



STUDY ON BLUE GROWTH AND MARITIME POLICY WITHIN THE EU NORTH SEA REGION AND THE ENGLISH CHANNEL

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Contents

| | |
|--|----|
| 0. General overview..... | 1 |
| 1. Marine and maritime economic activities | 2 |
| 2. List the 7 largest, fastest growing and most promising marine and maritime economic activities..... | 8 |
| 2.1 Listing and ranking the largest marine and maritime economic activities..... | 8 |
| 2.2 Ranking order for the 7 fastest growing marine and maritime economic activities over the 3 past years..... | 8 |
| 2.3 Ranking order of the 7 most promising marine and maritime economic activities..... | 9 |
| 3. Breakdown of maritime economic activities at regional level (NUTS 1 or NUTS 2) and selection of the most important maritime regions for the country..... | 11 |
| 4. List of existing clusters | 14 |
| 5. Analysis of maritime strategies at regional and national level, as well as those under preparation and their links with Smart Specialisation Strategies | 15 |
| Annex I – Detailed description of the sources and the methodology on maritime economic activities..... | 20 |
| Annex 2 | 25 |
| Annex 2 – Table used to assess the 7 most promising maritime sectors in Norway..... | 32 |



This country fiche template has been adapted from Study in the Mediterranean, Adriatic and Ionian and the Black Sea (MARE/2012/07 - REF. NO 2). The country fiche for countries with access to multiple sea-basins should provide a distinction for the regions alongside the different seas.

The “Blue Growth study” methodology has been adopted for defining the blue growth potential in each country involved in the study. The methodology is customised to:

- ensure it is aligned – as much as possible – with the economic role of the specific maritime area (on NUTS 0 and NUTS 2 levels)
- have access to a wider range of economic actors .

0. General overview

- ✓ The length of the **coastline in Norway** is 100 915 km¹.
- ✓ The **coastal area (defined as 10 km coastal zone area)** comprises **113 329 km²**. This is **20 per cent** of the total coastal area of the EU-22 MS².
- ✓ The Western, Southern and Eastern parts of Norway have strong clusters related to shipping and offshore oil and gas, while the Western and Northern parts have strong fishery and aquaculture related clusters.

For the brief macroeconomic overview of the country please indicate the:

- ✓ Size of the population in Norway in 2012 was 5.05 million.
- ✓ GDP of Norway in 2012 was 330 311 million Euro. The most important regions with regard to value creation are Oslo and Akershus, Agder and Rogaland and Vestlandet.
- ✓ Main economic sectors in Norway are:
 - Extraction of oil and gas, which constitutes about 20 per cent of GDP
 - Manufacturing, which constitutes about 16 per cent of GDP
 - Construction, which constitutes about 8 per cent of GDP
 - Wholesale and retail trade; repair of motor vehicles and motorcycles, which constitutes about 7 per cent of GDP
- ✓ The main maritime economic sector in Norway is offshore oil and gas, which had a value creation on 63 billion Euros in 2010. This sector constitutes about 80 per cent of all activity in Norway's maritime sector. Other important sectors are **deep sea shipping** with a value creation on 5 billion Euros in 2010 and **shipbuilding**, which had a value creation of about 3 billion in the same year (Menon, 2013³).

Overview of employment and social conditions in the geographic areas (last year available) please indicate:

- ✓ All counties in Norway except Hedmark and Oppland have access to the sea. In all, 92 per cent of the inhabitants in Norway live in "maritime areas", which can be identified as the sum up of maritime NUTS 3 areas.
- ✓ Due to high activity within offshore oil and gas, Norway experiences a shortage of labour, which results in import of labour from the EEA-area. Total employment in Norway is 2.6 million, which is 62 per cent of the total population. The unemployment rate is about 3.5 per cent. There are no major differences in the unemployment rate between the different regions in Norway on NUTS 2-level.

Key maritime strategies in the country (national, regional level policies and incentives etc.)

- ✓ The Government of Norway has strategies for all the maritime sectors. The most important are:
 - Offshore oil and gas: In 2011 the Government released its strategy on offshore oil and gas called "An industry for the future".
 - For deep and short sea shipping and shipbuilding, the Government has a strategy called "Steady as she goes".
 - For the fishery and aquaculture sector, the Government released its strategy "The world leading sea food producer" in 2012.
 - For the travel industry, which includes coastal tourism, the strategy is laid down in the document "Destination Norway", which was launched in 2012.

¹ According to The Norwegian Mapping Authority (2012). This includes the islands of Svalbard and Jan Mayen.

² Ibidem.

³ Please see Annex I for more information

1. Marine and maritime economic activities

This section provides an overview of the main maritime activities and the related socio-economic impacts of the most relevant maritime economic activities in the North Sea region at **NUTS 0 level**.

Table 1 - Overview of relevant maritime economic activities in a MS at NUTS-0 level

| Maritime economic activity | | GVA (€, billion) | Employment (*1000) | Number of enterprises | Further indicators | Source & Reference year |
|---|--|---------------------|-----------------------|--------------------------|-----------------------|---|
| 0. Shipbuilding | | | | | | |
| 0.1 | Shipbuilding (excl. leisure boats) and ship repair | 2.909 | 26.106 | 714 | | <i>Menon Business Economics, (2010)</i> |
| 0.2 | Construction of water projects | 0.014 | 0.208 | 24 | | <i>Menon Business Economics, (2010)</i> |
| 1. Maritime transport | | | | | | |
| 1.1 | Deep-sea shipping | 5.065 | 16.454 | 2273 | | <i>Menon Business Economics (2010)</i> |
| 1.2 | Short-sea shipping (incl. Ro-Ro) | 2.454 | 0.265 | 262 | | <i>Menon Business Economics (2010)</i> |
| 1.3 | Passenger ferry services | 1.105 | 2.514 | 479 | | <i>Menon Business Economics (2010)</i> |
| 1.4 | Inland waterway transport | | | | | No industry |
| 2. Food, nutrition, health and eco-system services | | | | | | |
| 2.1 | Catching fish for human consumption | 1.575 | 16.152 | 4694 | | <i>Statistics Norway (2010), Menon (2010)</i> |
| 2.2 | Catching fish for animal feeding | 0.106 | 1.071 | 314 | | <i>Statistics Norway (2010), Menon (2010)</i> |
| 2.3 | Marine aquatic products | 2.362 | 10.220 | 2942 | | <i>Statistics Norway (2010), Menon (2010)</i> |
| 2.4 | Blue biotechnology | N/A | N/A | N/A | N/A | N/A |
| 2.5 | Agriculture on saline soils | N/A | N/A | N/A | N/A | No industry |
| 3. Energy and raw materials | | | | | | |
| 3.1 | Offshore oil and gas | 63.754 | 52.800 | 97 | | <i>Statistics Norway (2010), Menon (2010)</i> |
| 3.2 | Offshore wind | 0.055 | 0.657 | 83 | | <i>Menon Business Economics (2011)</i> |
| 3.3 | Ocean renewable energy | N/A | N/A | N/A | N/A | N/A |
| 3.4 | Carbon capture and storage | 0.0102 | 0.0850 | 4 | | <i>Menon Business Economics (2010)</i> |
| 3.5 | Aggregates mining (sand, gravel, etc.) | | | | | No marine industry |
| 3.6 | Marine minerals mining | N/A | N/A | N/A | N/A | N/A |
| 3.7 | Securing fresh water supply (desalination) | | | | | No industry |

| Maritime economic activity | | GVA (€, billion) | Employment (*1000) | Number of enterprises | Further indicators | Source & Reference year |
|--|--|---------------------|-----------------------|--------------------------|-----------------------|--|
| 4. Leisure, working and living | | | | | | |
| 4.1 | Coastal tourism | 1.025 | 22.272 | 1656 | | <i>Menon Business Economics (2010)</i> |
| 4.2 | Yachting and marinas | 0.051 | 0.276 | 99 | | <i>Menon Business Economics (2010)</i> |
| 4.3 | Cruise tourism | 0.032 | 0.290 | 12 | | <i>Menon Business Economics (2010)</i> |
| 5. Coastal protection | | | | | | |
| 5.1 | Protection against flooding and erosion, preventing salt water intrusion, protection of habitats | N/A | N/A | N/A | N/A | N/A |
| 6. Maritime monitoring and surveillance | | | | | | |
| 6.1/6.2 | Traceability and security of goods supply chains, prevention and protection against illegal movement of people and goods | N/A | N/A | N/A | N/A | N/A |
| 6.3 | Environmental monitoring | 0.025 | 0.260 | 12 | | <i>Menon Business Economics (2010)</i> |

In the boxes below you will find a description of the different maritime economies in Norway:

Overview of maritime economic activities in a MS at NUTS-0 level

Shipbuilding

Shipbuilding (excl. leisure boats) and ship repair in Norway had a value creation of 2.9 billion Euros in 2010⁴. The activity is highly related to the offshore oil and gas sector. In recent years, shipyards in Norway have specialized in building offshore supply vessels and other oil and gas related ships. Usually, ships are designed in Norway. However, since labour cost in Norway is high, the hull is often built in a low cost country. The ship is then finished at a shipyard in Norway and fitted out with Norwegian equipment.

Due to high global activity in the offshore oil and gas sector, activity in the shipyards is expected to rise in the years to come. Continuous specialization is however needed to overcome the drawback of high labour costs.

Maritime transport

Total value creation in deep sea shipping was approximately 5 billion Euros in 2010. Norway has for several years been amongst the 10 largest nations in deep sea shipping measured in dead weight tons (dwt). Norwegian ship-owners are leading in sectors such as car transport, transport of chemicals etc. A sharp increase in capacity from countries such as China and Germany has however decreased Norway's portion of total dwt. Just as important is however that Norwegian ship-owners have strategically turned activity from traditional deep sea shipping to oil and gas related activity and other more specialized niches where both level of specialization and rates are higher.

The oil and gas related segment of deep sea shipping has for several years' experienced double-digit growth, and is expected to grow further. The growth rate is however expected to decrease to some extent.

Total value creation in short sea shipping was approximately 2.5 billion Euros in 2010. Short sea shipping in Norway consists mostly of a few large and professional and a lot of small family owned ship-owning companies. The sector has experienced sharp competition from land transport, as well as from shipping companies registered in the EEA-area. The Government has for a long period tried to move transport of goods from roads to ships, but has largely failed in its efforts. Measured both in share and quantity, sea transport has decreased sharply since 2006.

Due to high activity in the oil and gas sector, short sea shipping has experienced rising labour costs, not least for officers and engineers. These challenges are not expected to abate in the years to come. The segment is therefore experiencing rising costs and tougher competition, which makes future prospects look a bit dim.

⁴ Eurostat quotes a value creation of € 2.6 billion. Differences in numbers can be caused by issues related to foreign ownership in shipbuilding, which is considerable. Furthermore, the difference could also stem from different exchange rates between Norwegian kroner and Euros used by Eurostat and Menon. Please see notes on collection of data and calculations in the annex.

Total value creation in passenger ferries in Norway was 1.1 billion Euros in 2010. The industry has experienced growth during the last years, mainly due to a rise in tourism. The sector's competitiveness is highly dependent on Norway's policy with regard to its compensation scheme for tax for seamen. As other European countries, Norway has a support scheme to strengthen the competitiveness of the shipping industry. However, support to passenger ferries is highly controversial, and a potential new conservative government has signalled a willingness to cut subsidies. If this turns out to be the case, shipping companies such as Color Line are expected to move their activities to Denmark, while the future for companies such as Hurtigruten is more insecure.

Food, nutrition, health and eco-system services

Catching fish for human consumption in Norway had a value creation of 1.6 billion Euro in 2010⁵. The industry has experienced growth the last years due to rising demand from BRIC-countries. However, due to price fluctuations, income varies from year to year. Though value creation has increased, employment has decreased. Smaller boats are leaving the business and selling quotas to larger boats, leading to high productivity growth.

The Norwegian fish stocks have increased the last years. The reason for this is partly that resources have been harvested in a sustainable manner. Leading Norwegian experts claim that an increasing sea temperature has a positive effect on stocks. Landing of fish is expected to rise in the years to come. However, temporarily low prices for cod can reduce landings temporarily.

Catching fish for animal consumption in Norway is highly related to producing fish food for aquaculture production. Norway is among the largest producers of food for aquaculture, with leading producers such as EWOS. Due to an expected rise in aquaculture production, the sector is expected to grow.

Marine aquatic products in Norway had a value creation of 2.3 billion Euros in 2010. Due to a sharp increase in demand for BRIC-countries, the industry has experienced high growth the last 20 years, with some downturns related to fluctuations in price and diseases. The industry started with new technology for farming of salmon. Implementing the technology in large scale has made Norway the largest producer of Atlantic Salmon, with 60 per cent of world production. The last years, the industry has also made efforts to start fish farming of cod and other species. Due to large fluctuations in prices and technological problems, the effort has mostly failed.

The industry has potential for increasing production substantially. However, strict regulations on ownership and production harm the growth of the sector to some extent. Just as harmful however are challenges related to diseases and other environmentally related subjects.

⁵ Eurostat reports a value creation of € 1.1 billion. We base our numbers on Statistics Norway, which reports value creation of €1.6 billion. Due to lack of data, numbers from Eurostat do not include NACE 03(catching fish and aquaculture), whereas the numbers from Statistics Norway do. This will cause some discrepancies. Another source of difference could be differences in exchange rates used by Menon and Eurostat. Please see notes on collection of data and calculations in Annex I..



Energy and raw materials

Offshore oil and gas is by far Norway's most important industry. Total value creation was 64 billion Euros in 2010⁶, which constitutes about 20 per cent of GDP. Due to a petroleum tax of 78 per cent, the sector constitutes a substantial source of income for the Norwegian Government. From 2001 to 2010 investments in new fields and upgrading of existing fields have increased from 11.6 billion Euro to 17 billion Euro, giving the supplying industry and other parts of the Norwegian economy a substantial demand impulse.

Production has been reduced slightly the last years due to lower production from existing fields. However, in recent years, oil companies found new fields. In addition, serious efforts are made to prolong production from existing field by using new technologies for increased oil recovery. The Government is withholding environmentally valuable areas in certain parts of Northern Norway from oil production. The decision is however highly controversial, and there might be changes with a possible new conservative government. If these areas are opened, production is expected to increase to some extent.

Offshore wind had a value creation of about 0.5 billion Euro in 2010. Since then, however, value creation has decreased due to lower electricity prices and signals from government that it intends to reduce subsidies for the industry, causing the cancellation of several wind farm projects. The prospects for offshore wind in Norway are therefore considered dim.

Norwegian companies such as Statoil and Statkraft have made some large investments in European countries such as the UK. In addition, the Norwegian supply industry for oil and gas has used its competence from oil and gas on wind farms, resulting in substantial exports. Due to an expected increase in wind farm investments globally, exports might rise. However, competition in the field is considered tough, which makes margins lower than what the industry traditionally has experienced in the oil and gas sector.

Carbon Capture and storage in Norway had a value creation of about €100 million in 2010. The activity is highly related to a test centre for new technologies located close to a gas plant. Prospects are highly dependent on whether the test centre succeeds in developing new and efficient technology.

⁶ Eurostat reports a value creation of €71 billion. Eurostat data for GVA is from 2008, whereas our data from Statistics Norway is from 2010 (higher crude oil prices in 2008). Statistics Norway data for 2008 imply a GVA of € 78 billion. The difference stems probably from the fact that Eurostat data do not include NACE 0620. This can also explain the difference in the number of employees from the two different sources.

Leisure and tourism

Coastal tourism in Norway had a value creation on €1 billion in 2010. The industry's value creation decreased slightly between 2008 and 2010 due to the financial crisis, which makes Norway as a destination less cost-competitive. Tourism from Russia, China and Brazil has increased the last 5 years. However, still about 98 per cent of hotel stays are by tourists from OECD countries, with Germany and Denmark with the largest market shares. The part of the industry that is focused on tourism experience has lower profitability than the part that is focused on business travel. This is due to a higher willingness to pay in the business sector in combination with a smaller number of bookings from tourists in low season periods. In 2013 visits from OECD countries have decreased sharply. If this trend continues, profitability will decrease significantly, unless tourism from BRIC-countries increases.

Cruises had a value creation of €32 million in 2010. However, the numbers do not accurately reflect the cruise activity in Norway, which is considerable. Cruises are however often performed by shipping companies from other countries, which make value creation from Norwegian Cruise companies more moderate. Cruise tourists however spend money when being on shore. Studies from Grontmij (2010) shows that total turnover stemming from cruise tourism was €250 million in 2010⁷. Considering the substantial number of cruise tourists and the considerable environmental problems cruises cause in Norwegian fjords, experts consider the trickle down effects to be too small, and substantial efforts are made to increase spending by cruise tourists while on shore.

Cruise tourism has growth substantially the last years. Growth can be explained by an increase in tourism in Norway, partly due to a sharp increase in arctic cruising.

Yachting and marinas had a value creation of €51 million in 2010. The activity is mostly related to marinas, and value creation is first and foremost stemming from handling transport shipping and cruises. Transport of goods by ship has decreased the last years (Menon, 2012)⁸, despite Government efforts to increase sea transport. If the trend continues, value creation among marinas will probably decline, if cruising activities do not increase.

⁷ Grontmij/Carl Bro (2010) : Gjesteundersøkelse fra Cruiseturismen

⁸ Menon 2012 : Evaluering av «Stø kurs ».

2. List the 7 largest, fastest growing and most promising marine and maritime economic activities

2.1 Listing and ranking the largest marine and maritime economic activities

In table 2 below, we show the 7 largest maritime economies in Norway, with regard to GVA, employment and score.

Table 2 – Listing the 7 largest maritime economic activities in a MS at NUTS-0 level

| Rank | Maritime economic activities | GVA (million €) | Employment (*1000) | Score |
|------|--|--------------------|--------------------|-------|
| 1 | Offshore oil and gas | 63,754 | 52,800 | 345,2 |
| 2 | Deep-sea shipping | 5,065 | 16,454 | 33,6 |
| 3 | Shipbuilding (excl. leisure boats) and ship repair | 2,909 | 26,106 | 27,6 |
| 4 | Marine aquatic products | 2,362 | 10,220 | 16,9 |
| 5 | Coastal tourism | 1,025 | 22,272 | 16,3 |
| 6 | Catching fish for human consumption | 1,575 | 16,152 | 16,0 |
| 7 | Short-sea shipping | 2,454 | 0,265 | 12,4 |

As seen in Table 2, offshore oil and gas is the dominant maritime sector with a value creation more than 10 times larger than deep sea shipping. The activity in large parts of the maritime sector in Norway is highly related to the activity in the oil and gas sector, since the sector annually has investment costs of approximately € 25 billion.

2.2 Ranking order for the 7 fastest growing marine and maritime economic activities over the 3 past years

Table 3 below consists of a ranking of the 7 fastest growing economic activities:

Table 3 - Ranking order of the 7 fastest growing maritime economic activities in a MS at NUTS-0 level

| | Maritime economic activities | GVA (CAGR) | Employment (CAGR) | Score |
|---|--|---------------|----------------------|-------|
| 1 | Marine aquatic products | 71.7% | 13.9% | 0.43 |
| 2 | Catching fish for animal feeding | 22.2% | 13.4% | 0.18 |
| 3 | Cruise tourism | 24.7% | 3.2% | 0.14 |
| 4 | Environmental monitoring | 4.8% | 7.8% | 0.06 |
| 5 | Short sea shipping | -2.1% | 13.9% | 0.06 |
| 6 | Shipbuilding (excl. leisure boats) and ship repair | 11.7% | -1.7% | 0.05 |
| 7 | Yatching and marinas | 10.3% | -1.1% | 0.05 |

As seen in Table 3, marine aquatic products have the fastest growth in both GVA and employment. This is due to an increase in demand from BRIC-countries. Since demand is growing faster than supply, prices have also increased in the period, causing a growth of a remarkable 71.7 per cent. The same mechanisms can explain the growth in catching fish for animal and human consumption; which have also had a remarkable growth in the period. As seen in the table, GVA is growing faster than employment in the sea food sector. This is due to an increase in productivity, mainly caused by larger and more productive fish farms and larger and more productive fishing vessels.

As seen in the table, cruise tourism has had strong growth as well. However, the GVA in this industry is quite low compared to other sectors in the maritime economy in Norway. The same goes for environmental monitoring, short sea shipping, and yachting and marinas.

2.3 Ranking order of the 7 most promising marine and maritime economic activities

In the table below we have listed the 7 most promising maritime economies in Norway.

Table 4 - Ranking order of the 7 most promising maritime economic activities in a MS at NUTS-0 level

| Rank | Maritime economic activities |
|------|------------------------------|
| 1 | Offshore oil and gas |
| 2 | Deep sea shipping |
| 3 | Aquaculture |
| 4 | Catching fish |
| 5 | Ship building |
| 6 | Coastal tourism |
| 7 | Passenger ferry services |

Offshore oil and gas has a dominant position in the Norwegian maritime economies. The industry is considered world-leading on new technologies for deep sea and subsea production, and has substantial operations both on the Norwegian continental shelf, as well as on continental shelves elsewhere. Large conventional oil and gas fields have mostly been discovered. New fields often require innovation in order to reach a production phase. In this field, Norwegian companies are considered world leading.

The trickle down effects from oil and gas are considered high. Menon (2013)⁹ has shown that total employment from oil and gas is about 250 000 people, which is about 10 per cent of total employment in Norway. It is in shipbuilding, deep-sea shipping, coastal tourism and the maritime industry as a whole where the employment effect is strongest. Therefore, high potential in the oil and gas sector implies high potential also in deep-sea shipping and shipbuilding. The potential is however considered higher in deep-sea shipping compared to ship building, due to high international competition in ship building.

Aquaculture and fishing has large potential in relation to global economic growth. Due to a possible decrease in global catches caused by overfishing, demand will probably have to be met by aquaculture production, and Norway has a naturally given potential for growth due to sea temperatures and a long coastline.

Global elasticity between income and travel is 1.1. This means that if we increase our income by 10 per cent, we increase travel by 11 per cent. In the medium and long term, growth in the OECD is expected to

⁹ Menon 2012 : Trickle down effect from the oil and gas activity in Norway. Available at: <http://menon.no/upload/2013/07/05/menon-rapport-4-2013-ny.pdf>



strengthen. It therefore expected that the consumption of coastal tourism, passenger ferries and cruise tourism will rise.

3. Breakdown of maritime economic activities at regional level (NUTS 1 or NUTS 2) and selection of the most important maritime regions for the country

Table 5 - Overview of GVA per maritime economic activity per region in a MS

| GVA (€ billion), 2010 | | Oslo og Akershus | Agder og Rogaland | Vestlandet | Trøndelag | Nord-Norge |
|---|--|------------------|-------------------|------------|-----------|------------|
| 0. Shipbuilding | | | | | | |
| 0.1 | Shipbuilding (excl. leisure boats) and ship repair | 0.329 | 0.851 | 1.224 | 0.057 | 0.063 |
| 0.2 | Construction of water projects | No value | 0.003 | 0.001 | No value | 0.008 |
| 1. Maritime transport and shipbuilding | | | | | | |
| 1.1 | Deep-sea shipping | 1.164 | 1.362 | 2.290 | 0.074 | 0.081 |
| 1.2 | Short-sea shipping (incl. Ro-Ro) | 0.042 | 0.056 | 0.073 | 0.050 | 0.034 |
| 1.3 | Passenger ferry services | 0.271 | 0.256 | 0.218 | 0.027 | 0.228 |
| 1.4 | Inland waterway transport | | | | | |
| 2. Food, nutrition, health and eco-system services | | | | | | |
| 2.1 | Catching fish for human consumption | 0.076 | 0.087 | 0.672 | 0.194 | 0.513 |
| 2.2 | Catching fish for animal feeding | No value | 0.006 | 0.046 | 0.014 | 0.038 |
| 2.3 | Marine aquatic products | 0.106 | 0.131 | 1.009 | 0.293 | 0.774 |
| 2.4 | Blue biotechnology | | | | | |
| 2.5 | Agriculture on saline soils | | | | | |
| 3. Energy and raw materials | | | | | | |
| 3.1 | Offshore oil and gas | 2.437 | 57.282 | 3.245 | 0.483 | 0.186 |
| 3.2 | Offshore wind | 0.022 | 0.021 | 0.002 | 0.003 | 0.002 |
| 3.3 | Ocean renewable energy | | | | | |
| 3.4 | Carbon capture and storage | 0.002 | No value | No value | No value | No value |
| 3.5 | Aggregates mining (sand, gravel, etc.) | | | | | |
| 3.6 | Marine minerals mining | | | | | |
| 3.7 | Securing fresh water supply (desalination) | | | | | |
| 4. Leisure, working and living | | | | | | |
| 4.1 | Coastal tourism | 0.302 | 0.139 | 0.225 | 0.082 | 0.129 |
| 4.2 | Yachting and marinas | 0.001 | 0.023 | 0.006 | 0.011 | No value |
| 4.3 | Cruise tourism | 0.008 | 0.007 | 0.006 | 0.001 | 0.007 |

| GVA (€ billion), 2010 | | Oslo og Akershus | Agder og Rogaland | Vestlandet | Trøndelag | Nord-Norge |
|--|---|------------------|-------------------|------------|-----------|------------|
| 5. Coastal protection | | | | | | |
| 5.1 | Protection against flooding and erosion, preventing salt water intrusion, protection of habitats | | | | | |
| 6. Maritime monitoring and surveillance | | | | | | |
| 6.1/6.2 | Traceability and security of goods supply chains, prevention and protection against illegal movement of people and goods, | | | | | |
| 6.3 | environmental monitoring | 0.007 | 0.004 | 0.007 | 0.003 | No value |

Overall, the western and southern parts of Norway, consisting of Agder and Rogaland and Vestlandet, have a dominant position within the maritime economies. These regions have a dominant position both within offshore oil and gas, deep-sea shipping, shipbuilding and aquaculture.

Overall, Agder and Rogaland is the largest region with regard to GVA. This is due to its dominating position within offshore oil and gas, with large companies such as Statoil, BP and Conoco Phillips registered in the region. However, activities in these companies are spread all over Norway with large agglomerations in Vestlandet and Østlandet. Activity from oil and gas is however growing fastest in Northern Norway, as the area is considered to have potential for several large fields.

Another large economic activity is deep-sea shipping. Vestlandet is the dominant region within this industry with close to half of total GVA. A substantial part of deep-sea shipping is related to oil and gas. Another large segment is specialized transport. Those segments not related to oil and gas and gas or specialized shipping have declined the last years due to a decline in rates and enhanced competition.

Shipbuilding is also a quite large sector with a total GVA of about €2 billion. Also in this segment, Vestlandet is dominating with close to half of activity. The same goes for aquaculture, where we see the same pattern both with regard to total GVA and distribution.

In the table below an overview of total employment in different maritime economies is shown.

Table 6 - Overview of GVA per maritime economic activity per region in a MS

| Employment (number of people in thousands) | | Oslo og Akershus | Agder og Rogaland | Vestlandet | Trøndelag | Nord-Norge |
|---|--|------------------|-------------------|------------|-----------|------------|
| 0. Shipbuilding | | | | | | |
| 0.1 | Shipbuilding (excl. leisure boats) and ship repair | 2.167 | 7.637 | 10.926 | 1.136 | 0.967 |
| 0.2 | Construction of water projects | No value | 0.023 | 0.015 | No value | 0.164 |
| 1. Maritime transport and shipbuilding | | | | | | |
| 1.1 | Deep-sea shipping | 2.195 | 5.177 | 8.114 | 0.064 | 0.600 |
| 1.2 | Short-sea shipping (incl. Ro-Ro) | 0.338 | 0.416 | 0.617 | 0.567 | 0.391 |
| 1.3 | Passenger ferry services | 2.744 | 2.163 | 2.179 | 0.373 | 2.514 |
| 1.4 | Inland waterway transport | | | | | |

| Employment (number of people in thousands) | | Oslo og Akershus | Agder og Rogaland | Vestlandet | Trøndelag | Nord-Norge |
|---|---|------------------|-------------------|------------|-----------|------------|
| 2. Food, nutrition, health and eco-system services | | | | | | |
| 2.1 | Catching fish for human consumption | 0.773 | 0.931 | 5.923 | 1.734 | 6.069 |
| 2.2 | Catching fish for animal feeding | No value | 0.059 | 0.407 | 0.123 | 0.441 |
| 2.3 | Marine aquatic products | 0.463 | 0.587 | 3.756 | 1.102 | 3.863 |
| 2.4 | Blue biotechnology | | | | | |
| 2.5 | Agriculture on saline soils | | | | | |
| 3. Energy and raw materials | | | | | | |
| 3.1 | Offshore oil and gas | 2.882 | 34.936 | 11.530 | 2.113 | 0.687 |
| 3.2 | Offshore wind | 0.059 | 0.208 | 0.154 | 0.130 | 0.004 |
| 3.3 | Ocean renewable energy | | | | | |
| 3.4 | Carbon capture and storage | 0.029 | No value | No value | No value | No value |
| 3.5 | Aggregates mining (sand, gravel, etc.) | | | | | |
| 3.6 | Marine minerals mining | | | | | |
| 3.7 | Securing fresh water supply (desalination) | | | | | |
| 4. Leisure, working and living | | | | | | |
| 4.1 | Coastal tourism | 5.741 | 3.048 | 4.630 | 1.955 | 2.938 |
| 4.2 | Yachting and marinas | 0.013 | 0.080 | 0.055 | 0.055 | No value |
| 4.3 | Cruise tourism | 0.079 | 0.054 | 0.055 | 0.011 | 0.072 |
| 5. Coastal protection | | | | | | |
| 5.1 | Protection against flooding and erosion, preventing salt water intrusion, protection of habitats | | | | | |
| 6. Maritime monitoring and surveillance | | | | | | |
| 6.1/6.2 | Traceability and security of goods supply chains, prevention and protection against illegal movement of people and goods, | | | | | |
| 6.3 | environmental monitoring | 0.093 | 0.029 | 0.0705 | 0.026 | No value |

By comparing table 5 and 6 we see that there is a close correlation between GVA and employment. The regions with the highest GVA also have the highest employment.

With regard to GVA per employment offshore oil and gas is notably high. This is due to high profitability in the sector.

4. List of existing clusters

Table 7 - List and analysis of clusters

| | Member State(s) | Maritime economic activities covered | Status (mature, growing, early development) | Strengths | Weaknesses |
|---------------------------------|---------------------|---------------------------------------|---|--|---|
| Oil and gas cluster (Stavanger) | Norway, UK | Oil and gas | Mature | Global knowledge leader in deep sea production and subsea production. Strong competitiveness and presence in large parts of the world | Highly dependent on willingness by oil and gas companies to continue search and production Norway is the dominant country. |
| | Norway, Scotland | Aquaculture | Growing | Global knowledge leader on salmon production. Good research on new species. Growing demand caused by strong growth in BRIC-countries | Substantial challenges with regard to diseases and other environmental issues. Vulnerable to high fluctuations in fish prices. |
| Shipping cluster | Norway, UK, Denmark | Oil and gas related deep sea shipping | Growing | Global knowledge leader in maritime support for offshore oil and gas production. Strong presence in large parts of the world. | Highly dependent on willingness by oil and gas companies to continue search and production |

5. Analysis of maritime strategies at regional and national level, as well as those under preparation and their links with Smart Specialisation Strategies

In the table below the four most important Norwegian strategies for strengthening growth in the maritime industries are listed. We have in the table also shown links to “Blue growth objectives” and “Blue growth focus areas”.

Table 8 - Logical Diagram on policies/interventions towards maritime economic activities and the Blue Growth objectives

| Strategies | Objectives of strategy | Blue growth objectives | Blue growth focus areas |
|---|--|--|----------------------------|
| «An industry for the future» | Strengthen value creation in the oil and gas sector in Norway Strengthen job creation in rural areas | Increase growth potential of activities Enhance efficiency in harvesting European energy resources Advances in technology Security supply Increase growth potential of activities High value added specialized products Diversification of coastal communities' activities | |
| “Steady as she goes” | Strengthen value creation in the shipping industry | Increase growth potential of activities Advances in technology High value added specialized products Diversification of coastal communities' activities Healthy environment | |
| Destination Norway | Strengthen value creation in tourism | Increase growth potential of activities Advances in technology High value added specialized products Diversification of coastal communities' activities Increase attractiveness of coastal areas | Marine and coastal tourism |
| «The world leading seafood producer» | Strengthen long term value creation in fishing and aquaculture Continue sustainable harvesting and aquaculture industry | Increase growth potential of activities Advances in technology High value added specialized products Diversification of coastal communities' activities Increase attractiveness of coastal areas | Aquaculture |

As seen in the table, the strategies are much in line with blue growth objectives. However, only the strategies for tourism and aquaculture and fishing fit within the blue growth focus areas. The oil and gas sector and the shipping industry have however shown remarkable growth and are of vital importance to the Norwegian economy. Due to access to natural resources and advances in technology in the oil and gas industry and supply industry for oil and gas, growth in these sectors differentiates Norway from other European economies.

In Table 9 below, we have shown the links between different Norwegian strategies and smart specialization strategies (SSS).

Table 9 - Logical Diagram table on policies/interventions between economic activities and SSS

| Strategies | Objectives of strategy | Smart specialization strategies |
|--------------------------------------|--|---|
| «An industry for the future» | Strengthen value creation in the oil and gas sector in Norway Strengthen job creation in rural areas | Clusters Research infrastructure, centers of competence and science parks University-enterprise cooperation Key enabling technologies Internationalization Financial engineering instruments |
| “Steady as she goes” | Strengthen value creation in the shipping industry | Clusters Research infrastructure, centers of competence and science parks Innovation friendly business environment for SMEs University-enterprise cooperation Key enabling technologies Internationalization Financial engineering instruments |
| Destination Norway | Strengthen value creation in tourism | Clusters Research infrastructure, centers of competence and science parks Innovation friendly business environment for SMEs University-enterprise cooperation Key enabling technologies Internationalization Financial engineering instruments Green growth Social innovation |
| «The world leading seafood producer» | Strengthen long term value creation in fishing and aquaculture Continue sustainable harvesting and aquaculture industry | Clusters Research infrastructure, centers of competence and science parks Innovation friendly business environment for SMEs University-enterprise cooperation Key enabling technologies Internationalization Financial engineering instruments Green growth |

As seen in the table, all the Norwegian strategies for strengthening growth in different maritime economies have reference to a range of different smart specialization strategies. Improving access to finance for high risk and high potential projects, cluster support and university-enterprise cooperation are mainstays of Norwegian policy for strengthening growth among enterprises in all sectors of the Norwegian economy.

Impact of strategies

It is difficult to assess the importance of the different strategies, not least because additionality is unclear. Though the strategies are quite new, the policy for the different industries has been remarkably stable, not least in the oil and gas, fishing and aquaculture and tourism sectors.

Policy for oil and gas has for a long time promoted research and innovation in combination with a stable business environment. The policy has undoubtedly contributed to both increased value creation and global knowledge leadership in both the oil and gas sector and the supply industry, which consists of both shipbuilding and deep sea shipping, amongst others.

With regard to the shipping industry, Menon (2012)¹⁰ has shown that both value creation and employment would have been substantially lower without the shift in policy that came with the “Stø kurs”-strategy.

¹⁰ Menon 2012 : Evaluation of « Stø kurs ».

Strategies, impact on sustainable growth and funding

In the table below, we present a description of policies directly relevant for maritime economic activities, its priorities, consequences for maritime activities, impact on sustainable growth and issues related to funding.

Table 10 – Assessment of maritime policies¹¹

| Policy | Objectives | Priorities | Consequences for maritime activities | Impacts on sustainable growth | Investment and funding |
|-------------------------------------|---|--|---|---|---|
| Policy 1: (En næring for fremtiden) | Strengthen growth in the oil and gas sector. Strengthen trickle down effects in all parts of Norway | <p>Moving production further north into the Arctic.</p> <p>Strengthen international competitiveness of the supply industry</p> <p>Underlining the importance of geographically spreading trickle down effects to Northern-Norway</p> | Offshore oil and gas is by far the most important maritime industry in Norway. High investments in the sector have a large effect on maritime industries such as deep-sea shipping and shipbuilding. The activity also has effect on coastal tourism, mainly in the business segment. | Although use of oil and gas results in emissions, it is not clear that this has negative environmental effect. Emissions from gassare half of emissions from coal. A substitution of coal based production by gas based production would reduce emissions in Europe substantially. About 60 per cent of petroleum production in Norway is gas, and the share is growing | <p>The oil and gas sector has annual investments on the Norwegian continental shelf of about €25 billion. The number is expected to rise as production moves further north.</p> <p>Willingness to invest is highly dependent on future prices on oil and gas. As gas prices have decreased due to the shale gas revolution, oil and gas companies have recently been reluctant to invest in gas fields in the Arctic.</p> <p>The industry does not get financial support from the Structural Funds.</p> |
| Policy 2 name: Stø kurs | Strengthen growth in shipping and shipping related activities | <p>Strengthen innovation and knowledge leadership in important areas such as arctic operations, offshore supply etc.</p> <p>Securing that Norwegian companies have as good support schemes as in</p> | The shipping industry is one of Norway's largest. Due to better business conditions countries such as the Bahamas, Cayman Island etc., large parts of the shipping industry converted to convenience flags, causing a decrease of the industry in Norway. Now, support schemes are in place to secure competitiveness. The industry has grown remarkably the last years | <p>Norway is considered world leading on energy efficiency in the shipping industry.</p> <p>Due to relatively low prices for gas in comparison with oil, several shipping companies are</p> | <p>Due to highly cyclic prices, parts of the shipping related industry in Norway has been highly dependent on government lending mechanisms.</p> <p>In the oil and gas related part of the industry, access to private finance is good due to good profitability.</p> |

¹¹ Please see the country fiche guidelines for the methodology

| Policy | Objectives | Priorities | Consequences for maritime activities | Impacts on sustainable growth | Investment and funding |
|--|--|---|--|--|--|
| | | other European countries. | both due to a growing oil and gas sector and better framework conditions. | now turning to gas, which has remarkably lower emissions | The industry does not get financial support under the Structural Funds. |
| Policy 3: Destinasjon Norge | Strengthen growth in the travel industry | Strengthen labour productivity and cooperation in the travel industry | Labour productivity in the travel industry is low compared to other parts of the economy. This is due to low specialization and challenges related to large variations between low and high seasons. The aim is to strengthen growth by increasing specialization and cooperation between different parts | Coastal tourism is an important source for employment in rural parts of Norway. Strengthen growth in these areas is an important policy goal. | Due to low profitability and high risk, the travel industry is highly dependent on support schemes and government lending mechanisms. The industry does not get financial support under the Structural Funds. |
| Policy 4: Verdens fremste sjømatnasjon | Continue growth in the seafood sector. Continue sustainable harvesting. | Secure growth in large parts of the country. Strengthen environmentally sustainable growth in the aquaculture sector | Aquaculture and fishing is one of Norway's largest and fastest growing industries. Continued growth is considered essential for securing activity in more rural parts of Norway. | Fishery resources in Norway are harvested in a sustainable manner. Growth in stocks recent years is a clear indication of that. However, the aquaculture industry has severe challenges with regard to fish diseases and escaping of fish from farms. | Due to large fluctuations in prices, the aquaculture and fishing industries is highly dependent on government lending mechanisms. The more professional part of the aquaculture industry has good access to private finance. The industry does not get financial support under the Structural Funds. |

Assessment of broader strategies

In addition to strategies focused on strengthening long term growth in the maritime industries, several other broader support schemes are of vital importance to the industries. These are listed in the table below.

Table 11 – Assessment of a broader range of policies

| Policy | Objectives | Priorities | Consequences for maritime activities | Impacts on sustainable growth | Investment and funding |
|----------------------|---|-------------------------|--------------------------------------|-------------------------------|------------------------|
| Policy 1 name (GIEK) | Reduce risk related to exports of goods | All Norwegian exporting | GIEK provides guaranties for | Positive. | The Government of |

| Policy | Objectives | Priorities | Consequences for maritime activities | Impacts on sustainable growth | Investment and funding |
|--------------------------------|--|--|--|---|--|
| | and services | companies | export credits and is considered highly important to the shipbuilding and deep-sea shipping, and other parts of the supply industry to oil and gas. | Without these mechanisms, exporting would have been considered more risky | Norway issues guarantees up to about 25 billion Euro for export guarantees |
| Policy 2: Forskningsrådet | Strengthen innovation and research | Strengthen cooperation between research and businesses | Forskningsrådet has support schemes for all industries in the maritime sector, with special emphaties on offshore oil and gas, offshore wind, fishery and aquaculture, deep- and short sea shipping etc. | The short term effect from more research is hard to measure. However, long term effect is considered highly positive. Forskningsrådet puts special emphasis on sustainable growth in all their programs | Forskningsrådet is supported by the Government. Several of the programs cooperate closely with EU-related research programs |
| Policy 3: Innovation Norway | Strengthen innovation and internationalization in small and medium sized companies | Loans and support schemes for large parts of the maritime industries | Innovasjon Norge's lending mechanism is highly used by large parts of the maritime industry. Also support mechanism for cluster activity and is highly used | The short term effect from more emphasis on innovation and internationalization is hard to measure. However, long term effect is considered highly positive. | Innovasjon Norge is a government agency and receives support from the Government. Innovasjon Norge cooperates with EU on a professional basis, and receives a smaller amount through the CIP-program |

Annex I – Detailed description of the sources and the methodology on maritime economic activities

Menon Business Economics own database: The database contains all reported accounting data for all Norwegian companies from Brønnøysund Register Centre¹². Menons database has, based on registered number of employees, divided the companies' accounting numbers on different regional departments which gives a clearer picture of the values created in different regions.

Data in general

To convert the numbers from NOK to € we have used annual average of daily rates from Norges Bank (Norway's central bank).

All Numbers for Gross Value added is presented in current prices due to lack of data on GVA in factor prices.

Table 1 – Exchange rates used to convert the numbers. Source: Norges Bank (2013)

| | 2008 | 2009 | 2010 |
|-------|--------|--------|--------|
| NOK/€ | 8.2194 | 8.7285 | 8.0068 |

For all categories numbers are for 2010 and CAGR for the period 2008-2010.

0. Shipbuilding

Source of data: Menon Business Economics own database.

- 01. Shipbuilding: sum of NACE code: 33.15 and 30.11
- 02. Construction of water projects: Sum NACE code 42.91

1. Marin Transport:

Source of data: Menon Business Economics own database.

- 1.1 Deep-sea shipping:
Sum NACE 50.201 and 50.204 + share of NACE 77.34, 52.24, 52.10 and 52.22
- 1.2 Short-sea shipping:
Sum NACE 50.202 and 50.203 + share of NACE 77.34, 52.24, 52.10 and 52.22
- 1.3 Passenger Ferry services:
Share of NACE 50.10 + share of NACE 77.34, 52.24, 52.10 and 52.22
- 1.4 Inland waterway transport:
No available data: Very limited value creation and employees.

NACE 52.22 Service activities incidental to water transport

NACE 52.221 is Marinas and excluded from the numbers used to calculate deep-sea, short-sea and passenger. NACE 52.221 is presented in category 4.2 Yachting and marinas.

¹² Government administrative agency responsible for national regulatory and registration schemes for business and industry. www.brreg.no

Split between Deep-sea, Short-sea and Passenger:

By using 5-digit NACE codes we calculated the shares of Deep-Sea, Short-Sea and Passenger based on NACE 50, and applied these shares to be able to split NACE 77.34, NACE 52.24, NACE 52.10 and NACE 52.22 between the three categories.

Weights based on NACE 50.20, and used to split NACE 77.34, NACE 52.24, NACE 52.10 and NACE 52.22

Table 2 - Weights used to calculate split between NACE. 77.34, 52.24, 52.10 and 52.22 between deep-sea, short-sea and passenger

| | Number of persons employed | | | Value Added | | |
|------------------|----------------------------|-------------|-------------|-------------|-------------|-------------|
| | 2008 | 2009 | 2010 | 2008 | 2009 | 2010 |
| Deepsea | 53 % | 56 % | 55 % | 81 % | 79 % | 78 % |
| Shortsea | 7 % | 8 % | 8 % | 4 % | 5 % | 4 % |
| SUM | 60 % | 63 % | 63 % | 85 % | 83 % | 82 % |
| Passenger | 40 % | 37 % | 37 % | 15 % | 17 % | 18 % |
| Total | 100 % | 100 % | 100 % | 100 % | 100 % | 100 % |

Passenger split between Passenger Ferries and Cruise tourism:

| Description | Comments | | 2008 | 2009 | 2010 |
|--|------------------|-----------------|-------------|------------|------------|
| Passengers transported to/from main ports | excluding cruise | 1.000 passenger | 6,133 | 5,633 | 5,724 |
| Country level - Passengers embarked and disembarked in all ports | Ferry + cruise | 1.000 passenger | 6,208 | 5,728 | 5,876 |
| Percentage ferry (ECORYs) | | % share | 99% | 98% | 97% |
| Percentage ferry (Menon) | | % share | 98 % | 98% | 97% |

Maritime share of NACE 52.10 and 52.24

For NACE 52.10 and 52.24 we have included only the part of the industry which is considered maritime. To assign the weights we have used Menon's own classification of maritime sectors.

Table 3 - Part of NACE 52.24 and 52.10 which is considered maritime

| | Share maritime |
|--------------------------------------|----------------|
| NACE 52.10 (Warehousing and storage) | 1 % |
| NACE 52.24 (Cargo handling) | 100 % |

2. Food, nutrition and eco-system services

- 2.1 Catching of fish for human consumption
- 2.2 Catching of fish for animal feeding
- 2.3 Marine Aquatic products:

Source of data: Statistics Norway - National accounts for NACE 03.1 and 03.2, and Menon Business Economics database for NACE 10.20, 46.38 and 47.23.

For catching of fish (NACE 03.11 and 03.12) and marine aquatic products (NACE 03.2) Statistics Norway (National Accounts) are used as source. On national level the values for each of these NACE codes are available. On a regional level data is only available for the entire NACE 03. The split between fishing and marine aquatic products is then based on the weight on a national level.

Table 4 - Split between fish catching and marine aquatic products.

| | Employees | | | Value added | | |
|------------------------|-----------|------|------|-------------|------|------|
| | 2008 | 2009 | 2010 | 2008 | 2009 | 2010 |
| Catching fish | 70 % | 66 % | 63 % | 68 % | 52 % | 42 % |
| Marin aquatic products | 30 % | 34 % | 37 % | 32 % | 48 % | 58 % |

The weights in table 4 are also used to split up NACE 10.20 and 46.38 and 47.23.

To split NACE 03.11, NACE 03.12 and NACE 10.20 between human and animal consumption ECORYS estimates are used.

Table 5 - Split between fish catching for human consumption and animal feeding

| | 200852 | 200952 | 201052 |
|--|----------------|----------------|----------------|
| PRCCODE | Jan.-Dec. 2008 | Jan.-Dec. 2009 | Jan.-Dec. 2010 |
| Total for human consumption | 2,441,162,979 | 2,371,030,271 | 3,017,273,466 |
| Total not for human consumption | 137799287 | 139391713 | 217467486 |
| Total | 2,578,962,266 | 2,510,421,984 | 3,234,740,952 |
| % fit for human consumption | 95% | 94% | 93% |
| % unfit for human consumption | 5% | 6% | 7% |

2.4 Blue Biotechnology:

No available data. But the blue biotech environment in Tromsø employs about 500 people. Contains a cluster organization and a National marine biobank (MARBANK) and MARCENT SFI. The government has a strategy on building and supporting the development of a stronger biotech environment (both green and blue).

2.5 Agriculture on saline soils:

No data available

3. Energy and raw materials

3.1 Offshore oil and gas:

Sum NACE 06.10, 06.20 and 09.10.

Table 6 - Weights used to split oil and gas into different regions

| | Employees | | | Gross value added | | |
|--------------------------|-----------|-------|-------|-------------------|-------|-------|
| | 2008 | 2009 | 2010 | 2008 | 2009 | 2010 |
| LF1 1 Oslo og Akershus | 5.3 % | 5.2 % | 5.5 % | 5.5 % | 3.6 % | 3.8 % |
| LF2 2 Hedmark og Oppland | 0.0 % | 0.0 % | 0.0 % | 0.0 % | 0.0 % | 0.0 % |
| LF3 3 Sør-Østlandet | 1.4 % | 1.3 % | 1.2 % | 0.5 % | 0.2 % | 0.2 % |

| | | | | | | |
|-------------------------|--------|--------|--------|--------|--------|--------|
| LF4 4 Agder og Rogaland | 68.0 % | 66.3 % | 66.2 % | 81.5 % | 90.5 % | 89.8 % |
| LF5 5 Vestlandet | 20.5 % | 22.3 % | 21.8 % | 9.7 % | 5.0 % | 5.1 % |
| LF6 6 Trøndelag | 3.8 % | 3.7 % | 4.0 % | 2.3 % | 0.6 % | 0.8 % |
| LF7 7 Nord-Norge | 1.0 % | 1.1 % | 1.3 % | 0.5 % | 0.2 % | 0.3 % |

Source of data: Statistics Norway – National accounts 2010

3.2 Offshore wind:

Source of data: Menon Business Economics database and own classification.

3.3 Ocean renewable energy:

No industry.

3.4 Carbon Capture and storage:

Limited industry.

Source of data: Menon Business economics database and own classification

3.5 Aggregates Mining:

No marine industry

No marine aggregates mining according to UEPG and NGU (Norwegian geological research).

<http://www.ngu.no/no/hm/Hav-og-kyst/Havbunn/Kontinentalsokkel/Sand--og-grusressurser/>

3.6 Marine minerals:

N/A. Limited industry

3.7 Securing fresh water supply (desalination):

N/A. Limited industry.

4. Leisure, working and living:

4.1 Coastal tourism:

Source of data: Menon Business Economics own database.

NACE 55 – excluding regions without a coastline (Hedmark and Oppland)

4.2 Yachting and marinas:

NACE 52.221 (Marinas)

4.3 Cruise tourism:

Share of NACE 50.10 and 77.34 (see Marine transport)

5. Coastal protection:

5.1 Protection against flooding and erosion, preventing seawater intrusion, protection of habitants

N/A

6. Maritime monitoring and surveillance

6.1 /6.2 Traceability and security of goods supply chain, prevention and protection against illegal movement of people and goods

N/A

6.2 Environmental monitoring:

Source of data: Menon Business Economics database and Menon's own classification of environmental monitoring.

Data- collection and calculations for number of enterprises.

General comments:

For all maritime categories the same sources of data are used as those used to find GVA and number of employees (described above). The weights used to split up different NACE codes that overlap between categories are the same as those described above. To split the overlapping NACE codes to find number of enterprises, weights for number of employees in 2010 are used. The numbers presented here is for all active enterprises in 2010.

For those categories where Menon's database is used, only enterprises with asset value over 0 is accounted for. These numbers include subsidiaries.

Other comments for some of the categories:

Catching fish and marine aquatic products.

NACE 03: Statistics Norway only publishes number of enterprises for NACE 03 as a whole. The same weight as described above is therefore used to split enterprises in NACE 03 into Catching fish (for human consumption and animal feeding) and Marine aquatic products. These numbers include self-employed which are largely represented in the categories called "catching fish..". Numbers of enterprises for catching fish, especially for human consumption, is therefore a minimum estimate, whereas number of enterprises for marine aquaculture might be somewhat smaller than presented here.

Offshore Oil and Gas

As for GVA and number of employees, the numbers of enterprises are as collected from Statistics Norway. No data on number of enterprises is available for NACE 09.10. The number presented therefore only includes NACE 06.10 and 06.20.

Offshore Wind

These numbers are based on Menon's own classification. Number of enterprises might be somewhat misleading as wind often is a small part of the enterprise's activity. This is accounted for when calculating GVA and number of employees, but not in the numbers of enterprises.

Annex 2

| | | EUROSTAT | | | National statistics | | | Alternative sources (outside formal stats) | | | Other indicators (various sources) | | |
|------------------------------|--|----------------|------------|-------------------------|---------------------|------------|-------------------------|--|---------------|--|------------------------------------|--------------------|---------------------------------|
| Maritime economic activity | | GVA | Employment | Source & Reference year | GVA | Employment | Source & Reference year | GVA | Employment | Source & Reference year | Number of enterprises | Further indicators | Source & Reference year |
| | | (€, billion) | (*1000) | | (€, billion) | (*1000) | | (€, billion) | (*1000) | | | | |
| 0. Shipbuilding | | | | | | | | | | | | | |
| 0.1 | Shipbuilding (excl. leisure boats) and ship repair | 2,585.8 | 26,088 | Eurostat, data for 2010 | | | | 2.909 | 26.106 | Menon Business Economics (2010) | 714 | | Menon Business Economics (2010) |
| 0.2 | Construction of water projects | 19.7 | 232 | Eurostat, data for 2010 | | | | 0.014 | 0.208 | Menon Business Economics (2010) | 24 | | Menon Business Economics (2010) |
| 1. Maritime transport | | | | | | | | | | | | | |
| 1.1 | Deep-sea shipping | 4,055.6 | 15,911 | Eurostat, data for 2010 | | | | 5.065 | 16.454 | Menon Business Economics (2010) | 2 273 | | Menon Business Economics (2010) |
| 1.2 | Short-sea shipping (incl. Ro-Ro) | 210.8 | 2,314 | Eurostat, data for 2010 | | | | 2.454 | 0.265 | Menon Business Economics (2010) | 262 | | Menon Business Economics (2010) |
| 1.3 | Passenger ferry services | 826.7 | 10,680 | Eurostat, data for 2010 | | | | 1.105 | 2.514 | Menon Business Economics (2010) | 479 | | Menon Business Economics |

| | | EUROSTAT | | | National statistics | | | Alternative sources (outside formal stats) | | | Other indicators (various sources) | | |
|--|-------------------------------------|--------------|------------|--|---------------------|------------|---|--|------------|-------------------------|------------------------------------|--------------------|---|
| Maritime economic activity | | GVA | Employment | Source & Reference year | GVA | Employment | Source & Reference year | GVA | Employment | Source & Reference year | Number of enterprises | Further indicators | Source & Reference year |
| | | (€, billion) | (*1000) | | (€, billion) | (*1000) | | (€, billion) | (*1000) | | | | |
| | | | | | | | | | | | | | (2010) |
| 1.4 | Inland waterway transport | n/a | 1 | No GVA data on NACE 50.40 in Eurostat. Employment: Eurostat, data for 2010 | | | | N/A | N/A | No real size industry | N/A | | No real size industry |
| 2. Food, nutrition, health and ecosystem services | | | | | | | | | | | | | |
| 2.1 | Catching fish for human consumption | 1,116.8 | 11,832 | Eurostat (fish processing, wholesale & retail), PRODCOM (share of human/animal), data for 2010. No data in JRC on fishing for Norway | 1.58 | 16.15 | Statistics Norway (2010) and Menon (2010) | | | | 4 694 | | Statistics Norway (2010) and Menon (2010) |
| 2.2 | Catching fish for animal feeding | 54.8 | 606 | Eurostat (fish processing), PRODCOM (share of human/animal), data for 2010. No data in JRC on fishing | 0.11 | 1.07 | Statistics Norway (2010) and Menon (2010) | | | | 314 | | Statistics Norway (2010) and Menon (2010) |
| 2.3 | Marine aquatic products | n/a | n/a | No data available on Norway in JRC | 2.36 | 10.22 | Statistics Norway (2010) and Menon | | | | 2 942 | | Statistics Norway (2010) and |

| | | EUROSTAT | | | National statistics | | | Alternative sources (outside formal stats) | | | Other indicators (various sources) | | | |
|------------------------------------|-----------------------------|--------------|------------|--|---------------------|------------|---|--|------------|---|------------------------------------|--------------------|-------------------------|--|
| Maritime economic activity | | GVA | Employment | Source & Reference year | GVA | Employment | Source & Reference year | GVA | Employment | Source & Reference year | Number of enterprises | Further indicators | Source & Reference year | |
| | | (€, billion) | (*1000) | | (€, billion) | (*1000) | | (€, billion) | (*1000) | | | | | |
| | | | | | | | (2010) | | | | | | | Menon (2010) |
| 2.4 | Blue biotechnology | n/a | n/a | Not available in Eurostat | N/A | N/A | | | | No alternative data on Norway found centrally | N/A | | | |
| 2.5 | Agriculture on saline soils | n/a | n/a | No data available on Norway NUTS-2 agriculture and/or saline soils in Eurostat (possibly very limited) | N/A | N/A | | | | No marine industry | N/A | | | |
| 3. Energy and raw materials | | | | | | | | | | | | | | |
| 3.1 | Offshore oil and gas | 77,169.3 | 49,542 | Eurostat, data GVA 2008, Employment 2010. No GVA data on NACE 06.20 | 63.75 | 52.80 | Statistics Norway (2010) and Menon (2010) | | | | 97 | | | |
| 3.2 | Offshore wind | n/a | n/a | Sector not visible in Eurostat. | | | | 0.055 | 0.657 | Menon Business Economics database (2011). Uncertain data. Includes both on- and offshore Wind | 83 | | | Menon Business Economics database (2011). Uncertain data. Includes both on- and offshore |

| Maritime economic activity | | EUROSTAT | | | National statistics | | | Alternative sources (outside formal stats) | | | Other indicators (various sources) | | |
|----------------------------|----------------------------|---------------------|-----------------------|---------------------------------|---------------------|-----------------------|-------------------------|--|-----------------------|---|------------------------------------|--|---|
| | | GVA (€, billion) | Employment (*1000) | Source & Reference year | GVA (€, billion) | Employment (*1000) | Source & Reference year | GVA (€, billion) | Employment (*1000) | Source & Reference year | Number of enterprises | Further indicators | Source & Reference year |
| | | | | | | | | | | | | | Wind. |
| 3.3 | Ocean renewable energy | n/a | n/a | Sector not visible in Eurostat. | n/a | n/a | n/a | n/a | n/a | No alternative sources found for Norway. No real size industry | N/A | 10th country on OE patent list. There is a 4MW osmotic power plant in Statkraft, Tofte. Norway is developing the pressure-retarded osmotic technology. | |
| 3.4 | Carbon capture and storage | n/a | n/a | Sector not visible in Eurostat. | | | | 0.010 | 0.085 | Menon Business Economics database (2010). Only 4 companies | 4 | 1 project at Mongstad is cancelled, after being completed for 80%. 2 CCS projects operational (Sleipner and Snøhvit) | Menon Business Economics database (2010). Only 4 companies |

| | | EUROSTAT | | | National statistics | | | Alternative sources (outside formal stats) | | | Other indicators (various sources) | | |
|---------------------------------------|--|--------------|------------|---|---------------------------------------|------------|-------------------------|--|---------------|--|------------------------------------|--------------------|--|
| Maritime economic activity | | GVA | Employment | Source & Reference year | GVA | Employment | Source & Reference year | GVA | Employment | Source & Reference year | Number of enterprises | Further indicators | Source & Reference year |
| | | (€, billion) | (*1000) | | (€, billion) | (*1000) | | (€, billion) | (*1000) | | | | |
| 3.5 | Aggregates mining (sand, gravel, etc.) | 0.0 | 0 | Eurostat; No offshore aggregates mining in Norway according to UEPG | No marine aggregates mining in Norway | n/a | n/a | | | | | | |
| 3.6 | Marine minerals mining | n/a | n/a | Sector not visible in Eurostat. | N/A | | | | | No data found centrally | | | |
| 3.7 | Securing fresh water supply (desalination) | n/a | n/a | Sector not visible in Eurostat. | N/A | | | 0.000 | 0.000 | Not present in Norway according to Global Water Insights | | | |
| 4. Leisure, working and living | | | | | | | | | | | | | |
| 4.1 | Coastal tourism | 989.4 | 23,422 | Definition of coastal NUTS 2/3 regions based on Ecorys judgement (no Eurostat definition available), data from Eurostat | | | | 1.025 | 22.272 | Menon Business Economics database (2010) | 1 656 | | Menon Business Economics database (2010) |
| 4.2 | Yachting and marinas | n/a | n/a | Sector not visible in Eurostat. | pending | pending | ICOMIA | 0.051 | 0.276 | Menon Business Economics database (2010) | 99 | | Menon Business Economics database (2010) |

| | | EUROSTAT | | | National statistics | | | Alternative sources (outside formal stats) | | | Other indicators (various sources) | | |
|--|--|--------------|------------|---|---------------------|------------|---|--|------------|---|------------------------------------|--------------------|--|
| Maritime economic activity | | GVA | Employment | Source & Reference year | GVA | Employment | Source & Reference year | GVA | Employment | Source & Reference year | Number of enterprises | Further indicators | Source & Reference year |
| | | (€, billion) | (*1000) | | (€, billion) | (*1000) | | (€, billion) | (*1000) | | | | |
| 4.3 | Cruise tourism | 25.9 | 288 | (low estimate) Eurostat, data for 2010 | 0.42 | 10.90 | (high estimate) European Cruise Council, data for 2010 | 0.032 | 0.290 | Menon Business Economics database (2010) | 12 | | Menon Business Economics database (2010) |
| 5. Coastal protection | | | | | | | | | | | | | |
| 5.1 | Protection against flooding and erosion, preventing salt water intrusion, protection of habitats | n/a | n/a | Sector not visible in Eurostat. | N/A | N/A | | | | No data for Norway in PRC, The Economics of Climate Change | | | |
| 6. Maritime monitoring and surveillance | | | | | | | | | | | | | |
| 6.1/ 6.2 | Traceability and security of goods supply chains, prevention and protection against illegal | n/a | n/a | Sector not visible in Eurostat. | N/A | N/A | | | | No data found centrally. Problem of different definitions applied across sources & countries. | | | |

| | | EUROSTAT | | | National statistics | | | Alternative sources (outside formal stats) | | | Other indicators (various sources) | | |
|----------------------------|-------------------------------|--------------|------------|---------------------------------|---------------------|------------|-------------------------|--|------------|--|------------------------------------|--------------------|--|
| Maritime economic activity | | GVA | Employment | Source & Reference year | GVA | Employment | Source & Reference year | GVA | Employment | Source & Reference year | Number of enterprises | Further indicators | Source & Reference year |
| | | (€, billion) | (*1000) | | (€, billion) | (*1000) | | (€, billion) | (*1000) | | | | |
| | movement of people and goods, | | | | | | | | | | | | |
| 6.3 | Environmental monitoring | n/a | n/a | Sector not visible in Eurostat. | | | | 0.025 | 0.260 | Menon Business Economics database (2010) | 12 | | Menon Business Economics database (2010) |

Annex 2 – Table used to assess the 7 most promising maritime sectors in Norway

| | | Innovativeness | competitiveness | Employment creation | Relevance | Spill over | Sustainability |
|---|--|----------------|-----------------|---------------------|-----------|------------|--------------------|
| Maritime economic activity | | | | | | | |
| 0. Shipbuilding | | | | | | | |
| 0.1 | Shipbuilding (excl. leisure boats) and ship repair | + | - | + | ? | + | 0 |
| 0.2 | Construction of water projects | + | 0 | 0 | + | + | + |
| 1. Maritime transport | | | | | | | |
| 1.1 | Deep-sea shipping | + | + | + | ? | + | 0 |
| 1.2 | Short-sea shipping (incl. Ro-Ro) | 0 | 0 | 0 | ? | 0 | - |
| 1.3 | Passenger ferry services | 0 | 0 | + | ? | 0 | - |
| 1.4 | Inland waterway transport | | | | | | No industry |
| 2. Food, nutrition, health and eco-system services | | | | | | | |
| 2.1 | Catching fish for human consumption | 0 | + | 0 | ? | 0 | 0 |
| 2.2 | Catching fish for animal feeding | 0 | + | 0 | ? | 0 | 0 |
| 2.3 | Marine aquatic products | + | + | + | ? | + | - |
| 2.4 | Blue biotechnology | + | + | 0 | + | + | 0 |
| 2.5 | Agriculture on saline soils | N/A | N/A | N/A | N/A | N/A | No industry |
| 3. Energy and raw materials | | | | | | | |
| 3.1 | Offshore oil and gas | + | + | + | - | 0 | - |
| 3.2 | Offshore wind | + | - | 0 | + | + | 0 |
| 3.3 | Ocean renewable energy | N/A | N/A | N/A | N/A | N/A | |
| 3.4 | Carbon capture and storage | + | 0 | 0 | ? | + | + |
| 3.5 | Aggregates mining (sand, gravel, etc.) | | | | | | No marine industry |
| 3.6 | Marine minerals mining | N/A | N/A | N/A | N/A | N/A | |

| | | Innovativeness | competitiveness | Employment creation | Relevance | Spill over | Sustainability |
|--|---|----------------|-----------------|---------------------|-----------|------------|----------------|
| 3.7 | Securing fresh water supply (desalination) | | | | | | No industry |
| 4. Leisure, working and living | | | | | | | |
| 4.1 | Coastal tourism | 0 | - | 0 | + | 0 | 0 |
| 4.2 | Yachting and marinas | 0 | 0 | 0 | ? | 0 | 0 |
| 4.3 | Cruise tourism | 0 | 0 | 0 | ? | 0 | 0 |
| 5. Coastal protection | | | | | | | |
| 5.1 | Protection against flooding and erosion, preventing salt water intrusion, protection of habitats | N/A | N/A | N/A | N/A | N/A | No industry |
| 6. Maritime monitoring and surveillance | | | | | | | |
| 6.1/6.2 | Traceability and security of goods supply chains, prevention and protection against illegal movement of people and goods, | N/A | N/A | N/A | N/A | N/A | No industry |
| 6.3 | Environmental monitoring | 0 | 0 | 0 | + | + | + |