons, Danish Ship Finance

Figure T.2

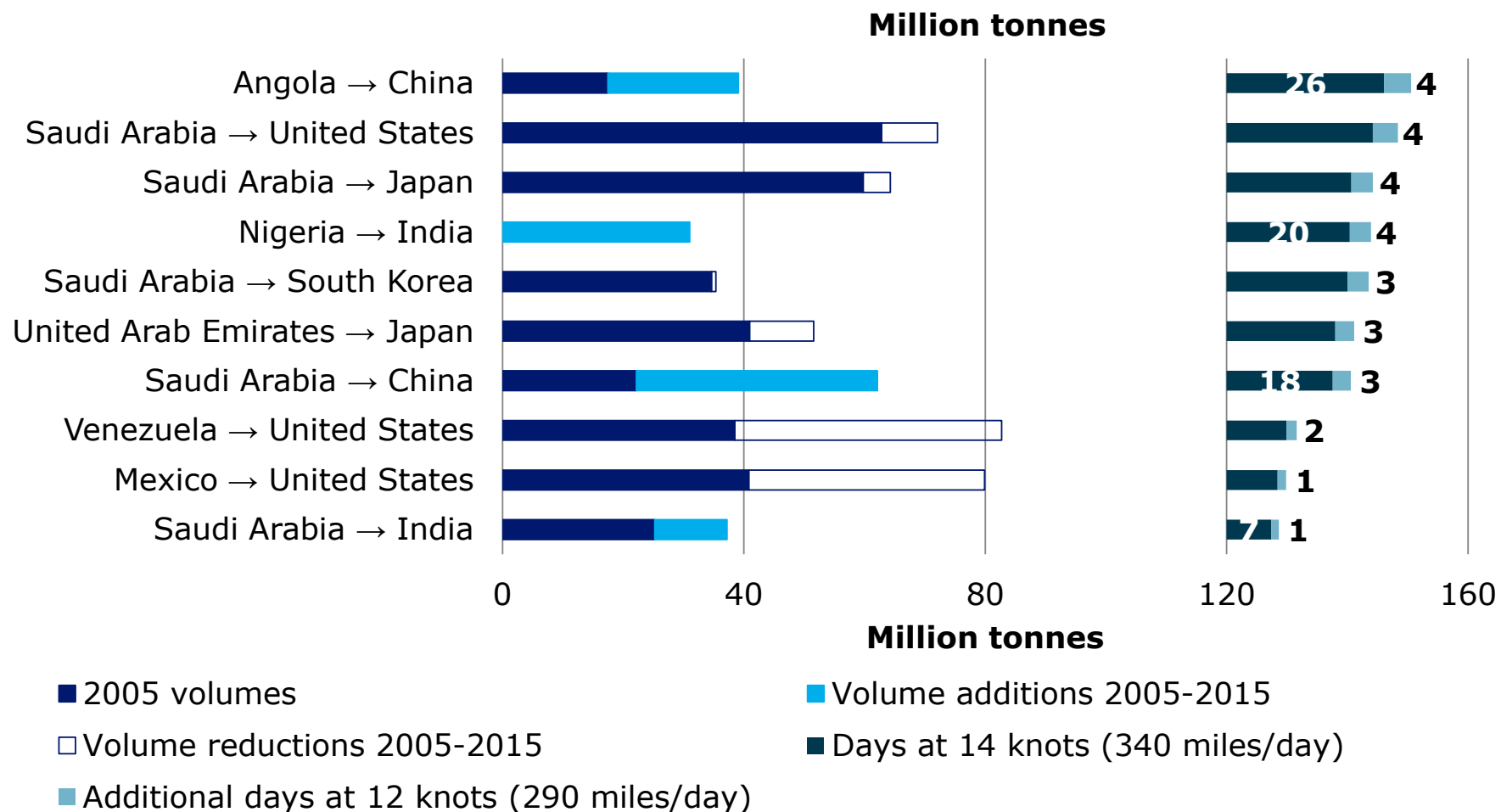


Sources: Clarksons, Danish Ship Finance



## Top 10 trades in 2015

Crude oil volumes have primarily increased on the long-haul routes, but have declined on the short-haul routes. Speed reductions from 14 to 12 knots have lengthened voyage times by up to four days



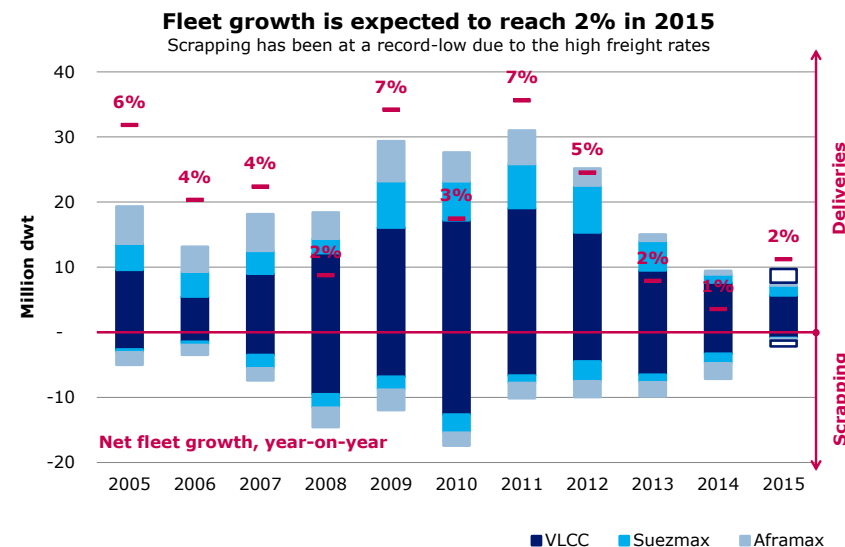
Sources: IHS Global Insight, Danish Ship Finance

THE CRUDE TANKER MARKET HAS CONTINUED TO GAIN MOMENTUM IN 2015, WITH DEMAND FOR CRUDE TANKERS DRIVEN BY LOWER CRUDE OIL PRICES. MOREOVER, VOYAGE DISTANCES HAVE INCREASED AND PORT CONGESTION HAS BECOME MORE PREVALENT, DECREASING THE PRODUCTIVITY OF THE FLEET. HOWEVER, HIGHER FREIGHT RATES HAVE LED OWNERS TO POSTPONE SCRAPPING AND OPERATE THE REMAINING FLEET AT INCREASED SPEEDS, LEAVING THE MARKET IN A CONTINUED VULNERABLE POSITION IF DEMAND FADES.

Crude Tanker freight rates have continued to exceed expectations during 2015, as the inflow of new vessels continues to be fairly low while demand for Crude Tankers has risen. The growth in Crude Tanker demand has been fuelled especially by temporary factors stemming from low crude oil prices and an increase in crude oil supply of roughly 2 million barrels per day compared with 2014. This massive supply increase has, however, not been counterbalanced by a similar increase in demand, and hence significant volumes have either been stored onshore or offshore on Crude Tankers. In any case, sea transportation has most likely been involved given that vessels are likely to have been used as floating storage – either as temporary storage facilities or as speculative storage facilities due to the contango situation. In addition, they have been used to transport surplus volumes to onshore facilities around the world. Thus, in 2015, demand for Crude Tankers has not only been driven by crude oil demand, but also by crude oil supply.

Asia has been the main driver of demand for Crude Tankers, as the low oil price has given refineries there an incentive to operate at near-maximum capacity at the same time as heavy storage build-ups have occurred. In addition, China has granted several independent refineries permission to import and refine crude oil, boosting demand for seaborne crude oil volumes further. As a result, ports in Asia have been severely congested, which has absorbed excess vessel supply. Port congestion has

Figure T.4



not been limited to Asia, but has also occurred in the Middle East during 2015, as bad weather conditions have shut down loading facilities.

Overall in 2015, average travelling distances have become longer, though this has been counterbalanced somewhat by increased vessel speeds. It should be noted that demand for Crude Tankers has not been uniformly high during the year: in times when demand and hence freight rates have dropped, floating storage has become attractive again, causing demand for Crude Tankers and hence freight rates to rebound.

#### FLEET GROWTH IS EXPECTED TO REACH 2% IN 2015

After having bottomed out at 1% in 2014, Crude Tanker fleet growth has been gaining pace and is expected to reach 2% in 2015 (fig. 4). This is a consequence of owners postponing scrapping to take advantage of high freight rates.

### SCRAPPING HAS ALMOST COME TO A HALT IN 2015

Unlike in 2014, when scrapping exceeded our expectations by far, scrapping in the first three quarters of 2015 almost came to a halt and only roughly 0.7 million dwt has been scrapped this year (fig. 4). Vessels have only been scrapped in the VLCC and Aframax segments, and in both of these, average scrapping ages have gone up, with the biggest rise in the VLCC segment, from 21 years in 2014 to 24 years.

### 7 MILLION DWT WAS DELIVERED IN THE FIRST THREE QUARTERS OF 2015

While high freight rates have severely limited scrapping, actual deliveries in the first three quarters of 2015 were almost in line with our expectations. Roughly three-quarters of scheduled orders materialised during this period and a total of 7 million dwt was delivered to the fleet. As usual, the VLCC segment accounted for the majority of this, roughly 74%, while the Suezmax and Aframax segments accounted for 20% and 6%, respectively (fig. 4). Cancellations occurred almost exclusively in the Suezmax segment, where 0.6 million dwt, equivalent to four vessels, was cancelled due to the ongoing restructuring process at Jiangsu Rongsheng, a Chinese yard. Postponements, on the other hand, occurred in all three segments, although they were most prevalent in the VLCC segment (fig. 5).

### THE GAP BETWEEN SUPPLY AND DEMAND CONTINUES TO WIDEN

Seaborne crude oil volumes are expected to grow by 1% during 2015, while distance-adjusted demand is expected to grow slightly more, indicating that average travelling distances have become longer. In any case, fundamental demand growth seems to be unable to counterbalance fleet growth – speed-adjusted fleet growth is estimated to reach 3%, as owners have increased speeds to take advantage of high freight rates. Rather than fundamentals, the high freight rates have been supported by temporary factors affecting both the supply and demand of Crude Tankers. While these factors benefit the market temporarily, they do not affect the nominal gap between supply and demand, which is hence expected to widen further in 2015. The Crude Tanker market thus continues to be highly fragile and freight rates may at times be very vulnerable to demand shocks.

Figure T.5

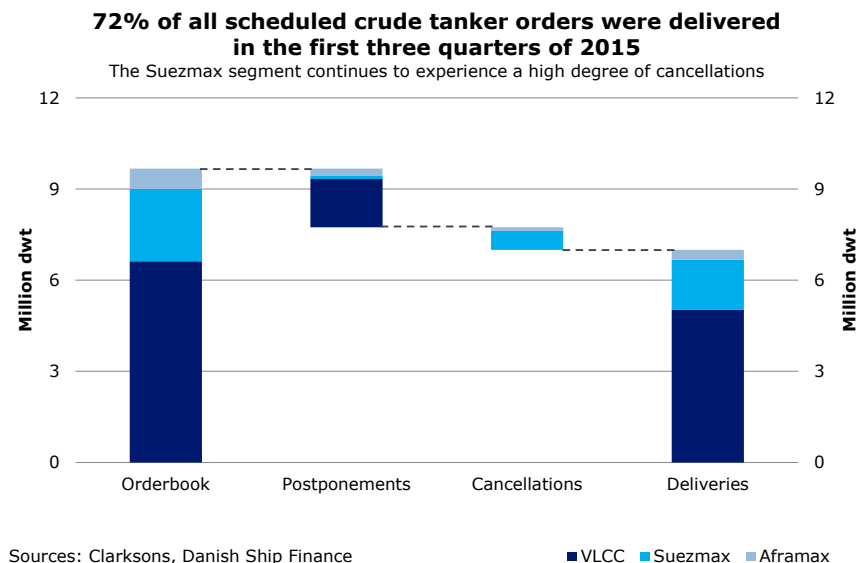
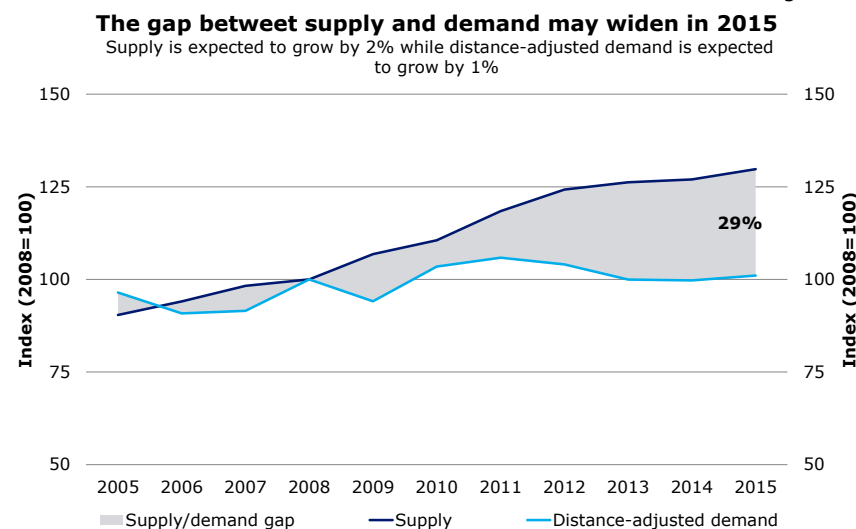


Figure T.6



### ASIA CONTINUES TO INCREASE ITS CRUDE OIL IMPORT VOLUMES

Asia, China in particular, continues to be the main driver of growth in seaborne crude oil trade. In 2015, the region is expected to increase its imports of seaborne crude oil volumes by 2%, equivalent to roughly 20 million tonnes (fig. 7).

### REFINERY INTAKE HAS BOOSTED DEMAND FOR ASIAN IMPORTS

The highest refinery margins in years are the main reason for the record-high Asian crude oil imports. The high margins have prompted refineries to delay maintenance and increase utilisation rates in order to maximise production.

### STORAGE BUILDS CONTINUE TO FUEL DEMAND FOR CRUDE TANKERS

Higher Asian import volumes have also been fuelled by temporary demand from storage builds. This has especially been the case in China, where both commercial and strategic petroleum reserves have been expanded significantly in 2015 on the back of the relatively low crude oil prices.

### A REGULATORY CHANGE IN CHINA HAS ALSO AIDED TANKER DEMAND

Chinese crude oil import volumes were also helped by a regulatory change regarding independent refineries i.e. non-governmental refineries, the so-called teapot refineries. These independent refineries previously refined mainly fuel oil and bitumen, producing low-quality petroleum products. But in 2015, some of them have been granted permission to import and refine crude oil, while others have been granted permission to refine imported crude oil, i.e. the latter will have to buy crude oil volumes from for instance another refinery with an import licence. In total, import licences worth 0.4 million barrels of crude oil per day have been granted, while permission has been granted for another 0.7 million barrels per day of imported crude oil to be processed. Hence, it is possible that import requirements from these independent refineries may increase by as much as 1.1 million barrels per day in 2015. But before the independent refineries could be granted permission to refine and import crude oil, they had to meet certain criteria. To mention a few, an independent refinery had to have a processing capacity above 40,000 barrels per day and tanks capable of holding at least 15 days of operating inventory. Furthermore, it had to own

Figure T.7

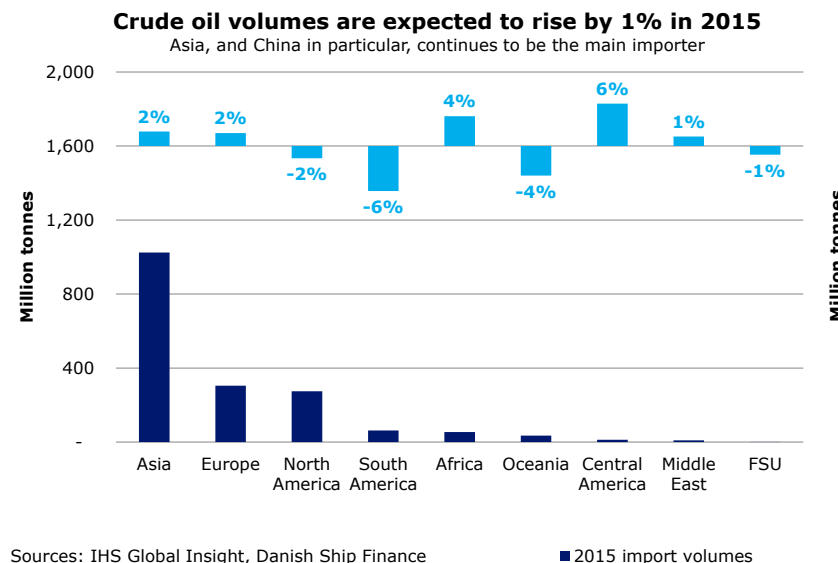
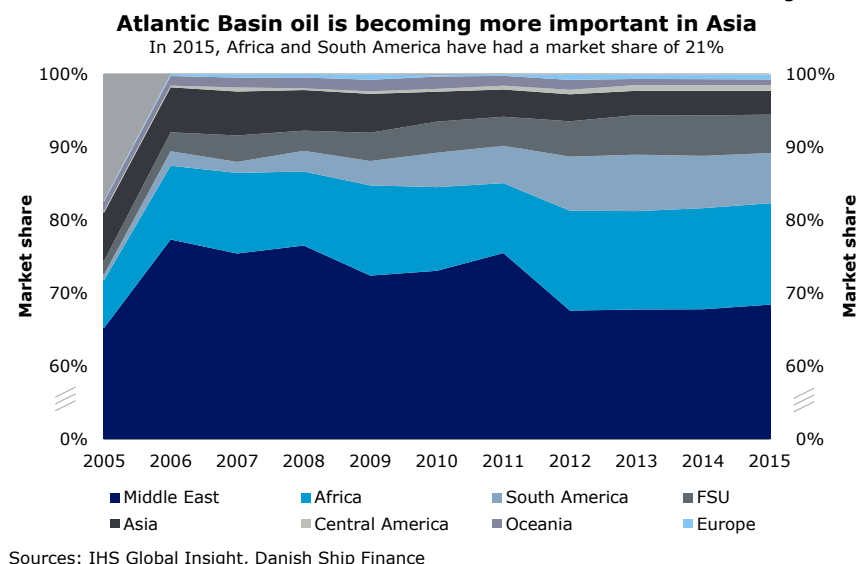


Figure T.8



at least one crude unit that had been operating commercially since before February 2015 and that had not previously had any access to imported crude oil.

#### CHINESE IMPORTS HAVE EXCEEDED 7 MILLION BARRELS PER DAY

In June 2015, China imported more than 7 million barrels per day, a new record high. Not only did these extra crude oil import volumes propel demand for Crude Tankers, they also resulted in severe congestion in and around Chinese ports, soaking up even more capacity than initially expected and causing freight rates to soar.

#### ASIA IS DIVERSIFYING ITS CRUDE OIL IMPORT VOLUMES

Average travelling distances have been getting longer, as Asian crude oil importers have been diversifying their additional crude oil import volumes away from the Middle East in favour of the Atlantic Basin crude oil producers in particular. Africa's market share has risen by 4 percentage points since 2010, reaching 14% in 2015. South America's market share has risen by a similar amount, reaching 7% in 2015 (fig. 8). In 2015, price differentials and the requirement for different crude oil grades have fuelled this transition further. Overall, the Crude Tanker market has benefitted from this development, as the productivity of the fleet has decreased due to the longer travelling distances.

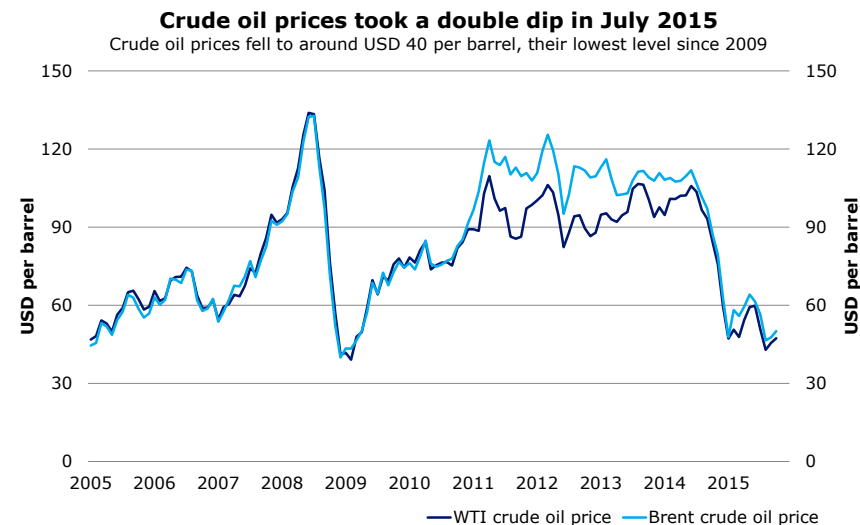
#### WEST AFRICAN OIL HAS BECOME ATTRACTIVE DUE TO ITS QUALITY...

In terms of crude oil grades, West African grades are usually lighter and sweeter than Middle Eastern grades. More specifically, they have a lower sulphur content and are able to produce more light-end products like naphtha without heavy refining, making them suitable for China's less complex refineries following the country's requirement as of 2016 for higher-quality petroleum products containing less sulphur (China 5).

#### ...AND BECAUSE IT HAS BEEN RELATIVELY CHEAPER AT TIMES IN 2015

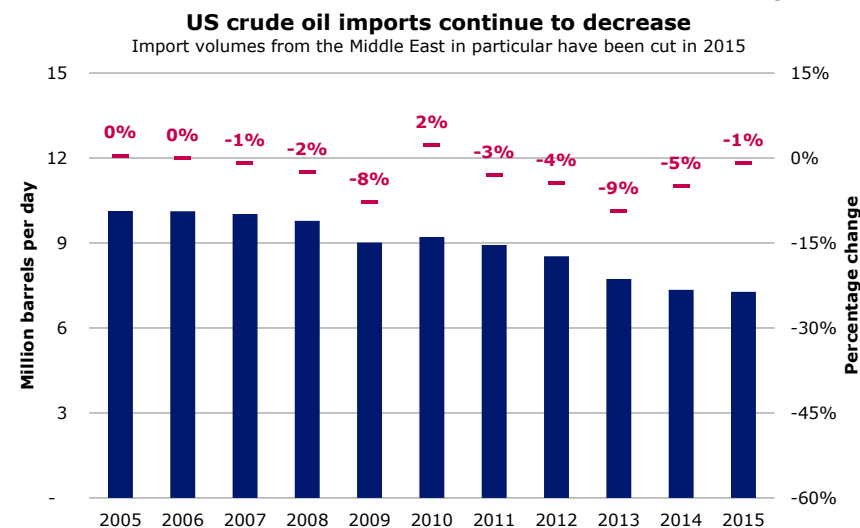
West African crude oil grades became even more attractive to Asian crude oil buyers during the summer months, as supply disruptions in Russia resulted in a price increase for Urals (the main Russian crude oil grade). The price increase made similar grades like the West African crude oil relatively cheaper.

Figure T.9



Sources: EIA, Danish Ship Finance

Figure T.10



Sources: EIA, Danish Ship Finance

### **SOUTH AMERICAN OIL HAS ALSO BECOME RELATIVELY CHEAPER IN 2015**

More generally speaking, the vast oversupply of crude oil has caused crude oil prices to vary significantly between regions in 2015, and the relative attractiveness of different crude oil grades has fluctuated regularly. For instance, during the year, WTI-linked crude oil grades became more attractive than, for instance, their Brent-linked counterparts, as the international crude oil benchmark price WTI (West Texas Intermediate) showed a far steeper decline than any other benchmark crude oil price. Consequently, several WTI-linked South American crude oil grades became more attractive to Asian buyers, benefiting distance-adjusted demand and thus increasing Crude Tanker demand.

### **THE US HAS IMPORTED A FEW ARBITRAGE CARGOES DURING 2015**

This price volatility resulting from the oversupply in the crude oil market has caused the spread between WTI and Brent to vary significantly from USD -0.20 per barrel to USD 14 per barrel in 2015 (fig. 9). In September, the spread narrowed to some of its lowest levels for several months, making it more profitable for several coastal US refineries to import seaborne crude oil volumes rather than buy landlocked domestic crude oil volumes transported by rail. They mainly imported West African crude oil cargoes, but also a few cargoes from Russia.

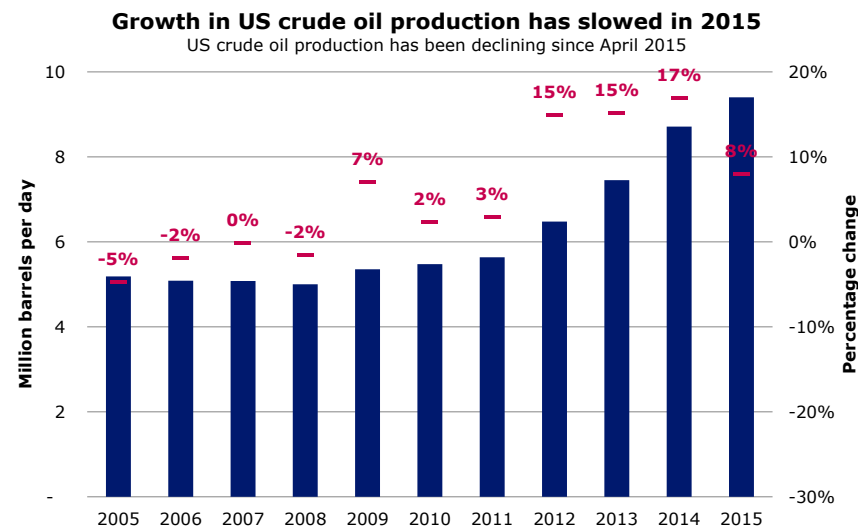
### **THE US CONTINUES TO CUT SEABORNE CRUDE OIL IMPORTS**

Even though the US has imported a few arbitrage cargoes this year, its overall imports of crude oil volumes, seaborne crude oil volumes in particular, have decreased further in 2015 (fig. 10). The US has been cutting crude oil import volumes significantly for several years now in order to accommodate its rapidly growing shale oil production. To begin with, it mainly cut imports of light and sweet crude oil grades from West Africa because of their resemblance to domestic crude oil. But in 2015, it has also reduced its crude oil imports from the Middle East because of its larger import volumes from Canada and Mexico.

### **THE US AND MEXICO HAVE SIGNED A SWAP AGREEMENT IN 2015**

One of the reasons the US has been increasing crude oil imports

Figure T.11



Sources: EIA, Danish Ship Finance

from Mexico is that in 2015 the two countries have signed a crude oil swap agreement, involving the exchange of US light and sweet crude oil for Mexican heavy and sour crude oil. The agreement is expected to be mutually beneficial, as it will enable Mexico's less complex refineries to produce higher-quality petroleum products too. On the other hand, the US will be able to mix its own light and sweet crude oil with Mexico's heavy and sour crude oil, thus obtaining a more medium crude oil grade similar to those for which its refineries are configured. Overall, the swap agreement between the US and Mexico is expected to optimise refinery yields, but will not necessarily be beneficial for Crude Tanker demand, as Mexican crude oil volumes are likely to replace Middle Eastern volumes, dampening distance-adjusted demand. Moreover, the productivity of the fleet may increase slightly, as Crude Tankers will be able to shuttle back and forth fully laden between Mexico and the US much of the time.



#### **US CRUDE OIL PRODUCTION IS CURRENTLY DECLINING**

Despite significant cost cutting and lower crude oil prices, US crude oil production increased significantly to 9.6 million barrels per day - the highest production rate since May 1972 - during the first four months of 2015. One reason for this may be that crude oil prices, although low, were still able to cover daily production costs, giving US shale oil producers an incentive to continue production at existing wells. Another reason may be that US crude oil producers redirected their attention away from new sites towards proven shale oil plays, increasing productivity per well by between 2% and 5%. The high depletion rates at shale oil wells mean that ongoing investments in new drilling rigs are needed for production to remain constant. However, significant cost cutting has stopped owners from completing several wells, and a huge backlog of uncompleted wells has built up. Consequently, since April 2015, US crude oil production has declined by 300,000 barrels per day to 9.3 million barrels per day (fig. 11). This may, among other things, be one of the reasons for the narrowing spread between WTI and Brent, which has led to several arbitrage cargoes being imported by the US this year.

#### **SEVERAL PRODUCERS HAVE RAISED OUTPUT LEVELS IN 2015**

While the US has been cutting crude oil production, several other crude oil producers have been increasing theirs. Saudi Arabia and Russia, in particular, have both been producing around all-time high levels. Saudi Arabia has even been able to increase its exports despite the recent start-up of its two new 400,000 barrel per day refineries, Jubail and Yanbu. Other crude oil producers like Brazil and Iraq have also been able to increase production this year. By the end of 2015, Brazil is expected to have grown its yearly production by 200,000 barrels per day, while Iraq may have been able to increase its production by twice as much. Iraq, however, had a few quality issues at the beginning of the year, which hampered exports. But after it started to export both Basrah light and Basrah heavy, exports quickly rebounded to their former levels. Altogether, these additional volumes have been more than enough to offset the decline in US

production, and, as a result, global crude oil supply was roughly 2 million barrels per day higher in the first half of 2015 than in the same period in 2014, boosting transport requirements and hence Crude Tanker demand.

#### **A NUCLEAR AGREEMENT CONCERNING IRAN WAS REACHED IN JULY**

Iranian crude oil exports have been stable in 2015, but after 14 July, when the nuclear agreement between Iran and a group of world powers was reached, a few Iranian VLCC vessels employed for floating storage sailed to Asia, enabling Iran to release its crude oil into the market soon after 15 December, when the International Atomic Energy Agency is due to assess whether it has initiated a scaling back of its nuclear efforts.

#### **CRUDE OIL PRICES DIPPED FURTHER IN JULY**

Crude oil prices dipped further in July, reaching their lowest levels since 2009, as fears of continued oversupply escalated. These fears arose due to a possible worsening of the imbalance between demand and supply caused by the potential return of Iranian barrels in combination with the recent turbulence in the Chinese economy and fears of a possible Greek euro exit in July. Brent dropped to USD 41 per barrel, while WTI fell below USD 40 per barrel (fig 9). Crude oil prices have since rebounded slightly, but are still below USD 50 per barrel.

#### **FLOATING STORAGE BECAME ATTRACTIVE AS FREIGHT RATES DROPPED**

During the summer months, when crude oil prices dipped further, the contango level in the crude oil market steepened, indicating that the difference between the current crude oil price and the forward price increased. This occurred at the same time as freight rates dropped significantly, making floating storage of crude oil an attractive option. Thus, several VLCC vessels were taken on charter with the option to store crude oil, reducing excess tonnage in the market and proving a boost to freight rates.



## CONTRACTING AND SHIP VALUES

CONTRACTING IN 2015 IS ON COURSE TO REACH THE SECOND-HIGHEST LEVEL EVER RECORDED, DRIVEN BY A COMBINATION OF HIGHER FREIGHT RATES AND LOWER NEWBUILDING PRICES. ON THE OTHER HAND, SECONDHAND PRICES HAVE RISEN, BUT STRONGER FREIGHT RATES HAVE ENSURED A BETTER BALANCE BETWEEN PRICES AND EARNINGS.

### CONTRACTING MAY REACH THE SECOND-HIGHEST LEVEL EVER IN 2015

Contracting in the first three quarters of 2015 alone surpassed 25 million dwt, almost twice as much as the average tonnage contracted in the first three quarters of last year. If the current rate continues, total contracting in 2015 will reach the second-highest level ever recorded. VLCC tonnage accounted for around 60% of the tonnage ordered in the first three quarters of 2015, which is in line with the historical average. In 2014, owners returned to the Suezmax segment and Suezmax tonnage comprised almost 25% of orders placed in the first three quarters of 2015. The remaining 15% was ordered in the Aframax segment, which after a few lean years has seen ordering surge to its highest level since 2007 (fig. 12).

### INTEREST IN SECONDHAND VESSELS IS STILL QUITE HIGH

The surge in freight rates also led to more interest in secondhand vessels. Though still at a high level, interest has waned somewhat during 2015, possibly because secondhand prices have risen significantly. Secondhand prices are now on average almost 20% higher they were at the same point in 2014. At the same time, newbuilding prices have decreased slightly, prompting owners to shift their focus to newbuilds.

### PRICES AND EARNINGS HAVE BECOME BETTER ALIGNED IN 2015

Despite the surge in secondhand prices, timecharter rates have risen relatively more, bringing price/earnings ratios down to levels resembling those recorded prior to the financial crisis (fig. 13). This development indicates a better alignment between prices and earnings in the Crude Tanker market and that current price levels are not purely based on expectations.

Figure T.12

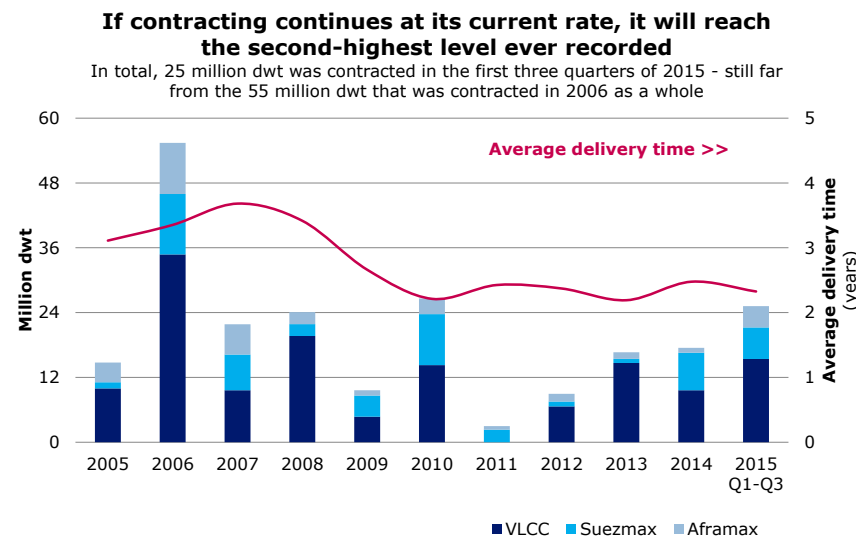
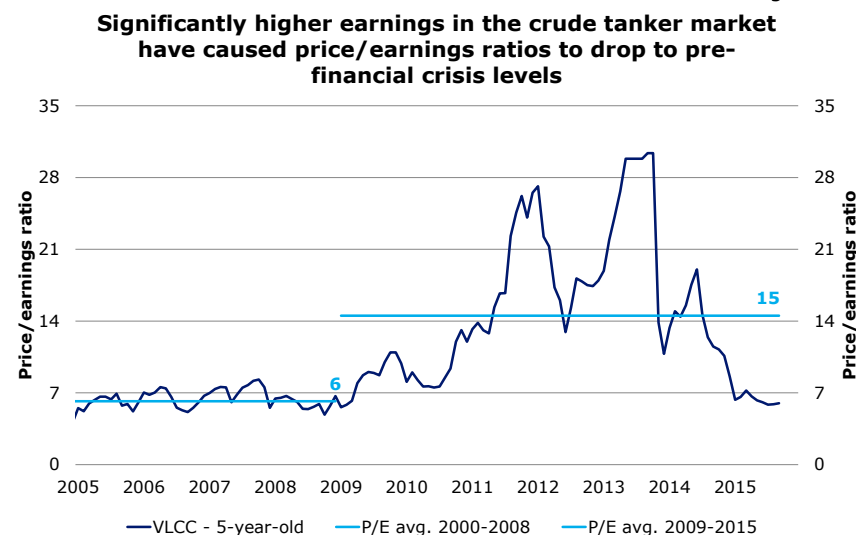


Figure T.13



## OUTLOOK

THE CRUDE TANKER MARKET IS EXPECTED TO REMAIN FRAGILE IN THE COMING YEARS, AS THE LARGE INFLUX OF NEW VESSELS MAY JEOPARDISE THE RECENT MARKET IMPROVEMENT. THE OVERSUPPLY OF CRUDE OIL IS, HOWEVER, EXPECTED TO CONTINUE TO CREATE OPPORTUNITIES FOR CRUDE TANKERS, SUCH AS ONSHORE INVENTORY BUILD-UPS AND FLOATING STORAGE.

The Crude Tanker market has improved significantly during the last year and in the coming six months it may gain even more strength due to a combination of low Crude Tanker fleet growth and high demand. In general, the first and fourth quarters of the year are characterised by high seasonal demand and weather-related disruptions. In 2015, Crude Tanker demand may also be fuelled by above-average refinery utilisation and continued inventory build-ups in China and India. At the end of 2015 and at the beginning of 2016, Iranian crude oil along with its Crude Tankers may return to the market. This could put additional pressure on crude oil prices, while its effect on freight rates may be muted.

In the longer run, the continued improvement in the Crude Tanker market is more uncertain, as fleet growth is expected to rise while the temporary factors currently bolstering the market may disappear.

Overall, refinery capacity in Asia is expected to continue to increase, while North American crude oil production may decline, possibly fuelling demand for seaborne imports into both regions.

### THE ORDERBOOK-TO-FLEET RATIO IS NOW AT 18%

As a consequence of the heavy contracting activity during the first three quarters of 2015, the orderbook-to-fleet ratio has jumped 5 percentage points since our last report (published in May 2015). The orderbook now represents 18% of the fleet and equals roughly 62 million dwt. As a result, the orderbook no longer corresponds to the proportion of vessels over the age of 15 years in the fleet. Hence, the Crude Tanker orderbook cannot be absorbed by premature scrapping, but is reliant on strong

Figure T.14

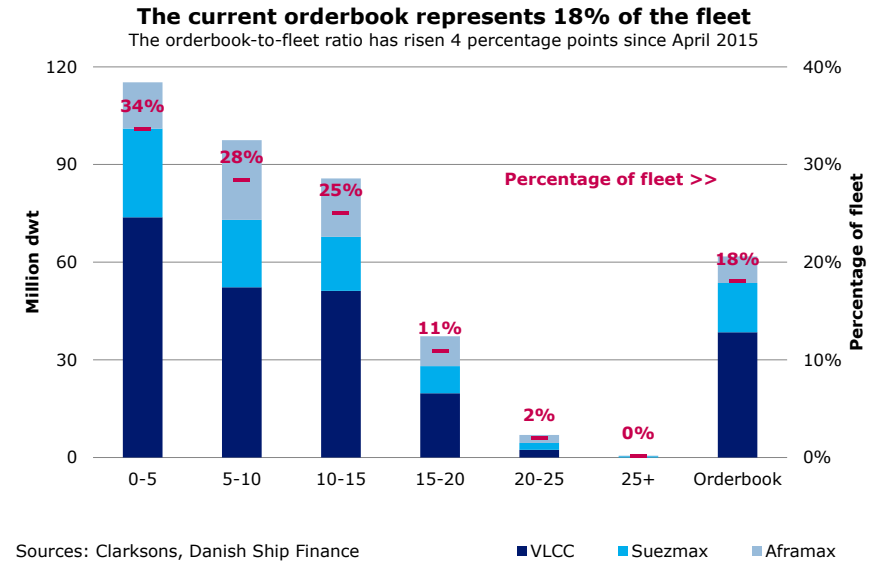
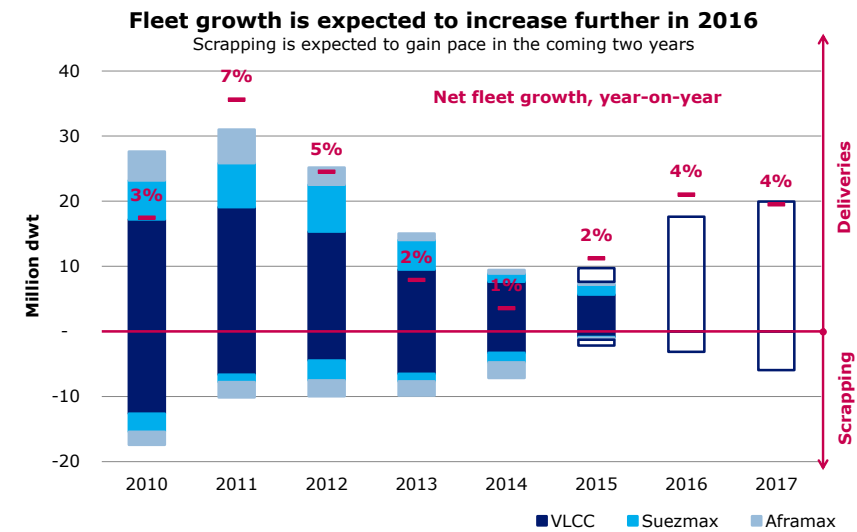


Figure T.15



growth in demand for seaborne crude oil volumes (fig. 14). The age distribution of the overall fleet in combination with the orderbook is likely to be one of the main factors triggering the next downturn in the Crude Tanker market if and when demand growth wanes.

#### FLEET GROWTH IS EXPECTED TO REACH 4% IN 2016

In our fleet projection we assume that vessels become eligible scrapping candidates the year before their fourth special survey. We expect scrapping to increase slightly in the coming two years, as the high influx of new vessels is expected to dampen freight rates. However, we also expect deliveries to increase. Based on statistics from the last three years, we assume that roughly 60% of the orderbook will be delivered according to schedule and that the remaining 40% will be postponed one year. Consequently, Crude Tanker fleet growth is expected to climb to 4% in 2016 and 2017. It is, however, important to keep in mind that the orderbook for 2017 is not yet full, so this figure could increase.

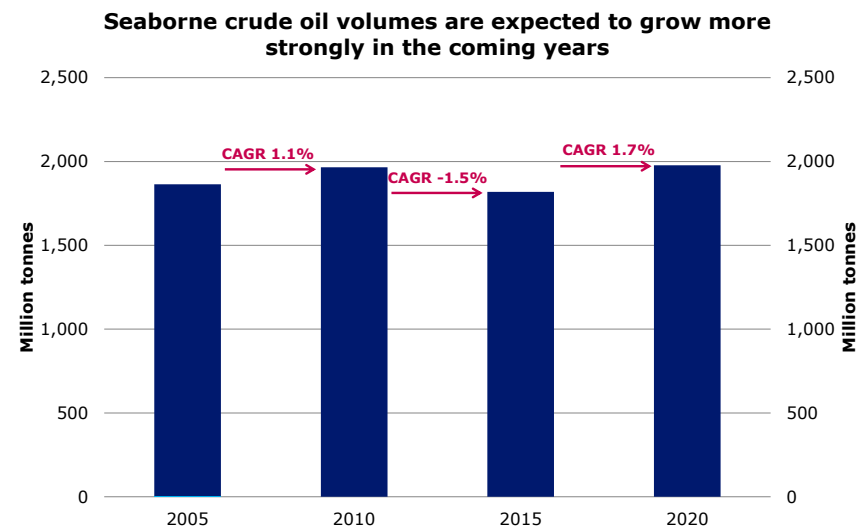
#### GROWTH IN DISTANCES IS EXPECTED TO ADD TO TANKER DEMAND

After several years of subdued growth, volumes of seaborne crude oil are expected to grow more strongly in the coming years (fig. 16). In addition, average voyage distances are expected to lengthen as Asian importers continue to diversify away from the Middle East. Some of the transition has already occurred and hence, growth in distances in the coming years will be less than we have seen from 2010 to 2015 (fig. 17). Demand for Crude Tankers, however, not only hinges on seaborne crude oil volumes, but is also affected by the fleet's productivity. The fleet's productivity, in turn, is affected by, for instance, triangulating opportunities, port congestion and weather-related disruptions. Consequently, if the productivity of the Crude Tanker fleet increases, freight rates could come under pressure even if growth in demand for seaborne crude oil volumes exceeds fleet growth, and vice versa if the productivity of the fleet decreases.

#### ASIAN IMPORT VOLUMES MAY CONTINUE TO GROW

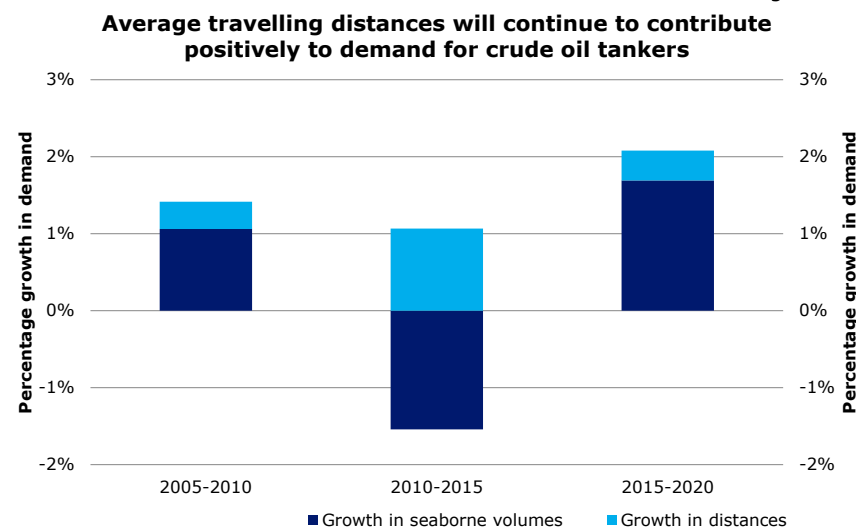
Asia is by far the largest importer of crude oil, and in the coming five years it is expected to increase its seaborne imports by

Figure T.16



Sources: IHS Global Insight, Danish Ship Finance

Figure T.17



Sources: IHS Global Insight, Danish Ship Finance

roughly 3% per annum. This will bring the region's total imports of seaborne crude oil to almost 1.2 billion tonnes in 2020, accounting for 60% of the world market (fig. 18). The remaining regions are not expected to contribute much to growth in Crude Tanker demand. North American imports of seaborne crude oil volumes are expected to decrease, while European import volumes are expected to remain roughly unchanged. Africa's imports of seaborne crude oil volumes are, on the other hand, expected to grow, although, with estimated growth of 2% per annum in the coming five years, volumes will be insignificant compared with Asia's.

#### REFINERY INTAKE AND STORAGE BUILDS DRIVE CHINESE DEMAND

China is expected to grow its imports of seaborne crude oil volumes by 55 million tonnes in the coming five years, reaching almost 370 million tonnes by 2020. This development will be driven by increasing refinery intake and storage build-ups. Hence China will continue to account for roughly 30% of Asia's seaborne crude oil imports.

#### CHINA'S REFINERY CAPACITY IS STILL EXPECTED TO GROW STRONGLY

China's refinery industry is expected to expand by an additional 1.6 million barrels per day, equivalent to roughly 70 million tonnes, in the coming five years (fig. 19). Although refineries seldom operate at maximum capacity due to maintenance and other factors, seaborne crude oil imports and hence Crude Tanker demand are expected to grow significantly.

#### CHINA CONTINUES TO GROW ITS STORAGE RESERVES

In the short to medium term, storage builds, both commercial and strategic petroleum reserves, are expected to support growth in demand for seaborne crude oil volumes. During the rest of 2015 and in 2016, China is planning to finalise more than 150 million barrels of storage capacity. If it continues to increase its storage reserves at the current rate of roughly 100,000 barrels per day - approximately 1% of China's regular import requirement - they will be filled within four years. But storage build-ups could easily occur at a faster rate if the necessary equipment is available and oil prices remain low. Even though storage build-ups in China may occur for some time, it is

Figure T.18

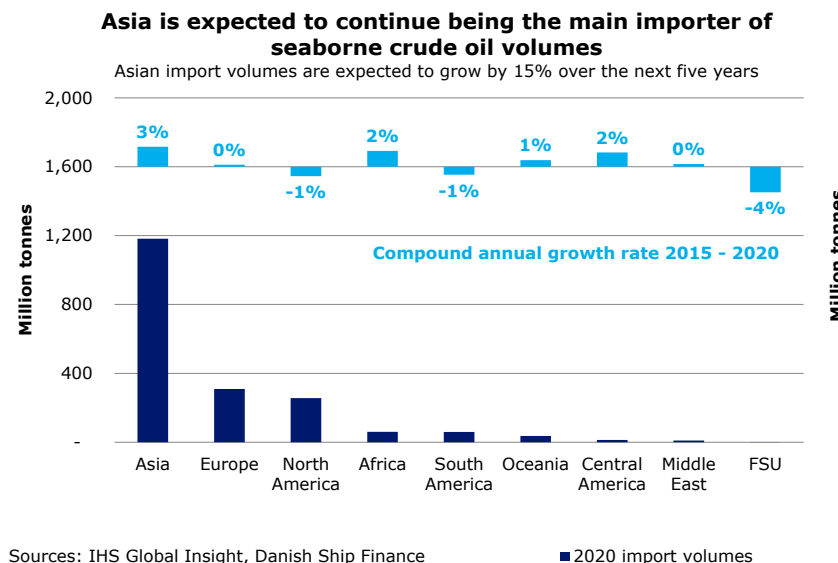
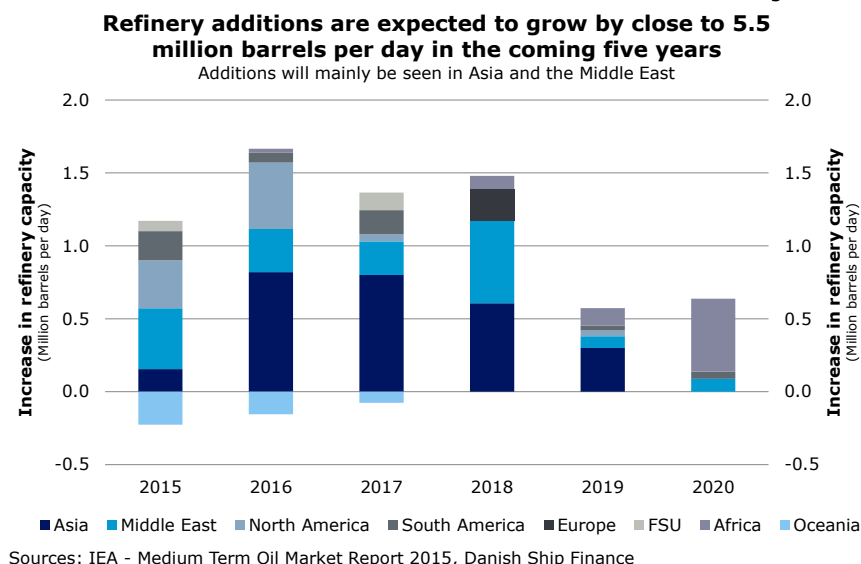


Figure T.19



important to keep in mind that the effect is temporary – and the speed at which reserves are filled is contingent on oil price levels – and that there is a risk that imports will fall back once inventories, both commercial and strategic petroleum reserves, are filled.

#### **THE MARKET IS BECOMING MORE DEPENDENT ON STORAGE BUILDS**

India is also expanding its strategic petroleum reserves, albeit on a smaller scale than China. It is expected to increase its storage capacity by more than 100 million barrels by 2020 and roughly 40% is expected to be finalised at the end of 2015 and at the beginning of 2016. This will likely increase India's demand for crude oil and Crude Tankers, although Crude Tanker demand may be limited given that average travelling distances on India's main importing routes are relatively short.

#### **IRANIAN BARRELS COULD FLOOD THE MARKET AT THE END OF 2015**

In July 2015 an agreement between Iran and a group of world powers was reached, according to which the country will limit its nuclear activities in exchange for the lifting of sanctions. The International Atomic Energy Agency has until 15 December to assess whether Iran has begun scaling down its nuclear activities. Consequently, after this date Iranian barrels could reach the market. It is believed that Iran currently has about 30 million barrels of crude oil and condensate in floating storage on about 15 VLCC vessels. The release of these barrels into the market could potentially put further downward pressure on crude oil prices and thereby revitalise floating storage once more. The level of floating storage, however, depends on the level of contango and freight rates. An increase in floating storage would normally provide an uplift to freight rates, as it would tighten Crude Tanker supply, but until floating storage or regular Iranian crude oil exports have been able to counterbalance the additional influx of Crude Tankers, freight rates could remain unchanged.

#### **THE LEVEL OF FUTURE IRANIAN OIL SUPPLY IS HIGHLY UNCERTAIN**

Regular Iranian crude oil supply is more uncertain. Iran currently exports around 1.3 million barrels per day of crude oil. Ac-

cording to official statements, it will be able to increase export volumes by 1 million barrels per day within a couple of months after sanctions have been lifted. Most independent analysts are more sceptical, and expect an increase of about half that amount by the end of 2016. One of the main reasons for their scepticism is that in 2012, before the sanctions took effect, Iranian crude oil exports were only 1.2 million barrels higher than today and production was already in decline. Also, during the past two years, Iran is believed to have neglected its production fields - which require constant investment and maintenance – preventing a rapid ramp-up of crude oil production. Moreover, there is a possibility that sanctions may not be lifted immediately, but may be lifted gradually in tandem with reductions in Iranian nuclear activity. In any case, freight rates may come under downward pressure at least until additional Iranian crude oil exports are able to counterbalance the return of the country's vessels. Fortunately, the vessels are returning to operation at a time when Crude Tanker demand is expected to be high, and so freight rates may not necessarily decrease; they may just slow down or remain stable.

#### **INTERNATIONAL OIL COMPANIES MAY STEP UP INVESTMENTS IN IRAN**

Iran currently possesses the world's fourth-largest crude oil reserves, and several international oil companies have already expressed an interest in developing these. Should international oil companies be allowed access, production may increase more rapidly than otherwise would have been the case, and the pressure on freight rates may be of shorter duration. Although demand for crude oil may not immediately be able to absorb supply, Crude Tankers may come in demand as surplus crude oil volumes may have to be transported to storage facilities or stored on Crude Tankers.

#### **THE EFFECT OF ADDITIONAL IRANIAN CRUDE OIL MAY BE LIMITED**

Eventually, more Iranian crude oil volumes are expected to hit the already oversupplied crude oil market, but the effect on Crude Tanker demand and hence freight rates may be fairly muted, as the return of Iranian Crude Tankers could be diluted by the positive impact of more crude oil exports.

### US CRUDE OIL PRODUCERS ARE STRUGGLING WITH LOW PRICES...

Given the already low crude oil prices and high breakeven prices, US crude oil producers are struggling to remain profitable. According to the IEA, about 48% of total US crude oil and condensate production has a breakeven price of less than USD 50 per barrel. That number drops to 41% for US shale and tight oil production. As a result, US crude oil producers, like so many others, have been cutting costs, and consequently US crude oil output has been declining since April 2015 (fig. 20). There is a genuine risk it may fall further, especially if additional Iranian crude oil volumes add to the downward pressure on crude oil prices.

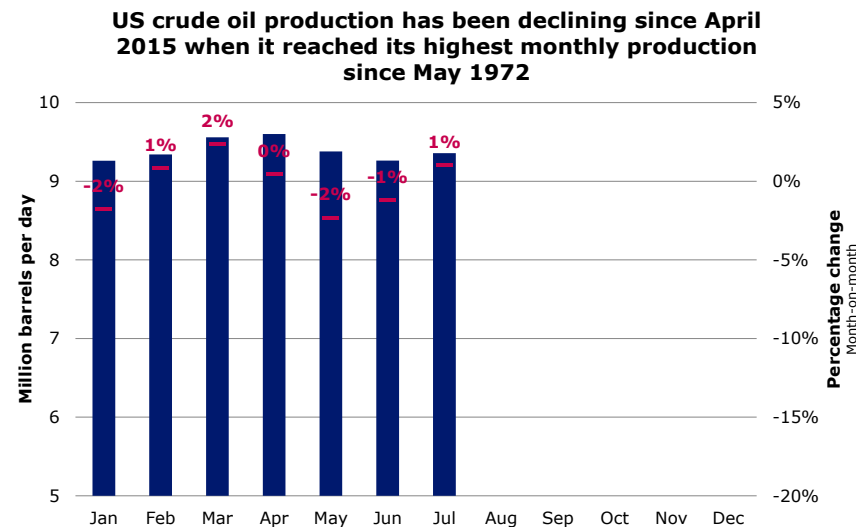
### ...AND US CRUDE OIL PRODUCTION COULD DECLINE FURTHER...

If crude oil production in the US continues to decline and its refineries carry on operating at current levels, the market may experience a shift in trading patterns whereby the US may require additional import volumes. Also, lower US crude oil production is likely to narrow the spread between WTI and Brent, giving some refineries, especially coastal refineries, an incentive to import seaborne crude oil volumes rather than buying domestic crude oil. The US is likely to resume crude oil imports from West Africa, the Middle East or both, depending on prices and which crude oil grades are in greatest demand at refineries.

### ...BOOSTING IMPORT REQUIREMENTS FROM WEST AFRICA...

Currently, it is the marginal producers, more specifically the shale oil producers, that are reducing production. If this continues at the same time as US refineries are operating at high utilisation rates, the US may have to resume imports of light and sweet crude oil from West Africa to compensate for the missing shale oil volumes. Moreover, during the past two years the US has gained access to more heavy and sour crude oil from Canada and Mexico, increasing the likelihood that additional light and sweet West African crude oil will be imported, should production continue to decline. If US refineries resume imports from West Africa, average travelling distances and hence Crude Tanker demand may decrease slightly, as long-haul volumes would likely be diverted from the Asian market to the US.

Figure T.20



Sources: EIA, Danish Ship Finance

### ...OR FROM THE MIDDLE EAST

Canadian oil sand producers are, however, struggling too and have already shut down or delayed several projects. This could jeopardise the US's heavy and sour crude oil supply from Canada and make more Middle Eastern barrels a necessity for blending purposes. If this proves to be the case, average travelling distances and hence Crude Tanker demand could increase, as Asian importers would have to replace Middle Eastern barrels with long-haul volumes from the Atlantic Basin. In either scenario, the productivity of the Crude Tanker fleet would likely increase, as more US imports would create additional triangulation opportunities, lowering demand for Crude Tankers.

### US REFINERIES MAY ALSO CHOOSE TO OPERATE AT LOWER UTILISATION

There is also the possibility that US refineries will decide to operate at lower operating rates given that their margins are likely to decrease and become more in line with industry standards, as lower US crude oil production may narrow the spread between



WTI and Brent. This may keep US seaborne import requirements at current levels, possibly averting a shift in trading patterns. However, lower utilisation rates at refineries in the US are bound to have some effect on the market, as utilisation rates may increase elsewhere in response.

#### **US OIL PRODUCTION CAN REACT VERY QUICKLY TO PRICE MOVEMENTS**

US crude oil production could continue to decline at least until crude oil prices recover, but when and if prices recover, it will not take long for US crude oil producers to ramp production back up thanks to a huge backlog of uncompleted wells. The reason these uncompleted wells have been drilled but not completed is that most costs are incurred in the final stages of completion. Moreover, several additional shale oil plays have already been identified in the US, and as the actual drilling process only takes about one month, this will also enable US shale oil producers to respond fairly quickly to price movements in the market.

#### **CRUDE OIL PRICES MAY REMAIN LOW FOR SOME TIME**

Crude oil prices, however, may remain low for some time, especially because additional Iranian barrels are expected to exacerbate the oversupply. But, lower crude oil prices have also led major crude oil producers to cancel or delay almost 5 million barrels per day of production projects. At some point, the market may demand these additional barrels. The low crude oil prices have also stimulated consumption, and the IEA expects consumption to increase by 1.7 and 1.4 million barrels per day in 2015 and 2016, respectively. Consequently, unless something unexpected happens, supply and demand in the crude oil market may begin to balance around 2017. However, there are still significant crude oil volumes in storage around the world along with several uncertainties in the oil market, among them geopolitical risks in the Middle East and renewable energy, which may either help the balancing process or slow it down.

#### **ALTHOUGH CURRENTLY STRONG, THE MARKET REMAINS VULNERABLE**

The Crude Tanker market is expected to gain strength in the fourth quarter of 2015, as low crude prices on top of strong sea-

sonal demand could boost demand for Crude Tankers. Weather-related disruptions are also more common in the fourth quarter, limiting the productivity of the Crude Tanker fleet. In 2016, the Crude Tanker market is expected to remain relatively buoyant, especially during the first quarter, but could at times be very volatile, as the market has to accommodate a relatively large influx of new vessels. Demand, although it mainly hinges on Asia, and China in particular, is expected to grow as refinery additions and storage build-ups continue to require more crude oil imports. However, there are still several downside risks, including the geopolitical situation in the Middle East, the expansion of the ESPO (Eastern Siberia – Pacific Ocean) pipeline and the re-balancing of the Chinese economy.



# PRODUCT TANKER

SHIPPING MARKET REVIEW – NOVEMBER 2015



**DANISH  
SHIP FINANCE**

# PRODUCT TANKER

IN 2015, THE PRODUCT TANKER MARKET HAS BEEN BOOSTED BY TEMPORARY FACTORS SUCH AS ARBITRAGE-DRIVEN TRADE AND 'FLOATING' STORAGE. WHEN THESE DISAPPEAR OR SUBSIDE, THE RECOVERY MAY GRIND TO A HALT, AS IT SEEMS UNLIKELY THAT UNDERLYING DEMAND WILL BE STRONG ENOUGH TO ABSORB THE RELATIVELY LARGE ORDERBOOK.

## FREIGHT RATES

THE PRODUCT TANKER MARKET HAS CONTINUED TO GAIN SUPPORT FROM HIGHER REFINERY THROUGHPUT AND TEMPORARY DEMAND FOR PRODUCT TANKERS IN 2015. BOTH SPOT AND TIMECHARTER RATES HAVE BENEFITTED FROM THIS DEVELOPMENT AND CLIMBED TO LEVELS NOT SEEN SINCE 2008.

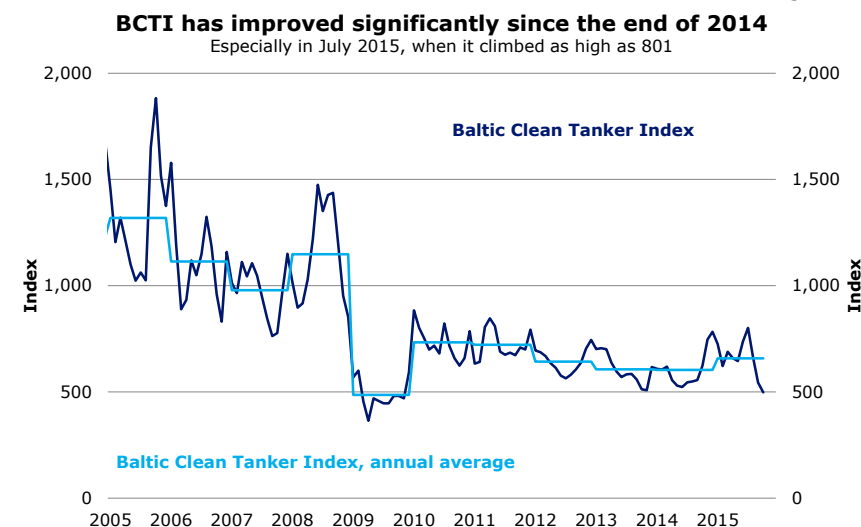
### THE BCTI HAS CONTINUED TO IMPROVE THROUGHOUT 2015

After a rough few years with a growing imbalance between supply and demand, the Product Tanker market has improved significantly in 2015. The recovery started towards the end of 2014, when higher refinery throughputs and lower oil prices boosted Product Tanker demand. This development has continued in 2015, resulting in an average Baltic Clean Tanker Index (BCTI) of 676 in the first three quarters of 2015, compared with 566 in the same period in 2014 (fig. 1). The third quarter – which usually sees fading demand – proved particularly resilient, at least to begin with. The BCTI climbed to 801 in July, but fell back to 544 in September.

### TIMECHARTER RATES HAVE SOARED IN 2015

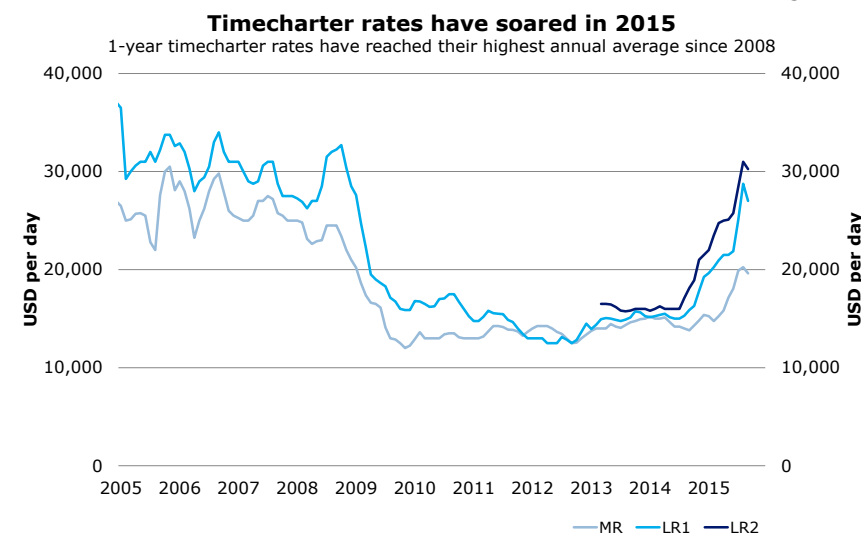
Timecharter rates have been quick to respond to the improved conditions in the Product Tanker market, especially the LR1 and LR2 timecharter rates, which increased 25% during the fourth quarter of 2014 on the back of the sudden rise in spot rates. The 1-year LR2 timecharter rate is now fluctuating around USD 30,000 per day (fig. 2). MR timecharter rates have been a little slower to react to the changing spot rates, as future expectations have been weighed down by the fairly large orderbook. However, since the second quarter of 2015, MR timecharter rates have increased too, reaching USD 20,000 per day in August for a 1-year timecharter.

Figure P.1



Sources: Clarksons, Danish Ship Finance

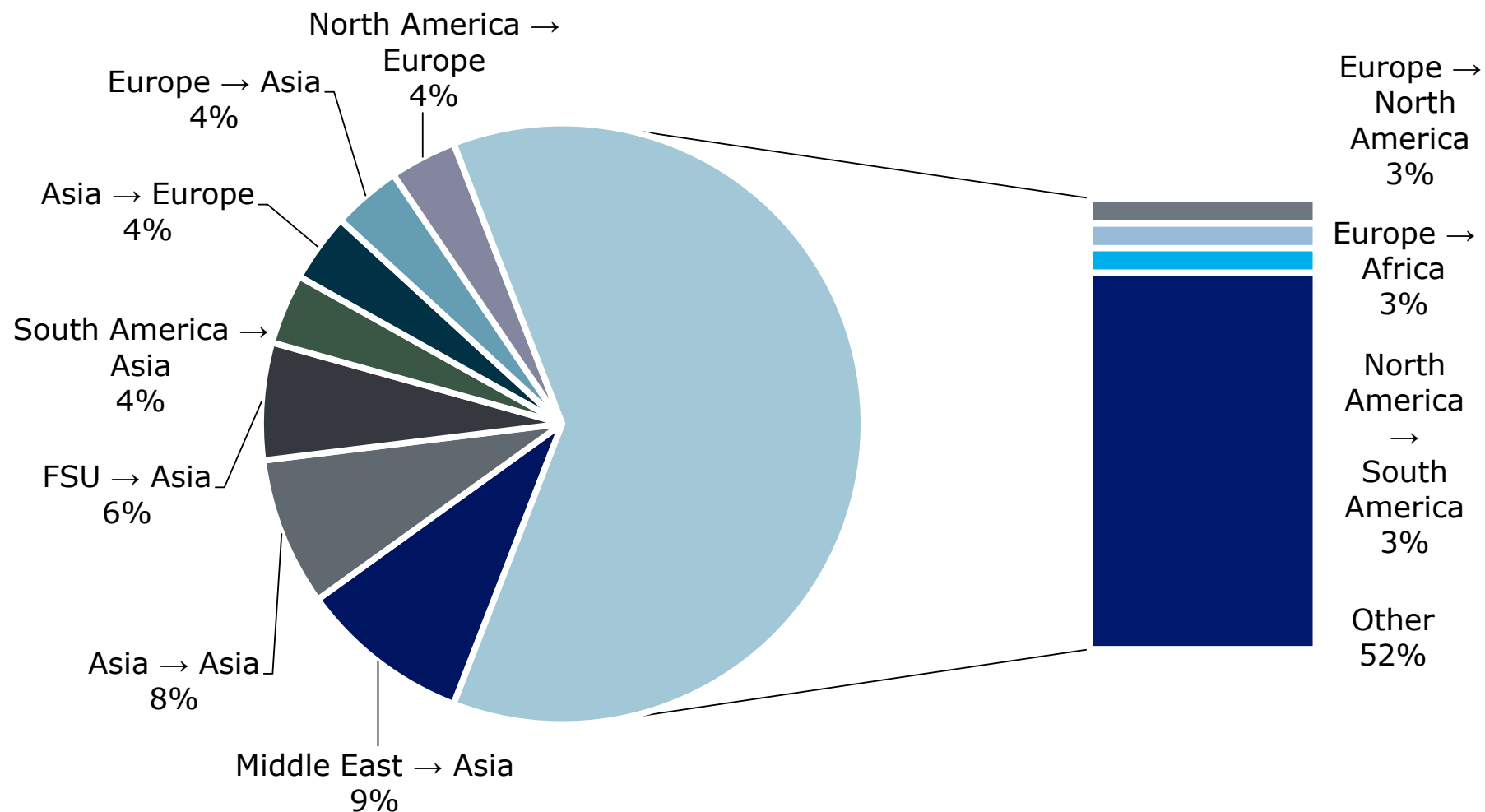
Figure P.2



Sources: Clarksons, Danish Ship Finance

## Major product tanker trades

(Measured in billion tonne-miles, 2015)



Sources: IHS Global Insight, Danish Ship Finance

## SUPPLY & DEMAND

SUPPLY GROWTH ONCE AGAIN EXCEEDS GROWTH IN DISTANCE-ADJUSTED DEMAND, BUT THE PRODUCT TANKER MARKET HAS BEEN BUOYED BY TEMPORARY FACTORS SUCH AS TRADING ACTIVITY, 'FLOATING' STORAGE AND WEATHER-RELATED DISRUPTIONS.

### FLEET GROWTH IS CLIMBING TOWARDS 7% IN 2015

The Product Tankers ordered during the heavy contracting that took place in 2013 are now beginning to enter the Product Tanker fleet. After a steady rise from 2% in 2012 to 4% in 2014, the Product Tanker fleet is expected to grow by 7% in 2015 (fig. 4), as high freight rates have given owners an incentive to put off scrapping decisions and continue trading vessels that, had freight rates been low, would probably have been scrapped.

### SCRAPPING MAY DROP TO A NEW RECORD-LOW LEVEL IN 2015

This postponement of scrapping decisions may push scrapping in 2015 down to a new record-low level. During the first three quarters of this year less than 0.7 million dwt was scrapped in the Product Tanker market (fig. 4). As in earlier years, the majority of this, equivalent to 0.6 million dwt or 18 vessels, was scrapped in the MR segment, while 0.1 million dwt equivalent to two vessels was demolished in the LR1 segment. As a consequence of high freight rates, average scrapping ages have risen in the two segments by an average of four years to 27 years. The LR2 segment, which seems to be in favour with owners at the moment, did not experience any scrapping at all during the first three quarters.

### SCHEDULED ORDERS CONTINUE TO BE POSTPONED ON A LARGE SCALE

Even though owners have refrained from carrying out any significant scrapping, a significant portion of scheduled orders have been postponed this year. The MR and LR2 segments have both seen a postponement ratio of roughly 25%, while the LR1 segment did not have any postponements at all, only a few cancellations, in the first three quarters of 2015. In total, 60% of scheduled orders were actually delivered during the first three quarters, less than in 2014 (fig. 5).

Figure P.4

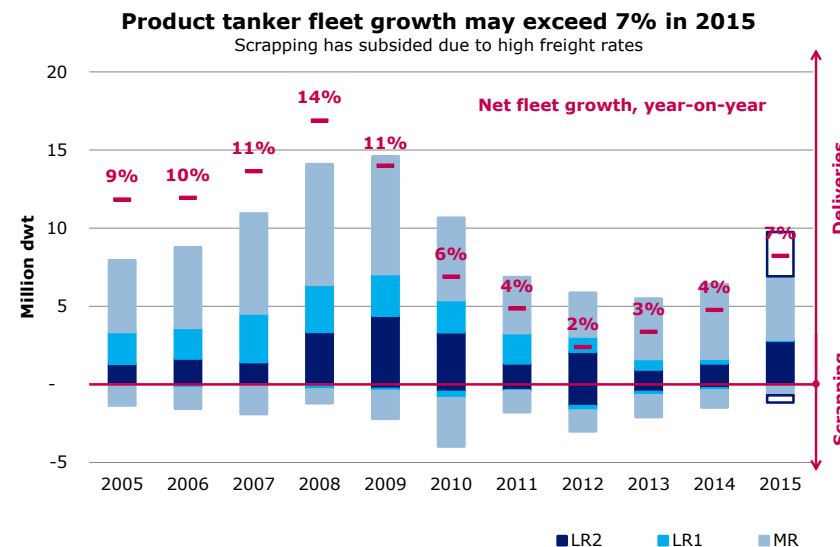
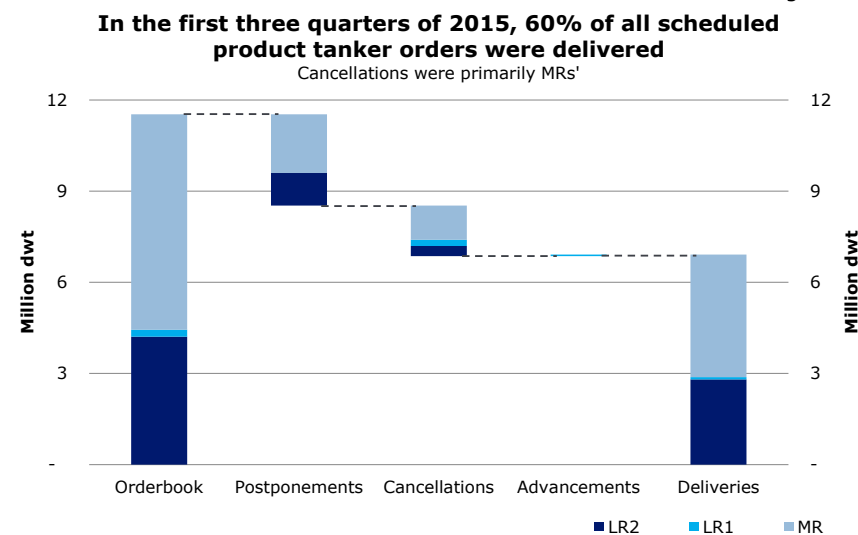


Figure P.5



### THE GAP BETWEEN SUPPLY AND DEMAND HAS WIDENED IN 2015

The nominal gap between supply and demand has widened in the Product Tanker market in 2015 (fig. 6). Fortunately, demand for Product Tankers has been supported by temporary effects such as more arbitrage-driven trade, weather-related disruptions and 'floating' storage (i.e. insufficient onshore storage capacity has forced cargoes to stay offshore for longer). These temporary factors enabled Product Tanker freight rates to remain at relatively high levels throughout the first three quarters of 2015, even though underlying demand for seaborne petroleum products seems to have remained roughly unchanged from 2014, according to figures from IHS Global Insight. Travelling distances have not provided any support to the market either; in fact, average travelling distances have decreased slightly in 2015 as exporters continue to prefer trading with neighbouring regions. Some of the oversupply has, however, been eased by the fleet's continued slowdown in speeds. Speed-adjusted fleet growth is expected to be roughly 1 percentage point lower than net fleet growth in 2015. This is, however, still 7% higher than growth in distance-adjusted demand. Hence, with freight rates being supported by temporary factors rather than fundamental improvements, the Product Tanker market continues to be very fragile.

### LOWER OIL PRICES HAVE ENCOURAGED MORE OIL CONSUMPTION

Growth in demand for Product Tankers in 2015 has to a large extent been propelled by the drop in crude oil prices and in turn prices of petroleum products. These lower prices have encouraged more end-user consumption and resulted in high refining margins, giving refiners an incentive to process as much crude oil as possible. As a result, transport requirements have increased and thereby demand for Product Tankers.

### VOLATILE OIL PRICES HAVE FUELLED DEMAND FOR PRODUCT TANKERS

As well as being lower, prices of petroleum products have also been more volatile in 2015, causing regional arbitrage windows to be opened and closed more frequently and hence intensifying trading activity. On some routes, arbitrage-driven trade can account for between 30% and 60% of the volumes transported. The lower oil prices have also enabled oil traders to trade larger

Figure P.6

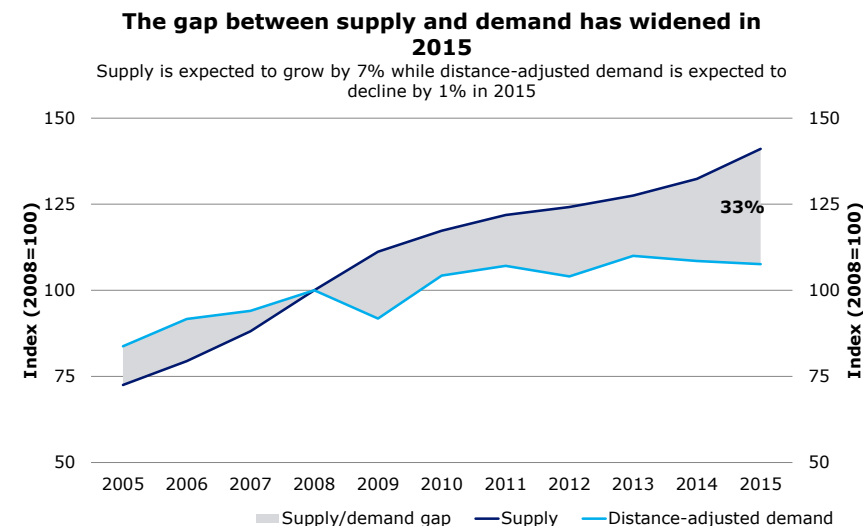
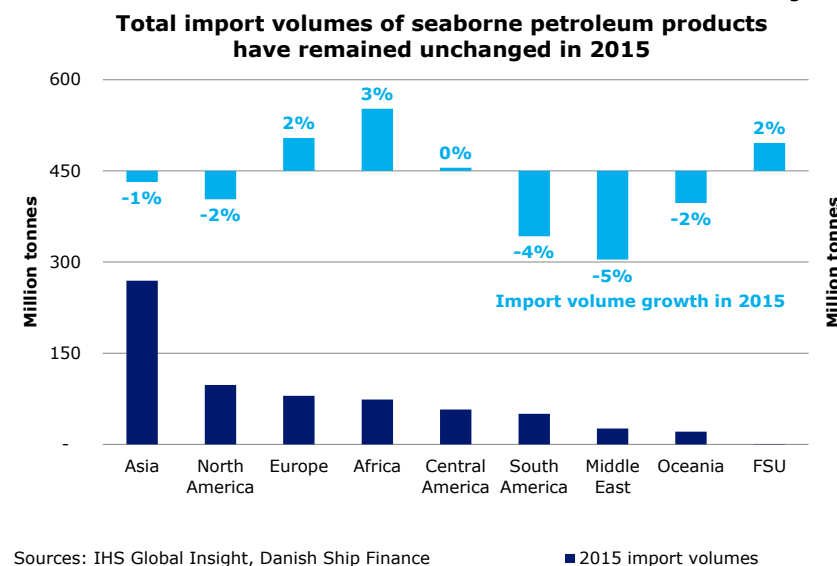


Figure P.7



volumes without breaking their lines of credit. Altogether, arbitrage-driven trade has absorbed significantly more Product Tanker in 2015 than in earlier years, as larger volumes have been traded more frequently. Also, average travelling distances and voyage durations on traded volumes of petroleum products may have been longer than our data indicates, bringing actual distance-adjusted demand into positive territory. It is important to keep in mind that trading of petroleum products does not necessarily have to occur to the same extent in the coming years.

#### ASIA REMAINS THE LARGEST IMPORTER OF PETROLEUM PRODUCTS

Asia is by far the largest importer of seaborne petroleum products, accounting for more than one-third of the world market. In 2015, Asia's imported volumes of petroleum products are expected to decrease by 1%, to a total of 270 million tonnes (fig. 7). The decrease has not been confined to one specific exporter, but is broad-based. Still, the Middle East and Europe have managed to increase their exports of petroleum product volumes to Asia, benefitting distance-adjusted demand.

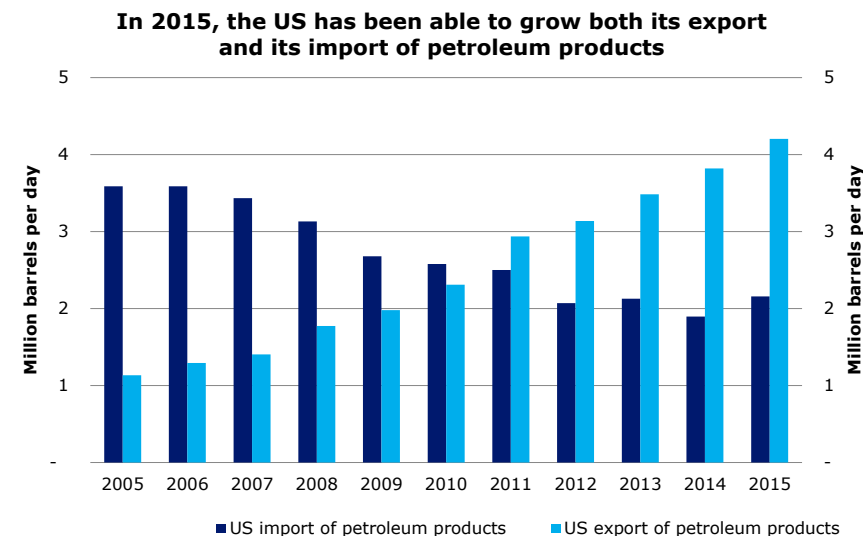
#### MIDDLE EAST IS INCREASINGLY SUPPLYING THE ASIAN MARKET

The Middle East has been able to increase its exports to Asia as refinery additions in the region have begun to be fully operational. In Saudi Arabia, the latest of its two new mega refineries, Yanbu, has boosted utilisation to roughly 80% during 2015. In the United Arab Emirates, the expansion unit at Ruwais has ramped up utilisation rates to between 80% and 90%. The capacity of both refinery additions is 400,000 barrels per day, adding significant volumes to the market for petroleum products and benefitting the LR2 market in particular.

#### EUROPEAN EXPORTS TO ASIA FUELLED BY HIGHER CRACKING MARGINS

European petroleum products have also been increasingly exported to Asia, notably China, in 2015, in order to satisfy China's increased appetite for imported naphtha in particular. Some months this year, Chinese gasoline demand has increased by more than 15%, boosting gasoline margins at refineries and giving domestic refineries an incentive to maximise gasoline production at the expense of other petroleum products, such as naphtha, whose refinery margins have been lower. At the same time, however, the petrochemical industry in Asia has seen the

Figure P.8



Sources: EIA, Danish Ship Finance

highest naphtha cracking margins since 2006, spurring its demand for naphtha and hence imports. In particular, European-sourced naphtha has increased sharply, benefitting distance-adjusted demand and demand for Product Tankers.

#### EUROPE HAS INCREASED ITS EXPORTS TO SEVERAL COUNTRIES

Europe has also increased exports of several other petroleum products to countries in South America, North America and especially Africa, where the US has scaled back its presence in 2015.

#### HIGHER CONSUMPTION HAS FUELLED US IMPORTS OF GASOLINE...

After years of decline, US imports of petroleum products, mainly gasoline, have increased slightly in 2015 (fig. 8). Imports have mainly increased into the east and west coasts of the US, as the area surrounding the Gulf of Mexico has sufficient refining capacity to support demand increases. The import requirements have been boosted by the country's much higher gasoline consumption, which has been driven by lower pump prices encouraging motorists to add mileage and invest in larger vehicles. As a result, US gasoline consumption has been close to its former highs during much of 2015 (fig. 9).

### ...WHILE DIESEL IMPORTS HAVE BEEN DRIVEN BY SUPPLY ISSUES

While gasoline imports increased throughout the first three quarters of 2015, diesel imports were most prevalent at the beginning of the year when the arbitrage flow between Europe and the US reversed for a short period. The reason for this rather rare occurrence was the double-whammy of refinery unit outages triggered by a very cold winter and the largest US refinery strike since 1980, involving 12 refineries. Furthermore, the very cold winter also drove up heating oil consumption at the same time as the new ECA regulations boosted demand for marine gas oil, meaning that additional imports were required.

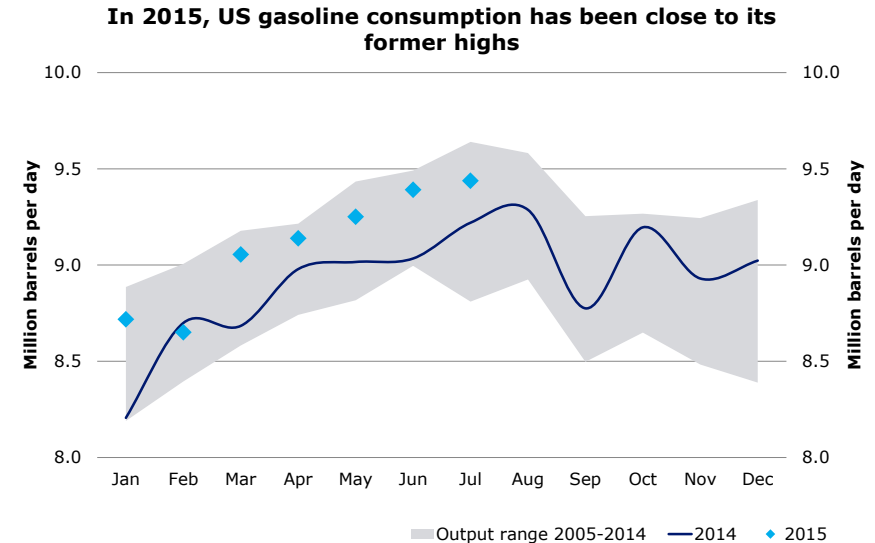
### CHINA IS ONE OF THE MAIN RECIPIENTS OF ADDITIONAL US EXPORTS

The US, more specifically the area surrounding the Gulf of Mexico, has also increased its exports of petroleum products, mainly diesel, in 2015, reaching the highest average level ever recorded during a single year. Asia, China in particular, has been one of the main recipients of the additional US export volumes. This has boosted Product Tanker demand, as the trade not only involves long travelling distances, but also few return cargoes, limiting the productivity of the fleet. MR tankers are likely to have been the main beneficiaries of this development, as the standard US parcel size and port capacity are suited to an MR trade. It is, however, worth mentioning that LR1 tankers are beginning to gain a foothold in the large US export market.

### 'FLOATING' STORAGE HAVE ABSORBED PRODUCT TANKERS IN 2015

The IEA expects consumption of oil to increase by an average of 1.7 million barrels per day or 1.8% in 2015, and although refineries have been operating at near-maximum capacity, certain petroleum products have continued to be in short supply in specific areas. Europe, for instance, is generally unable to satisfy its demand for jet fuel and diesel and has hence become a major destination and storage hub for several refineries around the world. However, during 2015, the European diesel and jet fuel market has become saturated and storage facilities have risen to near-record highs. This has forced imports to stay offshore even though the level of contango in the market is insufficient to

Figure P.9



make it profitable. In response, some buyers have opted to extend voyages by simply sailing longer routes to Europe, a move equivalent to floating storage, but without the long-term commitments or costs. This unusual situation is especially the jet fuel market has increased Product Tanker demand significantly. It is, however, not directly visible in our calculation of distance-adjusted demand, as the calculation only includes the most direct routes between importers and exporters.



## CONTRACTING AND SHIP VALUES

DESPITE HIGH EARNINGS, THERE HAS BEEN NO REAL SURGE IN CONTRACTING, BUT RATHER IT HAS REMAINED ROUGHLY IN LINE WITH THE 2014 LEVEL. OWNERS HAVE INSTEAD TURNED THEIR ATTENTION TO SECONDHAND TONNAGE, CAUSING SECONDHAND PRICES TO RISE. HOWEVER, LOWER PRICE/EARNINGS RATIOS INDICATE A BETTER BALANCE BETWEEN PRICES AND EARNINGS.

### CONTRACTING IS FOCUSED ON LR1 AND LR2 TONNAGE

During the first three quarters of 2015 less than 6 million dwt was contracted, similar to the 2014 level. The main change in 2015 compared with previous years is that contracting in the MR segment has been unusually low. Less than 1.3 million dwt of MRs has been contracted. Only once in recent history has MR contracting in the first three quarters of a single year been lower than that. That was in 2009, when total Product Tanker contracting amounted to less than 2 million dwt (fig. 10). This turn of events may indicate that owners are slightly worried about the outlook for MR tankers still, but unlike in the two LR segments, the MR orderbook can actually be absorbed if MR tankers older than 15 years are scrapped.

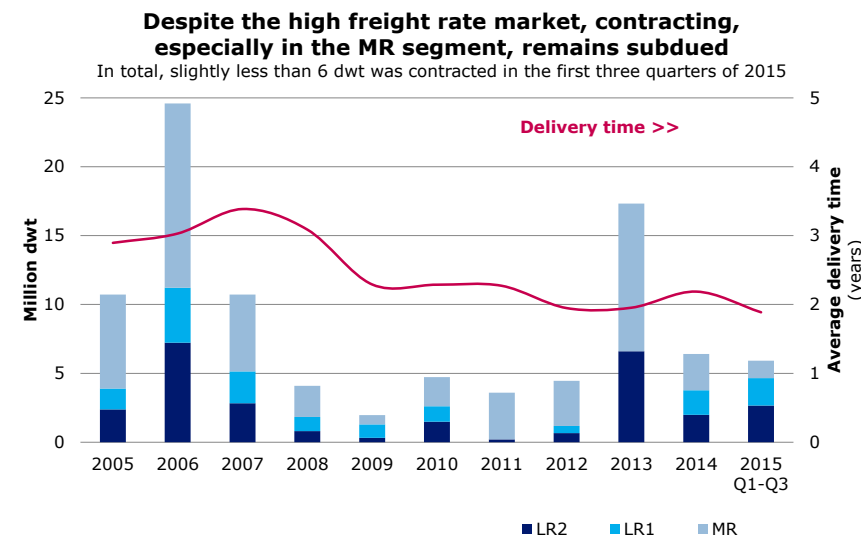
### MORE FOCUS ON SECONDHAND TONNAGE HAS CAUSED PRICES TO RISE

Newbuilding prices have been fairly stable during the past two years. Also, in the first half of 2015 in particular, owners were more reluctant to contract new Product Tankers, with the result that yards have kept prices low. Owners have instead focused more on secondhand tonnage, as freight rates have been especially strong. Consequently, secondhand prices took a leap at the start of the year and have remained fairly stable since. In September, they were about 10% higher than they were in the same month last year.

### THE BALANCE BETWEEN PRICES AND EARNINGS MAY HAVE IMPROVED

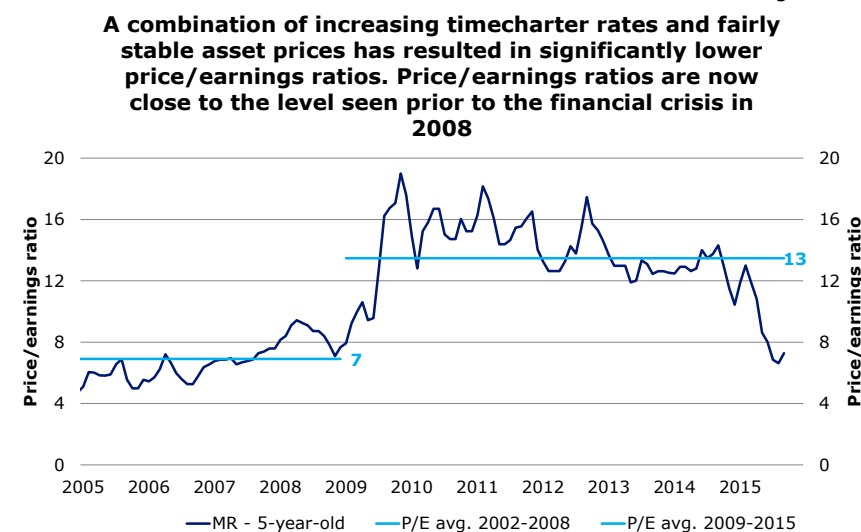
Even though secondhand prices rose significantly at the start of 2015, the recent spike in timecharter rates has been enough to ensure a significant drop in price/earnings ratios. Ratios have now reached a level not seen since before the financial crisis, indicating a better balance between asset prices and earnings (fig. 11).

Figure P.10



Sources: Clarksons, Danish Ship Finance

Figure P.11



Sources: Clarksons, Danish Ship Finance

## OUTLOOK

UNDERLYING DEMAND IS EXPECTED TO REMAIN INSUFFICIENT TO ABSORB THE INFLUX OF NEW PRODUCT TANKERS. AS A RESULT, TEMPORARY FACTORS, SIMILAR TO THOSE CURRENTLY SUPPORTING THE MARKET, ARE ESSENTIAL FOR FREIGHT RATES TO REMAIN HIGH.

In 2015, demand for Product Tankers has been exceptionally high, fuelled by lower prices for petroleum products. The high Product Tanker demand reflects an improvement in underlying demand for seaborne petroleum products as well as demand stemming from temporary factors such as arbitrage-driven trade and 'floating' storage. In the coming six months, demand for Product Tankers may gain additional strength due to seasonally higher demand and weather-related disruptions prone to occur during the winter in the Northern Hemisphere. The productivity of the Product Tanker fleet is, unlike many other shipping segments, very high, as there are considerable opportunities for triangulation. These are not expected to lessen in the coming years given that regional imbalances are likely to persist. These imbalances may be caused by the growing demand for specific petroleum products and the implementation of new and different fuel standards across countries, such as the China 5 fuel standard in China and the Bharat 3 fuel standard in India. However, it is important to remember that although demand may be buoyant in the coming years, new Product Tankers are pouring in and fleet growth is expected to remain relatively high. We fear that increased demand will not materialise in time to offset the inflow of new Product Tankers.

### THE ORDERBOOK OUTWEIGHS THE SHARE OF SCRAPPING CANDIDATES

As of October 2015, the orderbook totalled 22 million dwt and represented 16% of the fleet (fig. 12). The orderbook-to-fleet ratio varies considerably between the different vessel types. For instance, the MR orderbook, despite being the largest at 10 million dwt, only represents 12% of its current fleet, while the LR2 orderbook represents 25% of its current fleet. Consequently, when we compare the orderbooks with the number of potential scrapping candidates, i.e. vessels aged above 15 years, the MR

Figure P.12

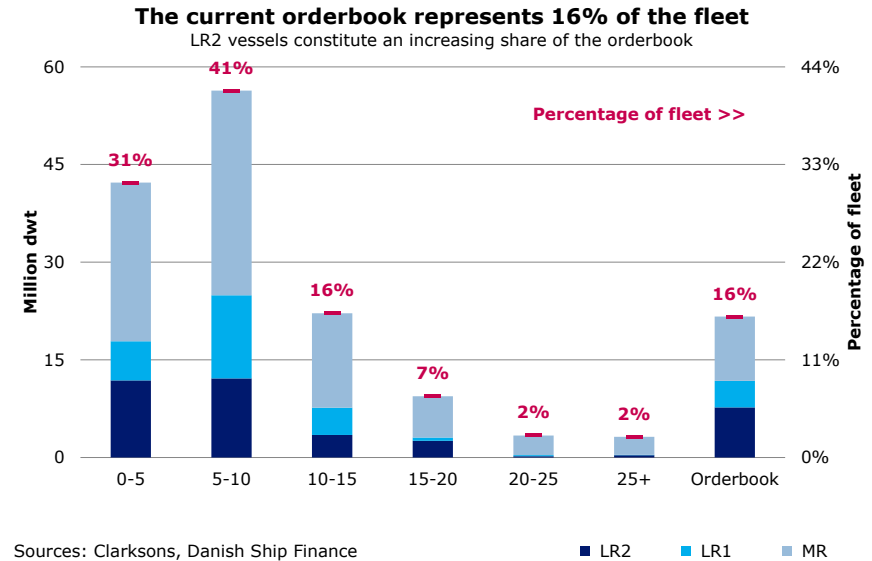
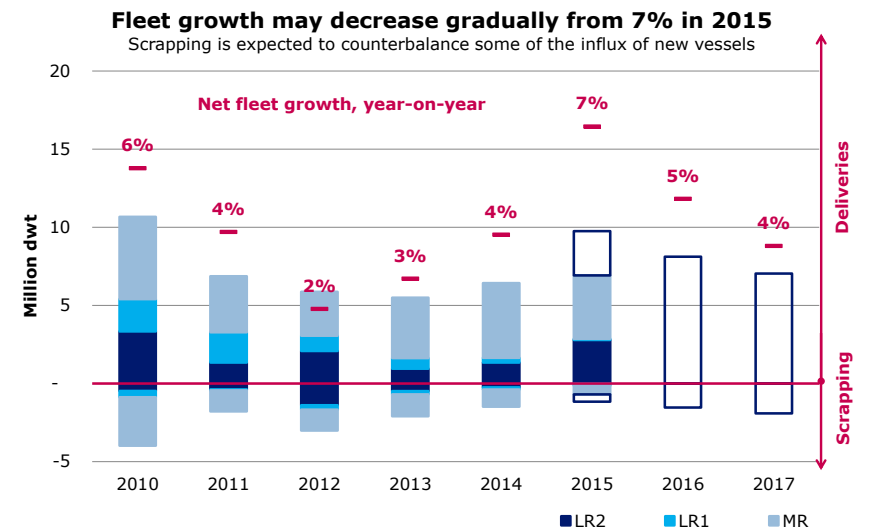


Figure P.13



orderbook is roughly in balance, while the LR1 and LR2 orderbooks contain between two to six times as many vessels. Therefore, if demand for LR tankers undershoots expectations, these vessel types in particular may be heading for a rough ride in the coming years. Overall, 12% of the Product Tanker fleet is above the age of 15, meaning that, the Product Tanker market is highly dependent on both premature scrapping and demand growth if the orderbook is to be absorbed and freight rates are to stay at current highs.

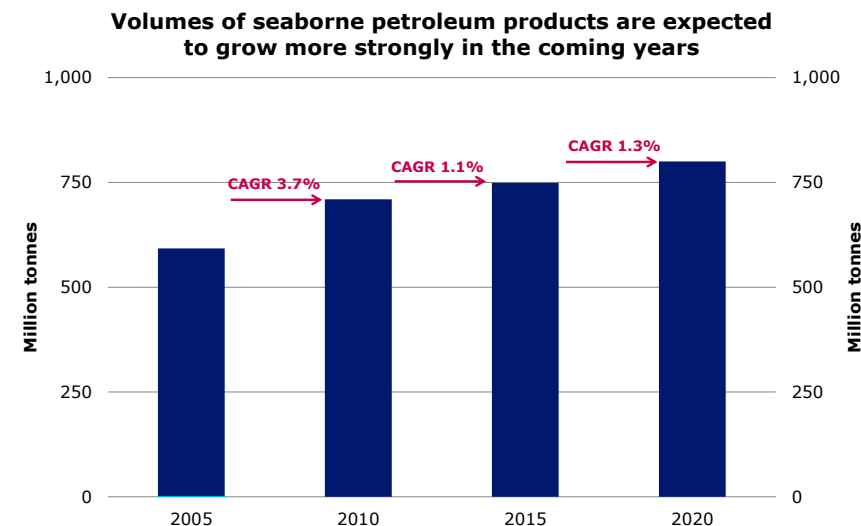
#### PRODUCT TANKER FLEET GROWTH IS EXPECTED TO LEVEL OFF

The current orderbook contains 22 million dwt scheduled to be delivered within the next 39 months. Of this, 4 million dwt is scheduled to be delivered in the fourth quarter of 2015, while the majority, 10 million dwt, is scheduled for 2016. Based on statistics from the last three years, we assume that roughly 70% of scheduled orders will be delivered on time, while the remaining 30% will be postponed for one year. Furthermore, we assume that scrapping will be particularly low during the remainder of 2015, before increasing in 2016 and 2017, when freight rates may come under pressure given the relatively high influx of new Product Tankers. Accordingly, fleet growth is expected to reach 7% in 2015, and then decrease to 5% in 2016 and 4% in 2017 (fig. 13). It should, however, be noted that fleet growth in 2017 is still highly uncertain, as the orderbook for that year is not yet full.

#### THE PRODUCTIVITY OF THE FLEET IS EXPECTED TO REMAIN HIGH

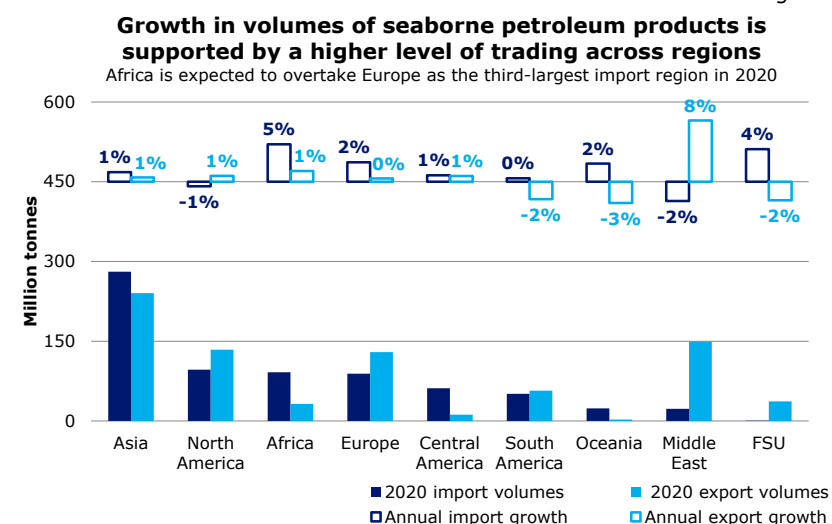
Demand for seaborne petroleum products is expected to grow by slightly more than 1% per annum in the coming years as regional imbalances of petroleum products may persist (fig. 14). Hence, the productivity of the Product Tanker fleet is expected to remain high and there should be plenty of possibilities for triangulating between countries. A high productivity is not necessarily positive for the Product Tanker market: as one vessel can carry more volume than if it has to ballast for half the time, it means that demand for seaborne petroleum products must grow more strongly to be able to absorb the high influx of new vessels than if the productivity was low.

Figure P.14



Sources: IHS Global Insight, Danish Ship Finance

Figure P.15



Sources: IHS Global Insight, Danish Ship Finance

#### AVERAGE DISTANCES ARE EXPECTED TO REMAIN UNCHANGED

The Product Tanker market may see little support from average travelling distances in the coming years, as two conflicting developments may leave them roughly unchanged from today's level (fig. 16). The first is that exporters are expected to continue to favour neighbouring regions in an attempt to minimise transportation costs, resulting in reduced travelling distances for the majority of their exported volumes. This reduction in travelling distances is, however, expected to be offset by the second development which is the probable use of more long-haul imports to cover regional shortages of certain petroleum products, for instance Asian gasoline imports from Europe. These conflicting developments seem likely to impact all Product Tankers, ranging from the smallest MR tankers to the largest LR2 tankers, as exporters are expected to optimise the vessel type based on a voyage's characteristics, travelling distances, etc.

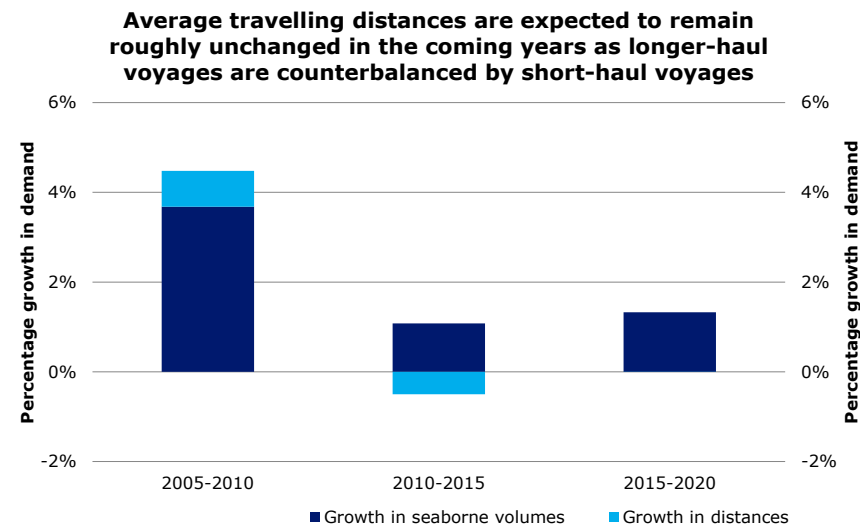
#### ASIA IS EXPECTED TO GROW ITS SEABORNE IMPORT REQUIREMENTS

No matter how the market for petroleum products develops in the coming years, Asian imports are expected to remain one of the most important pieces of the puzzle. Over the coming five years, Asia is expected to see its seaborne import requirements grow by slightly more than 1% per annum, roughly on a par with its historical increase in imported volumes of seaborne petroleum products. Similar to other regions, Asia is also expected to increase its exports of petroleum products, generating more trading activity by increasing the opportunities for triangulation. As a result, the productivity of the fleet is expected to remain high (fig. 15).

#### ASIA'S SUPPLY AND DEMAND IMBALANCES MAY INCREASE

In 2015, more than 50% of Asia's imported volumes of petroleum products came from intra-regional trade. That number is expected to slowly decline in the coming years, as Asia is increasingly experiencing a mismatch between demand and supply of specific petroleum products. There are at least two possible reasons for this development. The first may be that refineries are configured to optimise production of one specific petroleum

Figure P.16



Sources: IHS Global Insight, Danish Ship Finance

product while consumers demand another. In Asia, most refineries are configured to maximise diesel production, while demand for gasoline is currently growing fastest. This creates a need for additional imports. The second reason may be that the specifications of produced petroleum products do not meet the criteria for consumption. For instance, the sulphur content may be too high for the petroleum product to be suitable as a transportation fuel because of certain countries' fuel standards (i.e. China 5 – see appendix for further information).

#### MORE TRADING ACTIVITY MAY BE NECESSARY IN THE COMING YEARS

As mentioned, many Asian refineries are configured to maximise the production of diesel which, at the time they were designed, was expected to fall into short supply. However, as China, Asia's main engine for growth, is slowing down and transforming its economy from being investment-driven to more consumption-driven, growth in diesel demand is subsiding while growth in

gasoline demand is strengthening. Consequently, Asia's required imports of gasoline from regions further afield may increase, even though its refineries may be operating at near-maximum capacity. In particular, the Middle East, where refinery capacity is set to grow by 1.3 million barrels per day over the coming five years, is expected to supply much of Asia's additional import volumes. This will boost demand for LR2 tankers in particular given that loading facilities in the Middle East are built to handle these (fig. 17).

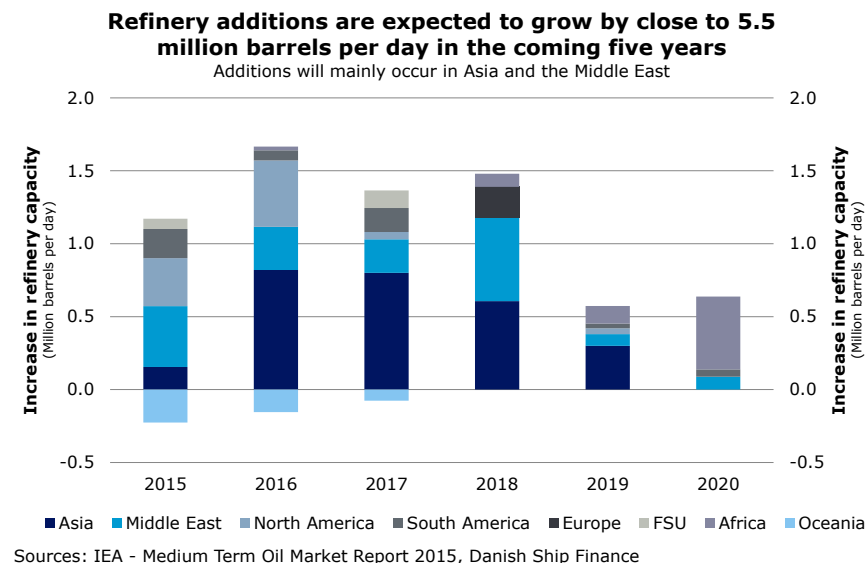
#### DIFFERENT FUEL STANDARDS MAY BOOST INTRA-REGIONAL TRADE...

Asia's intra-regional trade of petroleum products are also likely to increase if the specifications of those produced domestically do not meet domestic fuel standards. This type of mismatch may escalate in the coming years, as China, faced with severe pollution challenges, has announced that 11 provinces and cities across east China will start implementing the China 5 fuel standard for gasoline and diesel at the beginning of 2016. The remainder of China's 21 provinces will implement the China 5 fuel standard from 2017, one year earlier than planned. The China 6 fuel standard is expected to be mandatory by 2019. China will be the first Asian country to comply with the European standards for gasoline and diesel. Singapore is expected to comply shortly thereafter, while India is expected to begin implementing the Bharat 3 fuel standard, equivalent to Euro 3, in 2017, limiting sulphur content to 350 parts per million for diesel. Altogether, this paves the way for more intra-regional trade, as demand for particular product specifications varies between countries in Asia. This may support demand for MR tankers in particular, as they are preferred for short-haul voyages such as these.

#### ... AS WELL AS INTER-REGIONAL TRADE

Additional inter-regional import volumes are also likely, especially into China, as national forecasts suggest a shortfall in domestically-produced China 5-compliant fuels. Notably, several refineries owned by PetroChina will not be able to produce China 5-compliant fuels within the new specified deadlines. Currently, several upgrades are under way, subsidised by the government,

Figure P.17



which could indicate that increased inter-regional trade may be of relatively short duration. However, it appears unlikely that Asian refineries will be able to meet regional demand in the short to medium term, since only few refineries currently have the necessary equipment to produce China 5-compliant fuels. Overall, we expect to see increased inter-regional trading activity and potentially longer travelling distances as additional import volumes may possibly be sourced from both Europe and the Middle East given that both regions, although mainly the new refineries in the Middle East, are able to comply with the China 5 fuel standard. This will support demand for various Product Tankers.

#### ASIA MAY BE SHIPPING SURPLUS VOLUMES TO AFRICA

As Asia's main consumer, China, continues to demand higher-quality petroleum products (i.e. complying with China 5), a surplus of low-quality petroleum products in the region could build up. These barrels may possibly be exported to Africa, where re-

finery capacity is insufficient to meet growing demand for petroleum products – and where current fuel standards allow for a much higher sulphur content, up to 7,500 parts per million in some countries. In the coming five years, Africa is expected to increase its imported volumes of petroleum products by 5% per annum, overtaking Europe as the world's third-largest import region. In addition to Asia, Europe and the Middle East are expected to become larger suppliers too, especially the Middle East, due to its closer proximity to Africa. Although this may involve large volumes and inter-regional trading, African port infrastructure is seldom able to handle LR tankers. We therefore expect MR tankers to benefit the most from increasing African import volumes.

#### **REGIONAL IMBALANCES MAY NOT BE CONFINED TO ASIA...**

The problem of imbalances between supply and demand for certain petroleum products, gasoline in particular, may not be limited to Asia. Most regions, apart from Europe, seem to currently prefer gasoline over diesel vehicles. In the coming years, global GDP creation is expected to be driven increasingly by consumption rather than investments, boosting demand for gasoline rather than diesel.

#### **...BUT MAY BECOME A MORE GLOBAL PHENOMENON**

In 2015, growth in gasoline demand has been exceptionally strong and gasoline margins surged during the summer months, spurring refineries to produce as much gasoline as their configuration allowed. Consequently, they have little headroom for the expected increases in gasoline demand, and the gasoline imbalance may thus become a more global phenomenon.

#### **NEW REFINERIES MAY ALLEVIATE THE DEFICIT SOMEWHAT...**

New refinery capacity coming on line in the next five years may alleviate the problem somewhat, but it is important to keep in mind that they were also designed at a time when diesel was expected to fall into short supply. Hence, these new refineries are configured to maximise diesel output, rather than gasoline, which has since become more sought after. The upshot of this is that regions may have to look further afield to cover their gaso-

line consumption requirements, which will benefit distance-adjusted demand.

#### **...BUT OTHER SURPLUSES MAY ARISE AS A CONSEQUENCE**

At the same time, domestic refineries are likely to operate at near-maximum capacity to minimise the need for imports, thereby generating a surplus of other petroleum products, which will be available to the export market. Evidence of this development in China has already resulted in significantly higher diesel export licences. In general, trading activity is expected to grow, as domestic production of petroleum products seems unlikely to be able to match the consumption of specific petroleum products.

#### **EUROPEAN REFINERIES FACE TOUGH COMPETITION...**

In the coming years, the European refining industry is expected to see increased competition from world-class refining hubs in Asia, the Middle East and the US, as these hubs consist of highly complex refineries that benefit from economies of scale and easy access to feedstock (see Shipping Market Review – May 2015 for further details). As mentioned, these refineries are configured to maximise diesel output, while the gasoline balance may tighten in the coming years.

#### **...BUT STRONG GASOLINE DEMAND...**

A tight gasoline balance may benefit the European refineries, which despite being old and relatively simple are configured to maximise gasoline output. It is, however, important to keep in mind that European refineries are not able to maximise gasoline output to the same extent as a new refinery would be if it was equipped with the latest technological advancements and configured to maximise gasoline output at the same time. Hence, the European refinery industry continues to be very vulnerable to outside competition. But if the gasoline balance continues to be tight in the coming years, as expected, this could boost gasoline margins ahead of those of other petroleum products. This, in turn, could revitalise the European refinery industry somewhat given its high production of gasoline.



#### **...TOGETHER WITH THE HIGH MARGINS IN 2015 MAY REVITALISE THEM**

Furthermore, gasoline margins saw an unseasonable rise during the summer months this year, making European refineries very profitable. This situation could put the ongoing consolidation process in Europe, in which around 1 million barrels per day of capacity has been shut down within the last five years, on hold. In the event of this, the Product Tanker market may continue to see larger volumes flowing from Europe to Asia, although not necessary the other way, as increased fuel efficiency in an already saturated European market limits any additional European import requirements unless domestic production drops. Also, with refineries in neighbouring regions operating at high capacity, long-haul imports seem less necessary.

#### **THE MARKET REMAINS HIGHLY DEPENDENT ON TEMPORARY FACTORS**

The Product Tanker market was particularly strong during the first seven months of 2015, easing slightly in the following two months. The high freight rates were supported by temporary effects stemming mainly from lower and more volatile prices of petroleum products. The fourth quarter of 2015 may see a further strengthening, as seasonal demand and weather-related disruptions could absorb several Product Tankers. However, 2016, especially the second and third quarters, looks slightly more uncertain, as new Product Tankers continue to pour into the market and regular demand for seaborne petroleum products seems unlikely to be able to absorb them. The temporary factors that have held up the Product Tanker market to a great extent in 2015 may not be able to add much more support to the Product Tanker market in the coming years, as refineries around the world are already operating at near-maximum capacity and traders have already increased their trading volumes to reach their lines of credit. Consequently, we believe that freight rates and secondhand prices could come under pressure from next year as seasonal winter demand fades.



# LPG TANKER

SHIPPING MARKET REVIEW – NOVEMBER 2015



**DANISH  
SHIP FINANCE**

# LPG TANKER

DURING 2015, DEMAND FOR LPG TANKERS HAS BEEN FUELLED BY RISING LONG-HAUL EXPORTS FROM THE US AND A TEMPORARY TIGHTENING OF VESSELS' AVAILABILITY. IN THE COMING YEARS, DEMAND IS EXPECTED TO REMAIN BUOYANT, BUT RECORD-HIGH FLEET GROWTH IS SET TO PUT PRESSURE ON FREIGHT RATES.

## FREIGHT RATES

FREIGHT RATES HAVE SHOWN INCREASING STRENGTH DURING 2015, WITH AVERAGE FREIGHT RATES AT RECORD LEVELS. MOST NOTABLY, THE VLGC MARKET HAS BEEN EXCEPTIONAL, WITH A 1-YEAR TIMECHARTER RATE EXCEEDING USD 2 MILLION PER MONTH DURING THE SUMMER.

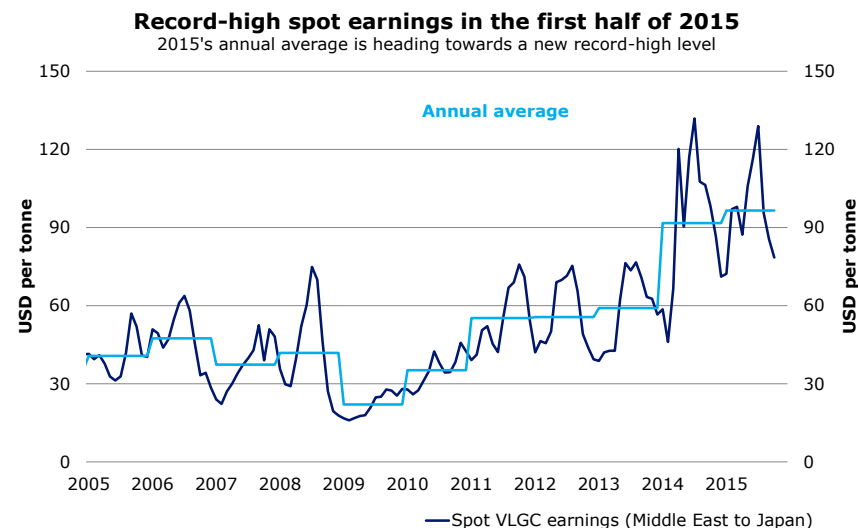
### SPOT RATES ARE STILL RELATIVELY STRONG

In 2014, the VLGC spot rate spiked during the summer months, hitting a new record high of USD 140 per tonne, equivalent to roughly USD 140,000 per day. During the first three quarters of 2015, the average spot rate continued to show strength, reaching USD 97 per tonne, driven by a very strong first six months which, following a short seasonal drop, gained strength as the arbitrage window between the US and Asia reopened. At the end of the second quarter, when petrochemical plants returned from maintenance, spot rates rose even further, reaching close to the record highs of 2014. Spot rates have since dropped significantly amid lower seasonal demand (fig. 1). The positive momentum in the larger vessel sizes seems to have spilled over into the smaller segments, where spot rates have been better than expected.

### TIMECHARTER RATES CONTINUE TO REACH NEW HIGHS

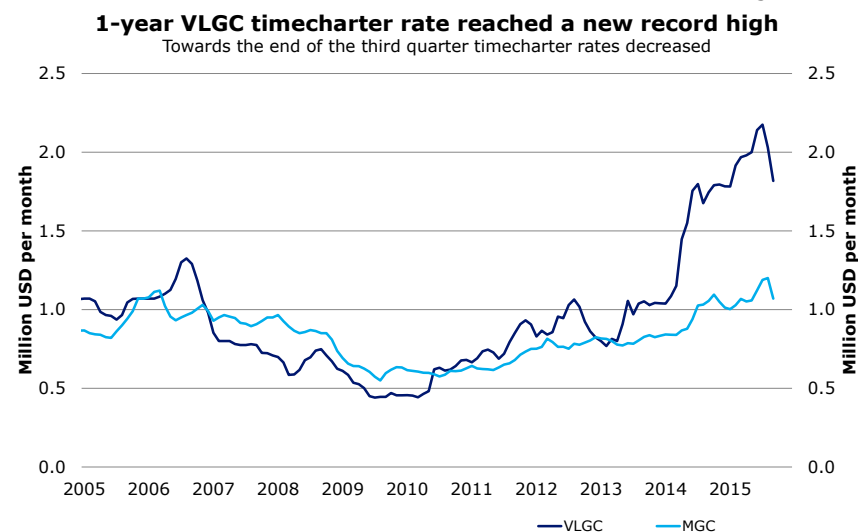
Unlike spot rates, timecharter rates have risen fairly smoothly throughout most of the past two years. In particular, the VLGC timecharter rate has had an extraordinary trajectory, rising from around USD 1 million per month at the beginning of 2014 to close to USD 2.2 million per month in July 2015, when increased interest in long-term charters drove timecharter rates higher for several of the larger vessel types. Timecharter rates have since declined as fleet growth is starting to be a cause for concern.

Figure LPG.1



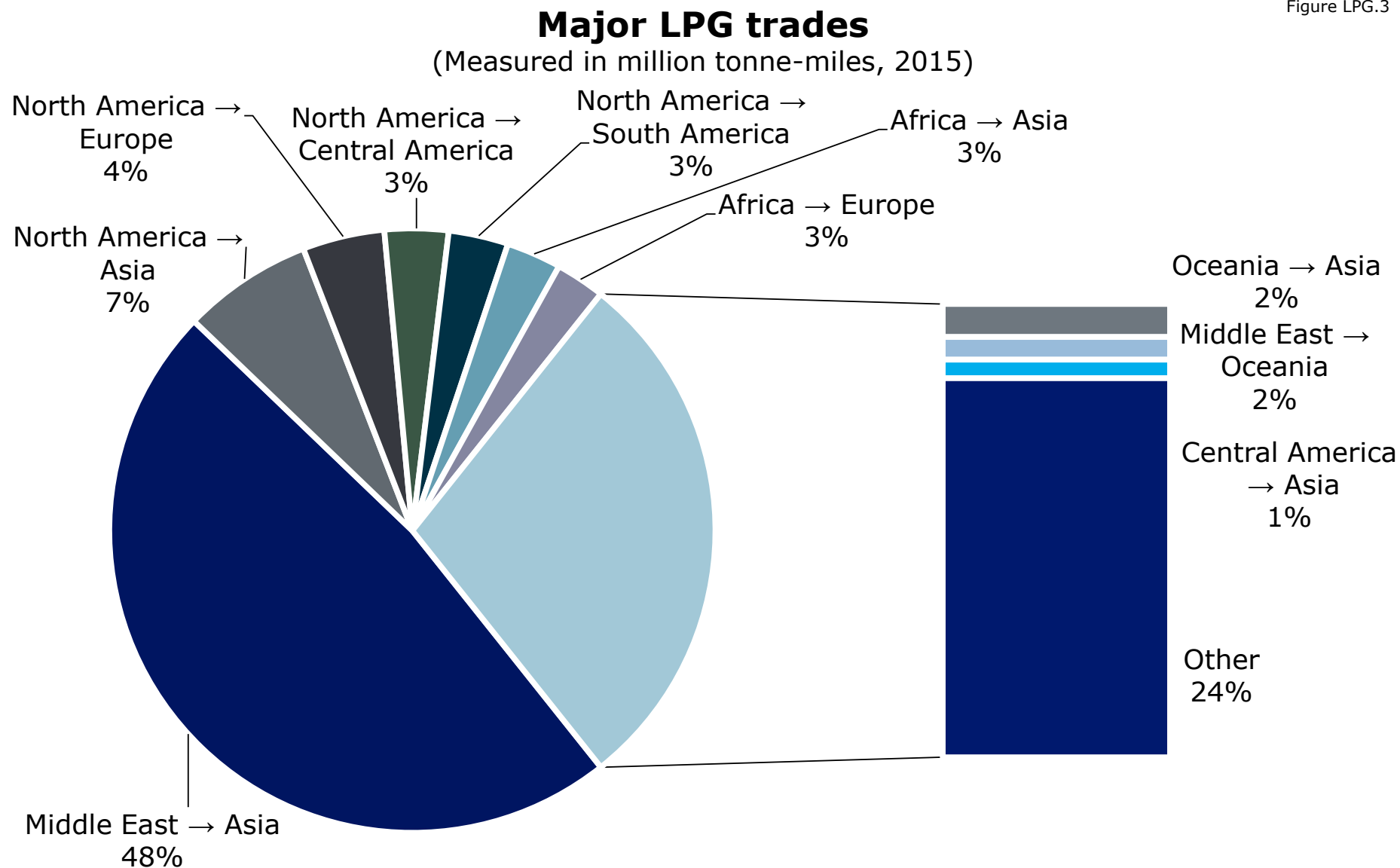
Sources: Clarksons, Danish Ship Finance

Figure LPG.2



Sources: Clarksons, Danish Ship Finance

Figure LPG.3



Sources: IHS Global Insight, Danish Ship Finance

## SUPPLY & DEMAND

FLEET GROWTH OUTPACED DEMAND FOR LPG TANKERS SIGNIFICANTLY DURING THE FIRST NINE MONTHS OF 2015, MAINLY IN THE THIRD QUARTER. BUT LOWER SPEEDS COMBINED WITH TEMPORARY SUPPLY DISRUPTIONS KEPT UTILISATION RATES AT CLOSE TO MAXIMUM DURING CERTAIN PERIODS, ESPECIALLY IN THE FIRST HALF OF 2015 WHEN FLEET GROWTH WAS ALSO MORE SUBDUED.

### FLEET GROWTH IS EXPECTED TO REACH A NEW RECORD HIGH IN 2015

During the first three quarters of 2015, the LPG fleet expanded by 10%, the highest growth rate ever recorded during that period. If the trend persists, the LPG fleet will expand by 16% in 2015, a new record high (fig. 4).

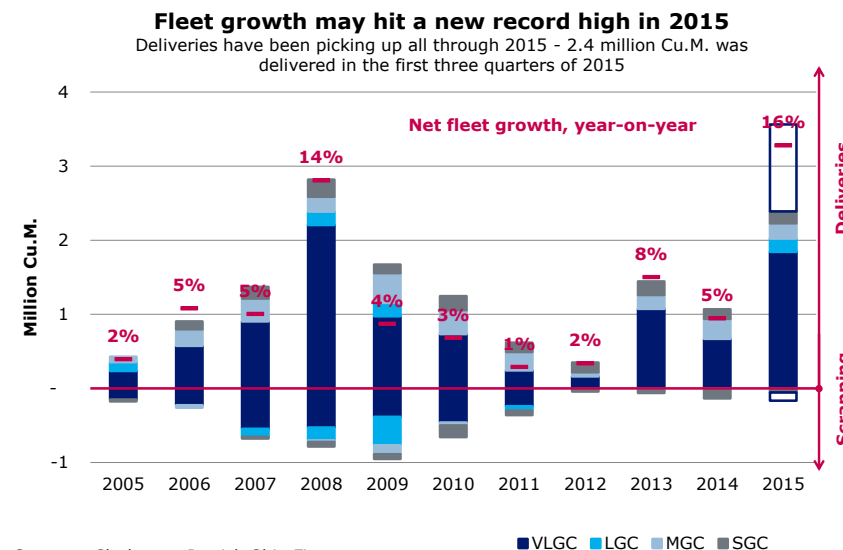
### MOST VESSELS ARE BEING DELIVERED ACCORDING TO SCHEDULE

The massive amount of tonnage contracted in 2013 and 2014 is now starting to be delivered to the fleet at an exceptional speed. During the first three quarters of 2015, 2.4 million Cu.M. was delivered to the fleet, more than half of this in the third quarter alone. This indicates that fleet growth was more subdued at the beginning of the year. During the first nine months of this year, yards delivered as much as 87% of scheduled orders on time. Delivery ratios were especially high for the larger vessel types, as owners were probably pushing to receive vessels while freight rates were still high. In the SGC segments, where freight rates have been lower and owners may have been in less of a hurry to receive vessels, the delivery ratio was only around 60% for the first three quarters of 2015 (fig. 5).

### SCRAPPING CONTINUES TO BE SUBDUED IN THE LPG MARKET

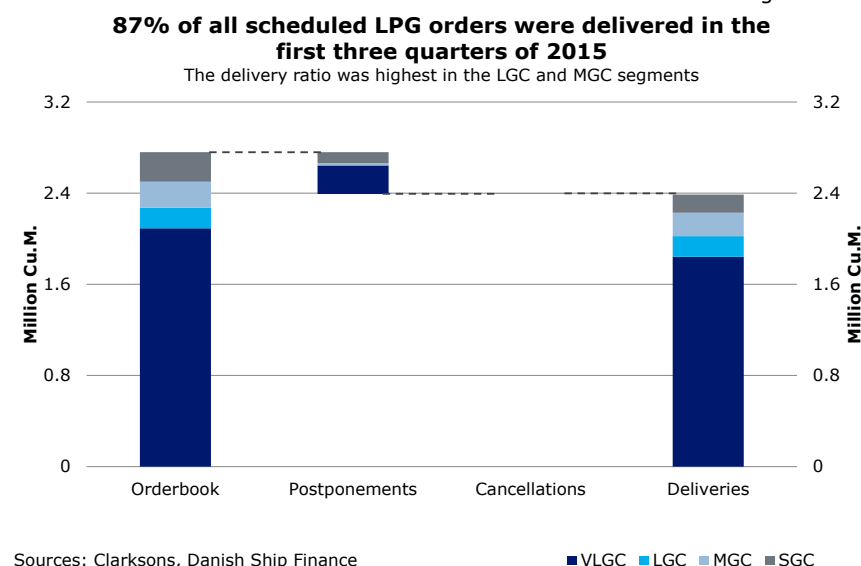
High freight rates have also led owners, particularly of larger vessel types, to postpone scrapping. During the first nine months of 2015 only 50,000 Cu.M., equivalent to four vessels, was scrapped, mainly in the SCG segment, where freight rates were lower. One small MCG vessel aged 32 years was, however, also scrapped (fig. 4).

Figure LPG.4



Sources: Clarksons, Danish Ship Finance

Figure LPG.5



Sources: Clarksons, Danish Ship Finance

### UTILISATION RATES IN THE LPG MARKET CONTINUE TO BE VERY HIGH

Despite high freight rates, it appears that the nominal gap between supply and demand widened during the first three quarters of 2015, as fleet growth reached a massive 10% and LPG volumes transported by sea expanded by roughly half of that (fig. 6). Freight rates were instead supported by lower speeds and supply disruptions which were caused by port congestion in India in particular and also the tanker collisions in the Houston Ship Channel. During the third quarter, however, freight rates came under slight pressure, as lower seasonal demand and higher fleet growth resulted in an excess of capacity.

### ASIA CONTINUES TO FUEL DEMAND FOR SEABORNE LPG VOLUMES

As in previous years, Asia has fuelled demand for seaborne LPG volumes. In 2015, Asia is expected to grow its imports of seaborne LPG volumes by 5%, equivalent to 2 million tonnes (fig. 7).

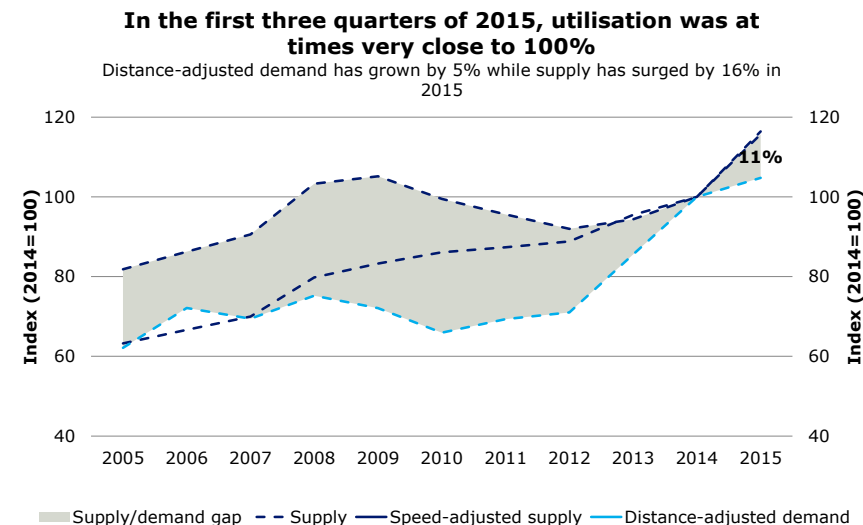
### NORTH AMERICA IS STRENGTHENING ITS POSITION IN ASIA

The Middle East remains the leading supplier of LPG to the Asian market, but the US is increasingly cementing its position as one of the world's largest exporters of LPG. In 2015, the US has continued to strengthen its position in the Asian market and has increased its market share. This development has been facilitated by Asian countries' desire to diversify their supply at the same time as the US has had significant volumes of low-cost LPG, propane in particular, available to the export market.

### INDIA FAVOURS SHORT-HAUL MIDDLE EASTERN LPG VOLUMES

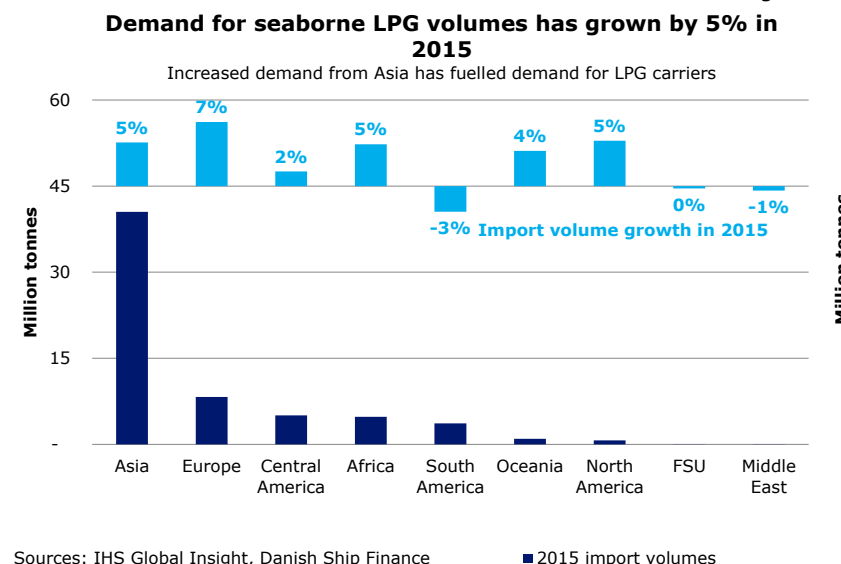
Not all Asian countries have been equally keen to diversify their supplies. India continues to prefer to receive LPG from the Middle East, whose geographical proximity makes LPG cheaper to import compared with LPG from the US. Furthermore, India's residential and petrochemical sectors primarily use butane, while the US mainly supplies propane, making US export volumes incompatible with Indian consumption requirements. In 2015, India's imports of seaborne LPG volumes increased significantly, as domestic LPG production was unable to keep up with rising demand. But, in general, India does not require much additional tonnage to satisfy its needs, as average travelling dis-

Figure LPG.6



Sources: Clarksons, IHS Global Insight, Danish Ship Finance

Figure LPG.7



Sources: IHS Global Insight, Danish Ship Finance

tances between the Middle East and India are fairly short. However, in the second quarter of 2015 especially, heavy port congestion in India absorbed much additional capacity as vessels were queuing up to unload cargoes. As a result, LPG vessels came to be in tight supply and freight rates surged to the highest level experienced during a second quarter.

#### **PROPANE DEHYDROGENATION PLANTS PROPEL CHINESE LPG IMPORTS**

In China, feedstock demand from propane dehydrogenation plants has continued to rise as three plants became operational in 2014 and another two plants have come on line in 2015. Additional import requirements have mainly been sourced from the US thanks to its competitive prices and high propane content, which has benefitted distance-adjusted demand and VLGC vessels in particular.

#### **LOW PROPYLENE MARGINS HAVE LED PRODUCERS TO CUT PRODUCTION**

In the latter part of 2015, propylene prices have dropped due to a combination of rising supply and fading demand in Asia. As a result, some producers have reduced their operating rates, lowering their LPG import requirements and increasing the availability of LPG vessels.

#### **HIGH ETHYLENE MARGINS BOOST STEAM CRACKING OPERATIONS...**

On the other hand, ethylene has become much more profitable during 2015, especially in Asia and Europe, and the spread between ethylene and naphtha has widened to a nine-year high on tightening supply amid scheduled maintenance and heavy turnarounds. This has prompted steam crackers to operate at maximum capacity this year and increasingly use LPG as a feedstock, as LPG has a higher ethylene production yield than naphtha. As a result, this has counterbalanced the negative effect of lower operating rates at propylene producers in Asia.

#### **...AND OPEN UP THE ARBITRAGE WINDOW BETWEEN THE US AND ASIA**

The sharp rise in ethylene prices also opened up the arbitrage window from the US to Asia at the beginning of 2015. Hence, several ethylene cargoes have been shipped on that route, benefitting distance-adjusted demand and MGC or smaller vessels in particular, as it is mainly in these segments that specialised LPG vessels capable of carrying ethylene can be found.

#### **JAPAN AND SOUTH KOREA ARE DIVERSIFYING THEIR IMPORT SOURCES**

As well as China and India, South Korea and Japan have also generated strong demand for LPG vessels. Although their imports have remained fairly stable in 2015, they are continuing to diversify their LPG imports away from the Middle East towards the US, which has resulted in higher distance-adjusted demand and vessel requirements.

#### **LNG IS REPLACING LPG IN THE RESIDENTIAL SECTOR IN JAPAN**

Japan has been able to keep its seaborne LPG import volumes fairly stable so far in 2015, as a fall in consumption, especially in the residential sector, has coincided with lower domestic LPG production caused by refinery shutdowns. LPG usage in the residential sector is increasingly being replaced by LNG imported from coal-bed methane projects in Australia and from the US. This type of LNG is also known as lean LNG, as it has a low calorific value. However, as LPG is used as a heat additive in lean LNG, it will not disappear completely in the residential sector in Japan despite the tough competition from LNG.

## CONTRACTING AND SHIP VALUES

LESS THAN 1.7 MILLION CU.M. WAS CONTRACTED IN THE FIRST THREE QUARTERS OF 2015. HOWEVER, MOST OF THIS TOOK PLACE IN SEPTEMBER, SPARKING FEARS THAT THIS IS THE START OF A RENEWED APPETITE FOR VESSELS AND THAT THE FOURTH QUARTER WILL SEE MORE TONNAGE ADDED TO AN ALREADY LARGE ORDERBOOK.

### CONTRACTING SURGED IN SEPTEMBER, BUT OVERALL HAS BEEN LOWER

During the first three quarters of 2015, less than 1.7 million Cu.M. was contracted. However, the majority, 40%, was contracted in September alone (fig. 8). If this recent appetite for vessels continues during the fourth quarter, total contracting in 2015 could reach as much as 4 million Cu.M.. The September rise could be due to owners' continued faith in high freight rates, but it could also be in response to the new NO<sub>x</sub> regulations imposed on vessels contracted after 1 January 2016. These new regulations are likely to have given owners an incentive to bring orders forward and hence may limit contracting activity in 2016. As in the past three years, contracting has been concentrated on the VLGC and MGC segments, in each of which 13 vessels have been ordered, compared with only two in the LGC segment.

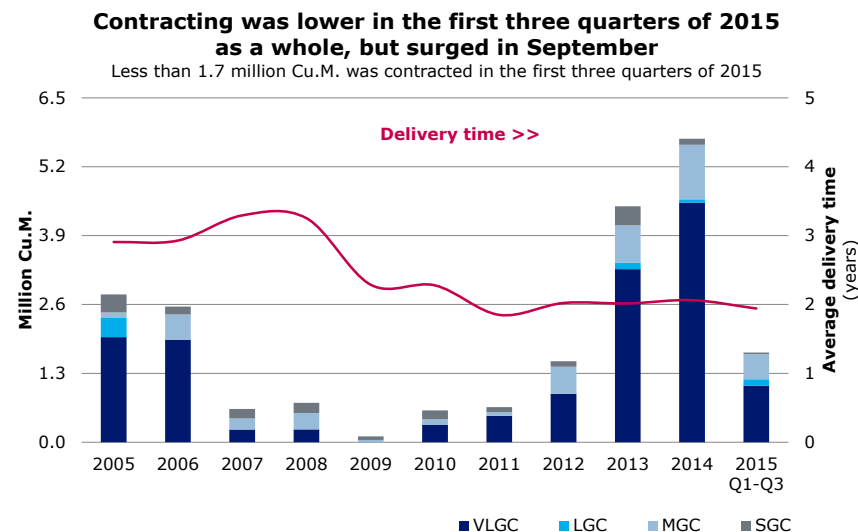
### SECONDHAND PRICES EXCEED NEWBUILDING PRICES IN SOME CASES

As a result of the more limited ordering, especially in the first half of the year, newbuilding prices have decreased slightly, but remain at a higher level than at the beginning of 2014. In contrast, secondhand tonnage has been very attractive owing to its ability to capture the benefits of high freight rates instantly. Thus, secondhand prices have either remained more stable or trended slightly upwards to a level exceeding newbuilding prices.

### PRICE/EARNINGS RATIOS HAVE REACHED A NEW ALL-TIME LOW

The more stable secondhand prices in combination with rising timecharter rates have caused price/earnings ratios to drop below 4 in 2015 (fig. 9). This development implies that asset prices are currently only slightly dependent on future earnings.

Figure LPG.8



Sources: Clarksons, Danish Ship Finance

Figure LPG.9



Sources: Clarksons, Drewry, Danish Ship Finance



## OUTLOOK

SUPPLY GROWTH IS EXPECTED TO EXCEED GROWTH IN DISTANCE-ADJUSTED DEMAND IN THE COMING YEARS, EVEN THOUGH DEMAND GROWTH IS EXPECTED TO REMAIN FAIRLY BUOYANT. SEVERAL RISK FACTORS ARE ALSO EMERGING SUCH AS SLOWER ECONOMIC GROWTH AND A LOWER OIL PRICE. THESE FACTORS COULD LOWER FLEET UTILISATION AND HENCE FREIGHT RATES.

After a few years of exceptionally high freight rates, freight rates and secondhand prices could come under pressure in the coming years, as it seems unlikely that demand growth for LPG vessels will be able to materialise in time to meet the large influx of new vessels. Demand is nevertheless expected to grow fairly strongly in the coming years as the petrochemical industry and the residential sector in Asia in particular continue to expand, although the transformation of the Chinese economy and the impending expansion of the Panama Canal could mean that the path will not always be equally smooth. The Panama Canal expansion especially constitutes a downside risk to the market in the short term, as it could increase the productivity of the LPG fleet. This could be counterbalanced somewhat by increased long-haul volumes, as reduced transportation costs would make US LPG more attractive to the Asian market.

### IN OCTOBER THE ORDERBOOK 'ONLY' EQUALLED 42% OF THE FLEET

As of October 2015, the orderbook amounted to 9.7 million Cu.M., representing 42% of the fleet. Although the ratio is still very high, it is significantly less than it was six months ago, when the orderbook totalled 51% of the fleet. At that time, the orderbook amounted to 10.6 million Cu.M. The reason for the relatively large decrease in the orderbook-to-fleet ratio is that contracting has dropped to a lower level, while vessels have started pouring into the fleet. The majority of the orderbook, 73%, is for VLGC vessels. Another 22% is for MGC vessels, while the remaining 5% is split between LGC and SGC vessels (fig. 10). This distribution indicates that we are set to see a massive shift in vessel sizes, with a relatively high number of large vessels entering the market.

Figure LPG.10

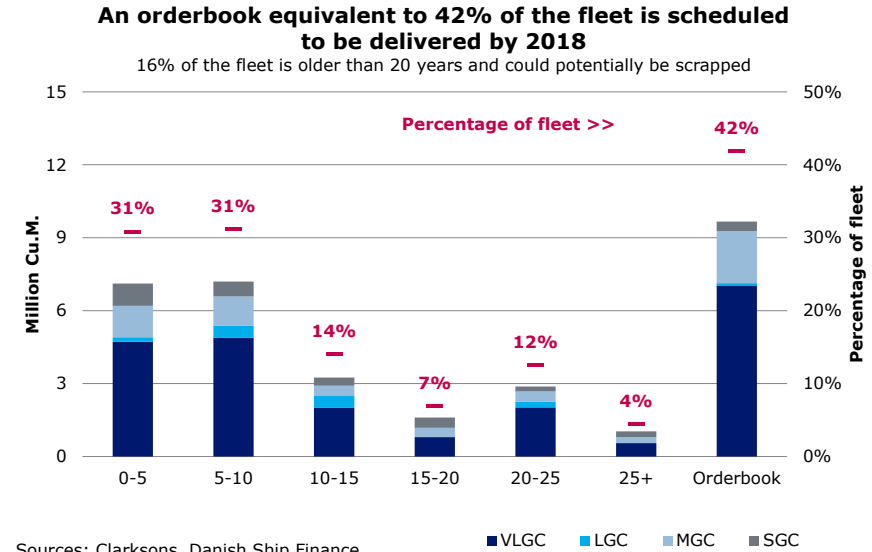
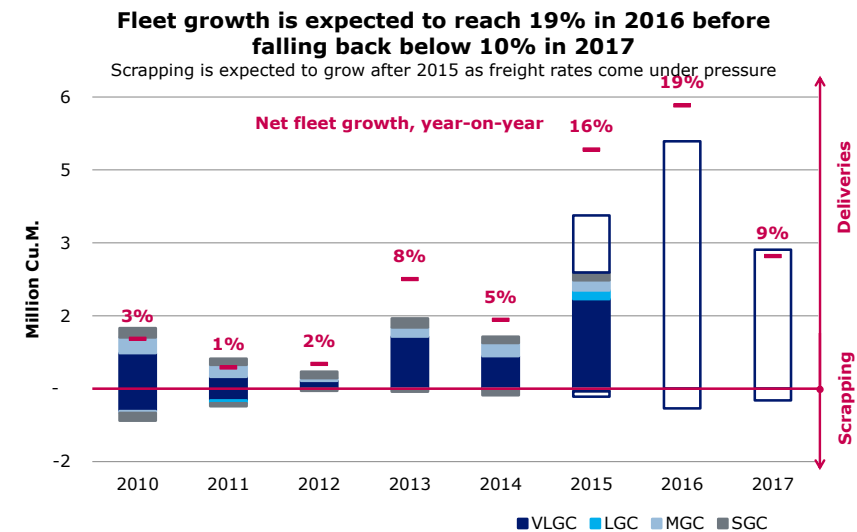


Figure LPG.11



### FLEET GROWTH IS EXPECTED TO REACH 19% IN 2016

The majority of the orderbook is scheduled to be delivered in 2016, consistent with the high level of contracting activity that took place in 2014. While postponements are likely to stem the tide slightly, fleet growth is still expected to reach a massive 19% in 2016. This will be the highest level ever recorded and 3 percentage points higher than the level we expect for 2015 as a whole. Scrapping is expected to counterbalance some of this, but again only slightly, as a mere 16% of the fleet is older than 20 years (fig. 10). We assume that a vessel becomes a potential scrapping candidate the year before its fifth special survey, limiting potential scrapping candidates in each year to a small portion of this. Hence, scrapping is expected to remain scarce, though it may increase slightly in 2016 and 2017 as lower freight rates could encourage owners to scrap more vessels (fig. 11).

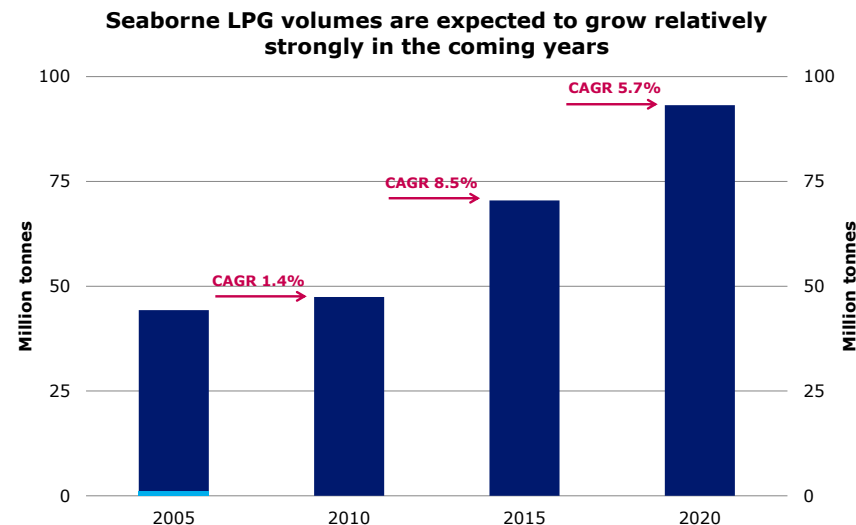
### GROWTH IN SEABORNE LPG IS EXPECTED TO REMAIN BUOYANT

Demand for seaborne LPG volumes is expected to continue to grow relatively strongly in the coming years, fuelled by rising demand from both the residential and the petrochemical sectors around the world (fig. 12 and fig. 13).

### THE EXPANSION OF THE PANAMA CANAL ENTAILS SOME RISK...

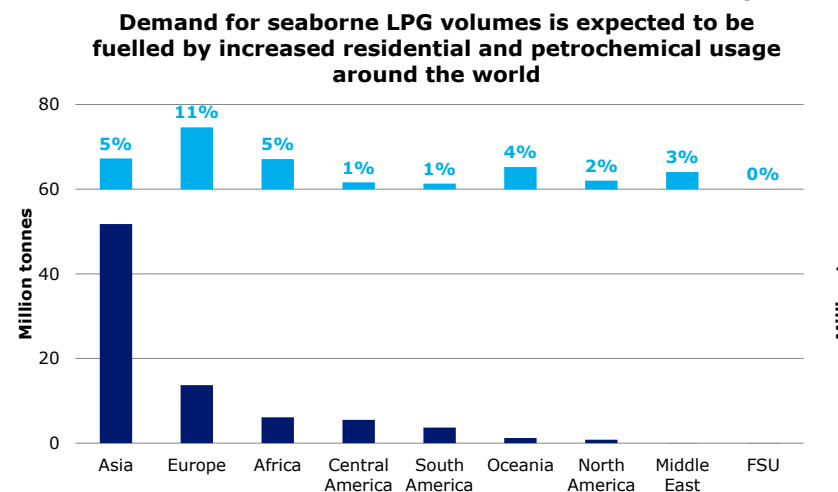
The development in average travelling distances is, however, slightly more uncertain (fig. 14). The expansion of LPG export facilities in the US is expected to add LPG volumes to the world market. A significant portion of these additional volumes are expected to head to Asia, the world's largest importer of LPG, supporting distance-adjusted demand and demand for LPG Tankers (see Shipping Market Review – May 2015 for further details). However, the expansion of the Panama Canal due for completion in the second quarter of 2016 may mean that average travelling distances on volumes transported between the US and Asia are shorter than on current routes, thereby increasing the productivity of the world fleet. Consequently, the development in average travelling distances depends on whether additional long-haul US exports are able to counterbalance the negative effect from the expansion of the Panama Canal.

Figure LPG.12



Sources: IHS Global Insight, Danish Ship Finance

Figure LPG.13



Sources: IHS Global Insight, Danish Ship Finance

■ 2020 import volumes

### ...AS WELL AS SOME OPPORTUNITIES FOR THE LPG MARKET

The expanded Panama Canal could also create some opportunities for the market, as US LPG exports could become an even more attractive commodity for Asian buyers if transportation costs decrease. This could boost US export volumes to Asia further and absorb additional LPG vessels. It is, however, still unknown how the expanded Panama Canal will be utilised by LPG vessels. It could be that some VLGC vessels will continue to sail around Cape Horn, thus increasing average travelling distances, while others may pass through the canal. It all comes down to the cost of transit and transit time.

### THE PRODUCTIVITY OF THE LPG FLEET IS EXPECTED TO REMAIN LOW

The productivity of the LPG fleet is in general very low, as the market, roughly speaking, is divided into exporters and importers of LPG. In the coming years, the productivity of the LPG fleet is likely to remain low, making ballast time an important factor in the market. Furthermore, in the coming years, Asia is likely to source additional LPG volumes from the US rather than the Middle East. This will benefit distance-adjusted demand and lower the productivity of the fleet, as both laden and ballast time from the US to Asia are much higher than from the Middle East to Asia. As with average travelling distances, however, the productivity of the fleet is also dependent on the expansion of the Panama Canal and the utilisation of it, which is still highly uncertain.

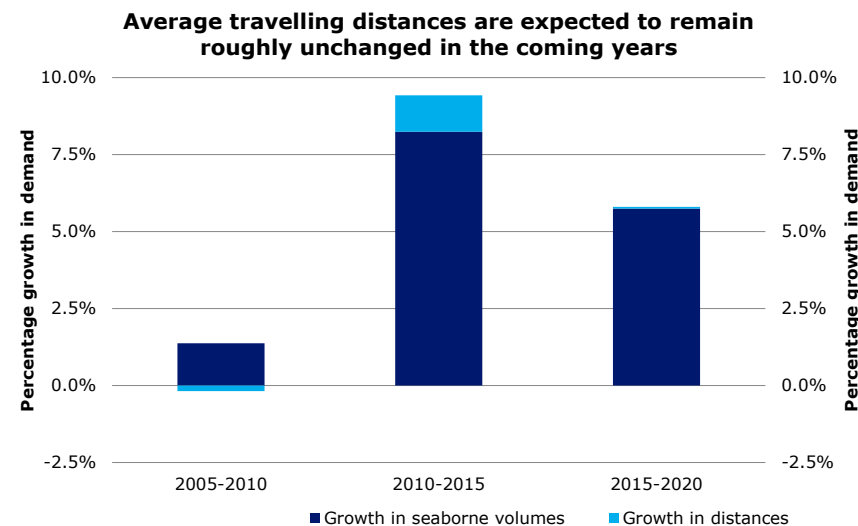
### ASIA IS EXPECTED TO GROW ITS IMPORTED VOLUMES SIGNIFICANTLY

Asia is by far the world's largest importer of seaborne LPG volumes. In the coming five years, its imports are estimated to grow even further, expanding at a rate of 5% per annum to reach 52 million tonnes in 2020 (fig. 13). Much of these additional volumes are expected to feed into the Chinese petrochemical industry in particular, and also into the residential sector in several Asian countries, mainly replacing kerosene and solid biofuels.

### LPG DEMAND FROM THE PETROCHEMICAL INDUSTRY COULD RISE AS...

LPG demand from the petrochemical industry in Asia is expected to be mainly fuelled by the construction of propane dehydro-

Figure LPG.14



Sources: IHS Global Insight, Danish Ship Finance

genation plants. However, the construction of pure LPG cracking units along with more versatile cracking units is also expected to increase demand for seaborne LPG volumes. In addition, if the price of LPG remains competitive, it may continue to encourage the substitution of naphtha at existing cracking units in the coming years, further boosting demand for LPG (see Shipping Market Review – May 2015 for further details).

### ...PROPANE DEHYDROGENATION PLANTS REQUIRE MORE LPG, BUT...

In the coming five years, Asia is expected to expand its propane dehydrogenation capacity by more than 8 million tonnes, which, assuming it operates at full capacity, will require roughly 10 million tonnes of propane. Domestic propane production is considered to be insufficient to support this additional requirement, making seaborne LPG imports a necessity. It is highly likely that much of this additional requirement will be sourced from the US given that its LPG has a high content of propane. In fact, several

propane dehydrogenation plants have already signed term contracts for US LPG volumes. As a result, distance-adjusted demand, as well as demand for LPG vessels, is likely to increase.

#### **...LOW OIL PRICES POSE A THREAT TO NAPHTHA SUBSTITUTION AND...**

Although demand for LPG from the petrochemical industry is expected to increase over the coming years, the decline in crude oil prices and hence naphtha prices is posing a threat to the feasibility of widespread substitution of naphtha with LPG at existing cracking units (see Shipping Market Review – May 2015 for further details). Consequently, additional LPG demand generated by a switch in feedstocks may be muted if oil prices remain low.

#### **...THE PROFITABILITY OF CERTAIN PETROCHEMICAL PROJECTS**

The low oil prices could also jeopardise certain petrochemical projects such as the construction of propane dehydrogenation plants or other propylene production projects such as the coal-to-olefins and methanol-to-olefins projects, causing them to be either delayed or cancelled. However, projects involving LPG are generally less expensive than the coal-to-olefins and methanol-to-olefins projects which have high capital costs. Thus, the coal-to-olefins and methanol-to-olefins projects are likely to be the first to be re-evaluated if oil prices remain low and demand growth wanes. Hence, projects requiring LPG are likely to materialise, although a few may be delayed, while existing plants may operate at slightly lower rates than initially expected. In China, where most of these projects are located, coastal plants are likely to operate at a higher rate than their inland counterparts given their more direct access to the world market. Consequently, demand for seaborne LPG volumes is expected to remain fairly robust - as long as they are competitively priced compared with domestic LPG volumes - in the short to medium term, increasing demand for LPG vessels.

#### **RIISING DISPOSABLE INCOME COULD STRENGTHEN LPG DEMAND,...**

The general rise in household wealth in Asia is expected to strengthen demand for LPG in the petrochemical sector. However,

er the transformation of Asia's largest economy, China, into being more consumption and service-driven rather than investment-driven may cause some blips, as growth in LPG demand could drop in response to reduced investments.

#### **...BUT, IN THE LONG RUN, IT FACES A THREAT FROM MORE RECYCLING**

In the long run, however, increased recycling and technological advancements could have a negative impact on LPG demand in the petrochemical industry, as these could enable more efficient use of the world's resources, reducing the amount of feedstock required. This process is also known as 'the circular economy'. For a more in-depth discussion of circular economies, please refer to the "General Review and Outlook" section.

#### **RESIDENTIAL LPG CONSUMPTION IN ASIA IS INCREASING...**

LPG demand in Asia not only hinges on demand from the petrochemical sector: the majority of LPG is used in the residential sector for heating appliances and vehicles. In rural areas in Asia millions of households are currently switching from kerosene and solid biofuels to LPG, which is easier to handle and more environmentally-friendly. However, this transition is to a large extent being driven by government subsidies and if these are withdrawn, demand for LPG – and thereby demand for LPG vessels – could fall.

#### **...AND IN INDIA, SUBSIDY REFORMS COULD ENHANCE IT FURTHER...**

In India the majority of households still rely on either kerosene or solid biofuels for consumption, but LPG use is growing. The Indian government is in the process of reforming its kerosene subsidies. The reform could potentially shift consumption away from kerosene towards more LPG. Domestic LPG production would not be sufficient to meet this additional demand, so India's import requirements could increase substantially.

#### **...WHILE INDONESIAN DEMAND RESTS ON HOUSEHOLD INCOME**

In Indonesia, much of the transition has already occurred, as back in 2007 the Indonesian government introduced a 'kerosene to LPG conversion' programme and began investing massively in LPG infrastructure. Hence, the potential for increased

demand in Indonesia primarily lies in increasing household wealth which could fuel LPG consumption per capita. Similar to most other Asian countries, domestic production in Indonesia is insufficient to cover consumption, and so demand for imports and LPG vessels may rise in tandem with demand for LPG.

#### **ASIA IS EXPECTED TO SOURCE MORE VOLUMES FROM THE US...**

Much of Asia's additional import volumes are expected to be sourced from the US, and several Asian buyers have already signed term contracts with US suppliers, supporting this development. The US is also currently expanding its export facilities by roughly 25 million tonnes, equivalent to almost 45 million Cu.M. over the coming five years to facilitate this growth. Although the effects of the expansion of the Panama Canal are still unknown, export volumes from the US to Asia are nevertheless expected to grow, boosting demand for VLGC vessels in particular.

#### **...BUT LOWER OIL AND GAS PRODUCTION COULD JEOPARDISE THAT...**

As mentioned, Asia is expected to increase its imports of US LPG in the coming years, but to what extent is still highly uncertain, as demand growth in Asia may not be the only determining factor for growth. US LPG is a by-product of the production of natural gas, crude oil and petroleum products, and as US crude oil production is currently subsiding, production of LPG may be in jeopardy. US production of natural gas and petroleum products, on the other hand, is still at record-high levels, supporting LPG production. But like crude oil producers, producers of natural gas have been cutting costs, which could possibly stabilise natural gas production in the US over the coming years, thereby limiting growth in US LPG production.

#### **...EVEN THOUGH, MUCH LPG CAN STILL BE RECOVERED**

However, significant volumes of US LPG remain unused, as large volumes of NGL (Natural Gas Liquids – which put simply, consists of all gaseous products except methane (LNG)) are being either flared or rejected into the natural gas stream, because the cost of moving it is too high or the transport capacity is in-

sufficient. If flaring of NGL is minimised, LPG production could increase even if crude oil and natural gas production decreases, but these volumes could be difficult to access and hence too expensive to utilise. Altogether, this could jeopardise US export potential and hence long-haul US exports, limiting demand for LPG vessels.

#### **FREIGHT RATES COULD CONTINUE ON THEIR DOWNWARD TRAJECTORY**

Freight rates could decrease further in the coming years, as it looks as though expected demand growth for LPG vessels will not materialise in time to meet the large influx of new vessels. Fleet growth is expected to be as much as 19% in 2016, 3 percentage points higher than in 2015, while demand for seaborne LPG volumes is expected to grow by 6%. Although the productivity of the LPG fleet is low and is expected to remain fairly low, the impending expansion of the Panama Canal poses some risks to the market, as average travelling distances could decrease as a result. On the other hand, the expansion could also create some opportunities if it lowers transportation costs, potentially making US LPG volumes more competitive than those from alternative suppliers. Nevertheless, we expect freight rates to decrease further, first in 2016 and then again in 2017.



# GLOSSARY

SHIPPING MARKET REVIEW – NOVEMBER 2015



**DANISH  
SHIP FINANCE**



## GLOSSARY

<i>Aframax:</i>	Crude oil tanker or product tanker too large to pass through the Panama Canal and with a capacity of 80,000 to 120,000 dwt.	<i>CGT:</i>	Compensated Gross Tonnage. International unit of measure that facilitates a comparison of different shipyards' production regardless of the types of vessel produced.
<i>Back-haul:</i>	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'.	<i>Chemical Tanker:</i>	DSF's definition: IMO I or IMO II tanker with stainless steel, zinc, epoxy or Marineline coated tanks.
<i>Barrel:</i>	A volumetric unit measure for crude oil and petroleum products equivalent to 42 U.S. gallons, or approximately 159 litres.	<i>China 5 fuel standard:</i>	The China 5 fuel standard is equivalent to the Euro 5 fuel standard, which stipulates a maximum sulphur content of 10 parts per million.
<i>BHP:</i>	Break Horse Power. The amount of engine horsepower.	<i>China 6 fuel standard:</i>	The China 6 fuel standard is not expected to stipulate a lower sulphur content than the China 5 fuel standard, but is instead intended to strip particulates from diesel while tightening the olefin and aromatic limits in gasoline.
<i>Brent:</i>	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.	<i>Clarksons:</i>	British ship brokering and research company. <a href="http://www.clarksons.net">www.clarksons.net</a>
<i>Bulk vessel:</i>	Description of vessels transporting large cargo quantities, including coal, iron ore, steel, corn, gravel, oil, gas, etc.	<i>Clean products:</i>	Refers to light, refined oil products such as jet fuel, gasoline and naphtha.
<i>Bunker:</i>	Fuel for vessels.	<i>CoA:</i>	Contract of Affreightment. Contract between a shipping company and a shipper concerning the freight of a predetermined volume of goods within a given period of time and/or at given intervals.
<i>Butane:</i>	Butane is an organic compound with the formula C <sub>4</sub> H <sub>10</sub> that is an alkane with four carbon atoms. Butane is a gas at room temperature and atmospheric pressure.	<i>Coating:</i>	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.
<i>Call on OPEC:</i>	Defined as total global petroleum demand less non-OPEC supply less OPEC natural gas liquid supply.	<i>Contango:</i>	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
<i>Capesize:</i>	Dry bulk carrier of more than approximately 100,000 dwt; too large to pass through the Panama Canal.		
<i>Cascading:</i>	The process of bigger vessels replacing smaller vessels across all ship sizes.		
<i>CEU:</i>	Car equivalent unit. Unit of measure indicating the car-carrying capacity of a vessel.		



	depending on storage availability and storage costs.		
<i>Crude oil benchmark:</i>	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.	<i>E&amp;P:</i>	subsidary of the US Department of Energy. <a href="http://www.eia.doe.gov">www.eia.doe.gov</a>
<i>Cu.M:</i>	Cubic Meter.	<i>Feeders:</i>	Exploration and Production. Small container carrier with a capacity of less than 1,000 teu.
<i>Deep sea:</i>	Refers to trading routes longer than 3,000 nautical miles.	<i>Fleet productivity:</i>	The productivity of a fleet depends upon four main factors: speed, port time, capacity utilization and loaded days at sea.
<i>Deep Sea, chemical:</i>	A chemical tanker larger than or equal to 20,000 dwt.	<i>Ethylene:</i>	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 produce antifreeze and various artificial fibers.
<i>Dirty products:</i>	Refers to heavy oils such as crude oil or refined oil products such as fuel oil, diesel oil or bunker oil.	<i>FPSO:</i>	Floating Production Storage Off-loading unit. Vessel used in the offshore industry to process and store oil from an underwater (sub-sea) installation.
<i>Distance-adjusted demand:</i>	The amount of cargo shipped multiplied by the average distance over which it is transported in order to determine actual ship demand .	<i>Front-haul:</i>	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'.
<i>Drewry:</i>	Drewry Shipping Consultants Ltd. British shipping and transport research company. <a href="http://www.drewry.co.uk">www.drewry.co.uk</a>	<i>Geared:</i>	Indicates that a vessel is equipped with a crane or other lifting device.
<i>Dwt:</i>	Dead Weight Tonnes. Indication of a vessel's cargo carrying capacity (including bunkers, ballast, water and food supplies, crew and passengers).	<i>Gearless:</i>	Indicates that a vessel is not equipped with a crane or other lifting device.
<i>Dynamic Positioning:</i>	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.	<i>Global order cover:</i>	Global order is the global orderbook divided by annual yard capacity.
<i>EIA:</i>	Energy Information Administration. A	<i>Gt:</i>	Gross Tonnes. Unit of 100 cubic feet or 2,831 cubic meters, used in arriving at the calculation of gross tonnage.
		<i>Handy, container:</i>	Container vessel of between 1,000-1,999 teu.
		<i>Handymax, dry cargo:</i>	Dry bulk carrier of between approximately 40,000 and 65,000 dwt.
		<i>Handysize, dry cargo:</i>	Dry bulk carrier of between approximately 10,000 and 40,000 dwt.
		<i>Head-haul:</i>	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.		
<i>Heavy distillates:</i>	This oil type includes fuel oils and lubes.		
<i>IEA:</i>	International Energy Agency. A subsidiary of the OECD. <a href="http://www.iea.org">www.iea.org</a>	<i>LR1, product tanker:</i>	Long Range 1. Product tanker with the maximum dimensions for passing through the Panama Canal (width of 32.21 metres and length of 289.5 metres) of approximately 60,000-79,999 dwt.
<i>IHS Global Insight:</i>	American economic consulting company. <a href="http://www.globalinsight.com">www.globalinsight.com</a>	<i>LR2, product tanker:</i>	Long Range 2. Product tanker too large to pass through the Panama Canal and with a capacity of 80,000 to 120,000 dwt.
<i>IMO:</i>	International Maritime Organization. An organisation under the UN.	<i>Medium, tanker (MR):</i>	Medium Range. Product tanker of between 10,000 and 60,000 dwt.
<i>IMO I-III:</i>	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.	<i>MGC:</i>	Medium Gas Carrier. LPG ship with a capacity of between 20,000 and 40,000 Cu.M.
<i>Inorganic chemicals:</i>	A combination of chemical elements not containing carbon. The three most common inorganic chemicals are phosphoric 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.	<i>Middle distillates:</i>	This oil type includes diesel, kerosene and gasoil.
		<i>Multi-Purpose:</i>	Dry bulk carrier with multiple applications, mainly as a feeder vessel or for special cargo.
<i>Intermediate:</i>	Medium-sized chemical carrier with a capacity of between 10,000 and 20,000 dwt.	<i>Nautical Mile:</i>	Distance unit measure of 1,852 meters, or 6,076.12 ft.
<i>LGC:</i>	Large Gas Carrier. LPG ship with a capacity of between 40,000 and 60,000 Cu.M.	<i>NGL:</i>	Natural Gas Liquids – which, put simply, consists of all gaseous products except methane which is also known as LNG.
<i>Light distillates:</i>	This oil type includes gasoline, naphtha and solvents.	<i>Offshore vessel:</i>	Vessel serving the offshore oil industry.
<i>LPG vessels:</i>	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	<i>OPEC:</i>	Organisation of Petroleum Exporting Countries.
		<i>Organic chemicals:</i>	Contain carbon and are also referred to as petrochemicals. Are used to produce virtually all products made from plastics or artificial fibres.
		<i>Panamax, container:</i>	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.
		<i>Panamax, tanker:</i>	Crude oil tanker or product tanker with the maximum dimensions for passing

	through the Panama Canal (width of 32.21 metres and length of 289.5 metres) of approximately 60,000—79,999 dwt.		3,000 nautical miles.
<i>Panamax, dry cargo:</i>	Dry bulk vessel with the maximum dimensions for passing through the Panama Canal (width of 32.21 metres and length of 289.5 metres) of approximately 65,000—100,000 dwt.	<i>Short Sea, chemical:</i>	Chemical tanker smaller than 10,000 dwt.
<i>Post-Panamax:</i>	Container vessel of approximately 3,000+ teu that is too large to pass through the Panama Canal.	<i>Small gas carrier:</i>	LPG ship smaller than 20,000 Cu.M.
<i>Product tanker:</i>	Tanker vessel with coated tanks used to transport refined oil products.	<i>Speed-adjusted fleet growth:</i>	The amount of tonnage multiplied by the average speed at which it sails in order to determine real fleet growth.
<i>Propane:</i>	Propane is a three-carbon alkane with the molecular formula C <sub>3</sub> H <sub>8</sub> , a gas at standard temperature and pressure, but compressible to a transportable liquid.	<i>SSY:</i>	Simpson Spence & Young, British ship brokering and research company. <a href="http://www.ssy.co.uk">www.ssy.co.uk</a>
<i>Propylene:</i>	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.	<i>Sub-Panamax:</i>	Container vessel of approximately 2,000-2,999 teu.
<i>PSV:</i>	Platform Supply Vessel. Offshore vessel serving the offshore oil installations.	<i>Suezmax:</i>	Crude oil tanker with the maximum dimensions for passing through the Suez Canal (approximately 120,000—199,999 dwt.).
<i>Refinery margin:</i>	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.	<i>Super Post-Panamax:</i>	Newest type of container vessel of approximately +12,000 teu.
<i>Refinery turnarounds:</i>	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.	<i>TCE:</i>	Time Charter Equivalent.
<i>Ro-Ro:</i>	Roll On – Roll Off. Common description of vessels on which the cargo is rolled on board and ashore.	<i>Teu:</i>	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.
<i>Short sea:</i>	Refers to trading routes shorter than	<i>Teu-knots:</i>	Unit of measure that takes account of the speed of ships when estimating the actual supply of ships within a segment.
		<i>Teu-nautical mile:</i>	Unit of measure indicating the volume of cargo, measured in teu, and how far it has been transported, measured in nautical miles.
		<i>Tight oil:</i>	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.
		<i>Tonne-mile:</i>	Unit of measure indicating the volume of cargo, measured in tonne, and how far it has been transported, measured in nautical miles.

<i>Tonnage:</i>	Synonymous with "vessel".
<i>Triangulation:</i>	Minimise ballast time by identifying cargoes in the area. This tends to improve earnings.
<i>Town gas:</i>	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.
<i>ULCC:</i>	Ultra Large Crude Carrier. Crude oil tanker of more than 320,000 dwt.
<i>Vegetable oils:</i>	Oils derived from seeds of plants and used for both edible and industrial purposes.
<i>VLCC:</i>	Very Large Crude Carrier. Crude oil tanker of between approximately 200,000 and 320,000 dwt.
<i>VLGC:</i>	Very Large Gas Carrier. LPG ship with a capacity of more than 60,000 Cu.M.

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