Baseline Scenario Marine Strategy Framework Directive

Client: Rijkswaterstaat Waterdienst

Rotterdam, 15 november 2013

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Rotterdam, 15 novembert 2013

ECORYS

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1 Introduction

1.1 Background

In 2012, The Netherlands submitted it's first part of the Marine Strategy to the European Commission (EC) according to the requirements of the Marine Strategy Framework Directive (MSFD). The aim of the MSFD is to establish good environmental conditions in the water system and to achieve sustainable balance between ecology and economy. In order to achieve this aim, a programme of measures has to be determined and reported to the EC in 2015.

Article 24 of the MSFD states that: "As a first step in the preparation of programmes of measures, Member States across a marine region or sub region should undertake an analysis of the features or characteristics of, and pressures and impacts on, their marine waters, identifying the predominant pressures and impacts on those waters, and an economic and social analysis of their use and of the cost of degradation of the marine environment."

This requirement applies also for the Dutch section of the North Sea (DCS). This area of approximately 58,000 km2 is intensively used by, among others, the following economic activities: fishery, short sea and deep-sea shipping, oil and gas exploration, sand and mineral mining, wind energy generation, cables and pipelines, defence, recreation and tourism. These economic activities can have a potential conflict with the marine environment of the North Sea. Based on the current presence and future development of these activities, the impact on the aquatic environment can be estimated.

In 2011 a first assessment of the current economic activities in the DCS and it's expected future development up to 2040 was carried out. By that time the economic already announced itself, but the scale, duration and impact was not clear. It is therefore necessary to update the future developments of the economic activities on the North Sea.

1.2 Objective

Against this background it is important to have an update of the current and future level of human activities on the North Sea.

The objective of this study is twofold:

1. To update the expected developments in the socio-economic sectors in and around the Dutch section of the North Sea area, based on the most recent economic insight, including the effects of the economic crises.

2. To give an outlook on the year 2050 with the aim to explore the potential external changes which could have an impact on the realisation of good environmental conditions in the marine water system.

1.3 Definition and approach

Definition economic activities

This report addresses the following direct economic activities that potentially impose pressures on the marine environment on DCS.

- Oil and gas extraction;
- Sand extraction;
- Shipping;
- Fishery;
- Wind energy;
- Pipes and cables.

Besides the above mentioned most significant economic activities, the North Sea is also used for other purposes: carbon capture and storage, military activities and land reclamation. These activities are briefly discussed in this report.

Furthermore, two indirect economic activities will be addressed. Tourism and recreation in coastal areas and the economic activities in seaports do not take place on the DCS but depend on the DCS due to the geographic location and due to the nature of these activities.

Economic indicators

The economic development of activities has been expressed in:

- Production volume;
- Production value in million euro;
- Gross added value in million euro;
- Employment in fte.

In particular production volume has a direct relation with the pressure of an economic activity on the aquatic environment. An increase in production can have a negative impact on environmental conditions through for instance the use of a larger area for the production, more pollution etc[1]. Added value can be used to measure the economic impact of possible measures. Measures can have a negative impact on a sector for instance a limitation of production or higher investments This will have repercussions on the added value of a sector.

Assessment past and current situation

For this study statistic data from CBS and NAMWA have been used to present the development of the economic activities in the past and the current situation. If the information for a specific sector was not available, other public data has been used, for instance annual reports of trade or sector organisations. Only public data has been used in order to make the economic description transparent and verifiable.
In order to compare the different sectors, economic data (added value, production value and employment) is reported for the years 1995, 2000, 2007-2011.

Assessment future development till 2027

To assess the future development of the economic activities, several sources have been used or consulted:

- WLO scenario's
- Recent sector specific forecasts if available, for instance recent forecast of harbour throughput or implementation of wind farms

[1] The correlation between economic activities and their impact on environmental conditions have not been examined in this study.

- Sector experts

Economic data is reported for the years 2015, 2021 and 2027.

Outlook 2050

The outlook for 2050 is based on experts judgement. Sector specialists have been asked to give there views on the future during a workshop.

1.4 Outline of the report

This report consist of three parts:

Chapter 1 Economic development till 2011. This chapter gives a description of the development of the economic activities in the past up to present (2011). In this part, the impact of the economic crisis on the sector will be discussed as well.

Chapter 2 Future prospect till 2027. The focus of chapter 2 is on the expected development of the economic activities in the period 2012-2027.

Chapter 3 Outlook 2050 gives an overview of the possible external changes in the future which could have an impact on the realisation of the MSFD aim: good environmental conditions in the water system and to achieve sustainable balance between ecology and economy.

2 Economic development till 2011

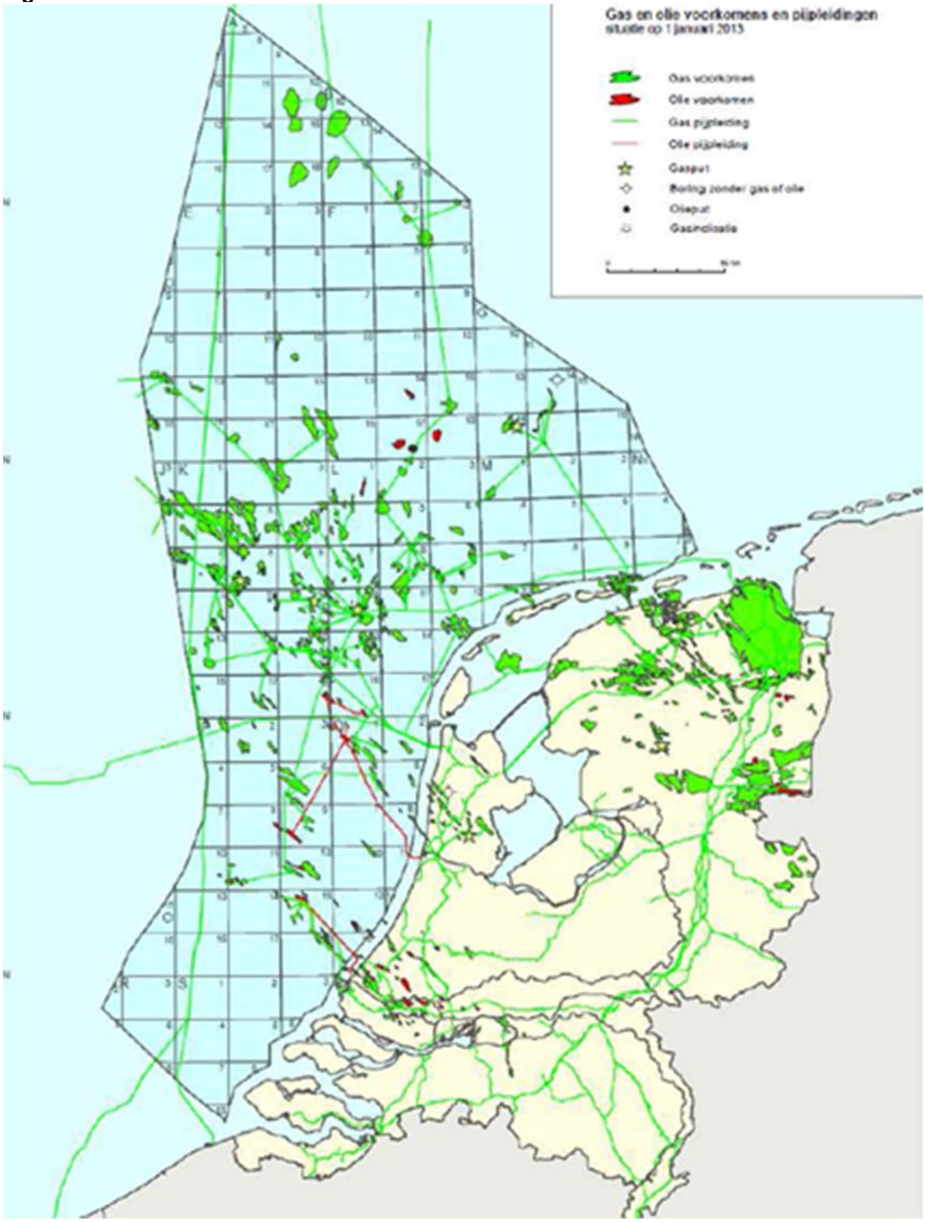
In this chapter, socio-economic development between 1995 and 2011 of the North Sea related economic activities will be discussed.

2.1 Oil and gas sector

2.1.1 Oil and gas reserve

The North Sea provides Europe's largest natural oil and gas reserve. Part of this oil and gas is contained in the Dutch offshore subsurface. Figure 3.1 below shows the Dutch oil (red) and gas (green) reserve per January 2013.

Figure 2.1 Gas and Oil reserves in the Netherlands as known on 1-1-2013



Source: Nederlands Olie- en Gas portal, 2013

In January 2013, the total (developed and undeveloped) reserve on the Dutch Continental Shelf (DCS) adds up to 163 billion Sm3 gas and 6.7 million Sm3 oil[2]. This reserve is based on proven accumulations which are in production or in the development phase[3]. Gas prospects add up to 90 to 220 billion Sm3 cut-off. This is the producible volume that might be present in as yet undiscovered accumulations in the subsurface of the Netherlands on the basis of geological information. The exploration potential for oil is not reported in the EZ annual review 'Oil and Gas in the Netherlands'. However, large oil discoveries are not expected (EZ, 2012).

Table 2.1 Dutch gas reserve per January 2013

	Reserve (billion Sm3)	# fields
Developed	111	152
Undeveloped	52	61
- production start 2012-2016		17
- other		44
Production ceased		41
- temporary closed		4
- closed		37
Total reserve	**163**	**254**

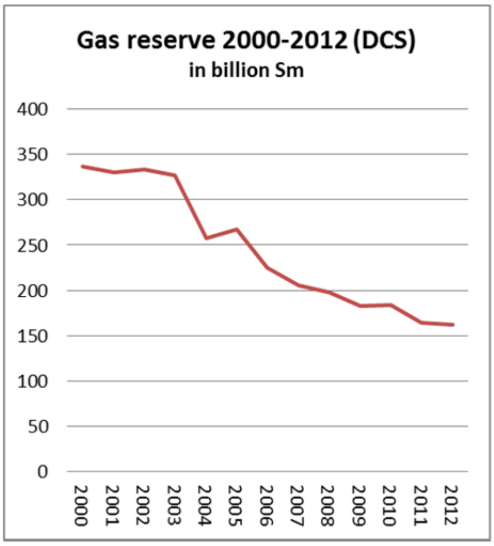
Source: http://www.nlog.nl/resources/Jaarverslag2012/Delfstoffen_2012_NL_final_NLOG.pdf

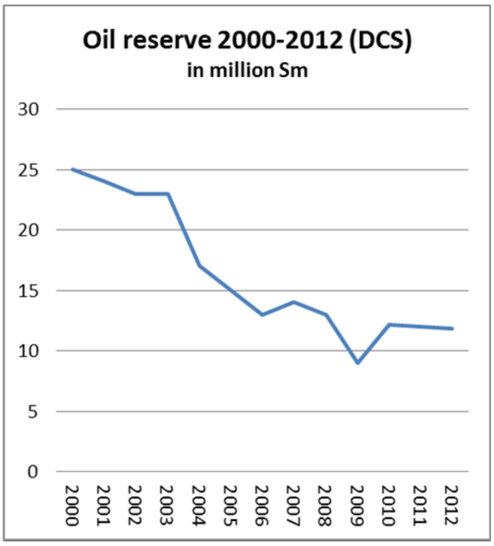
Table 2.2 Dutch oil reserve per January 2013

	Reserve (million Sm3)	# fields
Developed	6.1	11
Not developed	0.6	14
- production start 2013-2017		2
- other		12
Total	**6.7**	**25**

Source: Nederlands Olie- en Gas portal, 2013

The development of the gas and oil reserves on DCS in the period 2000-2012 is presented in the graphs below. Both gas and oil reserves show a decreasing trend since 2000. In the period 2007-2011, the average annual decrease of respectively gas and oil reserve is 5.5% and 3.8%.



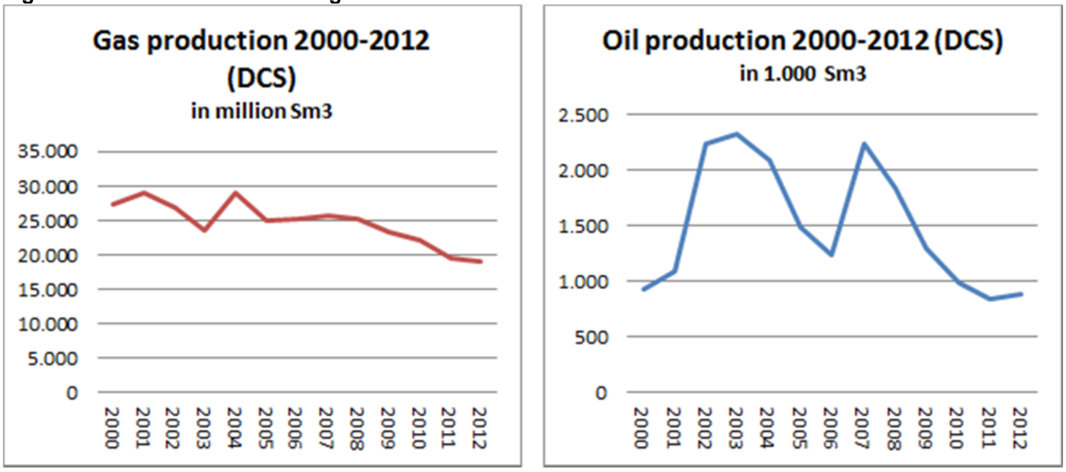


2 Sm3 = standard cubic meter
3 NLOG, 2013.

2.1.2 Oil and gas production

Figure 2.2 below shows the annual development of the volumes of gas and oil produced y in the period 2000 - 2012. The gas production decreases from 2007 to 2011 with an average rate of 6.5 percent. The oil production shows a higher decrease from 2007 onwards with a slightly increase in 2012. In 2012 the production of gas and oil from the DCS was respectively 19.0 billion Sm3 and 0.9 million Sm3.

Figure 2.2 Production of oil and gas on DCS



Source: Ecorys, based on NLOG, 2013.

2.1.3 Turnover, value added and employment

The economic value of the production of oil and gas on the DCS in 2011 is € 7.9 billion. This sector is responsible for an added value of approximately € 6.3 billion and about 700 fte. The production value and added value figures are based on CBS data corrected for it's share on DCS[4]. The employment figures are based on data from CBS taking into account only employees working offshore. According to NOGEPA, this figure is not correct and is more or less 3 times higher taking into account employees working onshore and three working shifts per day on drilling platforms.

In the period 2007-2011 the production value and added value fluctuated on a yearly basis, but increased during the entire period with respectively 2% and 7% (despite the decrease in gas and oil production). The employment figures however, show a decrease of in total 14%.

Table 2.3 Production value, added value en manpower of oil and gas on DCS

	1995	2000	2007	2008	2009	2010	2011
Production value (million euro)	2,692	4,306	7,741	8,996	6,919	7,076	7,917
Added value (million euro)	2,112	3,313	5,867	7,272	5,211	5,401	6,275
Man years (fte)	500	500	800	748	597	535	692

- The production value is based on the production amount and oil and gas prices of the dates in question.
- The value of Energie Beheer Nederland (EBN), a state owned energy company, is included in the production value and added value.

Source: CBS, 2013, edited by Ecorys.

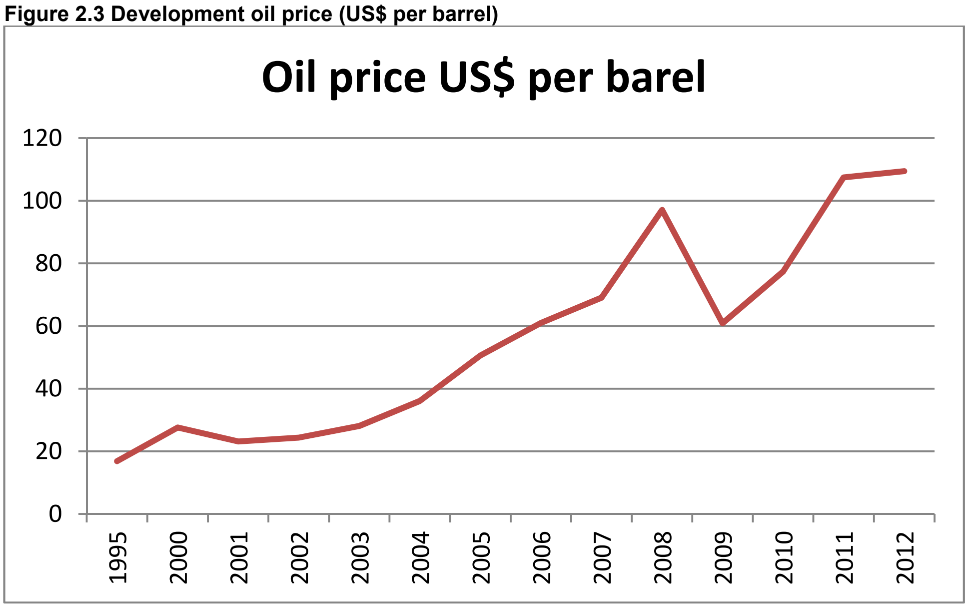
2.1.4 Impact of the economic crisis on the oil and gas sector

The economic crisis had a limited impact on the DSC production volume of oil and gas. As indicated in figure 2.2, the production of both oil and gas decreased in the period 2007-2011. The reduced production did not result in a decrease in production value and added value. Besides the

4 35% of production and added value can be assigned to DCS

production volume, the oil price has an impact on the economic value of the sector. A significant increase in oil price in 2008 compensated the decrease in production volume. In 2009, the oil price decreased resulting in a drop down of production and added value. Since 2010, the oil price is increasing, hence the production value and added value increased despite of a decrease in production volume.

Figure 2.3 Development oil price (US$ per barrel)



http://www.statista.com/statistics/262858/change-in-opec-crude-oil-prices-since-1960/

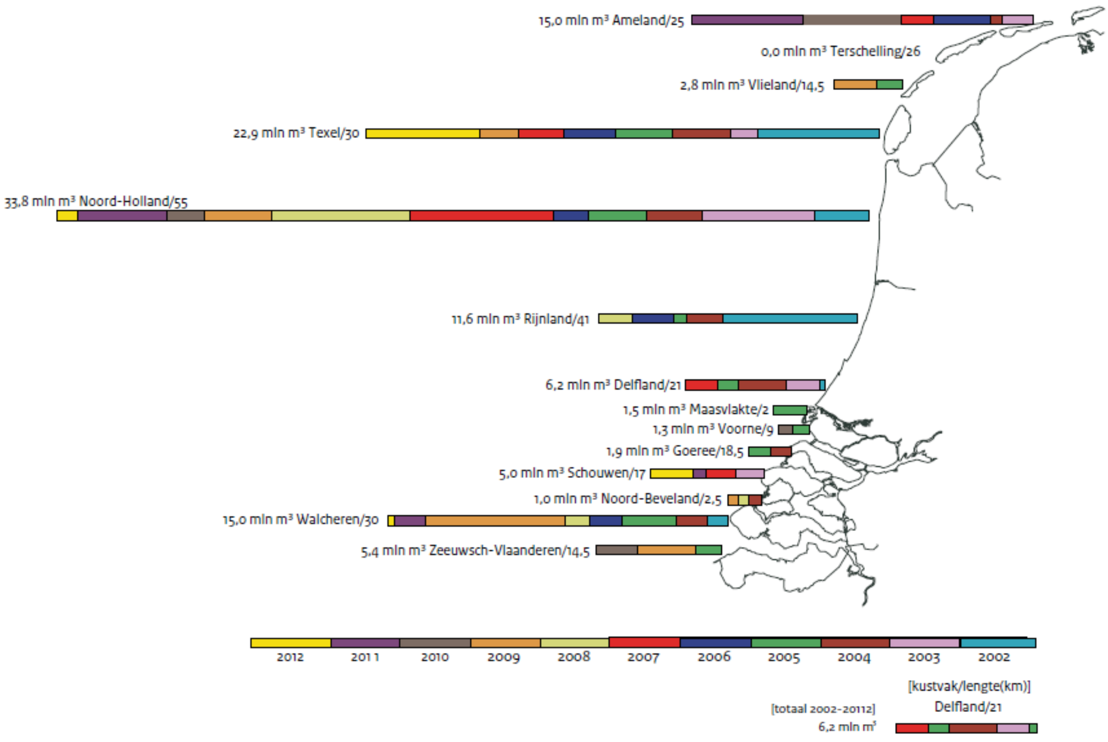
2.2 Sand extraction

2.2.1 Current activities

The Netherlands is Western Europe's largest marine sand extractor. Sand is used for two purposes:

- **beach nourishment (sand suppletion)**
  For the protection of the Dutch coast against flooding currently around 12 million m3 sand is extracted annually for beach nourishment (MER winning suppletiezand, 2012). The sand is added to the Dutch coast, to compensate for sand loss in areas susceptible for erosion and to keep pace with sea level rise. Sand suppletion needs to be repeated regularly for coastline protection to compensate for erosion, usually every five years. The sand for the suppletions is extracted from the bottom from sand pits with a concession from Rijkswaterstaat (RWS). Pits are located along the entire Dutch coast (see figure 2.4).

Figure 2.4 Locations and amounts of sand mining for suppletion in the Dutch part of the North Sea (2002-2012)



Source: Kustlijnkaarten, 2013.

- **land filling (commercial sand)**
  Besides beach nourishment, sand is extracted for land filling and construction works. For this purpose, annually approximately 25 Mm3 of commercial sand is extracted. Sand is extracted from several pits on the North Sea. For extraction, a permit is required from RWS Noordzee. The extraction rights are tendered on the market. The winner of the contract is legally bound to deliver sand to the market.
- **sand extraction for Maasvlakte2 and Zwakke Schakels**
  In the period 2008-2013 sand extraction for Maasvlakte 2, (230 million m3) and for Zwakke Schakels (50 million m3) has been predicted.

Although there is also concrete and construction sand present in the sea bottom, extraction in the short term is currently not taking place. This sand is located in deeper layers covered under large volumes of top sand. Extraction is only economically viable in combination with the extraction of large volume of top sand, under the condition that this sand is suitable for coastal defence measures or land filling.

2.2.2 Turnover, value added and employment

The net turnover is estimated at € 193 million in 2011. This is based on the volume of sand extracted in the North Sea and a price per m3 of € 2.99 for suppletion sand and €2.30 for commercial sand. The volume can be considered as a maximum, since these are the planned extraction volumes.
Value added and employment data of sand extraction is not available. To make an estimation of the values, the value added – production value ratio and value added – employment ratio of mineral extraction excluding oil and gas extraction (CBS) has been applied. This results in an added value in 2011 of € 44 million and 351 man years.

Table 2.4 Economic indicators sand extraction NCP

	1995	2000	2007	2008	2009	2010	2011
Production value (million euro)	33.0	57.0	69.2	246	244	207	193
Added value (million euro)	8.8	15.2	16.8	60	59	47	44
Man years (fte)	110	190	154	548	539	376	351

Source: ECORYS, based on RWS Noordzee

The increase in production value, added value and employment from 2008 onwards is a result of additional extraction of sand for Maasvlakte 2 and Zwakke Schakel.

2.2.3 Impact of the economic crisis on the sand extraction sector

The economic crisis does not have any reported impact on the extraction of sand for suppletion purposes. Coastal defence is a responsibility of the national government. Every year sand is added to consolidate the coastline where it is today. This is necessary to prevent deterioration of the protection level against flooding. Given the interests that are at stake, no budget cuts are foreseen in the future.

With respect to commercial sand (fill sand), the economic crisis has led to a drop in demand. Construction projects are delayed or being postponed, so overall, less fill sand is needed. This has been compensated by the need of sand for Maasvlakte 2 and Zwakke Schakels.

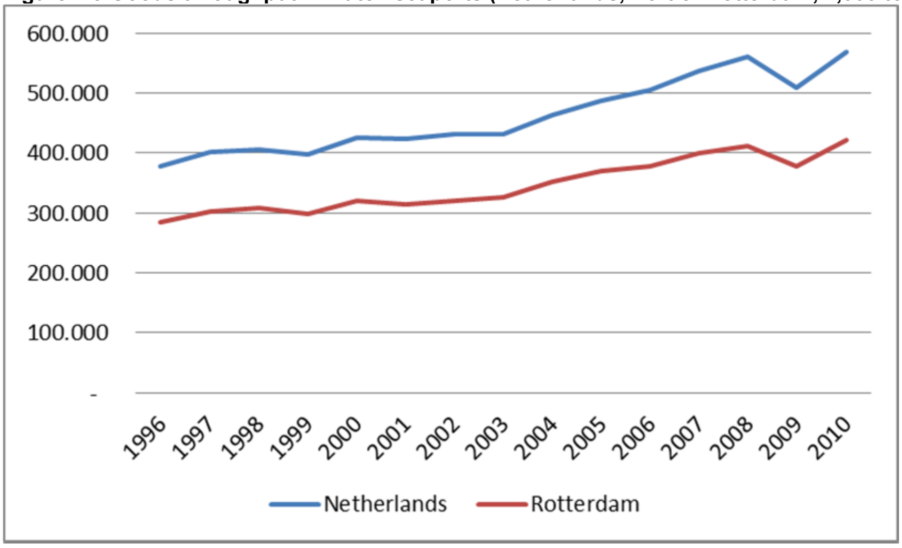
2.3 Shipping

2.3.1 Throughput Dutch Seaports

The Dutch part of the North Sea is one of the busiest waterways in the world, with over 57,000 travels from and to Dutch Seaports (CBS, 2013).

As shown in figure 2.5 below, overall throughput in sea ports in the Netherlands has increased in the period 1995-2010. The increase of port throughput showed clear signs of slowdown around the 2001 economic crisis. In 2009, as a result of the latest economic crisis, goods throughput showed a sharp decline (-8%). Since then throughput levels increased again. In 2010, a record quantity of 568 million tonnes was handled, of which around 75% in the port of Rotterdam. In 2013 routes for shipping are changed in order to accommodate harmonized future growth of shipping and other sectors in in the Dutch part of the North Sea.

Figure 2.5 Goods throughput in Dutch seaports (Netherlands, Port of Rotterdam, 1,000 tonnes)



Source: CBS (2013)

CBS does not provide throughput data after 2010. Based on information from the Port of Rotterdam Authority, we conclude that the increase in throughput after 2009 continued, with 1% growth in 2011 and 1,6% growth in 2012. Also the other North Sea ports reported a growth[5].

2.3.2 Turnover, value added and employment

From 2002 onwards, the Dutch sea shipping sector shows an upward trend with 2009 as an exception. From 2010 onwards, the upward trend continued. Production value increased from € 2.6 billion in 1995 to € 4.1 billion in 2008 and then dropped to €2.98 billion in 2010. Although the throughput in the Dutch Seaports increased again in 2010, the recovery of the production value took one year longer. While the production value increased again from 2010 onwards, the added value falls behind.

Due to larger vessels, on-going innovations in the sector and increasing relevance of employees from outside the Netherlands, the number of people employed in the Dutch shipping sector has decreased over the years. For 2011 the number of employees working in the Dutch sea shipping sector adds up to about 5.850 full time workers (direct employment), which is a decrease of over 200 full time workers in comparison with 2007.

Important to notice here, is that the values referred to in table 2. are not specifically related to activities in the Dutch part of the North Sea (DCS). The reason for this, is that it is not possible to establish an exact relationship between Dutch sea shipping on the one hand and the DCS on the other. The values relate to the whole sector, including Dutch ships that never or seldom are to be found in the Netherlands.

Table 2.5 Production value, added value and employment sea shipping

	1995	2000	2007	2008	2009	2010	2011
Production value (million euro)	2,626	3,689	3,710	4,100	3,160	2,980	3,159
Added value (million euro)	630	927	1,230	1,250	890	700	607
Man years (fte)	9,508	8,295	6,060	6,060	5,910	5,880	5,850

Source: CBS, 2013

5 Source: Port of Rotterdam, Haven in cijfers 2010 – 2011 - 2012

2.3.3 Impact of the economic crisis on the sea shipping sector

The economic crisis had a significant impact in 2009 with a decline in throughput. We can see an upward trend since 2009 in the throughput and production value, but the added value is still gradually decreasing.

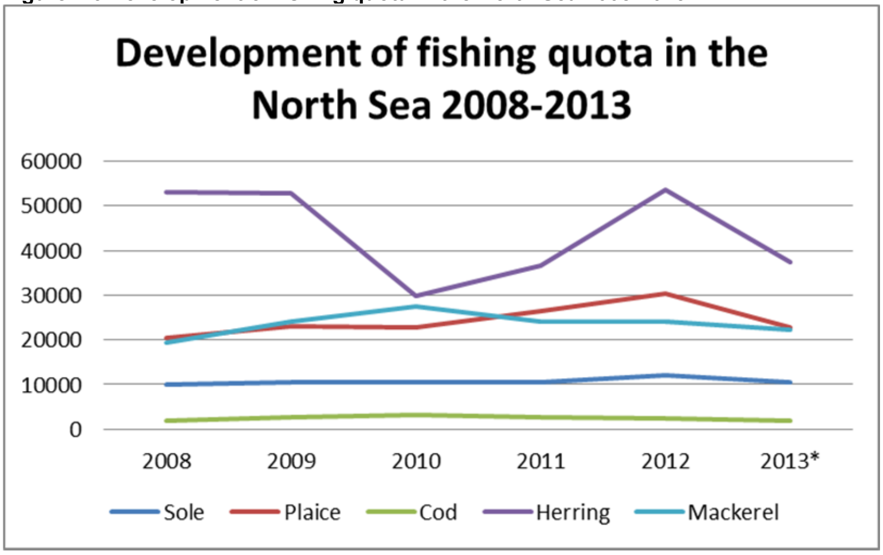
2.4 Fishery

2.4.1 Fishing quota in the North Sea

The fishery sector is a highly regulated sector. Coastal and marine fisheries are mainly regulated from the EU, through the Common Fisheries Policy, which is aiming for sustainable fisheries. Special attention is given to the discussion of Maximum Sustainable Yield (MSY). MSY is the maximum yield that can be achieved, year after year.

EU Fishing quotas are updated on a yearly basis. Most important for the Dutch fishing sector are the fish types herring, mackerel and plaice. Quota for plaice, cod, mackerel and sole in 2012 were comparable to previous years (see figure 2.6 below). Striking is that the herring quota was much higher in 2012 than in the years before. The quota for 2013 are based on 70% of the 2012 quota, definitive figures will be available in January 2014.
Since 2009, fishing quota are quite stable, with the exception of herring which quota increased with over 20,000 tonnes in the period 2010-2012.

Figure 2.6 Development of fishing quota in the North Sea 2008-2013*

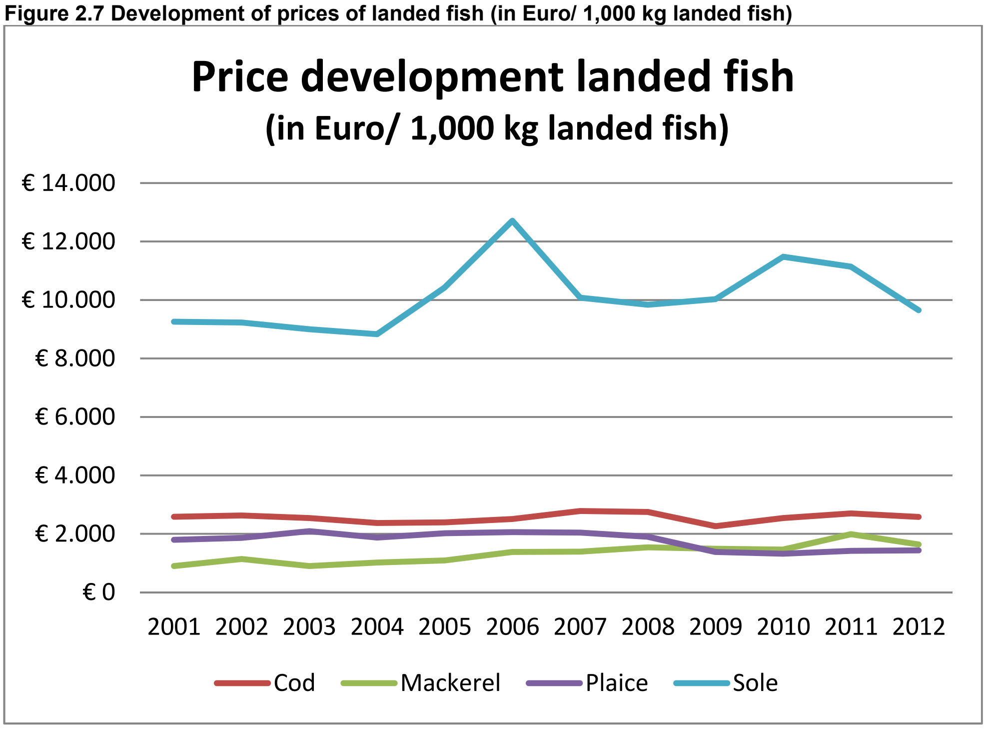


* Information for 2013 for plaice, cod, herring and mackerel are based on 70% of the previous quota, definitive figures will be available in January 2014.
Source: Pvis, 2008-2010, Rijksoverheid, 2013.

Also the prices of landed fish for cod, mackerel and plaice stayed relatively stable, however prices for sole are fluctuating heavily amongst years (figure 2.7). In 2012 prices for all fished species declined.

With restrictions on how much fish to catch on the North Sea and lower prices in 2012 on the auction, the Dutch fishery sector on the North Sea is facing a hard time. Besides this, also the pressure for sustainable catch is becoming more and more important.

Figure 2.7 Development of prices of landed fish (in Euro/ 1,000 kg landed fish)



Bron: CBS, 2013

Price development for herring is not available.

2.4.2 Turnover, added value and employment

The North Sea is one of the world's most important fishing grounds and therefore the Dutch fishery industry is still very active. Table 2.6 shows production value, added value and employment figures for the fishery industry in the period 1995-2011. The figures are based on national fishery figures corrected for DCS. The contribution of DCS fishery in total fishery is estimated at 22%, which is the average contribution in the period 1995-2005. This DCS contribution is assumed stable from 2006 onwards.

The development of production value, added value and employment is presented in the table below and shows a decrease in the past decade. The table presents only the Dutch fishing fleet. Some ships, however, are reflagged and now sailing under another country flag (for example Germany or Ireland). Although, the ship-owner is Dutch and the fish is landed at a fish auction in The Netherlands, this activity is not included in the estimates. As a result, in table 2.6 the economic significance of the DCS for fishing could be underestimated.

Table 2.6 Production value, added value en manpower of see fishery on DCS

	1995	2000	2007	2008	2009	2010	2011
Production value (million euro)	102	111	113	114	94	101	100
Added value (million euro)	61	58	45	35	31	28	25
Man years (fte)	804	770	594	592	474	498	493

Source: Ecorys, based on CBS, 2010.

Quota, prices of landed fish and fuel are the main factors influencing the production value and added value of the sector. The decrease in production value in 2009 for instance is a result of a decrease in landed price of 3% for mackerel to 27% for plaice. Because of the economic crisis households switched from the traditional North Sea fish species to less expensive alternative fish species from abroad. Despite the lower fish prices, most fishermen had a small profit due to the low oil price in 2009. The increase in oil price from 2009 onwards had a negative impact of the added value.

2.4.3 Impact of the economic crisis on the fishery sector

The impact of the economic crisis is visible in the figures from 2009 onwards. As discussed above households changed to less expensive fish species which resulted in a decreasing landed price. Furthermore, the increasing fuel prices had an impact on the sector.

2.5 Wind energy

2.5.1 Current offshore sites for wind farms and its capacity

Since 2006, energy is produced in the North Sea using offshore wind turbines. Currently two wind farms are in operation on DCS:

- Offshore Wind farm Egmond aan Zee (OWEZ) with an installed capacity of 108 MW;
- Offshore Wind farm Prinses Amalia (WP Q7) with an installed capacity of 120 MW.

The total capacity of the wind farms is 228 MW. The maximum annual generation potential is approximately 735 GWh per year, which is sufficient for the energy consumption of 215,000 households.

Table 2.7 Capacity and energy production by wind turbines on DCS

Wind energy	2007	2008	2009	2010	2011
Wind energy capacity on DCS (MW)	108	228	228	228	228
Wind energy production on DCS (GWh)	330	596	735	679	802

Source: CBS

2.5.2 Turnover, added value and employment

The production value in 2011 is calculated at € 40.1 million and depends on the wind energy production and market price for energy of € 0.05 per KWh. Added value from wind energy is estimated at € 12 million. Employment directly related to operation and maintenance of the wind farms corresponds to 75 full-time jobs.

Table 2.8 Production value, added value en employment in the wind energy on DCS

	1995	2000	2007	2011
Production value (million euro)*	0	0	16.5	40,1
Added value (million euro) *	0	0	4.7	12
Man years (fte) ***	0	0	36	75

* Based on a commodity price of € 0.05 per KWh

* Based on ratio production and added value for total energy and water sector (National Accounts, CBS)

** Based on ECORYS, Inventarisatie van de werkgelegenheid in de offshore windenergie sector (2009).

2.5.3 Impact of the economic crisis on the wind energy sector

The development of offshore wind energy capacity heavily depends on subsidies due to high development and construction costs. The economic crisis has an indirect effect on offshore wind energy development since the economic climate has an impact on the national budget (and available subsidies) and interest of other financiers. Without economic crisis, the targets could have been realised in an earlier stage. The governmental goal was 6,000 MW offshore wind energy in the year 2020. In 2011 this goal still existed, however formulated in a less ambitious way.

2.6 Piping and cables

This sector contains:
- Piping for transport of oil and gas
- Cables for electricity supply for wind turbines
- Telecom cables
- Interconnectors

The economic value of piping and cables for electricity supply for wind turbines is part of the economic value of the oil and gas sector and wind energy sector. Therefore only the telecom cables and interconnectors are described in this paragraph.

The economic significance of telecom cables and interconnectors is rising especially due to globalisation of the markets for telecom and electricity and a rising demand for telecom and electricity facilities.

Telecom cables
In 1922 the first telecom cable was placed in the North Sea between England and The Netherlands. From then the number of telecom cables was rising rapidly. At this moment there is 4,000 kilometre of telecom cables in the North Sea, of which 2,000 kilometre active cable. The cables being in use for the telecom are the older copper cables and the newer glass fibre cables. In the past, cables have been placed in combination with other works, so cost could be kept low. This has created overcapacity. This overcapacity still exists, despite the increase in data traffic.

The information about the telecom sector on the North Sea is limited. Because of the small number of businesses in the sector and the strong competition between them, information about economic performance and employment is sensitive.

Interconnectors
To secure our electricity supply, our national grid is connected to Germany and Belgium over land and UK and Norway over sea. At this moment, two interconnectors are in use:
- Since 2008 between Norway and the Netherlands (NorNed). With a total length of 580 kilometres, the NorNed cable has a capacity of 700 MW. TenneT and TSO Statnett are the owners.
- Since 2011 between England and the Netherlands (BritNed). The BritNed-cable has a capacity of 1,000 MW and a total length of 260 kilometres. The total investment costs are 600 million euro.

Via the NorNed and BritNed connection, electricity is transported in both directions. Which direction depends on differences in prices, differences in electricity use during the day and need for renewable energy (hydropower energy is imported from Norway).
The BritNed-cable transport electricity in both directions, induced by price differences and differences in use of electricity between both countries.

2.7 Other sea-based activities

This paragraph describes the remaining human activities in the Dutch part of the North Sea, not mentioned earlier in this chapter.

Carbon capture and storage

Carbon capture and storage is the process of capturing waste carbon dioxide (CO2) from large point sources, such as fossil fuel power plants, transporting it to a storage site, and depositing it where it will not enter the atmosphere, normally an underground geological formation. The aim is to prevent the release of large quantities of CO2 into the atmosphere (from fossil fuel use in power generation and other industries). It is a potential means of mitigating the contribution of fossil fuel emissions to global warming and ocean acidification.
Depleted gas fields and their associated pipelines are potential future spaces for CO2 storage, and the area to the north-west of Texel is a particular site for large-scale storage. Locations of certain underground water-retentive soil strata (aquifers) might also be used for CO2 storage.

Up to now, carbon capture and storage takes place on a small scale on the North Sea. The government aims to speed up this development and started demonstration projects with the aim to investigate technical and economic feasibility.
In Rijmond preparations started for two CCS-demonstration projects for storage on sea:

- Rotterdam Opslag en Afvang Demonstratieproject (ROAD) which is a large scale demonstration project in which CO2 from a large coal-fired power plant on the Maasvlakte will be captured and stored under the seabed about 20 kilometre from the coastline.
- Green Hydrogen Project (GHP) captures CO2 from a hydrogen factory and stores the CO2 in the same field as the ROAD project[6].

Military activities

On a regular basis, the Dutch army is doing military exercises on the North Sea. Furthermore, some parts of the North Sea are ammunition depots which are not used for a considerable time. About 4,200 km2 of the Dutch part of the North Sea (about 7% of the total surface) is occasionally used for military purposes.

The use of this area is not expected to change in the coming years. Due to an increase in activities on the North Sea, a combined use of the military area is a possibility. For instance opening the military area for sand extraction. Also economic activities with fixed equipment like wind mills or oil and gas extraction facilities can be combined with military exercises[7].

Land reclamation

Recently land reclamation occurred for the extension of the Rotterdam harbor (Maasvlakte 2). Furthermore, along the entire coastline beach nourishments are carried out to protect the sandy coast. These activities exert biological, physical and chemical pressures on the marine ecosystem. It is expected that some of these activities on the Dutch part of the North Sea will intensify over the coming decades, like for example, the construction of offshore wind farms and sand extraction for coastal protection.

2.8 Sea-dependant activities on land

Sea-dependant (indirect) economic activities are activities which do not take place on the DCS but depend on the DCS due to the geographic location and due to the nature of these activities. In this section we focus on the economic impact of two main activities: tourism and recreation in coastal areas and economic activities in seaports.

6 http://www.rijksoverheid.nl/onderwerpen/co2-opslag/co2-opslag-in-nederland
7 http://www.rli.nl/content/overzicht-activiteiten-noordzee-militaire-activiteiten

Concentration of recreation and tourism can be found along the coast due to the vicinity of the North Sea. Therefore, the production value of this sector can be partly allocated to the North Sea. Also the economic value of seaports has a clear link with the North Sea. However, it is difficult to determine the actual economic value attributed to the North Sea since the extent of dependence of the sector to the North Sea is not clear.

Tourism and recreation in the coastal area

With 250 km of sand beaches with dunes and a variety in beach resorts, the Dutch coastline is a tourist attraction for day trips and overnight visitors. Annually, about 8.3 million day trips and 7 million tourists stay overnight in the beach resorts along the coast[8]. Furthermore, the North Sea attracts, especially in summer, wind surfers, sport fishers, sailors and divers. The economic significance of the tourism and recreation sector in the coastal area is more than only the economic value of the accommodations, water sport and beach activities. Supplying companies play an important part as well.

The added value of the tourism and leisure sector in 2010 was € 13,986 million and 253,000 fte are employed[9]. The total expenses 37,280 million in 2011 which is after a significant decline in 2009 again on the same level of 2008. However, it is unclear which part of these figures is connected to coastal tourism.

Impact of the economic crisis

Currently this sector suffer the effects of the economic crisis, however, the crisis doesn't have an impact on beach visits and sport fishing.

Economic activities in seaports

The economic value of the seaports has a clear relation with the North Sea. The Netherlands has four large seaport areas: Northern Seaports (e.g. Delfzijl, Den Helder), North Sea Canal area (e.g. Amsterdam, IJmuiden), Rotterdam, Rhine and Meuse Estuary and Scheldebekken (e.g. Vlissingen, Terneuzen).

The whole of maritime activities can be regarded as a circle with multiple circles within (see figure 2.8). The inner circle - the core - consists of the activities that are focused on the primary function of the port: goods throughput and transhipment (transportation and distribution sector). Around it, is a second circle: the industry. Numerous industries are located in or near seaports, because due to the nature of the activities the presence of a sea port is a decisive location factor. Examples of port related industrial activities are the (petro) chemical industry, the crude-oil industry and basic metals industry. The wholesale and commercial and non-commercial services form a third circle. These activities facilitate the first two circles. The direct economic significance of seaports relates to these three circles. The fourth circle concerns the indirect effects on the suppliers of the port related activities; the so-called effect of backward linkages of the Dutch sea port areas on the rest of the Dutch economy.

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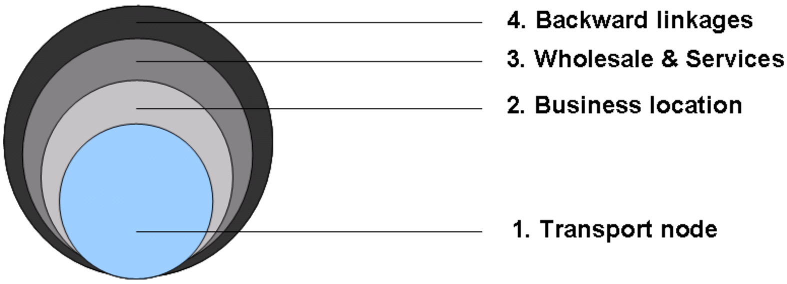
8 http://www.rli.nl/content/overzicht-activiteiten-noordzee-recreatie-en-toerisme

9 CBS, Toerisme en recreatie in cijfers 2011

Figure 2.8 Overview maritime activities



The Dutch seaports provide a major contribution to the economy. Annually, they contribute about € 24 billion directly, being 4% of the BNP (see table 2.9).

Besides their direct economic significance, the seaport areas have a substantial indirect economic significance in the form of added value and employment opportunities among suppliers and companies operating in the seaport area (the various circles described above). Indirectly seaports contribute to € 12.7 billion to national income. They provide a quick and efficient loading and unloading of goods. They also provide space for large-scale activities (including logistics and manufacturing).

In 2011, Dutch seaports handled over 580 million tonnes of cargo. The seaports provide employment to some 275,000 people work, directly (164,076) or indirectly (110,160).

Table 2.9 Economic value seaports

	Employment (working people)	Added Value (€ million)
Transport node		
- transport*	49,740	3,263
- services	16,809	2,470
- transshipment/storage	14,788	3,162
Industry	58,064	12,319
Wholesale	13,981	1,364
Commercial and non-commercial services	10,693	1,223
Total	**164,076**	**23,802**

* This category includes sea shipping

Source: Erasmus Universiteit Rotterdam (2013)

Impact of the economic crisis

The economic crisis had a larger impact on Dutch seaport compared to the average national impact, resulting in a larger decrease in harbor related activities in 2009. On the other hand, recovery of economic performance in this sector is in general faster compared to the rest of the economy. The contribution of the harbor to the economy increased again from 2010 onwards. The growth of employment did not keep pace with the economic performance, recovery of economic performance go hand in hand with efficiency increase and not with an increase in employment.

3 Future prospect till 2027

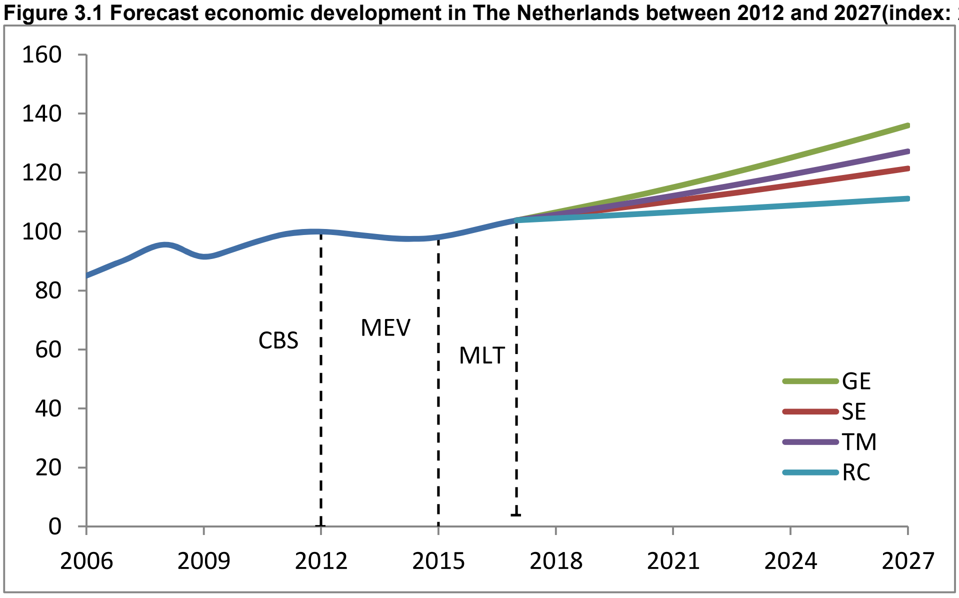
In this chapter, socio-economic development between 2011 and 2029 of North Sea related economic activities will be discussed in section 3.2 to 3.8. The first section (section 3.1) gives an overview of the economic development on a national level which gives the opportunity to compare the individual economic activity developments with the national development.

3.1 Economic development on a national level

The figure below shows forecasts for national employment in the period 2012-2017. For the near future (till 2017), the forecast is based on the most recent data of the national economic development (Macro Economische Verkenning 2014 en Economische Verkenning 2013-2017). It is expected that employment will decrease up to 2015 followed by a slight recovery. The forecasts after 2017 are based on the four long-term scenarios for The Netherlands from CBP.

The range for economic growth in the period 2012-2027 is estimated at +11 up to +36 percentage point. The main driver for the expected economic growth is the development in productivity which mainly depends on technological improvement. The highest expected growth in productivity is under scenario GE. In scenario RC, limited innovations take place, resulting in a low productivity and employment increase. The employment level in The Netherlands is -5 till +4 percentage point lower or higher compared to 2012.

Figure 3.1 Forecast economic development in The Netherlands between 2012 and 2027(index: 2012=100)



Bron: Ecorys o.b.v. CBS, NAMWA, LISA, LEI en CPB

3.2 Oil and gas sector

3.2.1 Future production

Gas

The table below presents the estimated supply of gas produced from the DCS in the period 2011-2027. The production prognoses from 2011 - 2015 are based on the growth rate of WLO scenario

GE since the production volume of GE in 2011, compared with the other three scenarios, is most consistent with the actual 2011 figures. The GE scenario shows an annual decline of gas production of 2.58% while the actual average annual decline in the past decade is 3.42%.

From 2016 onwards, the growth rate of the four WLO scenario's have been applied, resulting in a minimum and maximum value for the years 2021 and 2027. All four scenarios show a decline of gas production. The highest remaining reserves are expected in scenario SE. Scenario GE shows a more rapid decline of the off shore gas reserves and production, due to finalizing of the current policy giving priority to the exploration of small and marginal fields, increasing domestic demand and a constant export level.

Table 3.1 Production prognoses for gas in the period 2011 – 2027

Gas production	2011	2015	2021		2027	
			Min.	Max.	Min.	Max.
billion Sm3	19.6	15.9	18.7	11.3	14.6	15.9

Source: ECORYS, based on WLO study

Up to 2011 current prices, from 2011 onwards constant prices

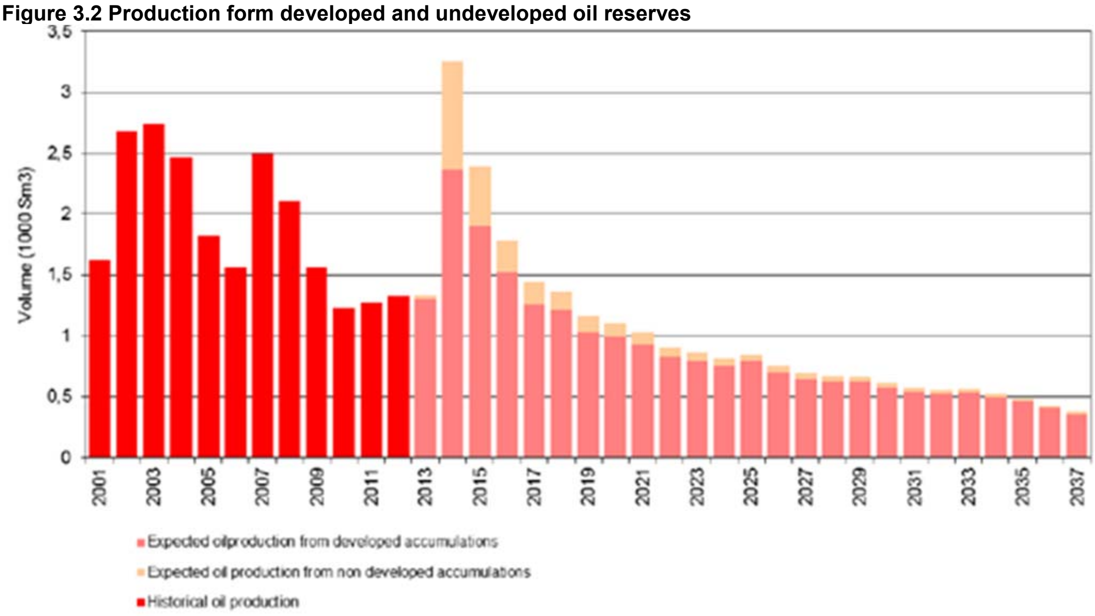
Oil

Latest information available on production of oil (onshore and offshore) dates 2012 and is presented in the figure below. This figure provides information on future production of oil from developed reserves and (proven, but yet) undeveloped reserves that are on a list of being developed. Extraction of undeveloped reserves is mostly economically not viable at the moment. However, it is likely that due to rising oil prices and technological developments, these fields are taken into production in foreseeable future (period 2014-2020). The decreasing trend of the last years has been reversed by the re-start of the production from the Schoonebeek field and the first oil coming from Q13-FA. From 2014 onwards production will show an overall decline towards 2037.

It is expected that after 2020, oil reserves on the North Sea will have run out and hence production equals zero. Discovery of new significant oil reserves is not expected (EZ, 2012). However, in July 2013 newspapers reported that researchers discovered possibly a new oil- and gas field in the northern part of the DCS. This new field could contain a numerous amount of gas and an unknown amount of oil[10].

[10] De Telegraaf, 9 juli 2013: Noordzee heeft extra olie- en gasmiljarden.

Figure 3.2 Production form developed and undeveloped oil reserves



Source: NLOG, 2013.

Factors influencing the future production

The future production (especially gas) is determined by the following factors:

- **Policy with focus on energy transition and renewable energy sources**
  Gas can be seen as a required partner for renewable energy sources as wind and sun. Therefore, an increasing production of renewable energy goes hand in hand with an increase in gas production. Replacement of gas by renewable energy sources is not an option since the energy demand will significantly increase in the future. To fulfill this demand oil and gas production is still needed[11].
- **Incentives policy of the government for small and marginal fields**
  Incentives are in place to stimulate exploration and production of economically marginal fields. The incentives make marginal fields more interesting for development and exploitation from the point of view of profit gain. The GasTerra Company is obliged to purchase the produced gas from marginal fields at market related prices, if that is requested by a producer[12].
- **The possibility to reduce development and operation costs**
  New techniques are available at this moment, which increase production and also decrease the operation costs. Fields are longer profitable with lower operation costs. More oil and gas can be extracted from the existing fields.
- **The possibility to reduce costs of exploration**
  New seismic techniques are available to reduce the risk of exploration and also to reduce the costs of drilling exploration wells. Technological progress makes it possible to identify gas prospects more easily, place wells more effectively, reduce the number of dry holes drilled, reduce drilling costs, and cut exploration time. This leads to both economic and environmental benefits.

3.2.2 Future economic value

Table 3.2 presents estimates for the production value, added value and number of man years for the period 2015, 2021 and 2027. All economic indicators follow a decreasing trend. The decline is based on decreasing production of oil and gas and constant prices (2011).

11 Source: Interview NOGEPA 2013

12 Source: Annual Report EBN 2009 and interview NOGEPA 2013

The forecast for *production value, added value* and *employment* up to 2015 is based on GE scenario growth rates for gas production which is most consistent to the gas production trend in the last decade. From 2016 onwards, the minimum growth rate is based on GE growth rate, the maximum growth rate is based on TM growth rate.

Table 3.2 Forecast for production value, added value and employment oil and gas DCS

	2011	2015	2021		2027	
			Min.	Max.	Min.	Max.
Production value (million euro)	7,917	7,132	5,912	6,189	4,201	5086
Added value (million euro)	6,275	5,653	4,686	4,905	3,329	4,031
Employment (fte)	692	639	530	554	376	456

Source: Ecorys 2013, based on WLO study

Up to 2011 current prices, from 2011 onwards constant prices

Factors influencing the future economic value

The future economic value is determined by the following factors:

- **The amount of gas and oil reserves available and the possibilities to develop these reserves**
  See section 4.2.1
- **Possibilities of the exploration and production of shale gas and coal bed methane**
  Although there is much attention for the unconventional gas resources (such as shale gas and coal bed methane) the exploration potential remains very uncertain.
- **The possibilities of carbon capture storage in the oil and gas fields**
  Depleted gas fields offer substantial storage capacity. Further development by the EU and national regulations on carbon capture and storage is required for this technique to become a feasible option. Strictly speaking there is a change of sector, however, the advantage for the oil- and gas sector is that when installations are used for CO2 storage the decommissioning costs of the infrastructure do not have to be paid by the sector. The infrastructure can be reused for CO2 storage, in OSPAR 2007/2008 international agreements are made for CO2 storage.

3.3 Sand extraction

3.3.1 Future extraction

2011-2017

The following table presents an overview of the annual need of sand and maximum amount of sand that can be extracted the period 2011-2017.

Table 3.3 Forecast sand needed and extraction

	2011	2012	2013	2014	2015	2016	2017
Expected bruto sand needed			10.15	14.49	20.91	22.24	18.65
Sand extraction for beach nourishment	12	12	12	12	12	20	20
Sand extraction for Maasvlakte 2	38	38	38	9,5	9,5	9,5	9,5
Sand extraction for commercial sand	25	25	25	25	25	25	25
Sand extraction for Westerschelde Container Terminal			3	11	6	0	0

	2011	2012	2013	2014	2015	2016	2017
Sand extraction for Zwakke Schakels	2.5		10 - 20	10 - 20	0	0	0
Total	**78**	**75**	**70 - 80**	**82 - 92**	**53**	**55**	**55**

Sources: MER winning suppletiezand Noordzee 2013 t/m 2017, MER winning suppletiezand Noorzee 2007-2012, Mer ophoogzand 2008-2017, MER maasvlakte 2

Extraction for sand suppletion

According to the advice of the Deltacommissie regarding a sustainable coast defence, over 86 million m3 sand is needed for coastal defence in the period 2013 to 2017 (MER winning suppletiezand Noordzee 2013-2017, 2012). The average extraction up to 2015 is 12 million m3 sand per year. From 2016 onwards, a maximum of 20 million m3 annually can be extracted. The sand extraction would be taken place in 19 locations along the Dutch coast, with main locations: Ameland Midden, Julianadorp and Schouwen (MER winning suppletiezand Noordzee 2013-2017, 2012).

Extraction for construction fill

The need for commercial sand on the short term is presented in the following table. Large infrastructural projects like e.g. Maasvlakte 2 and WCT Vlissingen increase demand significantly. From 2013 about 9.5 million m3 sand is extracted annually for Maasvlakte 2 (at least until 2018) and for WCT Vlissingen an additional 20 million m3 sand is needed in the period 2013 until 2015 (MER winning suppletiezand, 2012). Other large scale sand extractions are needed for commercial sand extraction (La MER: 25 million m3 in the period until 2017), and Zwakke Schakels (10-20 million m3 in 2013-2014).

Sand extraction strategy 2050

In “Notitie Zandwinning strategie 2050[13] thre scenarios are presented:

1. Low scenario: this scenario is based on Nationaal Waterplan and expects after 2015 annual sand suppletion of 20 million m3 and 13 milion m3 commercial sand extraction.
2. Middle scenario: this scenario is based on the high KNMI scenario with a sea level rise of 40 cm per century. This scenario is not expected to take place before 2025. For sand suppletion 40 million m3 sand is needed on an annual basis. 25 million m3 sand is needed for commercial purposes.
3. High scenario: This scenario is based on a sea level rise of 1.30 m per century. Around 85 million sand is needed for beach nourishment, while 25 million m3 sand is needed for commercial purposes.

Shift to alternatives

Recently a trend towards the use of cheaper or more environmentally sustainable filling materials other than sea sand can be observed (e.g. demolition waste, debris, other used materials). As a result demand for fill sand from the North Sea might decrease slightly over time. It is, however, not expected that this will have a large impact on extraction volumes, so no correction was made on the volumes reported above. Also, it is expected that less fill sand from land will be available in the future, so there will be an opposite effect on the demand for sea sand as well.

3.3.2 Future economic value

Table 3.4 shows how the economic value of sand extraction in the North Sea area (in terms of production value, added value and employment) is expect to develop over time. The development is based on the volume of sand extraction as discussed above. The economic values up to 2015

[13] RWS-DNZ Notitie zandwinstrategie 2015, maart 2011

have to be considered as maximum values, since the volumes are based on the maximum permit. The values from 2016 onwards are based on expected sand needed.

Table 3.4 Baseline economic value sand extraction (2011-2040)

	2011	2015	2021		2027	
			Min.	Max.	Min.	Max.
Production value (million euro)	193	133	91	91	91	314
Added value (million euro)	44	31	21	21	21	72
Employment (fte)	345	237	163	163	163	561

Source: ECORYS, based on notitie Zandwinningstrategie 2050

Factors influencing future use of the sea for sand extraction

For the MSFD it is important how the economic use of the North Sea with respect to sand extraction will develop autonomously in the coming decades. The main relevant factors to consider in this context are:

- Strong (potential) growth in the demand for sand used for coastal defence purposes (sand suppletion);
- An additional demand for sand due to large infrastructural and/ or land reclamation projects (construction projects);
- Shift to (cheaper or more environmentally sustainable) alternatives for sand extracted from the marine area.

3.4 Shipping

3.4.1 Future throughput Dutch seaports

Based on information provided by Rotterdam Port Authority, we can conclude that on the short term, an increase of throughput can be expected. The figure below shows an estimated increase in throughput of 14% for the period 2011-2015. We consider the throughput development of the other sea ports in The Netherlands similar to the expected development in Rotterdam.

Figure 3.3 Throughput development Port of Rotterdam 2011-2015 (x million ton)

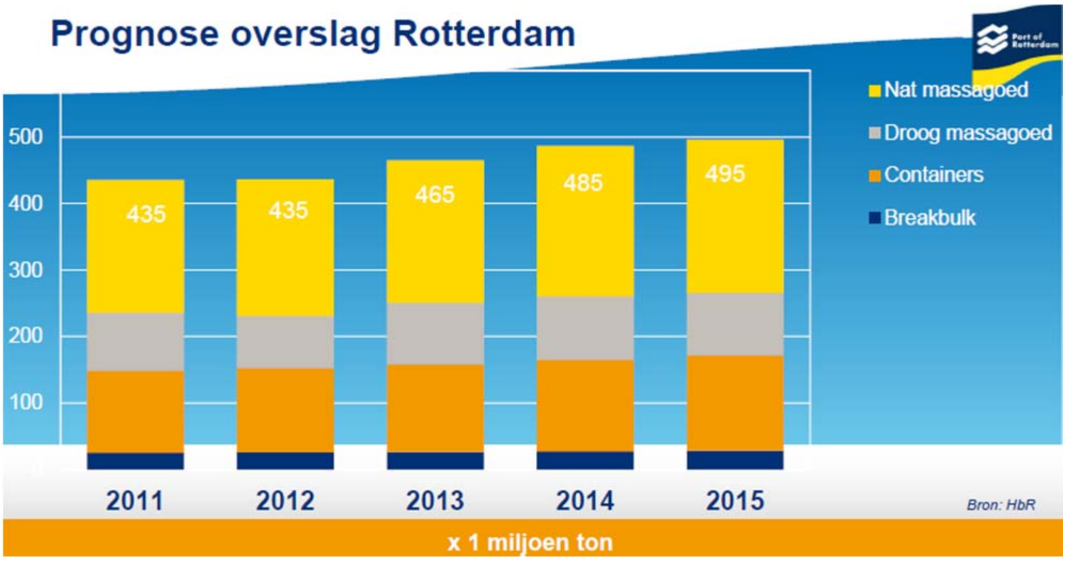


Table 3.5 contains estimates for throughput of goods in Dutch sea ports for the period 2011-2027. The forecast up to 2015 is based on the forecasts of Port of Rotterdam. After 2015, the growth

rates of the WLO scenarios have been applied, resulting in a minimum throughput conform RC scenario and a maximum throughput conform GE scenario.

Table 3.5 Forecast throughput in Dutch sea ports 2010-2027

	2011	2015	2021		2027	
			Min.	Max.	Min.	Max.
Throughput (ton x million)	580	660	652	759	632	852

Source: ECORYS, based on WLO study, prognoses Rotterdam Port Authority

Although the relationship between the goods handled in Dutch sea ports and the Dutch sea shipping sector is not one on one[14], in the past, it has been a good indicator of how the sector develops. Besides, particularly of interest for the MSFD is the development of ship movements in the DCS area. The amount of tons of goods handled in Dutch sea ports is a good indicator for this.

3.4.2 Future economic value

Table 3.6 shows estimates for the production value, added value and number of full time equivalents for the period 2015-2021-2027. Despite the expected increase in throughput in the near future (up to 2015). Representatives of large shipping companies expect that the overcapacity in the shipping sector will continue for several years[15], which will result in a decline of *production value and added value*. Because specific projections for the Dutch sea shipping sector are not available, the forecasts are based on the expected development of throughput (see table 3.6) from WLO. The assumption here is that goods throughput in Dutch sea ports will keep pace with world throughput, and that the share of Dutch sea shipping in the total volume of cargo shipped by sea remains constant. RC scenario is the only scenario predicting a decrease of the shipping sector. Therefore we applied the annual growth of RC scenario to the production value and added value in the period 2012-2015. From 2016 onwards, the growth rates of respectively GE and RC scenario are applied to estimate the maximum and minimum values up to 2027.

Table 3.6 Forecast production value, added value and employment shipping (nominal values)

	2011	2015	2021		2027	
			Min.	Max.	Min.	Max.
Production value (million euro)	3,159	3,134	3,098	3,604	3,002	4,048
Added value (million euro)	607	602	595	693	577	778
Employment (fte)	5,850	5,534	5,091	5,422	4,593	5,375

Source: ECORYS, based on WLO 2006

Over capacity and increasing ships are expected to be the factors affecting the development of *employment* as well. The number of people working in the shipping sector has been declining since 1995. It is not expected that this trend will change in the future. The prognosis for the period 2012-2015 are based on RC scenario for throughput in Dutch sea ports corrected for the forecasted labour productivity[16], since the estimated employment in this scenario is most similar to the realised employment in 2011. From 2016 onwards, the growth rates of respectively GE and RC scenario are applied to estimate the maximum and minimum values up to 2027.

Factors influencing the future economic value of the sector

Factors that have an influence on the development of the sector are:

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[14] Not all goods are landed by domestic ships.

[15] http://www.schuttevaer.nl/nieuws/zeevaart/nid15807-zeevrachtenmarkt--overcapaciteit-houdt-nog-jaren-aan.html

[16] WLO vier vergezichten: arbeidsproductiviteit ontwikkeling

- Growth of trade volumes;
  Economic crisis set aside, deepsea and short sea maritime transport volumes have grown quite significantly. In Europe, growth was most striking in container shipping and less so in the bulk markets. Growth o f trade volumes will have a positive impact on throughput in harbours.
- More attention for environmental issues;
  Recently environmental issues are becoming more important. At least two environmental issues are important for the shipping sector right now. Firstly, the future decisions about the CO2-emmissions, secondly the content of sulphur in fuel used in the sector. A potential issue is sub aquatic noise.
  - *CO2-emissions*
    Two European sea basins (Baltic Sea and North Sea) declared Emission Control Areas with stricter regulations on emissions from ships; EU strives to reduce CO_2 emissions from shipping by 40% (if feasible by 50%) in 2050 compared to 2005 levels.
    Together with the Dutch national authorities, the sector is working on a Declaration of Intend aimed at saving energy and reducing CO2-emmissions. The ambition of the KVNR is having an operational zero-emission ship in 2050. Dependent on the sectors covered, inclusion of shipping in the EU Emission Trading Scheme (EU ETS) could have a significant (negative) impact on the competitiveness of the sector.
  - *Sulphur in fuel*
    A decision has been made already by the IMO about the content of sulphur in fuel. Starting January 1st 2015, the sulphur content in shipping fuel may not exceed 0.1 percent in the Emission Control Areas (North Sea, Canal, East Sea). Recent studies show that as a result of higher unit costs, there may be a 'modal back shift' – a shift from transport by (sea) ship to transport by truck (over the road) (ECSA, 2010).
- Administrative burden short sea;
  More than 40% of all intra-European transport takes place via short sea shipping. It is generally assumed that in the coming decade short sea shipping will further increase. Given the potential for short sea shipping, priority is given to the removal of unnecessary administrative rules; both in the EU (between countries) and national. This will increase the cost effectiveness of the sector and thus might enhance growth of this sector.

3.5 Fishery

3.5.1 Future economic value

The future economic value is mainly affected by the following indicators:

- European quota for pelagic fish. Every year the quota are revised for the next year, on the basis of current fish stocks for the different species. According to Internationale Raad voor Onderzoek der Zee (ICES) fish stocks improve. Plaice stock is very high, Herring stock is healthy, Sole is stable and slowly increasing recent years[17]. Cod stock is still too low, but improving. In order to forecast the near future, we assumed a stable quota for the period 2012-2015 based on the average quotas in the period 2008-2012.
- Price for landed fish. Since the price remained relatively stable in the period 2008-2012 we assume also stable prices for the period up to 2015.
- Fuel price.

Table 3.7 shows estimates for the production value, added value and number of man years for the period 2015, 2021 and 2027. The forecasts of *production value* up to 2015 is assumed to remain stable since the fish quota are relatively stable in recent years and fish stocks improved. Furthermore, based on the stable prices for landed fish in the last five year, no extreme changes

17 http://www.wageningenur.nl/nl/Expertises-Dienstverlening/Onderzoeksinstituten/imares/show/Noordzeevisbestanden-gezond-zorg-over-kabeljauw-en-zeebaars.htm

are expected in the prices for the near future. From 2015 onwards, the minimum growth rate is based on the GE added value growth rate (-2.8% annually) and the maximum added value growth rate is based on the other three scenarios for which the growth rates are -1.2%.

In the past decade the average annual decrease of *added value* is 8.6%. The increasing oil price contributed significantly to this decrease. The oil price increased till 2012 and is expected to decrease in the year 2013 and 2014 [18]. WLO forecasted an annual decrease of added value between 1.2% (SE, TM, RC) and 2.8% (GE) which is considerably lower than the actual decrease in the past decade. However, since the oil prices are expected to decrease, GE scenario can be considered as a realistic scenario for the nearby future (period 2011-2015). From 2017 onwards, the minimum growth rate is based on the GE growth rate and the maximum growth rate is based on the other three scenarios for which the growth rates are -1.2%.

The estimated *employment* in 2011 follows the line of GE scenario, therefore the forecast for the employment up to 2015 is based on GE scenario. The forecasts assumed a continuous decrease in employment. From 2015 onwards, the minimum growth rate is based on GE growth rate, the maximum growth rate is based on the other three scenarios.

Table 3.7 Forecast for production value, added value and employment for fisheries on the DCS

	2011	2015	2021		2027	
			Min.	Max.	Min.	Max.
Production value (million euro)	100	100	93	85	85	75
Added value (million euro)	25	23	19	22	17	21
Employment (fte)	493	440	375	435	332	399

Factors influencing the future

Some factors have been mentioned before in this section, like fish quota, landing price, changing fish consumption patterns and oil price. Another factor having an impact on the development of the sector is the fleet capacity. In the past decade the Dutch fishing decreased every year with a few vessels. Also for the future a decline in vessels is expected. However, the existing fleet will become more sustainable in the near future due to regulations, changing ideas from customers about sustainability and high oil prices. The efforts being made have a strong focus on reducing fuel consumption, discards and sea bed distortion.

3.6 Wind energy

3.6.1 Future capacity

In 2009 twelve permits have been issued and three farms received subsidy and are currently under construction:

- Wind farm Q10 (Eneco Luchterduinen);
- Wind farm Buitengaats (project Gemini);
- Wind farm Zee-energie (Project Gemini).

In 2015 these three farms should be in operation. The total offshore wind energy capacity is by that time estimated at 1,000 MW. It is not clear when the owners of the nine permits will start constructing their wind farms, but they will not start before 2015.

[18] http://www.dnb.nl/binaries/711480_EOV_3-12_WEB_tcm46-273995.pdf

In September 2013 the Dutch Government and 40 actors in the energy sector signed the SER energieakkoord. The sector intends to realise an offshore wind energy capacity of 4,450 MW by 2023 with a cost reduction of 40 percent.

The table below presents estimates for installed offshore wind capacity in the period 2011-2027. For the short term (2011-2015), the estimate is based on the existing wind power capacity and the construction of three new facilities. For the year 2021, the implementation of SER Energieakkoord is taken into account. Since the new scheme for future wind farms between 2023 and 2027 is unknown, the installed capacity is based on the Strong Europe scenario growth rate. This scenario predicted an installed capacity of 3,000 MW in 2020, which is almost similar to the expected situation assuming that SER Energieakkoord will be implemented on time.

Table 3.8 Outlook installed capacity wind energy on DCS

	2011	2015	2021	2027
Wind power capacity (MW)	228	1,000	4,338	5,850
Wind power (GWh)	802	3,500	15,181	20,475

3.6.2 Future economic value

The future economic significance depends on the installed capacity as discussed above. The table below shows production value, value added and operation and maintenance related employment for the short and (middle-) long term. It is noticed here, that likely a large part of the new wind energy farms on the DCS will be exploited by foreign companies.

Table 3.9 Prognoses for production value, added value and employment wind energy DCS (nominal values)

	2011	2015	2021	2027
Production value (million euro)	40	175	628	1,.024
Added value (million euro)	12	52	2,197	3,583
Employment (fte)	75	330	1,184	1,.931

Factors influencing the future

Factors that have an influence on the development of the sector are:

- Dutch Renewable Energy Policy and objectives;
  The national target for electricity from renewable resources is 16% in 2020 (Noordzeeloket, 2013). The government is working on incorporating the working programme's spatial target of approximately 6,000 MW of offshore wind energy installed capacity in the North Sea in 2020 (EZ, 2009b).

- Permits and subsidies;
  The installation of an offshore wind farm requires a permit. By the end of 2009, twelve construction permits with a total of 3,250 MW were granted to initiators. The parties which acquired a permit, were able to submit a bid for the requested level of production subsidy from the SDE subsidy[19]. Since the allocated budget for the subsidy is limited, only two parties were able to get a subsidy. The construction of the three offshore wind facilities with a total capacity of 600 MW will start late 2013. Both wind farms are an initiative of the German Bard Engineering Group.

- Sustainability of wind energy;

[19] Stimulering Duurzame Energieproductie (SDE).

Currently wind energy is not sustainable without a subsidy, but the pace of technological progress in the wind industry is rapid. The general expectation for the sector is that – also because of increasing future fossil fuel prices – around 2030 wind energy could be competitive with other power sources, so subsidies will no longer be necessary.

3.7 Piping and cables

Future capacity telecom cables

About 90 percent of the Dutch population is connected to the internet. The use of the internet is changing. More and larger documents and data are sent all over the World using the internet. Supposing that the use of internet en telecom will also increase in the future due to more globalization, the data traffic will increase also.
Despite the growth of data traffic, no new cables are needed in the future until 2030. The present data capacity of the telecom cables in the North Sea is sufficient. Because of new innovations, more data can be transported through the cable with the same capacity. The newest innovation is glass fiber cable, trough which data is transported with light. The expectations are that with new innovations, the capacity is rising in the future due to glass fibre cables. At this moment, the capacity of the cables in the North Sea is enough for the future until 2030.

The idea of use of satellites can be regarded as a realistic one for future communication. Especially, since the costs for the construction of transatlantic telecom cables are high. But as long as the costs for a satellite connection are too high to compete with the telecom cables, this is no realistic alternative for the future.

Future capacity undersea interconnectors

There are plans for a third undersea interconnector between Denmark and the Netherlands (COBRA), with a capacity of 700 MW, a length of 275 kilometres, from Eemshaven (Netherlands) to Endrup (Denmark). The goal of the COBRA-cable is to provide the Dutch and Danish electricity markets with more sustainable energy, especially wind energy. End of 2014 a decision on the implementation of the project is expected.

3.8 Sea dependant activities on land

Tourism and recreation in coastal area

In the future, as a result of economic development and demographic change (ageing)l a considerable growth of tourism is expected. The coastal area provides opportunities to meet this growth. The number of yachts (including marinas) and sport fishery boats in territorial waters is expected to increase. An increase in number of divers is expected as well.

Economic activities in seaports

The economic development of seaports and related activities depends on the world trade. In 2012, the transshipment in Rotterdam was again a record and showed a recovery in world trade. The transshipment of almost all types of load showed a growth. In spite of the increase in volume, prices are still low due to strong competition. The profitability of the sector is still below the level of 2008. or the long run, the Port of Rotterdam estimates a yearly transshipment of 575 to 740 million tons in 2030, compared to 435 million tons in 2011. Especially the transshipment of containers is expected to show substantial growth.

4 Outlook 2050

Introduction

The previous chapter described the expected social economic developments for the different sectors up to 2027. Although 2027 is an important year for the MSFD, the improvement of aquatic environment does not end by then. Therefore this chapter provides an outlook up to the year 2050, with the purpose to explore what possible changes may occur which affect the scope of the MSFD objectives in the external context: good environmental conditions in the water system and a sustainable balance between ecology and economy

Results presented in this chapter are based on the outcomes of two workshops held with experts in the field of water quality and scenario's and include e.g. DGRW, RWS, PBL and Deltares. The most important issues for the long term development of the MSFDare mentioned In the first workshop. The second meeting was a deepening-session, in which the results of the first meeting were further explored. After both meetings the outcomes were summarised in factsheets per sector. In this chapter you will find the most important uncertainties for the MSFD goals until 2050 and their impact on the sectors.

Results

The following economic sectors were analysed during the workshops:

- Shipping;
- Energy;
- Food;
- Sand;
- Tourism;
- Public functions;

All of the above sectors are analysed on the themes: size and developments, innovations and sustainability, environmental issues on the long term and policies. Based on the outcomes of this assignment we determined the growth potential of the sectors up to 2050. Growing conditions are defined to come to the potential growth. Finally the results are described in factsheets per sector. Those are included in annex 3: factsheets (in Dutch).

Annexes

Annex 1 Experts consulted

Sector	Organization	Expert
Petroleum and gas	Nogepa	Mr. A. Tacoma,
Sand	RWS Noordzee	Mr. R. Smedes
Shipping	RWS	Mr. B. Turpijn
Fishery	Minisistry of Economic Affiars	Mr. W. Schermer Voest
	WUR	Mr. H. van Oostenbrugge
Wind energy	Pondera Consult	Mr. E. Arends
	Ministry of Infrastructure and Environment	Mrs. N. de Koning
Piping and cable	Ministry of Economic Affairs, DG Energy and Telecom	Mr. S. van Merkom Mr. H. Nikkels

Annex 2 Literature

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Annex 3 Factsheets

Workshop Gebiedsagenda Noordzee

Thema Scheepvaart

De scheepvaart behelst de koopvaardij, offshore supply vaart en ferry diensten binnen de Nederlandse EEZ.

Huidige omvang en ontwikkelingen

Met ongeveer 260.000 scheepsbewegingen per jaar[1] is de Noordzee een van de drukst bevaren zeeën ter wereld. Een zeer groot gedeelte van deze scheepsbewegingen zijn van en naar de Nederlandse zeehavens, met Rotterdam als 'Gateway to Europe'. De zeehavens realiseerden in 2011 een toegevoegde waarde van €36,5 miljard in 2011[2], 6,1% van het BBP. De zeehavens zijn goed voor 164.000 arbeidsplaatsen. Verwacht wordt dat het aantal scheepsbewegingen op de Noordzee blijft toenemen de komende jaren. Transportvolumes groeien, Nederlandse zeehavens worden uitgebreid (Maasvlakte 2) en nationaal en Europees beleid stimuleert de modal shift naar de scheepvaart. (EU Blue Belt, TEN-T, Marco Polo etc.) De containeroverslag zal naar verwachting in 2040 met 50% tot 200% groeien en transport van alternatieve brandstoffen zoals LNG en bio-brandstof zal toenemen. Daarnaast zullen windmolenparken op zee en toenemende exploratieve activiteiten naar alternatieve brandstoffen de offshore-supply vaart stimuleren.

Innovaties en duurzaamheid

De scheepvaart zal de komende jaren zich moeten aanpassen aan maatregelen ter vermindering van de verontreiniging van scheepvaart. Binnen de MARPOL ANNEX VI regelgeving van de IMO worden limieten gesteld aan de emissies als NOx en SOx voor schepen. Voor de zogenoemde ECA's (Emission Control Areas) zijn deze limieten strenger en de Noordzee is een van deze ECA's. De SOx limieten (vanaf 2015 strenger) verplichten schepen op schonere brandstoffen te varen of aanpassingen te maken op de uitlaatsystemen. De NOx limieten (vanaf 2016 strenger) maken motorische aanpassingen nodig. Mede door deze beleidsdruk is de sector meer en meer op zoek naar duurzame oplossingen en alternatieven om schepen steeds schoner te laten varen. Ook het varen op LNG behoort hierbij tot de mogelijkheden.

Milieuaspecten op de lange termijn

Verwacht mag worden dat op de lange termijn de scheepvaart op de Noordzee schoner zal zijn dan het nu is. Elk schip zal minder emissies uitstoten en varen op schonere brandstoffen. Echter, de scheepsbewegingen op de Noordzee zullen ook in grote mate toenemen. De Noordzee zal dus nog intensiever gebruikt worden voor de scheepvaart dan op dit moment het geval is. Daarbij komt dat veel negatieve effecten lokaal van aard zijn (SOx, NOx emissies, horizonvervuiling, geluidsoverlast, filedruk, ecosysteem, etc). Daarnaast zal ook aan land de fysieke ruimte voor havenactiviteiten moeten toenemen, terwijl de havens niet aan bereikbaarheid over land en zee mogen inleveren.

Beleid- en regelgeving

Zoals gezegd is de scheepvaart internationaal gezien onderhevig aan het beleid van de IMO (o.a. MARPOL en SOLAS -regelgeving). Daarnaast wordt er op EU niveau sterk ingezet op het versterken van de interne markt (o.a. Single BlueBelt voor intra-EU scheepvaart, 319 versterkte TEN-t havens) en emissie maatregelen (plannen om CO2 emissies verplicht te monitoren en rapporteren). Het Nederlandse Zeevaartbeleid zet in op een verantwoord varen, met aandacht voor het milieu en veiligheid. De Beleidsnota Noordzee gaat hier concreet op in door *“een stelsel van routeringsmaatregelen, clearways en ankergebieden dat de scheepvaart op een veilige en vlotte manier kan accommoderen”* na te streven. Inmiddels is een nieuwe scheepsroutering ingevoerd op de Noordzee om de toenemende drukte van schepen te kunnen faciliteren.[(3)]

Workshop Gebiedsagenda Noordzee

Thema Energie

Binnen het thema energie valt de olie & gaswinning op zee, windenergie door windparken op zee en andere energievormen zoals getijden– en golfenergie.

Huidige omvang en ontwikkelingen

De Noordzee is verantwoordelijk voor een significante bijdrage aan onze eigen energievoorzieningen en exportmogelijkheden. Totale jaarlijkse olie en gaswinningsbaten zijn hier €5 miljard. Op zee wordt op 143 locaties olie (8%) en gas (92%) gewonnen. Deze zijn voor 33% verantwoordelijke voor de totale gasproductie in Nederland en voor meer dan 80% van de totale olieproductie. (1)Het Offshore Windpark Egmond aan Zee en het Prinses Amalia Windpark zijn momenteel de enige Nederlandse windparken op zee, goed voor 228MW.
Er zullen de komende jaren een beperkt aantal nieuwe winlocaties voor olie en gas op de Noordzee tor ontwikkeling worden gebracht. Verwacht wordt dat tussen 2020 en 2050 de meeste winningen worden gestopt door uitputting van de velden. Van windenergie daarentegen wordt veel verwacht de komende jaren. In 2009 zijn 12 nieuwe vergunningen afgegeven voor de bouw van windmolenparken op zee. Drie parken goed voor 730MW worden de komende jaren gebouwd. Daarnaast heeft de overheid twee gebieden van 344 km2 (Borssele) en 1170 km2 (IJmuiden) aangewezen voor de ontwikkeling van windparken.(2)

Innovaties en duurzaamheid

In de overgang naar een volledig duurzame energiehuishouding kan de CO_2 die vrijkomt bij industriële activiteiten worden afgevangen en vervolgens opgeslagen in lege gas of olievelden op de Noordzee. CO_2 opslag wordt nog slechts op kleine schaal bij test-sites uitgevoerd. Na 2020 zal gebruik op grote schaal pas aan de orde zijn.
Een nieuwe vorm van energie is Ocean Energy (OE), bestaande uit getijden en golfenergie, osmotische energie en OTEC (Ocean Thermal Energy Conversion). Ook al zijn er een aantal Nederlandse bedrijven actief in het ontwikkelen en testen van OE-vormen zijn de activiteiten op de Noordzee momenteel nog beperkt, maar er zijn zeker mogelijkheden voor op de lange termijn. Getijdenenergie wordt nu getest bij Den Dolder, maar is ook mogelijk als de Afsluitdijk wordt opgeknapt. Golfslagenergie zou in potentie langs de kust van Noord-Holland opgewekt kunnen worden en er zijn pilots voor osmotische energie bij IJmuiden.(3)

Milieuaspecten op de lange termijn

Streven van de overheid is om op lange termijn de Nederlandse energievraag volledig duurzaam in te vullen. Ruimte op de Noordzee is hiervoor zeker nodig voor windparken, CO_2 opslag en vormen van Ocean Energy. Wat dit voor directe consequenties heeft voor het mariene ecosysteem is echter een belangrijk punt dat onderzocht dient te worden. Daarnaast is er horizonvervuiling.

Beleid- en regelgeving

Doel van de Nederlandse overheid is een energiehuishouding die voor 14% uit duurzame bronnen bestaat. In 2050 moet dit volledig duurzaam zijn ingevuld. Maatregelen die dit streven ondersteunen is een fiscaal vergroeningspakket, het op korte termijn volledig exploiteren van beschikbare gas en olievoorraden waaronder ook kleine velden. CO2-opslag dient gestimuleerd te worden en na 2020 moet de Noordzee plaats bieden aan windmolenparken met een gezamenlijk vermogen van 4450 megawatt. Dat is ruim 20 keer zoveel als de 220 megawatt die nu (2013) staat opgesteld.

Workshop Gebiedsagenda Noordzee

Thema Voedsel

Binnen het thema voedsel valt de visserij, aquacultuur en mariene biotechnologieën.

Huidige omvang en ontwikkelingen

De Nederlandse Noordzeevisserijvloot bestond in 2012 uit circa 600 schepen. Economisch belangrijke doelsoorten zijn: tong, schol, koolvis, schelvis, tarbot en griet, haring en garnalen. In totaal werden in 2011 aan 262,000 ton aan vis een zeevruchten door Nederlandse schepen binnengehaald. De visserijvangst is echter sinds 2005 sterk aan het dalen, 33% over 2005-2011 en staat onder druk.(1) Dit komt mede door de strikte regelgeving van het GVB (Gemeenschappelijk Visserijbeleid van de EU), die quota's en zoneringen instelt voor de visserij. Daarnaast zijn huidige vangmethoden zeer energie-intensief. De visserij zal zich de komende jaren tot duurzame sector moeten ontwikkelen. Aquacultuur is de kweek van vis of schelp- en schaaldieren en waterplanten. Ongeveer de helft van de vis die in Nederland gegeten wordt, is geteeld. Dit zijn met name schelpdieren (60.000 ton per jaar).(2) Mariene biotechnologieën staat als sector nog in de kinderschoenen. Mariene organismen als bacteriën, algen en sponsen worden gebruikt als ingrediënten voor farmaceutische, cosmetische of als voedsel binnen aquacultuur.

Innovaties en duurzaamheid

In overleg met de Nederlandse visserijsector, natuurorganisaties en met de andere EU-lidstaten wordt in het kader van het Europees Gemeenschappelijk Visserijbeleid ingezet op de verduurzaming van de visserij in de Noordzee. Duurzame vangstmethodes als de de sumwing, hydrorig, pulskor en pulswing worden op hun bruikbaarheid onderzocht. Deze methodes moeten de zeebodem met rust laten en zorgen voor minder ongewenste bijvangsten. Binnen de aquacultuur wordt ook stevig ingezet op een duurzame productie. Mosselzaadinvanginstallaties (mzi's) lijken een kansrijke toekomst te hebben als vervanger van het sleepnet (mosselkor) dat mosselzaad van de bodem vist. Deze en andere vormen van maricultures zijn mogelijk goed te combineren met windparken. Voor alle initiatieven voor het exploiteren van maricultures is een vergunning nodig onder de Visserijwet. Belangrijke toetsen bij vergunningverlening zijn het voorkomen van verspreiding van ziekten bij het 'verslepen' tussen verschillende locaties en het nutriëntenneutraal kweken. [(3)]

Milieuaspecten op de lange termijn

Op de lange termijn kan de klimaatverandering van invloed zijn op de visserij. Soorten kunnen wegtrekken of nieuwe soorten vis kunnen juist de Noordzee binnentrekken door veranderingen in golfstromen.

Beleid- en regelgeving

Het beleid voor de Nederlandse zeevisserij wordt in belangrijke mate bepaald door het GVB. De belangrijkste doelstelling van het GVB is het in stand houden van de visbestanden, om zo duurzame bevissing mogelijk te maken. Op de Noordzee is visserij is niet toegestaan in windturbineparken, binnen een zone van 500 meter rond mijnbouwplatforms, in scheepvaartroutes, aanloopgebieden en *clearways,* boven gronden waar veel munitie ligt en in bepaalde delen van Natura 2000-gebieden. Dit is alles bij elkaar slechts een relatief klein deel van de totale ruimte van de Noordzee.

Workshop Gebiedsagenda Noordzee

Thema Zandwinning

Het zand dat gewonnen wordt op de Noordzee heeft voornamelijk de functie van kustsuppletie en als ophoogzand op land. Daarnaast vindt er winning van grind en schelpen plaats.

Huidige omvang en ontwikkelingen

Nederland wint ruim 25 miljoen m^3 zeezand per jaar. Dit is het meest van alle landen grenzend aan de Noordzee. Ongeveer 12 miljoen m^3 per jaar wordt gebruikt om de Nederlandse kust te onderhouden (kustsuppletie). De andere 13 miljoen m^3 wordt gebruikt als ophoogzand.
Er wordt vanuit het Nederlandse deel van de Noordzee weinig grof industriezand aangevoerd. Grind wordt in zeer geringe mate aangevoerd als bijproduct van zand.(1)
Gegeven de verwachte zeespiegelstijging de komende decennia becijferde de Deltacommissie dat de hoeveelheid zand voor kustsuppletie moet stijgen naar een winning van 85 miljoen m^3 per jaar om de kust goed te kunnen onderhouden. Daarnaast wordt rekening gehouden met een benodigde toename van zeezand als ophoogzand tot 25 miljoen m^3 per jaar.

Innovaties en duurzaamheid

Technische ontwikkelingen moeten op termijn het winnen van zand op dieper gelegen bodems mogelijk maken. Zo heeft Damen Dredging Equipment een zuigkop ontwikkel die op 200 meter diepte zand kan opzuigen. Dit soort innovaties verruimt mogelijk de mogelijkheden van zandwinning op de Noordzee. Winnen tot grotere diepte is, volgens de huidige inzichten, effectiever qua kosten en ruimtebeslag. Ook vanuit ecologisch oogpunt is diepere winning op een kleiner oppervlak te verkiezen boven minder diepe winning op een groter oppervlak.(2)

Milieuaspecten op de lange termijn

In principe bevat de strook tussen de doorgaande nap -20 meter dieptelijn en de 12 mijlszone tot 2040 ruim voldoende zand om te voldoen aan het hoogste zandvraag-scenario voor zandsuppletie en tegengaan van overstromingen (oppervlakte van 2000km^2 nodig). Heikel punt is mogelijk het ecologisch waardevolle gebied De Zeeuwse Banken, die precies binnen deze strook ligt. Er liggen geen natura2000 gebieden binnen deze strook.
Mocht zandwinning op verder gelegen plekken nodig zijn in de toekomst dient wel de afweging gemaakt te worden met extra externe kosten vanwege de grotere transportafstand.

Beleid- en regelgeving

Het huidige beleid is gericht op het voorzien van voldoende betaalbaar zand voor zowel kustveiligheid, als voor gebruik van zand op land. De winning moet ook op maatschappelijk verantwoorde manier gebeuren, zoals de Beleidsregels Ontgrondingen in Rijkswateren voorschrijven. In de huidige reservegebieden voor zandwinning heeft zandwinning prioriteit boven andere functies. Deze ruimte is voldoende voor de komende decennia. Daarom heeft zandwinning in andere gebieden geen prioriteit.

Naast zand worden in kleinere hoeveelheden schelpen gewonnen. Het beleid is dat schelpenwinning is toegestaan zeewaarts van de nap –5m dieptelijn en in hoeveelheden die in overeenstemming zijn met de natuurlijke aanwas.

Workshop Gebiedsagenda Noordzee

Thema Toerisme

Binnen het thema toerisme valt kusttoerisme, watertoerisme (recreatieve vaart) en cruisetoerisme.

Huidige omvang en ontwikkelingen

In 2012 had Nederland een nieuw record van buitenlandse bezoekers. 12 miljoen toeristen kwamen naar Nederland die ongeveer €5 miljard uitgaven. (1) Voor toeristen in Nederland is de kust een belangrijke trekpleister, circa 26% van de buitenlandse toeristen verblijven in de Nederlandse kustgebieden tijdens hun verblijf. Wat betreft binnenlands toerisme verblijft 21% in de Nederlandse kustgebieden. Kusttoerisme is in totaal goed voor een toegevoegde waarde van €0.9 miljard en 41.000 FTE. (2) Nederland kent ongeveer 1100 jachthavens, hiervan zijn er echter 17 aan te merken als jachthavens langs de Nederlandse kustlijn. Op 5 locaties zijn plannen om een nieuwe jachthaven te ontwikkelen. (3) Nederland wordt ook steeds populairder als cruisebestemming. In 2012 deden 225 cruiseschepen de Nederlandse cruisehavens (Rotterdam, Amsterdam, IJmuiden), tegenover nog 168 in 2011. Volgens de beleidsnota Noordzee valt te verwachten dat de Nederlandse kust steeds intensiever gebruikt zal worden door diverse vormen van vrije tijd en toerisme.

Innovaties en duurzaamheid

Het ontwikkelen van walstroom voor cruiseschepen zorgt ervoor dat deze schepen niet meer hun motoren moeten laten draaien als ze aan wal liggen. De walstroom zorgt dan voor de benodigde elektriciteit. Echter, 80% van de scheepsemissies in havens wordt veroorzaakt door het manoeuvreren van en naar de aanlegplaatsen, waar walstroom niet bij helpt.

Milieuaspecten op de lange termijn

In de Nederlandse natuurgebieden wordt graag gerecreëerd, zo ook in de kustgebieden. Maar aanwezigheid van toerisme kan een negatieve impact hebben op de natuurlijke habitat. Over het algemeen is de natuurlijke verstoring door watersportactiviteiten marginaal te noemen. (4) Cruiseschepen zijn ongeveer verantwoordelijk voor 93 tot 615 kg CO_2 per passagier per dag. Daarnaast zijn cruiseschepen verantwoordelijk voor een aanzienlijke hoeveelheid rioolvuil en afval. Een toename van het aantal calls van cruiseschepen in Nederland heeft mogelijk dus negatieve milieueffecten. Echter, het lozen van rioolwater in zee is door de IMO verboden, tenzij er gecertificeerde lotingssystemen worden gebruikt. Wat betreft het lozen van afval valt de Noordzee onder een 'special zone' van de IMO; wat betekent dat er naast plastic ook andersoortig afval niet in zee mag worden geloosd. (5)

Beleid- en regelgeving

Het Nederlandse toerismebeleid heeft drie hoofdpunten: een toenemend aantal toeristen naar Nederland zien te trekken, ondernemerschap en duurzaamheid. (6) In beginsel heeft recreatie overal toegang binnen de kaders van afstemming met het mariene system en met de activiteiten van nationaal belang (scheepvaart, olie- en gaswinning, defensie, 5 zandwinning en windenergie), mits de activiteiten van nationaal belang niet belemmerd worden. Het streven van de overheid is om recreatie en natuur meer ruimte te geven aan de kust de komende jaren, dit kan zeewaarts gebeuren door middel van kustverbreding. Om ongewenste effecten van recreatie tegen te gaan, kan in het desbetreffende Natura 2000-beheerplan een zoneringsmaatregel worden getroffen. Het gebied is dan bijvoorbeeld in het broed, paai- of trekseizoen tijdelijk afgesloten voor recreanten.

Workshop Gebiedsagenda Noordzee

Thema Publieke functies

Onder dit thema vallen meerdere functies zoals defensie, kabels en leidingen en het mariene ecosysteem. Deze worden elk kort beschreven.

Defensie

Rond de 7% van de EEZ wordt gebruikt als militair (oefen)-gebied. Hierbij wordt er onderscheid gemaakt tussen schietgebieden, vlieggebieden, mijnoefengebieden en voormalig munitiedumpgebieden. De ruimtebehoefte van deze functies zal de komende jaren constant blijven. De huidige gebieden zijn tot 2014 vastgelegd in het Tweede Structuurschema Militaire Oefenterreinen. Medegebruik door andere functies is toegestaan mits dit de militaire oefeningen niet in de weg staat. Het is al langere tijd verboden om munitie in zee te dumpen, de munitie in de voormalige dumplocaties blijft op haar plek liggen, er is volgens Rijksoverheid geen directe noodzaak om deze munitie op te ruimen. Experts twijfelen echter aan de effecten op het milieu, als ook de veiligheid van deze gebieden.

Kabels en leidingen

Op het Nederlands Continentaal Plat ligt aan ongeveer 3600 km aan pijpleidingen (olie en gas) en 4000km kabels (telecom en elektra). Ruim de helft van de kabels zijn inmiddels niet meer in gebruik, deze moeten worden opgeruimd. Er wordt in de toekomst een stabilisatie verwacht van het aantal kabels en leidingen. Olie en gasvelden worden in de toekomst minder gebruikt, terwijl er meer gebruik zal zijn van windparken, die ook kabels vereisen.
Streven van de overheid is om de kabels en leidingen zo veel mogelijk te bundelen in bepaalde tracés om zo efficiënt mogelijk met het ruimtegebruik om te gaan. Daar waar kabels en leidingen liggen is namelijk geen zandwinning mogelijk en kunnen schepen niet ankeren. De opruimplicht voor kabels en leidingen is alleen verplicht als de maatschappelijke baten van het opruimen opwegen tegen de kosten.

Mariene ecosysteem/natuur

De Noordzee is een complex marien ecosysteem. Belangrijk voor de kwaliteit van de Noordzee is de open verbinding met de Atlantische Oceaan, instroom vanuit de stroomgebieden van de grote Europese rivieren en de invloed van de visserij. De kwaliteit van de Noordzee is de afgelopen jaren verbeterd, maar voor een aantal stoffen is de kwaliteit nog onvoldoende.
Het is onduidelijk wat een wereldwijde klimaatverandering en stijging van de zeespiegel voor invloed heeft of het mariene ecosysteem. Ook is er een zorg over het toenemende gebruik van menselijke activiteiten op zee en aan de kust.
Het waterkwaliteitsbeleid is internationaal vormgegeven in de Europese Kaderrichtlijn Water, de Nitraatrichtlijn en het OSPAR-verdrag. Doel is het voorkomen en terugdringen van negatieve effecten van verontreinigende stoffen en van een overmaat van nutriënten.
In het raamwerk van de Europese Vogel- en Habitatrichtlijn zijn de Voordelta, de Noordzeekustzone, de Westerschelde en de Vlakte van de Raan al aangewezen als Natura-2000 gebieden. De instandhouding en het herstellen van de natuurlijke habitat zijn in deze gebieden leidend. Het is de verwachting dat andere gebieden ook als Natura2000 gebieden worden aangeduid zodra de geldende wetgeving voor Natura2000 gebieden is aangepast van geldend tot 12-mijlszone naar volledige EEZ.

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