OPTIMAR

— Benchmarking strategic options for European shipping and for the European maritime transport system in the horizon 2008-2018

INTRODUCTION & SUMMARY

In co-operation with:
- Planet
- AISLive
- Dynamar
- Global Insight
- ShipBiz International
- Fundación Valenciaport
- SAI-Institute of Shipping Analysis
Introduction

In 2007, the Commission's Directorate General for Energy and Transport (DG TREN) decided to conduct a study in view of formulating possible future EU policy options for maritime transport. This study should be prospective in nature and focus on trends and plausible shipping scenarios in the horizon 2008-2018.

Lloyd’s Register-Fairplay Research has been leading the consortium of companies that have produced this report. All companies have contributed to the final report. Dynamar BV has contributed specifically to the sections about container shipping, Global Insight France (SA) to the sections about liquid and dry bulk and ShipBiz International to the sections about roro, ferry and cruise.

SAI – the Institute of Shipping Analysis has been involved in the description and analysis of the activities in the Baltic Sea region. Planet S.A. has done the same for the Eastern Mediterranean and the Black Sea, and Fundación Valenciaport of the Western Mediterranean including the Atlantic south of the North Sea.

AISLive has contributed with AIS-data on ships movements which have formed a valuable input to the understanding and analyses. Professor Tor Wergeland of SAI has been a significant contributor, particularly to the sections about signals of future changes, SWOT-analyses, scenarios and strategic recommendations.

Outside the consortium, Eurostat has provided comprehensive ports data and Cambridge Energy Research Associates (CERA) have provided the basic three scenarios which then have been further adapted to this study.

Several consultative meetings have been held with the national maritime administrations of the EU and Norway and with a group of high level shipping experts. Further, there have been consultations with representatives from the sectors of shipping, ports, ships equipment manufacturers and academic institutions.

In accordance with the tender specification, this report is divided into four parts;

- Part A: Geographical distribution and evolving patterns of seaborne trade,
- Part B: Signals of future change in shipping,
- Part C: SWOT analysis,
- Part D: Shipping scenarios and strategic recommendations.

There are two major issues that are addressed in this report;

1. By 2018, the shipping transport services available to the European industry should at minimum be just as efficient, reliable and sustainable as today. This includes that there should be sufficient transport capacity available and that the port and port hinterland capacities should be able to cope with the anticipated cargo volumes.

2. By 2018, the shipping industry should at minimum be just as competitive and have an equally strong, or better, position on the global markets.

For the two major issues, factors are to be identified that could jeopardize or strengthen the efficiency, reliability and sustainability of; the shipping services, the availability of tonnage supply and the adaptation of port & hinterland capacities.

To address the requirements set out above and to meet with the terms of reference to this report, the disposition of the report is focusing on the goods flows, the ports and the shipping markets and for the purpose of this report crucial parts of the maritime cluster.

All forecasts presented are produced for a baseline scenario. These forecasts are later used as benchmarks in the impact analyses of the alternative scenarios. Part A of the report is covered in chapters 1 to 4.

In chapter one the global trade and seaborne transport are described. Among the findings in this chapter, it could be highlighted that container volumes grow at a high pace, but the shipped quantities are still much higher in the bulk sectors.

Chapter two covers the European regions and their ports. The regions’ characteristics are described and the differences between them are evident. The plethora of ports is displayed given the strategic asset that many of them represent.

Chapter three describes the major ship markets and the EU interest. The fleet growth in many segments is striking. It is also noteworthy that EU member states’ ship registers are decreasing in relative terms.
Chapter four is looking at the other shipping related sectors in Europe and their dependence on the shipping sector.

Part B of the report is covered in chapter 5 signals of future change, which forms a platform for the following SWOT analysis in chapter 6 (Part C).

Some major findings in the SWOT analysis are over supply in many shipping segments, no foreseen port capacity problems for bulk handling, but rather for container handling.

Part D is covered in chapter 7 “Year 2018 scenarios” and chapter 8 “Strategic recommendations”. A number of key elements that are put into the context of the three basic scenarios.

Summary

Global growth, trade and seaborne transport

The large differences in economic performance and growth between the countries of Europe can be attributed to differences in economic structure, degrees of liberalisation and economic policies. These differences are likely to encourage labour mobility between member states of the EU. Economic differences can also be viewed as a significant asset, if the various parties are able to gain mutual benefits from cooperation and thus enhance development.

The following figure illustrates the relation between real GDP growth in percent and the corresponding growth in US$ for the year 2006. The exceptional growth percentages for Latvia and Estonia that year are striking, but given the relatively small size of those economies that growth is small in absolute terms (US$). The growth is still important to those countries, but for the European continent as a whole it is of minor importance.

As a comparison three countries of high significance to the EU have been plotted in the graph; the USA, Russia and China. The USA and China are large trading partners to the EU. So is Russia, but with a more limited product mix.

When it comes to the seaborne trade the bulk volumes dominate clearly, accounting for some ¾ of the tonnes of goods carried in deep sea trade. Early estimates amount to about Bn6.9 tonnes carried in deep sea trades 2007, whereof Bn2.6 tonnes of liquid bulks, a little less major dry bulks and about Bn1.7 tonnes of general cargo.

Trade grows steadily over time, which the illustration highlights. It should be noted that trade normally grows even in periods of business contraction, however at a lower pace. It takes major recessions to produce negative growth in trade.

Over the entire period containerised trade has grown at an average annual rate of ten per cent. Meanwhile has the general cargo category excluding containers hardly grown at all and over the last three years it has decreased significantly. The container has taken over a substantial part of shipments from the general cargo vessel segment and general cargo ships are today rarely employed in deep sea operations.
In our Liquid bulk seaborne trade the baseline growth forecast looks at an average annual growth rate of 2% per annum.

Russia and North Sea remain the main source of oil supply to Europe up to 2018.

The average annual oil prices is parked at historically high levels.

Inwards volumes will continue to dominate port handling in EU27.

Saudi Arabia continues to remain the worlds largest exporter of liquid bulk tonnes, in 2007 Saudi Arabia exported over 722 million (metric) tonnes of liquid bulk goods (the majority of which was crude petroleum). Western Africa is increasing in importance, especially for Europe.

On the import side the United States and Japan are the two top importers of liquid bulk commodities. For both countries crude petroleum is the largest liquid bulk import cargo.

In our dry bulk seaborne trade scenario Far East continues to be main driver for global dry bulk trade.

Ores and coal the largest bulk commodities.

Americas are the largest sources for European imports.

NW Europe is the largest import region.

Overall dry bulk commodities include the following; coal, iron ore & steel, grains & cereals, sugar, oil seeds & soy beans, animal feed, bauxite, zinc, alumina, nickel, aggregates, salt, phosphate & fertilizers, and scrap material. Global dry bulk trade has enjoyed strong average annual growth in the past four years at 6.0%, thanks in part to strong demand for bulk commodities in China’s rapidly growing market. Growth in the dry bulk market will slow to 3.1% growth in the next five years (2008-2012) before slowing to 2.3% annual growth over the long-term forecast (2012-2018).

China was one of the largest bulk commodity importers from the world in 2007 and despite expected slower growth from China and from the bulk shipping markets, China will remain one of the largest importers in 2018. Japan, South Korea, the United States and Taiwan are also among the top five bulk commodity importers in the world.

Brazil will be one of the largest bulk commodity exporters in 2007 with over 364 million dry bulk shipping tonnes exported. Like China’s imports, Brazil's exports are also expected to slow somewhat in the medium to long-term.

Our view of the general cargo seaborne trade is that containerized cargo will grow at an annual average of 7% (tonnes) and 8% in teu. Cargo handled in the roro-system is forecasted to about 5% p.a. Other general cargo is forecasted to grow slowly.

Far East continue to be the main source for containerized cargo.

Roro is used mostly for intra-European volumes. Vehicle trade forms the exception.

The total general cargo handling in the EU27 ports amounted to 1.3Bn tonnes in 2006, which was more than the total dry bulk and less than the total liquid bulk handling that year.

Close to half of the volumes was cargo in containers, a third was cargo on roro ships and the remaining 19% was “other” general cargo.

The latter category consists mainly of break bulk.

The global containerized trade increased by 10.5% in 2007. Globally about 125 million full teu have been carried according to the latest estimates.

Over the last 27 years the container trades grew with 9.2% on average per year. The last 10 and 5 year the growth was on average 9.8% and 12% respectively. For 2008 a drop in growth has been estimated to a level of 8% after which the trade outlook becomes much more unclear but growth could pick-up again at a more than 2-digit level on the positive perspective.

More negatively would be the scenario that global trade will be faced the prolonged effect of a deeper financial crisis when growth of around 6-7% are to be expected.

Passenger transport is diverse but smaller ferries fulfil an important short distance, urban transport function – quite often for passenger transports only (without cars).

Trend wise shift towards cargo in the ropax sector; particularly in North Europe.

European cruises forecasted to expand strongly.

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Passengers are carried all over the world most in ferries but also in cruise ships. The ferries are life lines for many remote places and the transport work they do is thus very important. The cruise
passengers are more important for the communities that they visit since the passengers tend to spend a good amount of there. Deep sea offshore production grows in importance. The European competence is renown and will continue to be in demand.

The port traffic is set grow substantially over the years to come to the benefit of all port related service activities; tugs, dredgers, pilotage salvage & rescue to mention but a few.

**European regions and their ports**

- In general there are vast differences between the European regions and the port volumes follow population density.
- Bulk ports are located nearby power plants and refineries.

Next figure illustrates the port throughputs in 2006, divided on major cargo type, direction and EU region. A number of observations can be made from this graph;

Liquid and dry bulk cargoes dominate – about two thirds of the total volumes handled, much of it in the North Sea region and Western Mediterranean.

Inwards and outwards volumes of bulk cargoes are imbalanced – inwards volumes are much higher, whereas volumes in containers are fairly balanced, which may come as a surprise. This is due to the higher weight of outwards cargo.

Roro cargo is fairly balanced. This is natural since the absolute majority of this cargo is intra-European.

Cargo in the roro system is also expected to grow fast, at around an annual average of 4.5%.

In the following graphs, the volumes have been divided to reflect cargo bound for/from ports within the EU27 (intra-EU trade) and cargo from/for other regions (extra-EU trade). First 2006 are presented and then the forecast for 2018.

Extra-EU volumes dominate the bulk and container cargoes both now and then.

An important share of extra-EU liquid bulk volumes are imports from Russia.

Intra-EU liquid cargo volumes are substantial following the intensive short sea shipments of refined oil products from the refineries.

Roro traffic is largely used for short sea shipments, with the exception of vehicle carriers such as pure car carriers. Roro traffic is expected to grow in intra-EU trade, largely either to relieve road congestion or to support the forest and steel industries in Sweden and Finland.

The table presents the total port handling in all the EU27 countries including both domestic and intra-European trade. In total, inwards and outwards volumes are unbalanced. There are significant differences on country levels and even more so in individual ports.

The ports in Estonia and Latvia have much higher outwards volumes in absolute terms (tonnes). If seen in relative terms, then Lithuania and Poland make the list as well. Countries with a substantial inwards volume overshoot are the Netherlands, Spain, Italy, U.K. and France.
The 20 largest dry bulk ports in Europe is presented below. Rotterdam is by far the largest port followed by Hamburg. The imbalance between inwards and outwards cargo is striking.

The major liquid bulk ports in Europe are illustrated in next figure.

Rotterdam and Marseille are large ports for the handling of inwards cargo, while Bergen (Mongstad) in Norway is a large loading port. Container handling is a more balanced activity if measured in tonnes, which is the data behind next figure. This is only half the story though since empty containers also have to be handled. Rotterdam, Hamburg, Bremerhaven, Antwerp, Gioia Tauro, Algeciras and Felixstowe are all large container ports. Many of these ports also are transhipment hubs for containers that are carried by feeder vessels to the port of destination.

The table below illustrates the 15 largest ports 2007 in terms of number of port calls and in terms of aggregated dwt of the ones that AIS-live cover with their antennas. The figures do not include ferries, since the tables would be completely dominated by ferry crossings at short distances then. The enormous importance of Rotterdam and Antwerp for central Europe becomes very clear.
Major ship markets and the EU interest

- In general the most shipping segments will have strong fleet growth until 2018.
- The EU operators’ share of world fleet control has been unchanged over the last 30 years.
- Over the same period the EU flagged share of the fleet has decreased by a third.

The major conclusion is that the supply will be enough in general (even if it always can be short supply deficiencies in short periods) but maybe too large in some fleets, which itself can distort the markets.

The next graph illustrates the world fleet development of ships larger than 100gt going in international traffic over time. The most numerous sectors is the general cargo and the service ships.

Still bulkers and tankers are dominating but container ships and especially passenger ships gains in importance.

There are many ways of defining the importance of a country or a region of countries in the shipping world. The mostly used three decades ago where the register, or more commonly known word – the flag state of the individual ships. In the recent 30 years the EU27 countries flagged fleet of ships has grown from 118M gt to 162M gt or by 37%, but given that the world fleet at the same time has grown from 400M to 800M gt or 100% the EU27 share has decreased.

This is illustrated here where the red line shows the downward slope for the fleet of EU flagged ships from a share of 30% in 1978 to 20% now.

Another, measure of the importance of a country or a shipping region is the amount of owned tonnage. Opposed to the flag the gt development in an EU27 perspective has been a lot better over the recent 30 years with an approximately 32% share of the world fleet at the starting point and 33% in 2007. The reason that the European share are as high now is credited to the very positive development in Germany the recent decade.

If a comparison is made between the ownership, operation and flag of tonnage is made some countries has substantial differences – they are highly concentrated on just owning or operating a ship. Germany stands out in the crowd if measured in gt with at least 41.5M gt owned but not operated tonnage. Denmark for instance operates a lot more tonnage than they own.
The ownership of the ship and the flag state traditionally were closely linked but that is not the case today. However, the flag state today has little in common with who decides of a ship or where the money for the operation goes and this comes for the ownership as well.

Thus the group operators country becomes interesting since that is the highest possible level of decision making. Here the EU 27 has hovered just above 30% since the 80s as illustrated by the red line.

In number of ships this means that companies within EU countries controls 23% or 17,581 commercial ships larger than 100gt of the world fleets 77,517 ships as Figure 24 illustrates.

Out of the 27 EU countries there is only Hungary that does not have any merchant ship in their control but also the Check Republic, Slovakia and Austria are small and have one digit numbers.

In gt the EU share is larger, at 32% or 256M gt of the total 788M gt as illustrated above. The largest country in the world is China ahead of runner up Japan. Greece find itself at the third spot by an impressive 10% of the total gt. UK is the second largest country in EU by 5% as have Denmark.

**Other European shipping actors**

Europe’s maritime sector is a world player as shown in the earlier chapters. Shipping and logistics, shipbuilding, and related services and fields, ranging from cargo handling and coastal tourism to off-shore energy fields, fishing and aquaculture provide about 5 million jobs across Europe. Coastal tourism account for a fair share of these. Some 70% of shipping-related jobs are onshore – in shipbuilding, naval architecture, science, engineering, electronics, cargo handling and logistics. Commercial shipping and port operations account for a third of the economic value of the maritime cluster and are seen as important new growth areas for employment, notably in the field of logistics.

Many ports have become major economic and employment hubs, driving local and regional development on the basis of maritime-related industries such as high-tech shipbuilding, shipbroking, cargo handling and port services, offshore energy, fisheries, and marine research.

The economic importance of the maritime cluster in Europe is indicated by the European Metalworker’s Foundation who have stated that their sector’s 1.3 million employees together generate value added totalling €70 billion. A similar assessment presented by the European Sea Ports Organisation arrives at an employment figure of about 2.5 million people and an added value of about €111Bn.

**Signals of future change**

To make SWOT analysis and scenarios for the EU27 shipping industry 19 signals of future change were chosen. Some of the 19 drivers are more likely to happen simultaneously with other drivers, hence the clustering below.

Another approach is to classify the drivers along two dimensions: The degree to which the outcomes of the drivers are uncertain and the degree of impact the driver is likely to have on shipping.
SWOT analysis

- In general the SWOT analysis reveals that there will be over supply in many shipping segments; good news for shippers, bad news for ship operators.
- No port capacity problems for bulk handling.
- Port capacity constraints for container handling.

One of the main tasks of this project is to analyse if the EU ports and infrastructure can cope with the development that is expected up until 2018, and if not, suggest what the EU can do about it.

Since the conditions differ widely on the infrastructural side both among regions and among the cargo types this summary focus on the large three commodity groups, liquid, dry and containerised cargo. The perspective is from an industry/society point of view and not a competition view from or in between the ports themselves. The analysis are for large regions and seen aggregated overall and thus the strengths, weaknesses, opportunities and threats could differ much for individual member state ports.

For liquid cargo there is a good balance between port facilities and demand outlook, but for LNG. The ship capacity will be plenty. When it comes to volumes the dependence of Russia is very high. Potential volumes find itself among renewable liquid fuels.

Also for dry cargo the balance is good between port facilities and demand outlook in general and the ship capacity will be plenty. Here new volumes from the former Soviet Union are a potential and a threat would be that Russia would like to cater for their cargo in own ports.

In a port/society view the container system will have enough ship capacity and networks will continue to develop favourably but the business is space demanding and several ports have problems to find the needed space. For individual ports the restructuring of the networks means both a threat and an opportunity. New potential volumes are transshipment of Russian cargo.

For the European ship operators many things differ in between the segments and that is highlighted in the main report but many things could be applicable in several sectors.

The perspective is the one of an averaged sized EU member state company (ship owner or operator). On the positive side they have generally high competence in all operational aspects.

On the negative side there will be an actual shortage of officers in the world in the future and this looks even worse in an European aspect since here the life at sea seems less attractive today compared with shore side alternatives.

In general there are both opportunities and threats in the large fleet growth and the following restructure that will affect many of the market segments – highlighting the cyclical aspects of the market were timing in the purchase and sale price of the ship as an asset are crucial.

Potential for most markets are to be find in Asia and Russia, with China being the largest driver. The European member states’ Maritime Administrations are active in international fora but they are not good enough in cooperating. Many of the national registers are not attractive enough – for various reasons. Increased cooperation and harmonisation could enhance the attractiveness of EU registers which is an opportunity. The threat is that the economic control of the world fleet shifts towards Asia and thus their register becomes clearly larger and more important.

Year 2018 scenarios

The scenarios in this chapter are to a large extent built on the extensive, continuous scenario work done by Cambridge Energy Research Associates (CERA). The geo-political, macro-economic and energy market parts of their scenarios form the foundation for the shipping related parts of the scenarios produced for this report.

The critical questions raised in the formulation of the scenarios are in;

Asian Phoenix: How is the rise of Asia altering the global balance of power? What does it mean for geopolitics and the energy industry? What will happen to the competitiveness of European industries? What is the effect on containerized cargo?
**Break Point:** How high can oil prices rise? What would it take to drive average annual oil prices above $120 per barrel? How would the world react? Where will Europe source its supply of energy? What will be the impact for the transports of energy products and further to the oil, gas and coal carrier segments?

**Global Fissures:** How would a world faced with a sustained slowdown in global economic growth and integration affect energy demand and long-term investment in the energy industry? How will such a slow down in activity match the anticipated growth in the supply of tonnage? These three main scenarios are divided upon a perspective where the EU policy stays as is or if it is changed and the following six scenarios are established.

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<td>Pro-active ++</td>
<td>Money maker ++</td>
<td>Transition to sustainability</td>
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The 19 signals of future change are tested against the six scenario storylines according to if they are important for the scenario outcome and in what direction they affect shipping.

**New materials:** Over the scenario period, the impact of new materials is low in all but the transition to sustainability scenario where the development provides incitements for a rapid introduction of new, light, strong, anti-fouling materials.

**New sustainable energy:** This is only an issue in the Break Point scenarios, where a large scale transition to renewable energy sources would have a dramatic influence on the demand for petroleum shipments. Biofuels also need to be shipped, but distances are foreseen to be much shorter.

**ICT:** In Money-maker ++, a global standard is assumed to be introduced. In the Short sea shipping opportunities scenario, a European standard is expected to be launched. In most scenarios, the impact is seen as positive. The only negative aspect is the lack of standards.

**Availability and quality of crew:** In the most negative market development scenarios (Bunker price struggle and the two Global fissures scenarios) the availability of crew will not be a restraining factor due to the lack of employment for the ships.

In contrast, crew availability becomes a troublesome issue in the more positive scenarios, particularly in Money-maker, where the absence of new policy measures are not supplementing/matching the industry’s own efforts.

**Trade barriers:** The removal of trade barriers has a positive impact on the demand for, primarily deep sea shipments. The opposite is valid for the Global fissures scenarios, where protectionist moves have a direct negative impact on the same activities. In the short sea shipping opportunities scenario, the negative impact on deep sea shipments is cushioned somewhat by a positive development of short sea shipments. The impacts affect different actors in many cases though.

**Role of multinationals, location of economic activity:** This driver is strongly influenced by the type of scenario. In the positively oriented Asian Phoenix scenarios, the multinationals act as described in the positive paragraph above and in the Global fissures as in the negative. In the short sea shipping opportunities scenario, deep sea operators are not faring well, while the outlook for short sea operators is fairly positive. This is due to the expected allocation of production resources closer to consumption areas.

**Terrorism:** The introduction of balanced pro-active measures, coupled with enhancement of compliance with existing measures have the potential of reducing both the risk for and the harmful effects of terrorist attacks. Extreme measures could have a negative effect on efficiency. All measures will add to costs somewhere, but to various degrees.

**Regional conflicts:** Regional conflicts have the potential to harm trade relations and thereby demand for transport of goods to and from the countries concerned. These threats form part of the Break point and Global fissures scenario storylines. In the Asian Phoenix scenarios, it is the absence of major conflicts that is the reason for the positive evaluation.

**Global warming:** Shipping is recognized as both a contributor and a saviour. In the positive set of scenarios shipping comes out well, while the potential introduction of really strong measures would be the cause of serious problems for the majority of the industry – particularly deep sea shipments of energy (LNG possibly excluded) and medium to high speed shipments of containers and vehicles. The drama is a product of the Break point scenarios.
Consumers’ perception of sustainability: Large scale changes in consumer preferences could lead to a significant impact on the type of goods transported and the distribution pattern of the same. In the Transition to sustainability scenario, policies taken are aimed at punishing non-preferred fuels. This would lead to a quicker, but more painful restructuring of shipping activities.

Greenhouse gas emissions regulations: Regulations introduced could span from exempting all shipping activities from any type of punitive regulations, fees or taxes to levying the same heavy across-the-board. As for any other environmental issues, the impact would be within the Break point scenarios.

Pollution & other emissions regulations: The emissions to air and water of harmful substances such as particular matters or sulphur are local to regional in their physical impact. In a wider perspective and seen over a longer period of time, the overall impact on shipping should be marginal.

Transport mode taxation: The relative competitiveness of short sea shipping vis-à-vis land transport alternatives would increase significantly and thereby boost the shift of cargo. Once an established preferred modal choice, the continued development is secured. The Break point and Global fissures scenarios underpin the impact of measures taken.

Freight conferences: The removal of antitrust immunity regulations would open up for competition in a wider sense than today. If this is pursued in a Global fissures scenario without supportive balanced measures (for instance non-discriminatory measures) then detrimental price competition will follow. On the other hand could the same development open up for significant short sea shipping opportunities if measures are introduced to support this.

Safety and security: Measures introduced in a non-discriminatory and careful way will have limited cost driving effects. The impact is low in all scenarios.

Ageing populations: Demographic changes affect the structure of consumer behaviour. This is of interest for the cruise shipping sector, to mention the one with most likely the highest direct impact. This is a driver of low uncertainty of happening and is thus fairly predictable. The overall all impact on shipping is low, with the exception of passenger shipping. The three basic scenarios range from very positive to very negative, but with no impact of pro-active measures.

There is however a connection with a higher impact and that is the ageing group of seafarers. The retirement/recruitment ratio is unfavourable and this is the cause of the imminent problems.

Migration of large populations: The gloomier the scenario, the graver is the development of the migration problems. The impact on shipping is generally low. No impact of pro-active measures foreseen.

Transition of economic power from US/EU to Asia: The transition of economic and political power as well as technology to the Far East secures the need for shipment of input, intermediate and finished goods across the globe. In the Global fissures scenario this transition is significantly reduced and the impact on shipping is marked.

Russia: High growth in Russia and a European focus on all exports and imports is a positive development. Volatile economic and political development, and a changed focus towards Asia is a less favourable alternative.

Strategic recommendations

This chapter contains our strategic recommendations for the European Commission. It is clear that the current shipping policy with the adopted state aid guidelines has been working reasonable well so far.

The challenges ahead are however plentiful as highlighted in previous chapters. Some of these challenges can be met by policy changes, removal of existing policies or the introduction of new ones. The areas to address with policies are diverse.

External relations. Trade is a fundamental factor for the demand for transport. Some of the cornerstones of well-functioning trade are the free movement of goods and the stability of the business environment for the trade. Maintaining a dialogue is important in all situations, be that in trade negotiations or when faced with regional conflicts.

It is recommended that the work in the WTO is continued and that strong efforts are made to strengthen the positions.

Multi- and bilateral agreements are second best alternatives that should be pursued in parallel without undermining the work in the WTO. Removal of trade barriers benefit transport and should be encouraged.

As for the representation of the EU27 it should be underlined that, seen from a European shipping perspective, it is favourable that EU27 speaks with one voice. Words should be possible to back with
demands and if necessary with sanctions in those cases where this is relevant.

**Short sea shipping.** An expansion of short sea shipping activities is necessary to alleviate congestion and reduce the growth of emissions while still servicing growing transport volumes. Overall transport costs are bound to rise over time and we will have to be prepared to internalise external costs at some point in the future. The challenge is to ensure that it is done in a non-discriminatory way.

- Port and fairway fee structures need to be looked at to ensure that short sea shipping is not discouraged in any way.
- The importance of the success of the maritime space without barriers is underlined. The efforts made should continue with the highest possible ambition.
- Preserving the large number of smaller ports is essential when the short sea shipping network is to expand and land transport distances are to be minimized.
- The efficiency and costs for modal shifts ie. the sea to rail or road interface is key to the success of short sea shipping. This has been addressed in the programmes Pilot Actions for Combined Transport (PACT), the MarcoPolo and the Motorways of the Seas. All three programmes were/are fairly pragmatic in their approach. This should be supplemented with basic research and innovation on cargo modes, cargo handling and logistic solutions with the aim at finding solutions that cut lead times, transport and handling costs.

**Port infrastructure investment fast-track.** There is a mounting need for investments in ports in Europe, particularly for the handling of containers and liquefied natural gas (LNG). The latter involves the allocation and construction of regasification facilities.

*It is recommended that the procedures for environmental assessments and all related approvals that are in practice in the EU today are assessed and reviewed. The aim should be to establish procedures that cut the overall lead time significantly without giving in to any of the environmental demands.*

**Transition to sustainability.** The IMO has set the guidelines for reducing the emissions from shipping activities. The time frame is surprisingly short in the perspective of a ship owner’s ability to take any major actions with the exception to switch to better quality fuels. Theoretically, one good option for the ship owners is to fuel their vessels with natural gas (NG) or liquefied natural gas (LNG), which would reduce the emissions to levels far below the requirements. From an emissions point of view that would position sea transports as the cleanest mode of transport.

*It is recommended that a research programme is set up that is focusing on energy use for ships, bunker fuels or other types of fuels, propulsion systems, coatings and supply chain efficiency.*

**Availability and quality of crew.** The supply of seafarers have been raised by several instances of the maritime cluster as of growing concern. This is a combination of attracting young people to the maritime sector, ensuring quality of education and retaining those already within the sector. The latter is not so much about keeping seafarers within the maritime cluster, quite the opposite. Few are leaving the cluster, but there is a demand from shore based, maritime related activities for experienced seafarers that competes with the option of staying at sea.

*Recruitment is first and foremost an operational responsibility for the employers ie the ship owners/operators/managers. It is up to them to ensure that the job offer as such is attractive enough. Factors at play here are of course salaries, working conditions on board, time at sea vs time at home, communication possibilities on board and much more.*

There is however more to the issue that needs to be addressed. We recommend that a policy package is launched containing;

- Commissioning of a study of the perception among young people in Europe of how a career at sea is. The results of the study should be guidance for the final formulation of a policy on recruitment supporting measures.
- Joint EC and industry PR campaign about the advantages of a career at sea.
- An inventory is made of the capacities, capabilities, content and qualities of the maritime education offered in EU27 today. If lack of capacity and/or insufficient quality then this should be addressed quickly.
- A support scheme for apprenticeship onboard. Taking onboard apprentices could be claimed to be the industry’s own responsibility, but there are a few issues that need to be addressed to take onboard an apprentice (cabin, food, safety training etc).
- Soft loans for students.

**EU and the IMO.** Decision in the IMO are generally taken by consensus, which largely contributes to the slow decision process. Real voting is a rare event, but the underlying voting power is still highly important for the ratification of regulations for shipping.

By the enlargement to 27 member states, the EU influence in the IMO has increased. However, the
ship operators in the member states have maintained their share of world fleet control, whilst the EU flagged fleet has decreased by a third over the past thirty years.

The value of EU member states to speak with one voice in international forums such as the IMO is debated. The standpoint in this report is that it is powerful to represent a consensus view of the EU27. Doing so would enhance the chances of getting necessary and/or preferred decisions ratified in the IMO. We are talking about decisions on safety, security and environmental impact. The recommendation is twofold:

- Work for a consensus presentation in the IMO, preferably via a permanent EU representation. As second best alternative, or a step on the way, preparatory work for a consensus view to be presented by the member states with the effect of “one voice”.
- Work for the replacement of ratification based on flag by ratification based on the fleet defined by the country of residence of the company issued with a Documents of Compliance (DOC) for the ships as defined by the IMO.

**Transport policy.** Transportation of goods is a necessity for a well functioning economy. In the future it will be increasingly important that the transport sector contributes to a sustainable economic development by delivering cost and energy efficient solutions in an environmentally friendly way. This will in general imply more costly transportation, and then it will be more important that transportation is viewed in the perspective of a total, intermodal chain. In the future it will be a demand for the best supply chains from a total cost perspective.

It is recommended that a major study is commissioned to estimate the total costs of the use of the various modes of transportation, including all the indirect costs related to infrastructure investments, wear and tear, congestion and bottleneck problems, energy use, emissions of harmful substances etc.

On the basis of such a study it should be a political challenge to device a tax system for the transport sector that creates a level playing field. If such a system is established, the market mechanisms will find the optimal supply chains. The Greening Transport Package is a positive initiative in this context.

**State aid.** There are various forms of support to maritime activities currently in place under the state aid guidelines. These have been developed over time and the practice of, for instance, tonnage tax is generally considered successful.

Some argue that it is very important that member states preserve their right not to introduce some of the measures. Seen in broader perspective and over a longer period of time, questions could be raised over the rationale of special treatment for certain industries, such as shipping.

Seen in a 2018 perspective, there is no need to revisit any of these support schemes or special treatments. Most of them could be said to have functioned well.

**Competition in ports.** The opening up for competition in the provision of port services has been proposed and rejected over the years. This apparently is a difficult issue that nevertheless needs to be resolved in one way or the other.

The recommendation is that the work with a port package is restarted, possibly with a revised approach.

**Safety.** There is always more that can be done and measures already taken need to followed through and updated.

The functions of Port State Control and that of EMSA are important for the control and management of compliance. This concerns the quality of ships, but could well be considered to be extended to cover also the crews competence, not just their certificates.

The recommendation is that focus of attention is given to studies of safety culture and how compliance is perceived and met in the different cultures. The ambition is to have a uniform interpretation of the conditions for compliance. The result from this study should lead to a revision of the safety measures if deemed necessary.

**ICT standards.** In order to promote the development and utilisation of safe digital navigation, improved communication between ship and shore-based administrations, the EU27 (member states or via the EC) should actively work for the establishment of global standards. A sub-objective is to work for the establishment of a European standard.

**Security.** There is always more that can be done and measures already taken need to followed through and updated.

Regulations already in place should be perused and compliance controlled. As with safety, it is recommended that studies are undertaken on how compliance is perceived and met throughout the Union. This is a burning issue given the fairly recent expansion of the number of member states.

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Christopher Pålsson & Niklas Bengtsson
Lloyd’s Register-Fairplay Research
The money maker

After the incredibly profitable years in the late 00s, many experts believed that the shipping markets were doomed to many years of depression, due to the record high ordering of vessels in the mid 00s. The shipping markets did not, however, return to the long depression of the 1980s and 90s, and the primary reason for that is to be found in the high growth of the Asian economies, with China and India as the primary locomotives. These economies have continued to sustain growth rates of 8-10% in GDP and much higher growth rates in the imports of key products like iron ore and oil as well as in container shipments, both for exports and imports.

10 years ago the oil prices fluctuated around 100$ per barrel, and although oil prices have remained fairly high, increased OPEC production has caused a downward pressure on prices. The combination of high Asian growth, more OPEC production and slow steaming of vessels have enabled an absorption of the high order books of 2007 without dramatic reductions in freight earnings.

China and India have not only played crucial roles as economic locomotives, but also in the political sphere do they play a much more important role in the world today. Their engagements in the United Nations and the WTO have contributed to a safer world and continued trade liberalization, with more trade in agricultural products, which again has been positive for shipping.

The positive development for shipping has naturally spread to the port sector, where there is hectic activity to try to cope with the growth. Port development is a long term process, and sometimes bottleneck situations do occur, but generally the port sector has managed to accommodate higher volumes.

There has been one area of constant disputes, however, and that is in the energy policy field. European countries have pressured for strong global initiatives to reduce the emissions of CO2 to the atmosphere, but particularly China and the USA seem unable to agree on anything in this field. China accuses the US of being the main energy sinner with many times as high energy consumption per capita as China and thus the country that should lead on in the energy conservation struggle. USA on the other hand point to the enormous growth rates of the Chinese energy consumption, which to an alarming degree is based on coal, and this disagreement seems to prevent some international agreement that could turn an alarming development.

This is currently the main cloud on the horizon, combined with the mounting internal political problems in China due to the increasing gap between rich and poor and the mounting problems of the banking and housing sector of the Chinese economy, as well as failed attempts of creating a suitable social security system in the vast country. It is therefore doubtful that the next decade will be as good for shipping as the last ten years have been.
China and India have led the Asian region to economic prosperity in the last decade. With sustained growth rates of 8-10% in GDP and much higher growth rates in the imports of key products like iron ore and oil as well as in container shipments, the demand side of the shipping markets has seen positive developments, indeed. This development has been matched by some bold political initiatives in the EU in the period 2010-12 that also contributed to the extremely good markets.

The motivation for the initiatives were not really to improve the markets as such, this came more as a side effect. The primary motivation was twofold: to see improvements in safety and quality of shipping services and to contribute to energy savings. The first was achieved through a set of regulations that literally removed sub-standard ships from being engaged in European trades, thus effectively reducing the supply side and the second was achieved through regulation of allowed maximum speed of vessels and other initiatives to both reduce total energy consumption of vessels as well as increasing the energy efficiency of this transport mode. Again the side effect was to reduce the supply side and further contributing to improved markets.

The successful way in which China and India have assumed their roles in international politics by convincingly taking on leading roles within both the United Nations system, particularly within IMO, as well as in WTO, has further contributed to a safer world and a world in which international trade has had optimal conditions. Strong progress has been made in liberalizing the agricultural sector, particularly after EU dramatically changed their agricultural policy by drastically reducing support to EU farmers. Again this political initiative had positive side effects for shipping, as the result was a series of demonstrations, particularly in France and other south European countries that for long periods of time paralyzed the road transportation systems. This became an opportunity for short sea shipping that came up with transport solutions that survived a return to the normal on the roads of Europe. Today, short sea shipping has not only challenged road transportation, but has become the preferred transport mode on major routes in Europe. The main obstacle in this rosy picture is, however, the difficulties in getting a match between port capacity and the growing demand. The shipping industry complains that port planning takes way too long time, compared to what we see is possible in Asia. The EU Commission has set up a committee to come up with suggestions as how to speed up the process, but critics claim this also takes too long.

So, on this last day of the year, is everything just peachy? Not really. Despite the good will of China and India in their roles as economic powers, they never seem to be able to agree with the USA in the energy policy field. The US want China and India to stop using so much coal (and oil) in their energy consumption, as this leads to unacceptable levels of CO2 emissions. China continues to counter this argument by just pointing out that USA have the highest specific consumption of energy in the world and should thus be leading on in attempts of reducing their energy consumption. The UN climate panel points to this disagreement as the main obstacle in the struggle for preventing catastrophic climate changes, and it is a tone of urgency in their latest report indicating that this is serious, indeed.
After the historical break-through agreement at the Climate Conference in Copenhagen in 2009, the world has really had to learn to live with high oil prices. In the years after this memorable conference, the leading nations of the world have been able to agree on a global system of taxation on the actual use of fossil fuels. This has been made possible primarily because the new president after the retirement of George W. Bush in 2009 has seen it as a main task to lead on in more positive international efforts of cooperation rather than the unilateral struggle against terrorism.

We all know the effects: Record high oil prices has led to record high gasoline prices, with strong effects on travel and transportation. The most dramatic reductions have been in the overall demand for oil, with very negative results for the profitability of the sector, despite of slow-steaming effects also reducing supply, but not sufficiently to prevent freight rate reductions. The aviation sector is severely hit, with dramatic reductions in holiday and leisure travels. In shipping, two segments seem to have benefited from this: the ferry segment and to some extent the container business since air shipments of perishable and other previously air transported cargo in some cases have become prohibitively expensive. The ferry business is seeing dramatic restructuring, where the fast ferry operators are the big losers and those with long haul overnight ferries are seeing improved markets.

Despite the high oil prices, the world show a remarkable ability to live with this new set of relative prices. The development seems to have brought the main economic powers: USA, EU, Japan, China and India closer together in many ways, and the spirit of international cooperation has spilled over into other political arenas, like trade policy, where much progress has been made within the WTO, which has been good for shipping. The high bunker prices have led to new transport systems with lower speeds and a need to use more ships to keep the frequency up.

The Middle East remains a political hotspot, however, and with a declining oil demand, the struggle to be the preferred supplier has led to several instances which brought countries to the brink of war. Some experts believe it is only a matter of time before a main local dispute can blossom into a full-fledged international crisis.

High energy prices have obviously led to a field day for those supplying the alternatives: wind power, solar energy and nuclear energy, where the growth potential is astronomical, but is restricted by the production capacity.

A lot of research is going on in finding the ultimate replacement of fossil fuel, but commercial solutions do not seem just around the corner. This means that the struggle for survival in many shipping segments will continue. The port sector is the one struggling the most, at least with any new developments, as the negative climate makes all private investors shy away from this sector completely at the moment.
It has been a remarkable decade of change. It started with a combination of an US presidential election and a global climate conference in 2009 that created a window of opportunity for policy makers. The result has been a multitude of initiatives that most probably will change the world, as we know it, fundamentally forever. The global tax on the use of fossil fuel sent the prices of oil, gas and coal sky high, and the effects have been dramatic.

For shipping the most obvious short term effect was that of a near market collapse. Oil demand was drastically reduced, and the same for gas and coal, particularly the latter. The effect was dampened somewhat by reductions in supply due to the lower speed of the vessels as a result of IMO regulations, but the net effect was negative, indeed, from a ship owner’s point of view. The positive result, however, has been a drastic reduction in the CO2 emissions from the shipping sector, but even more importantly, a new attitude of the necessity to change. This has permeated the political and research arenas to the degree that we probably are seeing the beginning of something radically new.

The technology of converting hydrogen into a useable fuel with the use of solar energy has developed drastically, highly boosted by the many facets of the innovative EU research program “the Hydrogen Society”. Experts begin to see a role of shipping in transporting hydrogen in large volumes in specialized tankers. In Denmark, the introduction of a new generation electrical cars, based on a highly efficient new fuel cell battery technology, has been such a success that the government has prohibited the use of traditional cars in the cities, and the adjustment seems to go without disrupting protests. The experience here has led Chinese and Indian politicians to voice that similar actions should be taken on a large scale there.

The UN climate panel are quite optimistic in their latest report, stating that the development in CO2 emission reductions has gone much faster than they had believed possible.

In Europe, short sea shipping is expanding rapidly, based on new, environmental friendly ships that the trucks simply cannot compete with on some routes. Thanks to the coordinating efforts of the EU commission, the shipping community has gone hand in hand with ship builders and ship equipment producers to show the world that Europe remains the centre of maritime innovation. The port sector is also going in position to design and start building the first hydrogen terminals, to a large degree based on long term experience with demanding LNG terminals. The European maritime cluster is showing strength and a remarkable willingness to cooperate across traditional boundaries.

On the global political scene, the energy challenge has clearly united the big players and it is today much easier to get even radical proposals through the UN system, including the IMO, than ever before. By abandoning the agricultural policy of the EU, Europe is clearly showing solidarity with the third world on a scale hitherto unknown. This has been good for shipping, so despite the many examples of reductions in earnings for some shipping segments, the overall picture is one of a promising future.
The last decade has been truly depressing seen with the eyes of those believing that globalization was a good thing. It all started with the development of the US economy. In the mid 00s, one could sense that something was not quite right with the US financial sector. A series of irresponsible loan schemes sent the housing market into recession, then the Asian economies seem to have lost faith in the new US administration that came into office in 2009, and almost stopped investing in US bonds, which made it obvious to the world that the US deficit was no longer sustainable and the US economy went into a deep recession, with effects almost like the famous 1929 Wall Street crash. This quickly spread to the international scene, with a substantial drop in growth rates both in Europe and in Asia.

The effect on shipping was instant: Demand for transportation was reduced across all shipping segments and with the high orderbooks from the late 00s, the resulting drop in freight rates was quite dramatic.

What makes the situation a lot worse than just an isolated US recession is the fact that the crisis has spilled over into the political arena in troublesome ways. First of all, the European Central Bank failed in its coordination efforts with China and Japan to dampen the effect of the US development. Then the anti-globalization NGOs launched a very effective internet campaign, which in contrast was brilliantly coordinated, that has basically altered the political climate: it is now easier to get support for all sorts of protectionist and nationalistic ideas than to get support for getting globalization back on track. In the WTO they work overtime to deal with the many complaints of violation of existing treaties, and all attempts of more liberalization initiatives are put on hold.

The only examples of something positive for shipping earnings are regrettably coming from regional conflicts, predominantly in Africa and the Middle East, often connected to acts of terrorism. Some parts of shipping has always profited from conflicts, but it is sad to recognize that this is the most positive elements in a troubled world.

In Europe, pessimism is ruling the shipping sector, investors flee to Asia, where there is still some growth and nobody cares about innovation and research. The shipbuilding sector is just a shadow of what it was just 10-12 years ago, and absolutely nobody is willing to invest in ports and terminals, which even in a depressed market is creating bottleneck problems.

In the current political environment, all discussions about global warming and emission of climate gases seem to have vanished, which is really bad news for the long term perspective of our globe.
When the US economy went into serious recession in 2009, most economists agreed that this would just be a temporary dip, because coordinated policies of other countries and regions would help to quickly restore growth in the global economy. How wrong they were! A total failure in policy coordination opened the door for the critics of globalization, labelling the US recession and the coordination failure as symptomatic for a vulnerable globalization process. The result of this, cleverly orchestrated by NGOs using the internet, was a surge of nationalistic ideas and anti-free-trade argumentations that has effectively reduced economic growth all over. Shipping is the one sector really suffering from this development, particularly the reduction in Chinese growth, which was the main source for the golden shipping years 12-15 years ago.

When it became obvious that the recession had spread to all types of demand, the European shipping community initiated a dialog across traditional boundaries, arguing that unless something was done to counter the negative economic development, European shipping would be reduced to nothing within just a few years. In the ensuing debate, the shipping industry was adamant that they did not want any direct subsidies as a means of survival, so the end result became a mix of research initiatives, mainly regarding safety and quality and environmental friendly technologies, and a very bold political decision: a new taxation scheme for all transportation modes, where the tax is reflecting the total social, environment and infrastructure costs of each transport mode. Despite the practical problems of agreeing on actual tax rates and the many protests from trucking companies and railways all over Europe, the Commission held on to the idea, which has given short sea shipping a real boost in its development. Through a series of mergers and acquisitions, some large regional operators have been formed with sufficient size and financial strength to create efficient short sea shipping networks, transferring millions of tons of cargo from congested roads on to environmentally friendly ships.

The positive development is clearly reflected in port and terminal investments. From being a neglected and almost backwards moving sector, the European ports and terminals have been, and still are, in very positive development. The new taxation system has convinced investors that this is a sector for the future, so even very expansive plans have easily secured private finance. 

So, in a world where the globalization process is in reverse and trade liberalization attempts are at a standstill, and most shipping sectors are suffering badly, short sea shipping is thriving and because of this, it is still a hope that European shipping may survive these bad years after all.
11 Approach

The figure to the right illustrates the analytical approach used in this publication. Changes in demand for seaborne transport capacity are a function of economic growth and international trade, which in turn result from changes in the business environment.

The effects of changing demand for seaborne transport capacity depend on how the markets are organised; the market structure (e.g. monopoly, oligopoly etc), strategies used to meet demand and products and services developed to meet demand, as well as the different components of utilisation.