NORWEGIAN MINISTRY OF TRADE,
INDUSTRY AND FISHERIES

Strategy

# Maritime Opportunities – Blue Growth for a Green Future

## The Government's Maritime Strategy

*Photo: Maritimt Forum*

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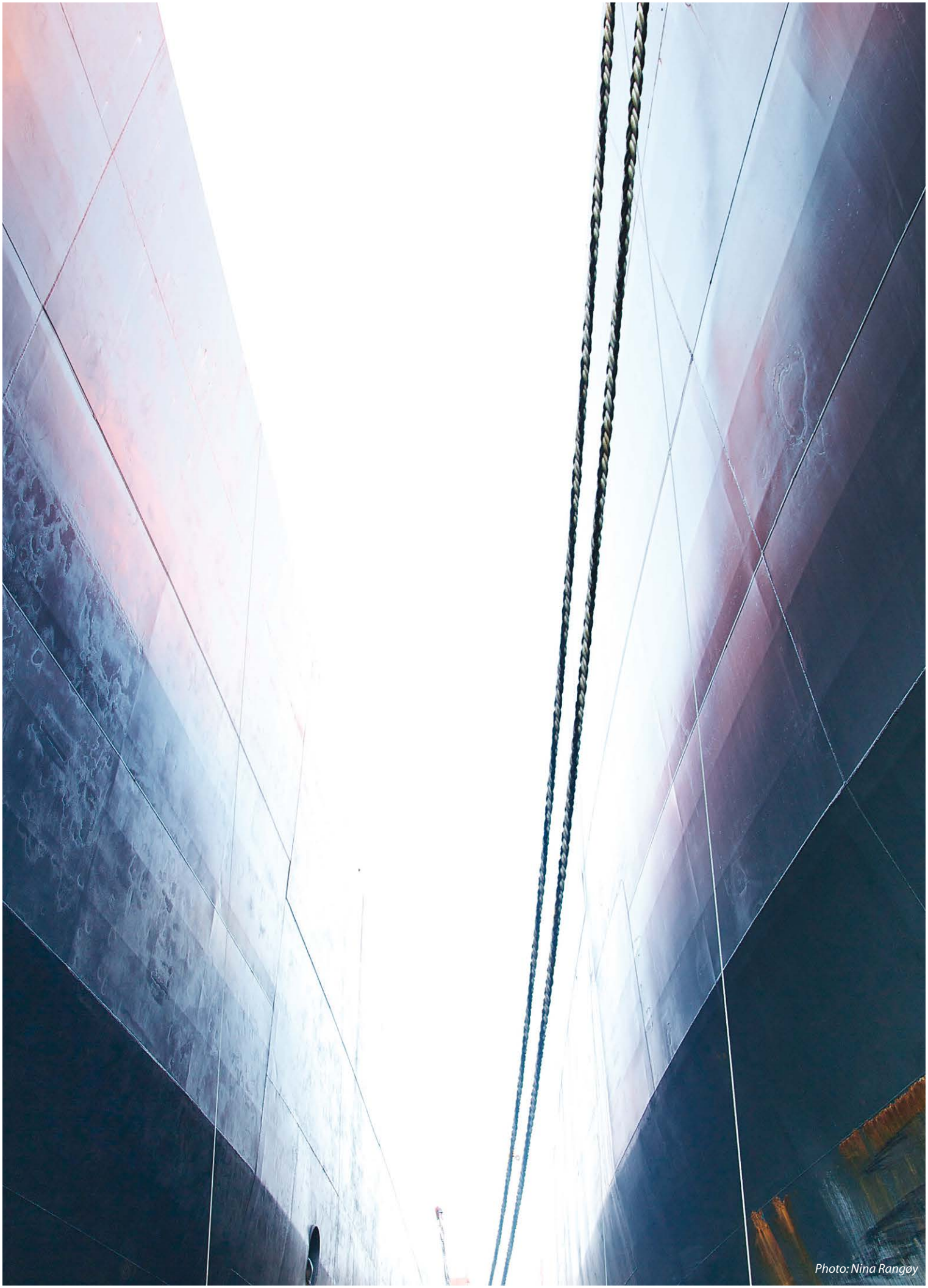


*Photo: Nina Rangøy*

# FOREWORD BY THE MINISTER

The Government's commitment to the maritime industry is firmly rooted in the Sundvolden platform. The maritime industry is currently among Norway's most global, innovative and forward-looking industries. Its employment rate, value creation and spillover to other industries make it an important driving force in Norwegian business and industry. In order for the industry to further develop its value creation potential, it must be given the necessary political attention in order to continue its positive development.

The Government considers the maritime industry as a priority industry. We have a competitive tonnage tax regime which we will continue. The tax refund scheme for employing seafarers is strengthened, and the Government has allocated more funds to research and development. At the same time we see that the number of vessels in the NIS register has dropped considerably, and that a dwindling portion of cargo along the coast is transported by Norwegian registered vessels, and that the offshore fleet is facing challenges by the drop in oil prices. Also, we still have an untapped potential both with regard to making shipping greener and by developing new and employ known technology across the ocean space. This is why the Government now presents a maritime strategy. Through this strategy the Government now wishes to establish a stable and forward-looking regulatory framework as a basis for future growth and value creation for the maritime industry in Norway.

It is important that terms and conditions are designed in such a way that they stimulate development and value creation in the maritime industry effectively. In order to contribute to this I invited representatives from the maritime industry to five thematic hearings in various parts of the country in the autumn of 2014. I have also met with the Strategic council for maritime development (MARUT). Through these meetings the industry has contributed with knowledge and given valuable advice for the Government's work with this strategy.

The opportunities which the industry is facing requires long-term efforts from the various players. Interaction between authorities, research, and commercial and industrial players in the industry is important in this context. The opportunities the maritime industry provides for value creation and industrial activity, can be developed primarily by the industry itself.

Central areas of the Government's commitment to the maritime industry are: trade areas for NIS registered vessels, environment, maritime administration and simplification, competence and education, research, development and innovation, international regulatory frameworks, blue growth, and the High North.

This strategy document contains a review of the authorities' efforts and the measures relevant to further development and value creation in the maritime industry – as well as specific actions to contribute to fulfilling our ambitions for the maritime industry in these areas.

I look forward to a continued good and close cooperation with the industry participants. Only together we can ensure that the maritime industry remains one of the most important sectors of Norwegian value creation and employment in the future!

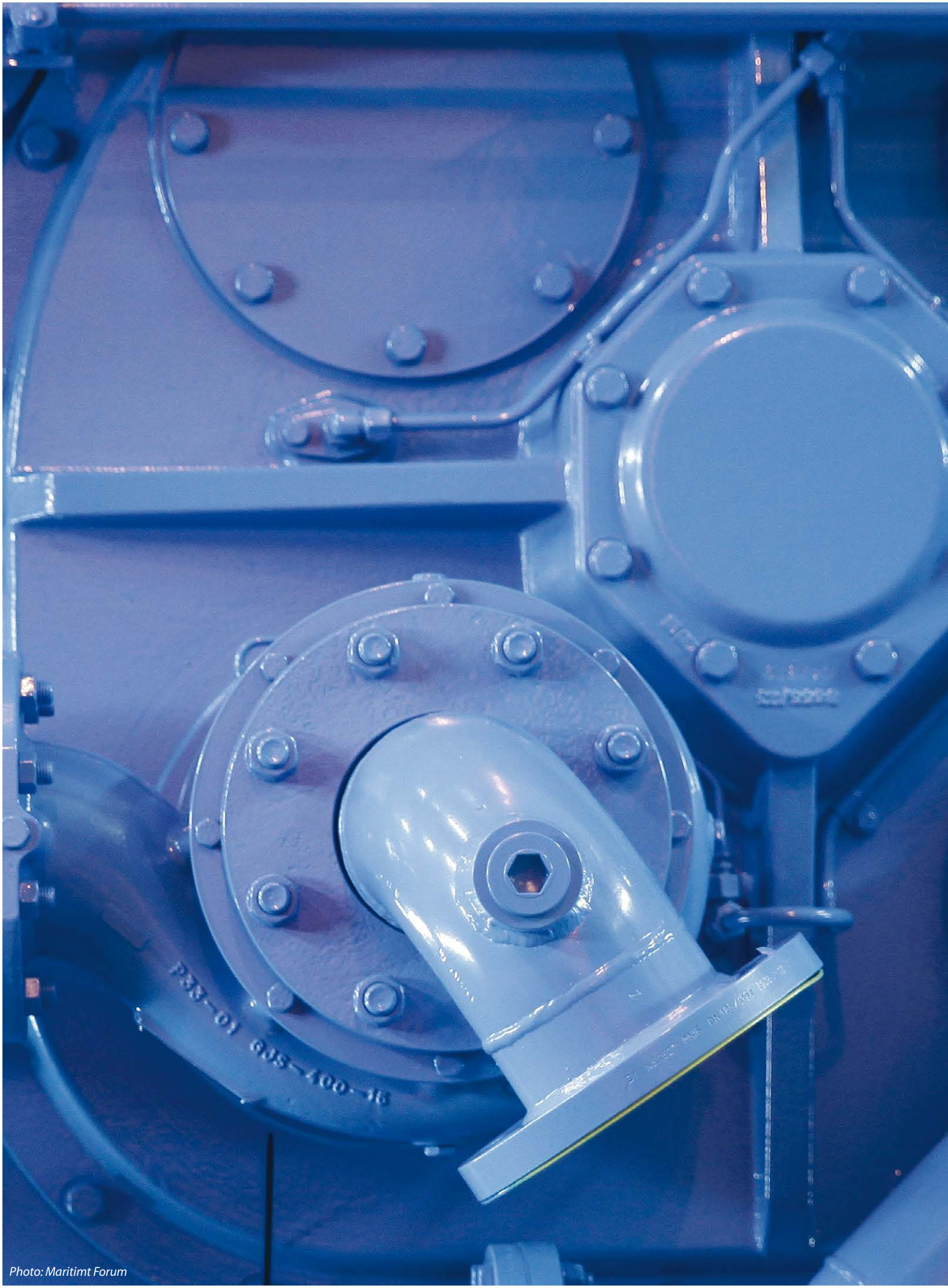


*Photo: Maritimt Forum*

# 01 SUMMARY

The Government's main goals for the maritime industry are sustainable growth and value creation

TRADE AREAS FOR NIS REGISTERED VESSELS

ENVIRONMENT

MARITIME ADMINISTRATION

COMPETENCE AND EDUCATION

**The Government's main goals for the maritime industry are sustainable growth and value creation. The maritime strategy presents the Government's policy to develop the maritime potential of the ocean industries.**

**In order to reach this goal, the Government will:**

- ensure that Norway continues to be a leading maritime nation with a large fleet registered in Norway
- stimulate green growth for the Norwegian maritime industry as well as the use of environmental friendly technology and alternative fuel for vessels
- ensure an efficient and customer oriented maritime administration and competitive ship's registers
- strengthen the Norwegian maritime industry's access to qualified personnel
- stimulate increased research, development, and innovation in order to strengthen the value creation and competitiveness of the maritime industry
- work for a harmonized global regulatory framework, open markets, high requirements for maritime safety, environment, and social standards
- develop a strong Norwegian ocean related cluster by stimulating increased interaction between the ocean industries
- ensure sustainable maritime value creation in the High North while taking into account issues such as increased activity, safety, and the environment

### Trade Areas for NIS registered vessels

The Government will ensure that Norway continues to be a leading maritime nation with a large fleet registered in Norway. In order to maintain and further develop the maritime industry, it is important to ensure a considerable and competitive fleet under Norwegian flag. The Government will continue the tonnage tax regime, strengthen the tax refund scheme for employing seafarers, and ease the trade area limitations for NIS registered vessels.

### Environment

The Government has ambitious environmental goals for the maritime industry. The potential for developing a green Norwegian shipping industry is great. A green shift will contribute to strengthening value creation in the industry and give a competitive edge.

### Maritime Administration

In order for Norway to continue to be a leading maritime nation, it is important that we have a modern maritime administration offering good solutions for the maritime industry. The Government will continue its efforts to facilitate the development of a maritime administration providing digital services, accessibility, and service.

RESEARCH, DEVELOPMENT AND INNOVATION

INTERNATIONAL REGULATORY FRAMEWORKS

BLUE GROWTH


THE HIGH NORTH

### Competence and Education

Norway is a high-cost country, however, we are competitive on knowledge based products. The access to competence is therefore vital to maintaining and developing competitiveness and value creation in the maritime industry. In order for Norway to continue to be a world leading maritime nation also in the future, the Government will strengthen maritime education and knowledge development.

### Research, Development, and Innovation

Research, development, and innovation are necessary for developing the competitiveness and adaptability of the maritime industry. The public support system is to contribute to strengthening the knowledge base for maritime research, development, and innovation.

### International Regulatory Frameworks

The Norwegian maritime industry is global and dependent on international success. The Government will work actively to ensure that the industry is given access to international markets and a competitive regulatory framework.

### Blue Growth

Norway has high competence and a strong professional environment in the ocean industries. However, the maritime, seafood, oil and gas industries can grow more by learning from each other. The Government will stimulate increased cooperation between the ocean industries.

### The High North

Norway has long traditions of shipping in the High North, and the Norwegian maritime industry has extensive knowledge of the specific conditions and challenges prevailing in the Arctic. The Government will continue to further develop Norway's position as a leading arctic maritime nation.

The Government's strategy cointains a number of efforts to follow up on the Government's main priorities.

*Photo:DNV GL*

# 02 THE NORWEGIAN MARITIME INDUSTRY

| VALUE CREATION, billion NOK | | | EMPLOYMENT [3] | |
|---|---|---|---|---|
| | 2004 | 2013 | 2004 | 2013 |
| Shipowners | 43,5 | 102,0 | 37 956 | 48 022 |
| Services | 14,9 | 35,2 | 20 712 | 28 393 |
| Equipment | 9,5 | 28,5 | 14 013 | 24 714 |
| Shipyard | 3,3 | 8,7 | 8 077 | 11 098 |
| **Totalt** | **71,2** | **174,4** | **80 757** | **112 227** |

Table 1: Value creation and employment in the maritime industry 2004–2013
*Source: Menon Business Economics.*

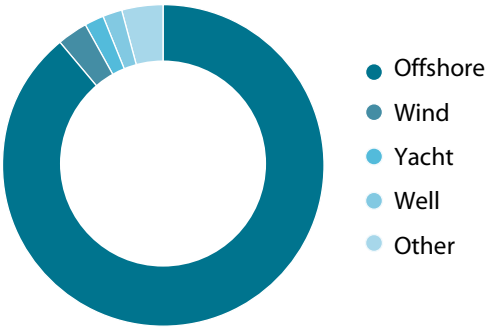



Figure 1: The order book at Norwegian shipyards
*Source: The Federation of Norwegian Industries.*

## Maritime value creation and employment

Norway has a leading global maritime industry with competitive businesses within the full breadth of the maritime industry spectrum. The maritime industry has had great significance for settlements, value creation and employment, especially in rural areas. The industry is also highly international and has a high share of exports.

In "*A Knowledge Based Norway*"[1] the maritime industry is defined as businesses designing, developing, building, supplying, maintaining, modifying, owning, operating, and distributing vessels, equipment and specialized services to all types of vessels and other floating units. All businesses having more than 50 per cent of their revenue in the maritime industry, are included in the value creation and employment figures in this chapter. When the industry is so broadly defined, large portions of the knowledge based service industries are included, and the maritime industry overlaps considerably with the offshore industry.

Menon Business Economics was commissioned by Maritimt Forum to prepare the report "*Maritime value creation book 2015*", which contains an update of value creation figures and other key figures for the maritime industry. According to this report, the maritime industry had a value creation of NOK 175 billion in 2013[2]. This is a 145 per cent increase from 2004. About 112,000 people were employed in the maritime industry in 2013, and in the same period it has increased by about 31,500 people, corresponding to 40 per cent more than in 2004. The maritime industry was Norway's second largest export industry in 2013, second only to oil and gas, and constituted 38 per cent of Norway's total export (oil and gas excluded).

Suppliers of maritime equipment have had the strongest growth in the last decade. Value creation is tripled in the period, while employment has increased by 76 per cent. The Federation of Norwegian Industries estimates that about 60 per cent of equipment deliveries are for the offshore market.

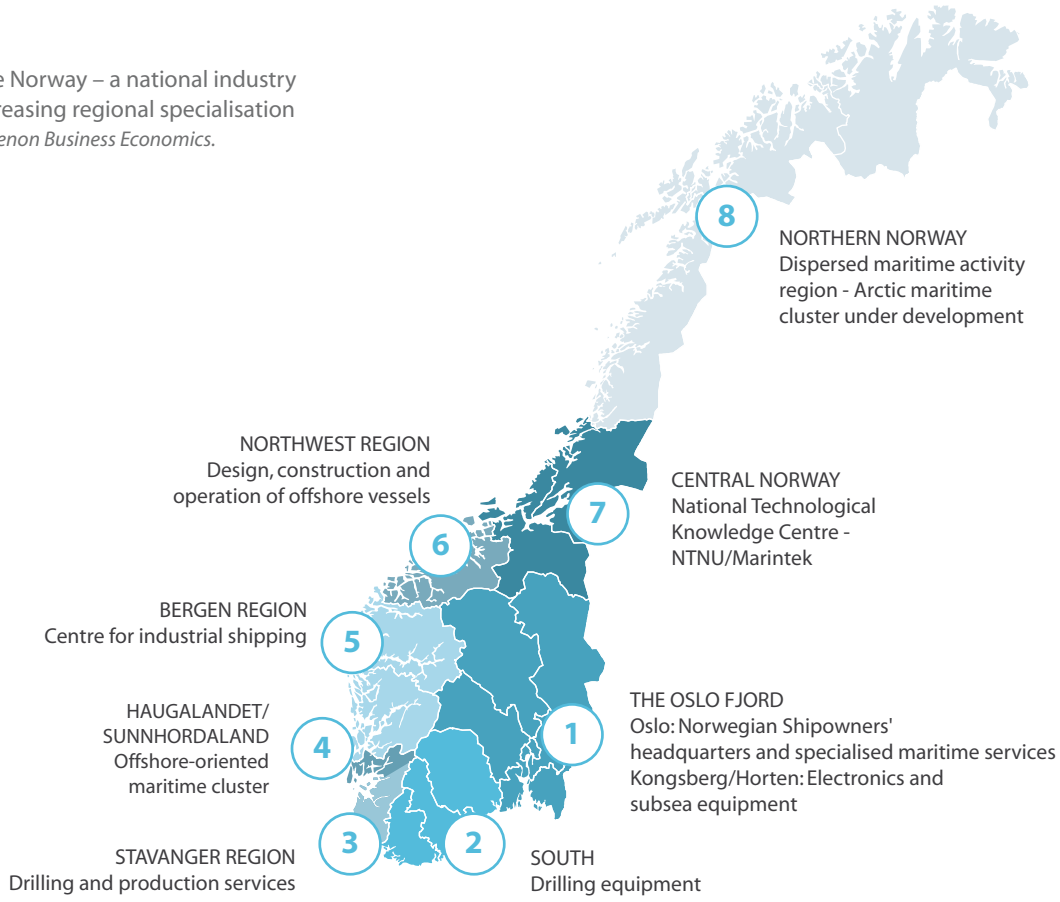
Maritime service providers is broadly based and includes among other things design, consulting services, insurance, brokerage, classification, and financial services. This segment has seen a growth in value creation of 137 per cent in the past ten years, and an increase in employment by 37 per cent.

Norwegian shipyards have seen a growth in value creation of 164 per cent in the past ten years, and an employment growth of 37 per cent. Norwegian shipyards mainly build specialized, relatively small vessels for Norwegian shipowners. Offshore vessels are clearly the dominant vessel type.

Shipping companies have seen an increase in value creation of 134 per cent in the period, and an increase in employment by 27 per cent. Offshore shipping companies have seen a particularly strong growth, more than 20 per cent average growth per year, in this period and constitute an increasing percentage of value creation from shipping companies. Traditio-

1) *Reve, T. og Sasson, A., 2012, "A Knowledge Based Norway".*
2) *All value creation figures are measured in current prices.*
3) *Only employees in Norway are included in the figures. Employees in the companies' organisations outside Norway are not included.*

Maritime Norway – a national industry with increasing regional specialisation
*Source: Menon Business Economics.*




nal shipping services have experienced zero growth in the period.

Norwegian controlled vessels[4] employ a total of 46,000 seafarers [5]. About 18,000 of these are Norwegians. Maritime offshore and domestic scheduled traffic are the most important employment segments for Norwegian seafarers. The number of Norwegian employees in the Norwegian Ordinary Ship Register (NOR) has remained stable, while the number of employees in the Norwegian International Ship Register (NIS) has shown a downward trend since the 1990s. Foreign seafarers now constitute 90 per cent of employees in NIS. The most important recruitment countries for foreign seafarers are the Philippines (about 11,600), India (about 2,000), Russia (about 2,000), and Poland (about 1,700).

## Regional significance of Norwegian maritime operations

We find maritime businesses along the entire Norwegian coast, from Finnmark in the North to Østfold in the South-East. During the past 10–20 years the industry has become more and more concentrated in local, specialized clusters.

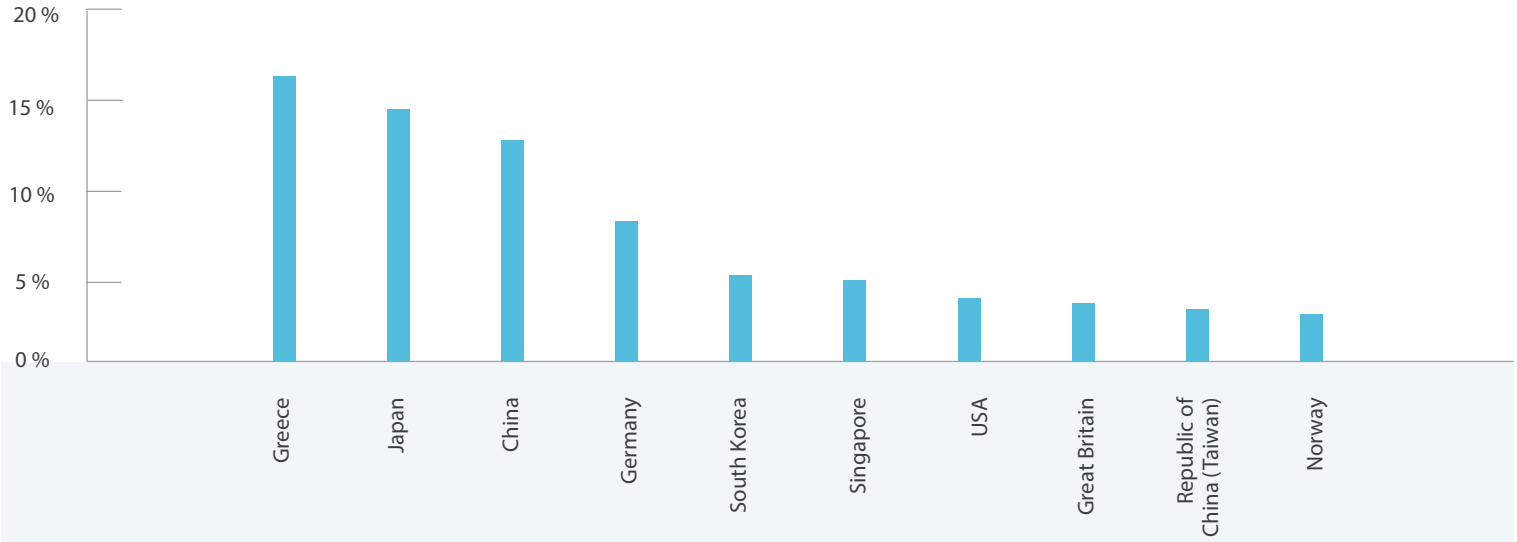
The strong increase in revenue, employment and value creation previously mentioned in this chapter has benefited all the maritime regions, however, development has been very diverse. While value creation in offshore dominated regions such as the Stavanger area, the Sørlandet and Møre and Romsdal has more than tripled since 2004, the development is weaker in areas dominated by international shipping. This is especially true of the Oslo and Bergen regions. At the same time a lot of the growth in these two regions can be linked to increasing offshore activity. The Oslo Fjord is the region with the highest growth in value creation in 2012 with NOK seven billion, whereof the bulk can be linked to the development of the seismic shipping companies.

Haugalandet/Sunnhordland is a good example of the offshore shift that has taken place. While Haugesund

*4) NOR/NIS vessels under foreign flag, belonging to Norwegian shipping companies, per definition Norwegian owned by 50 per cent or more.*

*5) Source: shipowners' and seafarers' associations (all employment figures in this section). The figures also include seafarers employed in Norwegian controlled shipowners' organisations outside Norway.*

Figure 2: The largest shipowning nations 2014 – percentage of world tonnage.
*Source: UNCTAD, "Review of Maritime Transport 2014".*




was one of the country's leading cities for traditional shipping a few decades ago, the region is now characterized by offshore shipping companies, offshore shipyards, and ship design for offshore vessels. In Møre and Romsdal this development is even more obvious, with a consecutive value chain of companies specializing in ship equipment, design and building of offshore vessels as well as a large number of operative offshore shipping companies. In the Oslo Fjord area, the development is moving towards service providing, both within finance and information and communications technology (ICT).

The significance of the maritime industry is clearly greatest in Western and Southern Norway. In Møre and Romsdal, the maritime industry represents more than 30 per cent of the business sector's total value creation[6]. In Hordaland, Rogaland, Vest-Agder and Aust-Agder this percentage is around 20 per cent. The percentage of employees in the business sector working in the maritime industry varies between 10 and 20 per cent in these counties. However, for some municipalities the employment rate is much higher, for example Utsira (79 per cent), Sandøy (70 per cent), and Ulstein (69 per cent).

## The world fleet – ownership and registration flags

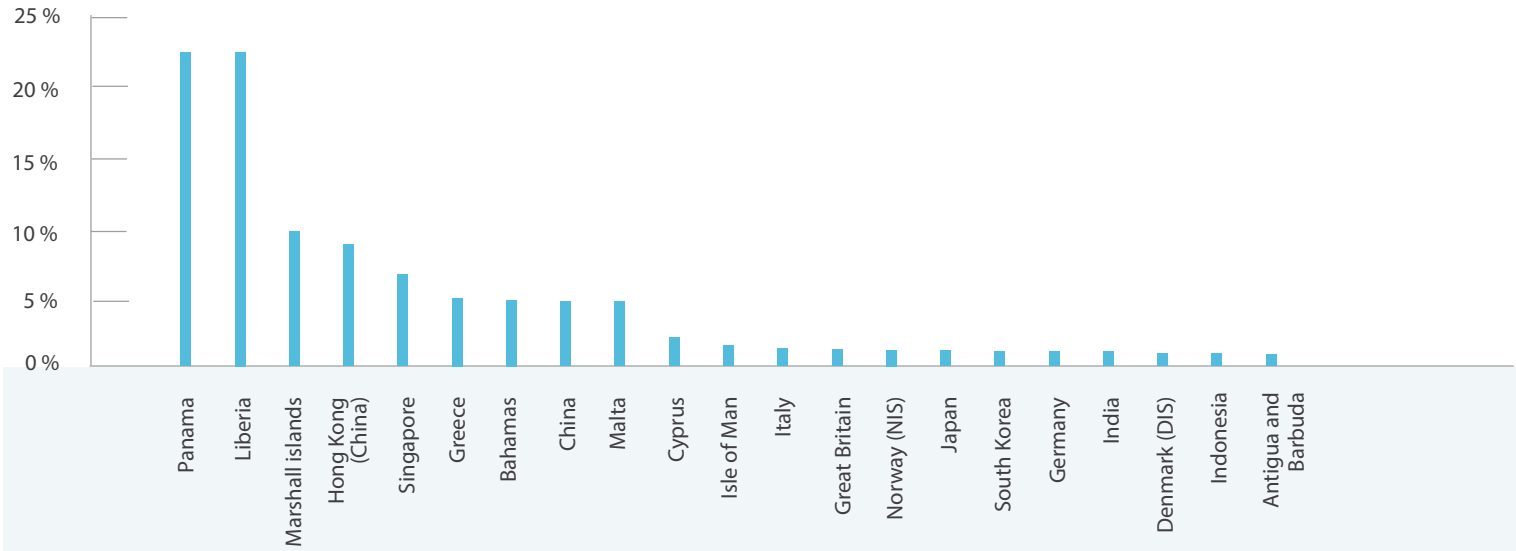
The world fleet has grown considerably since the beginning of the 2000s, and in the past ten years, world tonnage has more than doubled[7]. For a long time Norway was the world's third largest shipping nation after Japan and Greece. However, from 2004 Norway's share of the world fleet has dropped. The Norwegian merchant fleet has had a relatively stable number of vessels, around 1800–1900 vessels, during this period and has thus not participated in the international growth. The specialization of Norwegian shipping, with, among other things, several advanced offshore vessels with relatively low tonnage but high value has, however, led to a total reduction of Norwegian tonnage by 17 per cent.

Norway is currently the world's tenth largest shipping nation in terms of tonnage, and the world's seventh largest shipping nation in terms of the number of vessels. The Norwegian fleet is modern and specialized in advanced and capital intensive segments such as offshore, chemical tankers, and roro, and in the Maritime value creation book 2015, Menon Business Economics has estimated that the Norwegian fleet is the world's sixth largest in terms of value.

Traditionally vessels have been registered in a ship's register in the country where the shipping company has been controlled. Since the mid-1900s more and more vessels have been controlled in countries other than where the shipping company's ownership interests lay. Registering vessels in countries that provide tax advantages, but do not necessarily have an active shipping policy or shipping legislation, is considered "flags of convenience ".

*6) Menon Business Economics.*
*7) UNCTAD Review of Maritime Transport 2014.*

Figure 2: The largest shipowning nations 2014 – percentage of world tonnage.
*Source: UNCTAD, "Review of Maritime Transport 2014".*




The largest flag states are currently Panama, Liberia, and the Marshall Islands. Norway (NIS only) is ranked as the world's 14th largest flag state, and has 1.1 per cent of world tonnage[8]. Norwegian shipowners with externally registered vessels use especially the flag states Bahamas, Singapore, Malta, and the Marshall Islands.

### Norwegian maritime operations globally

The maritime industry is international by nature. Norwegian controlled vessels made more than 100,000 port calls in 165 different countries in 2013[9].

Nearly 90 per cent of Norwegian marine equipment is exported[10]. In 2012 the export value was NOK 45 billion, which corresponds to 8 per cent of Norwegian export of goods and services (export of oil and natural gas excluded). If we include drilling equipment and specialized maritime equipment, the export increases to 75 billion or 12 per cent of Norwegian export.

**80–90 %**
**of world trade is transported by sea**

China, South Korea, and Japan are the world's three largest shipbuilding countries. Together the three countries represent more than 86 per cent of the total order book[11]. The European shipyard industry is still important in specialized segments. Norwegian shipyards are international leaders in new builds of advanced offshore vessels, and ship design in the offshore segment is also an important export product.

Norwegian maritime service providers are internationally oriented businesses, with world leading businesses in finance, research, brokerage, and classification.

The industry's international nature and high share of export also lead to a high degree of local presence in foreign markets and employees from several countries. DNV GL is a good example with more than 500 offices in 100 different countries and about 16,000 employees from nearly 100 different nations.

### The significance of the global economy

The international economy is still marked by the financial crisis in 2008 and 2009. The global economy has recovered somewhat, however, development has been uneven. The growth is higher in emerging economies than in the traditional industrial countries. The sharp decline in oil prices gives lower income for oil exporting countries, but gives at the same time increased purchasing power for the importing countries. The effect on total demand is believed to be positive, so that the low oil

8) *UNCTAD Review of Maritime Transport 2014.*
9) *Statistics Norway.*
10) *Menon Business Economics, "Maritime Equipment Suppliers 2014".*
11) *Clarkson Research Services, World Shipyard Monitor – December 2014.*

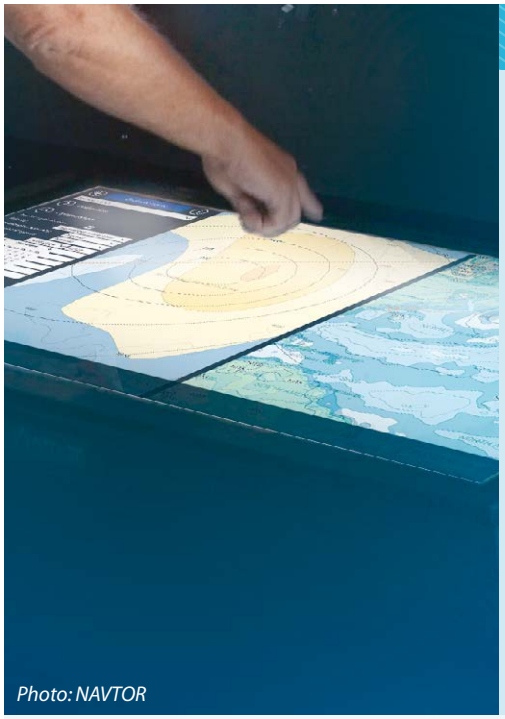


Photo: NAVTOR

## Equipment manufacturers – a diverse group

Maritime equipment is dominated by a small group of locomotives, although with a large and diverse undergrowth of smaller companies. Dominant euipment manufacturers are Rolls Royce Marine (engine and propulsion systems, etc.), Kongsberg Maritime (dynamic positioning, etc.), and MHWirth (drilling equipment).

The smaller equipment manufacturers are distributed on a wide range of specialized products for vessels and other floating devices. NAVTOR and Seonics are good examples of smaller, recently established equipment manufacturers with innovative products.

NAVTOR was established in 2011 and is currently a considerable player in maritime electronic navigation, e-Navigation. NAVTOR NavStation has been developed as the world's first digital chart table, homologated for use on a navigational bridge. On the digital chart table the vessels get online direct access to important and necessary navigational data such as electronic charts, nautical publications, and weather information for optimal and dynamic route planning.

Seaonics was established in 2011. Its headquarter is in Ålesund. The company develops and manufactures offshore handling equipment which improves all critical lifting and handling tasks. Their products are used in subsea construction, module handling, well intervention, reservoir exploration, trawling, and other specialized applications at sea. Seaonics is thus also a good example of a business that focuses across our three major ocean industries.

price will stimulate stronger growth in the global economy. IMF, OECD and other international forecasters expect an increase both in global GNP and in world trade this year and the next.

The changes now taking place in the global economy affect the shipping market both nationally and internationally. About 80 per cent of world trade is transported by sea[12]. Global financial growth and the development in world trade are the most important drivers for shipping. Since the 2000s the framework for international trade has been characterized by an increase in regional trade agreements at the expense of the development of multilateral agreements. In the aftermath of the financial crisis some countries have also implemented protectionist measures in shipping.

The drop in oil prices in the autumn of 2014 and the decline in demand from the petroleum sector globally affects the maritime offshore industry. Several institutions, including the central bank of Norway (Norges Bank) and Statistics Norway, expect the investment level on the Norwegian Continental Shelf will drop in the next few years. There is also uncertainty associated with the market prospects internationally. The tendency towards offshore vessels being laid up, employees being laid off, and deliveries of vessels at Norwegian shipyards being postponed, can have significant consequences for the Norwegian maritime cluster. [13]

The growth in international trade is expected to increase in the future.[14] The world's merchant fleet is expected to grow by 4–5 per cent in 2015. Before the financial crisis a lot of new vessels were ordered, resulting in an average fleet growth of 13 per cent per year from 2009 to 2012.[15]

The decline in the global economy due to the financial crisis together with a considerable growth in the fleet has resulted in overcapacity and a drop in the rates in the freight markets, especially in dry bulk. The rates are expected to remain low in 2015. The tank market shows signs of improvement, and a reduced order book contributes to more balance in the market. Increased oil import in Asia and possible future oil export from the US may contribute to further strengthening. The LNG fleet is increasing, but demand has been stable in 2014. New LNG facilities are completed in Australia and Indonesia in 2015, this opens for higher demand[16]. The roro market is characterized by overcapacity.

The changes in the freight markets lead to increased fragmentation of the shipping markets, which may also lead to the access to funding being more selective. Contracting is expected to follow the development in the freight markets. The order book at international shipyards is slightly increasing after a short decline in 2013. This provides overall better market prospects, also for equipment suppliers.

*12) UNCTAD, Review of Maritime Transport 2013.*
*13) The Norwegian Shipowners' Association, "Norwegian Offshore Shipping Companies – In Challenging Waters" (2015).*
*14) OECD Economic Outlook, November 2014.*
*15) Baltic Dry Index.*
*16) The Platou Report 2015.*

*Photo: Wilhelmsen*

*Photo: Thinkstock*

# 03 MARITIME POLICY FOR THE FUTURE

# Maritime Policy for the Future

**The main goal of the industrial policy is the greatest value creation possible in Norwegian economy within a sustainable framework. The Government wishes to conduct an active maritime policy which supports the overall goal of the industrial policy. Thus Norway can continue to be a leading maritime nation and an attractive maritime host country.**

The Government's main goals for the maritime industry are sustainable growth and value creation. The maritime strategy presents the Government's policy to realise the maritime potential of the ocean industries.

Central areas of the Government's further commitment to the maritime industry are: trade area limitations for NIS registered vessels, environment, maritime administration, competence and education, research, development and innovation, international regulatory frameworks, blue growth, and the High North. These constitute areas in which the Government will make an active effort in order to reach the main goal for the maritime policy. The Government has a wide set of measures, and the strategy points to a number of efforts to follow up on the Government's main priorities in these areas.

The Ministry of Trade, Industry and Fisheries is responsible for the overall maritime policy, but other ministries are also responsible for parts of the maritime policy, and several subordinate agencies have responsibilities in the area.

# 3.1. Trade area limitations for NIS registered vessels

**The Government will ensure that Norway continues to be a leading maritime nation with a large fleet registered in Norway.**

In order to maintain and further develop the Norwegian maritime industry, it is vital to ensure a considerable and competitive fleet and competence under Norwegian flag. Fewer and fewer vessels are sailing under Norwegian flag, both internationally and along the coast. At the same time there has been a significant increase in the number of Norwegian controlled vessels under foreign flag. A competitive tax refund scheme for employing seafarers is a prerequisite for ensuring the access of Norwegian operative maritime competence.

The Government wants to soften the trade area limitations for NIS registered vessels and strengthen the tax refund scheme for employing seafarers. This will contribute to more Norwegian registered vessels while ensuring adequate access to Norwegian operative maritime competence.

The Government wants to soften the trade area limitations for NIS registered vessels and strengthen the tax refund scheme for employing seafarers.

### Vessels in Norwegian ships' registers

In 1991, 896 vessels were registered in NIS. In April 2015 the number was reduced to 528 vessels. The merchant fleet in NOR has been stable. At the same time there has been a significant increase in the number of Norwegian controlled vessels under foreign flag. There are now about 1000 Norwegian owned vessels under foreign flag. This constitutes about half the Norwegian controlled tonnage.

NIS vessels have limitations as to where they may carry cargo or passengers (trade areas). Vessels registered in NOR may carry cargo and passengers between Norwegian ports. The same also applies to vessels under all other countries' registers. NIS vessels are the only ones that do not have this access. An increasing share of the Norwegian short sea shipping takes place with vessels registered outside Norway, and the share now constitutes about 2/3.

The Government has adopted a regulatory change which makes it possible for cruise ships registered in NIS to call at Norwegian ports. The regulatory change means that NIS registered cruise ships may carry passengers between Norwegian ports if specific conditions are met. In order to avoid competition with ordinary national passenger transport, one of the conditions is that the passengers cannot purchase tickets only between Norwegian ports.

### The trade area committee

In the winter of 2014 the Ministry of Trade, Industry and Fisheries appointed a committee to evaluate the trade area limitations for NIS registered vessels and the adaptation of the tax refund scheme for employing seafarers. In the autumn of 2014 the committee was assigned to undertake an additional study for the evaluation of measures to strengthen the NIS register and promote employment of Norwegian seafarers. The committee has submitted two reports, in September 2014 and January 2015.


Photo: Grieg Group

The committee has presented mutually agreed solutions for softening the trade area limitations in all three areas included in the current limitations for NIS vessels; short sea, offshore, and international ferries. This is linked with a limited expansion of the current tax refund scheme for employing seafarers. One main consideration, especially for the trade unions, has been to avoid solutions that will stimulate re-flagging from the NOR to the NIS register both in short sea and offshore shipping. On this basis an adequate tax refund scheme for NIS vessels in short sea shipping has not been proposed, and only a limited opening for NIS vessels in offshore operation has been proposed.

The committee finds that there is great potential for re-flagging vessels operating in international traffic, to NIS. In order to strengthen the competitiveness of the NIS register, the committee proposes a number of measures linked to service, usability, marketing, as well as a reduction of special national requirements.

### Softening the trade area limitations for NIS registered vessels

In order to further develop the maritime industry, it is important to ensure a considerable and competitive fleet under Norwegian flag. The Government will therefore soften the current trade area limitations for NIS registered vessels. This means that NIS vessels in short sea shipping and construction vessels in NIS are allowed up to three months' continuous operation in Norwegian waters, and that the trade area limitations for international ferries between Norwegian and foreign ports outside the Nordic region, are removed.

### Strengthening and simplifying the tax refund scheme for employing seafarers

The Government assumes that a competitive tax refund scheme is a prerequisite for ensuring sufficient access of Norwegian operative maritime competence. The Government will therefore remove the limit for maximum refunds to vessels in short sea shipping, the coastal route Bergen–Kirkenes, and international ferries in NOR. The limit for maximum refund is continued for vessels engaged in the petroleum activity; however, the limit is to be increased in line with the expected inflation in 2016.

For NIS vessels a new, common tax refund scheme will be established with a tax refund level similar to the current NIS scheme. The requirement for Norwegian minimum staffing is removed, and a refund is given from the first seafarer. The new scheme is based on paid income tax and social fees like in the current scheme for vessels in NOR. The transition to a common tax refund basis is revenue-neutral and involves simplification both from an administrative perspective and for the industry. The scheme will apply to vessels included in the current reimbursement scheme as well as for NIS vessels in short sea shipping.

Special tax refund schemes will be prepared for international ferries and construction vessels in NIS (similar to the trade area committee's proposal).

In connection with the restructuring, sailing vessels above 498 gross tonnes mainly engaged in education will be given access to a tax refund scheme corresponding to the coastal route Bergen–Kirkenes. The sailing vessels' contribution to securing Norwegian

*Photo: Maritimt Forum/Ingrid Thorseth*

maritime competence and recruiting Norwegian seafarers naturally suit the purpose of the scheme.

A new and simplified regulation and guide for the tax refund scheme are being prepared and will be submitted for consultation. The European Surveillance Authority (ESA) must be notified of the change in the tax refund scheme. This will be done through a notification of the regulatory changes. It is a goal that new regulations are to be in force as soon as possible in 2016.

### NIS registered vessels at Svalbard

The Government will propose regulatory changes so that vessels registered in NIS can carry cargo and passengers between ports at Svalbard as well as between Svalbard and the mainland. The proposal will be submitted for consultation. A regulatory change may have a positive effect on the NIS register both in re-flagging from foreign registers and in keeping currently NIS-registered vessels in NIS.

### Enactment of the subsidy scheme for the employment of seafarers

The Government will enact the tax refund scheme. The work on a legislative proposal will be initiated in the autumn of 2015, aiming at submission during the course of 2016.

**The Government will implement:**

- a limited softening of the trade area limitations for NIS registered vessels in short sea shipping
- a limited softening of the trade area limitations for NIS registered international ferries
- a limited softening of the trade area limitations for NIS registered construction vessels
- a strengthening of the NOR register's competitiveness, among other things by removing the limit for maximum refunds in the tax refund scheme for employing seafarers for NOR vessels in short sea shipping and international ferries, as well as for the coastal route Bergen–Kirkenes
- the establishment of a special tax refund scheme adapted to NIS, replacing the current reimbursement scheme. It will give tax refund from the first seafarer. At the same time it will be required that training positions are linked to the scheme
- the establishment of special tax refund schemes with a tax refund level similar to the current NOR scheme for NIS-registered passenger vessels in international traffic and construction vessels in NIS.
- the inclusion of sailing vessels above 498 gross tonnes mainly engaged in education in a tax refund scheme corresponding to the coastal route Bergen–Kirkenes.
- a proposition of regulatory changes so that vessels registered in the Norwegian International Ship Register (NIS) can carry cargo and passengers between ports at Svalbard as well as between Svalbard and the mainland.

# 3.2. Environment

**The Government wants to stimulate green growth for the Norwegian maritime industry as well as the use of environmental technology solutions and more environmentally friendly fuel for vessels.**

The Government has ambitious environmental goals for the maritime industry. In the white paper, Meld. St. 13 (2014–2015) "*Ny utslippsforpliktelse for 2030 – en felles løsning med EU*" ("*New emissions commitment for 2030 – a common solution with the EU*") the Government has pointed out environmentally friendly shipping as a priority area in climate policy.

Shipping is basically an energy efficient transport alternative for cargo transport. New technology and new solutions for operating vessels provide possibilities for future reductions in emissions from the sector. Using more environmentally friendly fuel and energy efficient vessels are key factors in reducing emissions from shipping. Norway is currently leading in the development and use of gas-powered vessels and battery powered ferries, among other things. This advantage can be utilised and developed further. A green change in the Norwegian maritime industry will be important in Norwegian climate and environmental policy, and will be able to give the Norwegian maritime industry a competitive edge.

Shipping has lately been subject to a stricter international regime with regulations limiting emissions to air and water. Requirements for emissions, together with the industry's desire to reduce costs associated with fuel consumption, causes shipping to seek ways to become increasingly energy efficient.

Internationally the tightening of environmental regulations combined with changes to market conditions has made environmental investments more attractive. It is also increasingly acknowledged that energy efficient and environmentally friendly vessels will fare better in future competition. In addition to energy efficient design, an increasing number of vessels use batteries, fuel with lower emissions, and onshore power. Nationally there has also been a considerable increase in environmental investments in shipping. One reason why an industrial environment for developing and utilizing environmental technology exists is clear and predictable environmental requirements as well as comprehensive and good policy instruments from research to market. The Government's political platform prepares the ground for this.

## Environmentally friendly fuel in Norwegian domestic traffic

Using more environmentally friendly fuel to solve the environmental challenges of shipping will lead to a considerable reduction in greenhouse gas emissions, air pollution, and emissions to the sea. Emissions of nitrogen oxides (NOx), sulphur oxides (SOx), black carbon (BC), and particles (PM) contribute to damaging health and the environment, while CO2 is the main greenhouse gas emitted by shipping. According to Statistics Norway's emission statistics, which is mainly based on the sale of fuel to the shipping industry, shipping and fisheries represent about 6 per cent of Norway's total emissions of greenhouse gases, and more than 20 per cent of the NOx emissions, and this is included in Norwegian emissions commitments and reports. New technology has made it possible to identify emissions from vessels on the basis of observed activity. Calculations made using this method indicate that emissions from domestic shipping are higher than the estimate in Statistics Norway's emissions statistics. [17] Several types of environmentally friendly fuels are available for maritime use as alternatives to the diesel oils which are mainly used today. Gas (LNG), bio fuel and electricity, including onshore power and hybridisa-

*17) Source DNV GL "Compilation of basic data on current maritime transport and fuel consumption") (report No.: 2014-1667). The method in the report can be used as the basis for the continued work with the emission accounts nationally and internationally.*

| | LNG | Bio fuel | Electric | Onshore power |
|---|---|---|---|---|
| Reduction of greenhouse gases | Moderate | High** | Very high | Low* |
| Reduction of NOx | High | Negative*** | Very high | Low* |
| Reduction of SOx | Very high | Very high | Very high | Low* |
| Investment cost | Moderate | Low | High – expected to decrease | Moderate |
| Fuel cost | Low | High – expected to decrease | Low | Low |
| Accessibility (incl. infrastructure) | Good | Low | Moderate | Moderate |

**Only 7% of emissions from vessels take place in port, and the potential to reduce national emissions using onshore power is thus limited, however, it may reduce local air pollution, especially particulates and NOx, in some areas during the time the vessels are in port.*

*** Assuming that requirements are made for documented sustainable production and reduced emissions in a life cycle perspective compared to fossil.*

**** Not for biogas; the reduction is as for LNG.*

Table 2: Qualitative evaluation of some of the key parameters associated with fuel alternatives in relation to diesel. Dark green colour indicates a favourable rating, followed by light green, yellow, orange, and red. Red indicates an unfavourable rating. *Source: Based on DNV GL.*

tion, are considered to have the greatest potential. LNG gives no sulphur or particle emissions and involves a considerable reduction of NOx, while electricity reduces both climate and environmental emissions considerably.

Analyses made by DNV GL[18] show that the increased use of more environmentally friendly fuel, in addition to reductions in emissions, can also lead to business development. In order to stimulate the industry to invest in the green change, it must be profitable for the participants to use environmentally friendly technology.

## Onshore power

Onshore power can be a specific measure to reduce local pollution from vessels. Since the emissions being reduced take place in port, this will particularly reduce particulates and NOx in local air pollution in some areas during the time the vessels are in port[19]. Only 7 per cent of emissions from maritime transport take place in port, so that the potential for reducing the national emissions with the help of onshore power are limited.

## Short sea shipping – renewal of the fleet

The traditional short sea fleet transporting goods along the Norwegian coast, consists of many old vessels. There is a strong desire in the industry to renew the fleet. There are about 1,000 vessels in the short sea fleet. Out of these, about 500 vessels are part of the cargo fleet; about 350 are ferries, while a good 160 are other vessels.

Propel AS, is collaboration with Vista Analyse, were commissioned by the Ministry of Trade, Industry and Fisheries to carry out an assessment in 2015 of a subsidy scheme for the condemnation of vessels: "*Utredning av tilskuddsordning for kondemnering av skip*» ("*Assessment of a subsidy scheme for the condemnation of vessels*").

Propel's report shows that the increased scrapping of vessels has a potential for making the fleet more environmentally friendly, however, it is a measure on its own only to a limited extent to invest in new vessels. The Ministry will now evaluate the report further, also for the purpose of ensuring the potential for environmental improvement in the renewal of the fleet.

The short sea shipping fleet may use the policy instruments in connection with investments in new vessel on the same basis as other industries. However, due to low profitability it will be a challenge for part of the industry to gain access to current instruments.

Fulfilment of the objective to transfer the transport of goods from road to sea depends on the short sea shipping fleet. Fewer heavy vehicles on Norwegian roads will give both road safety and environmental benefits. One of the goals of transferring goods is to streamline goods transport and reduce external costs in order to facilitate competitive and sustainable transport distribution in the goods transport sector.

Since its start in 2003, Short Sea Promotion Centre has given relevant businesses increased knowledge of the offer of short sea shipping, and is considered a competence centre for short sea shipping, communicating neutral market information and contributing to increased focus on intermodal transport.

On 21 January 2015 the Government presented a national port strategy, and has already implemented a number of measures which can strengthen sea transport and in the long term contribute to the transfer of goods. These are subsidy schemes for port collaboration, streamlining of the pilotage service, strengthening

*18) Source DNV GL "Evaluation of measures for more environmentally friendly fuel in the shipping industry") (report No.: 2015-0086).*

*19) Source DNV GL "Compilation of basic data on current maritime transport and fuel consumption") (report No.: 2014-1667).*

## Onshore power: Good for the environment

With support from Enova, and formerly Transnova, the NOx fund and respective ports, Color Line has built onshore power facilities in both Oslo and Kristiansand. The onshore power facility will contribute to a more sustainable and environmentally friendly operation of vessels bunkering in Kongsgårdbukta. The facilities will reduce CO2 emissions by 2,300 tonnes per year, which corresponds to the emissions from 1,300 cars per year. The emissions of NOx, SOx, and particulates will be considerably reduced. Noise from the vessels will also be reduced.

> Using more environmentally friendly fuel and energy efficient vessels is a key factor in solving the environmental challenges of shipping

of the Norwegian Coastal Administration as a transport agency, 10 per cent of the returns on the infrastructure fund to maritime transport in 2015, national port strategy for more efficient ports, and tax discounts for environmentally friendly vessels.

The Government will facilitate the development of ports into efficient hubs that appear attractive to goods owners and transporters. Key measures identified in the port strategy are the simplification of port structure, development of efficient, intermodal hubs through strengthening the backbone port regime, facilitating stronger and more robust ports, as well as developing a regulatory framework for port capital facilitating market oriented ports for the benefit of maritime transport. There are ongoing efforts to improve the scientific basis for decisions in preparing better port statistics and statistics for transport.

The Government will stimulate the transfer of goods from road to sea, also in the work on the National Transport Plan by evaluating a temporary subsidy scheme for the transfer of goods directed towards businesses electing to use maritime transport rather than land transport.

### Measures for green shipping

#### Fees and charges

Maritime transport is subject to many different fees and charges. The total proceeds from fees and charges paid by shipping are estimated to NOK 1.6–1.7 billion for 2015, of which approximately NOK 1 billion are user payments for public services. Environmental fees are important for a climate and environmentally friendly maritime transport. International maritime transport depends on an internationally level playing field, and is therefore exempt from these environmental fees. Commercial vessels are exempt from the basic tax on mineral oil, but they pay the CO2 tax. The Government will ensure a tax and fee regime which strengthens environmentally friendly short sea shipping. In the Pilotage Act Prop. 65 L (2013–2014) "*Act relating to the pilotage service*" and in Parliamentary bill (Prop. 1 S (2014-2015)) for the Ministry of Transport and Communications it is stated that the Government will consider reducing the fees for the Norwegian Coastal Administration as a means to promote local shipping. From 2015 the pilotage tax is environmentally differentiated.

#### The NOx agreement

The NOx fee was introduced in 2007 to stimulate reductions in emissions. The parlament's (Storting's) tax resolution allows for businesses to be eligible for tax exemptions if they are covered by an environmental agreement with the government on NOx reducing measures (the NOx agreement). Through the agreement the industry organisations commit themselves to contribute to the reduction of NOx emissions. Businesses joining the agreement also commit themselves to make payments to the business sector's NOx fund. The NOx fund has channelled funds for reduction of emissions from vessels. The current NOx agreement is valid until the end of 2017. The business associations have addressed the Ministry of Climate and Environment wishing to extend the agreement. The Government is planning to negotiate with the associations for a new agreement as the basis for further exemptions for the NOx fee after 2017. Negotiations can start as soon as the Government has more clarity on the level of Norway's international emissions commitments, including any new ones, from 2030.

#### Enova

Enova is an important means to further an environmentally friendly restructuring of energy production as well as contribute to the development of energy and climate technology. This is mainly done through financial support and consultancy. From 01 January 2015 Enova took

*Illustration: DNV GL – Green costal traffic programme*

### Green coastal traffic programme

DNV GL is behind the initiative "Green coastal traffic programme», where the industry and the authorities are to make the Norwegian shipping fleet and Norwegian shipping more environmentally friendly and efficient. In order to strengthen collaboration between the industry and the authorities, the Minister of Trade and Industry, the Minister of Climate and Environment, and the industry signed a declaration on collaboration which aims to ensure that environmentally friendly fuel is used to a greater extent by the maritime industry. 18 organisations participate in the programme; among these are Statoil, Posten/Bring, and Kongsberg Maritime.

over the responsibilities of Transnova, and transport continues to be an important focus area.

### Innovation Norway

The environmental technology scheme in Innovation Norway is to contribute to commercialize research projects in environmental technology by giving investment grants to pilot and demonstration projects in all types of businesses. Since the environmental technology scheme was established in 2010, risk protection in the form of grants has been allocated at a total of NOK 1.04 billion to 237 projects. Projects in the maritime sector have been granted NOK 78.3 million in support during the first five years of the environmental technology scheme. About 70 per cent of the allocations have been to climate relevant projects.

### The Research Council of Norway

The MAROFF programme and the SkatteFUNN scheme contribute to realizing the Government's maritime focus for promoting environmentally friendly value creation. Environment is one of the main priority areas of the MAROFF programme. In 2014 a total of NOK 85 million were allocated to environmental projects through these schemes. A new transport programme, Transport 2025, is to contribute to new knowledge and innovations for the development of future transport systems for road, rail, sea, and air, including passenger transport and commercial transport. The programme is to contribute to a more sustainable transport system within financial, social and environmental frameworks. Among the programme's priority areas, the following are particularly significant to shipping: competitive Norwegian business sector, higher transport security and liability, better climate and environment, future-oriented infrastructure, and the overall perspective of the transport system.

### Ferry tenders and zero emission technology

There are currently 102 county road ferry services and 17 state road ferry services. The ferry services have been and are important players for implementing new, environmentally friendly technology. The technological development leading to low and zero emission solutions being applied in ferry operations could contribute to lower costs for using such solutions in shipping. The Government is to ensure that all future tenders on state road ferry services have requirements for zero emission technology, when the technology warrants this. The Government will make requirements to low emission and zero emission technology in ferry tenders when technology warrants it. It will be further evaluated how it can be ensured that similar technologies are phased into county municipal ferry operation.

### The Norwegian Maritime Authority

Good competence in the Norwegian Maritime Authority is of great importance for the directorate's ability to be an active partner when the industry proposes new, environmentally friendly solutions for vessels. The Norwegian Maritime Authority must be able to offer its clients a predictable and efficient process when the industry wishes to build vessels with new climate and environmentally friendly solutions. The Government will therefore enable the Norwegian Maritime Authority to strengthen its competence on new, climate friendly solutions for shipping.

### International environmental regulatory framework

The biggest environmental improvements can be achieved through international environmental requirements laid down in IMO, and where a market for good environmental solutions can be created. Norway is a driving force in developing a good international framework for climate and environmentally

Photo: Samferdelsfoto

## Norled's "Ampere"

Norled AS operates the world's first fully electric car ferry, which was developed at Fjellstrand AS in Omastrand. The ferry is of the type ZeroCatTM120, and it has serviced the route Lavik–Oppedal since February 2015. The ferry has a capacity for 120 cars and 360 passengers, and it operates with a speed of approximately 10 knots. Passage time is 20 minutes. Low energy consumption is the most important feature for the ferry to be able to operate on battery only. The ferry is therefore built in aluminium and has a catamaran hull. All systems are optimized for low energy consumption. The ferry is the result of broad international collaboration.

friendly shipping. The international environmental regulatory framework has become significantly more restrictive in the last 15 years. Intensification of air pollution requirements and the establishment of energy efficiency requirements are among the most important changes. Norwegian authorities also strive to ensure that new, environmentally friendly solutions also have good safety requirements, and are now particularly involved in international regulatory development for safe storage and bunkering of LNG. In collaboration with other countries the Government will work to improve the environmental requirements for vessels. The most important thing is to succeed in establishing second generation climate requirements for international shipping. The first climate requirements became effective on 01 January 2013. Among other things, they made energy efficiency requirements for new builds (design requirements). There are currently negotiations for the establishment of requirements for monitoring and reporting the vessel's emissions of greenhouse gases, as well as the establishment of requirements that will entail more energy efficient operation of vessels. It is also important that IMO's strictest NOx requirements are introduced in more areas than today. North Sea countries and the Baltic countries are working together to present such a proposal in the IMO.

## The Government will:

- continue and further develop instruments supporting R&D, piloting, and commercialisation of solutions for a more environmentally friendly shipping industry, including measures like energy efficiency measures, LNG hybrid solutions, bio fuel, and zero emission solutions such as electrical operation.
- plan to negotiate with the associations for a new agreement as the basis for further exemptions for the NOx fee after 2017.
- make requirements to low emission and zero emission technology in ferry tenders when technology warrants it. It will be further evaluated how it can be ensured that similar technologies are phased into county municipal ferry operation.
- have Enova develop cost-effective instruments supporting investments in environmental and climate initiatives in the transport sector, including the maritime sector.
- stimulate the transfer of goods from road to sea, also in the work on the National Transport Plan by evaluating a temporary subsidy scheme for the transfer of goods directed towards businesses electing to use maritime transport rather than land transport.
- in collaboration with the port owners develop an overall plan for increased use of onshore power in Norwegian ports, including funding and other means to achieve this.
- consider changes in environmental fees in order to stimulate cost-effective emission reductions in shipping.
- consider introducing a temporary scrapping scheme for Norwegian registered vessels in order to improve the environmental standard of the fleet.
- enable the Norwegian Maritime Authority to strengthen its competence on new, climate friendly solutions for shipping. The goal is a predictable and efficient process for licencing of vessels built with innovative climate and environmentally friendly technology.
- target the work in IMO to further develop a climate and environmentally friendly international regulations.
- work with the EU on a regulatory framework for environmentally friendly shipping, including facilitating the development of necessary infrastructure for supply.

# 3.3. Maritime Administration

**The Government will ensure an efficient and customer oriented maritime administration and competitive ships' registers.**

Norwegian shipping administration is handled by the Norwegian Maritime Authority. The Norwegian Maritime Authority has the main responsibility for safety and environment with regard to vessels and crews, and performs inspection and supervision of Norwegian and foreign vessels and crews. The Norwegian Maritime Authority is also responsible for ensuring legal protection for Norwegian registered vessels.

Shipping companies can freely choose in which countries they wish to register their vessels. The choice of ships' register/flag is mainly about factors such as quality and service in maritime administration, cost level of crews and other framework conditions, as well as special national requirements in the register, if any. The emergence of international, commercial ships' registers in recent years has caused shipping companies to be defined as clients for which the registers compete. This means that the Norwegian Maritime Authority is exposed to competition, and that service, availability and competence is continuously measured against the quality of the services of the maritime administrations of other countries.

The trade area committee has proposed measures to strengthen the competitiveness of the NIS register, including simplification of the legislative framework/ interpretations as well as other administrative measures.

The Government emphasizes the important role of the Norwegian Maritime Authority in the maritime Norway while pointing out areas where the directorate requires special attention in the future in order to stay competitive.

### The preferred maritime administration

Norwegian maritime administration shall be client oriented, efficient, and highly competent. In order for the Norwegian Maritime Authority to be a preferred partner for its clients, the employees must have correct and updated competence in relation to the industry's needs. Interacting with the industry, competent employees will be able to work towards Norwegian competence and innovation setting the standard in international legislation through its work in IMO.

### Digitizing, service and simplification

The Norwegian Maritime Authority has already streamlined the submission of documents for vessel registration so that clients now can submit a number of documents in electronic form. Electronic reporting in other important areas has also been facilitated. The efforts on simplification through digitizing are to be continued.

The maritime industry is international and often operates in other time zones. In the 2015 national budget, NOK 5 million were allocated to the establishment of 24-hour service for handling inquiries related to Norwegian registered vessels. The system is established and will be evaluated to see if it works as intended. An extension of the on-call system is also justified by a desire for better service and increased availability. Frequent contact meetings between the Norwegian Maritime Authority and the industry are also a central part of the Norwegian Maritime Authority's efforts towards customer attention and service.

## The Norwegian Maritime Authority

The Norwegian Maritime Authority is the administrative and supervisory authority for work concerning the safety of life, health, environment, and material assets on board vessels with Norwegian flag and foreign vessels in Norwegian waters. The directorate is also responsible for ensuring legal protection for Norwegian registered vessels and the rights in these. The clients of the Norwegian Maritime Authority are seafarers, shipping companies, shipyards, educational institutions, banks and financial institutions, as well as other parts of the Norwegian maritime industry.

The Norwegian Maritime Authority has its headquarters in Haugesund, seven regions with supervisory offices along the coast, and a separate department for the ships' registers NIS and NOR in Bergen. The directorate is placed under the Ministry of Trade, Industry and Fisheries and the Ministry of Climate and Environment (environmental matters), and has a total of 320 employees

**Main responsibilities are:**

- registering vessels and rights in vessels
- supervising the building and operation of vessels with Norwegian flag and their shipping companies
- issuing certificates for seafarers
- supervising foreign vessels in Norwegian ports
- supervising working and living conditions on board vessels
- developing Norwegian and international regulatory framework
- promoting Norway as a flag state
- managing subsidy schemes on behalf of the Ministry
- monitoring risk exposure
- educational and preventive efforts to reduce the number of accidents both in the leisure fleet and the commercial fleet

### Promoting Norwegian ships' registers

The Government wishes to reverse the negative trend in the number NIS registered vessels. The Norwegian Maritime Authority works nationally and internationally to promote NIS as a quality register towards shipping companies. This is to continue.

### Clear regulatory framework

A clear and user friendly regulatory framework contributes to reaching the goal of being an efficient and customer oriented administration. The regulatory efforts of the Norwegian Maritime Authority includes international regulatory development, implementation in Norwegian legislation, own initiated regulatory development and enforcement of the regulations.

The regulatory development takes place mainly through international conventions. In the past few years, the Norwegian Maritime Authority has worked on and implemented simplification of the national regulatory framework. Norwegian authorities are focused both on removing and on not introducing new special requirements[20] for vessels in Norwegian registers. The work on simplification, improvement and harmonization of the regulatory framework is to continue.

### Bareboat registration

The trade area committee has pointed out that many flag states open for so-called bareboat registration, where a vessel registered in one state, is also registered in another state.[21] However, bareboat registration is not allowed according to Norwegian laws.

In the Stokke Committee's report "*NIS med fokus på service og kvalitet*" ("*NIS with focus on service and quality*") (2004) it was proposed that both bareboat flagging-in to NIS (bareboat flagging-in) and flagging out from NIS to other countries' ships' registers (bareboat flagging out) were to be allowed. The trade area committee in its report share this view and it is pointed out that all larger registers open for this. It is also pointed out that access to bareboat registration may send a signal that the NIS register has gotten rid of a special requirement. In the committee's opinion, this may strengthen the total appeal of the NIS register. The committee therefore proposes that bareboat registration is allowed, both in and out. The Government agrees with the committees' assessment and will consider opening up to bareboat registration both in and out.

*20) Special requirements are to be understood as requirements in addition to those following from the international regulatory framework that applies to the vessel. The international regulatory framework leaves it up to the flag state to regulate further details in some cases. Such regulations could be perceived as special regulations in some cases.*

*21) Bareboat-registration*

## Services which may be reported electronically to the Norwegian Maritime Authority:

- applications for vessel certificates and inspections with an estimate of 4,000 transactions per year
- applications for personnel certificates and inspections with an estimate of 33,000 transactions per year
- refund applications in accordance with the tax refund scheme for employing seafarers with an estimate of 2,500 transactions per year
- reporting of accidents with 500 transactions per year

*Photo: Norwegian Maritime Authority*

## The Government will:

- continue the development of simple electronic information access and electronic portal pages in the Norwegian Maritime Authority.
- continue promoting NIS as a competitive register.
- consider opening for bareboat registration (both in and out).
- remove unnecessary prohibitions and injunctions specific for Norway.

> The Norwegian Maritime Authority shall be a preferred partner for its clients

# 3.4. Competence and Education

**The Government will strengthen the Norwegian maritime industry's access to qualified personnel.**

The access to competence is vital to maintaining and developing competitiveness and value creation in the maritime industry. In the maritime cluster, practical experience from the sea, linked with research based knowledge, is a key to technology development and innovation throughout the value chain.

The industry depends on qualified labour in anything from banking, trade, consultancy, manufacturing, technology development, finance, shipping, stock-broking, classification, research, and teaching. In order for Norway to maintain its position as a world leading maritime nation, one must strive for higher quality in maritime education, cf. for example Maritimt Forum's report "*Maritim utdanning for sjøbaserte yrker*" ("*Maritime education for sea based professions*») (2014).

### Maritime education in Norway

Maritime education is offered at six institutions for higher education in Norway: Buskerud og Vestfold University College, Stord/Haugesund University College, Ålesund University College, University of Nordland, University of Tromsø, and the Norwegian Naval Academy in Bergen. The Nordic Institute of Maritime Law at the University of Oslo offers research and training in maritime law. Maritime education is also offered at 21 upper secondary schools and 13 maritime vocational schools. There are also 103 safety centres in Norway, both privately owned and affiliated to public educations institutions offering courses, training and consultancy in fields relating to health, environment and safety based on IMO conventions.

### Recruitment needs

Figures show that the number of applicants for maritime education has declined in the past few years. It is therefore necessary to continue the efforts to recruit skilled and motivated students.

Recruitment initiatives, such as the portal www.ikke-foralle.no, the trainee programme Maritim Trainee, and Ocean Talent Camp have contributed to making career options in the maritime industry at sea and in the land based industry and services sectors visible.

Also, the development in the number of candidates in the candidate database shows that more and more complete naval officer training.

Seafarers are also in demand in land based maritime businesses. The NHO competence survey 2015 shows that 65 per cent of the member businesses of NHO Shipping express a great need or some need for vocational skills in the future. The need for new seafarers depends on the market situation. A weaker demand for offshore and shipping services under Norwegian flag may reduce the need for new seafarers.

### Technology and science

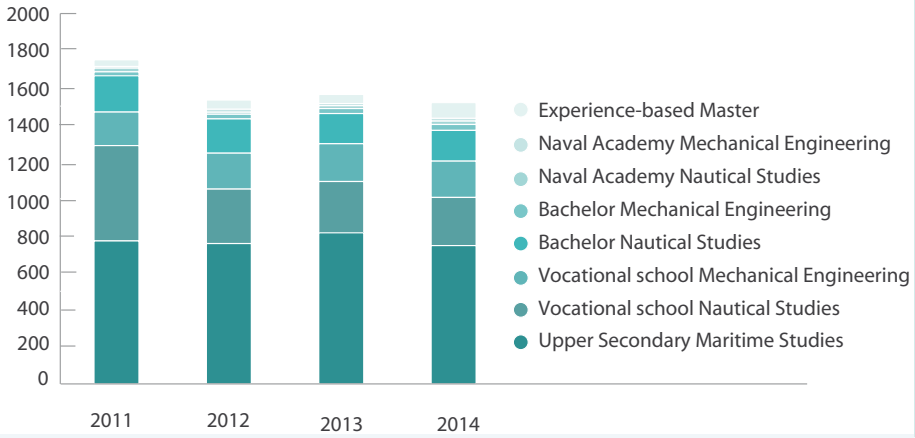
Technology and science are particularly important educations for the maritime industry. The Norwegian maritime industry is specialized and has advanced production competing in technology and innovation. Streamlining production methods and product development also involves the need for increasingly advanced competence in technology.

It is therefore positive that there has been a steady rise in the development of the total number of admissions to technology and scientific subjects in the past few years, so that more candidates are educated in the future.

### MARKOM2020

MARKOM2020 is a development project for maritime competence established by the Ministry of Education and Research in 2011. The main goal is to lift the education to a higher and more specialized level while providing world class education.

Figure 4: Accumulated national admission maritime education, all levels, 2011–2014
*Source: The Directorate of Education, Database for statistics on higher education (DBH), Markom2020 and the Norwegian Naval Academy.*




## World Maritime University (WMU)

Highly trained personnel in government administration, ports and shipping companies are also important to global maritime safety. World Maritime University, administratively placed under the UN maritime agency IMO, has an important role in educating case officers and managers from developing countries within the maritime sector. Norway resumes the support to WMU and will sign a two-year agreement in the range of NOK 4.5 million per year. The support is earmarked for scholarships for students from priority countries. By supporting the WMU, Norway contributes to ensuring the necessary competence enhancement in areas important to Norway and other maritime nations. WMU is also an important tool for developing networks between relevant institutions in countries which have had students at WMU, and thus contributing to collaboration between nations in an area that gets increasing attention, and which is important for managing the seas in a broad sense.

The project includes the university colleges in Ålesund, Stord/Haugesund, Buskerud and Vestfold, as well as the University of Tromsø. Since 2013 the maritime vocational schools have been integrated through the sub project MARFAG2020.

MARKOM2020 has contributed to strengthening collaboration on educational materials, teaching, and recruitment. The formal competence among the academic staff is significantly raised. The institutions have established specialized bachelor and master programmes with different profiles. In 2014 the efforts to build a common national degree for researcher education in maritime operations towards 2020 were started. The researcher education will create lasting partnerships between the four MARKOM2020 institutions and regional maritime businesses.

MARFAG2020 is to manage and coordinate targeted quality and competence enhancing efforts in vocational schools. Preliminary experiences in vocational schools indicate that collaborating on common challenges and towards common goals contribute to greater interaction and efficiency in vocational schools, so that resources are utilized better.

The Government will continue and develop MARKOM2020 so that universities, university colleges and vocational schools develop their academic collaboration further with regard to quality enhancing efforts, competence development and collaboration with the business community.

### Upper secondary education

The most important maritime subjects in upper secondary education are sailor studies and motorman studies, which are offered at 21 upper secondary schools. Many of the schools share premises with vocational schools. Where collaboration between schools works well, this gives an enabling and inspiring academic environment. Development in the number of applicants is positive. In 2002 there were 625 applicants. In 2015 this had increased to 883.

In the report from Maritimt Forum in 2014 – "Maritim utdanning for sjøbaserte yrker" ("Maritime education for sea based professions") it is pointed out that the quantitative offer of maritime education at the upper secondary level is good, however, the need for future recruitment of teachers, the need for more updated learning materials, including electronic materials, and apprenticeships in businesses are emphasized as important challenges.

### Qualification and increased recruitment of vocational teachers

There is currently a lack of qualified vocational teachers in several study programmes, such as technical and industrial production, which educates skilled maritime workers. If the current trend in number of applicants for vocational teacher education continues, the lack of qualified teachers will increase within a few years.

In order to reduce the number of employees in teaching positions who are not trained teachers, the Government will implement specific competence measures. A scholarship programme is to be implemented for those who work in schools, have relevant competence and wish to become teachers. The Ministry of Education and Research will spend eight million NOK on this in 2015. The goal is that vocational teachers should be able to update their competence regularly, so that students learn more.

### More relevant vocational training offers

The Ministry of Education and Research is now conducting a review of vocational training which will also have an impact on quality and relevance in maritime

## The STCW Convention[22]

The STCW Convention in IMO requires that all activities related to training, evaluation and documentation of competence regarding the qualifications of seafarers shall be approved and continuously monitored, and that it is documented in a quality standard system. The Norwegian Maritime Authority is the controlling authority towards the Norwegian education and training institutions regarding the implementation of the STCW requirements. In the syllabi for maritime education it is required that the students cover the theory requirements for the certificates, which means that the Norwegian Maritime Authority's executive certification authority will be an important premise provider for the contents of the education.

Photo: Kongsberg

studies. A full review of the supply structure of vocational training has been initiated in order to ensure better relevance between what schools/counties offer, and the competence needed in the labour market. A new supply structure is to be proposed by the Directorate of Education.

### Surveying the equipment situation in upper secondary schools

In order to ensure quality in education and relevant equipment for the professions for which the schools are to prepare their students, the Ministry of Education and Research is now performing a survey of the equipment situation in upper secondary schools. The report will be submitted by the end of 2015, and it will form the basis for discussions with school owners, that is county municipalities, on improvement initiatives.

### Vocational school education

Recruitment for, quality and organisation in technical and maritime vocational training are very important to the maritime industry. It has been suggested that it is a challenge to cover the learning requirements of the STCW Convention in a two-year vocational education, particularly with regards to Mechanical Engineering.

In the summer of 2013 a committee was therefore appointed in order to review vocational school education in Norway and propose a new and comprehensive policy for the vocational school sector. In December 2014 the committee submitted NOU (green paper) 2014:14 "*Fagskolen – et attraktivt utdanningsvalg*" ("*Vocational school – an attractive choice in education*"). The committee proposed several measures in connection with admission rules, quality assurance, and development. A new funding scheme has been proposed for the reintroduction of government funding of vocational schools and reduce the number of vocational schools in order to create more robust academic environments and strengthen quality. In the spring of 2015 the report was out for a broad consultation. On this basis the Ministry of Education and Research wishes to present a white paper on vocational school education.

The Government will transfer the responsibility for funding of the public vocational schools to the government, and will in this context evaluate the funding if maritime vocational education. Through MARKOM2020 the Ministry of Education and Research will contribute to strengthening maritime vocational education, through MARFAG2020.

### Higher education

If the maritime industry is to be able to compete internationally, it is necessary to strengthen the quality of higher education, improve recruitment and facilitate good collaboration between universities, university colleges and the business community. There are several ongoing national processes which can contribute to strengthening educational areas which are relevant to maritime knowledge and competence, associated with structure as well as funding. The Ministry of Education and Research also intends to submit a report on quality in higher education by 2017.

### Structure in higher education

Several evaluations and reports have pointed out the problem of the Norwegian university and college sector having too many small and scattered academic environments in education and research. There are too many study programmes with too few students and too many singular courses at many institutions. This means that resources and efforts are spread too much. In the spring of 2015 the Ministry of Education and Research presen-

*22) The International Convention on Standards of Training, Certification and Watchkeeping for Seafarers.*

**The Y-way**

The Y-way is a programme that gives people with vocational education and craft certificates an opportunity to pursue higher education without having general admission. The courses are adapted for people with vocational background, and the graduates are highly sought after in the business community. Admission through the Y-way for students in nautical studies is offered at Ålesund University College, Stord/ Haugesund University College, and the University of Nordland.

> In the maritime cluster, practical experience from the sea, linked with research based knowledge, is a key to technology development and innovation throughout the value chain

ted a white paper on structure in higher education, Meld. St. 18 (2014–2015) "Konsentrasjon for kvalitet. Strukturreform i universitets- og høyskolesektoren ("*Concentration for quality. Structural reform in the university and college sector*"). The proposals of the white paper will mean that the institutions currently offering maritime education will be part of larger academic environments. This could contribute to better quality of education and research as well as more efficient use of resources.

In the 2015 national budget the Ministry of Education and Research allocated four new recruitment positions to maritime education which may be used for Ph.D. studies and postdoc. The Government will allocate new recruitment positions for maritime education in connection with the implementation of the long-term plan for research and higher education.

### Funding of universities and university colleges

Maritime education is equipment-intensive. Close monitoring by specialist personnel is a prerequisite for training students on advanced machines. This is the reason why Maritimt Forum and MARKOM2020, among others, have proposed that maritime professional studies are raised from Category E to Category B in the student funding system. The Ministry of Education and Research appointed an expert group in 2014 to review the funding of universities and university colleges. The group was asked to evaluate the effects of the current funding model and how it affects the priorities of the institutions, as well as present specific recommendations for how universities and university colleges should be funded in the future. The expert group submitted its report on 07 January 2015.

The expert group proposes that the main features of the current funding system are continued. They propose some changes as to what is given financial rewards, such as rewards for graduating candidates, strengthening the incentives for focusing on quality in research, and reducing the number of educational categories in the funding system from six to four. In connection with the efforts to follow up on the funding of universities and university colleges, the placement of maritime education will be assessed. The Ministry of Education and Research will follow up on the proposals in connection with the national budget for 2016.

A progressive maritime higher education requires modern equipment and updated simulator capacity and other systems. This requires that the institutions invest in infrastructure. Close collaboration with the business community has been important for the institutions to be able to have relevant and updated equipment. The Government will consider strengthening the grants for equipment in maritime education to ensure that candidates have competence corresponding to the industry's needs.

### Interaction between education and the industry

Interaction between educational and research environments and economic and business life is vital for graduates and research results to contribute to increased innovation and adaptability in private enterprises and the public sector. Through contact with the industry education is adapted to the needs of society, while new knowledge and new ideas enter the industry through research collaboration.

The participants in the maritime industry must assume the responsibility of having close dialogue with the institutions that are most relevant with regard to which types of specialisation the maritime industries need, and discuss matters regarding relevance, quality, and recru-


Photo: Farstad Shipping ASA

itment in education. The Government will contribute to collaboration between the business community, educational institutions and authorities in order to ensure an optimum scope, relevance, and academic quality in maritime education. In order to ensure recruitment of teachers for maritime subjects and strengthened links to the practice field, the educational institutions and the industry should enable personnel with operative practical experience to be involved in teaching more often.

Innovation Norway also offers an initiative to contribute to making it easier for regional educational institutions to provide competent labour adapted to the competence needs of regional business environments. The Government will strengthen the access to competent labour in regional maritime business environments through the programme "Kompetanseutvikling i regionale næringsmiljø" ("*Competence development in regional business environments*").

The access to competence is vital to maintaining and developing competitiveness and value creation in the maritime industry

The Nordic Institute of Maritime Law at the University of Oslo (NIFS) is the leading centre of expertise in the Nordic region for research and teaching in Maritime Law, Petroleum Law and related subjects. The maritime law research community in Oslo contributes to Norway's leading position in shipping and maritime law, and has contributed to emphasizing and promoting Norwegian legal solutions in maritime legislation. Research and educational programmes under the auspices of NIFS contribute considerable expertise to the maritime administration in Norway.

### Access to maritime training positions

The reputation of the maritime profession is positive, and the industry has almost doubled the number of training positions in the past ten years. The growth has still been so rapid that the industry is not able to provide an adequate number of training positions.

Shipping companies covered by the tax refund scheme contribute to training initiatives for seafarers, and are required to have an average of two apprentices in training per vessel during the year, as well as pay NOK 500 per refund recipient per month to the competence fund of the Norwegian Maritime Competence Foundation (SNMK).

Payments from the fund have contributed to a positive development in the number of training positions, with an increase from about 1,000 training positions in 2004 to nearly 3,100 by the end of 2014.

In connection with the implementation of the trade area committee's report about the trade area limitations for NIS vessels and the tax refund scheme, the Government will evaluate initiatives which could contribute to more apprenticeships/cadet positions.

In order to simplify the cadets' options to acquire the necessary years of experience to obtain a certificate, the Norwegian Maritime Authority will allow that most of the experience can be acquired in trade areas 1 and 2 in domestic scheduled traffic. Specific parts of the training must take place in larger trade areas in order to fulfil the requirements of the STCW Convention.

## Competence development in regional business environments

Through the programme "Competence development in regional business environments" the Maritime Association of Sogn og Fjordane and NCE Subsea engaged in collaboration on developing the maritime and petroleum oriented business community in Sogn og Fjordane. This is to be done by establishing active interaction between the business community and educational institutions, both on regional and national levels. The project also contains a number of specific goals and activities which will contribute to improving the maritime industry's access to relevant competence. Businesses are to contribute with several specific challenges for bachelor's and master's theses, supplementary education programmes are to be established for existing employees, and existing educational programmes at regional university colleges are to be adapted to become more relevant.

*Photo: Maritimt Forum/Ingrid Thorseth*

### Increased apprenticeship grants

In the past two national budgets, the Government has increased the grants to businesses offering apprenticeships with a total of NOK 7,500 per apprentice contract, which is expected to result in even more apprenticeships.

### Using apprenticeship clauses in government procurements

The Government will tighten up the requirement to the use of apprentices in government contracts by requiring that suppliers to the public sector shall use apprentices. This is an important signal that public enterprises wish to support businesses that focus on the long-term development of skilled workers and professional expertise, and will apply to both Norwegian and foreign providers. Requirements may be applicable to government procurements in the transport sector, for ferries and other sea based transport services provided to municipalities, counties and state.

### The armed forces

The Norwegian Navy is a net provider of highly qualified maritime competence to the civilian maritime industry. The armed forces are one of the country's largest maritime apprentice companies. Increased competence flow between the civilian and military maritime sectors and increased co-operation between civilian and military education are desired.

### The Government will:

- continue and develop collaboration project MARKOM2020 so that universities, university colleges and vocational schools develop their academic collaboration further with regard to quality enhancing efforts, competence development and collaboration with the business community.
- through MARKOM2020 the Ministry of Education and Research will contribute to strengthening maritime vocational education, cf. MARFAG2020.
- transfer the responsibility for funding of the public vocational schools to the state, and will in this context evaluate the funding of maritime vocational education.
- in connection with the efforts to follow up on the funding of universities and university colleges, the funding of maritime education will be assessed.
- allocate new recruitment positions for maritime education in connection with the implementation of the long-term plan for research and education.
- contribute to close collaboration between the business community, educational institutions and authorities in order to ensure optimum sizing, relevance, and academic quality in maritime education.
- encourage education providers to strengthen maritime competence also in relevant educational areas other than maritime education.
- in connection with the implementation of the trade are committee's report and additional study evaluate initiatives which could contribute to more apprenticeships/cadet positions.
- strengthen the access to competent labour in regional maritime business environments through the programme "Kompetanseutvikling i regionale næringsmiljø" ("Competence development in regional business environments").
- consider whether stricter requirement shall be made for the use of apprentices in government contracts in the maritime transport sector.
- the Government will consider strengthening the grants for equipment in maritime education to ensure that candidates have competence corresponding to the industry's needs.

# 3.5. Research, Development and Innovation

**The Government will stimulate increased research, development, and innovation in order to strengthen the value creation and competitiveness of the maritime industry.**

The industry's own ability to adapt and innovate, and the public support system's focus on research, development and innovation (RD&I) have been key prerequisites for Norway's leading position as a maritime nation, especially in environment and offshore. At the same time the industry is experiencing strong international competition. Investments in RD&I will be vital to the further development of the Norwegian maritime industry's competitiveness and ability to adapt. The ability to participate and capture the research taking place outside Norway is also important in this context.

The public support system is to contribute to strengthening the knowledge base for maritime development and innovation. For 2015 the Government has facilitated a strong focus on some nationwide and broadly aligned instruments, without thematic limitations. Few constraints should channel the support to the qualitatively best projects with the greatest potential for value creation and socioeconomic growth, regardless of industry and location. Projects from the maritime sector can receive support through the general schemes of the support system on equal terms with other industries. The Government will strengthen the general support system.

### The Research Council of Norway

In 2014 a total of NOK 480 million were allocated to the maritime industry through various schemes in the Research Council of Norway[23]. The MAROFF programme and the SkatteFUNN scheme represent most of the grants.

### The MAROFF programme

The MAROFF programme in the Research Council of Norway shall contribute to maritime businesses and research environments developing their knowledge advantages. The target group for MAROFF is the shipping industry, the shipyard industry, service providers and equipment providers to all types of vessels and to aquaculture facilities. The priority areas of the programme are environment and environmentally friendly utilization of energy, demanding maritime operations, and advanced transport and logistics.

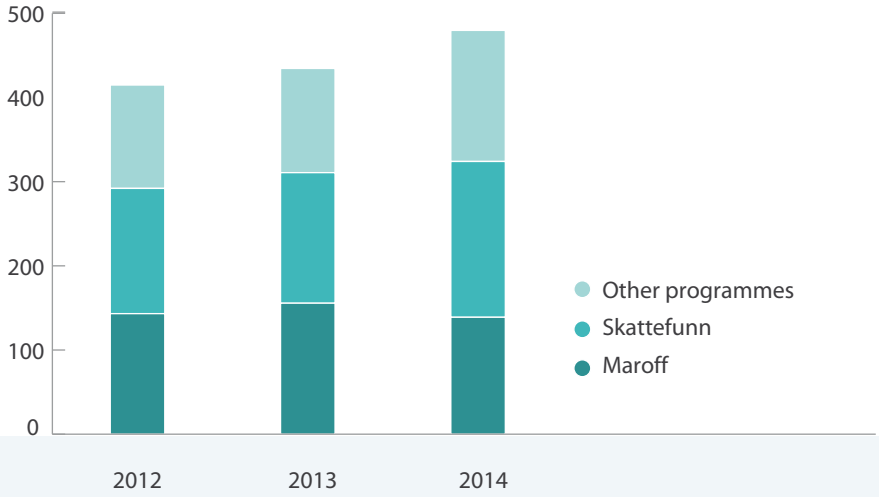
Since 2006 the MAROFF programme has been reinforced with NOK 70 million to a total of NOK 136.1 million in 2015 through the Ministry of Trade, Industry and Fisheries' budget. The support has contributed to triggering private investments, and it contributes to building competence in businesses, for example through collaboration between businesses and external research environments. The applications hold higher and higher quality, and they represent many interesting competence and innovation projects. The Government will continue the programme.

### SkatteFUNN

The SkatteFUNN scheme is an important instrument for the maritime industry. In 2014 there were 365 approved maritime projects with budgeted tax deductions of NOK 185 million. In the 2015 national budget the Government increased the budget limits for the annual tax deduction through the SkatteFUNN scheme for intramural R&D from NOK 8 million to

*23) Grants through SkatteFUNN are based on budgeted tax deductions in approved projects.*

Figure 5: The development in support to the maritime sector from the Research Council of Norway through the MAROFF programme, SkatteFUNN, and other programmes.
*Source: The research council of Norway.*




## SFI and SFF for the maritime industry

Out of the 17 new SFIs that received grants in November 2014, seven of the new centres were directed towards the maritime industry, aquaculture and/or offshore. Among these we find Ålesund University College. Through Norwegian Centres of Excellence (SFF), NTNU and Marintek in Trondheim have received grants for Autonomous Marine Operations and Systems (AMOS). AMOS is to contribute with ground-breaking, basic and interdisciplinary knowledge in marine hydrodynamics, marine constructions, and cybernetics.

NOK 15 million, and the limits for the total intramural R&D and procured R&D from approved research institutions increased from NOK 22 million to NOK 33 million. Small and medium sized maritime businesses may receive 20 per cent of the project costs as tax deductions through the tax settlement. Large businesses may receive 18 per cent of the project costs as tax deductions.

### Other programmes

The Research Council of Norway also has other instruments and application types that the maritime industry can use. Among these are Centres for Research-based Innovation (SFI) and Norwegian Centres of Excellence (SFF). These instruments cover the entire spectrum from basic research and competence building to applied research and development. In 2014 NOK 155 million were allocated to maritime industrial and research environments under "Other programmes".

Through SFI and SFF the Government will stimulate Norwegian research environments to establish centres dedicated to long-term and basic research, and strengthen Norwegian research environments working closely with innovative businesses at a high international level.

### User-driven Research based Innovation

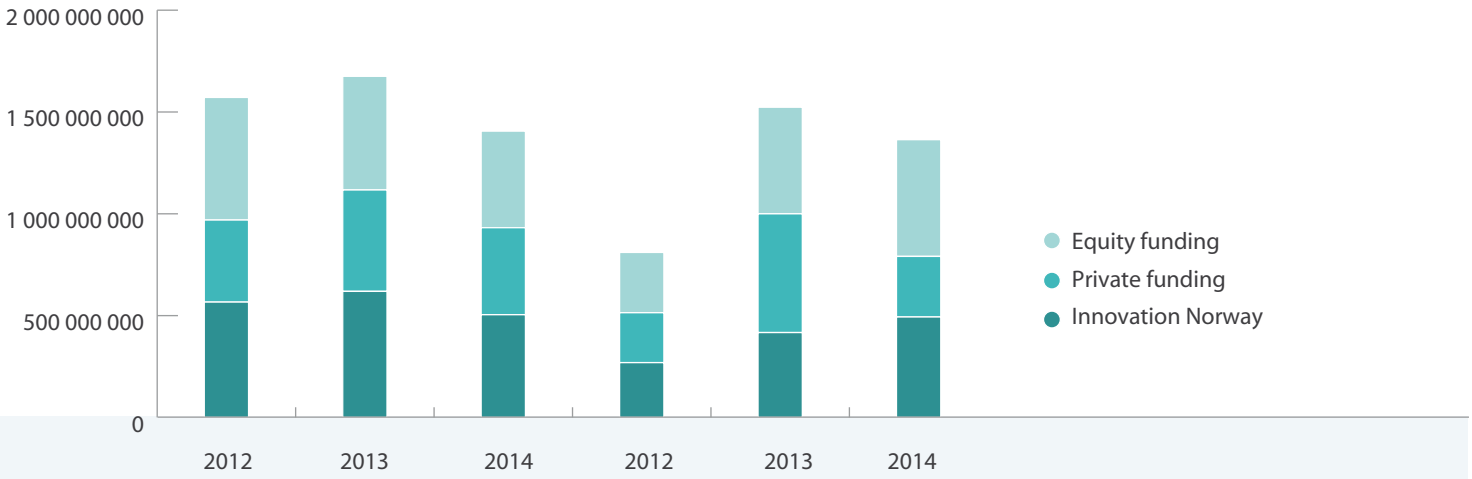
User-driven Research based Innovation (BIA) was established in 2006 after merging several previous industry oriented programmes. A central limitation has been that BIA does not support projects falling under a thematic programme, such as the MAROFF programme. The Norwegian maritime industry receives grants mainly through MAROFF, however, the maritime industry can also receive grants from BIA when applying for grants for research associated with production and production processes of technical marine industry. The BIA programme has been strengthened by NOK 90 million in 2014 and NOK 70 million in 2015 respectively, and the allocation through the national budget is about NOK 543 million in 2015.

### Innovation Norway

Innovation Norway has a number of general, nationwide services and activities which contribute to innovation and value creation in the maritime industry. In 2014 Innovation Norway contributed with a total of NOK 474 million to maritime projects. Out of this, market loans, low-risk loans and guarantees constituted about 70 per cent. The rest was given in the form of grants and innovation loans. For each NOK supported by Innovation Norway to the maritime industry, the industry has contributed with NOK 1.80 in 2014.

Low-risk loans are offered to businesses that need funding of long-term capital needs. The loan is given on competitive market conditions with a repayment period and adapted to the business' needs. Innovation loan (risk loan) is an offer that can be used for compensatory funding in businesses with profitable projects which are difficult to fund in the private credit market. Such loans can be used for a number of different purposes and contribute to the completion of good projects that would not have been realised otherwise. Innovation Norway also offers guarantees for operating credit and investment loans

Figure 6: The granted amount from Innovation Norway to the maritime industry from 2009–2014, including equity funding and private funds. *Source: Innovasjon Norge.*




which can be given to small and medium sized businesses that have difficulties getting loan funding in banks due to a too great perceived risk or the lack of collateral.

### Cluster programmes

Through the cluster programme Norwegian Innovation Clusters the Government wishes to increase collaboration based development activities in the established maritime clusters. Projects are supported on three different levels: Arena, Norwegian Centres of Expertise (NCE), and Global Centres of Expertise (GCE). Arena is offered to cluster projects in an early phase, while NCE and GCE are offered to mature cluster projects with a national and global position respectively. GCE Blue Maritime, GCE NODE, NCE Subsea, NCE Systems Engineering, and NCE Maritime Clean Tech are examples of clusters particularly relevant to the maritime industry.

### The long-term plan for research and higher education

The Government has presented a long-term plan for research and higher education, Meld. St. 7 (2014–2015) "*Langtidsplan for forskning og høyere utdanning 2015–2024*" ("*Long-term plan for research and higher education 2015–2024*"). The overall goal of the long-term plan is to contribute to strengthening Norway's competitiveness and ability to innovate, solve great societal challenges, and develop excellent academic environments. Among other things, the long-term plan will help Norway strengthen its position as a leading maritime nation. Global and technological development trends associated with the sea creates new maritime opportunities. The long-term plan will help the Norwegian maritime industry to be at the forefront of the development by developing and utilizing knowledge that promotes innovation and facilitates the necessary adaption. The long-term plan emphasizes two priority construction projects supporting the long-term priorities. One of these is the upgrade of the Marine Technology Centre in Trondheim, Ocean Space Centre (see chapter 3.7.).

### International research collaboration

There is international collaboration in many of the innovation projects and in most of the competence projects in the MAROFF programme. MAROFF is also actively involved in the EU's new research programme, Horizon 2020, where there are opportunities for maritime players in Norway. Horizon 2020 is the world's largest research and innovation programme, with a budget of 80 billion Euros for the period 2014–2020. Norway participates as a full member. The programme shall help improve economic growth and employment in Europe. One of the focus areas of the programme is maritime research. Applicants may receive financial support for writing applications and additional funding for participating in projects. Applicants may also receive support for participating in forums which set the agenda for upcoming thematic announcements.

MAROFF also funds ERA-Net MARTEC II together with research funding organisations in 25 European countries. ERA-Net MARTEC is a transnational collaboration programme in maritime technology, where Norwegian participants in collaboration projects may receive up to 60 per cent support from the Research Council of Norway.

*Cleaning system for ballast water installed on board Esvagt Faraday. Photo: Gunnar Larsen*

### Cleaning systems for ballast water

Development and optimisation of Norwegian cleaning systems for ballast water based on UV technology to meet new requirements from the US. Knutsen Ballastvann AS, MMC Green Technology AS, and Optimarin AS have jointly developed and optimised cleaning technologies for ballast water combining filtering and UV irradiation. This is to satisfy new international requirements and thus be competitive internationally. This is the result of a technological development process from the Research Council of Norway to Innovation Norway and further developed as a product.

International bilateral research collaboration is important. For example, Singapore (Maritime and Port Authority) and the Research Council of Norway have signed a Memorandum of Understanding (MoU) on joint collaboration in maritime research, development, education, and training. This has led to a number of R&D collaboration projects between businesses and research environments from both countries. Also, Norway and Brazil have R&D collaboration in the petroleum sector, which is also relevant for maritime environments. Research collaboration is also part of the more general maritime collaboration agreements with Japan and South Korea.

### The armed forces and maritime R&D

The armed forces and the Norwegian Defence Research Establishment have many points of intersection with the maritime industry in research and development. This applies to disciplines such as subsea technology, autonomous systems, navigation, simulation, communication, and the use of satellites in ocean surveillance. Closer collaboration between the defence sector and the civilian maritime sector in these research areas could strengthen the maritime cluster.

### Maritim21 strategy

A comprehensive research and innovation strategy for the maritime industry, Maritim21, was presented to the authorities in 2010. The Maritim21 strategy was developed by the maritime industry. The purpose was to contribute to increased innovation rate in the Norwegian maritime industry in areas where Norway has a particular competitive edge. The MAROFF programme has been largely focusing on the areas recommended in the Maritim21 strategy, and revised its programme plan for 2010–2019 in 2012 in order to reflect the priorities of Maritim21. The strategy needs to be updated. The Government wants a continuation of Maritim21 for the preparation of a new Maritim21 strategy, through an earmarking in the allocations from the Ministry of Trade, Industry and Fisheries to the MAROFF programme in the Research Council of Norway.

### The Government will:

- continue the efforts in maritime research and innovation in the business sector through the MAROFF programme.
- encourage the maritime industry to use the general support system through the Research Council of Norway and Innovation.
- support the continuation of Maritim21 to prepare a new Maritim21 strategy.
- focus especially on the ocean in the long-term plan for research and higher education.
- help maritime research environments utilize the opportunities offered by EU's framework pro - gramme for research and education, Horizon 2020.
- increase collaboration based development activities through the established maritime clusters in Norwegian Innovation Clusters.

# 3.6. International Regulatory Frameworks

**The Government will work for a harmonized global regulatory framework, open markets, high requirements for maritime safety, environment, and social standards in international forums.**

More and more countries wish to take part in maritime value creation, and the global competition is strong. International competition contributes to learning, innovation, and development, and this is a prerequisite for continued good growth potential in the industry. The maritime industry depends on international markets and equal framework conditions. The Government will contribute to ensuring a unified global regulatory framework for the industry, open markets, and high requirements for maritime safety, environment, and social standards in international forums.

### Market access and equal framework conditions

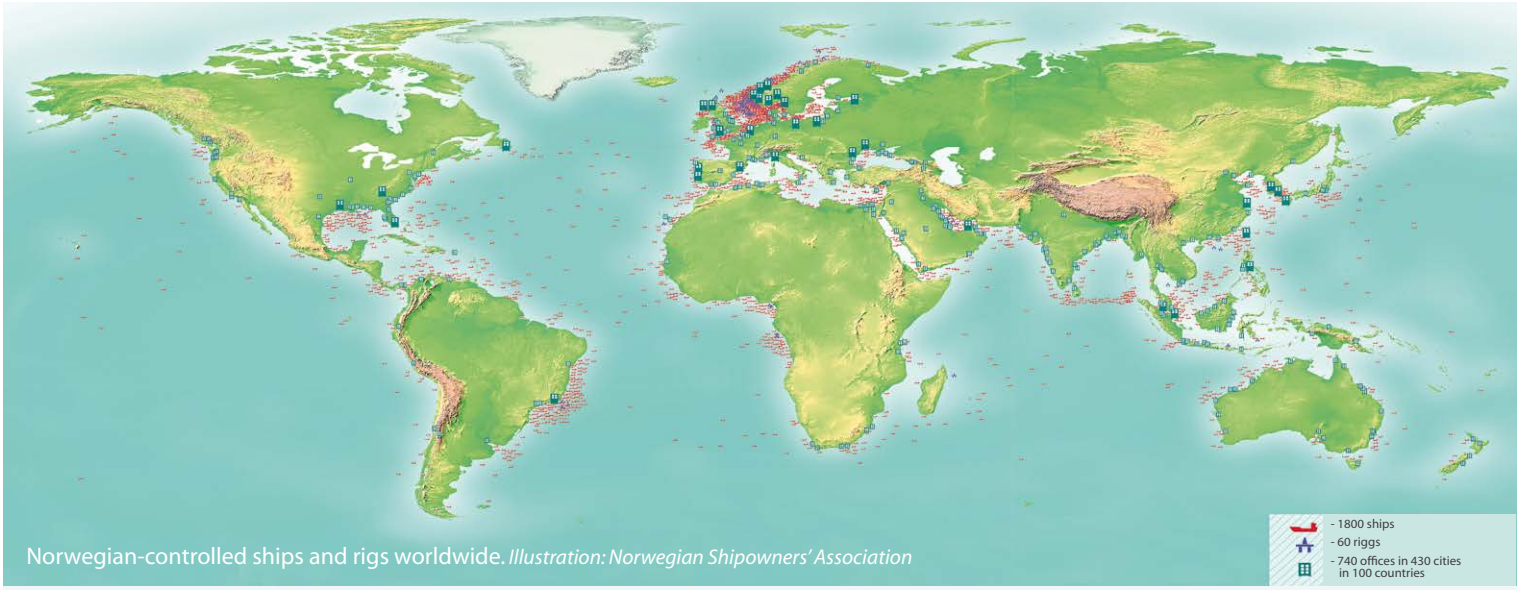
#### Trade agreements and bilateral collaboration agreements

In the efforts to ensure market access and equal framework conditions for the maritime industry, the Government places great emphasis on work in international forums such as WTO, EFTA, OECD, as well as in the UN International Maritime Organisation (IMO) and the UN international labour organisation (ILO). The EEA Agreement ensures contractually based market access for the Norwegian shipping industry in the EEA area.

The market for international maritime transport services is largely deregulated; however, the open market situation is only marginally embodied in international agreements. We have also seen tendencies to an increasing degree of protectionism in the years following the financial crisis. The Government therefore prioritizes the efforts to establish an agreement for open international trade regulations with equal terms for maritime services. Norway is a driving force for contracting the terms in international trade agreements through the World Trade Organisation (WTO), Trade in Services Agreement (TISA), and the EFTA free trade agreements. Norway is currently negotiating on the EFTA free trade agreements with a number of countries, including Indonesia, Vietnam, and Malaysia, where maritime transport is among Norway's main interests. The consideration for what serves Norwegian shipping interests will be a key criterion also in the future when choosing partner countries.

Norway also negotiates bilateral shipping agreements with countries where we have specific interests to protect. The Government currently promotes the efforts to establish a bilateral shipping agreement with Brazil.

The Government also wishes to increase the use of bilateral investment agreements (BITs) where appropriate. The main purpose is to protect Norwegian investments abroad, especially in countries where the political and economic situation is unstable, and to make sure that Norwegian businesses can compete on an equal footing with businesses from other countries. It is also an important consideration that the agreements shall promote investments in developing countries and contribute to economic growth in these countries. Norway has not signed any BITs since the mid-1990s. There have been many attempts to solve the legal and political problems raised by such agreements. There are strong and defensible interests opposing each other; investors' need for protection and states' right to regulate on




Norwegian-controlled ships and rigs worldwide. *Illustration: Norwegian Shipowners' Association*

their own territory. There are ongoing efforts to prepare a new mandate for investment agreements.

In addition to formalised multinational and bilateral agreements, Norway depends on good bilateral collaboration with other important maritime nations. The collaboration agreements are useful tools for government relations. However, it is equally important that the agreements are to stimulate industrial collaboration and secure market access for Norwegian maritime businesses. The work in bilateral maritime collaboration groups with countries such as India, Japan, South Korea, and Russia is to continue. Other countries, with which it is a priority to have a close and good maritime dialogue, are Brazil, China, Singapore, Turkey, Germany, and the US. Norwegian maritime businesses with interests in these countries play a key part in this work.

There are also important market and collaboration opportunities in countries in Southeast Asia such as the Philippines, Indonesia, and Vietnam. In the years to come several African countries are also expected to become important maritime partner countries.

The EU and the US play an important part in the development of international shipping policies and regulations. Trade and fishery councellors at the embassies in Washington and Brussels therefore have among their key responsibilities to safeguard Norwegian maritime interests.

Also, there are a number of ongoing bilateral and regional trade negotiations which have direct and indirect impact on the Norwegian maritime industry, such as the Trans-Pacific Partnership Agreement (TPP)[24] and the Transatlantic Trade and Investment Partnership (TTIP)[25]. TTIP could have major consequences for the Norwegian business sector, since the EU and the US are our most important trading partners.

The authorities' work in international forums is vital in order to ensure equal framework conditions and market access for the maritime industry.

## The regulatory framework

The Law of the Sea and the UN Convention on the Law of the Sea determine the main international legal framework for the regulation of shipping. The Law of the Sea determines a number of principles which are important to Norwegian shipping, including the flag state principle and the right of innocent passage. The Law of the Sea also forms the basis for the development of the regulatory framework in the UN shipping organisation IMO.

The regulatory framework for shipping is determined largely through international authority organisations such as IMO and ILO. Norway is an active contributor in the efforts to negotiate an internationally binding regulatory framework on the safety and environmental areas in IMO. The Government strives

*24) Negotiations between Australia, Brunei, Canada, Chile, Japan, Malaysia, Mexico, New Zealand, Peru, Singapore, the US, and Vietnam*
*25) Negotiations between the EU and the US for a transatlantic trade and investment agreement.*

GIEK financed

**48**

vessels in 2014

Photo: Scanpix

to have an international regulatory framework negotiated in IMO and ILO, and for rapid entry into force of new, adopted regulations. IMO conventions usually have a tonnage requirement among the conditions for entry into force. By increasing tonnage under Norwegian flag Norway can increase its international influence while strengthening the international regulatory framework. Norway has been among the first to join international conventions.

Through participation in ILO Norway also contributes actively to the efforts to develop good working conditions on board vessels in the form of international social standards for shipping. By ratifying a convention the member states commit to fulfil the convention while accepting international monitoring through the ILO monitoring system. ILO's "Maritime Labour Convention" (MLC) became effective on 20 August 2013. MLC provides rules for working conditions and living conditions on board vessels, and it is the most extensive and comprehensive international regulatory framework made for seafarers, shipowners and maritime nations.

The international regulatory framework is implemented in Europe through regulations and directives. EEA relevant legislation must be implemented in our national legislation. Norway therefore works actively towards the EU to ensure that the EU's own maritime regulatory work is in accordance with international legislation as far as possible. We also collaborate closely with EU member states in the IMO work. The EU also designs other regulations and regulatory frameworks, including guidelines on state aid for shipping which also include Norway through the EEA agreement. The Norwegian tonnage tax scheme and tax refund scheme for employing seafarers are notified and approved by the EFTA Surveillance Authority (ESA) in accordance with these guidelines. The Government will maintain a close dialogue with the European Commission and the member states in order to safeguard Norwegian interests.

**Export funding**

Through the Norwegian Export Credit Guarantee Agency's (GIEK) guarantees and loans from Export Credit Norway AS, the Government facilitates Norwegian export of goods and services and investments abroad. The schemes shall help Norwegian exporters compete based on price and quality of goods and services exported, and not on which financing terms are offered through public export financing. The maritime industry is a large and important user of public export financing.

The maritime industry is a considerable user of the schemes of GIEK and Export Credit Norway. The Government will continue competitive export financing through GIEK and Export Credit Norway

The main GIEK scheme is an ordinary guarantee scheme. In 2015 the limit was NOK 145 billion. In comparison, the limit was NOK 40 billion in 2004. By the end of 2014 the total outstanding liability under the ordinary guarantee scheme was NOK 87.3 billion.

*Photo: Vinciv Taneo/Grieg Star Shipping*

## Team Norway

Team Norway is a network based collaboration between various public and private players who work to promote Norwegian-based business internationally. The purpose of the collaboration is to contribute to increased value creation in the Norwegian economy through the exchange of information, coordination, coordinated efforts, and joint initiatives. This work should also contribute to a more unified and business oriented profiling of Norway abroad.

The Ministry of Trade, Industry and Fisheries coordinates collaboration in Team Norway together with the Ministry of Foreign Affairs and the Ministry of Petroleum and Energy. Team Norway can be reached at teamnorway@nfd.dep.no. Team Norway networks are currently established under the direction of the Foreign Service missions in a number of countries. These consist of various players from different countries, jointly representing a wide diversity of different organisations. Examples of participants are Innovation Norway, the Norwegian Shipowners' Association, Norwegian Seafood Council, INTSOK, INTPOW, and Norwegian industry clusters abroad.

The bulk of GIEK's outstanding liability was associated with the oil and offshore industry, by about 86 per cent of the limit. Also, about 5 per cent of the outstanding liability was under the scheme associated with traditional shipping. GIEK funded a total of 48 vessels in 2014, 41 of these were associated with the offshore industry, 5 with shipping, and 2 were crew boats for offshore windmills.

GIEK also gives building loan guarantees for the building of new vessels. GIEK guarantees up to 50 per cent of each loan. One or more banks guarantee the rest of the amount, on equal terms. Previously the buyer had to pay a minimum of 20 per cent of the contract amount during the building period. As part of the maritime strategy, the Government has changed this requirement. The new regulations in force from 01 May 2015 allow the buyer to pay less than 20 per cent during the building period. GIEK can determine this part based on the risk in each case. Easier access to funding will make Norwegian shipyards more competitive. A stronger shipyard industry is also important to Norwegian subcontractors.

In 2015 Export Credit Norway can issue loans to buyers of Norwegian export goods and capital services for a total of NOK 20 billion. There will also be an authorization to exceed the allocation by up to NOK 30 billion. By the end of 2014 Export Credit Norway had a lending balance of NOK 60.9 billion. 68 per cent of these were associated with vessels and marine equipment. Export Credit Norway financed a total of 43 vessels built at Norwegian owned shipyards, equipment for 11 rigs, and marine equipment for more than 20 vessels in 2014.

It is important to ensure that government export funding of vessels in different countries takes place on equal terms. Publicly supported export credits and export credit guarantees are currently regulated by the OECD associated agreement "Arrangement on Officially Supported Export Credits" (Arrangement). Norway also participates in an international working group (International Working Group – IWG) examining the possibilities of a new agreement that includes more countries than the current OECD agreement, for example China. Norway is also active in the working group for shipbuilding in OECD where the long-term ambition is to eliminate subsidies and create equal competitive conditions in the shipbuilding industry

### Internationalisation and profiling

The Government places great emphasis on assisting Norwegian companies abroad and promoting Norwegian export. Given the high export share and international presence of the maritime industry, this is one of the priority sectors. Innovation Norway is a key player in these efforts. Innovation Norway currently assists Norwegian businesses in evaluating market opportunities in more than 30 countries, many in emerging markets. The work is done through consulting services, networking services, competence and profiling services.

The Foreign Service and Innovation Norway coordinate their services in countries where both are represented. The Foreign Service is to have a priority outreach effort, network meetings and hold maritime conferences at the stations where this is considered relevant. Assistance to individual businesses also has

## Agreement between the armed forces and Wilh. Wilhelmsen

The armed forces have signed an agreement with Norwegian owned Wilh. Wilhelmsen Group in order to reinforce response capacities in Norway. This is the first time the armed forces signs an agreement with a private industrial player of this magnitude. The preparedness contract will improve the responsiveness of the armed forces, and Wilhelmsen's logistics deliveries will have a significant impact on Norway's defence capability. The shipping company has, among other things, cargo vessels that can carry heavy military material such as tanks, armoured assault vehicles, and artillery. The contract, which has seven years' duration, means that the shipping company shall assist with logistics, transport, and deliveries to the armed forces. The agreement also gives the armed forces the option to use the infrastructure of Wilhelmsen's subcontractor, NorSea Group, located along the entire coast of Norway.

*Photo: Wilhelmsen*

high priority at all relevant stations. Competence with regard to maritime industry and markets is important for this work to function well. Delegation visits and political visits abroad are to be used to profile maritime Norway and support Norwegian maritime businesses where relevant. The door opening function of state visits and other official travel is very important for the maritime industry in many countries.

Previous studies have shown that the Norwegian maritime industry essentially has a good reputation internationally. It is still important to work on reputation building on a national level and in each business. Targeted profiling of the Norwegian maritime industry is an important part of this. Profiling the maritime industries abroad has two purposes. It supports the marketing efforts of Norwegian players abroad, and it promotes Norway as a host country for maritime business. Strengthening collaboration in Team Norway (see the fact box) is an important part of this work.

The Government will also increase focus on maritime industries in the Ministry of Defence's marketing support and the industry's opportunities in an industrial collaboration. The marketing support is an export promoting measure towards foreign businesses and foreign authorities of Norwegian made materials which the armed forces use or are planning to procure. This also includes shipyard and equipment suppliers. The scheme does not involve financial grants, but personnel support which is given as an export promoting measure. The maritime industry will be able to profit from this scheme. When an industrial agreement with a foreign supplier of defence materials to Norway is signed, the goal is to build long-term business relations. Successful agreements could lead to long-term collaboration and market effects far beyond what is credited to the supplier in the industrial collaboration accounts. This also applies to maritime business and industry.

### Maritime safety/piracy

As a major maritime power, Norway has vital interests linked to the safety of commercial shipping. In parts of the world, freedom of navigation in busy sea routes and the utilization of sea areas are threatened by piracy and maritime crime in both national and international waters. Norway plays an active part in the efforts to fight piracy by means of financial contributions to capacity building projects and participation in international forums working for joint global solutions. Norway has participated militarily with a frigate (2009 and 2013) and an Orion surveillance aircraft (2011) in the Gulf of Aden and the Indian Ocean. In 2011 Norway adopted a regulation allowing the use of private armed guards on board Norwegian vessels in certain exposed areas. In 2013 a Norwegian frigate was the flagship of NATO's standing naval force 1 and led anti-piracy operations in the Gulf of Aden.

The formal collaboration with the Norwegian Shipowners' Association on shipping preparedness is based on an agreement from 01 January 2006. The purpose of the agreement is to ensure the best possible pre-

Photo: Odfjell SE

**The Government will:**

- pursue an active policy to promote Norwegian interests in IMO and ILO.
- participate and contribute actively in the EU/EEA efforts in the maritime area.
- pursue trade agreements through EFTA, WTO, TISA, and bilateral maritime agreements to create stable framework conditions and a level playing field globally.
- contribute to international processes for updating international legislation for export financing of vessels. OECD WP6 and IWG.
- work proactively and continue the broad commitment to prevent and combat maritime crime and piracy.
- continue competitive export financing through GIEK and Export Credit Norway.
- support the industry's reputation and promotion activities, for example through Team Norway.
- promote the maritime industry in the Ministry of Defence's marketing support and industrial collaboration.

paredness and handling of current emergency situations in the shipping area. The Norwegian Shipowners' Association shall have a "preparedness and safety contact" to whom the Ministry relates. It is otherwise up to the Norwegian Shipowners' Association to organise the work internally. As compensation for the duties performed, the Ministry of Trade, Industry and Fisheries will allocate grants through the national budget. For 2015 the grant is NOK 3.1 million.

The preparedness secretariat of the Norwegian Shipowners' Association continuously collects and distributes information on threat assessments for shipping. The preparedness secretariat supports all Norwegian shipping companies in their crisis management, and an important part of the work is continuous information to shipping companies and vessels on various threats. Through the Ministry of Trade, Industry and Fisheries, the preparedness contact can assist all the government ministries when needed.

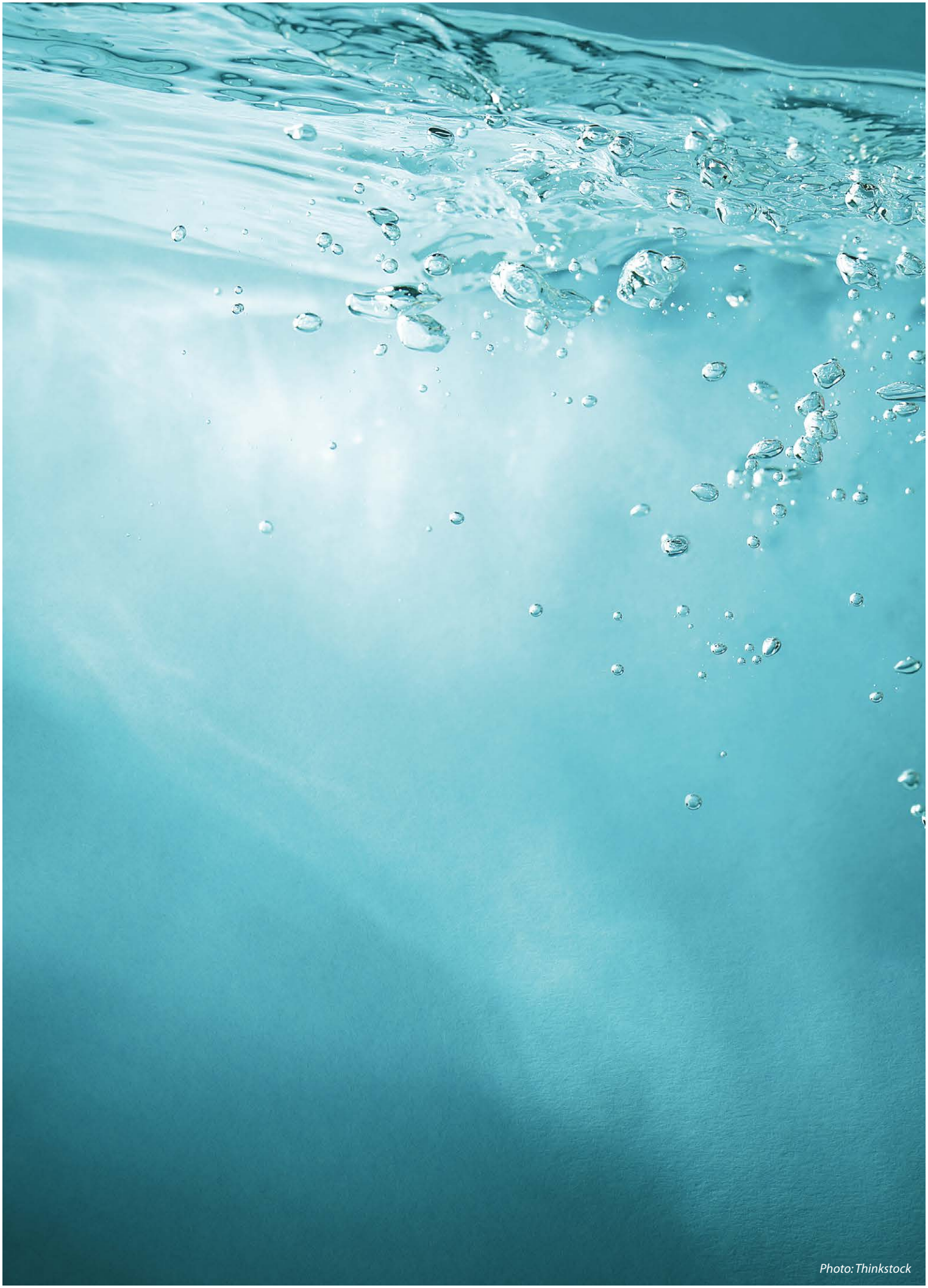


*Photo: Thinkstock*

# 3.7. Blue Growth

**The Government will help develop a strong Norwegian ocean related cluster by stimulating increased interaction between the ocean industries.**

The ocean covers 70 per cent of the earth surface and is an important source of food through the seafood industry, a source of energy through the development of offshore oil and gas, as well as for renewable energy through the extraction of offshore wind, waves, and tidal water, and a source of minerals through mineral extraction on the seabed.

Norway has high competence in the ocean industries[26], and the maritime, seafood, and oil and gas industries could have a potential for increased value creation by learning from each other. By developing new and applying known technology across the ocean space we can utilize the potential for future growth and value creation in the maritime industry. The Government will help develop a strong Norwegian maritime cluster by stimulating increased interaction between the ocean industries.

### Value creation in the Norwegian ocean industries – blue growth

With its long coast, traditions, and knowledge of the sea, Norway has developed into an important ocean space nation. By the ocean space we mean the ocean surface, the ocean depths, and the geological formations on and under the seabed[27]. Increased value creation in the ocean industries is here defined as blue growth. The most important ocean industries in Norway measured by their contributions to value creation are the oil and gas industry, the maritime industry, and the seafood industry. Parts of the tourism industry are also linked to businesses by the coast or at sea, and offshore wind farms is a growing industry. In the future the development of new ocean industries could also contribute to value creation, for example mineral extraction on the seabed, renewable energy from the sea, marine ingredient industry, and marine bioprospecting.

Menon has, on commission from the Ministry of Trade, Industry and Fisheries, calculated the total value creation in Norwegian ocean industries to be NOK 815 billion in 2013, or approx. 27 percent of the GNP.[28] In the period 2004 to 2013 value creation has increased by 114 per cent. The figure below shows value creation in the three ocean industries in the period 2004–2013.

There is clear overlap between these industries. The biggest overlap by far is found between the companies in the petroleum supply industry and the maritime industry. Several companies are large in both the maritime industry and in the oil and gas industry, and are therefore registered in both populations.

The size of the overlap between the maritime industry and the oil and gas industry was NOK 122 billion measured by value creation in 2013. This corresponds to 70 per cent of value creation in the maritime industry. The overlap between the maritime industry and the seafood industry is only NOK 0.3 billion measured by value creation[29].

*26) See the fact box for definition of the ocean industries. Source: Menon, 2015.*

*27) Definition of the ocean space, Marintek, 2011.*

*28) The figures are based on Menon's accounting database with detailed information at company level. Sole proprietorships are not included. This affects the seafood industry in particular, especially fisheries.*

*29) The fishing vessel companies are included in the seafood industry, but not in the maritime industry. Thus there is no overlap at the industry level due to this. The overlap is then due to some shipping companies and equipment providers with both maritime and marine customer bases.*

## Definition of the ocean industries

**The oil and gas industry** consists of operating companies (oil companies) and associated supplier industry. The latter is defined as businesses delivering oil and gas related products or services to upstream oil and gas industry, either directly to the oil companies (operators) or indirectly to other suppliers.

**The maritime industry** is defined as all businesses owning, operating, designing, building, supplying equipment or specialized services to all types of vessels and other floating devices[30].

**The seafood industry** is defined as fisheries, aquaculture, and processing and exporting seafood as well as suppliers of equipment and services for the various parts of the value chain.

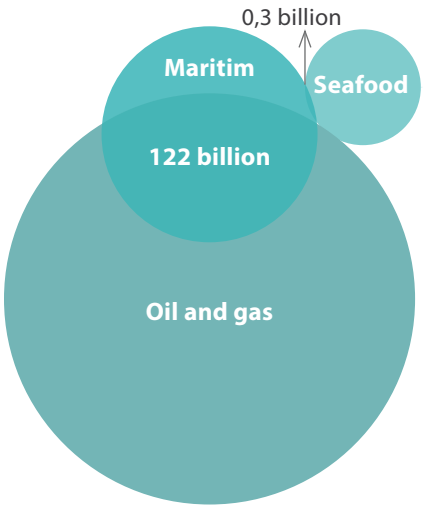



Figure 8: Overlap between the ocean industries. *Source: Menon, 2015*

Seeing ocean industries in context makes it possible to utilize synergies. The various ocean industries can learn from each other, utilize technology across and develop products and services common to the ocean industries. For the maritime businesses and other ocean businesses this means opportunities for new products and markets. For example, suppliers to the maritime, seafood, and oil and gas industries can find new markets for their equipment by supplying new types of vessels and ocean structures. It will also be possible to develop a number of services such as surveillance, weather and wave information of common interest to the ocean industries. Coordination and development of services and products associated with search and rescue operations are also important across the ocean industries.

The Coast Guard is society's most important tool for maintaining sovereignty, exercise of authority, resource management, and emergency preparedness, and contributes on behalf of a number of ministries and agencies to sustainable management of resources and to the exercise of authority in Norwegian areas and zones. The introduction of new and modern helicopters in the Coast Guard will have a major impact on Norwegian maritime monitoring and action preparedness.

### Ocean space technology – public instruments for research and innovation

Ocean space technology research and maritime technology and competence are vital to innovation and future value creation in the maritime industry. Norway currently has high competence in ocean technology and is therefore in a good position to develop this further.

In 2014 the Research Council of Norway and Innovation Norway submitted a report[31] on how government R&D funds to ocean technology research can be used more efficiently to create growth in the Norwegian industries. The report shows that a total of NOK one billion is spent annually on government funded R&D linked to technology for the ocean industries oil and gas, maritime industry and marine industry, however, that there is a great potential for extracting technical synergies by increased interaction between the sectors.

The Research Council of Norway and Innovation Norway are now following up on their own recommendations in connection with the review of instruments directed towards ocean technology and supply industry. The Research Council of Norway has had joint announcements between aquaculture programme HAVBRUK and MAROFF as well as a joint announcement between petroleum programme PETROMAKS, MAROFF, and the Russian basic research fund on the challenges for petroleum and the maritime sector in the Arctic in 2014. The Government will conduct more joint announcements for research programmes MAROFF, PETROMAKS, and HAVBRUK in the Research Council of Norway.

Both the Research Council of Norway and Innovation Norway have a number of instruments available to

30) *Cf. the definition in chapter 2.*
31) *"Proposal for a more coordinated R&D effort towards the ocean technology supply industry to the marine, maritime, and offshore industry".*

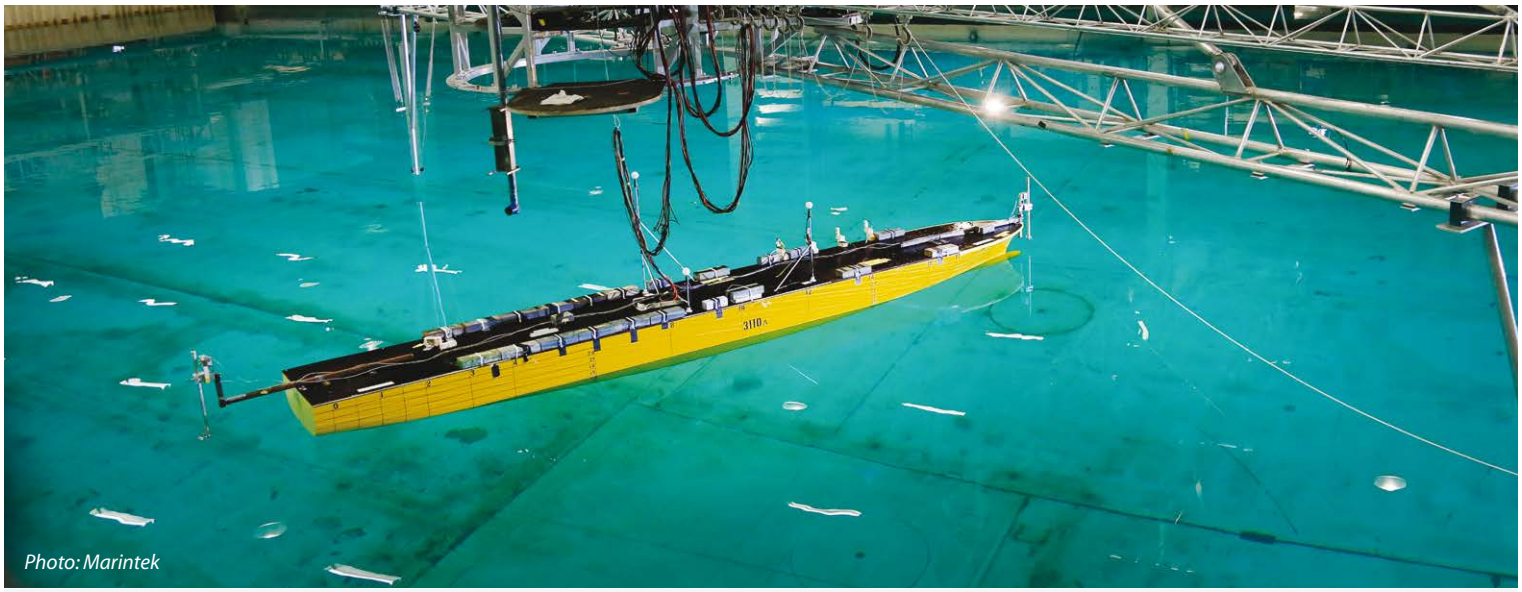


Photo: Marintek

the ocean industries, however, it is necessary to simplify information and availability towards businesses. They will therefore together develop a common web portal, "Blue business-portal". The portal will be completed by the end of 2015.

In order to achieve inter-sectorial development collaboration between the ocean industries, a "crossover frame" is to be established in Innovation Norway, modelled on the "innovation frame". The innovation frame shall stimulate increased innovation through several joint innovation and research projects between businesses, where at least one of these is part of a cluster. There will also be a need for an incentive for more interaction, "crossover", between the various ocean industries in Innovation Norway's cluster programme. The purpose of a "crossover frame" is to mobilize businesses and clusters to think across sectors, and to reward the development of intersectorial projects.

The cluster programme Norwegian Innovation Clusters (see chapter 3.5) could also be used to strengthen interaction between the ocean industries. The Global Centre of Expertise (GCE) Blue Maritime cluster in Møre wishes, among other things, to develop the current strong position in advanced specialized vessels while extending the activity to new areas. This applies to biomarine industries, mineral extraction on the seabed, and ocean renewable energy, all of which have a considerable potential for increased value creation.

In the Government's long-term plan for research and higher education, "Ocean" is one of six thematic priorities. A priority project here is Ocean Space Centre. The Government has allocated funds in 2015 for further investigation of the scope of, and technical solutions for, a new marine technology centre in Trondheim, Ocean Space Centre. The goal is that Ocean Space Centre is to become an internationally leading knowledge centre for ocean space technology. This type of research and technology are vital for innovation and future value creation in the maritime industry, oil and gas activities, and the marine industry.

NTNU's focus on the Centre for Autonomous Marine Operations and Systems (AMOS) also involves research which could yield results across the ocean sectors. AMOS is a Norwegian Centre of Excellence (SFF) which is to help develop intelligent vessels and ocean structures, autonomous unmanned crafts (under water, on water and in air), and robots.
It will also be natural to look at how we can strengthen synergies between ocean industries in the efforts of internationalisation, profiling, and marketing in Norway and abroad, both from the authorities, the public support system, and in the industry.

**Ocean industries – international initiatives**

Several international initiatives which are fully or partially linked to challenges associated with the ocean have been initiated in the past few years.

The Joint Programming Initiative Healthy and Productive Seas and Oceans (JPI Oceans) was established in 2011 as a coordinating and strategic platform open to all EU member states and associated countries investing in marine and maritime research. Norway has been one of the driving forces behind the establishment of JPI Oceans. The goal of JPI Oceans is to contribute to a clean and rich ocean providing food and other resources and services to future generations. Technology for monitoring the

## Vessel for Offshore Wind

In January 2015 Ulstein Verft signed a contract with the German company Bernhard Schulte on building two vessels for Offshore Wind. The vessels are of the type ULSTEIN SX175 and are developed by Ulstein Design & Solutions. These are the first two vessels for Offshore Wind to be delivered by the company. Ulstein is committed to sustainable growth and new solutions to better utilize the possibilities of the ocean space. Ulstein brings technology and experience from the oil industry into renewable industries.

Photo: Ulstein

ocean and development of marine and maritime industries is one of the priority areas of the strategic research and innovation agenda prepared by JPI Oceans. The Government will work to establish an ocean technology project with Norwegian participation in JPI Oceans. The goal is to utilize the synergies in European research in an area where Norway has important interests.

The OECD is conducting a study on "The Future of the Ocean Economy" with particular emphasis on the prospects for emerging ocean industries towards the year 2030. The report, which is expected to be submitted by the end of 2015, will provide important knowledge as the basis for further policy development in this area. It would be in Norway's interest to participate in the follow-up. The Government will therefore consider a possible follow-up of the OECD report.

The European Commission's two reports on blue growth, "Blue Growth", in 2012 and 2014, are an integrated part of the EU's efforts on integrated maritime policy (IMP). "Blue Growth" is the maritime element of the Europe 2020 projects for smart, sustainable and inclusive growth. In addition to the traditional maritime sector the growth potential and efforts to trigger this in coastal and cruise tourism, renewable energy in the ocean and at sea, mineral extraction on the seabed, aquaculture, and biotechnology in the ocean are included.

The Government will follow the EU's initiatives and efforts to develop an integrated maritime policy. The Government's maritime strategy will also constitute important input from Norway to the European Commission's work on blue growth in the future. The Government will also place particular emphasis on utilizing the opportunities and contribute to research and innovation on blue growth within the framework of the EU's research programme Horizon 2020.

### The Government will:

- see the Norwegian ocean industries in context and emphasize the synergies between industries in the work with internationalisation, profiling, and marketing.
- establish a joint "Blue business portal" for Innovation Norway and the Research Council of Norway.
- conduct joint announcements for the research programmes MAROFF, PETROMAKS, and HAVBRUK.
- consider rewarding crossover projects under Innovation Norway.
- continue working with the project Ocean Space Centre as a knowledge hub for Norwegian ocean technology.
- consider a possible follow-up of the OECD report "The Future of the Ocean Economy", which is scheduled to arrive at the end of 2015.
- work to establish an ocean technology project with Norwegian participation under JPI Oceans.
- arrange a joint conference for the ocean industries.
- the Government will follow the EU's initiatives and efforts to develop an integrated maritime policy on blue growth.

# 3.8. The High North

**The Government will ensure sustainable maritime value creation in the High North while taking into account issues such as increased activity, safety, and environment.**

Norway has long traditions of shipping in the High North, and the Norwegian maritime industry has extensive competence on the specific conditions and challenges prevailing in the Arctic. The Northern seas are changing, and the deglaciation means opportunities for greater economic activity in the area, both in petroleum activities, shipping, fisheries, and tourism. Increased economic activity at potential new sea routes offer opportunities for growth and value creation in the Northern areas, especially for the maritime industry. This also involves new challenges for both environment and safety. However, a well-functioning infrastructure is a prerequisite for increased value creation, improved security and reduced environmental risk. The Government is committed to facilitating a sustainable development of the activity in the High North within a framework that ensures a comprehensive, ecosystem-based management.

Successful value creation in the High North depends on viable local communities along the coast. It is therefore important to ensure local ties when preparing comprehensive national strategies. The Government will strengthen collaboration with the arctic maritime industry and local communities in the further development of a comprehensive policy for the High North.

In 2013 "Arctic Maritime Cluster" was established as an Arena project[32]. The purpose is to stimulate increased innovation and stronger competitiveness based on collaboration between businesses, knowledge communities and public development players. The cluster's vision is to be part of the leading knowledge and industrial environment in Norway associated with arctic challenges.

The increased activity also has an important foreign policy dimension. Norway is to be a premise provider for the development in the North, and through the High North policy we shall safeguard key Norwegian interests. Norway manages large ocean areas in the North, and the Norwegian presence and the exercise of sovereign rights must be safeguarded. The Coast Guard's mission and good capacity in search and rescue is very important in this context.

### Utilization of natural resources

The maritime industry currently plays an important part in value creation and employment in the four northernmost counties; however, as a maritime region this region is still small compared to the rest of the country. A potential increased future extraction of petroleum and mineral resources in the Barents region will contribute to growth in the maritime industry in the High North. The Government will maintain an aggressive petroleum policy in the North by facilitating the allocation of new exploration areas, which shall contribute to ensuring the development and operation of new oil and gas fields for many decades. This will lead to increased demand for maritime services. Deglaciation can also open for increased fishing activity further north. An increase in cruise traffic and tourism in the North would also give more opportunities for developing business onshore.

*32) The project is supported by Innovation Norway, SIVA, and the Research Council of Norway.*

## Sea ice in the Arctic Ocean, technology and agreements

At the Fram Centre in Tromsø the research programme "Sea ice in the Arctic Ocean, technology and agreements" aims at providing knowledge which may form the basis for the management of potential business activity in the Arctic Ocean. The research programme "Environmental impact of industrial development in the north (MIKON)" is to prepare methods and models for things such as impact assessment, environmental risk analysis, and surveillance.

Photo: Kjell Røang

### New transport routes

The global climate changes mean that previously icy waters in the Northern areas gradually become more accessible to international shipping traffic. Destination traffic to and from ports in the region are expected to see the biggest growth. To commercial shipping the deglaciation means that three potential sea routes could be opened: The Northeast Passage, the Northwest Passage, and the Transpolar Route. The interest in transit traffic through the Northeast Passage was increasing for a while. The sailing route can become important in the long term, however, there is currently some uncertainty associated with future use of the sea route. When and to what extent the Transpolar route across the Arctic Ocean can be used, is very uncertain.

### Svalbard

Svalbard is centrally located in the High North and may have increasing importance in the future as a base for rescue and pollution preparedness and as a platform for offering maritime services. The capacity at the Longyearbyen harbour is currently too small. At the same time Longyearbyen is facing great challenges, and a new port infrastructure will be an important measure and a necessary prerequisite for further development in areas such as research, tourism, logistics, and maritime services. In National transport plan 2014–2023 up to NOK 200 million have been allocated to a new port structure in Longyearbyen. These issues will also be discussed in a new white paper on Svalbard which the Government aims at presenting by 2016. With regard to heavy infrastructure such as port facilities, the Parlament (Storting) has previously referred to the strong national interests and obligations under international law associated with the archipelago, and that this calls for a strong government commitment[33].

### A broad knowledge initiative in the North

Through a long tradition and experience in shipping, Norway has acquired special competence with regard to the conditions prevailing in the High North. Further development and growth in the High North depend on our maintaining and further developing this competence. On this basis the need to establish a national competence centre for arctic maritime competence and education of seafarers associated with operation in arctic waters is now being discussed.

Norway is a world leader in innovation and technology for demanding operations in the North. The Government wishes to build on this unique competence as a basis for value creation and sustainable development.

### Research and innovation

Norway's location, access to natural resources and competence provides a unique opportunity to further develop technology and innovation associated with operation and transport in cold climate areas.

Through the Research Council of Norway and the MAROFF programme the authorities contribute to the development of technologies for the maritime sector, operation and transport in the Northern areas. The MAROFF programme supports, among other things, methods, technology, and analyses for risk

*33) Proposition to the Parlament (Storting) no. 336 (2008–2009), cf. Meld. St. no. 22 (2008–2009) Svalbard.*

Photo: Hurtigruten/Trym Ivar Bergsmo

assessment og environment/climate in connection with additional challenges, escape, evacuation, rescue from vessels in the High North. During the period 2011–2013 NOK 42.2 million were allocated to 22 projects labelled "The High North" under MAROFF.

Ocean space technology research and competence and increased collaboration and emphasis on synergies between the ocean industries are also vital to innovation and future value creation in the maritime industry in the North.

### Strengthened environmental protection, safety at sea, rescue and oil spill preparedness

Norway has sovereignty over large ocean areas, and more than 80 per cent of shipping in the Arctic is currently in Norwegian waters. We therefore have a special responsibility both as a flag state and as a coastal state to facilitate safe and environmentally friendly shipping traffic in the vulnerable arctic areas and ensure good monitoring and presence in our ocean areas.

The High North present specific operational challenges for vessels and crew, while the area has great natural resources which are vulnerable to impact, for example by acute oil spills. Extreme weather conditions and long distances combined with inadequate charts and limited access to communication systems, present a constant challenge. Long distances require particularly efficient search and rescue operations as well as preparedness against acute pollution and in clean-up operations. More collaboration between public and private players could be a way to handle some of the challenges.

### Legislation

In order to ensure sustainable development in the High North and prevent accidents and harmful emissions, it is important that the shipping industry operates with high safety and environmental standards.

The main challenges in the Arctic are transnational and should be handled through close international collaboration. The UN Convention on the Law of the Sea constitutes the legislative framework for all use of the ocean areas. In the same way as for other waters, shipping traffic and sea rescue in the Arctic is covered by international regulations on vessel standard, crew qualifications and operation laid down in the UN maritime organisation IMO.

However, the legislation has so far not been adapted to the specific conditions prevailing in arctic waters. On this basis Norway has been a driving force to put binding global rules in place for sailing in arctic areas (the Polar Code). The Polar Code makes specific requirements for vessels operating in these waters, such as, among other things, requirements as to construction, equipment, operation, protection of the marine environment, navigation, and crew competence. The Polar Code becomes effective on 01.01. 2017. The Government will work nationally and internationally to ensure effective implementation of the legislation.

Safe navigation and operation of vessels in the High North also depend on correct training. The Polar Code also makes requirements regarding who on board should have special training, and the specific


Photo: Hurtigruten/Joe Decker

content of the training requirements will be regulated through amendments to the STCW convention.

### Emergency preparedness

Norway shall maintain its important role in search and rescue in the High North. A good search and rescue system is also a prerequisite for future value creation and business development.

The location of the Northern ocean spaces makes search and rescue and preparedness against acute pollution challenging.

In order to improve preparedness, especially in Svalbard, the Governor's helicopter service was strengthened in the spring of 2014. The new helicopters have longer range, reduced response time, and modern search, communication and safety equipment, among other things. The Governor's new service vessel is also a vital resource in rescue and emergency preparedness work.

The Coast Guard is an important tool for maintaining sovereignty, exercise of authority, resource management, and emergency preparedness. It patrols Norwegian ocean areas and zones, and one of its goals is to be present in the fisheries protection zone around Svalbard at all times. The Coast Guard and the armed forces' surveillance aircrafts are also important resources in search and rescue operations in the High North. New rescue helicopters will also help strengthen the rescue service.

The Arctic countries signed an agreement on collaboration on search and rescue in 2011. The agreement became effective in 2013, and it forms the basis for, among other things, appropriate search and rescue regions, collaboration mechanisms, and mutual help and assistance. An agreement was also signed on arctic collaboration on preparedness against acute pollution in 2013.

The maritime industry has taken the initiative to the search and rescue project SARiNOR. The purpose of the project is to create an arena for collaboration in search and rescue between private and public players. The project shall help develop and test new methods to increase rescue efficiency and capacity. The project has broad participation from both the public and the private sector.

The Norwegian Coastal Administration has just completed an environmental risk and preparedness analysis for Svalbard and Jan Mayen. The analysis will provide a better basis for dimensioning preparedness against acute pollution in these areas. The Government will also establish an environmental base / oil spill response base in Lofoten/Vesterålen and has initiated the work to evaluate form and content. The Government will perform a new, comprehensive review of preventative safety at sea and preparedness against acute pollution, and will present a white paper in the spring of 2016. The High Northwill have an important place here.

The Norwegian Society for Sea Rescue performs important safety work at sea and is a vital resource in sea rescue along the Norwegian coast. For 2015 NOK 81.2 million were allocated to the Norwegian Society for Sea Rescue. There will be a need for the

### Knowledge acquisition – value creation in the North

The report "Kunnskapsinnhenting – verdiskaping i nord" ("Knowledge acquisition – value creation in the North") from 2014 contains a thorough survey of the current situation and future prospects for value creation and employment in Northern Norway, with particular emphasis on fisheries, aquaculture, new marine industries, tourism, renewable energy, and minerals. Northern Norway is a region rich in resources and has great potential for economic growth and value creation. The knowledge acquisition has also considered measures to contribute to future growth.

The report can be read at *http://www.regjeringen.no/pages/38675752/W_0001_B_Framtid_i_nord_2014.pdf*

### Arctic Business

The Norwegian Shipowners' Association has taken the initiative to an international meeting place, "Arctic Business", where business executives and decision makers on a high strategic level in the business community from sectors such as shipping, oil and gas, fisheries and aquaculture, and the mineral industry can get together to exchange, discuss, reconcile and coordinate information on the situation in the Arctic, ideas for business opportunities, and "best practices" for sustainable business development. Arctic Business was arranged for the first time in the autumn of 2014 in Bodø. The Norwegian Shipowners' Association has gotten DNV GL, the Kongsberg Group, and Statoil to join the team.

Norwegian Society for Sea Rescue's efforts for safety at sea also in the future.

#### Further development of infrastructure

In the contributions to the strategy work the industry has been concerned that the High North does not have sufficient necessary infrastructure in order to accommodate a large increase in activity in a safe, environmentally friendly, and efficient way.

Still, Norway is the arctic coastal state that must be considered having the best developed infrastructure in the area, especially with regard to ocean surveillance. This causes Norway, with its geographical position and existing and planned infrastructure, to have an advantage as an international partner and with regard to potential positioning of international activities.

#### Communication

Well-functioning communications systems are a necessary prerequisite for safe navigation and for efficient and safe rescue service and emergency communication. However, existing satellite communication systems have little or no coverage north of 75 degrees. The Government wishes to work to get good communication solutions in place for the Northern ocean areas, especially with regard to broadband services for vessels. In mid-2015 the Norwegian Space Centre will submit a report on potential concepts for ensuring the establishment of robust systems for communication by satellite. The report is expected to be processed by the Government during 2015.

Efficient preparedness also depends on land based communication working optimally. It is therefore desirable to assess the need to expand the maritime coastal radio service (HF radio) to cover the High North better than they currently do.

#### Ocean surveillance

Monitoring shipping traffic in the High North is vital to Norwegian exercise of authority and sovereignty, as well as efficient preparedness. Through satellite based data collection from vessels' automatic identification systems (AIS), Norway has a considerably better overview of shipping traffic in the Norwegian Arctic Ocean areas. The Government has allocated funds to maintain the satellite based AIS capacity through the National Transport Plan. Since land based AIS has limited coverage on Svalbard, the Government will assess the need to extend this coverage.

Barentswatch is a surveillance and information system where agencies with operative responsibilities at sea can share information safely and efficiently. A public information portal with services and applications for the public is also included. The system contributes to improved collaboration in the management of the Northern areas, and leads to, among other things, faster and more coordinated response during search and rescue operations and more efficient combating of fishing crimes.

The Government has decided to establish a separate analysis unit at the vessel traffic service in Vardø. The responsibilities of the unit will be, among other things, detecting illegal fishing, transport of illegal

## Arctic Expedition Cruise Operators (AECO)

Cruise ships have been doing maritime mapping for their own use for years. In collaboration with Lindblad Expeditions and their Antarctic partner IAATO, AECO has found a method that allows cruise operators to share historical sea mapping data from the Arctic and Antarctic.

Photo: Kjell Røang

fish, and deviations from regulations and procedures for transporting dangerous and polluted cargo.

In the summer of 2013 the vessel reporting system Barents SRS was established. This system, which is approved by the UN maritime organisation IMO, imposes reporting duties on vessels associated with a certain risk when sailing between Norwegian and Russian waters. The system gives Norwegian and Russian authorities better situational awareness of the shipping traffic in the Barents Sea.

### Maritime mapping

Safe navigation in the Arctic depends on dependable maritime navigational charts and ice data, and it is an important part of the infrastructure to safeguard life, health, environment, and assets. The mapping of the Arctic Ocean areas is inadequate. Increased traffic density, larger draft vessels and faster vessels make new requirements for the charts. The Government has initiated the efforts to map important areas around Svalbard.

The possibilities of utilizing more sources of information in maritime mapping, such as data from shipping itself, will also be considered.

### Increased interaction across borders in the North

Shipping plays an increasing part in Arctic cooperation, and the Government will reinforce its participation in this work. Cooperation takes place through High North dialogues and close collaboration with other Arctic states, our Nordic neighbours, European allies, the EU, North Atlantic Coast Guard Forum, as well as new Asian observers in the Arctic Council.

### The Government will:

- strengthen collaboration with the arctic maritime industry and local communities in the further development of a comprehensive policy for the High North.
- ensure that maritime activity adheres to high standards for safety and preparedness in the North.
- contribute to strengthening the global promotion of Norway's unique arctic maritime competence and favourable geographical position for arctic maritime activity, research, and competence building.
- assist IMO in taking take the appropriate consideration to the special environment prevailing in the High North in its future legislative work that affects shipping traffic in the Arctic.
- ensure good preparedness in relation to search and rescue and oil spill response in the High North.
- evaluate the need for developing a satellite to cover the broadband requirement in arctic waters.
- further develop Barentswatch, including strengthening collaboration with Arctic states.
- consider establishing an arctic maritime competence centre in the North.
- strengthen international collaboration on arctic maritime policy, also bilaterally, regionally in the Arctic Council, and internationally in IMO.
- ensure effective implementation of the Polar Code.
- consider a further operationalisation of the agreement on search and rescue in connection with aviation and shipping in the Arctic (SAR Arctic).

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