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Think Ocean

Maritime Outlook
Report 2018

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Think

Ocean

Maritime Outlook

Report 2018

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Think Ocean

The oceans connect the world. Norwegian shipping is truly global, helping to make Norway a major maritime power. Norway now ranks as the world's fifth largest shipowning nation measured in fleet value. The industry's global footprint means that international headlines can influence trade patterns, investments, and the bottom line. No other industry is so directly influenced by developments in other parts of the world.

Transportation of goods and energy production has been the trademark of shipping. The coming years will see new opportunities emerge for generating renewable energy, increased food production, and harvesting of other natural resources, minerals and medicines from the sea. A broad range of solutions for the future lies in the depths of the ocean. New ocean opportunities represent new opportunities for the Norwegian maritime cluster. We are proud that the Norwegian maritime industry is proactive and forward-leaning in finding good solutions to the challenges facing the world. This despite much of the industry having faced extremely demanding markets over the past years.

Despite fluctuating cycles and markets, three themes will continue to guide the efforts of the shipping industry and the Norwegian Shipowners' Association in the years to come:

- We must reach international accord in the UN maritime organisation IMO on an ambitious strategy for reducing CO₂ emissions from shipping
- Shipping must seize the opportunities presented by increased digitalisation, a development that will impact every aspect of our members' operations
- The industry must contribute to solutions for sustainable development and cultivation of our oceans

CLIMATE Shipping is already the most energy-efficient way of transporting goods. More than 80 per cent of world trade is moved by ship, while 2.2 per cent of greenhouse gasses generated by humans originate from shipping. Still we must reduce emissions from our industry if we are to reach the goals of the Paris Agreement. The global nature of shipping means that only international, common solutions can contribute to substantial emission reductions. The Norwegian Shipowners' Association supports ambitious regulations for shipping, and we believe the industry can reduce its CO₂ emissions by 50 per cent by 2050, measured from 2008. The process of establishing international rules is well underway in the UN regulatory body for shipping, IMO. We have high expectations for success in reaching international accord on a reduction strategy in 2018, with the Norwegian maritime cluster taking a leading role in following up the strategy.

DIGITALISATION The main activity of shipping has always been moving goods from one place to another. This will continue to be the core of our business in the future. Digitalisation reveals a range of new opportunities, and the development will be further strengthened in the years to come. Regarding operations, business models, competencies, vulnerability, and a number of other aspects of our business, we will be challenged to think in new ways. We have already undergone a minor digital revolution during the last ten years. July 2018 will mark ten years since the first iPhone was sold in Norway. Since that time the smart phone has changed many practical aspects of our daily lives. What lies ahead is hard to predict, but there is little doubt that processes employing digitalisation and autonomy will pick up speed dramatically. With



the will and the ability to adapt among owners, employees, regulatory authorities and technology suppliers, we believe the Norwegian maritime cluster will be leading within new digital solutions.

SUSTAINABILITY The oceans contain not only vast opportunities, but also a sensitive ecosystem. Everyone making their living on, in and under the sea has a particular responsibility to ensure that this activity is conducted in a sustainable manner. Each year more than eight million tonnes of garbage end up in the sea. We now find plastic and micro plastic in all the world's oceans. The situation is dramatic and demands action. First of all, comprehensive measures must be taken on land to stop garbage from ending up in the oceans. Secondly, we must do what we can to clean up. The industry can contribute to this work in many ways. Examples of this are equipping ships with sensors to collect data and track the health of the oceans, and harnessing the power of innovation in the industry to devise technology for removing garbage from the sea. But if we are to succeed in meaningful cleaning, garbage must be assigned value and become a resource to be returned to land. Establishing a deposit scheme for ocean garbage would support the development of infrastructure for collecting and recycling garbage and keep it from further weakening the health of the oceans.

It is this wealth of challenges and opportunities that makes it so exciting to be a part of the maritime industry. But if we are to contribute to solutions,

certain basic prerequisites must be met. The most important of these is value creation. Only companies able to achieve sustainable profitability over time will have the ability to grow their business, retain employees, and invest in future solutions.

This report deals primarily with how our members view markets in the year ahead, and how they have fared in the past months and years. We have also described the political terms and conditions that are most critical for maintaining a leading maritime industry in Norway. We appreciate the active maritime policies practiced by the government with the support of a broad political majority over the past years. The result is a strengthening of Norway's maritime position despite challenging times. In the present business cycle, our members continue to report demanding market conditions, but there are also bright spots giving reason for optimism. Yet it is still too early to declare the crisis as over for those shipping segments with activities in the offshore oil and gas industry.

We trust this report provides a useful picture of our industry's situation and outlook on the future, and we wish you an informative reading.


Harald Solberg

CEO, Norwegian Shipowners' Association

Summary

Our 2018 survey shows a change in outlook among members of the Norwegian Shipowners' Association. Since the financial crisis hit in 2008, the transport segments have gradually increased their turnover to roughly the same level as before the financial crisis. Offshore segments, which have faced very demanding times since the price of oil fell in 2014, have seen their turnover cut by half over the last two to three years. Since then turnover has stabilised at a very low and unsustainable level. Offshore drilling companies are expecting some improvement, while offshore shipping companies indicate that their revenues will further decline in 2018.

Shipowners' total turnover fell by five per cent from NOK 224 billion in 2016 to NOK 213 billion in 2017. This appears likely to turn around in 2018. Overall, more than half of shipowning companies expect increased revenue in 2018, while one in four expect turnover to decline. The rest anticipate no change. If the forecast is accurate, shipowners' total revenue will be NOK 219 billion in 2018, up almost three per cent from last year.

Norwegian shipowners' revenue from markets outside Norway accounted for about 60 per cent of total turnover, or NOK 129 billion in 2017. This is a marginal decline of NOK 3 billion from 2016. For 2018, we estimate that shipowners' share of foreign income will increase slightly, to just under NOK 135 billion. By comparison, Norwegian shipping companies had NOK 122 billion in operating revenues from petroleum related

activities in 2017. This represents 57 per cent of total petroleum related revenues.

All segments express increased optimism for improved operating results. More than half the companies surveyed expect better operating results in 2018 compared with 2017, twice as many as in last year's survey. 23 per cent expect results to be weaker this year than last, down by half from one year ago.

The biggest change in anticipated results is found among offshore shipping companies. Despite these companies' anticipated decline in revenue of two per cent in 2018, there are fewer offshore shipping companies expecting weaker earnings in the future; 32 per cent in 2018, compared to 70 per cent in 2017. However, improvement in operating results for these shipowners is still no indication of sustainable profitability, or profitability at all. Low rates and low activity levels mean that these shipowners still face very demanding times.

In last year's outlook report we wrote that the number of ships and rigs in layup had increased steadily since the autumn of 2014. Now we see that peak layup has been reached. In February 2017 there were 183 ships and rigs in layup. The corresponding figure for February 2018 is 162, a decrease of almost twelve per cent. However, it is worth noting that the number of rigs in layup has been stable at 25 from February 2017 to February 2018.



PHOTO: ODFELL SE

Forecasts for the remainder of 2018 indicate further recovery. The number of ships and rigs in layup is expected to fall to 110, a reduction of 44 ships and eight rigs. The entire reduction is expected to occur in the offshore segments. This is due to a combination of increased activity on the Norwegian Continental Shelf, increased recycling, and ship sales. If the forecast proves accurate, we will see layup levels at the end of 2018 corresponding to the autumn of 2016. Even if the situation improves, it will still be very demanding through 2018.

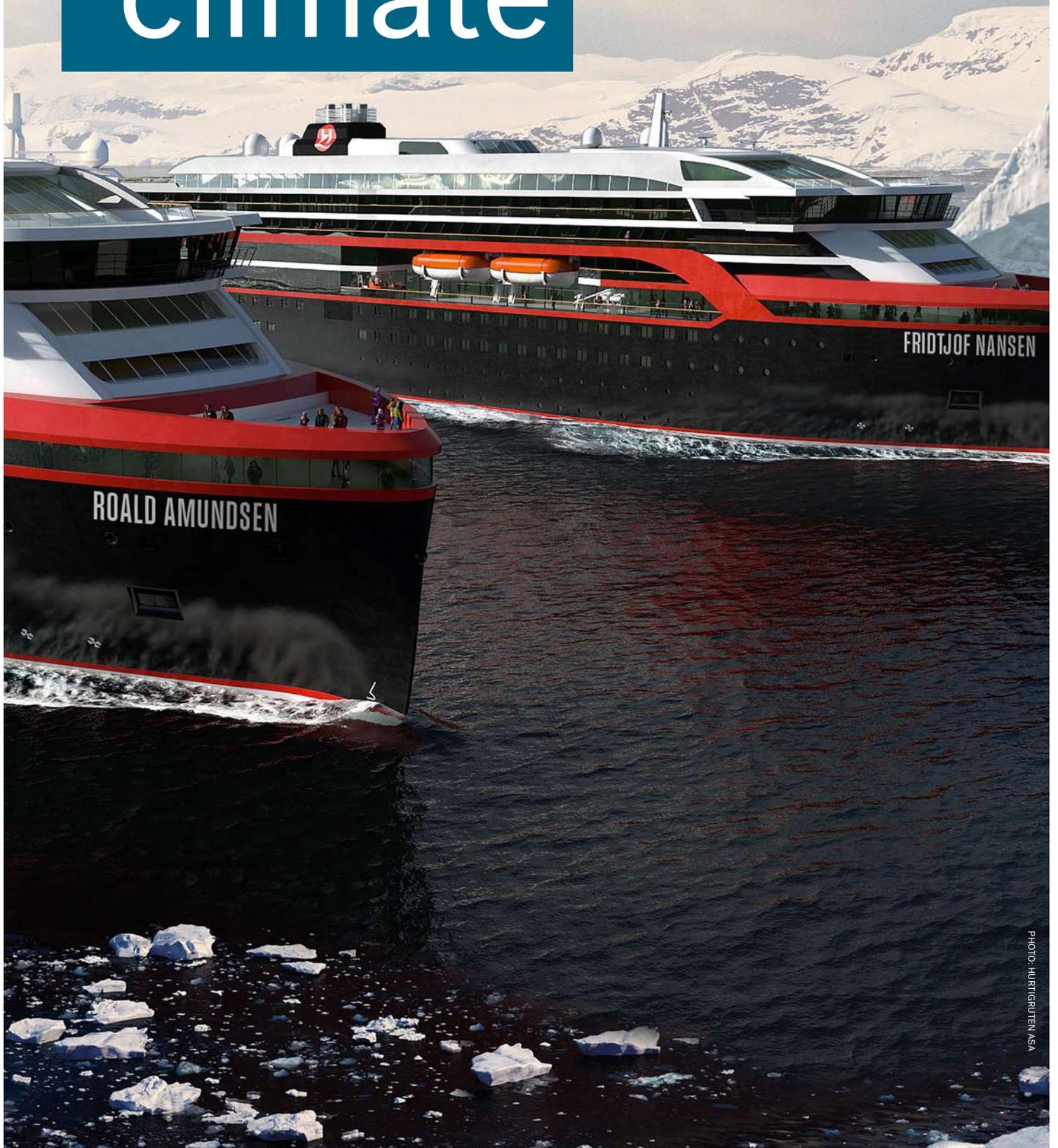
2017 was yet another year where shipping companies had to reduce their number of employees. During the year shipping companies had to terminate or place on leave 3,100 employees. Corresponding figures were 8,300 in 2016 and 7,300 in 2015. A large portion of these reductions occurred in offshore shipping, one of the

segments with the highest number of Norwegian seafarers. In total, 1,800 Norwegian employees were terminated and placed on leave in 2017.

Regarding employment expectations for 2018, shipowners overall indicate that they will increase staff by 1,700 persons. Deep sea shipping companies being the most optimistic ones.

As a result of holistic and good maritime policies, including the relaxing of trade area limitations and expansion of the tax refund scheme for seafarers, 82 ships have flagged in to Norwegian registers over the last three years. Shipping companies report a potential to flagging in an additional 111 ships in 2018. This is significant, as a large number of vessels under the Norwegian flag is important for Norway's impact in international fora.

A new climate



– Everything will go fully electric, apart from (ironically) rockets. Ships are the next easiest to solve after cars. Intercontinental flight is hardest, constrained by gravimetric energy density.

ELON MUSK*

It's 2018, and climate issues have become commercially relevant. The financial sector now views climate as a risk factor on a par with any other, and new regulations will place stringent limitations on shipping's carbon footprint. At the same time, technology is advancing faster than ever. The primary message from contributors to this feature is simple: The shipowner of the future must be thinking about climate today.

When Gro Harlem Brundtland published the UN Report *Our common future* in 1987, the term 'sustainable development' entered the vernacular, and environmental issues were emphatically placed on the political agenda. The report's main message was unambiguous: we who are living today must amend our actions so they do not hinder future generations from meeting their own needs. With this report, the political seeds of today's climate accords were sown.

In the UN maritime organisation IMO, sustainable development of the global fleet has been on the agenda for several years. This work gained new relevance and traction in the wake of the Paris Agreement. There are now high expectations for the CO₂ strategy that will be adopted in April of this year.

"We are working for shipping to become the first industry to be explicitly regulated in line with the Paris Agreement. It is important that this happens in the IMO, to ensure a level playing field for the global fleet," says Harald Solberg, CEO of the Norwegian Shipowners' Association.

The new face of risk

New and ambitious rules for emissions reduction, combined with increased demand for water-borne transportation services, means that the industry is heading into an exciting era. DNV GL expects demand for shipping services to increase by 60 per cent by 2050:

"In light of future regulatory requirements, we believe it is imperative that the industry find solutions that make it possible to accommodate this growth without a corresponding rise in CO₂ emissions" says Knut Ørbeck-Nilssen, CEO of DNV GL Maritime. "This is one of the biggest challenges we will face over the next few years. It will place demands on the industry in the form of investment, implementation of new technology, and new fuel solutions."

In the report *Maritime forecast to 2050*, DNV GL launched the concept of the 'carbon-robust ship' as a model for developing ships able to withstand abrupt regulatory, technological and market shifts coming as a result of climate policies. A carbon-robust ship should be equipped to survive a number of scenarios for decarbonisation. Simply put: managing climate risk, put into practice.

* Roar Os Ådland, 11 July 2017, blog entry «Shipping: Electric before Autonomous»

60 % of our members say they can cut Co₂ emissions in half by 2050.

[Read more p. 48](#)

The need for companies to acknowledge climate risk began to gain attention in 2017. In June of that year, the Financial Stability Board (FSB) presented the report *Recommendations of the Task Force on Climate-related Financial Disclosures*, prepared under the leadership of Michael Bloomberg. The report was commissioned by the

G20 countries and contains a number of recommendations on how companies can report on climate risk. The report divides climate risk into two categories: risk related to the

transition to a low carbon economy, and risk related to physical assets. Transitional risk is especially associated with reputation, technology, markets and framework conditions. The report provides recommendations to companies on how to analyse this type of risk. The recommendations are intended to help investors see which companies are at risk, and which are well prepared for the challenges that climate change represents.

Awareness of climate risk is on the rise in the EU as well. In January, the EU High-Level Expert Group on Sustainable Finance recommended that credit rating agencies also look at sustainability criteria, including risk associated with the transition to a low-carbon economy, when performing their analyses. In Norway, the government has set up a committee to “... assess climate-related risk factors and their significance for the Norwegian economy, including financial stability.” The committee will deliver its report in December. All this means that we will be hearing a lot more about climate risk in 2018.

“The financial sector has not been especially clear about climate risk previously, but now it is coming on full strength,” says Thina Saltvedt, Senior Adviser for Sustainable Finance in Nordea. “The risk is increasing as climate change accelerates, and in the future we will assess climate risk along the same lines as credit and market risk. We are in the middle of the green transition, and that makes it all the more important to put a price on transitional risk,” she says. “It is impossible to imagine that the comprehensive decarbonisation facing the world will not affect how banks think about investment and financing. Our role is to encourage the movement of capital to where it will provide the best return for companies and investors in the long term, and that is in a sustainable direction.”

Saltvedt believes it is important to follow closely the development of framework conditions, such as the IMO's CO₂ strategy. "If a company does not have an appropriate strategy, it will negatively impact their risk rating," she says. Saltvedt believes Norwegian shipping companies have to accept that the concept of climate risk is here to stay, and she has a few tips for the industry: "Do not wait to adjust to the new reality. The pressure will only increase going forward. Secondly, cooperate with the supply chain to find good solutions that reduce your carbon footprint."

Many respected investors, including Norway's Pension Fund, are already demanding climate risk assessments prior to investing:

"Projects with high climate risk are associated with lower returns and the possibility of 'stranded assets,'" says Idar Kreutzer, managing director of Finance Norway. He believes investors and lenders will increasingly insist on climate risk reporting. "As major borrowers and issuers, shipowners are of course no exception here. Investors and lenders will also require transparency and climate risk reporting for shipping."

In other words, CO₂ changes not only the climate, but also business models, investment decisions and policies. Shipowning companies of the future must be climate-robust.

"As the IMO's emission reduction strategy is implemented over the next few years, Norwegian shipping and the maritime cluster must take the lead," says Harald Solberg, CEO of the Norwegian Shipowners' Association. "The Norwegian maritime industry is well positioned to develop solutions that the whole world will seek. We may not manufacture electric cars in Norway, but we are leading in technology for low-emission shipping.»

«This is a strength we must build on," says Solberg.



The intelligent ship

The experimental vessel Telemetron follows its pre-programmed course in the Trondheim fjord when another vessel suddenly appears on a collision course. Using advanced sensor technology, Telemetron scans the surrounding area and calculates speed and direction of the oncoming vessel. This is an experiment in the future of shipping, and one of the challenges is to develop sensors that can read and interpret surroundings effectively enough to make autonomous shipping more than just a research project.

Autonomy is referred to as the great game changer in shipping. Initially it will provide a solution for coastal traffic and national waters, but eventually it will be possible to send large autonomous ships across long distances, between countries and continents.

Geir Håøy is CEO of Kongsberg Maritime, and is responsible for the construction of the world's first zero-emission autonomous ship, *Yara Birkeland*. "A ship without crew will allow greater flexibility in hull design. The requirement for comfort during operations is reduced, and space previously designated for crew can be freed up for more cargo and designed to reduce wind resistance. By designing the hull for optimal energy efficiency, fuel consumption can be reduced significantly," says Håøy.

Around the same time that *Yara Birkeland* is making its first unmanned voyage between the ports of Porsgrunn, Brevik and Larvik, a Wilhelmsen-controlled drone may be swooping in to Singapore harbour, loaded with papers and documents from a ship. This is one of the projects Wilhelmsen is working on, and yet another example of how shipping has, in only a few years,

50 % of our members state that they will run autonomous ships in 2050.

[Read more p. 54](#)

Beate Kvamstad-Lervold, Research Director at SINTEF Ocean:

“Technological developments are happening almost overnight, and they will have a huge impact on the way the companies operate,” says Kvamstad-Lervold. “Nevertheless, digitalisation of operations and processes is just one element in shipping’s biggest challenge – finding ways to reduce emissions in line with the two-degree goal from the Paris Agreement. In the long run, ships will have to move to more environmentally friendly propulsion.”

gone from being mostly analogue to taking its place in the thick of a digital transformation. 3D printing of spare parts and sensor technologies that monitor ships and flag maintenance needs are just some of the projects that Wilhelmsen is already working on.

“I do not think you can survive in this industry if you are too conservative,” says Wilhelmsen Group CEO Thomas Wilhelmsen. He has the full support of

The value of energy efficiency

Lasse Kristoffersen, CEO of Klaveness, is in no doubt. The commercial value of energy efficiency will increase significantly from as early as 2020. The new sulphur cap directive dictates maximum 0,5 per cent sulphur content in bunker fuel. While the heavy fuel oil ships have been running on has been relatively cheap, shipowners must now either install scrubbing technology on board, rebuild engines to run on LNG, or switch to marine diesel, a distillate also used by the aerospace and automotive industry and in the agricultural sector. These changes are likely to have a significant impact on price, and for many shipping routes it could mean doubling the price of fuel. This gives the industry clear incentives to become more energy efficient, and to find new and more energy-efficient propulsion methods.

“Shipping has contributed significantly to increased world trade,” says Kristoffersen. “Now we must reduce emissions and become more energy efficient. This is the greatest challenge of our time. And the one who finds the best solution, wins.”

He is not alone in thinking that this is precisely where the greatest opportunities lie.

The battery revolution

“The maritime industry is today one of the most exciting areas for creating new profitable value chains in Norway,” says Arvid Moss, Executive Vice President of Energy and Business Development at Hydro. The company recently acquired Corvus Energy, a global leader in ship electrification solutions, and Moss believes strongly that electrified operations, either full or partial, will be crucial for shipping to meet new and stricter environmental requirements.

“When we know that one electric ferry reduces CO₂ emissions by as much as many thousands of electric cars, it stands to reason that there is a significant climate effect from every kroner invested,” says Moss.

This resonates with Narve Mjøs, head of the Green Coastal Shipping Program, an award-winning environmental initiative with the goal of giving Norway the world’s cleanest and most efficient coastal fleet:

“We are well underway in showing the world that Norway is a pioneer in maritime environmental engineering solutions,” says Mjøs. “But even if we get 20 to 30 battery-powered ships a year in traffic along the coast, we still need to speed up considerably. Emissions from Norwegian domestic shipping are significant in Norway’s climate and environmental accounting. There has been a battery revolution in ferries, but we need to do even more, also in other maritime segments, to manage the CO₂ cuts we have committed to through the Paris Agreement.”

It is not always easy to recognise a revolution when you are wrapped up in the events, but a revolution may in fact be underway. Only three years ago, the world’s very first battery-powered ferry *Ampere* began serving the Lavik-Oppedal route in Sogn og Fjordane. The Norwegian Public Roads Administration now estimates that there will be more than 60 battery ferries in operation along the coast by 2021. And while battery operation has so far been limited to smaller boats, the technology is now migrating to larger, more energy-intensive ships.





40 % of our members state that they will be running a battery powered ship within 15-20 years.

[Read more p. 48](#)

When Color Line puts the Color Hybrid on the route between Sandefjord and Strømstad in

2020, it will be the world's largest hybrid ferry. At the same time, Hurtigruten's guests can enjoy the view of the Trollfjord from the world's first hybrid propulsion expedition ship.

Large battery packs reduce emissions

significantly, and ships can also sail completely emission-free on pure battery power for shorter periods of time.

“Shipping will be both quiet and emission-free in the future. We will use our new expedition ships as icebreakers for this technology and show the world that hybrid operation of large ships is already possible,” says Hurtigruten CEO Daniel Skjeldam.

In a market long characterised by low rates and low oil prices, many might think that the economic incentive to invest in energy efficiency has been lacking. For Hurtigruten, the focus on sustainability is part of a long-term strategy, but they also see a significant economic upside:

“Large ships burn large quantities of fuel, and the savings from switching to electric power are considerable. In addition, possible future pricing of climate and particulate emissions will increase the cost of polluting. When that happens, we will see rapid changes in shipping,” says Skjeldam.

Shaken

– not stirred

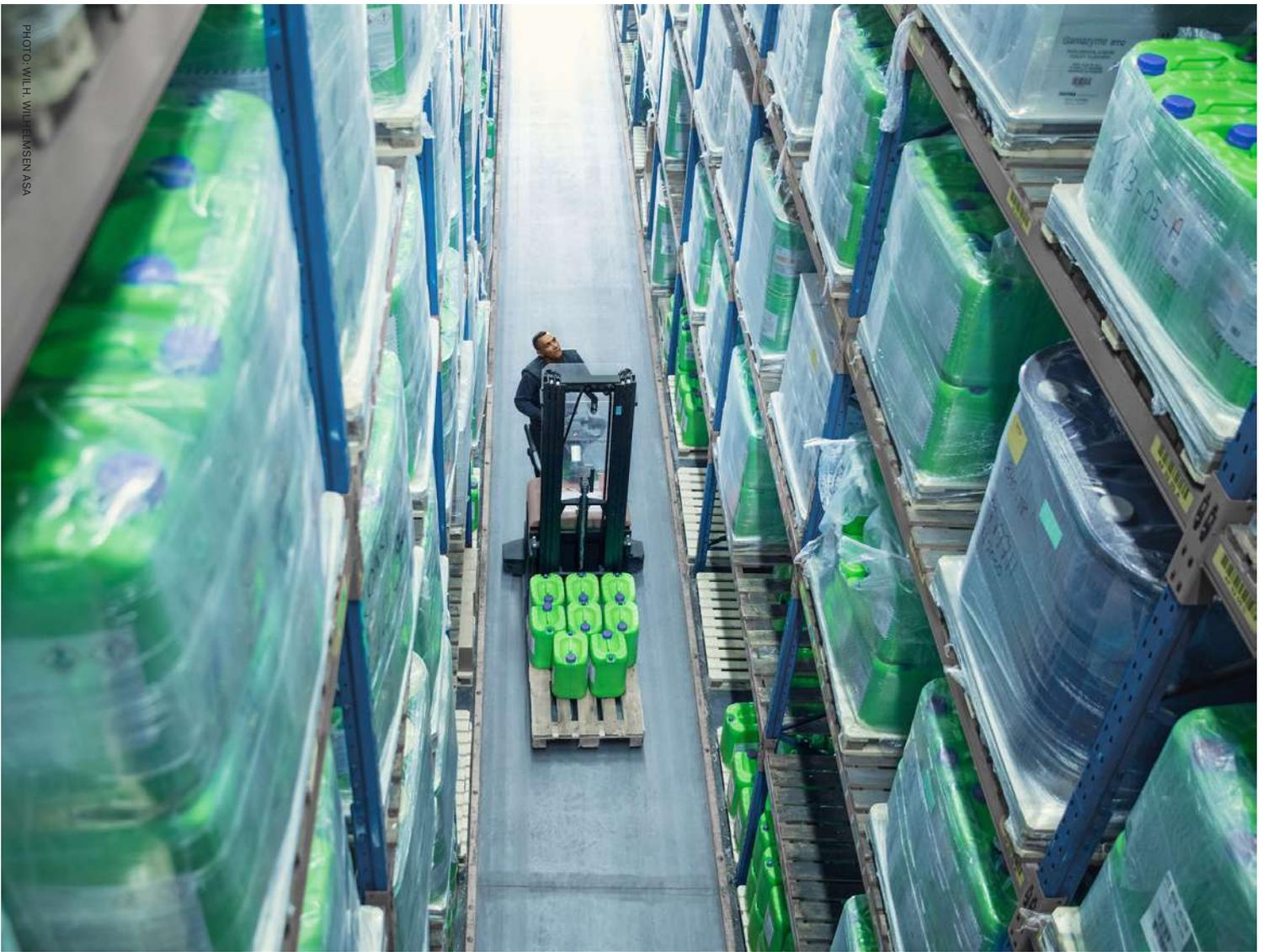
In 1995, Clayton M. Christensen introduced the term *disruption* to describe innovation that unexpectedly interferes with an existing market by making current business models irrelevant. His book *The Innovator's Dilemma* became a bestseller at the same time as dot.com fever was at its peak. Christensen's theory proposes that established companies set on maintaining their position are often surprised and vulnerable when startup companies find new technologies that provide cheaper and better solutions.

Shipping is also seeing its business models being challenged. Among other things, autonomy is making it possible for cargo owners to handle all or parts of the logistical chain themselves. This is the case with Yara Birkeland in Norway, but also large global players like Amazon and Alibaba are working intensely to find new and more efficient logistics solutions.

Maersk is one company that is taking the competition from merchants like Amazon and Alibaba seriously. As part of their digitalisation strategy, they signed a partnership with IBM in January with the aim to use blockchain technology to digitalise the global supply chain. The goal is to provide a digital platform based on open standards that can be used by the entire global shipping ecosystem to share information digitally.

“Giant retailers like Amazon are not interested in phones and email – they want to be hooked up electronically and digitally so the business transacts on its own,” said Søren Skou, CEO of A.P. Møller Maersk to Bloomberg earlier this year. “It’s not just a question of a smooth delivery. Amazon also wants better information about shipments to manage supply chains as effectively as possible. If we don’t do our job well, then there’s no doubt that big, strong companies like Amazon will look into whether they can do better themselves.”

He is supported in this view by professor Øystein Fjeldstad at the Norwegian Business School, BI:



“I think we are far overdue for a major restructuring of all sectors that organise ships and freight. Shipping is a global network service that links geographic locations, and uses different transport systems. The ecosystem includes brokers, charters, and others. Many, if not most of these functions, can be digitalised.”

Nonetheless, Professor Roar Os Ådland at the Norwegian School of Economics, NHH, believes that Norwegian shipping companies are well positioned to face future challenges in shipping:

“Norwegian shipping companies are not overly exposed to markets where autonomous ships and new business models can cause major upheavals, such as container freight. Additionally, shipping companies have over time developed logistical chains that are extremely efficient and cheap, and it is difficult to make it cheaper than it already is,” says Ådland. “Norwegian shipowners have the ability to see the emergence of new niches and markets early on. That is an important skill in today’s market,” he says.

Back in Trondheim, Telemetron performs a successful manoeuvre and passes the oncoming vessel by a safe margin. Researchers from NTNU, the Norwegian University of Science and Technology, have no doubt that this is the future of shipping.

“The competition to develop the best technology is already well underway,” says Morten Breivik, Department Head at NTNU. “Many countries are now investing aggressively to secure market shares in maritime technology. If Norway intends to maintain its position as a leading maritime nation, we will have to invest accordingly.”

He believes the ongoing technological shift can be a tremendous opportunity for maritime Norway, but warns that it will not happen by itself:

“We must seize the opportunity.”





The Norwegian Shipowners' Association: in our view



PHOTO: GC RIEBER SHIPPING AS



PHOTO: FRED. OLSEN WINDCARRIER AS



A global powerhouse

The Norwegian maritime industry is knowledge-intensive and truly global. It employs 90,000 people in Norway and generates value of NOK 140 billion annually. As one of only a few nations in the world, Norway has a complete maritime cluster with world leaders in most segments, including shipowning, classification, finance, shipyards and equipment supply. At the core of this cluster are the shipowners, who also provide the industry with access to seafaring competence.

In these demanding times, it is even more important to maintain predictable and competitive maritime policies. Focusing on blue growth and a sustainable ocean-based economy will ensure new jobs and new growth opportunities, allowing Norway's close relationship to, and knowledge of the sea to be translated into future technological developments, innovation and value creation.

Around 40 per cent of our country's value creation from business activities takes place in companies with Norwegian private ownership. Competitive framework conditions for Norwegian private ownership are central to the further development of maritime value creation in Norway. The most important measure for improving access to competent and long-term capital, and increasing growth opportunities in Norway, is to remove the wealth tax on working capital.

A competitive Norwegian tonnage tax regime is essential for maintaining Norway's attractiveness as a host country for shipping companies and other maritime activities. The competitiveness of the regime must be maintained in order for shipowners to be able to invest in and from Norway. In addition, a competitive net wage scheme is essential to support recruiting of Norwegian seafarers on Norwegian registered ships, thereby securing Norwegian maritime competence. This is an important contribution to a complete maritime cluster.

The Norwegian Shipowners' Association encourages the authorities to:

- Maintain competitive and stable framework conditions for the Norwegian maritime cluster
- Ensure a competitive Norwegian tonnage tax regime
- Strengthen the tax refund and net wage schemes for Norwegian seafarers on Norwegian registered ships
- Strengthen the competitiveness of the NOR and NIS ship registers
- Ensure attractive and competitive export financing schemes through GIEK and Export Finance Norway
- Remove the wealth tax on working capital

The seaway is the green way

Marine transport accounts for three quarters of all transport in Norway. Short sea shipping carries passengers and all types of goods between Norwegian ports and to and from ports in Europe. Norwegian companies compete not only with shipping companies in Europe, but also with road and rail transport. Maritime transport is the most energy-efficient mode of transportation, and an increased share of goods on ships reduces road traffic and accidents, road wear, and other socio-economic expenses.

A target has been set in the Norwegian National Transport Plan for 30 per cent of road transport travelling more than 300 kilometres to be transferred to sea and rail by 2030. This can be achieved through effective policy initiatives and measures. However, only 3,4 per cent of the total budget for the Norwegian National Transport Plan for 2018-2029 will go to Coastal Administration, including maritime transport. In order to reach the target, it is crucial to implement measures that strengthen the competitiveness of maritime transport.

The Norwegian Shipowners' Association encourages the authorities to:

- Develop a short sea shipping strategy that will help strengthen the competitiveness of this industry
- Reduce and simplify the tax and fee regimes for short sea shipping to ensure more equal terms for the various modes of transport, f. ex. by reducing national pilotage fees
- Modernise and improve the national pilot services by developing more robust and high-tech environments, and continuing to facilitate increased use of Pilot Exemption Certificates along the Norwegian coast
- Prioritise major improvements in maritime transport infrastructure, including facilitating more efficient port operations and a more rational port structure in Norway
- Facilitate the renewal of the short sea shipping fleet, including better funding measures for investments in ships, f. ex. the establishment of an improved top-up funding scheme and improvements in the depreciation system

A competitive and attractive Norwegian Continental Shelf (NCS)

Oil and gas resources will continue to create great value and income for the Norwegian society for many decades, and contribute to securing jobs, value creation and welfare throughout the country. Sustained high industrial activity in Norway requires increased focus on business-oriented education and a broad spectre of competence, from apprentices to researchers.

Over the last three years, cost levels on the NCS have been substantially reduced. The oil and gas industry has nearly halved its total level of cost since 2013. We believe that further cost reductions must ensure sustainable profitability for all players in the value chain. It is essential that balance in the cost cuts is maintained, and that all players on the NCS contribute to lasting cost reductions. In today's market, we must conclude that rates for maritime offshore activities are not robust enough to ensure sound profitability. With increased activity we also expect a higher rate level.

The Norwegian Shipowners' Association encourages the authorities to:

- Maintain a steady and stable pace in allocating new areas for petroleum activity, through both licensing rounds and awards in predefined areas (APA)
- Ensure predictable and long-term tax and fee schemes for the industry
- Support diversity of contributors and healthy competition on the NCS

Offshore wind – a new era for Norwegian industry

If the Paris Agreement and the EU's goal of a carbon neutral Europe by 2050 are to be realised, huge amounts of renewable power generation will be required. Offshore petroleum, shipping, and marine operations with related technological development and project experience, are areas where Norway has world-leading expertise. Combined with Norwegian industry's expertise in floating solutions, this represents a significant opportunity to further develop technology and expertise from our ocean-based industries in new segments such as ocean-based renewable energy.

Offshore wind has been singled out as a natural driver in the continuation of European energy conversion. The industry's ambition is to develop offshore wind on market terms, but in order to mature and commercialise the technology, financial instruments for demonstration and risk mitigation are still needed.

The Norwegian Shipowners' Association encourages the authorities to:

- Follow up Parliament's decision to establish a support scheme for floating offshore wind and other forms of ocean-based renewable technology, not least to trigger investments in a full-scale demonstration facility in Norway
- Clarify the tax regime for offshore wind in Norway
- Ensure that state aid, loan and guarantee schemes prioritise offshore wind projects specifically
- Prioritise offshore wind and renewable energy in the Research Council's programs, and implement recommendations from "Energy21", the national strategy for research, development, demonstration and commercialisation of new energy technology
- Through active participation in the IMO, contribute to harmonised regulations and standards for offshore wind in the North Sea, including clarification of regulations for transport of industrial personnel

Maritime education and digitalisation

Technological development in the maritime industry is progressing rapidly. Funding of technological and maritime studies must therefore be increased. A strategy for maritime education that specifically addresses the impact that digitalisation will have on the education of future seafarers is also needed. This should be seen in connection with the likely continuation of MARKOM2020, a collaborative project on higher maritime professional education.

Norway needs a flexible, scalable educational system. It is important that maritime educational institutions are well-rooted in the local business community. Costly infrastructure requires a large degree of co-location. This is essential for creating strong academic environments and good cooperation, and to encourage specialisation.

The Norwegian Shipowners' Association encourages the authorities to:

- Develop a strategy for maritime education with particular focus on digitalisation and sustainable retraining
- Integrate and finance practical training in maritime education
- Ensure robust financing of costly maritime and technical education
- Link maritime academies and colleges to create strong competence environments
- Establish effective transfer schemes between academies and colleges

Maritime research and innovation

The future of the maritime industry is green and innovative, and the need for innovation is more pressing now than ever. Digitalisation will contribute to changes in decision-making, supply of services, and business models in the maritime industry. Data enables better resource utilisation and optimisation of maritime operations.

Autonomous and smaller, unmanned ships in particular will be made significantly more energy efficient than today's cargo ships. Rolls Royce has calculated that the energy requirement for waterborne freight can be reduced by up to 30 per cent by eliminating on board accommodation along with personal safety equipment and the corresponding energy requirement, and using the space for goods. The speed of unmanned ships may be reduced, without longer sailing time leading to increased crew costs. This will further reduce energy demands and provide a competitive platform for all-electric operations on short to medium distances. We are pleased that the Norwegian authorities support the opening of test areas for autonomous ships. It is important that Norwegian authorities assume a key role in this development.

The Norwegian Shipowners' Association encourages the authorities to:

- Realize a future-oriented Ocean Space Centre in Trondheim
- Strengthen maritime and petroleum-related research and ensure adequate framework conditions for research and pilot programmes such as MAROFF, DemoHav, OG21, PETROMAKS and DEMO 2000
- Contribute to the establishment of a Centre for Research-driven Innovation for autonomous ships
- Ensure that regulations, both internationally through the IMO and nationally, do not hinder the desired development of new technology
- Support Norway as a pioneer in both new technology and the development of systems that contribute to an energy efficient maritime industry

Green technology and new climate solutions

In order to achieve the goal of becoming a low-emission society, greenhouse gas emissions must be reduced dramatically, also from Norwegian shipping. This process is well underway in the UN's regulatory body for shipping, the IMO, with Norway taking a leading role. The Norwegian Shipowners' Association advocates mandatory emission reductions, and our target is 50 per cent lower CO₂ emissions by 2050, compared with 2008. This is a challenging target, as shipping is expected to grow by 60 per cent in the same period.

To reach the target, we need to develop new designs, new engines with alternative fuels, and more efficient methods of operation. LNG represents the most important low-emission alternative for ships until full-scale zero-emission alternatives become viable. All-electric or hydrogen-powered ships provide an inspiring vision for the future, but unfortunately these technologies are not available in the market on a large scale today. No other country has a maritime cluster better equipped to develop future climate-friendly and energy-efficient low and zero-emission solutions for ships.

Carbon capture and storage (CCS) is a major technological undertaking, an important business development project, part of the green shift, and a significant global climate initiative. If we are to reach global climate targets, we will have to realise carbon capture and storage. It is important that the authorities avoid creating uncertainty about the framework conditions around CCS.

The Norwegian Shipowners' Association encourages the authorities to:

- Provide a solid framework for research and development of low and zero-emission solutions for ships, based on our technological advantages in the use of LNG. This means establishing infrastructure for bunkering and investing in LNG as a core technology in the transition towards zero-emission solutions
- Support environmentally friendly solutions through removing fees on low-emission fuels such as LNG, LPG, hydrogen and biofuels
- Establish a CO₂ fund for industry transportation, where the CO₂ tax is used to support and stimulate climate-friendly hybrid solutions for domestic green short sea shipping based on electricity and natural gas
- Ensure confidence in the framework conditions for carbon capture and storage in order to allow development of a comprehensive value chain, and create incentives for CO₂ capture, transport and storage

Open markets and international regulations

The Norwegian maritime industry operates in markets where key elements of framework conditions are determined on a global basis. It is important that the Norwegian authorities continue to actively support the development of international maritime regulations through the IMO and ILO.

The European countries represent the Norwegian maritime industry's largest and most important trading partner. The EEA agreement and other agreements with the EU ensure market access, predictability and equal terms of competition in Europe, and underpin the government's European policy. It is important that the Norwegian authorities actively work to secure terms of competition for Norwegian interests on at least the same level as the EU with regard to Brexit. Furthermore, it is important that Norwegian interests are ensured at least the same access to foreign markets as other comparable countries.

The Norwegian Shipowners' Association encourages the authorities to:

- Actively support the UN's maritime organisation IMO in developing relevant regulations for timely implementation
- Ensure compliance with the principles of international shipping embodied in the Convention on Law of the Sea, including taking an active role in the development of a new instrument on the use of marine biological diversity of areas beyond national jurisdiction
- Ensure good cooperation with EU institutions and member countries based on the EEA agreement
- Establish post-Brexit maritime dialogue with Britain
- Work actively to negotiate free trade agreements with those countries where the EU has similar agreements
- Ensure consideration of maritime interests in negotiations on a free trade agreement with China

The High North

The High North represents tremendous opportunities for economic growth, research and innovation. Sustainable exploitation of these opportunities exposes operators and equipment to challenges that require specialised competence and experience. Developing commercial activity in the Arctic therefore requires a responsible approach based on scientific, industrial, and experience-based expertise. To ensure sustainable solutions, value creation, safety, and acceptable environmental risk, relevant international regulations for Arctic maritime operations and comprehensive upgrading and development of relevant infrastructure are imperative, and acceptable industry standards must be developed.

80 per cent of shipping traffic in the Arctic occurs in or passes through areas where Norway is responsible for search and rescue preparedness. Infrastructure is a prerequisite for sustainable growth and green development in the High North. In order for Norway to exploit the significant natural resources and safeguard our foreign policy interests in these areas, infrastructure and capacities for security and preparedness must be properly dimensioned.

The Norwegian Shipowners' Association encourages the authorities to:

- Actively contribute to harmonised implementation of the Polar Code
- Strengthen search and rescue services in the High North in line with the SARiNOR project
- Develop search and rescue capabilities with a strong presence in the geographic Arctic, including through the strengthened presence of emergency response and rescue vessels
- Intensify efforts to chart the waters around the Svalbard archipelago
- Ensure year-round operation of the "Polarsyssel", the Governor of Svalbard's service vessel
- Invest in a weather radar on Svalbard to ensure daily collection of ice and weather information
- Strengthen and modernise communications infrastructure in the High North, including robust solutions that contribute to increased coverage north of the 75th parallel

Cleaner oceans

Each year eight million tonnes of plastic ends up in the sea. If steps are not taken, it is estimated that the amount of plastic garbage in the oceans will quadruple by 2050. The challenge of ocean garbage begins on dry land, and thus the problem must be solved first and foremost through a series of initiatives on land.

That being said, shipping has both a responsibility and an opportunity for finding solutions that can help solve one of our greatest challenges. Marine garbage in the oceans knows no borders. Much of the practical clean-up can and should be carried out by nations in their own waters and on their own beaches, but marine garbage is a global challenge that has to be met with coordinated international efforts.

We believe that increased efforts and new policy instruments for cleaner oceans are needed. Shipping companies and the rest of the Norwegian maritime cluster, in close cooperation with research communities and the authorities, are prepared to participate in a broad international effort to improve environmental conditions in the world's oceans by removing plastic from the sea. As we progress toward this goal, market mechanisms must be implemented to establish a comprehensive value chain for dealing with plastic in the oceans.

The Norwegian Shipowners' Association encourages the authorities to:

- Take a leading international role in removing plastic from the oceans
- Invite shipping companies and the Norwegian maritime cluster to take part in an international effort to remove plastic from the oceans
- Implement a market mechanism to establish a comprehensive value chain for removing plastic from the oceans
- Require municipal ports to establish refuse programs for better management of plastic waste, for example by facilitating increased use of recycling as part of the value chain

Maritime safety and preparedness

The Norwegian-controlled fleet operates all over the world, around the clock. Ships and companies are therefore exposed to many of the threats and security-related challenges in the world. The fleet is also a good monitor of constantly evolving developments in the world. Due to its global presence and the number of ships, the fleet represents a formidable emergency preparedness resource for the Norwegian authorities and their allies. In order to contribute to global maritime security, and Norway's ability to exploit the fleet as an emergency preparedness asset, improved contingency plans and a comprehensive strategy are needed.

The Norwegian Shipowners' Association encourages the authorities to:

- Develop a Norwegian comprehensive strategy for systematic contribution to improving maritime security in vulnerable regions
- Establish plans and systems to ensure utilisation, coordination, and planning for effective use of shipping capacity in worst case scenarios, nationally and internationally
- Perform a complete review of cyber attack challenges, and facilitate the establishment of organisations, systems and capabilities to ensure a common defence of the cyber infrastructure
- Carry out projects on Svalbard and in the Arctic that will support increased activity and sustained presence in the region
- Secure specialised helicopter capacity for maritime counter-terror operations and emergency response at sea

The maritime industry – one of Norway’s largest industries

Norway is one of only a few countries with a complete maritime cluster, consisting of leading international shipping companies, seafarers, shipyards, equipment and manufacturers,

classification societies, ship designers, brokers, and providers of insurance and financial services.

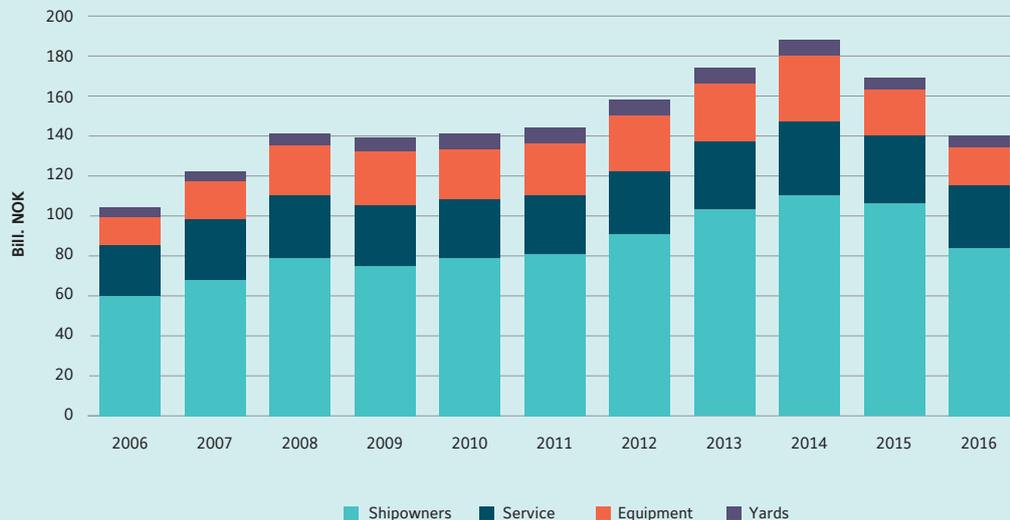
A knowledge-based maritime industry

The Norwegian maritime industry is knowledge-intensive and truly global. It employs 90,000 people in Norway and generates value of NOK 140 billion annually. The Norwegian maritime industry has experienced strong growth in productivity. The industry manages to produce more, or better without significantly increasing costs. One reason for this is that the maritime industry is becoming steadily more knowledge-based. There are several processes contributing to this development. Maritime companies, including shipowners, equipment manufacturers, yards and service providers, all play a central role in the development of highly advanced technologies for the oil and gas industry. Specialised vessels, positioning systems and control

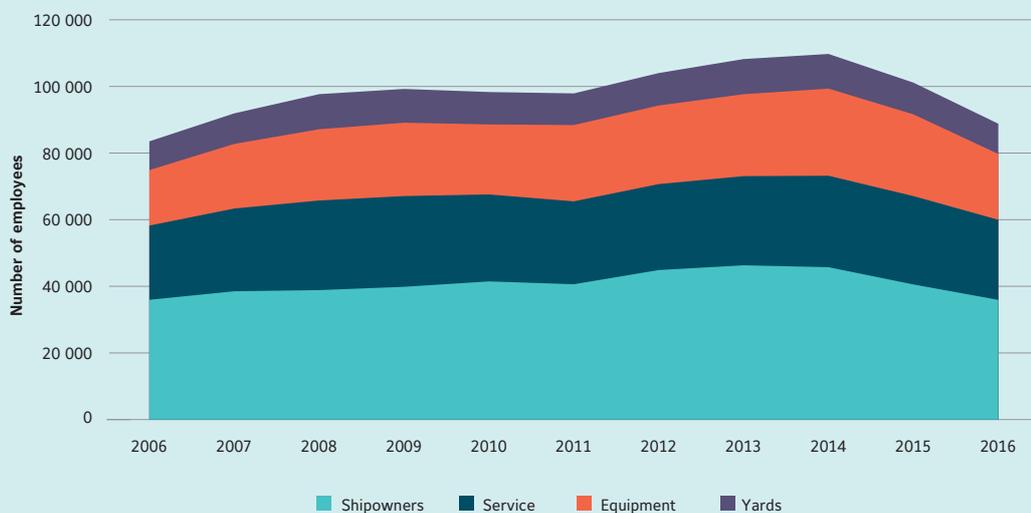
systems are just some of the areas of expertise where Norwegian companies command a leading position.

Shipping is increasingly integrated into a complex international network of logistics, requiring sophisticated databases, surveillance systems and means of communication. Norwegian companies are key players in driving this development. Increasingly stringent requirements on safety and the environment are also stimulating continuous innovation and technological development in ship design, propulsion systems and ballast water treatment technologies, among other areas.

Value creation in the maritime industry 2006 to 2016 – by main groups (bill. NOK)



Employment in the maritime industry in Norway 2006 to 2016 – by main groups

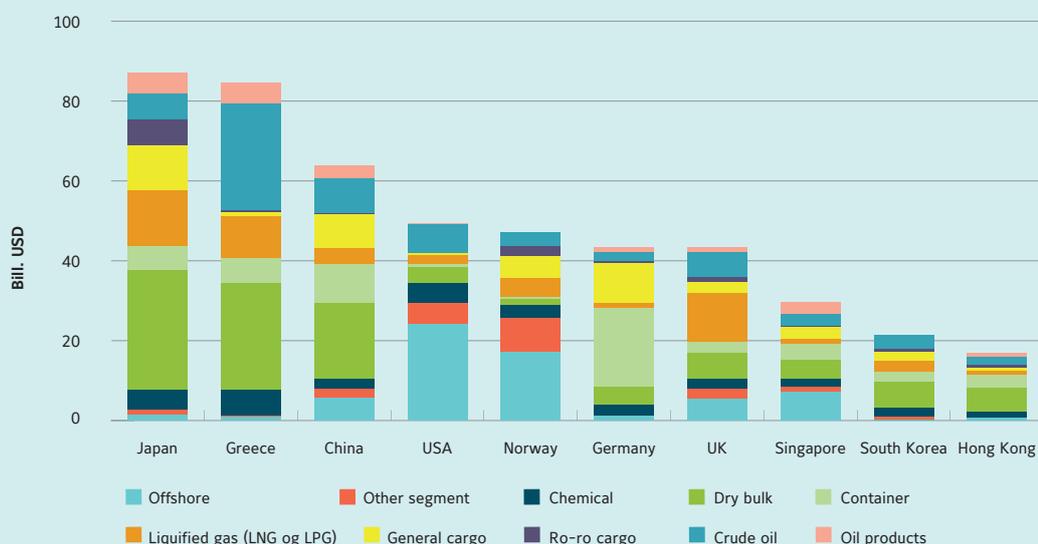


The Norwegian fleet now ranks as number five in the world of shipowning nations

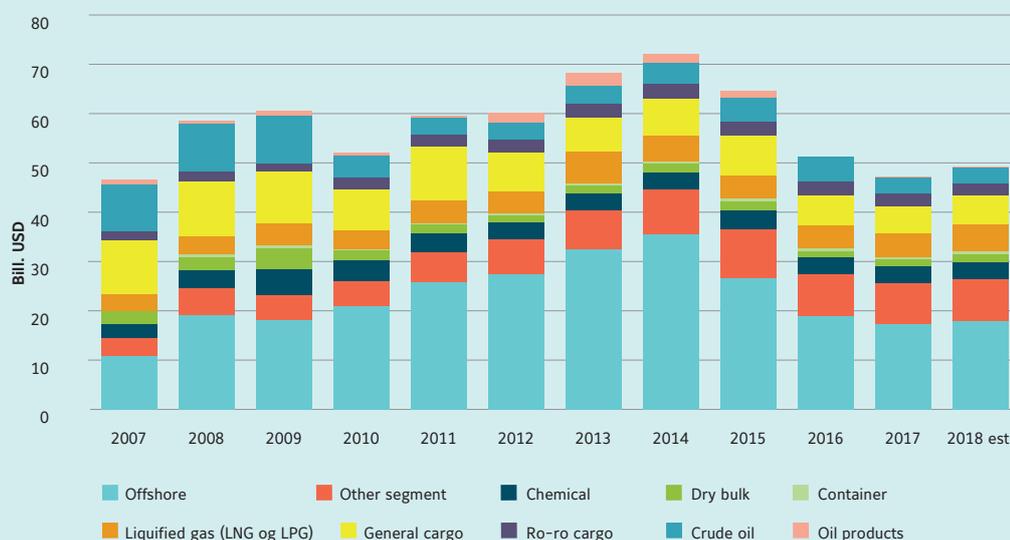
When assessing the international standing of a shipping nation, carrying capacity is the most common standard of measure. For many years, Norway ranked third in total tonnage, behind Greece and Japan. But carrying capacity alone cannot provide a representative picture of the shipping industry's international position and value creation. There are several reasons for this, the most significant being that the size of a ship's cargo conveys only limited information on its makeup and value. The Norwegian fleet counts a large number of advanced and high-value vessels not necessarily designed to maximise carrying capacity, but rather to perform complex operations.

The value of the world fleet is for 2017 calculated to USD 791 billion. This is a decrease of 7 per cent from the year before. Norway, who the last couple of years have ranked as number six among the world's shipowning nations, now ranks as number five. Japan, Greece, China and the USA are ranked ahead of Norway. The offshore segment has the highest value in the Norwegian fleet. Only the USA has an offshore fleet with a higher value than Norway. Estimates for 2018 show a slight increase in the value of the world fleet in total, this also applies to the Norwegian fleet.

Top ten merchant fleets of the world by market value by segments as of 2017



Development in the Norwegian fleet market value by segments



Statistics for value creation and employment in the maritime industry for 2016 are gathered from the Maritime Forum. Figures are compiled by Menon Economics. Figures for the value of the world's merchant fleet are also compiled by Menon Economics.

The Norwegian-controlled foreign-going fleet

The Norwegian-controlled foreign-going fleet has seen a steady growth both in number of ships and by tonnage for the last couple of years, and now stands at 1,771 ships. This equals a growth of three per cent in number of ships, and as much as six per cent in deadweight tonnage. The Norwegian International Ship Register has also seen a good growth in recent years and is by March 2018 counting over 610 ships. The composition of the Norwegian-controlled foreign-going fleet shows that offshore service ships make up the largest segment, measured in number of ships.

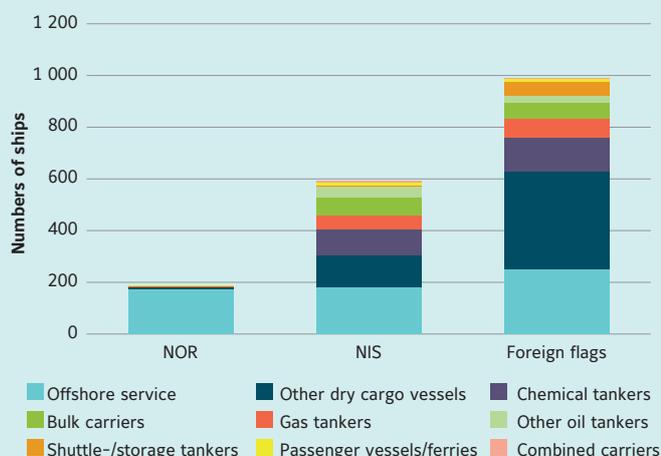
Development in the Norwegian-controlled foreign-going fleet 2008-2018



Development in the Norwegian International Ship Register (NIS) 2013-2018



The Norwegian-controlled foreign-going fleet by flag and ship type as of 1 January 2018



SOURCE: NORWEGIAN SHIPOWNERS' ASSOCIATION

Norwegian shipowners – delivering services and transport world wide

Short sea

The short sea segment transports passengers and all types of freight along the coast of Norway, and to and from European ports. Seaborne transport is an important part of the transport system, and 40 percent of European domestic transport goes by ship. Short sea shipping is critical for both commercial shipping needs and the competitiveness of Norwegian industry. Members of the Norwegian Shipowners' Association control around 160 short sea ships. The industry contributes to efficient logistical and transportation solutions. A single short sea ship can take the volume of several hundred trucks off the road.

Deep sea

The deep sea fleet consists of several segments where Norwegian shipowners are world leaders and control significant market shares. These segments include car carriers, tankers, dry bulk, LNG, chemical, container and general cargo, among others.

Members of the Norwegian Shipowners' Association control more than 600 ships in the deep sea segment. The ships make nearly 30,000 port calls around the world each year. The companies maintain many offices abroad, giving Norwegian shipowners a strong presence on all continents.

Offshore

Norway is one of the world's largest maritime offshore nations. Shipowners participate in all phases of offshore petroleum activities, from the first seismic surveys and exploration, to production and decommissioning of spent fields. The Norwegian offshore fleet has a high number of vessels for the transportation of supplies and equipment to and from offshore installations. The North Sea and the Norwegian Continental Shelf is a highly important market for ensuring the international competitiveness of offshore shipping companies. In addition, the presence is high on the shelves of other countries, such as Brazil, Australia and the United States. Members of the Norwegian Shipowners' Association control more than 50 mobile offshore units, and the most advanced and modern offshore fleet in the world, consisting of 550 vessels.

Norwegian Shipowners' Association's Member Survey 2018

About the member survey:

This chapter is based on a survey of Norwegian Shipowners' Association members, statistics from our own databases, and value creation analyses from Menon Economics. In the survey, our members, Norwegian international shipping companies, were asked to provide key figures on turnover and operating results, employment, market developments, access to capital, growth markets, and global trends.

The member survey was carried out between 24 January and 8 February 2018. A total of 93 shipowners responded to the survey, and their replies are incorporated into figures presented in this year's Maritime Outlook Report. This gives a response rate of about 70 per cent. A more detailed description of the data basis and methodology is found at the end of this report. This year marks the sixth edition of the Maritime Outlook Report, first released in 2013.

FOUR SHIPPING SEGMENTS ARE REVIEWED IN THE SURVEY:

- **Deep sea shipping** – tankers, dry bulk, LNG, chemical, containers, cargo and car carriers in intercontinental trade
- **Short sea shipping** – the same segments as for deep sea, conducting regional freight trade in Europe, and including passenger ships trafficking European routes
- **Offshore shipping** – platform supply vessels, anchor handling vessels, construction vessels, seismic and other offshore-related specialised vessels, and subsea support vessels
- **Offshore drilling** – mobile rigs, drill ships, lodging, and floating production, storage and offloading units (FPSO)

Change of outlook among shipowners

The overall outlook among the Norwegian Shipowners' Association's members has undergone a noticeable, positive change. The transport segments have gradually increased their turnover since the onslaught of the financial crisis in 2008, and turnover is now around the same level as before the financial crisis. The offshore segments have experienced extremely challenging markets since the fall in oil prices in 2014, and activity has stabilised at a very low and unsustainable level. Despite expectations of some improvement in rig markets, the offshore shipping segment anticipate a further reduction in revenue in 2018.

Offshore segments are still facing very demanding times, with low resource utilisation, high layup levels, low rates and short time horizons on contracts. This situation is not sustainable, and the offshore segments may again be characterised by further restructuring and refinancing in 2018.

Improvement expected in shipowner revenues

Shipowners' collective turnover fell by five per cent, from NOK 224 billion in 2016, to NOK 213 billion in 2017. The decline in revenue is directly linked to a continued fall in the offshore segments. This appears likely to turn around in 2018, and all segments, with the exception of offshore shipping, report expectations of increased revenue in 2018. Overall, more than half of shipowners expect increased revenue in 2018, while one in four expect revenue to decline in 2018, and the remainder expect no change. If this prognosis is correct, shipping companies' total revenues will reach NOK 219 billion in 2018, up almost three per cent from last year.

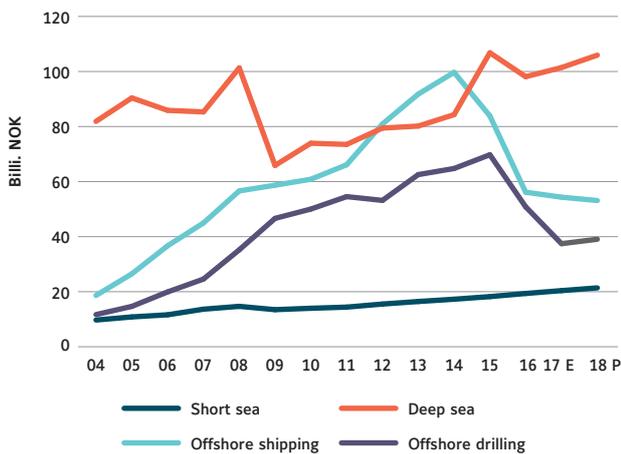
Percentage change in Norwegian shipowners' turnover from the previous year (including 2017 estimates and 2018 prognosis)



Revenue decline in 2017 was significantly lower than predicted in last year's Outlook Report. Forecasts warned of a 10 per cent decline, while reported figures for 2017 show that revenues fell by five per cent. All segments showed better results in 2017 than anticipated at the beginning of the year. In particular, offshore drilling company turnover declined less than expected in the beginning of 2017. At that time offshore drilling companies reported an expected decline of 42 per cent. Results showed a 26 per cent reduction, which still constitutes a dramatic reduction in revenue.

For the offshore shipping segment, forecasts indicate that the downturn in revenue from 2017 will continue into 2018. Since 2014, total revenue has been reduced from NOK 100 billion to NOK 54 billion in 2017. The 2018 forecast is for offshore shipping companies' turnover to decrease by about two per cent and end at around NOK 53 billion.

Turnover 2004-2018 (prognosis) - by segment



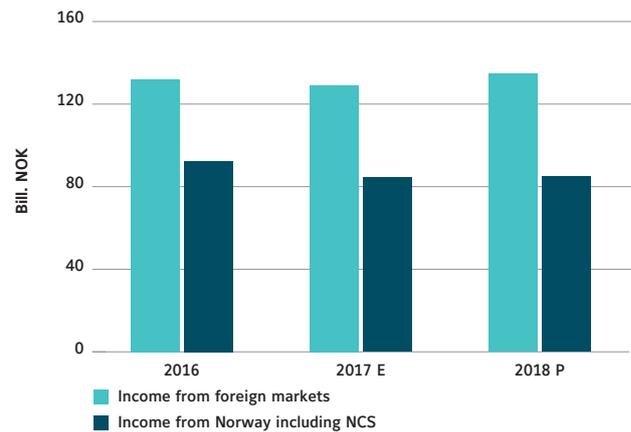
Offshore drilling companies anticipate a slight increase in revenue in 2018, following a dramatic fall of 45 per cent over the last two years. Forecasts for 2018 indicate that the offshore drilling companies' revenues will increase by four per cent and end at NOK 39 billion. By comparison, offshore drilling companies' revenues were around NOK 68 billion in 2015.

Deep sea shipping companies expect an increase in revenue in 2018 of four per cent, making the total revenue in this segment NOK 106 billion. For the short sea shipping segment the increase in revenue is expected to constitute five per cent, and end at NOK 21 billion in 2018.

Majority of revenue generated abroad

As one of only a few countries, Norway has a complete maritime cluster, with leading players among shipping companies, class societies, financial institutions, shipyards and equipment suppliers. These companies face strong competition in markets around the world. Most of their revenue also comes from abroad. The results of the outlook survey show that Norwegian shipowners' revenues from markets outside Norway account for about 60 per cent of total revenues - NOK 129 billion in 2017. This is a marginal decline of NOK 3 billion from

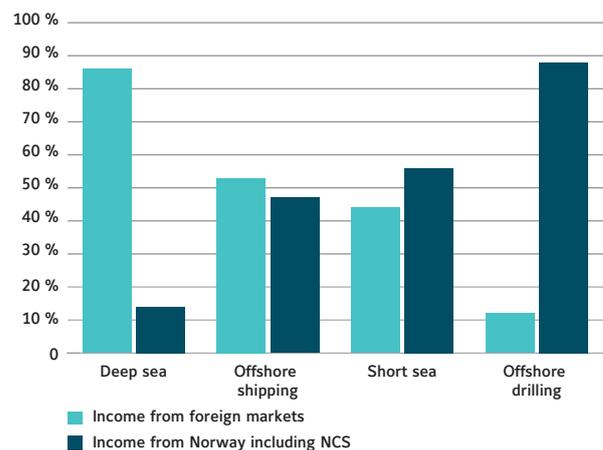
Total turnover for Norwegian shipowning companies - Norwegian and foreign markets



2016. The estimated share of income generated abroad is expected to increase to 61 per cent in 2018.

Not surprisingly, the largest share of income for deep sea shipping companies derives from foreign markets, with NOK 85 billion in estimated revenues in 2017, accounting for 80 per cent of the total income in this segment. This segment's income from foreign markets will increase by nine per cent in the period 2016 to 2018, from NOK 82 to NOK 89 billion, respectively. Short sea shipping companies derive 58 per cent of their income from markets outside of Norway.

Percentage of turnover by segment for 2017, Norwegian and foreign markets



Although offshore shipping companies' revenues have fallen sharply since 2014, the foreign share has remained relatively stable between 55 and 60 per cent. In 2017, these companies' turnover from abroad amounted to NOK 29 billion. Offshore drilling companies, as in previous years, derive most of their income from activities on the Norwegian continental shelf.

NOK 122 billion from the petroleum sector

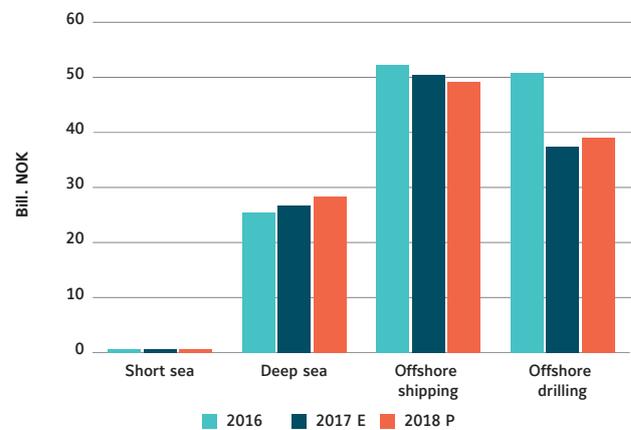
Norway is one of the world's largest maritime offshore nations, with 635 Norwegian-controlled offshore service vessels and rigs. The Norwegian Continental Shelf has, since the offshore oil and gas adventure started more than 50 years ago, been an important arena for ensuring international competitiveness. In 2017, Norwegian shipping companies had NOK 122 billion in operating revenues from the petroleum sector. This represents a fall of almost ten per cent, from NOK 135 billion in 2016.

Since the turn of the millennium, the Norwegian maritime industry has earned an increasing share of its income from offshore activities. The business analysis company Menon Economics has previously estimated that revenues from the oil and gas sector have accounted for three-quarters of the industry's total revenues. The shipowners' share has been at least as high, likely over 80 per cent. Our outlook survey indicates that shipowners' total petroleum share was 60 per cent in 2016, 57 per cent in 2017 and will end at 56 per cent in 2018.

Markets are particularly demanding for offshore drilling companies, leading to reduced petroleum revenues. However, this is expected to improve slightly in 2018 for this segment, in line with the somewhat more optimistic expectations of stronger markets. Offshore shipping companies' revenues from the petroleum sector also fell in 2017, albeit less than for offshore drilling companies. A slight

decline is also anticipated in 2018. Interestingly, deep sea shipping income from the petroleum sector increased from NOK 25 to NOK 28 billion from 2016 to 2018.

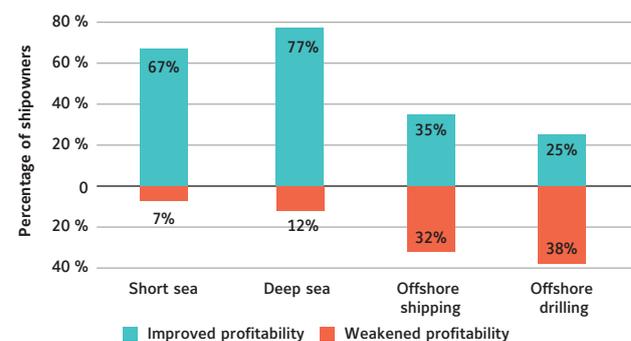
Total turnover from deliveries to oil/gas companies and offshore supplier industry



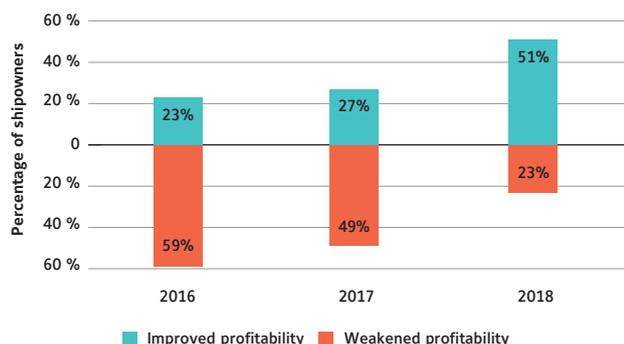
Improved profitability in sight

There has undoubtedly been a change in outlook among shipping companies over the last year. More than half now expect operating results to improve in 2018 compared to 2017. This is twice as many as in last year's survey. 23 per cent expect results to be worse this year than last year, or half that of one year ago.

Shipowners' expectations for operating results in 2018 compared with 2017



Shipowners' expectations for operating results compared to the previous year



All segments report increased optimism with regard to operating profit. The biggest change in profit expectations is found among offshore shipping companies. Despite the fact that these shipowners expect a decline in revenue of two per cent in 2018, we see a decline in the percentage of offshore shipping companies anticipating weaker results, 32 per cent compared to 70 per cent in 2017. The share of those expecting improved operating profits has increased from 15 to 35 per cent. However, improvement in operating profit for these shipowners is still no indication of sustainable profitability, or profitability at all.

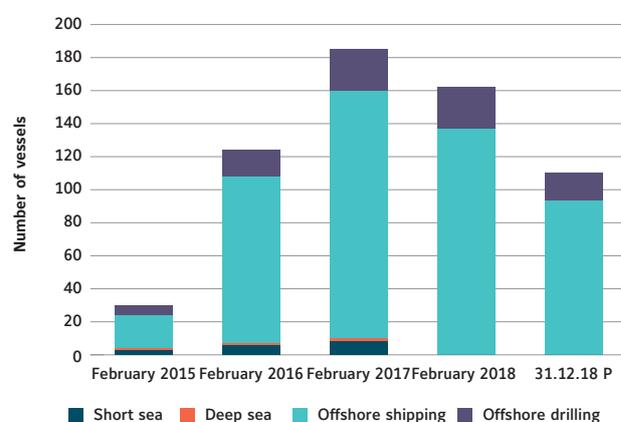
Low rates and low activity levels mean that shipping companies within offshore shipping still face very demanding times. Although markets are tough, companies are taking measures to strengthen their profitability. Offshore drilling companies' expectations for profits are still weak, and a majority still anticipate weaker rather than stronger profitability.

Deep sea shipowners are the most optimistic segment. Nearly eight out of ten companies in this segment expect better profitability, while only one in ten expect weaker operating profits. Short sea shipping companies are almost equally optimistic; seven out of ten expect profits to improve this year, while only seven per cent expect weaker profitability.

Layup peak passed

158 ships and 25 rigs were in layup as of February 2017, compared to 137 ships and 25 rigs in February 2018. Judging by these figures, peak layup appears to have been reached in 2017.

Vessels in layup, 2015-2018



In particular, a reduction in the number of offshore service vessels in layup has contributed to the current trend in layup statistics. This segment reduced its number of ships in layup from 148 in February of last year to 137 in February of this year. Furthermore, short sea and deep sea shipping report a reduction in the number of ships in layup. One year ago, short sea and deep sea shipping companies had ten ships in layup. This year there are none. For offshore drilling companies, the situation is different; the number of stacked rigs in February this year is unchanged from February of last year.

Layup prognoses for the rest of the year indicate further improvement. The number of ships and rigs in layup is expected to fall to 110, a reduction of 44 ships and eight rigs. All this reduction will take place in the offshore segments. This is due to a combination of increased activity on the Norwegian Continental Shelf, increased scrapping, and sales of ships. If this forecast proves accurate, we will see a layup situation at the end

of 2018 corresponding to the autumn of 2016 - two years after the oil price fall in 2014. Nonetheless, conditions will still be very demanding toward the end of 2018.

The fleet that has been in layup these past years has aged, lost value, and continued to incur expenses for their owners. This is another factor contributing to the demanding situation facing shipowners in the offshore shipping segment.

2018 - Expected increase in employment

2017 was yet another year where shipowners found it necessary to reduce staff. During the year, companies had to place on leave or terminate 3,100 employees. Corresponding figures were 8,300 in 2016 and 7,300 in 2015. At the same time, 2,800 persons were hired by shipowners in 2017, half of these in offshore drilling companies. This means that shipping companies reduced their number of employees by 300 in 2017.

A large share of the downturn has been linked to offshore shipping, one of the segments with the largest number of Norwegian seafarers. This meant that many of those placed on leave and terminated

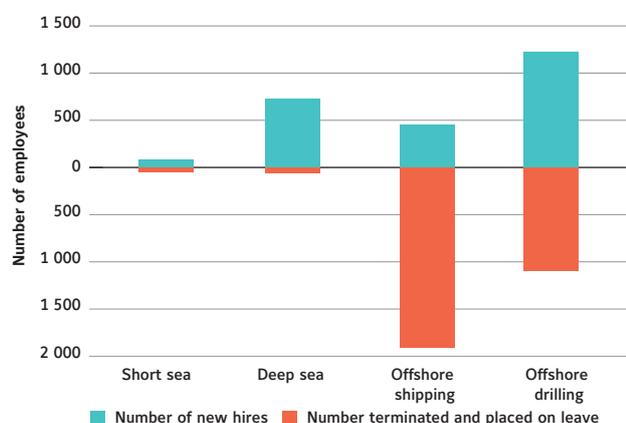
were Norwegians. In total, 1,800 Norwegian employees were placed on leave and terminated in 2017, representing a 58 per cent share.

Staff cuts were fairly evenly distributed between seafarers, offshore drilling workers and onshore employees. Almost all cuts have taken place in offshore shipping and offshore drilling companies. Deep sea shipping companies retained nearly all their staff in 2017, and hired significantly more than they laid off or terminated.

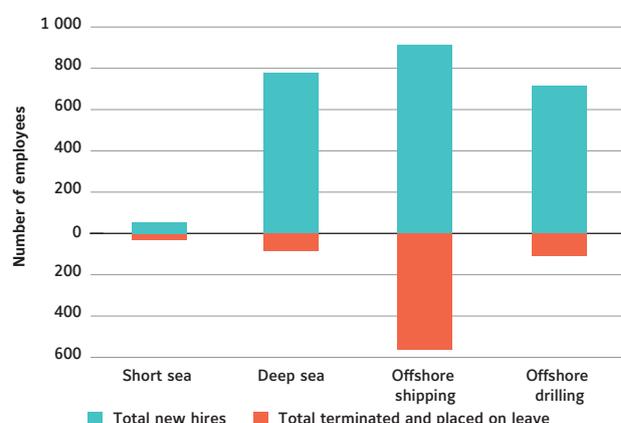
The share of those placed on leave increased from 15 per cent in 2016 to 22 per cent in 2017. This may indicate that shipping companies are more inclined to believe they will need to increase staff in the near future.

All segments expect increased employment in 2018. Shipowners expect a growth in employment of 1,700. The deep sea segment has the highest expectation for employment growth. Offshore drilling and offshore shipping companies follow respectively. Short sea shipping companies expect a small growth in employment in 2018.

Change in employment in shipowning companies, 2017



Anticipated change in employment for shipowning companies, 2018



Fewer regard access to capital as tight

Low or unstable economic growth following the financial crisis, low oil prices from 2014, and a reduction in oil and gas activity both in Norway and internationally, have impacted the entire maritime value chain. As a consequence of the fall in oil prices, since we started with our outlook surveys, we have seen that access to capital has been gradually weakened from 2014 to 2017.

In this year's survey we can observe careful optimism among shipowners. Still only 22 per cent regard access to capital as good, but the proportion considering the capital market as tight is down from 60 to 39 per cent.

We must go back to 2015 to find a more positive assessment of the capital market. However, this varies considerably between segments. While the transport segments are more likely to experience capital access as good, offshore segments are still experiencing tight access. This reflects the varying situations in which the different segments find themselves. The transport segments are experiencing better profitability and increased revenue, while offshore segments are experiencing low or no profitability and have seen revenue cut by half in three years.

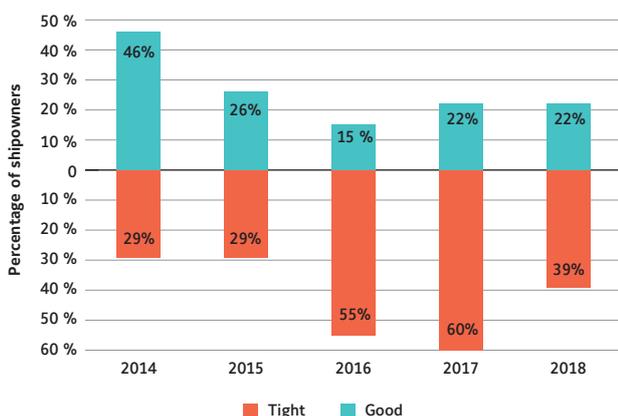
Short sea shipping companies are most positive to the current situation in capital markets. Similarly, among deep sea shipping companies, a larger share experience good rather than tight capital access, while in the offshore segments the picture is quite different. Half of both offshore shipping and offshore drilling companies are still experiencing tight access to capital.

Careful optimism for improved access to capital

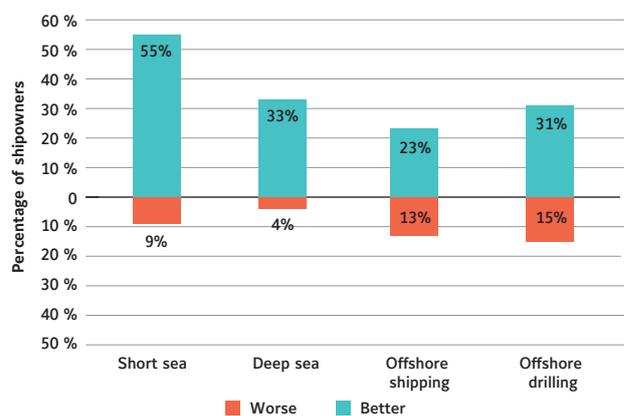
We see expectations of improvement in the capital market among shipowners. One of three companies expect access to capital to improve in 2018. At the same time last year, only 15 per cent of shipping companies expected the same. However, the majority of companies expect that capital access will remain unchanged throughout the current year.

Deep sea and short sea shipping companies have a positive view of developments in capital markets. Only one in three deep sea shipowners expect capital access to improve, but this is likely because these companies already experience access to capital as good. As such, more than 60 per cent of deep sea shipowners anticipate no change. Among short sea shipowners, the majority expect that capital access will improve during 2018.

Change in perceived access to capital 2014-2018



Expectations for access to capital in 2018



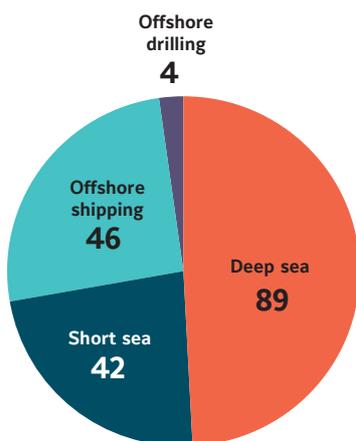
This year, one in four offshore shipping companies anticipate improved access to capital, while only 13 per cent expect it to worsen. Among offshore drilling companies we find roughly the same expectations.

Plans for newbuilding in all segments

The combination of anticipated increased revenue, improved operating profit and less restrictive capital markets should make shipowners better equipped to order new vessels. In this year's survey, shipowners state that they plan to order a total of 177 ships and four rigs over the next five years.

Most of the orders are expected to come in the transport segments. Seven out of ten short sea and deep sea shipping companies plan to order ships over the next five years. The corresponding figure among offshore shipping companies is four out of ten, while only one in ten offshore drilling companies plan to place orders.

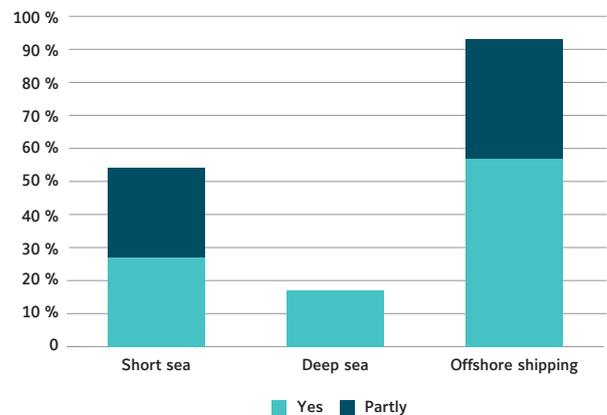
Number of ships that shipowners anticipate building in the next five years, by segment



Deep sea shipping companies expect to order 89 vessels, followed by offshore shipping with 46 vessels, and short sea with 42 vessels.

Nearly six out of ten offshore shipping companies confirm that Norwegian shipyards will be considered for newbuildings. This indicates how important the Norwegian offshore shipping segment is for Norwegian shipyards and suppliers. The fact that the investment rate in the offshore shipping segment is expected to pick up somewhat will also bolster order books for Norwegian shipyards and suppliers in the maritime cluster.

Percentage of shipowners who will use Norwegian yards for newbuilding of ships, by segment





Predictability and stability are prerequisites for operating from Norway

Stability and predictability are highlighted as the most important when shipping companies are asked to name factors critical to owning and operating in and from Norway. Predictable and competitive framework conditions related to wealth tax, tonnage tax and tax refund schemes for seafarers are deemed the most important prerequisites for shipping companies to conduct business from Norway.

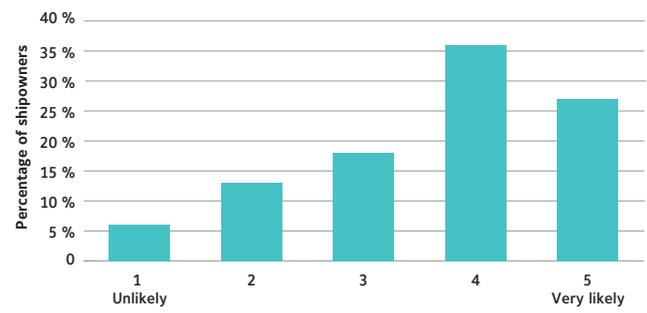
97 per cent oppose wealth tax on working capital

In the Norwegian maritime industry in general, and in shipping companies in particular, there is a high degree of private ownership. Competitive terms and conditions for Norwegian private ownership are therefore essential to the further advancement of maritime value creation in Norway. This also serves to explain the high degree of engagement among shipping companies related to the wealth tax. Fully 97 per cent of shipping companies confirm that the removal of wealth tax on working capital is an important measure to ensure competitive framework conditions for Norwegian private ownership.

A competitive tonnage tax is essential

A competitive Norwegian tonnage tax regime is essential for maintaining Norway's attractiveness as a host country for shipping companies. Based on shipowners' responses, the tonnage tax regime's competitiveness must continuously be maintained in order for shipowners to find it attractive to invest in and from Norway.

Likelihood of shipowners relocate operations out of Norway if the tonnage tax regime is significantly weakened

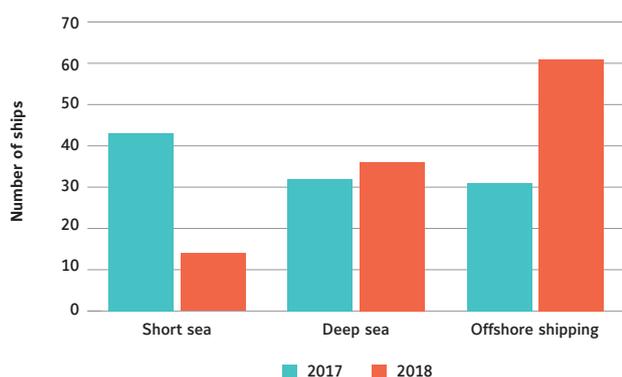


63 per cent of shipping companies respond that it is likely or highly likely that they would move their business out of Norway if the Norwegian tonnage tax regime should be significantly weakened. Only six per cent respond that it is unlikely that the business will be moved out. There are no significant differences between shipping segments.

Significant potential for flagging more ships to the Norwegian registry

A significant number of ships sailing under the Norwegian flag is an important prerequisite to Norway's continued ability to influence international shipping regulations. Norwegian registered ships have also proven to be an important arena for developing Norwegian maritime competence.

Potential for flagging ships to the Norwegian register in 2018 (NIS/NOR)



As a result of holistic and good maritime policies, including the relaxing of trade area limitations and expansion of the tax refund scheme for seafarers, 82 ships have flagged in to Norwegian registers over the last three years. Shipping companies report a potential to flagging in an additional 111 ships in 2018. The possibility is greatest among offshore shipping companies, who are considering flagging in an additional 61 vessels. Deep sea and short sea shipping companies account for the remaining 50 vessels, with 36 deep sea vessels and 14 short sea vessels.

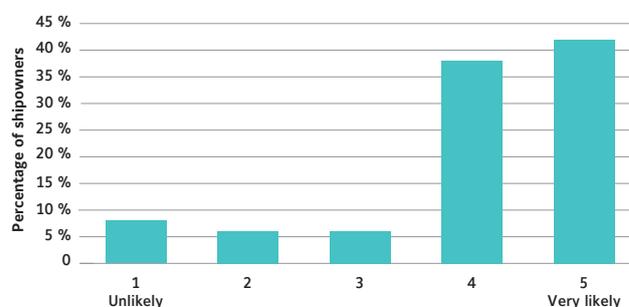
Asked what makes the Norwegian registry attractive, the need to maintain high quality and service combined with competitive terms receives high priority. Many also point out the importance of stable and predictable framework conditions that are not subject to political changes from year to year.

Competitive tax refund schemes ensure Norwegian seafarers

Competitive tax refund schemes is by far the most important factor in getting shipping companies to choose Norwegian seafarers on their ships. A total of eight out of ten shipping companies respond that they will replace Norwegian seafarers with foreign crew if tax refund schemes for Norwegian seafarers are significantly weakened.

Shipowners also state that experience-based operational competence gained at sea will be the most important for their company over the next ten years. This is also named as the most difficult competence to acquire. To make it attractive to invest in Norwegian maritime competence, it is crucial that the tax refund schemes maintain their competitiveness.

Probability that Norwegian seafarers will be replaced by non-Norwegians if the tax refund schemes for seafarers are significantly weakened





Ambitious solutions for climate and the environment

Cut greenhouse gas emissions in half by 2050

The ambition of the Norwegian Shipowners' Association is for the industry to cut 50 per cent of CO₂ emissions by 2050. This is an ambitious goal, as it is estimated that maritime transport worldwide will increase by about 60 per cent in the same period. Asked whether shipowners believe that they would be able to halve their emissions by 2050, about 60 per cent say that they think it would be possible. Only 15 per cent respond that they do not think it would be possible, and about 25 per cent are unsure.

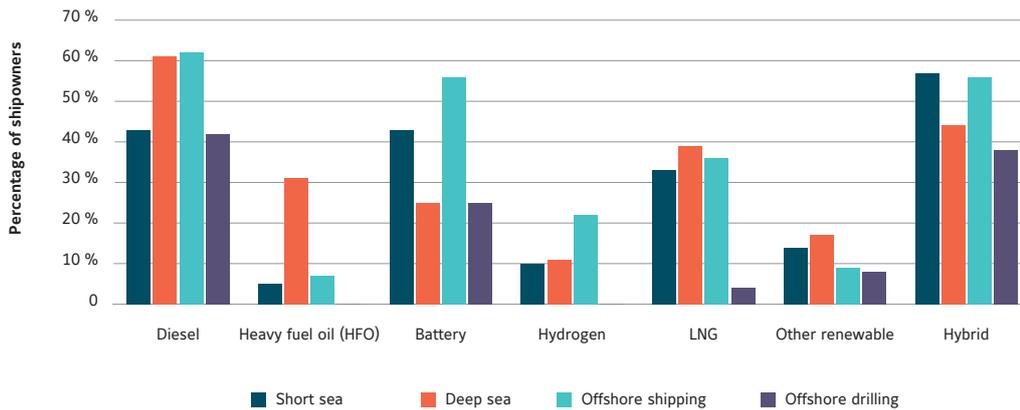
Shipping is a global industry. In order to ensure equal framework conditions between countries and regions, it is important that environmental and climate regulations are established internationally through the International Maritime Organization, IMO. Shipowners would appear to have positioned themselves in anticipation of the entry into force of new sulphur requirements from 2020, and global rules for CO₂ emissions from shipping. Asked how these regulations will affect shipowners' operations, they reply that it will present no significant challenge.

Shipping is already the most energy-efficient mode of transporting goods, and significant cuts in emissions will require a combination of several different measures. The Norwegian Shipowners' Association has commissioned a report from DNV GL outlining possible measures to cut CO₂ emissions by 50 per cent by 2050. Among other measures, DNV GL highlights the need for both technological and operational advances. Technological advances include energy-efficient components on the ship, as well as more energy-efficient hull and ship design. The transition to low and zero-emission propulsion solutions is another. Operational changes include the possibility of using data analysis to improve sailing patterns, as well as reducing the speed of ships. A combination of these will probably enable shipping to achieve the ambition of reducing climate emissions by 50 per cent by 2050.

Fuel and propulsion solutions

Asked what fuel or propulsion solutions shipping companies will be using on their ships and rigs in 15-20 years, almost half say that they will be using hybrid solutions. Nearly 40 per cent say they will be

Fuel/propulsion solutions that shipowners say they will use on their ships in 15-20 years



using batteries, and about 30 per cent say they intend to use LNG. Diesel will still be the most widely used option in 15-20 years, with about 55 per cent of shipping companies reporting this as the fuel of choice. Only twelve per cent of shipping companies state that they will still use heavy fuel oil.

Short sea shipping companies are those with the greatest expectations of change in fuel solutions. Almost none of the short sea shipping companies believe they will be using heavy fuel oil in 15-20 years, and well over half believe they will use diesel. At the same time, nearly 60 per cent of short sea shipping companies believe that they will use hybrid solutions, and more than 40 per cent believe their ships will use batteries.

Offshore shipping companies are the most positive toward battery technology and hybrid solutions. Over 55 per cent of offshore shipping companies believe they will use hybrid solutions and batteries in 15-20 years. This is also the segment that is most positive toward hydrogen. One in five companies in this segment believe they will use hydrogen in 15-20 years.

Global trade

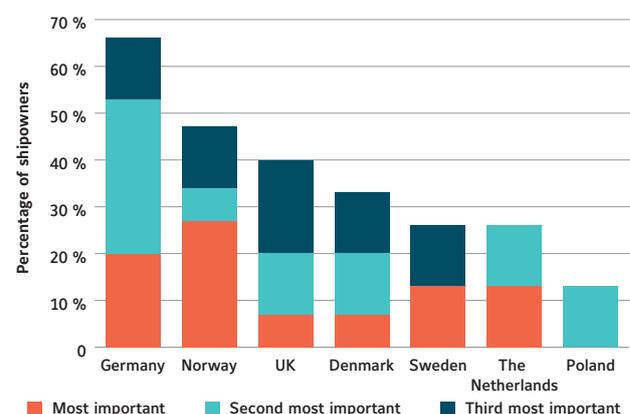
The Norwegian maritime industry is global and holds strong positions in markets around the world. This has led to revenues from markets outside Norway accounting for well over half of shipowners' total revenue. Yet, when we look at the total for all shipowners, the Norwegian market is strong. Norway, including the Norwegian Continental Shelf, as in previous years, is the most

important single market for Norwegian shipping companies. The number of respondents naming Norway as the most important market has been doubled since 2016, making Norway even more important than in last year's outlook survey. China and the UK have also become more important for Norwegian shipping companies, while Denmark and Russia appear to have become less important.

Germany and Norway – most important markets for short sea shipowners

For short sea shipping companies, Germany is named as the most important market. Seven out of ten shipping companies rank Germany as the first, second or third most important market for the further development of their business. Norway follows, surpassing the UK as the second most important market for these companies. Last year, roughly half of the respondents reported the UK as one of their most important markets, while nearly half of the shipowners rank Norway as number two this year.

Significant markets for short sea shipowners

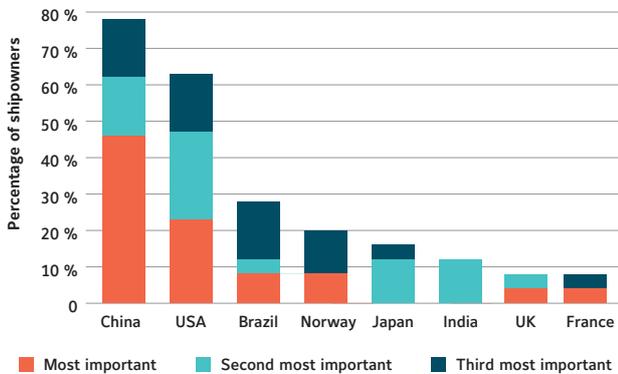


China and the US - most important markets for deep sea shipowners

Deep sea shipowners name China and the US as their two most important markets, followed by Brazil, Norway and Japan. All continents are represented on the list of the three most important countries for deep sea shipping companies, with the exception of Africa.

Three out of four shipping companies in this segment rank China as the first, second, or third most important, while the corresponding share for the US is about 60 per cent. The remaining countries are ranked at the top for between 20 and 25 per cent of deep sea shipowners.

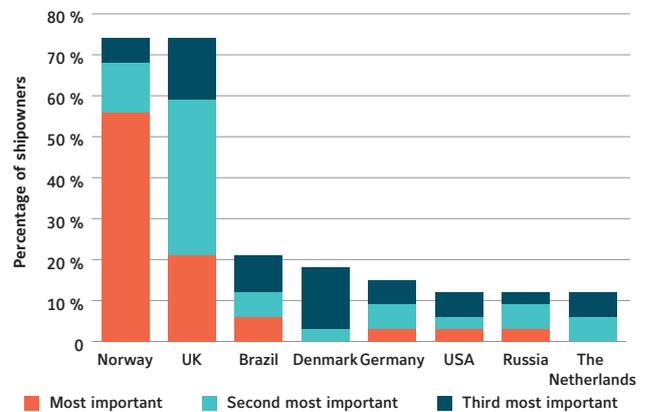
Significant markets for deep sea shipowners



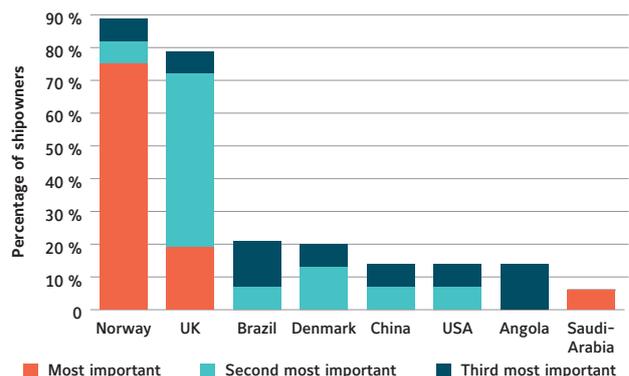
Norway and the UK - most important markets for the offshore segments

For offshore shipping and offshore drilling companies, Norway and the UK are by far the most important markets, followed by Brazil and Denmark. Fully six out of ten indicate the Norwegian Continental Shelf as the most important market for their business, and four out of ten name the British sector as their second most important market. By comparison, one in five offshore shipping and offshore drilling companies indicate Britain as their principle market. One in five also state that the Brazilian sector is one of their three most important markets.

Significant markets for offshore shipping companies



Significant markets for offshore drilling companies





Expectations for the High North and China, but protectionism looms

Shipping is global by nature and directly influenced by international trends and global developments. In this year's outlook survey, shipping companies were asked how various international conditions impact their business, on a scale from very negative to very positive.

Increased activity in the High North the most positive development

As in last year's report, increased activity in the High North appears to be the most positive among international developments for Norwegian shipping companies. Deep sea shipping companies are the exception, reporting that increased activity in the High North will not notably affect their business, neither positively nor negatively.

Offshore drilling companies are most positive toward this trend, followed by offshore shipping companies. This is identical to the results of last year's survey and is related to the fact that these companies have particularly high expectations for the development of oil and gas activities in the Barents Sea. At the same time, opportunities in the Arctic imply obligations; increased activity also increases the risk of incidents that can affect people, assets, or the environment. For this reason, the development of commercial activity in the

Arctic requires a gradual and responsible approach based on scientific, industrial and practical competence and know-how.

Increased development of offshore wind power is also perceived as positive. Both short sea shipowners and offshore shipping companies view the development of offshore wind power as positive for their business.

Normalised relations with China positive for shipowners

Normalisation of the relationship between China and Norway is considered as positive by all shipping segments, especially among deep sea shipping companies, who also state that growing Chinese geopolitical ambitions are positive for their business.

Protectionism the most negative development

Protectionism is perceived as the most negative development by all four shipping segments. Particularly for companies in the deep sea segment, which mainly derives its revenues from abroad, stable international policies are crucial to ensuring predictable framework conditions. Major changes in trade policy can potentially lead to major

changes in trade patterns and thus transport patterns, and constitute uncertainty and risk elements for these shipowners.

Of the shipping segments, deep sea shipping companies are the most negative toward protectionism and developments in Russia, followed by offshore shipping companies. This feedback expresses our members' concerns and sensitivity regarding increasing protectionism and political leveraging of protectionism.

Uncertainty regarding Brexit and US trade policies

Shipowners also state that they regard Brexit and US trade policies as mildly negative for their business. The shipowners' feedback that Brexit is considered only slightly negative should be viewed in light of significant uncertainty surrounding future relationships between the UK and the EU-EEA, making it difficult to assess risk. The same uncertainty also applies to US trade policies and shipowners' assessments of how US trade policy will affect their business.

60 per cent of shipowners have activities in other ocean industries

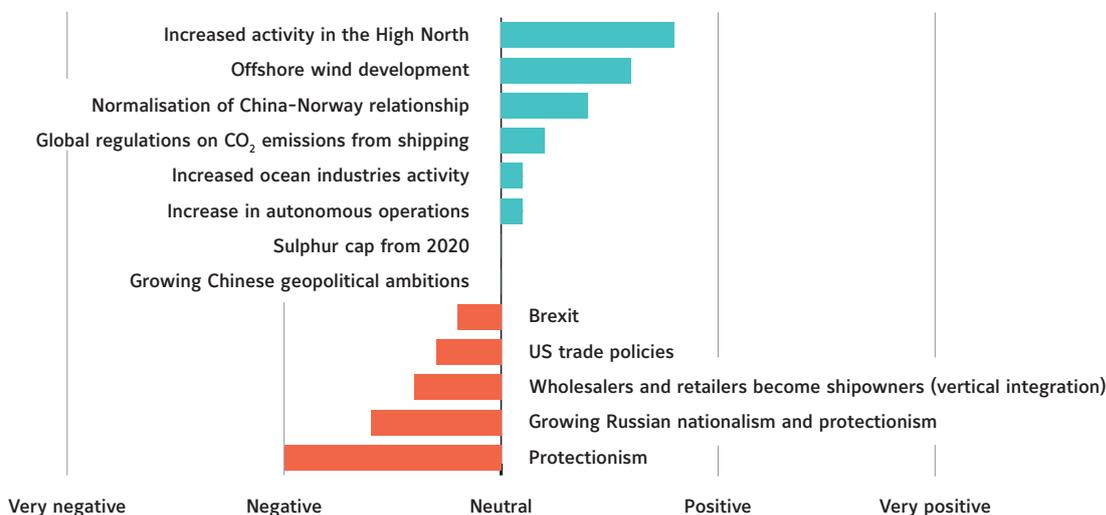
In a world that will grow by two billion people by 2050, we must find new solutions that contribute to climate-friendly and sustainable global growth. The oceans have great potential to provide energy efficient transport, food production, mineral extraction, metals and energy.

Six out of ten shipping companies have stated in the outlook survey that they have activities in ocean industries other than traditional shipping and oil- and gas operations offshore. This applies mainly to offshore shipping companies, but also to some deep sea and short sea shipping companies. Offshore drilling companies have reported that this option is generally not relevant for them.

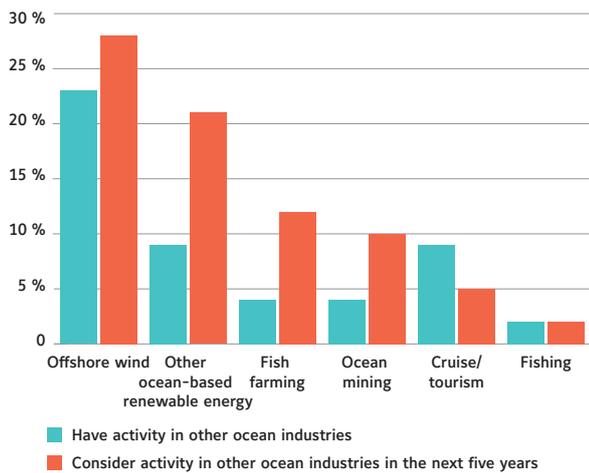
Great potential in offshore wind

Offshore wind represents significant commercial potential for Norway. Norwegian shipping companies' expertise and technology are in demand in the global market and could contribute to making offshore wind power the next major renewable energy solution.

Shipowners' views of selected global trends

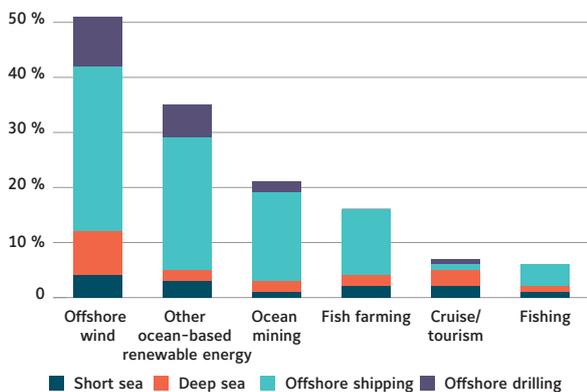


Percentage of shipowners with activity in other ocean industries and expectations for these industries



In addition to today’s main segments - traditional shipping with freight of goods and passengers and offshore oil and gas operations - the offshore wind segment appears to be the most interesting ocean industry for shipping companies. One out of three shipping companies state that they do business in offshore wind today. Another five per cent are considering entering this market over the next five years. Offshore shipping companies in particular see potential in offshore wind and other ocean-based renewable energy.

Percentage of shipowners regarding these ocean industries as relevant for their future business



Strong growth anticipated in other ocean industries

Far fewer shipping companies have activities related to other ocean-based renewable energy today, but one in five shipping companies are considering investing in this segment over the next five years. This is also the segment that most offshore shipping companies consider as relevant.

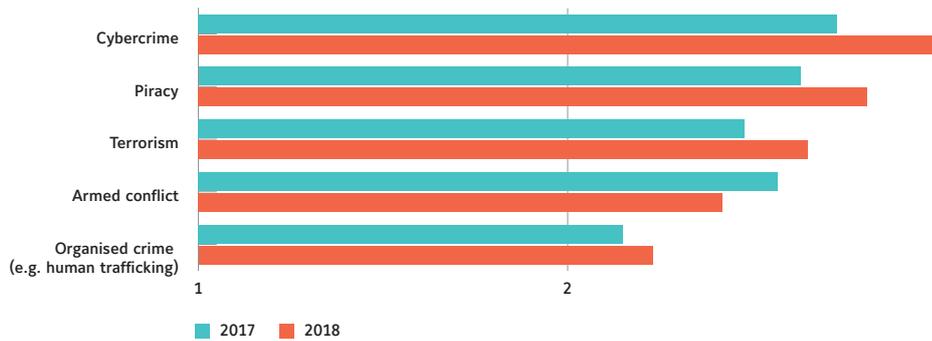
Only four per cent of shipowners have activities related to aquaculture today, but twelve per cent say that they will consider this market over the next five years.

Cybercrime viewed as the greatest security threat

Ships in the Norwegian-controlled fleet sail all over the world, and they represent a strategically important emergency preparedness resource for the authorities in times of peace, crisis and war. At the same time, the ships are “a little piece of Norway”, and a crisis on board a Norwegian ship is therefore as serious as a crisis on Norwegian soil. The fleet can thus be both a resource in crisis situations, and a target for hostile actions.

Four of the five security threats listed in the outlook report are perceived as more serious for shipping companies in this year’s survey than they were last year. The exception is armed conflict, which is perceived as somewhat less of a threat than last year. Deep sea shipping companies, in particular, experience their business as being affected by security threats.

To what degree the following security threats impact the shipping companies' operations
Scale from 1 to 5, where 1 = Insignificant and 5 = Significant



When asked to what degree the various security threats affect shipowners' operations, cybercrime emerges as the most serious. This is especially true for short sea shipping companies, where many more experience this as a threat this year compared with last year.

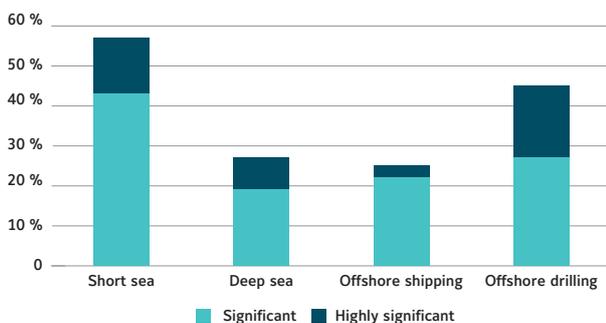
Offshore shipping and offshore drilling companies also state that cybercrime is the security threat that affects their operations the most. Deep sea shipping companies, on the other hand, report piracy as the biggest security threat.

There is reason to assume that cybercrime threats will become more relevant as more businesses migrate to increasingly digitalised, automated and autonomous services.

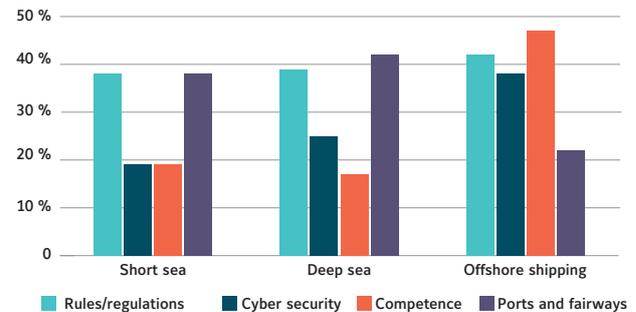
Half of shipping companies will have autonomous ships by 2050

Norway is a leader in autonomous shipping and has opened several geographical areas to test and further develop this technology. The world's first all-electric and autonomous cargo ship, Yara Birkeland, is Norwegian and will begin operations in 2019. Rolls-Royce has calculated that energy needs can be reduced by 30 per cent if those areas reserved for crew on a ship are replaced with increased cargo capacity.

Percentage of shipowners viewing cybercrime as a threat to their business



Percentage of shipowners viewing the following as significant barriers to using unmanned ships

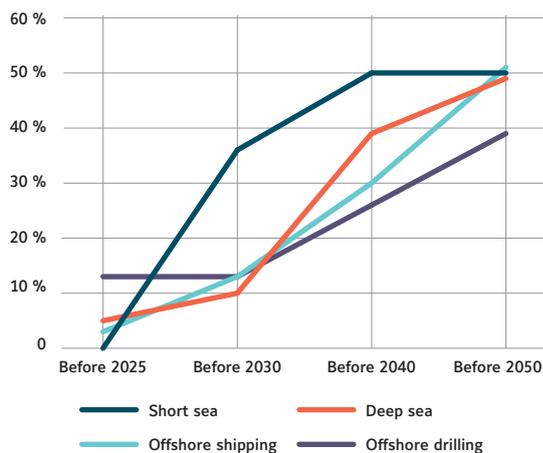


Around one in twenty shipping companies believe they will use unmanned ships or rigs already by 2025. The short sea shipping and offshore shipping segments report the greatest optimism for use of unmanned ships by 2030. By 2050, about half of shipowners believe they will be using unmanned ships and rigs.

Regarding barriers for use of unmanned ships and rigs, shipping companies name rules and regulations as most significant, followed by competence, ports and fairways, and cyber security.

These developments are of interest when we know that shipping companies consider one of the areas of competence essential to further development of cyber technology, ICT and data processing, as among the most important for their business in the next ten years. At the same time, shipowners state that they fear such expertise will be difficult to come by.

Percentage of shipowners who say they will be using unmanned ships and rigs, 2025-2050



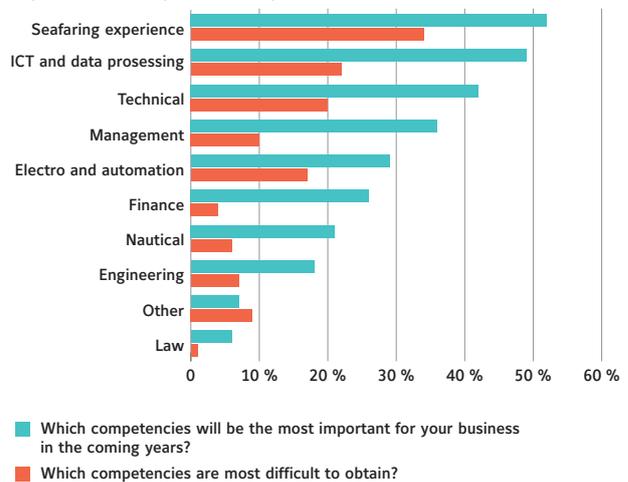
Competence for the future

If Norway is to maintain its world-leading role in the maritime industry, in addition to maintaining competitive maritime policies, it is imperative to establish active competence policies.

A broad spectrum of competence is needed

The experience-based competence of seafarers is critical to innovation. This is confirmed in the outlook survey, where the shipping companies were asked what kind of expertise they believe will be most important for their business in the next ten years.

Shipowners' competence requirements



In this year's survey, half the shipowners state that seafaring experience is likely to be the most important competence for their business over the next ten years. At the same time, one in three shipping companies state that operational experience is the most difficult to obtain.

The future of the maritime industry is green and innovative, with digitalisation contributing to rapid changes in decision-making and business models, while larger amounts of data enable better resource utilisation and optimisation of ships. Therefore, it comes as no surprise that ICT and data processing are considered to be important to nearly half of shipping companies, but no more than one in five believe that this kind of expertise is difficult to obtain. The exception is short sea shipping, where almost 40 per cent believe this competence is difficult to come by.

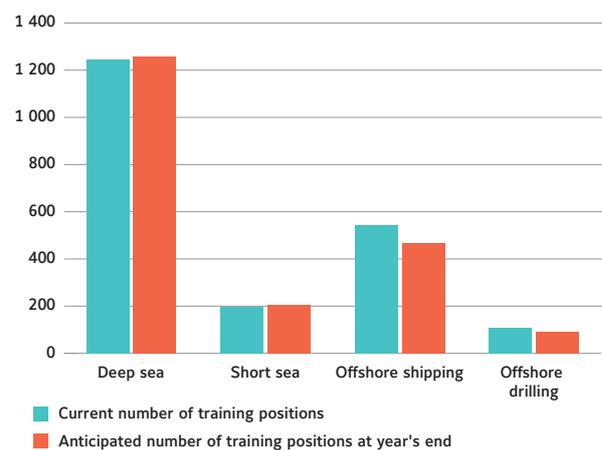
The survey shows a need for a wide range of competence in shipping companies, in addition to operational experience from sailing and ICT and data processing. Shipowners also require expertise within management, finance, engineering, electromechanics and automation.

Shipowners have 1,725 training positions

More than half the shipping companies state that they offer training positions. In total there are 1,725 training positions, a decline from both last year and 2016 of between 135 and 375 positions.

Seven out of ten training positions are now on-board ships in the deep sea fleet. Deep sea shipping companies also have the largest share of training spots, with 69 per cent reporting such positions. The corresponding share for offshore shipping companies is 65 per cent, 47 per cent among short sea shipping companies, and 20 per cent for offshore drilling companies.

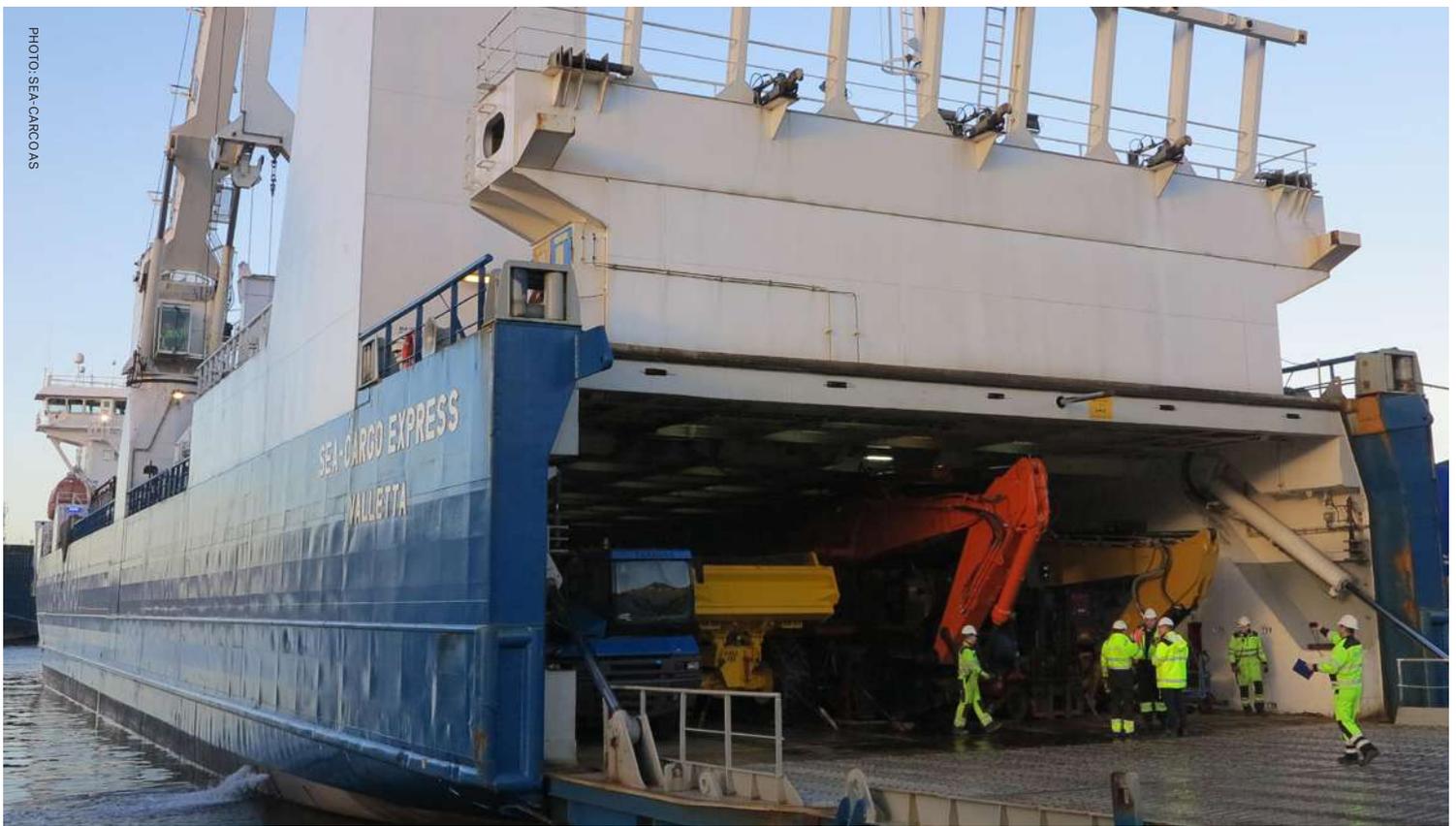
Number of training positions, current and year's end



Half of the training positions in Norwegian shipping companies in international trade are occupied by Norwegian apprentices and cadets, mainly on Norwegian deep sea vessels. Nevertheless, the increase is highest among foreign cadets, with an increase of 450 positions from 2017.

At present there are 600 Norwegian apprentices, with three out of four on Norwegian offshore and deep sea vessels. The latter group has shown the greatest increase since the beginning of 2017.

No major changes are expected in training positions in 2018. All four segments expect a slight increase. Foreign cadets are the only group expected to decline slightly.



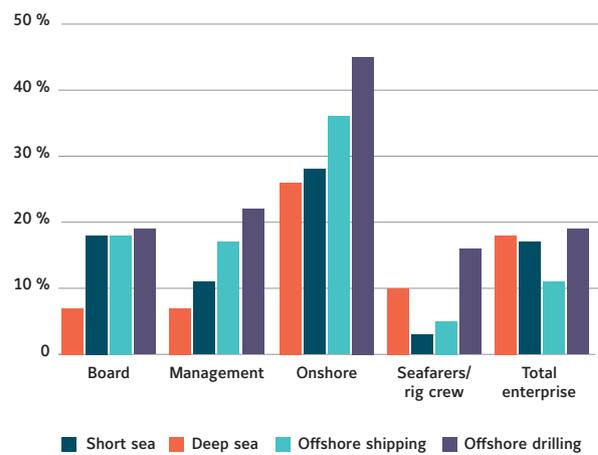
Few women on boards and in top management

The maritime industry has for several years focused on recruiting women to seafaring careers. Despite this, maritime education is among those disciplines with the highest proportion of men. Men dominated maritime higher education in 2017 when nearly 80 per cent of students were male.

This is most likely due to the fact that maritime industry traditionally has been, and still is, a male-dominated industry where seafarers take their operational experience ashore and apply it in onshore operations. Thus, both onshore organisations and ship's crews have traditionally had a low proportion of women.

Half of shipping companies state that they have no women on their boards, and nearly half report that women are not represented in top management. However, only seven per cent of shipping companies have no women among their onshore employees.

Percentage of women in shipowning companies, by profession and segment



Offshore drilling companies report the highest proportion of women in management and on boards, while the share is lowest in short sea shipping companies.

Data basis and methodology

Data sources used in this report are quoted in the text, tables and figures. Sources and methodology are described below. The Norwegian Shipowners' Association has worked in collaboration with Menon Economics on the analysis.

Member survey on framework conditions and the shipping companies' future prospects

The Norwegian Shipowners' Association conducted a survey of its members between 24 January and 8 February 2018. The members were sent an electronic questionnaire to survey their expectations of trends in economic KPI's, growth markets, access to capital and competence, and political framework conditions. The analysis carried out by Menon Economics includes 93 of 133 member companies, giving a response rate of about 70 per cent. Companies participating in the survey are on average larger than those abstaining, meaning that the response rate expressed as a percentage of combined membership size is higher than 70 per cent. Additionally, the responders are seen as representative of members, both in terms of size and type of company. The material thus provides a sound basis for extrapolating from sample to population. Almost without exception, responses came from owners and senior management.

Calculation of shipping companies' turnover growth in 2017 and 2018

Menon Economics maintains its own accounts database with an overview of all Norwegian shipping companies' turnover in 2016.

The questionnaire asked the shipping companies to state their turnover from 2016, estimated turnover for 2017, and projected percentage of growth in turnover for 2018. Since Menon Economics does not have complete turnover figures for all shipping companies in 2017, these have been calculated as follows:

- a) The shipping companies' self-reported turnover in 2016 is compared with audited turnover for the same year, to determine whether the self-reported turnover in the survey can be used as a basis for calculating the turnover of the total population of shipping companies in Norway.
- b) Self-reported turnover in 2017 is adjusted for the share of total turnover in each of the four

shipping company groups included in the data basis.

- c) Forecasts for 2018 are calculated by multiplying the 2017 turnover for each member company by their own projected growth for 2018. The estimated turnover is then summed up for all of the four shipping company groups. Estimated turnover is also adjusted for the share of total turnover in each of the four shipping company groups included in the data basis.

Valuation of the world's shipping fleet

Menon Economics has estimated the value of the world's merchant fleet from 2001 to the present, distributed among 14 segments, and all the world's countries. Selected segments are consolidated in this report. Value is calculated within designated vessel segments on the basis of newbuild costs, freight rates, age, number of ships, life expectancy, and gross and deadweight tonnage. Fleet size data is obtained primarily from IHS Fairplay, while valuation data is gleaned from a number of sources, including Clarksons Platou, the UNCTAD Review of Maritime Transport, and Worldyards. In order to arrive at preliminary value estimates for 2018, volume statistics for 2017 are combined with pricing data for 2018. The most substantial change in calculation methods compared to previous years is a change in the valuation model for LPG and crude oil. The value of the vessels in these two segments is reduced as a result of this. In addition, cruise ships are removed from the fleet numbers and the historical figures are also adjusted for this.

Norwegian-controlled foreign-going fleet – definitions and parameters

The Norwegian Shipowners' Association maintains statistics on the Norwegian-controlled foreign-going fleet. The parameters for inclusion of ships in the Norwegian-controlled foreign-going fleet are based on the following principles:

- All ships registered in the Norwegian International Ship Register (NIS)
- Ships registered in the Norwegian Ordinary Ship Register (NOR), and engaged in foreign trade
- Ships sailing under a foreign flag and owned by Norwegian-controlled shipping companies (stipulating 50 per cent Norwegian ownership or higher) and engaged in foreign trade



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