Statistics Netherlands

Economic description of the North Sea for the Netherlands, 2005, 2008, 2010, 2011*

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Summary: In this study an economic valuation of activities related to the Dutch Continental Shelf (DCS) is presented for the years 2005, 2008, 2010 and 2011. Activities at sea such as sea shipping, oil and gas production and wind energy production are included in this study. Also included are economic activities in seaports and in the coastal area of the North Sea. The reason for this study is the European Marine Strategy Framework Directive, which requires social and economic analysis for the use of the marine environment. The applied valuation method covers all activities of Dutch companies based on the 'resident principle' of the national accounts. Figures on production, intermediate consumption and value added are presented for the different relevant industries. In addition, also the number of employed persons (fte), number of employees (fte) and the compensation of employees are presented.

Activities at sea include the following industries: oil and gas extraction, fisheries, sea shipping, and sand extraction. Since 2006 harvesting of wind power also has become a relevant activity. Measured in production and value added, oil and gas extraction is by far the most important activity on the DCS.

To measure the economic impact on land in areas which are related to the North Sea, relevant industries are selected in specific seaports and the coastal area. For the coastal area Hotels and restaurants, Fisheries, Retail trade and Recreational, cultural and sporting activities have been selected. In seaports Manufacturing, Transport Storage and Communication, Wholesale and Construction have been selected as relevant industries. In these industries, proximity or accessibility to the North Sea is a critical location factor.

Employment related to the Dutch Continental Shelf was in 2005 equal to 161 thousand employees (fte). Employment was in 2011 equal to 166 thousand employees (fte). Value added generated by activities related to the Dutch Continental Shelf was in 2005 equal to 22.7 billion euro. Value added was in 2011 equal to 23.2 billion euro.

The North Sea economy was hit relatively hard during the economic crisis. Employment and value added decreased more than average in this period.

Key messages for the North Sea economy during the period 2005-2011:

- *The contribution of the North Sea economy to GDP (fixed price level) decreases over time during the years 2005-2011. In real terms the North Sea economy has become smaller over the years.*
- *North Sea economy has been hit relatively hard by the economic crisis, especially between 2008-2010.*
- *Manufacturing generated the largest part of value added on land in the North Sea economy, especially in the seaports.*
- *The share of employment related to manufacturing activities declined in the reference period, while the share of employment related to activities in the coastal area (retail trade, hotels and restaurants) increased.*

Index

1. Introduction 5

2. System boundaries and definitions 7

3. Activities at sea 8

3.1 Oil and gas extraction 8

3.2 Fisheries 9

3.3 Sea shipping 11

3.4 Sand extraction 12

3.5 Wind energy 13

4. Activities on land 14

4.1 Methodology 14

4.2 North Sea coastal area 16

4.3 Seaports 17

4.4 Overview: results for activities on land 26

5. Summary of the results 28

5.1 Development over time (2005-2011) 29

5.2 Structure of the North Sea economy 31

6. Evaluation of the methodology used and recommendations 34

7. Annex A Exposure hours for companies and contractors in Crude petroleum and natural gas production and support activities 36

8. Annex B Map of the coastal area 37

9. Annex C Map of the selected seaports 38

10. Annex D Production in the coastal area 39

11. Annex E Production in the Port of Rotterdam 40

12. Annex F Production in the Port of Amsterdam 41

13. Annex G Glossary 44

14. Annex H References and Internet sources 45

1. Introduction

In this new report (finalised March 2014) an economic valuation of activities related to the Dutch Continental Shelf (DCS) is presented for the years 2005, 2008, 2010 and 2011. The data for 2011 (second estimate) are still preliminary.

This study valuates the economic activities of Dutch companies on the Dutch Continental Shelf (DCS), which is part of the North Sea. Besides the activities taking place at sea, also activities taking place on land in areas related to the North Sea are included. These areas on land are Dutch seaports and the coastal area.

This study is motivated by the European Union's Marine Strategy Framework Directive. The economic valuation presented will facilitate the social and economic analysis of the use of the marine environment of the DCS.

Box 1- European Union's Marine Strategy Framework Directive

"The aim of the European Union's ambitious Marine Strategy Framework Directive (adopted in June 2008) is to protect more effectively the marine environment across Europe. It aims to achieve good environmental status of the EU's marine waters by 2020 and to protect the resource base upon which marine-related economic and social activities depend. The Marine Strategy Framework Directive constitutes the vital environmental component of the Union's future maritime policy, designed to achieve the full economic potential of oceans and seas in harmony with the marine environment.(European Commission, 2010)

Article 8 (DIRECTIVE 2008/56/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL, 17 June 2008):

In respect of each marine region or subregion, Member States shall make an initial assessment of their marine waters, taking account of existing data where available and comprising the following:

(a) an analysis of the essential features and characteristics, and current environmental status of those waters, based on the indicative lists of elements set out in Table 1 of Annex III, and covering the physical and chemical features, the habitat types, the biological features and the hydro-morphology;

(b) an analysis of the predominant pressures and impacts, including human activity, on the environmental status of those waters.

(c) an economic and social analysis of the use of those waters and of the cost of degradation of the marine environment.

Statistics Netherlands (CBS) has performed this study in commission of the Ministry of Infrastructure and Environment. The assignment to analyse the economic activities of the North Sea follows from a study executed on the economic description of river basins for the Netherlands (Brouwer *et al*., 2005; Statistics Netherlands, 2010a) This NAMWArib[1] methodology is internationally coordinated.. Part of the methodology used in the river basin is adopted in this paper for the valuation of seaports and the Coastal area. This study on the North Sea is the second consecutive study on the North Sea economy executed by Statistics Netherlands. The method is also presented and described as the Marine Water Accounts approach in the European guidance document on economic and social analyses for the Marine Strategy Framework Directive(European Commission, 2010). According to the evaluation performed in 2013 by the Working Group for Economic and Social Assessment, most member states have used or plan to use this Water Accounts approach to perform the economic analysis of their marine waters.

A coherent description of economic activities related to the North Sea has been made for four reference years, namely 2005, 2008, 2010 and 2011. The economic figures presented in this paper include the variables production, intermediate consumption and value added (both in current and in a fixed price level (2005)). Also, variables related to labour are presented: the number of employees, number of employed persons and compensation of employees[2].

[1] National Accounting Matrix including river basins.

[2] Compensation of employees include wages paid to employees and the contribution paid by an employer for social security and pension schemes (Annex H Glossary)

Before the valuation of economic activities in quantitative terms is presented, a short conceptual description of the main source used in this study, the Dutch National Accounts, is provided in chapter 2. This chapter also discusses the geographical boundaries used in this study (delineation). In chapter 3 the activities at sea are discussed. These activities include oil and gas extraction, shipping, fishing, the harvest of wind energy and the extraction of sand and gravel extraction). The fourth chapter deals with the activities on land related to the North Sea, particularly in seaports and along the North Sea coast. In the final chapter (5) the conclusions are presented. Recommendations for future research are also included in this chapter.

2. System boundaries and definitions

National accounts

The main data source used in this study is the Dutch National Accounts (Statistics Netherlands, 2012). The system of national accounts shows a quantitative overview of the economic process of a country and its economic relations with the rest of the world. The core in the national accounts is a number of important economic indicators such as gross domestic product (GDP) and national income. Benefits of using figures from the national accounts are that all variables are linked together in a consistent way. The quality is improved because the definitions that underlie the system make it possible to confront different statistics. Also international comparability is an advantage because concepts and definitions are based on international guidelines provided by the United Nations, the European Union and other international organisations. The international standards are documented in the United Nations System of National Accounts (UN, 1993) and the European System of Accounts (Eurostat, 1995)).

Geographical boundaries

The North Sea is located on the European continental Shelf and bordered by Great Britain in the west and by Belgium, the Netherlands, Germany, Denmark and Norway in the east.

The measurement of activities of Dutch companies on the North Sea in this study is limited to the Dutch part of the Continental Shelf (DCS). The DCS is the part of the North Sea, adjoining the Dutch coast, where the Netherlands claims exclusive rights to mineral resources. This Dutch part of the continental shelf in the North Sea is also regarded as part of the economic territory. Figure 3.1 shows a map of the DCS.

The Wadden Sea, located in the North of the Netherlands, is not included in the figures presented in this study. The Netherlands has included the Wadden Sea under the EU Water Framework Directive and not under the EU Marine Strategy Framework Directive that is relevant for this study.

The geographical boundaries for activities in the coastal zone are discussed in chapter 4. The geographical boundary of the seaport areas are mostly based on information provided by the relevant Port Authorities and these are also discussed in more detail in chapter 4. Activities related to the seaports located outside the defined areas are not included.

Residents

An important concept in the national accounts is the resident principle. An institutional unit is said to be resident within the economic territory of a country if it maintains a centre of predominant economic interest in that territory. GDP is an aggregate measure of production by all resident units. However, some of this production may occur abroad and as a result production in the national accounts differs from the sum of all production that takes place within the geographic boundaries of the national economy. All figures in this report represent only activities of resident companies and employees. For example fishing vessels, registered outside the Netherlands, active on the DCS are not included in the estimates of the Dutch production of fisheries in this study, nor are Dutch fisheries active outside the DCS.

3. Activities at sea

In this section economic activities taking place on the DCS by resident companies are described. This includes the extraction of oil and gas, fisheries, shipping, the extraction of sand and since recently the production of energy from wind.

3.1 Oil and gas extraction

The Netherlands have significant subsoil quantities of natural gas as well as some smaller oil deposits. Since the discovery of these stocks in the nineteen fifties and sixties they have been exploited to meet demand of users in the Dutch economy and to facilitate exports to foreign countries. Extraction of natural gas and oil contributes significantly to GDP and to economic growth. Over the last twenty years, the benefits arising from oil and gas extraction, contributed on average 3 per cent to total revenue of the Dutch Government.

On the DCS some oil but mainly natural gas is extracted. The value of production, intermediate consumption and value added of these activities is published annually in the Dutch Regional Accounts (CBS, 2013a). In the regional accounts, an 'extra-territorial region' is defined, which comprises the territorial waters, the Dutch part of the continental shelf in the North Sea and the so-called territorial enclaves situated abroad (Dutch embassies, consulates, military bases, etc.)[3]. For oil and gas extraction, only the DCS is relevant. Table 3.1 shows economic key figures for oil and gas extraction on the DSC. With the exception of the number of employees and employed persons, the figures are based on the regional module of the national accounts.

The number of employees in table 3.1 are based on data on offshore exposure hours (Annex A) provided by the State Supervision of Mines (SSM) in response to figures published in the first version of this study in 2010[4]. In calculating the number of employees (fte) the assumption was made that one full time employee works 1,600 hours per year on average. Offshore exposure hours of companies and contractors include companies in the industries "Crude petroleum and natural gas production" and "Supporting Crude petroleum and natural gas production" as well as other industries supplying goods and services to the oil and gas industries (caterers, suppliers of installations, etc).

In order to make a distinction between the core industry and suppliers the number of employees (fte) in mining and quarrying from national accounts has been used as a starting point. The figures on onshore and offshore exposure hours (SSM) allow a geographical distribution between the DCS and activities on land.

Compensation of employees has been adjusted to the calculated level of employees by multiplying the average compensation per employee of the relevant industry from the national accounts with the calculated employment level.

[3] The Dutch national accounts refer to the economic territory of the Kingdom of the Netherlands in Europe. The Dutch section of the continental shelf in the North Sea is also regarded as a part of that economic territory. The economies of the countries of the Kingdom of the Netherlands outside Europe (Curaçao, Sint Maarten and Aruba) are not described in the Dutch national accounts. The islands (public bodies) Bonaire, Sint Eustatius and Saba are indeed part of the Netherlands but are also not included in the national accounts.

[4] Because this study makes use of data of SSM in order to calculate data on employment , data on employment in this study is not fully consistent with data in the regional accounts.

Table 3.1: Economic key figures of the oil and gas extraction on the Dutch Continental Shelf

		2005	2008	2010	2011
Oil and Gas extraction	Number of employees	2.5	2.8	2.3	2.7
	Compensation of employees	233	300	255	296
	Number of employed persons	2.5	2.9	2.3	2.7
	Production	5,673	8,477	5,389	6,004
	Intermediate consumption	1,477	1,642	1,290	1,256
	Value added	4,196	6,834	4,099	4,748
	Value added (pricelevel 2005)	4,196	4,142	3,631	3,360
Employment figures x1000 fte, Monetary Values x €1000 000					

Prices of energy carriers (oil and gas) were very high in 2008. These prices decreased after 2008 due to the crisis. Price developments have a large impact on value added numbers in current prices of oil and gas extraction. The year 2010 was a relative cold year, which has led to more extraction of natural gas. To the contrary, 2011 was a relative warm year. Employment (employed persons, fte) is quite stable over time in the period 2005-2011.

3.2 Fisheries

Unlike the extraction of oil and gas, the Dutch Regional Accounts do not provide figures for other relevant activities on the DCS. In the regional accounts economic activities are generally allocated to the registered address of the companies on land (oil and gas extraction is an exception). For fisheries, economic activities are allocated to the ports where the fishing vessels are registered.

Macro-economic figures for the fishing industry (NACE)[5] are obtained from the Dutch National Accounts . The fishing industry in the Netherlands consists of Cutter fisheries, Large-scale High sea fisheries, mussel farming and aquaculture. The last two activities do not take place on the DSC. For mussel farming, there is a relationship with the North Sea since the sea provides salt water. Mussels are generally harvested from either the Wadden Sea or the Oosterschelde, thus outside the geographical boundaries of this study.

The Agricultural Economics Research Institute (LEI, Compendium voor de leefomgeving, 2006) has published figures for the Dutch fishing industry indicating yields on the DCS for 2001, 2002 and 2003. These figures are extrapolated for the years in this study. These percentages are used to allocate the macro-economic figures of the Dutch fishing industry to the DCS. This results in the economic figures in table 3.2a representing the relevance of the DSC for Dutch fisheries (excluding indirect effects, only NACE class Fisheries (NACE 3) is taken into account; NACE class fish processing is not taken into account (NACE 10.2).

[5] An industry refers to a group of companies or organisations that produce similar goods or services. NACE is the acronym used to designate the various statistical classifications of economic activities developed in the European Union (Eurostat, website). NACE provides the framework for collecting and presenting a large range of statistical data according to economic activity in the fields of economic statistics. Statistics produced on the basis of NACE are comparable at European and, in general, at world level. The use of NACE is mandatory within the European Statistical System. One NACE code is assigned to each unit recorded in statistical business registers, according to its principal economic activity. The principal activity is the activity which contributes most to the value added of the unit.

A unit may perform one or more economic activities described in one or more categories of NACE. The principal activity of a statistical unit is the activity which contributes most to the total value added of that unit.

Table 3.2a: Economic key figures of the (Dutch) fisheries on the Dutch Continental Shelf

		2005	2008	2010	2011
Fisheries	Number of employees	0.22	0.20	0.18	0.18
	Compensation of employees	13.4	12.4	12.2	12.7
	Number of employed persons	0.61	0.56	0.54	0.52
	Production	100	106	93	90
	Intermediate consumption	59	73	67	67
	Value added	41	33	26	23
	Value added (pricelevel 2005)	41	43	39	32
Employment figures x1000 fte, Monetary Values x €1000 000					

Table 3.2b: Economic key figures of the Dutch fisheries

	2005	2008	2010	2011
Number of employees and self employed persons (x 1,000 fte)	2.9	2.7	2.6	2.6
Value added (x €1,000,000)	195	157	127	114
Employment figures x1000fte, Monetary values x100000				

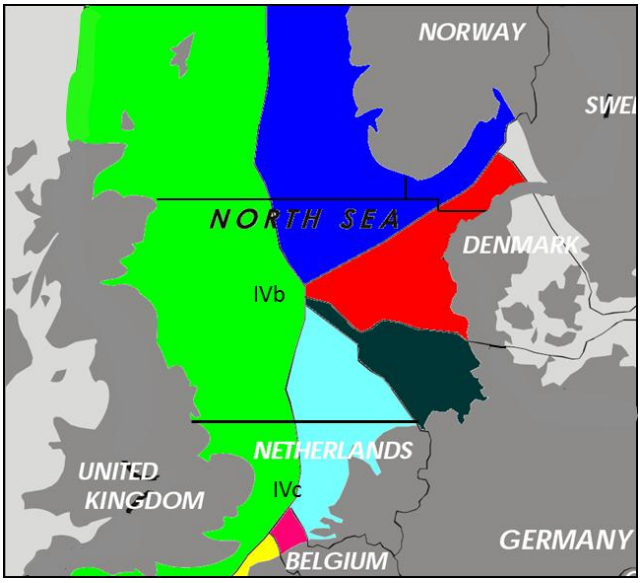
In the industry fisheries there are relatively a lot of self-employed persons. The total number of employed persons decreased since 2005 (-15 per cent). Compensation of employees also decreased (-5 percent). Value added in current prices has decreased due to higher energy prices (especially in 2008) and due to less economic activity among other things. Profitability is quite under pressure in this industry.

Fisheries by non- residents on the DCS

Alongside the activities of Dutch companies, also international companies use the DCS for e.g. fishing. The value of these activities is not included in the previous estimates because foreign activities do not contribute to Dutch GDP. In this section *indicative* figures for the share of Dutch and foreign share in the total industry of fishing on the DSC are presented.

For monitoring the catch of fisheries and the stock of fish, the North Sea is divided in ICES[6] areas. Eurostat publishes the tonnes of fish caught per country. The DCS is included in two ICES areas. These areas, IVb and IVc, are shown in figure 3.1.

Figure 3.1: ICES areas that overlap with the Dutch Continental Shelf [7]



[6] International Council for the Exploration of the Sea.

[7] Source http://nl.wikipedia.org/wiki/Nederlandse_Exclusieve_Economische_Zone adapted by CBS for ICES areas.

In the relevant ICES areas, the share of the Dutch fisheries is shown table 3.2c. In area IVc, of which the DCS overlaps about half its surface, the share of Dutch fisheries in the tonnes caught is much larger than in area IVb. Area IVb is mainly fished by Danish fishing vessels.

Table 3.2c: Tonnes of fish (x 1,000) caught by Dutch Vessels and total tonnes caught in relevant ICES areas (source: Eurostat)

		2005	2008	2010	2011
NL	ICES 4B	42	27	28	40
	ICES 4C	65	49	53	52
Total	ICES 4B	602	591	686	753
	ICES 4C	128	90	127	107
NL/Total	ICES 4B	7%	5%	4%	5%
	ICES 4C	51%	54%	41%	48%
	Total	15%	11%	10%	11%

The value of production depends on the species caught and the price per tonne, but the tonnes caught are indicative for the share of the Dutch fisheries (residents) on the DCS.

3.3 Sea shipping

The North Sea is important for marine traffic and its shipping lanes are among the busiest in the world. International shipping companies navigate the Dutch Continental Shelf intensively. The National Accounts provide macro-economic figures for the Dutch sea shipping industry. Though inland vessels may sometimes use the DCS, sea shipping is the most relevant industry. Macro-economic data for the industry sea shipping represent all international and national activities of Dutch sea shipping companies (residents). Sea shipping includes the transport of both cargo and passengers. The residence principle refers to the centre of economic interest of the operators of vessels[8]. The vessels of the Dutch operators may carry a flag of another territory. The ownership of the vessels operated by Dutch residents can therefore be with a foreign company.

Table 3.3: Economic key figures of the (Dutch) sea shipping industry on the Dutch Continental Shelf

		2005	2008	2010	2011
Sea shipping	Number of employees	5.9	5.9	6.9	6.8
	Compensation of employees	326	387	458	418
	Number of employed persons	8.0	7.7	8.7	8.6
	Production	4,913	4,876	3,885	3,885
	Intermediate consumption	3,576	3,665	3,158	3,269
	Value added	1,337	1,211	727	616
	Value added (pricelevel 2005)	1,337	1,691	1,385	1,310
Employment figures x1000 fte, Monetary Values x €1000 000					

The total national figure is used for the valuation of the DCS, since only shipping on the DCS exclusively is considered irrelevant, because the international accessibility matters and not so much the DCS itself.

[8] In the particular case of ships flying flags of convenience, it is often difficult to determine the residence of the operating unit, because of complex arrangements involving the ownership, mode of operation and chartering of such ships, and the fact that the country of registry in most instances is different than the country of residence of the operator (or owner). Nonetheless, in principle, the shipping activity is to be attributed to the country of residence of the operating unit. If that unit establishes a branch (direct investment) in another country to manage the operation, for tax or other considerations, the operation is to be attributed to the resident (branch) of that country. (SNA 1993, UN)

The industry of sea shipping is also included in the analysis of seaports in chapter 4. This results partly is an overlap in figures. In chapter 5 all relevant activities are summed. The overlap between sea shipping at sea and sea shipping in seaports is corrected by excluding sea shipping from the seaports in order to compile a total picture.

Value added in current prices of sea shipping decreased quite substantially in the period 2008-2010. Prices for sea shipping services were much under pressure since 2009. The same holds for the volume of the activity (less volume to transport). Due to the global economic crisis less goods were shipped from one country to the other (less international trade).

Sea shipping of non- residents on the DCS

Ships operated by foreign sea shipping companies use the DCS for transport to and from Dutch seaports as well as other destinations outside the Netherlands. It is not feasible to valuate these transport movements for this study. Data sources are scarce since considering the DCS exclusively is irrelevant for most purposes. The value of these activities is not included in the previous estimates because foreign activities do not contribute to Dutch GDP.

3.4 Sand extraction

Sand is collected from the sea bottom of the North Sea. This sand is used for land reclamation and the protection of the coast as well as for fill sand for (infrastructural) projects. Also maintaining shipping channels on the DCS is a purpose of this activity. Sand and gravel extraction on the DCS are included in the industry 'construction', more specifically 'hydraulic engineering'. Besides sand and gravel extraction this industry includes for example construction of bridges and dams. Data on hydraulic engineering are difficult to find, in the Dutch National Accounts this industry is included in the much broader industry 'civil engineering'.

In order to specify sand and gravel extraction on the DCS requires multiple steps. Firstly, hydraulic engineering needs to be specified. The next step requires the allocation of a part of hydraulic engineering to sand and gravel extraction. Finally, figures for sand and gravel extraction activities need to be allocated geographically to the DCS. Dutch sand and gravel extraction companies are very active in different geographical areas, both nationally and internationally.

Financial statistics on both hydraulic engineering and civil engineering are available for 2005, 2008, 2010 and 2011 (Statline, Statistics Netherlands). The share of hydraulic engineering in the net revenue of civil engineering industry is used to allocate figures for civil engineering in the National Accounts to hydraulic engineering (see table 3.4; data for value added and production). For all figures presented the share of hydraulic engineering is assumed to be equal to the share in production.

Table 3.4: Economic key figures of Hydraulic engineering by Dutch companies

		2005	2008	2010	2011
Hydraulic engineering (NL)	Number of employees	5	6	6	6
	Compensation of employees	259	310	354	366
	Number of employed persons	6	6	7	7
	Production	1,047	1,322	1,429	1,523
	Intermediate consumption	726	926	980	1,035
	Value added	321	390	449	488
	Value added (pricelevel 2005)	321	344	379	403
Employment figures x1000 fte, Monetary Values x €1000 000					

The second step requires isolating dredging activities from the industry hydraulic engineering. No suitable indicators for this specification have been found so far. In addition, no suitable indicators for the geographical specification have been found. Sand extraction from the DCS is thereby only included Pro Memoria (P.M.) in this study. The lack of detailed information of dredging activities and the difficulty of isolating dredging activities from other hydraulic engineering activities and the geographical location of these activities motivate this decision.

In an earlier study (Voet, L. (Royal Haskoning), B. Budding (Rebel Group), 2008) of economic activities on the DCS, the extraction of sand was estimated based on financial statistics (Statistics Netherlands) of the industry 'sand and gravel extraction'. Figures on the quantities of sand produced/extracted on the North Sea and prices estimated by experts are used for the geographically allocation of the national figures. The main argument for abandoning this approach is that the sand and gravel extraction companies active on the DCS are not included in the industry 'sand and gravel extraction', but rather in 'hydraulic engineering'.

3.5 Wind energy

Due to the strong prevailing winds, countries surrounding the North Sea, particularly Germany, UK and Denmark, have used these windy areas near the coast for the generation of wind energy since the 1990s. In the Netherlands, wind energy is harvested on the DCS since 2006. Statistics Netherlands has calculated production, intermediate consumption and value added of these activities. This calculation is based on the amount of energy produced by wind turbines on the DCS. In 2011 802 kWh of electricity was produced by offshore wind farms (Statistics Netherlands, Statline, September 2013). This equals 16 per cent of the total national production of wind energy. Based on a study of Statistics Netherlands (CBS, 2013b) on the sustainable energy sector figures have been compiled for the offshore wind energy production (exploitation phase).

Table 3.5: Economic key figures of the production of wind power on the Dutch Continental Shelf

		2005	2008	2010	2011
Wind energy	Number of employees	-	0.1	0.1	0.2
	Compensation of employees	-	5.5	6.3	7.5
	Number of employed persons	-	0.1	0.1	0.2
	Production	-	54	55	66
	Intermediate consumption	-	23	26	31
	Value added	-	31	29	35
	Value added (pricelevel 2005)	-	31	35	39
Employment figures x1000 fte, Monetary Values x €1000 000					

Wind energy production (exploitation phase) is labour extensive. Both the small size of this activity and the capital intensive nature of the activity explain why this activity does not contribute much to employment once offshore wind farms are operational. Subsidies are not included in the figures presented in table 3.5.

4. Activities on land

Both seaports and coastal areas in the Netherlands have a strong economic link to the North Sea. Economic activities in these areas depend on access or proximity to the sea. In this chapter, the economic key figures of sea ports and in coastal areas are presented. Firstly, the methods used for calculating the economic figures are discussed. Next, the results for the North Sea coastal area are presented and the explicit choices made are described. The third section discusses the economic activities in eleven different Dutch seaports e.g. Rotterdam, Amsterdam, IJmuiden. This chapter ends with a summary of the results for the activities on land.

4.1 Methodology

The method used for estimating economic key figures for the areas of interest is based on the NAMWARib[9] method that is used by Statistics Netherlands to calculate the economic figures for different subriver basins (Brouwer et al., 2005; CBS, 2010). NAMWARiB provides information about the interactions between the physical water system and the economy at a national and subriver basin scale.

For the purpose of geographical research, the Netherlands is divided into 40 COROP regions. The Dutch regional accounts of Statistics Netherlands annually present economic key figures (Production, Value Added, etc.) per COROP region. This study has the purpose to allocate these COROP figures to the relevant seaports and to the coastal area.

In constructing statistics for the areas of interest a register of companies is used. The company register provides information on individual companies: e.g. location (address), the number of employed persons and the type of industry (NACE class). Geographical data on the surface area are used for allocating the COROP figures to the areas of interest.

Two distinct methods (hereafter scenarios) for measuring the activities in the area of interest are presented in this study. The first scenario (A) limits the surface of the coastal area and ports (i.e. the areas of interest) to the predefined geographical boundaries. The location of these boundaries is described in the sections 4.2 and 4.3. The second scenario (B) shows the results of extending the areas of interest to complete zip code zones.

Below the first scenario (*scenario A*) is described in four steps. The second scenario (*scenario B*) is similar but skips the second step. The second scenario allocates all zip codes containing both a coastal area[10] and a seaport entirely to the seaport.

1 **Define the area of interest.**
Since there was no clear definition of a coastal area, a coastal area had to be defined. For the seaports, the maps published by port authorities on the internet were used as a guideline. The definition of the areas is presented in sections 4.2 and 4.3.

2 **Calculate the share of the surface area of interest in the zipcode zones.**
The register of companies allows locating the companies in a 4-digit zip code. A full zip codes (6-digits) map is not available. To correct for zip codes being larger than the area of interest the surface areas (percentages) are used.

3 **Allocate the key economic figures per COROP region to the areas of interest.**
All key figures were allocated using the data on the persons employed per company from the register.

4 **Selection of relevant industries.**

[9] For more information: http://www.helpdeskwater.nl/onderwerpen/wetgeving-beleid/nationaal/economische-aspecten/namwa/

[10] The coastal area and the seaports can overlap. To avoid double counting this geographical overlap is solved by allocating areas that indeed overlap to the seaports.

The results in the next sections will underline the necessity of this action.

Scenario A assumes a proportional geographical distribution of economic activities within a zip code zone. In step 2 surface area is used to allocate the figures of a zip code to a particular portion of the zip code.

The second step assumes that labour productivity of the zip code areas in the areas of interest is equal to that of the COROP region containing the area of interest. Per zip code and per industry, all economic figures per employed person are equal[11]. Since the company register gives no specific information on the contracted hours of work for persons employed an equal part-time ratio is implicitly assumed as well for all zip codes in a particular COROP area.

The disadvantage of the methodology used is that the location where the employees are registered is not always equal to the place where production actually takes place (i.e. the production site). Many of the large companies have a production site in a seaport and an office located in the city centre or in a Business Park. Employees are sometimes registered in the city location only. Since production is allocated based upon the registered employees this results in an underestimation of production at the production site[12].

In addition, the valuation does not include forward and backward linkages with other industries or geographical areas. For example the oil industry in Rotterdam uses engineering services (intermediate consumption) produced by another industry. Indirectly, employment is generated by this outsourcing. These kind of spill over effects are not included in the figures presented in this study.

The advantage of this method is continuity over time and consistency between different geographical areas. Under conditions, such as limited rearrangements in zip codes, developments in the areas of interest can be monitored over time. In addition, the same data sources were used for all geographical areas. Different geographical areas can be compared and summed. The Dutch regional accounts, which are used to construct the results, are based upon internationally coordinated definitions and concepts (Eurostat (1995); UN (1993).

Allocating economic figures to the coastal area (Example)

In region (COROP) Y there are four zipcodes of which only two are located in the coastal area. For zipcode A 90 per cent of the surface area of this zipcode is located in the coastal area. For zipcode B 10 per cent of the surface area is located in the coastal area. The company register provides that in zipcode A 200 persons are employed in industry X. In zipcode B 500 persons are employed in industry X. Allocated to this part of the total coastal area (90 per cent *200+10 per cent*500= 230) are 230 employed persons.

The company register also provides that in the total region Y 1500 persons are employed in industry X. This means that 15.3 per cent (230/1500) of the economic key figures of this region (production, added value, employees, compensation of employees) are allocated to the coastal area in scenario A. The total figures per industry for each region are provided by the regional accounts (Statistics, Netherlands).

For scenario B this figure is larger since complete zipcodes are included, (200+500), resulting in 700 employees. This means that 46.6 per cent (700/1500) of the economic key figures of region Y (production, added value, employees, compensation of employees) are allocated to the coastal area in scenario B.

The provisional economic key figures per COROP area are available about twenty months after the end of the reference year. Final economic data per COROP area are available 3 years after the reference year.

[11] Production per unit employment per industry is assumed equal for every zipcode in a particular COROP area

[12] This problem has been solved partially for the Rotterdam port by applying total COROP figures only for certain relevant industries. See paragraph 3.3.1 for more information.

For industries containing less than three companies in the areas of interest or that have only one company employing more than 75 per cent of all employees in that industry, no figures are presented (because of confidentiality). To prevent publishing data for individual companies, these industries will be aggregated with similar NACE industries.

4.2 North Sea coastal area

The coastal area has been defined as a ***one kilometre wide strip*** of land after the Dutch North Sea coastline and includes the entire Dutch Frisian Islands (Wadden eilanden). The coastal strip was put not directly behind the shoreline but behind the beach and sand dunes, since the latter area includes little or no economic activity. The beach and sand dunes were located using a land use map; all dry natural terrain bordering the North Sea has been defined as beach and sand dunes. Annex B shows a map of the Netherlands illustrating the location of the beach and sand dunes as well as the coastal strip including the Dutch Frisian Islands. Applying another definition of the coastal zone will result in different economic figures for the coastal zone. In this study we apply a more narrow definition of the coastal zone than some other studies do[13]. This more narrow definition has been applied in this study because parts of the NUTS-3 regions along the coast are not always directly depended on the North Sea (for example the centre of The Hague). It is hard to define the coastal zone which is depended on the North Sea.

The estimate of the total production (all industries included) in the coastal area is heavily influenced by industries whose relationship to the North Sea is not obvious.

Narrowing down the industries of a coastal economy is a necessity for a fair estimate of the coastal economy. This selection is to some extent a subjective matter. The difficulty in selecting relevant industry is illustrated by the example below.

Textbox: Real estate in the coastal area (Example)

For real estate activities, the argument can be made that this industry is big in the coastal area because the coast is an attractive residential and business location. In this case, one could argue to include the real estate industry in the selection of the coastal economy. Analysis of the results for this industry clarifies that the Hague area is important in the figure for the coastal area. The proximity to the sea is not the only factor defining this area as an attractive location, so are employment opportunities and urban facilities such as shops, restaurant and theatres. Therefore, it is sensible to exclude the real estate industry from the coastal economy.

Industries, for which proximity to the coastline is an important, or even necessary location factor, include:

- Hotels and restaurants
- Retail trade
- Recreational, cultural and sporting activities
- Fisheries[14]

For the calculation of the economic figures for the activities in the coastal area scenario B as described in paragraph 4.1 is preferred, because the one kilometre strip used in scenario A is somewhat arbitrary. Choosing scenario B (including the full surface of all zip codes along the coast) may however lead to an overestimation. An advantage of scenario B is that the assumption that economic intensity is spread out proportionally within a zip code is no longer relevant.

[13] Eurostat (2011), Regional yearbook 2011, Ch.13. Coastal regions are referred to as NUTS-3 regions along European coasts

[14] Fisheries has already been taken into account as an activity at sea. In the totals of the North Sea economy we correct for double counting.

Table 4.1: Key indicators for selected industries in the coastal area.

Year	Industry	Number of employees	Compensation of employees	Number of employed persons	Production	Intermediate consumption	Value added	Value added (pricelevel 2005)
2005	Fishing	0	22	1	238	140	98	98
	Hotels and restaurants	10	279	13	1,140	561	579	579
	Recreational, cultural and sporting activities	3	99	4	348	196	153	153
	Retail Trade	12	322	14	810	323	488	488
Totaal 2005		24	722	32	2,537	1,219	1,318	1,318
2008	Fishing	0	21	1	262	181	81	105
	Hotels and restaurants	11	342	15	1,386	705	681	636
	Recreational, cultural and sporting activities	3	106	4	370	213	156	155
	Retail Trade	13	384	16	929	396	533	567
Totaal 2008		27	853	35	2,946	1,495	1,451	1,462
2010	Fishing	0	21	1	229	164	65	95
	Hotels and restaurants	11	342	14	1,299	650	648	559
	Recreational, cultural and sporting activities	2	101	4	343	196	147	130
	Retail Trade	12	378	15	885	378	507	546
Totaal 2010		26	842	34	2,755	1,388	1,367	1,330
2011	Fishing	0	22	1	227	169	58	81
	Hotels and restaurants	11	357	15	1,351	668	683	581
	Recreational, cultural and sporting activities	2	101	4	345	196	149	130
	Retail Trade	12	373	14	822	363	460	522
Totaal 2011		26	853	34	2,745	1,395	1,350	1,314

Employment figures x1000 fte, Monetary Values x €1000 000

Table 4.1 provides estimates for the available key indicators for the coastal area. 'Retail trade' and 'Hotels and restaurants' are the most important industries. It is important to note that these industries are seasonal and the results partly depend on the weather in a specific year.

Remarkably, the value added in current prices has increased while the value added in 2005 prices declined for hotels and restaurants. Restaurants apparently have increased some of their prices between 2008 and 2011

The industry 'Fisheries' is the smallest of the selected industries. Part of the production in this industry overlaps with the production of fisheries in the chapter on activities on the sea (DCS). This overlap concerns only the activities on the DCS of fishing companies located in the selected coastal area. The fish processing industry and fish auction is not taken into account here.

4.3 Seaports

Six seaports in the Netherlands are discussed separately in this section: Rotterdam, Amsterdam, IJmuiden (clustered with Velsen and Beverwijk), Drechtsteden, Vlissingen, Terneuzen. Figures for five other seaports (Moerdijk, Den Helder, Harlingen, Delfzijl and Eemshaven) are presented in section 4.3.7. A geographical overview of the seaports included is presented on the map in Annex C.

4.3.1 Port of Rotterdam

The port of Rotterdam is Europe's largest port for (trans) shipment of goods. It is located between the North Sea coast and the city centre of Rotterdam along the Nieuwe Waterweg. In defining the port, area maps published by the Port Authority[15] were used. Annex E shows the production level per industry in the port of Rotterdam.

Analysis of the data shows that, although production is located in the defined area of the port, the employees are in some cases registered at office locations in the centre of Rotterdam. Since production (and other variables) is allocated based upon zip codes of the companies where employment is registered, production is also virtually shifted to the centre of Rotterdam. This statistical problem exists for all ports and the coastal area, but is most prominent in the Port of Rotterdam. The activities of a few large companies are very substantial. Missing a couple of these companies, because the registered location differs from the production site, results in a substantial error. To correct for this statistical problem we have included the total economic figure for the whole COROP region of a few industries in the North Sea economy. The COROP region that includes the port of Rotterdam is called the 'Rijnmond' .Only for a few major industries this correction has been carried out.

[15] http://www.portofrotterdam.com/en/shipping/port-map/pages/default.aspx

The COROP figures of Rijnmond have been incorporated for a few industries:

- Manufacture of petroleum products; cokes, and nuclear fuel
- Manufacture of basic chemicals and man-made fibres
- Transport on water
- Supporting transport activities

To make a similar correction for Electricity, gas and water supply is not fully justified. Only the production part of this industry has a direct relation with the port. These plants depend on supply by ship and use water for cooling. However, the distribution part of this industry does not have a direct relationship with the sea. Therefore this industry is not included in the valuation of the seaport. The power plants located in the port are ignored, because production cannot be distinguished from distribution in the regional economic figures.

For the ports the following industries are selected as relevant:

- Manufacturing
- Wholesale Trade
- Construction, the construction of buildings excluded.
- Transport, storage and communication

The industry of Electricity supply is located in the seaports. Power plants are supplied by waterways or make use of residual heath of the manufacturers located in the ports' industrial areas. This may be considered a relevant industry, but as stated before the methodology used does not result in an adequate estimate for this activity.

Construction is included, because this includes installations for ships and for on- and offshore facilities. Since these businesses are located in the area of interest, construction companies are included even though the port location may be a less critical factor than for some manufacturing or transport companies.

Table 4.2 shows the key figures for the selected industries in the Rotterdam Port.

Table 4.2: Key indicators for selected industries in the Port of Rotterdam

Year	Industry	Number of employees	Compensation of employees	Number of employed persons	Production	Intermediate consumption	Value added	Value added (pricelevel 2005)
2005	Construction	3	142	4	431	236	195	195
	Manufacturing	15	1,042	16	34,781	29,244	5,538	5,538
	Transport, storage and communication	31	1,649	32	7,853	4,601	3,251	3,251
	Wholesale trade	5	229	5	1,018	524	494	494
Total 2005		54	3,062	57	44,083	34,605	9,478	9,478
2008	Construction	8	391	8	1,257	726	532	481
	Manufacturing	17	1,252	17	49,188	43,946	5,241	5,821
	Transport, storage and communication	29	1,650	30	7,675	4,343	3,332	3,408
	Wholesale trade	5	261	5	1,123	568	555	553
Total 2008		58	3,553	61	59,243	49,584	9,660	10,263
2010	Construction	3	170	4	492	277	214	180
	Manufacturing	16	1,281	17	48,682	44,302	4,380	6,049
	Transport, storage and communication	26	1,586	28	6,611	3,814	2,797	2,979
	Wholesale trade	6	331	6	1,482	629	853	814
Totaal 2010		52	3,367	54	57,267	49,023	8,244	10,022
2011	Construction	6	307	6	902	516	386	331
	Manufacturing	16	1,303	16	58,821	53,879	4,942	5,955
	Transport, storage and communication	27	1,634	28	6,820	3,973	2,847	3,015
	Wholesale trade	5	292	6	1,496	567	930	819
Totaal 2011		54	3,537	57	68,040	58,935	9,105	10,120

Employment figures x1000 fte, Monetary Values x €1000 000

Since the definition of the port and its industrial area is based on maps of the Port Authority, scenario A might be preferred in this case. In this scenario, the estimated figures are based on a stricter geographical definition. The most relevant industries have a large share (93 per cent on average) in the production of the port. (Annex E).

The results in table 4.2 show that the industries located in the port and industrial area are not very labour-intensive. Production in the Rotterdam Port for the selected industries was about 1190 thousand euros per employee in 2011. For the total economy, this figure is 175 thousand euros per employee. Most of the workers are employed and not self-employed.

The scope of the figures for the port of Rotterdam is limited by the geographical location of businesses. The analysis does not include any linkages or spin offs with the Dutch economy outside the assigned location. Only companies registered in the port and their industrial areas are included. In other words it is a static approach. Forward and backward linkages have been quantified in an earlier study of CBS on the North Sea (CBS, 2011). The Dutch Continental Shelf has on average (1995, 2000, 2007), taking into account all relevant activities, an employment multiplier of 1.6.

In the period 2005-2011 value added in fixed prices increased with 7 percent. In the period 2005-2008 value added in fixed prices increased with 8 percent. After 2008 value added in fixed prices decreased in the period 2008-2010 and slightly increased in the period 2011-2010.

In the period 2005-2011 value added in current prices decreased. In the period 2005-2008 value added in current prices still increased with 2 percent. Value added was equal to 9.1 billion euro in 2011.

Employment increased in between 2005-2008. The level of employment decreased in the period 2008-2010. To the contrary, in 2011 employment grew quite significantly. In 2011 the level of employment (57 thousand FTES) was more or less the same as in 2005 .

Manufacturing is the largest industry in the port of Rotterdam. Manufacture of coke, refined petroleum products and manufacturing of Chemicals and chemical products are very important industries in this port.

Other important activities in the port of Rotterdam are transport on water and the storage and handling of goods. Transport on water shows a decline since 2005, partly explained by the acquisition of Dutch shipping companies by foreign enterprises. The crisis had also a major impact on the volume of the activities of this industry. As a result of the crisis, the activities of the industry 'storage and handling of goods' declined. Both transport and supporting activities recovered slowly after 2010.

4.3.2 Amsterdam

The North Sea Canal connects the port of Amsterdam to the North Sea. It's the second largest port of the Netherlands for transhipment of goods. The map[16] published on the internet by the Port Authority was used to define the area. In Annex F production per industry is shown for all industries[17]. Unlike the Port of Rotterdam, concentration of production in only a few industries is smaller. Economic activities are more diverse in the Port of Amsterdam. Industries like banking and other (financial) services, which are usually not located in a port and dependent on supply/transport by water, cover a big share of the production. This indicates that the spatial separation of the relevant industrial industries is not strong in this region and selected zip codes.

The same industries as for the description of activities in the port of Rotterdam are selected: 'Manufacturing', 'Wholesale Trade', 'Construction', 'Transport, storage and communication'. The results for this selection of industries are shown in table 4.3 for scenario A. Scenario A is preferred, because the concerning zip codes are intensively used for less related economic activities (see chapter 4.1 for explanation of method A)

[16] http://www.portofamsterdam.nl/havenkaart

[17] The production of some industries in Annex F can depend on the location where the employees of a few large companies are registered. This explains the strong increase of Computer programming, consultancy and related activities; information service activities (part of Financial and business activities) in scenario B between 2008 and 2010. Financial and business activities are not selected as an industry with a strong relation to or dependency on a port location.

Selected industries produce 60 per cent of total production in the defined area in scenario A. For Rotterdam, this figure is 90 in scenario A. This means that the designed area for Rotterdam is more exclusively used by the selected industries.

Table 4.3: Key indicators for selected industries in the Port of Amsterdam

Year	Industry	Number of employees	Compensation of employees	Number of employed persons	Production	Intermediate consumption	Value added	Value added (pricelevel 2005)
2005	Construction	1	26	1	84	49	36	36
	Manufacturing	2	129	3	1,068	840	228	228
	Transport, storage and communication	4	212	4	1,133	558	575	575
	Wholesale trade	2	123	2	561	282	279	279
Total 2005		9	491	10	2,846	1,729	1,117	1,117
2008	Construction	1	30	1	118	72	46	41
	Manufacturing	2	122	2	1,542	1,226	316	234
	Transport, storage and communication	5	276	5	1,361	705	656	684
	Wholesale trade	2	136	3	618	321	297	298
Total 2008		10	564	11	3,640	2,324	1,316	1,258
2010	Construction	1	52	1	192	117	75	64
	Manufacturing	2	127	2	1,278	1,021	256	215
	Transport, storage and communication	5	270	5	1,191	682	508	546
	Wholesale trade	2	126	2	570	293	277	288
Totaal 2010		10	574	11	3,231	2,114	1,117	1,113
2011	Construction	1	49	1	185	112	73	61
	Manufacturing	2	134	2	1,497	1,211	285	234
	Transport, storage and communication	5	269	5	1,146	654	492	521
	Wholesale trade	2	116	2	542	273	268	270
Totaal 2011		10	568	10	3,369	2,250	1,119	1,086

Employment figures x1000 fte, Monetary Values x €1000 000

In the period 2005-2011 value added in fixed prices decreased with 3 percent. In the period 2005-2008 value added in fixed prices increased with 13 percent. After 2008 value added in fixed prices decreased sharply in the period 2008-2010 as well as in the period 2010-2011. Especially transport, storage and communication performed below average.

In the period 2005-2011 value added in current prices was more or less stable. In the period 2005-2008 value added in current prices increased with 18 percent. Value added was equal to 1.1 billion euro in 2011.

Employment increased in between 2005-2008. In 2011 the level of employment (10 thousand FTES) was more or less the same as in 2005 .

4.3.3 Port of IJmuiden

Close to the North Sea, along the canal that connects Amsterdam to the sea, there is a cluster of ports and industrial areas Including the cities of IJmuiden, Beverwijk and Velsen-Noord. The definition of this area is based on the location of ports for the transhipment of goods and the adjoining industrial areas. Production of steel is the biggest industry in this area (basic metal industry).

Table 4.4: Production in the IJmuiden cluster

	Production Port of IJmuiden (cluster) (x€1,000,000)							
	Scenario A				Scenario B			
Industy	2005	2008	2010	2011	2005	2008	2010	2011
Manufacturing	3,734	4,357	4,487	4,406	4,013	4,677	4,772	4,721
Wholesale trade	100	153	147	158	214	313	309	332
Transport, storage and communication	215	191	155	137	358	343	277	258
Construction	72	97	59	70	173	225	150	189
Financial and business activities	301	296	306	297	765	743	704	736
Other Industries	266	292	562	588	963	1,022	1,181	1,234
Total production	4,687	5,386	5,716	5,656	6,486	7,324	7,392	7,469

This cluster of ports and industrial areas shows a strong presence of manufacturing. In order to include the steel producer in this port completely, the figure for 'Manufacturing of basic metals' is equal to the total regional figure for the IJmond Corop. Since this correction was made in both scenarios, scenario A can be preferred. Scenario A limits the selected geographical area better.

When the same industries as in the Rotterdam and Amsterdam ports are selected this results in the figures presented in table 4.5.

Table 4.5: Key indicators for selected industries in the IJmuiden cluster.

Year	Industry	Number of employees	Compensation of employees	Number of employed persons	Production	Intermediate consumption	Value added	Value added (pricelevel 2005)
2005	Construction	1	20	1	72	38	34	34
	Manufacturing	10	646	10	3,734	2,173	1,561	1,561
	Transport, storage and communication	1	43	1	215	100	116	116
	Wholesale trade	1	31	1	100	39	61	61
Total 2005		12	740	13	4,120	2,349	1,771	1,771
2008	Construction	0	23	1	97	51	46	42
	Manufacturing	10	762	11	4,357	3,142	1,215	1,549
	Transport, storage and communication	1	45	1	191	96	95	95
	Wholesale trade	1	47	1	153	57	96	92
Total 2008		13	876	13	4,798	3,346	1,452	1,779
2010	Construction	0	16	0	59	31	27	23
	Manufacturing	10	629	10	4,487	3,645	842	1,716
	Transport, storage and communication	1	50	1	155	71	84	81
	Wholesale trade	1	48	1	147	58	88	86
Totaal 2010		12	743	13	4,847	3,805	1,042	1,906
2011	Construction	0	17	0	70	37	32	28
	Manufacturing	10	618	10	4,406	3,621	785	1,551
	Transport, storage and communication	1	43	1	137	64	73	70
	Wholesale trade	1	51	1	158	63	96	91
Totaal 2011		12	730	12	4,771	3,785	986	1,739

Employment figures x1000 fte, Monetary Values x €1000 000

In the period 2005-2011 value added in fixed prices decreased with 2 percent. In the period 2005-2008 value added in fixed prices was quite stable. After 2008 value added in fixed prices increased sharply in the period 2008-2010 but decreased in the period 2010-2011. Especially manufacturing suffered in 2011.

In the period 2005-2011 value added in current prices decreased sharply. Value added was equal to almost 1 billion euro in 2011. Value added was equal to 1.8 billion in 2005.

Employment was stable in between 2005-2008. In 2011 the level of employment (12 thousand FTES) was smaller as in 2005.

4.3.4 Port of Drechtsteden

This port consists of multiple unconnected areas in the municipalities of Dordrecht, Zwijndrecht, Papendrecht, Sliedrecht, Hendrik Ido Ambacht, Alblasserdam, s'-Gravendeel and Puttershoek. The geographical boundaries are based on "*Case study Inland ports of Drechtsteden*" (TNO, 2004) and Google Maps. Table 4.6 shows the results per industry for both scenario A and B.

Table 4.6: Production in the Port of Drechtsteden

	Production Port of Drechtsteden (x€1,000,000)							
	Scenario A				Scenario B			
Industy	2005	2008	2010	2011	2005	2008	2010	2011
Manufacturing	1,367	1,832	1,784	1,889	2,824	3,784	3,791	4,123
Wholesale trade	615	861	949	1,082	1,080	1,479	1,615	1,780
Transport, storage and communication	269	391	381	398	552	840	742	821
Construction	445	514	610	635	1,120	1,322	1,534	1,558
Financial and business activities	467	500	518	498	1,376	1,434	1,500	1,276
Other Industries	582	453	408	460	1,995	2,166	2,104	1,774
Total production	3,746	4,552	4,651	4,964	8,948	11,025	11,285	11,333

Since this port consists of a few small geographical areas within an urbanised region, scenario A is preferred. This scenario may result in a better estimate for postal codes which are included for a small part in the port. The results for the economic key figures for the relevant selected industries in scenario A are presented in table 4.7.

Table 4.7: Key indicators for selected industries in the port of Drechtsteden (Scenario A)

Year	Industry	Number of employees	Compensation of employees	Number of employed persons	Production	Intermediate consumption	Value added	Value added (pricelevel 2005)
2005	Construction	3	137	3	445	238	208	208
	Manufacturing	6	263	7	1,367	967	401	401
	Transport, storage and communication	2	79	2	269	124	145	145
	Wholesale trade	5	223	5	615	236	379	379
Total 2005		16	702	17	2,696	1,564	1,133	1,133
2008	Construction	3	142	3	514	288	226	202
	Manufacturing	6	294	6	1,832	1,344	488	480
	Transport, storage and communication	2	105	2	391	200	192	193
	Wholesale trade	6	280	6	861	328	533	519
Total 2008		17	820	18	3,598	2,159	1,439	1,393
2010	Construction	3	157	3	610	341	269	229
	Manufacturing	6	319	7	1,784	1,335	449	469
	Transport, storage and communication	2	100	2	381	189	193	197
	Wholesale trade	6	307	6	949	354	595	572
Totaal 2010		17	883	18	3,725	2,219	1,506	1,467
2011	Construction	3	156	3	635	355	280	237
	Manufacturing	6	317	6	1,889	1,433	456	462
	Transport, storage and communication	2	103	2	398	200	198	199
	Wholesale trade	6	349	7	1,082	402	680	635
Totaal 2011		17	925	19	4,005	2,391	1,615	1,533

Employment figures x1000 fte, Monetary Values x €1000 000

In the period 2005-2011 value added in fixed prices increased with 35 percent. In the period 2005-2008 value added in fixed prices increased with 23 percent. After 2008 growth in value added continued. Especially wholesale activities grew hard in the period 2005-2011.

In the period 2005-2011 value added in current prices increased too. Value added was equal to almost 1.6 billion euro in 2011. Value added was equal to 1.1 billion in 2005.

Employment grew in between 2005-2008. This growth in employment continued in 2010 and 2011. Employment in wholesale trade grew quite sharply in this period.

4.3.5 Port of Vlissingen

In defining the location of this port information of the 'Port Authority, Zeeland Seaports[18]' has been used. Zeeland Seaport is the port authority for both the port of Vlissingen and the port of Terneuzen. The Terneuzen port is discussed separately in section 4.3.6.

In the port of Vlissingen, production in 'manufacture of basic chemicals and man-made fibres' and 'manufacture of basic metals' are the most important industries. The total production figure in the selected area is shown in table 4.8.

Table 4.8: Production in the Port of Vlissingen

	Production Port of Vlissingen (x€1,000,000)							
	Scenario A				Scenario B			
Industy	2005	2008	2010	2011	2005	2008	2010	2011
Manufacturing	560	739	670	796	1,344	1,711	1,458	1,711
Wholesale trade	7	13	12	11	14	31	27	26
Transport, storage and communication	38	47	40	38	90	110	91	87
Construction	12	20	23	21	27	47	54	50
Financial and business activities	10	7	12	19	22	14	28	40
Other Industries	30	92	53	54	62	220	124	123
Total production	657	919	810	938	1,558	2,132	1,781	2,037

Like the other ports the industries selected to delimit the port economy are: 'Manufacturing', 'Wholesale Trade', 'Construction', 'Transport, storage and communication'. Option B is preferred. The assumption is made that postal codes that include the relevant geographical areas consist of little economic activity, in the relevant industries that is unrelated to the seaport.

[18] http://www.zeelandseaports.nl/en/the-port/accessibility/port-maps.htm

Table 4.9: Key indicators for selected industries in the port of Vlissingen

Year	Industry	Number of employees	Compensation of employees	Number of employed persons	Production	Intermediate consumption	Value added	Value added (pricelevel 2005)
2005	Construction	0	9	0	27	14	13	13
	Manufacturing	3	145	3	1,344	1,027	317	317
	Transport, storage and communication	1	29	1	90	38	52	52
	Wholesale trade	0	5	0	14	6	8	8
Total 2005		4	188	4	1,474	1,084	390	390
2008	Construction	0	12	0	47	27	20	18
	Manufacturing	2	134	2	1,711	1,335	376	351
	Transport, storage and communication	1	29	1	110	52	58	56
	Wholesale trade	0	10	0	31	12	18	18
Total 2008		3	186	3	1,899	1,426	472	444
2010	Construction	0	15	0	54	30	24	20
	Manufacturing	2	126	2	1,458	1,195	263	314
	Transport, storage and communication	1	28	1	91	40	51	48
	Wholesale trade	0	9	0	27	11	16	16
Totaal 2010		3	177	3	1,629	1,276	354	398
2011	Construction	0	13	0	50	29	21	18
	Manufacturing	2	131	2	1,711	1,385	327	317
	Transport, storage and communication	1	29	1	87	35	51	46
	Wholesale trade	0	9	0	26	11	15	15
Totaal 2011		3	182	3	1,875	1,460	415	396

Employment figures x1000 fte, Monetary Values x €1000 000

In the period 2005-2011 value added in fixed prices was more or less stable. In the period 2005-2008 value added in fixed prices increased with 14 percent. After 2008 growth in value added stopped and value added declined in the period 2008-2010 and 2010-2011.

In the period 2005-2011 value added in current prices increased. Value added was equal to almost 0.4 billion euro in 2011. Value added was equal to 0.4 billion in 2005 too.

Employment declined in between 2005-2008. In 2011 the level of employment (3 thousand FTES) was smaller as in 2005.

4.3.6 Port of Terneuzen

Terneuzen is located close to Vlissingen; both ports are managed by Zeeland Seaports. The port areas of Terneuzen are spread along the Ghent–Terneuzen Canal and the Western Scheldt. The presence of large chemical companies confirms the economic relevance of this seaport. Production in the reference years for this seaport is presented in table 4.10.

Table 4.10: Production in the Port of Terneuzen

	Production Port of Terneuzen (x €1,000,000)							
	Scenario A				Scenario B			
Industy	2005	2008	2010	2011	2005	2008	2010	2011
Manufacturing	1,424	2,166	1,633	1,933	6,692	9,724	7,732	8,801
Wholesale trade	41	46	37	37	104	114	99	95
Transport, storage and communication	88	115	199	188	249	281	475	449
Construction	35	47	50	76	108	158	174	217
Financial and business activities	158	178	204	214	431	433	432	450
Other Industries	269	263	265	272	568	657	634	613
Total production	2,016	2,815	2,387	2,720	8,151	11,368	9,546	10,625

Like the port of Vlissingen scenario B is preferred. For the relevant industries the results are presented in table 4.11.

Table 4.11: Key indicators for selected industries in the port of Terneuzen

Year	Industry	Number of employees	Compensation of employees	Number of employed persons	Production	Intermediate consumption	Value added	Value added (pricelevel 2005)
2005	Construction	1	33	1	108	62	46	46
	Manufacturing	6	401	7	6,692	5,314	1,378	1,378
	Transport, storage and communication	2	74	2	249	113	136	136
	Wholesale trade	1	33	1	104	46	58	58
Total 2005		10	541	10	7,153	5,535	1,618	1,618
2008	Construction	1	42	1	158	92	67	60
	Manufacturing	6	413	6	9,724	7,932	1,792	1,611
	Transport, storage and communication	2	82	2	281	130	151	146
	Wholesale trade	1	37	1	114	50	63	63
Total 2008		9	574	9	10,278	8,205	2,073	1,879
2010	Construction	1	60	1	174	103	71	60
	Manufacturing	6	375	6	7,732	6,436	1,296	1,362
	Transport, storage and communication	2	94	2	475	275	200	223
	Wholesale trade	1	30	1	99	50	49	50
Totaal 2010		9	559	10	8,480	6,864	1,616	1,695
2011	Construction	1	69	1	217	131	86	73
	Manufacturing	5	368	6	8,801	7,333	1,468	1,317
	Transport, storage and communication	2	93	2	449	256	194	206
	Wholesale trade	1	28	1	95	48	47	46
Totaal 2011		9	559	10	9,562	7,768	1,794	1,642

Employment figures x1000 fte, Monetary Values x €1000 000

In the period 2005-2011 value added in fixed prices was more or less stable. In the period 2005-2008 value added in fixed prices increased with 16 percent. After 2008 growth in value added stopped and value added declined in the period 2008-2010 and 2010-2011.

In the period 2005-2011 value added in current prices increased. Value added was equal to almost 1.8 billion euro in 2011. Value added was equal to 1.6 billion in 2005.

The level of employment declined in between 2005-2008. In 2011 the level of employment (10 thousand FTES) was more or less the same as in 2005.

4.3.7 Other seaports

The port of Moerdijk is located along the 'Hollands Diep' river. It's located close to the port of Drechtsteden, both are located quite far inland. The port is known for the presence of companies in the "manufacture of basic chemicals and man-made fibres" industry.

The 'other' seaports included in this section are located in the northern part of the Netherlands and include Den Helder, Harlingen, Eemshaven and Delfzijl. The Den Helder port is known for the presence of the Royal Navy of the Netherlands. The number of employees working in the Royal Navy in Den Helder cannot be published because of confidentiality. All employees working in the industry 'defence' are registered centrally in The Hague in the company register of Statistics Netherlands. Table 4.12 shows the geographical distribution of the production.

Tabel 4.12: Production in the port of Moerdijk and northern seaports, geographically divided.

	Production (x €1,000,000)							
	Scenario A				Scenario B			
Port	2005	2008	2010	2011	2005	2008	2010	2011
Moerdijk	960	1,162	2,328	2,574	3,735	4,514	4,857	5,414
Delfzijl	424	584	560	658	1,461	1,882	1,755	2,045
Harlingen	66	102	81	64	281	425	337	270
Den Helder	89	128	138	176	196	267	290	377
Eemshaven	14	25	11	13	67	94	58	63
Total Production	1,553	2,000	3,118	3,484	5,739	7,182	7,297	8,168

The production in the ports of Moerdijk and Delfzijl are considerably larger than in the other ports in this selection. The port of Eemshaven has the smallest production figure of the seaports presented in the reference years.

For all five seaports discussed in this section scenario B is preferred over A. For small ports areas the share of the surface area of the port in the postal codes concerned is generally small.

In scenario A this results in the allocation of a small share of the companies located in the postal code to the seaport. For scenario B the economic key figures of relevant industries are presented in table 4.13.

Table 4.13: Key indicators for selected industries in the port of Moerdijk, Den Helder, Harlingen, Eemshaven and Delfzijl

Year	Industry	Number of employees	Compensation of employees	Number of employed persons	Production	Intermediate consumption	Value added	Value added (pricelevel 2005)
2005	Construction	1	34	1	117	66	51	51
	Manufacturing	7	403	7	4,442	3,415	1,027	1,027
	Transport, storage and communication	4	157	4	822	436	386	386
	Wholesale trade	3	115	3	358	136	222	222
Total 2005		14	709	16	5,739	4,053	1,685	1,685
2008	Construction	1	38	1	149	85	63	57
	Manufacturing	7	464	7	5,071	3,936	1,135	1,115
	Transport, storage and communication	5	248	6	1,352	802	550	585
	Wholesale trade	3	169	4	611	253	357	352
Total 2008		17	919	18	7,182	5,076	2,106	2,109
2010	Construction	1	45	1	155	92	63	53
	Manufacturing	6	367	6	5,201	4,320	881	976
	Transport, storage and communication	6	293	6	1,270	714	556	608
	Wholesale trade	4	191	4	672	307	365	372
Totaal 2010		16	896	17	7,297	5,432	1,865	2,009
2011	Construction	1	46	1	170	101	70	59
	Manufacturing	6	380	6	5,881	4,941	940	958
	Transport, storage and communication	6	297	6	1,332	757	574	629
	Wholesale trade	4	218	5	784	349	435	429
Totaal 2011		16	941	18	8,168	6,149	2,019	2,075

Employment figures x1000 fte, Monetary Values x €1000 000

In the period 2005-2011 value added in fixed prices increased (23 percent). In the period 2005-2008 value added in fixed prices increased with 25 percent. After 2008 growth in value added stopped and declined in the period 2008-2010 and 2010-2011.

In the period 2005-2011 value added in current prices increased. Value added was equal to almost 2 billion euro in 2011. Value added was equal to 1.7 billion in 2005.

The level of employment increased in between 2005-2008. In 2011 the level of employment (18 thousand FTES) was larger than in 2005.

4.3.8 Comparison of ports

Figure 4.1 shows the development of value added in *fixed prices* over the years for all ports. Most notable is the development in Drechtsteden, where despite the crisis growth in value added (fixed prices) remained positive in all periods under consideration. Especially wholesale activities grew hard in the period 2005-2011. Also the Other ports performed above average.

The ports of Amsterdam and IJmuiden are not yet recovered from the crisis; their value added in a fixed price level is still below the 2005 level. Especially manufacturing suffered in IJmuiden in 2011 compared to 2010. Transport, storage and communication activities shrank in the period 2008-2010 in the Port of Amsterdam. The volatility seems to be larger in small ports as in big ports.

Figure 4.1 Development over the years of value added in fixed prices (percent)

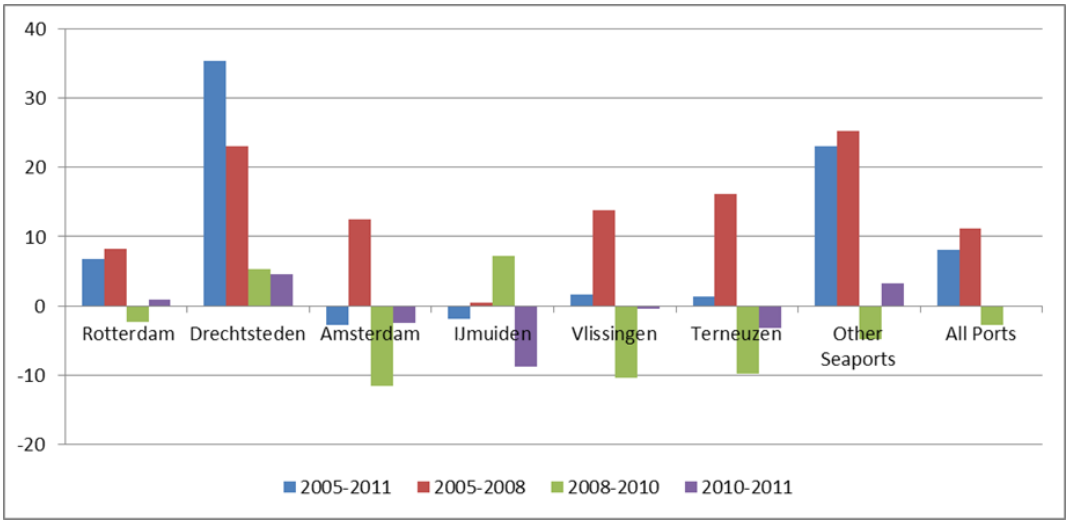
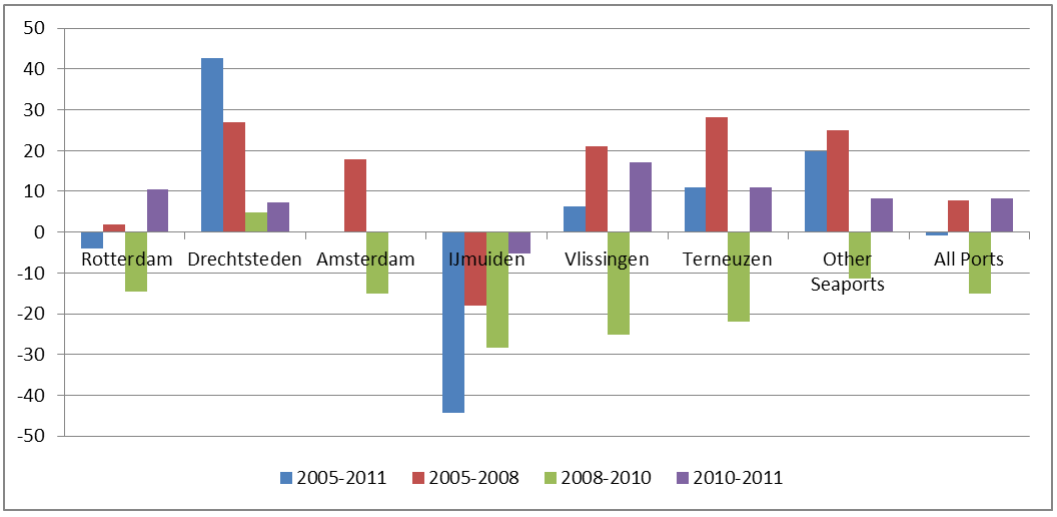


Figure 4.2 shows the development of value added in *current prices* over the years for all ports. Most notable are the ports of Drechtsteden and IJmuiden. Despite the crisis, the growth in value added in current prices remained positive in all periods in Drechtsteden. Value added generated in the port of IJmuiden decreased sharply in all of the reference years especially because prices were under pressure (basic metal industry). Considering value added in current prices, most ports generated in 2011 more value added than in 2005 (recovery). Only the ports of IJmuiden and Rotterdam did not fully recover (compared to the level of 2005)

Figure 4.2, Development over the years of value added in current prices (percent)



4.4 Overview: results for activities on land

In the reference period 2005-2011, the total number of employees (full time equivalent) for the selected industries in the areas of interest grew from 143 thousand in 2005 to 147 thousand in 2011, table 4.14. For the Netherlands as a whole, the total number of employees grew from 5.7 million in 2005 to 5.9 million in 2011. Compensation per employee is larger in selected industries for seaports than for the selected industries in the coastal area.

Table 4.14: Key figures for activities on land in predefined areas (selected industries and preferred scenario's).

Year	Industry	Number of employees	Compensation of employees	Number of employed persons	Production	Intermediate consumption	Value added	Value added (pricelevel 2005)
2005	Coastal zone	24	722	32	2,537	1,219	1,318	1,318
	Rotterdam	54	3,062	57	44,083	34,605	9,478	9,478
	Other Seaports	65	3,370	70	24,029	16,313	7,715	7,715
Total 2005		143	7,154	158	70,649	52,137	18,512	18,512
2008	Coastal zone	27	853	35	2,946	1,495	1,451	1,462
	Rotterdam	58	3,553	61	59,243	49,584	9,660	10,263
	Other Seaports	68	3,939	73	31,394	22,537	8,857	8,861
Total 2008		153	8,346	168	93,583	73,616	19,967	20,586
2010	Coastal zone	26	842	34	2,755	1,388	1,367	1,330
	Rotterdam	52	3,367	54	57,267	49,023	8,244	10,022
	Other Seaports	67	3,831	72	29,210	21,710	7,500	8,588
Total 2010		145	8,041	160	89,233	72,121	17,111	19,940
2011	Coastal zone	26	853	34	2,745	1,395	1,350	1,314
	Rotterdam	54	3,537	57	68,040	58,935	9,105	10,120
	Other Seaports	68	3,905	72	31,750	23,803	7,947	8,471
Total 2011		147	8,295	162	102,534	84,133	18,402	19,905
Employment figures x1000 fte, Monetary Values x €1000 000								

Value added in current prices for the selected industries in the areas of interest is equal to 4.1% of the Dutch total value added in 2005. In 2008 this figure is equal to 3.8 per cent, in 2010 it was equal to 3.3 per cent and in 2011 it was equal to 3.4 per cent. The share of production of the selected activities in the total production figure is larger. For 2005, 2008, 2010 and 2011 the share in production is equal to 7.3, 8.1, 7.8 and 8.7 per cent respectively.

Textbox: Differences to the Port Monitor (Haven monitor)

Since 2004 the Port Monitor (Haven monitor) is published annually. The Port Monitor includes economic figures on seaports. The objective of the Port Monitor overlaps partially with the objective of our study on seaports in the Netherlands. Both studies present figures on employment and value added in the seaports, but results differ substantially.

In this textbox a brief explanation of the differences between the Port Monitor (RebelGroup Advisory et al., 2009) and the figures presented for seaports in this study is provided.

The estimate of total (direct) value added for all seaports in this study is smaller than the value added estimated in the Port Monitor. The largest part of the difference is explained by different geographical boundaries. In this study seaports are limited to industrial areas surrounding these ports only. In many cases maps provided by port authorities have been used in determining the boundaries. The Port Monitor in multiple cases, e.g. Rotterdam and Amsterdam, includes complete municipalities in setting their boundaries. The geographical boundaries set in the Port Monitor are much broader than the boundaries set in this study.

Scheveningen is also included as a seaport in the Ports Monitor. The economic activities in Scheveningen are included in the coastal area in this study.

Another difference is the industries selected. Some examples are given: Fisheries are included in the figures of the Port Monitor. In this study this industry is not labelled relevant in the sea ports (already covered by activities at sea). The figures of this study include more different construction industry classes than the Port Monitor does. Waste processing activities in seaports are included in the Port Monitor while these activities are not included in this study.

A third difference is calculation of direct transport activities. In this study direct transport activities are estimated like all other industries based on location. The Port Monitor makes use of data on transport performances.

5. Summary of the results

In this chapter the main economic figures for activities at sea (chapter 3) and activities on land (chapter 4) are summarised in order to construct a total estimate for all activities related to the Dutch Continental Shelf. The combined figure is also compared to macro-economic key figures for the Dutch economy. This chapter ends with some recommendations for future research and a short reader for correct interpretation of the presented data. Table 5.1 presents a summary of the economic key figures for the relevant activities. Table 5.2 shows the contribution of the North Sea economy to the total Dutch economy. The economic importance of the activities related to the Dutch Continental Shelf (DCS) is presented for the years 2005, 2008, 2010 and 2011*. The data for 2011 (second estimate) are still preliminary.

Table 5.1 Summary of the economic key figures for activities at sea and on land (selected industries)

		2005	2008	2010	2011
Total on land	Number of employees	138	147	138	140
	Compensation of employees	6828	7959	7583	7877
	Number of employed persons	150	161	151	154
	Production	65736	88707	85348	98649
	Intermediate consumption	48561	69951	68963	80864
	Value added	17175	18756	16384	17786
	Value added (pricelevel 2005)	17175	18895	18555	18595
Total on sea	Number of employees	9	9	10	10
	Compensation of employees	572	705	731	734
	Number of employed persons	11	11	12	12
	Production	10686	13512	9423	10046
	Intermediate consumption	5111	5403	4541	4623
	Value added	5575	8109	4882	5422
	Value added (pricelevel 2005)	5575	5907	5089	4741
Total North Sea economy	Number of employees	146	156	147	150
	Compensation of employees	7400	8664	8314	8611
	Number of employed persons	161	172	163	166
	Production	76422	102219	94770	108695
	Intermediate consumption	53673	75354	73504	85487
	Value added	22749	26865	21266	23208
	Value added (pricelevel 2005)	22749	24801	23644	23336
Employment figures x1000 fte, Monetary Values x €1000 000					

Table 5.2 Contribution North Sea economy to total economy.

		2005	2008	2010	2011
Total share of the Netherlands	Number of employees	2.6%	2.6%	2.5%	2.5%
	Compensation of employees	2.9%	2.9%	2.8%	2.8%
	Number of employed persons	2.5%	2.5%	2.4%	2.5%
	Production	7.9%	8.9%	8.3%	9.2%
	Intermediate consumption	10.6%	12.1%	12.0%	13.2%
	Value added	5.0%	5.1%	4.1%	4.3%
	Value added (pricelevel 2005)	5.0%	5.0%	4.8%	4.7%
Employment figures x1000 fte, Monetary Values x €1000 000					

5.1 Development over time (2005-2011)

From the figures presented in this study it appears that in the period 2005-2011 value added in *current prices* of the North Sea economy slightly increased (plus 2.0 per cent). Value added of the North Sea economy in real terms (price level 2005) increased slightly more (plus 2.6 per cent). So, in real terms the North Sea economy has become larger over years[19].

Figure 5.1 shows the growth in value added in the North Sea economy compared to the growth of the Dutch economy (both in current prices as well as in a fixed price level).

Figure 5.1 North Sea economy versus total Dutch economy

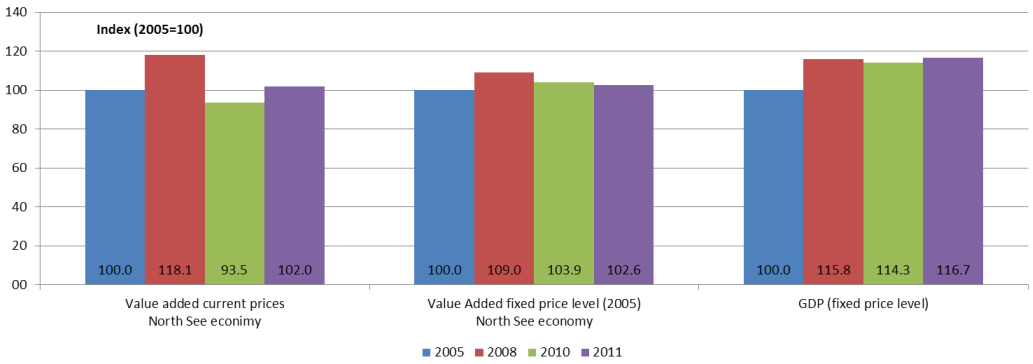
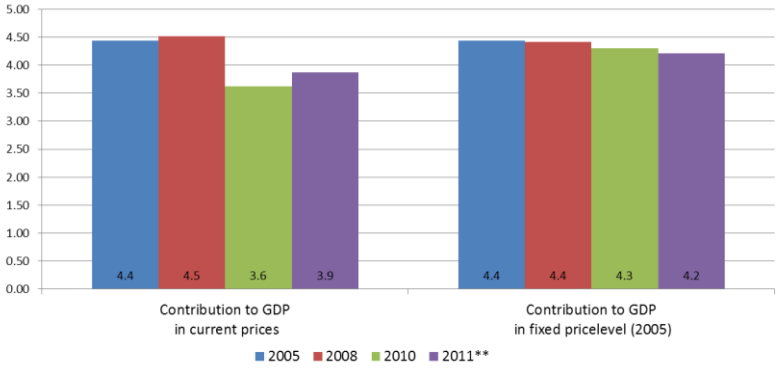


Figure 5.2. shows that the contribution of the North Sea economy to GDP decreases over time. The share of the North Sea economy in total GDP (current prices) was equal to 4.4 per cent in 2005 and decreased to 3.9 per cent in 2011. The contribution of the North Sea economy to the total Dutch GDP measured in fixed prices decreased subsequently from 4.4 per cent in 2005 to 4.2 per cent in 2011.

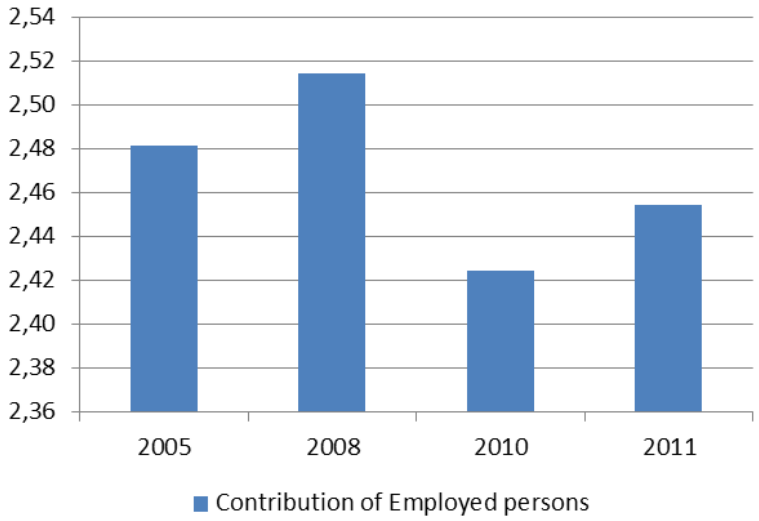
Figure 5.2 Contribution to GDP of North Sea Economy



[19] Economic growth is defined as the volume growth of gross domestic product (GDP). Growth in value added of the North Sea economy in current prices cannot be compared with the economic growth of the total Dutch economy. Price fluctuations are imbedded in the current price approach. Value added in current prices are therefore deflated with relevant price-indices in order to compile statistics on value added in a fixed price level. Value added in a fixed price level of the North Sea can be compared with macro-economic growth.

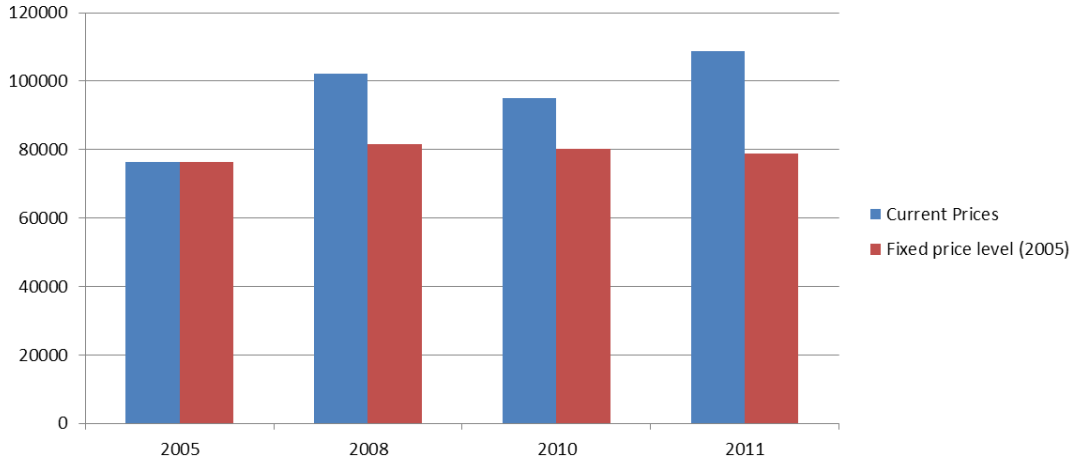
The decline in the economic contribution mentioned above is also notable when looking at the contribution of the North Sea economy in terms of total employed persons. In 2005 the contribution was 2.48 per cent and decreased to 2.45 per cent in 2011, as shown in figure 5.3.

Figure 5.3 Contribution of North Sea economy to employed persons



The share of the North Sea economy production in total Dutch production (current prices) of the relevant activities grew subsequently from 7.9 per cent in 2005 to 9.2 per cent in 2011. Production value created by the North Sea economy equalled 108.7 billion euro in 2011, measured in current prices. Expressed in 2005 prices, production in 2011 was equal to 79.0 billion euro (for details annex G). Price increases were very substantial in the North Sea economy (especially in the oil and gas industry, oil refineries and the chemical sector[20]. Figure 5.4 shows the production of the North Sea economy.

Figure 5.4 Production North Sea economy in current prices and fixed price level (million euro).



[20] If growth in production value is used as indicator for growth in environmental pressure, it is recommended to use production value in fixed prices instead of production value in current prices. Production in current prices of certain activities can be very volatile due to price fluctuations (for example oil and gas prices).

2005-2008

Growth in value added of the North Sea economy in nominal terms equalled 18.1 per cent in the period 2005-2008. This growth is partially caused by price increases. Growth in real terms was equal to 9 per cent. The Dutch economy as a whole grew 9.7 per cent in real terms in this reference period. So the North Sea economy did grew as fast as the rest of the economy during a period of economic prosperity. In the period 2005-2008 the number of employed persons working in the North Sea economy grew by 6.8 per cent

2008-2010

During the financial and economic crisis (2008-2010) the development in value added in real terms was equal to -4.7 per cent for the North Sea economy, while in the same period the Dutch economy shrank with -1.7 per cent. This indicates that the North Sea economy has been hit relatively hard by the economic crisis. Employment in the North Sea economy decreased with 5.2 per cent in the period 2008-2010, which is significantly more than the 1.7 per cent decrease (employed persons) in the total Dutch economy

2010-2011

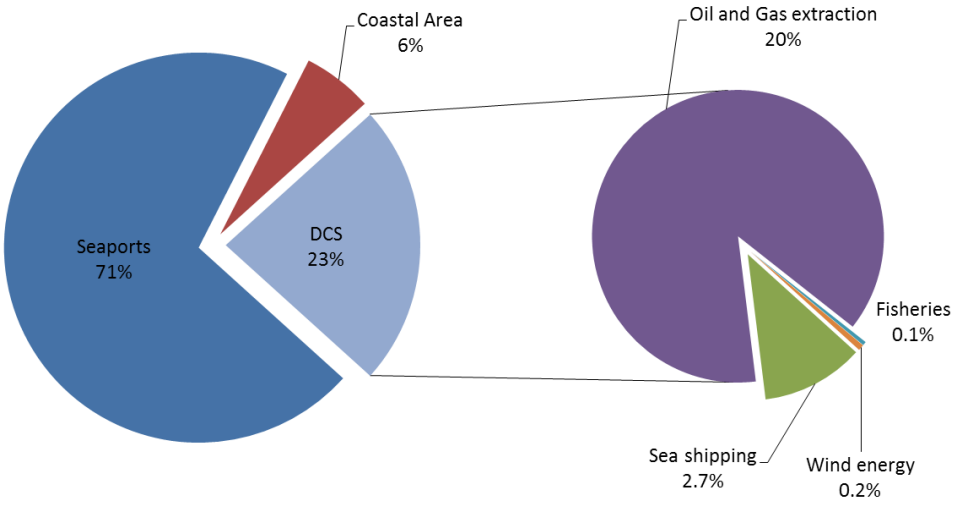
In the period 2010-2011 the number of employed persons in the North Sea economy grew 1.7 per cent. In the period 2010-2011 growth in real terms was equal to -1.3 per cent for the North Sea economy and plus 1.2 per cent for the Dutch economy. So, economic activities were still more than average under pressure in the North Sea economy.

5.2 Structure of the North Sea economy

Figure 5.5 shows the contribution of different activities to the value added generated by the North Sea economy in 2011. The activities in the seaports have the largest share in total value added of the relevant activities. Extraction of oil and gas on the DCS also has a large share in total value added. It is notable that fishing and wind energy have now become equal contributors[21]. In 2005 there was still hardly any production of offshore wind energy.

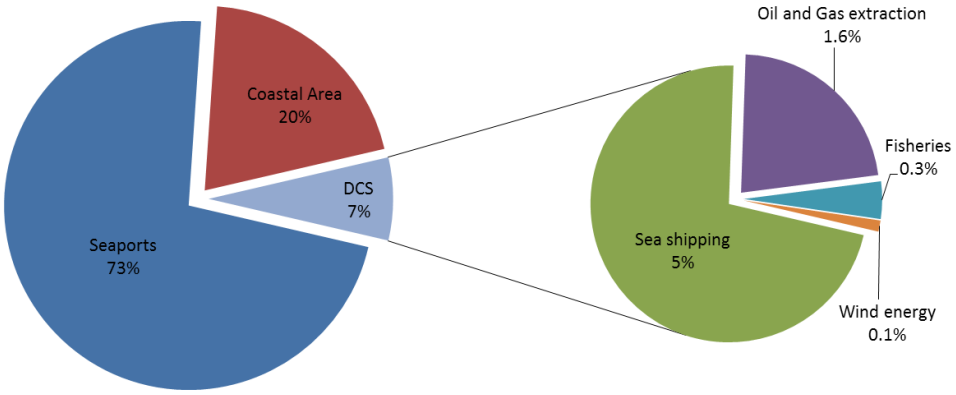
[21] Gross value added; so depreciation is included. The level of depreciation is different per activity.

Figure 5.5 Share in total value added of different activities on or related to the DCS (2011)



The share of relevant North Sea activities in the estimated number of employed persons in 2011 is shown in figure 5.6. Unlike the share in value added, the contribution to employment of extraction of oil and gas on the DCS is relatively small. This is due to the fact that this industry is characterised by low labour intensity. The largest part of employment is generated by activities taking place in seaports and in the coastal area.

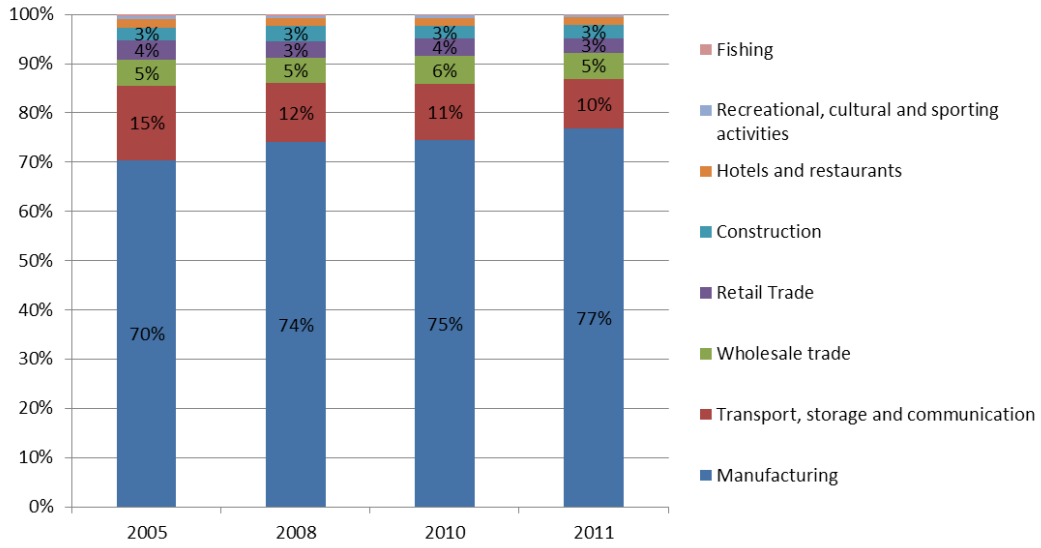
Figure 5.6 Share in total employment of different activities on or related to the DCS (2011).



In the selected seaports, manufacturing generated the largest part of value added as shown in figure 5.7. For the four reference years used in this study manufacturing has a share between seventy and eighty per cent of the estimated value added in seaports and the coastal area.

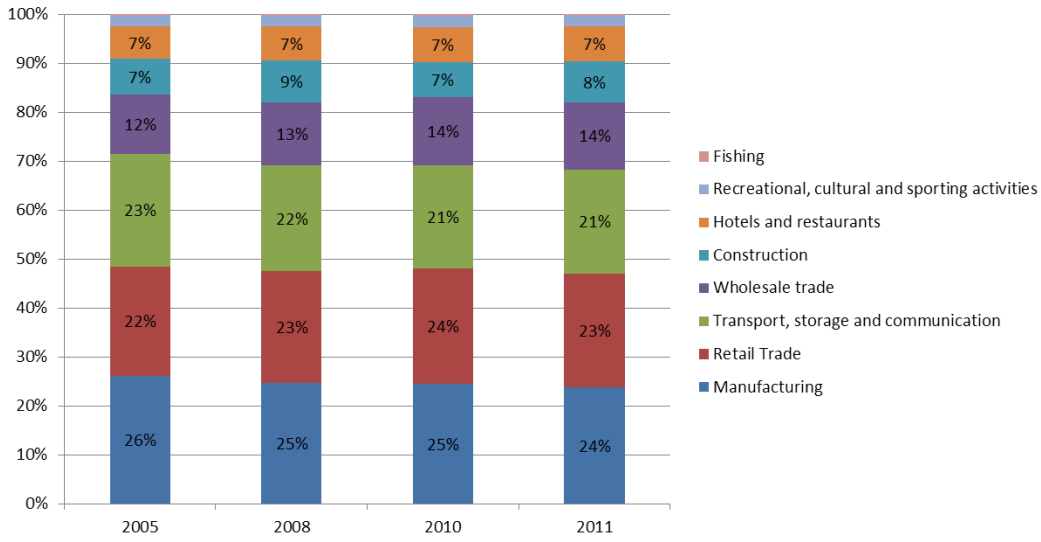
In manufacturing, the most important activities are 'the manufacture of chemicals and chemical products' (Rotterdam, Terneuzen and Moerdijk), 'the manufacture of coke and refined petroleum products' (Rotterdam) and 'the manufacture of basic metals' (IJmuiden).

Figure 5.7 Share in value added of relevant industries in the selected seaports and coastal area



In figure 5.8 the share in the total employment is presented for the relevant industries selected for seaports and in the coastal area. In 2005, 'Manufacturing' had the largest share in the number of employed persons. The share of manufacturing declined in the reference period, while the share of the activities in the coastal area (retail trade and hotels and restaurants) increased.

Figure 5.8 Share of the relevant industries in the employment in the selected seaports and coastal area.



6. Evaluation of the methodology used and recommendations

The figures presented in this report are based on figures from the national accounts or the regional accounts. The national or regional figures are recalculated to specific geographical areas: the Dutch Continental Shelf, the selected seaports or the coastal area. Using data from the national accounts means that the concepts and definitions used are consistent and based on international definitions. Other advantages are that the data sources are produced annually and that time series are available. Since data are published per industry, it is possible to analyse the economic structure of the areas of interest.

For the estimations of economic activities on the DCS (activities at sea) the starting point for the analysis is always the data of the National accounts. As a second step, several different sources where used in order to allocate the activities (national data) to different geographical areas (source for allocation differs per activity). The figures for production of wind power on the DCS are based on already available figures at Statistics Netherlands. For fisheries, external sources were used to allocate the national figures to the DCS. For the number of employees in the offshore oil and gas extraction data supplied by State Supervision of Mines was used. The figures on production, intermediate consumption and value added in this industry were taken from the Regional accounts of the Netherlands (Statistics Netherlands).

The quality of the sources used differs and is difficult to determine. The continuity is a problem in the availability of some data sources. For example, the figures on the revenues of fishing on the DCS ((LEI, Compendium voor de Leefomgeving, 2006) are published only for 2001, 2002 and 2003. So it is recommended to search for a more actual data source in order to compile better estimates for fisheries.

Part of the methodology used in the economic analysis for river basins (Brouwer *et al.*, 2005) is adopted in this study to analyse the seaports and the coastal area. An advantage is that different types of areas are estimated in a similar way. A drawback of this methodology is that it allocates production to the location where employees are recorded in the 'company register' of Statistics Netherlands. When the 'administrative location' differs from the actual production site, the results may not be precise. Especially for seaports, where large companies with multiple locations are present, this is likely to result in underestimating the economic value generated in this region for these economic activities. This problem is partly solved by allocating total figures for the larger region (COROP) to a seaport for some relevant industries. This methodological problem is less substantial for the river basin analysis because these geographical areas are much larger.

A recommendation for future research is to examine alternative methods for estimating economic activities in seaports in order to solve the discrepancy between the company register used and the (multiple) location of the companies involved. Internet sources on seaports may allow pinpointing relevant companies in seaports and allocating them manually and individually to the relevant port. Another alternative that could be applied to the coastal area as well as to the seaports is using the LISA register. The company register (ABR) used in this study has 'the company' as an entity. The entity in the LISA register is the 'branch (of a company)'. Theoretically, the LISA register would provide more geographical detail. However, the LISA register may not cover some relevant industries, such as fisheries. LISA is used in other studies like Ecorys (2013). LISA has no information on production and value added.

Adding figures on air- and water pollution to the economic key figures is recommended. Production in real terms allows for environmental-economic analysis. The Pollutant Release & Transfer Register, established by a collaboration of Dutch research institutes, provides information on emissions per industry and in case of large companies per individual company. For activities on the DCS, some data are already available. These figures include both Dutch and international companies and cannot be directly related to the economic figures, which are

based on the resident principle. For activities in seaports and in the coastal area, the possibility to merge data on emissions and the economy should be explored.

This study includes both economic figures in current prices (nominal) and in fixed prices (real). Presenting the figures in real terms leads to a different picture and therefore to a different message than presenting the nominal figures. The two concepts and the corresponding figures can be used for different purposes. Nominal figures on value added can be used to analyse to what extent the North Sea economy generates income to have purchasing power. If prices of the products produced by the North Sea economy go up, this has a positive effect on the spending power of the North Sea economy. For example, one can buy more bread and milk for the same amount of gas exploited in the North Sea economy, so the terms of exchange improve.

Figures in real terms for the North Sea can directly be compared with economic growth figures. These figures suit analysis on the evolvement of production possibilities in the North Sea economy. Different objectives call for either nominal or deflated figures. Carefulness is required in interpreting these figures.

Unfortunately, compiling a reliable estimate for the extraction of sand was not feasible. This activity is included in the broader industry of civil engineering. A suitable source facilitating the allocation of civil engineering to the DCS is not available at this moment in time. Consulting the industry concerned is recommended before incorporating the numbers for extraction of sand in the aggregates.

Current developments in the port of Eemshaven and the port of Rotterdam include the construction of power plants. These sites are supplied by means of transport over water. In addition, the sea provides a direct access to cooling water. This activity could be depended upon a port location. Methodological issues were the main reason for excluding this industry as a relevant industry so far. If this activity becomes more prominent in the future in sea ports it is recommended to examine the feasibility of an alternative methodology in order to compile statistics for these relevant activities.

Lastly, Statistics Netherlands is now revising the national accounts (implementation of new ESA 2010[22]) . The results of this revision will be published in 2014. National accounts figures will differ from earlier presented figures due to the implementation of new conceptual insights and new data sources. Regional accounts will be revised after the revised national accounts figures have been published (expected late 2014). The figures of this study heavily rely on the regional accounts data. It is recommended to revise the economic figures of this study on the North Sea in the near future in order to keep consistency with other macro-economic national accounts numbers in the future.

[22] The European System of National and Regional Accounts (ESA 2010) is the newest internationally compatible EU accounting framework for a systematic and detailed description of an economy. The ESA 2010 was published in the Official Journal on 26 June 2013. It will be implemented as from September 2014; from that date onwards the data transmission from Member States to Eurostat will follow ESA 2010 rules The ESA 2010 differs in scope as well as in concepts from its predecessor ESA 95 reflecting developments in measuring modern economies, advances in methodological research and the needs of users. The structure of the ESA 2010 is consistent with the worldwide guidelines on national accounting set out in the System of National Accounts 2008 (2008 SNA). In order to support the application manuals and handbooks will be published by Eurostat.

7. Annex A Exposure hours for companies and contractors in Crude petroleum and natural gas production and support activities

	2005	2006	2007	2008	2009	2010	2011	2012
ONSHORE								
Exposure hours Company	2,417,609	1,600,063	1,667,217	1,600,845	1,896,980	2,289,623	2,523,230	2,818,080
Exposure hours Contractors	3,851,575	4,141,477	3,975,919	4,252,282	5,475,270	5,649,990	4,494,160	5,138,361
Total exposure hours Company & Contractors	6,269,184	5,741,540	5,643,136	5,853,127	7,372,250	7,939,613	7,017,390	7,956,441
OFFSHORE								
Exposure hours Company	1,019,814	1,146,571	1,225,397	944,195	996,841	980,746	974,572	1,035,188
Exposure hours Contractors	5,258,791	6,115,727	5,992,028	7,066,183	6,404,720	5,731,817	6,227,694	8,046,307
Total exposure hours Company & Contractors	6,278,605	7,262,298	7,217,425	8,010,378	7,401,561	6,712,563	7,202,266	9,081,495
Total general exposure hours	12,547,789	13,003,838	12,860,561	13,863,505	14,773,811	14,652,176	14,219,656	17,037,936

Annex B Map of the coastal area

	Beach/Sand dunes
	Coastal area

Annex C Map of the selected seaports

Annex D Production in the coastal area

			Production Coastal area (x €1000,000)																					
				Scenario A				Scenario B							Mean share									
Industy aggregated	Industy	Industy		2005D	2008D	2010D	2011NV		2005D	2008D	2010D	2011NV			A	B	NL							
Agriculture, forestry	1	Arable farming	1	15	19	27	25		44	60	79	80			0.2%	0.3%	0.2%							
	2	Horticulture	1	215	266	260	253		704	836	823	805			2.2%	3.5%	0.8%							
	3	Animal farming	1	46	41	37	38		85	78	73	77			0.4%	0.3%	0.9%							
	4	Other agriculture	1	48	61	71	78		120	139	179	204			0.6%	0.7%	0.3%							
	5	Forestry and logging	1	1	1	0	1		2	1	1	2			0.0%	0.0%	0.0%							
Fishing	6	Fishing and aquaculture	1	186	195	167	166		238	262	229	227			1.6%	1.0%	0.0%							
Crude petroleum and natural gas production	7+8	Oil and gas industry	0	13	20	13	16		8	35	15	27			0.1%	0.1%	2.0%							
Mining and quarrying	8	Other mining	0	X	X	X	X		X	X	X	X			X	X	X							
Manufacturing	9	Manufacture of food products, beverages and tobacco products	1	732	791	525	300		1019	1201	1057	602			5.2%	4.2%	5.3%							
	10	Manufacture of textiles, wearing apparel and leather products	1	9	11	12	12		19	22	29	22			0.1%	0.1%	0.3%							
	11+12	Manufacture of wood and of products of wood and cork,except furniture; manufacture of articles of straw and plaiting materials	1	15	22	11	11		26	42	24	25			0.1%	0.1%	0.8%							
	12	Manufacture of paper and paper products	0	X	X	X	X		X	X	X	X			X	X	X							
	13	Printing and reproduction of recorded media	1	X	X	X	X		X	X	X	X			X	X	X							
	13+14	Manufacture of coke and refined petroleum products	0	21	25	20	23		99	155	91	122			0.2%	0.5%	3.7%							
	15+16	Manufacture of chemicals and chemical products	1	125	104	156	215		210	177	248	326			1.4%	1.1%	4.8%							
	16	Manufacture of basic pharmaceutical products and pharmaceutical preparations	0	X	X	X	X		X	X	X	X			X	X	X							
	17	Manufacture of rubber and plastics products	1	24	13	10	14		99	37	33	38			0.1%	0.2%	0.6%							
	18+19	Manufacture of other non-metallic mineral products	1	17	34	20	27		47	86	63	87			0.2%	0.3%	1.3%							
	19	Manufacture of basic metals	0	X	X	X	X		X	X	X	X			X	X	X							
	20	Manufacture of fabricated metal products, except machinery and equipment	1	81	116	82	90		231	333	239	256			0.8%	1.2%	1.6%							
	21	Manufacture of computer, electronic and optical products	1	6	9	7	8		16	29	28	32			0.1%	0.1%	1.1%							
	22	Manufacture of electrical equipment	1	19	31	22	22		26	51	29	28			0.2%	0.1%	0.4%							
	23	Manufacture of machinery and equipment n.e.c.	1	45	54	47	57		124	147	137	179			0.5%	0.6%	1.7%							
	24	Manufacture of motor vehicles, trailers and semi-trailers	1	4	5	5	5		25	28	29	35			0.0%	0.1%	0.8%							
	25	Manufacture of other transport equipment	1	59	79	67	64		232	313	262	251			0.6%	1.2%	0.4%							
	26	Manufacture of furniture; other manufacturing	1	36	42	42	42		97	109	115	113			0.4%	0.5%	0.9%							
	27	Repair and installation of machinery and equipment	1	41	66	43	47		55	82	43	52			0.4%	0.3%	0.7%							
Electricity, gas, water supply and waste treatment	28+29	Electricity, gas, steam and air conditioning supply	1	75	45	41	27		179	153	96	81			0.4%	0.6%	3.3%							
	29	Water collection, treatment and supply	0	X	X	X	X		X	X	X	X			X	X	X							
	30+31	Sewerage; waste collection, treatment and disposal activities; materials recovery; remediation activities and other waste management services	1	19	17	12	12		54	47	46	46			0.1%	0.2%	0.9%							
	31	Recycling	0	X	X	X	X		X	X	X	X			X	X	X							
Construction of buildings	32	Construction of buildings	1	411	500	416	417		908	1021	819	853			3.9%	3.9%	2.9%							
Construction	33	Construction of roads etc	1	49	43	32	32		94	90	87	90			0.4%	0.4%	1.1%							
	34	Other construction	1	284	333	299	322		672	746	675	727			2.8%	3.1%	2.9%							
Wholesale trade	35	Wholesale and retail trade and repair of motor vehicles and motorcycles	1	95	107	111	107		251	244	270	261			0.9%	1.1%	1.4%							
	36	Wholesale trade, except of motor vehicles and motorcycles	1	408	465	545	542		1159	1431	1447	1502			4.4%	6.1%	6.5%							
Retail Trade	37	Retail trade, except of motor vehicles and motorcycles	1	435	503	496	459		810	929	885	822			4.3%	3.8%	2.6%							
Transport, storage and communication	38	Land transport and transport via pipelines	1	138	145	121	121		313	342	306	320			1.2%	1.4%	1.8%							
	39	Water transport	1	216	284	153	110		300	369	138	94			1.7%	1.0%	0.5%							
	40	Air transport	1	17	1	1	1		18	2	1	1			0.0%	0.0%	0.8%							
	41	Warehousing and support activities for transportation	1	38	65	80	73		59	89	121	110			0.6%	0.4%	1.1%							
	42	Postal and courier activities	1	35	25	16	21		52	45	36	42			0.2%	0.2%	0.4%							
	44	Publishing activities	1	40	49	45	43		79	81	83	82			0.4%	0.4%	0.7%							
	45+46	Motion picture, video and television programme production, sound recording and music publishing activities; programming and broadcasting activities	1	151	108	98	97		520	228	210	201			1.0%	1.3%	2.3%							
	46	Telecommunications	0	X	X	X	X		X	X	X	X			X	X	X							
Hotels and restaurants	43	Accommodation, food and beverage service activities	1	803	932	867	905		1140	1386	1299	1351			7.9%	5.7%	1.6%							
Financial and business activities	47	Computer programming, consultancy and related activities; information service activities	1	86	120	121	132		193	256	264	293			1.0%	1.1%	1.7%							
	48	Financial service activities, except insurance and pension funding	1	240	290	425	411		570	635	976	929			3.1%	3.4%	4.3%							
	49	Insurance, reinsurance and pension funding, except compulsory social security	1	5	12	5	8		39	53	31	48			0.1%	0.2%	1.7%							
	50	Activities auxiliary to financial services and insurance activities	1	65	85	89	95		164	200	201	207			0.8%	0.8%	0.6%							
	51	Real estate activities	1	1066	1198	1217	1226		2133	2132	2127	2169			10.6%	9.4%	5.3%							
	52	Legal and accounting activities; activities of head offices; management consultancy activities	1	386	421	453	449		1171	979	1435	1461			3.9%	5.6%	3.0%							
	53	Architecture and engineering activities; technical testing and analysis	1	132	151	142	130		437	428	383	334			1.2%	1.7%	1.2%							
	54	Scientific research and development	1	187	148	101	87		312	232	201	126			1.2%	1.0%	0.3%							
	55	Advertising and market research	1	59	65	59	53		124	136	123	111			0.5%	0.5%	0.7%							
	56	Other professional, scientific and technical activities; veterinary activities	1	84	64	62	68		160	131	121	131			0.6%	0.6%	0.5%							
	57	Rental and leasing activities	1	42	84	73	70		94	164	170	160			0.6%	0.6%	0.8%							
	58	Employment activities	1	95	113	80	74		218	421	321	286			0.8%	1.4%	1.6%							
	59	Travel agency, tour operator reservation service and related activities	1	86	82	79	79		197	137	166	136			0.7%	0.7%	0.6%							
	60	Security and investigation activities; services to buildings and landscape activities; office administrative, office support and other business support	1	88	117	114	106		198	302	392	406			1.0%	1.4%	1.1%							
General government	61	Public administration and defence; compulsory social security	1	1164	2706	1101	1179		2216	4448	2097	2140			13.4%	11.8%	5.9%							
	62	Education	1	241	319	288	293		426	574	554	563			2.6%	2.3%	2.9%							
Care and other service activities	63	Human health activities	1	438	498	596	749		814	895	1031	1322			5.2%	4.5%	3.3%							
	64	Social work activities	1	363	349	409	365		667	707	762	713			3.4%	3.1%	2.6%							
Recreational, cultural and sporting activities	65	Creative, arts and entertainment activities; libraries, archives, museums and other cultural activities; gambling and betting activities	1	151	159	128	137		209	220	186	200			1.3%	0.9%	0.7%							
	66	Sports activities and amusement and recreation activities	1	77	85	90	87		139	149	155	144			0.8%	0.6%	0.3%							
Care and other service activities	67	Activities of membership organisations	1	67	66	79	85		315	301	314	334			0.7%	1.4%	0.5%							
	68	Repair of computers and personal and household goods	1	8	11	11	11		15	20	23	24			0.1%	0.1%	0.1%							
	69+70	Other personal service activities	1	59	135	69	67		109	211	127	128			0.7%	0.6%	0.4%							
	70	Activities of households as employers of domestic personnel and undifferentiated goods and services production of households for own use	0	X	X	X	X		X	X	X	X			X	X	X							
Total				10160	12900	10764	10786		21055	25154	22504	22943			100.0%	100.0%								

Annex E Production in the Port of Rotterdam

				Production Port of Rotterdam (x €1000,000)																			
				Scenario A						Scenario B						Mean share							
Industy aggregated	Industy	Industy		2005D	2008D	2010D	2011NV	2005D	2008D	2010D	2011NV	A	B	NL
Agriculture, forestry	1	Arable farming		1	1	2	1	2	7	18	9	0.0%	0.0%	0.2%
	2	Horticulture		1	16	17	25	22	174	217	219	215	0.0%	0.3%	0.6%
	3	Animal farming		0	X	X	X	X	X	X	X	X	X	X	X
	4	Other agriculture		1	10	9	9	12	31	100	77	40	0.0%	0.1%	1.3%
Fishing	5	Fishing and aquaculture		0	X	X	X	X	X	X	X	X	X	X	X
Crude petroleum and natural gas production	7+8	Oil and gas industry		1	32	66	45	20	43	86	60	36	0.1%	0.1%	2.0%
Mining and quarrying	8	Other mining		0	X	X	X	X	X	X	X	X	X	X	X
Manufacturing	9	Manufacture of food products, beverages and tobacco products		1	688	1421	1582	1986	835	1620	1698	2158	2.2%	2.2%	5.3%
	10	Manufacture of textiles, wearing apparel and leather products		1	12	9	12	12	21	16	19	19	0.0%	0.0%	0.3%
	11	Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials		1	9	9	9	9	13	12	13	12	0.0%	0.0%	0.3%
	12	Manufacture of paper and paper products		1	42	33	25	26	49	40	31	31	0.1%	0.1%	0.5%
	13+14	Printing and reproduction of recorded media		1	23862	35733	34121	42617	23968	35749	34136	42632	53.4%	49.2%	3.7%
	14	Manufacture of coke and refined petroleum products		0	X	X	X	X	X	X	X	X	X	X	X
	15+16	Manufacture of chemicals and chemical products		1	9081	10563	11751	12851	9082	10566	11751	12851	17.5%	16.1%	4.8%
	16	Manufacture of basic pharmaceutical products and pharmaceutical preparations		0	X	X	X	X	X	X	X	X	X	X	X
	17+18	Manufacture of rubber and plastics products		1	102	135	91	92	136	180	123	127	0.2%	0.2%	1.2%
	18	Manufacture of other non-metallic mineral products		0	X	X	X	X	X	X	X	X	X	X	X
	19	Manufacture of basic metals		0	X	X	X	X	X	X	X	X	X	X	X
	19+20	Manufacture of fabricated metal products, except machinery and equipment		1	228	202	194	181	332	319	317	279	0.3%	0.5%	2.4%
	21	Manufacture of computer, electronic and optical products		0	X	X	X	X	X	X	X	X	X	X	X
	21+22	Manufacture of electrical equipment		1	147	196	140	133	205	280	212	210	0.2%	0.3%	1.5%
	23	Manufacture of machinery and equipment n.e.c.		1	113	382	278	369	167	475	372	505	0.4%	0.5%	1.7%
	24	Manufacture of motor vehicles, trailers and semi-trailers		1	34	34	28	39	54	45	37	51	0.1%	0.1%	0.8%
	25	Manufacture of other transport equipment		1	9	42	34	37	11	50	37	39	0.0%	0.0%	0.4%
	26	Manufacture of furniture; other manufacturing		1	12	23	16	16	37	65	66	63	0.0%	0.1%	0.9%
	27	Repair and installation of machinery and equipment		1	342	428	424	454	416	534	537	558	0.7%	0.7%	0.7%
Electricity, gas, water supply and waste treatment	28	Electricity, gas, steam and air conditioning supply		0	X	X	X	X	X	X	X	X	X	X	X
	28+30+31	Sewerage; waste collection, treatment and disposal activities; materials recovery; remediation activities and other waste management services		1	313	1144	902	1291	574	1368	1212	1421	1.4%	1.6%	4.1%
	31	Recycling		0	X	X	X	X	X	X	X	X	X	X	X
Construction of buildings	32	Construction of buildings		1	283	318	251	277	512	601	485	559	0.5%	0.8%	2.9%
Construction	33	Construction of roads etc		1	9	25	44	49	17	56	77	164	0.0%	0.1%	1.1%
	34	Other construction		1	423	1232	448	854	750	1767	839	1224	1.1%	1.6%	2.9%
Wholesale trade	35	Wholesale and retail trade and repair of motor vehicles and motorcycles		1	92	132	99	97	270	348	276	254	0.2%	0.4%	1.4%
	36	Wholesale trade, except of motor vehicles and motorcycles		1	926	991	1383	1399	1516	1624	2046	2132	1.9%	2.7%	6.5%
Retail Trade	37	Retail trade, except of motor vehicles and motorcycles		1	1939	2172	2121	1999	1946	2177	2127	2004	3.3%	3.1%	2.6%
Transport, storage and communication	38	Land transport and transport via pipelines		1	482	648	550	607	782	1127	947	990	0.9%	1.4%	1.8%
	39	Water transport		1	3797	3037	2470	2591	3797	3038	2471	2591	4.9%	4.5%	0.5%
	40	Air transport		0	X	X	X	X	X	X	X	X	X	X	X
	40+41	Warehousing and support activities for transportation		1	3426	3756	3376	3438	3436	3769	3387	3447	5.6%	5.2%	1.9%
	42	Postal and courier activities		1	44	47	45	31	87	73	71	61	0.1%	0.1%	0.4%
	44	Publishing activities		1	9	26	13	8	16	37	30	18	0.0%	0.0%	0.7%
	45	Motion picture, video and television programme production, sound recording and music publishing activities; programming and broadcasting activities		1	43	110	67	56	73	184	128	125	0.1%	0.2%	0.5%
	46	Telecommunications		1	52	51	89	90	120	99	141	134	0.1%	0.2%	1.7%
Hotels and restaurants	43	Accommodation; food and beverage service activities		1	73	82	71	49	144	160	148	123	0.1%	0.2%	1.6%
Financial and business activities	47	Computer programming, consultancy and related activities; information service activities		1	62	69	77	54	109	111	123	105	0.1%	0.2%	1.7%
	48	Financial service activities, except insurance and pension funding		1	122	269	325	108	201	414	506	268	0.3%	0.5%	4.3%
	49	Insurance, reinsurance and pension funding, except compulsory social security		1	4	35	3	3	5	48	4	9	0.0%	0.0%	1.7%
	50	Activities auxiliary to financial services and insurance activities		1	37	65	54	18	65	91	71	39	0.1%	0.1%	0.8%
	51	Real estate activities		1	220	244	224	169	514	455	439	411	0.4%	0.7%	5.3%
	52	Legal and accounting activities; activities of head offices; management consultancy activities		1	305	420	469	347	427	580	603	467	0.6%	0.8%	3.0%
	53	Architecture and engineering activities; technical testing and analysis		1	163	255	276	257	262	449	415	389	0.4%	0.5%	1.2%
	54	Scientific research and development		0	X	X	X	X	X	X	X	X	X	X	X
	54+55	Advertising and market research		1	79	238	238	221	122	382	416	386	0.3%	0.5%	1.0%
	56	Other professional, scientific and technical activities; veterinary activities		1	57	20	37	31	80	51	71	71	0.1%	0.1%	0.5%
	57	Rental and leasing activities		1	57	172	133	140	114	263	215	216	0.2%	0.3%	0.8%
	58	Employment activities		1	155	298	287	201	252	544	512	447	0.4%	0.6%	1.6%
	59	Travel agency, tour operator reservation service and related activities		1	7	7	12	21	30	34	44	62	0.0%	0.1%	0.6%
	60	Security and investigation activities; services to buildings and landscape activities; office administrative, office support and other business support		1	331	586	508	495	399	790	674	642	0.8%	0.9%	1.1%
General government	61	Public administration and defence; compulsory social security		1	48	130	72	65	234	344	408	437	0.1%	0.5%	5.9%
	62	Education		1	91	372	405	105	224	514	528	228	0.4%	0.5%	2.9%
Care and other service activities	63	Human health activities		1	32	42	46	29	223	219	116	90	0.1%	0.2%	3.3%
	64	Social work activities		1	103	300	95	29	210	422	171	124	0.2%	0.3%	2.6%
Recreational, cultural and sporting activities	65	Creative, arts and entertainment activities; libraries, archives, museums and other cultural activities; gambling and betting activities		1	20	33	35	28	44	66	74	73	0.0%	0.1%	0.7%
	66	Sports activities and amusement and recreation activities		1	7	10	10	6	27	34	35	30	0.0%	0.0%	0.3%
Care and other service activities	67	Activities of membership organisations		1	29	30	41	17	49	59	59	29	0.0%	0.1%	0.5%
	68	Repair of computers and personal and household goods		1	2	1	1	1	5	5	5	5	0.0%	0.0%	0.1%
	69	Other personal service activities		1	9	10	10	11	64	41	42	43	0.0%	0.1%	0.3%
					48898	66660	64050	74064	53278	72705	69639	79651	100.0%	100.0%	

Annex F Production in the Port of Amsterdam

					Production Port of Amsterdam (x €1000,000)																			
					Scenario A						Scenario B						Mean share							
Industry aggregated		Industry			2005D	2008D	2010D	2011NV	2005D		2008D	2010D	2011NV		A		B		NL	
Agriculture, forestry	1	Arable farming		0	X	X	X	X			X	X	X		X		X		X	
	3	Animal farming		0	X	X	X	X			X	X	X		X		X		X	
	1+3+4+5	Other agriculture		1	1	0	0	0	9		6	5	6		0.0%		0.0%		1.5%	
	5	Forestry and logging		0	X	X	X	X	X		X	X	X		X		X		X	
Crude petroleum and natural gas production	7+8	Oil and gas industry		1	60	40	114	144	66		43	119	145		1.6%		0.6%		2.0%	
Mining and quarrying	8	Other mining		0	X	X	X	X	X		X	X	X		X		X		X	
Manufacturing	9	Manufacture of food products, beverages and tobacco products		1	522	742	706	890	1069		1502	1518	1754		13.0%		8.9%		5.3%	
	10	Manufacture of textiles, wearing apparel and leather products		1	19	21	17	18	32		40	32	32		0.3%		0.2%		0.3%	
	11	Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials		1	2	3	2	2	9		17	11	13		0.0%		0.1%		0.3%	
	12	Manufacture of paper and paper products		1	0	0	0	1	5		9	10	10		0.0%		0.1%		0.5%	
	13	Printing and reproduction of recorded media		1	32	24	16	17	128		206	141	164		0.4%		1.0%		0.5%	
	14	Manufacture of coke and refined petroleum products		0	X	X	X	X	X		X	X	X		X		X		X	
	14+15+16	Manufacture of chemicals and chemical products		1	355	550	295	338	469		761	543	617		7.0%		3.6%		8.0%	
	16	Manufacture of basic pharmaceutical products and pharmaceutical preparations		0	X	X	X	X	X		X	X	X		X		X		X	
	17	Manufacture of rubber and plastics products		1	12	17	7	8	33		38	50	59		0.2%		0.3%		0.6%	
	18	Manufacture of other non-metallic mineral products		0	X	X	X	X	X		X	X	X		X		X		X	
	19	Manufacture of basic metals		0	X	X	X	X	X		X	X	X		X		X		X	
	18+19+20	Manufacture of fabricated metal products, except machinery and equipment		1	63	128	85	90	210		289	224	253		1.7%		1.5%		3.0%	
	21	Manufacture of computer, electronic and optical products		1	12	22	19	14	70		105	125	92		0.3%		0.6%		1.1%	
	22	Manufacture of electrical equipment		1	0	0	0	2	4		5	2	10		0.0%		0.0%		0.4%	
	23+24+25	Manufacture of machinery and equipment n.e.c.		1	10	11	73	77	91		149	128	140		0.8%		0.8%		3.0%	
	24	Manufacture of motor vehicles, trailers and semi-trailers		0	X	X	X	X	X		X	X	X		X		X		X	
	25	Manufacture of other transport equipment		0	X	X	X	X	X		X	X	X		X		X		X	
	26	Manufacture of furniture; other manufacturing		1	4	7	11	8	119		200	53	33		0.1%		0.6%		0.9%	
	27	Repair and installation of machinery and equipment		1	34	17	46	33	79		56	220	171		0.6%		0.8%		0.7%	
Electricity, gas, water supply and waste treatment	28	Electricity, gas, steam and air conditioning supply		0	X	X	X	X	X		X	X	X		X		X		X	
	29	Water collection, treatment and supply		0	X	X	X	X	X		X	X	X		X		X		X	
	30	Sewerage; waste collection, treatment and disposal activities; materials recovery; remediation activities and other waste management services		0	X	X	X	X	X		X	X	X		X		X		X	
	28 t/m 31	Recycling		1	110	157	91	131	283		328	113	158		2.2%		1.4%		4.3%	
Construction of buildings	32	Construction of buildings		1	75	148	100	120	225		359	240	277		2.0%		1.7%		2.9%	
Construction	33	Construction of roads etc		1	21	49	113	100	193		197	267	272		1.3%		1.4%		1.1%	
	34	Other construction		1	63	69	79	84	292		316	324	332		1.4%		1.9%		2.9%	
Wholesale trade	35	Wholesale and retail trade and repair of motor vehicles and motorcycles		1	67	62	40	30	169		166	178	142		0.9%		1.0%		1.4%	
	36+37	Wholesale trade, except of motor vehicles and motorcycles		1	528	579	590	567	1711		1812	1933	1920		10.4%		11.3%		9.1%	
Retail Trade	37	Retail trade, except of motor vehicles and motorcycles		0	X	X	X	X	X		X	X	X		X		X		X	
Transport, storage and communication	38+39+40	Land transport and transport via pipelines		1	373	591	442	475	529		908	793	866		8.6%		4.7%		3.2%	
	39	Water transport		0	X	X	X	X	X		X	X	X		X		X		X	
	40	Air transport		0	X	X	X	X	X		X	X	X		X		X		X	
	41	Warehousing and support activities for transportation		1	174	219	211	235	250		331	346	364		3.8%		2.0%		1.1%	
	42	Postal and courier activities		1	36	39	25	29	109		105	76	97		0.6%		0.6%		0.4%	
	44	Publishing activities		1	366	347	293	254	1062		1274	1442	1248		5.8%		7.7%		0.7%	
	45+46	Motion picture, video and television programme production, sound recording and music publishing activities; programming and broadcasting activities		1	184	166	220	153	1179		996	1317	958		3.4%		6.9%		2.3%	
	46	Telecommunications		0	X	X	X	X	X		X	X	X		X		X		X	
Hotels and restaurants	43	Accommodation; food and beverage service activities		1	25	27	25	24	100		98	98	84		0.5%		0.6%		1.6%	
Financial and business activities	47+48	Computer programming, consultancy and related activities; information service activities		1	267	297	390	392	832		945	1492	1438		6.2%		7.1%		6.0%	
	48	Financial service activities, except insurance and pension funding		0	X	X	X	X	X		X	X	X		X		X		X	
	49	Insurance, reinsurance and pension funding, except compulsory social security		0	13	17	101	29	71		116	502	153		0.7%		1.2%		1.7%	
	50	Activities auxiliary to financial services and insurance activities		1	9	19	9	10	44		86	44	47		0.2%		0.3%		0.6%	
	51	Real estate activities		1	401	432	134	153	778		962	617	739		5.2%		4.8%		5.3%	
	52	Legal and accounting activities; activities of head offices; management consultancy activities		1	213	172	135	136	654		570	409	408		3.1%		3.2%		3.0%	
	53	Architecture and engineering activities; technical testing and analysis		1	27	44	27	28	71		109	83	89		0.6%		0.5%		1.2%	
	54	Scientific research and development		1	6	7	8	7	24		28	24	28		0.1%		0.2%		0.3%	
	55	Advertising and market research		1	89	119	139	138	213		269	280	294		2.2%		1.6%		0.7%	
	56	Other professional, scientific and technical activities; veterinary activities		1	35	41	41	45	103		104	122	135		0.7%		0.7%		0.5%	
	57	Rental and leasing activities		1	12	31	31	26	45		77	82	126		0.5%		0.5%		0.8%	
	58	Employment activities		1	68	134	67	60	383		703	401	367		1.5%		2.8%		1.6%	
	59	Travel agency, tour operator reservation service and related activities		1	42	43	90	110	65		107	188	180		1.3%		0.8%		0.6%	
	60	Security and investigation activities; services to buildings and landscape activities; office administrative, office support and other business support		1	38	46	47	24	172		223	167	118		0.7%		1.0%		1.1%	
General government	61	Public administration and defence; compulsory social security		0	X	X	X	X	X		X	X	X		X		X		X	
	61+62	Education		1	347	320	390	347	1751		1593	1957	1772		6.5%		10.9%		8.9%	
Care and other service activities	63	Human health activities		0	X	X	X	X	X		X	X	X		X		X		X	
	63+64	Social work activities		1	61	36	54	342	360		311	424	835		2.2%		2.9%		5.9%	
Recreational, cultural and sporting activities	65	Creative, arts and entertainment activities; libraries, archives, museums and other cultural activities; gambling and betting activities		1	15	30	25	35	48		79	56	69		0.5%		0.4%		0.7%	
	66	Sports activities and amusement and recreation activities		1	5	3	7	4	13		13	21	16		0.1%		0.1%		0.3%	
Care and other service activities	67	Activities of membership organisations		1	20	20	22	28	52		59	62	71		0.4%		0.4%		0.5%	
	68	Repair of computers and personal and household goods		1	1	2	1	2	5		2	3	0		0.0%		0.0%		0.1%	
	69+70	Other personal service activities		1	4	16	6	6	22		117	24	25		0.1%		0.3%		0.4%	
	70	Activities of households as employers of domestic personnel and undifferentiated goods and services production of households for own use		0	X	X	X	X	X		X	X	X		X		X		X	
Total					4820	5867	5344	5765	14200		16793	17266	17128		100.0%		100.0%			

Annex G Summary of the results for selected activities on the DCS, in seaports and in the coastal area.

		2005	2008	2010	2011
Seaports (-/- Seashipping in seaports)	Number of employees	113	120	112	115
	Compensation of employees	6106	7106	6740	7024
	Number of employed persons	118	126	118	120
	Production	63199	85761	82592	95904
	Intermediate consumption	47342	68456	67575	79468
	Value added	15857	17305	15017	16436
	Value added (pricelevel 2005)	15857	17432	17225	17281
Coastal Zone	Number of employees	24	27	26	26
	Compensation of employees	722	853	842	853
	Number of employed persons	32	35	34	34
	Production	2537	2946	2755	2745
	Intermediate consumption	1219	1495	1388	1395
	Value added	1318	1451	1367	1350
	Value added (pricelevel 2005)	1318	1462	1330	1314
Total on land	Number of employees	138	147	138	140
	Compensation of employees	6828	7959	7583	7877
	Number of employed persons	150	161	151	154
	Production	65736	88707	85348	98649
	Intermediate consumption	48561	69951	68963	80864
	Value added	17175	18756	16384	17786
	Value added (pricelevel 2005)	17175	18895	18555	18595
Sea shipping	Number of employees	5.9	5.9	6.9	6.8
	Compensation of employees	326	387	458	418
	Number of employed persons	8.0	7.7	8.7	8.6
	Production	4913	4876	3885	3885
	Intermediate consumption	3576	3665	3158	3269
	Value added	1337	1211	727	616
	Value added (pricelevel 2005)	1337	1691	1385	1310
Fisheries	Number of employees	0.22	0.20	0.18	0.18
	Compensation of employees	13.4	12.4	12.2	12.7
	Number of employed persons	0.61	0.56	0.54	0.52
	Production	100.4	105.7	93.4	90.3
	Intermediate consumption	58.9	73.1	67.1	67.4
	Value added	41.5	32.5	26.3	23.0
	Value added (pricelevel 2005)	41.5	42.5	38.6	32.3
Oil and Gas extraction	Number of employees	2.5	2.8	2.3	2.7
	Compensation of employees	233	300	255	296
	Number of employed persons	2.5	2.9	2.3	2.7
	Production	5673	8477	5389	6004
	Intermediate consumption	1477	1642	1290	1256
	Value added	4196	6834	4099	4748
	Value added (pricelevel 2005)	4196	4142	3631	3360
Sand extraction	Number of employees	P.M.	P.M.	P.M.	P.M.
	Compensation of employees	P.M.	P.M.	P.M.	P.M.
	Number of employed persons	P.M.	P.M.	P.M.	P.M.
	Production	P.M.	P.M.	P.M.	P.M.
	Intermediate consumption	P.M.	P.M.	P.M.	P.M.
	Value added	P.M.	P.M.	P.M.	P.M.
	Value added (pricelevel 2005)	P.M.	P.M.	P.M.	P.M.
Wind energy	Number of employees	-	0.1	0.1	0.2
	Compensation of employees	-	5.5	6.3	7.5
	Number of employed persons	-	0.1	0.1	0.2
	Production	-	54	55	66
	Intermediate consumption	-	23	26	31
	Value added	-	31	29	35
	Value added (pricelevel 2005)	-	31	35	39
Total at sea	Number of employees	9	9	10	10
	Compensation of employees	572	705	731	734
	Number of employed persons	11	11	12	12
	Production	10686	13512	9423	10046
	Intermediate consumption	5111	5403	4541	4623
	Value added	5575	8109	4882	5422
	Value added (pricelevel 2005)	5575	5907	5089	4741
Total North Sea Economy	Number of employees	146	156	147	150
	Compensation of employees	7400	8664	8314	8611
	Number of employed persons	161	172	163	166
	Production	76422	102219	94770	108695
	Intermediate consumption	53673	75354	73504	85487
	Value added	22749	26865	21266	23208
	Value added (pricelevel 2005)	22749	24801	23644	23336

Annex H NACE 2008 Industry Classes

Northsea (NAMEA)	Northsea Description	SBI 2008	SBI+2008 Description
1	Arable farming	1	Crop and animal production, hunting and related service activities
2	Horticulture	1	Crop and animal production, hunting and related service activities
3	Animal farming	1	Crop and animal production, hunting and related service activities
4	Other agriculture	1	Crop and animal production, hunting and related service activities
5	Forestry and logging	2	Forestry and logging
6	Fishing and aquaculture	3	Fishing and aquaculture
7	Oil and gas industry	6	Extraction of crude petroleum and natural gas
7	Oil and gas industry	9	Mining support service activities
8	Other mining	8	Other mining and quarrying
8	Other mining	9	Mining support service activities
9	Manufacture of food products, beverages and tobacco products	10	Manufacture of food products
9	Manufacture of food products, beverages and tobacco products	11	Manufacture of beverages
9	Manufacture of food products, beverages and tobacco products	12	Manufacture of tobacco products
10	Manufacture of textiles, wearing apparel and leather products	13	Manufacture of textiles
10	Manufacture of textiles, wearing apparel and leather products	14	Manufacture of wearing apparel
10	Manufacture of textiles, wearing apparel and leather products	15	Manufacture of leather and related products
11	Manufacture of wood and of products of wood and cork,except furniture; manufacture of articles of straw and plaiting materials	16	Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials
12	Manufacture of paper and paper products	17	Manufacture of paper and paper products
13	Printing and reproduction of recorded media	18	Printing and reproduction of recorded media
14	Manufacture of coke and refined petroleum products	19	Manufacture of coke and refined petroleum products
15	Manufacture of chemicals and chemical products	20	Manufacture of chemicals and chemical products
16	Manufacture of basic pharmaceutical products and pharmaceutical preparations	21	Manufacture of basic pharmaceutical products and pharmaceutical preparations
17	Manufacture of rubber and plastics products	22	Manufacture of rubber and plastics products
18	Manufacture of other non-metallic mineral products	23	Manufacture of other non-metallic mineral products
19	Manufacture of basic metals	24	Manufacture of basic metals
20	Manufacture of fabricated metal products, except machinery and equipment	25	Manufacture of fabricated metal products, except machinery and equipment
21	Manufacture of computer, electronic and optical products	26	Manufacture of computer, electronic and optical products
22	Manufacture of electrical equipment	27	Manufacture of electrical equipment
23	Manufacture of machinery and equipment n.e.c.	28	Manufacture of machinery and equipment n.e.c.
24	Manufacture of motor vehicles, trailers and semi-trailers	29	Manufacture of motor vehicles, trailers and semi-trailers
25	Manufacture of other transport equipment	30	Manufacture of other transport equipment
26	Manufacture of furniture; other manufacturing	31	Manufacture of furniture
26	Manufacture of furniture; other manufacturing	32	Other manufacturing
27	Repair and installation of machinery and equipment	33	Repair and installation of machinery and equipment
28	Electricity, gas, steam and air conditioning supply	35	Electricity, gas, steam and air conditioning supply
29	Water collection, treatment and supply	36	Water collection, treatment and supply
30	Sewerage; waste collection, treatment and disposal activities; materials recovery; remediation activities and other waste management services	37	Sewerage
30	Sewerage; waste collection, treatment and disposal activities; materials recovery; remediation activities and other waste management services	38	Waste collection, treatment and disposal activities; materials recovery
30	Sewerage; waste collection, treatment and disposal activities; materials recovery; remediation activities and other waste management services	39	Remediation activities and other waste management services
31	Recycling	38	Waste collection, treatment and disposal activities; materials recovery
32	Construction of buildings	41	Construction of buildings
33	Construction of roads etc	42	Civil engineering
34	Other construction	43	Specialized construction activities
35	Wholesale and retail trade and repair of motor vehicles and motorcycles	45	Wholesale and retail trade and repair of motor vehicles and motorcycles
36	Wholesale trade, except of motor vehicles and motorcycles	46	Wholesale trade, except of motor vehicles and motorcycles
37	Retail trade, except of motor vehicles and motorcycles	47	Retail trade, except of motor vehicles and motorcycles
38	Land transport and transport via pipelines	49	Land transport and transport via pipelines
39	Water transport	50	Water transport
40	Air transport	51	Air transport
41	Warehousing and support activities for transportation	52	Warehousing and support activities for transportation
42	Postal and courier activities	53	Postal and courier activities
43	Accommodation; food and beverage service activities	55	Accommodation
43	Accommodation; food and beverage service activities	56	Food and beverage service activities
44	Publishing activities	58	Publishing activities
45	Motion picture, video and television programme production, sound recording and music publishing activities; programming and broadcasting activities	59	Motion picture, video and television programme production, sound recording and music publishing activities
45	Motion picture, video and television programme production, sound recording and music publishing activities; programming and broadcasting activities	60	Programming and broadcasting activities
46	Telecommunications	61	Telecommunications
47	Computer programming, consultancy and related activities; information service activities	62	Computer programming, consultancy and related activities
47	Computer programming, consultancy and related activities; information service activities	63	Information service activities
48	Financial service activities, except insurance and pension funding	64	Financial service activities, except insurance and pension funding
49	Insurance, reinsurance and pension funding, except compulsory social security	65	Insurance, reinsurance and pension funding, except compulsory social security
50	Activities auxiliary to financial services and insurance activities	66	Activities auxiliary to financial service and insurance activities
51	Real estate activities	68	Real estate activities
52	Legal and accounting activities; activities of head offices; management consultancy activities	69	Legal and accounting activities
52	Legal and accounting activities; activities of head offices; management consultancy activities	70	Activities of head offices; management consultancy activities
53	Architecture and engineering activities; technical testing and analysis	71	Architectural and engineering activities; technical testing and analysis
54	Scientific research and development	72	Scientific research and development
55	Advertising and market research	73	Advertising and market research
56	Other professional, scientific and technical activities; veterinary activities	74	Other professional, scientific and technical activities
56	Other professional, scientific and technical activities; veterinary activities	75	Veterinary activities
57	Rental and leasing activities	77	Rental and leasing activities
58	Employment activities	78	Employment activities
59	Travel agency, tour operator reservation service and related activities	79	Travel agency, tour operator, reservation service and related activities
60	Security and investigation activities; services to buildings and landscape activities; office administrative, office support and other business support	80	Security and investigation activities
60	Security and investigation activities; services to buildings and landscape activities; office administrative, office support and other business support	81	Services to buildings and landscape activities
60	Security and investigation activities; services to buildings and landscape activities; office administrative, office support and other business support	82	Office administrative, office support and other business support activities
61	Public administration and defence; compulsory social security	84	Public administration and defence; compulsory social security
62	Education	85	Education
63	Human health activities	86	Human health activities
64	Social work activities	87	Residential care activities
64	Social work activities	88	Social work activities without accommodation
65	Creative, arts and entertainment activities; libraries, archives, museums and other cultural activities; gambling and betting activities	90	Creative, arts and entertainment activities
65	Creative, arts and entertainment activities; libraries, archives, museums and other cultural activities; gambling and betting activities	91	Libraries, archives, museums and other cultural activities
65	Creative, arts and entertainment activities; libraries, archives, museums and other cultural activities; gambling and betting activities	92	Gambling and betting activities
66	Sports activities and amusement and recreation activities	93	Sports activities and amusement and recreation activities
67	Activities of membership organisations	94	Activities of membership organizations
68	Repair of computers and personal and household goods	95	Repair of computers and personal and household goods
69	Other personal service activities	96	Other personal service activities
70	Activities of households as employers of domestic personnel and undifferentiated goods and services production of households for own use	97	Activities of households as employers of domestic personnel

Annex I Glossary

Employed persons: are all persons who are working for a business unit or private household residing in the Netherlands. Employed persons include all persons who:

– have a paid job for at least one hour a week.

– perform a job of which the payment is withheld from registration of tax and/or social insurance authorities, while the work itself is legal.

– are temporarily not working (due to illness, bad weather, etc.), but who continue to receive their remuneration.

– have taken a temporarily unpaid leave.

Employed persons may either be employees or self-employed.

Employee: Resident or non-resident who is employed under contract and who receives wage as compensation. This excludes self-employed individuals. Managing directors of limited companies are considered to be employees.

Self-employed: individual that earns his/her income by performing labour on his/her own (company, profession) or who cooperate in the business of their family. The latter are not counted as self-employed if there is an employment contract

Compensation of employees: The total remuneration paid by employers to their employees in return for work done. Even if they are actually withheld by the employer and paid directly to tax authorities, social security schemes and pension schemes Compensation of employees is distinguished between wages and salaries and employers' social contributions.

Full-time equivalent job: Labour input in full-time equivalent jobs is calculated by expressing all jobs (be it full-time, part-time or flexible) to full-time equivalents. The full-time equivalent is obtained by dividing the annual contractual hours of the job by the annual contractual hours considered full-time (in the same branch of industry). Two half-time jobs thus add up to one full-time equivalent. For self-employed (mostly not included in the figures in this paper) the full-time equivalent is the quotient of the usual weekly work hours of that job and the average weekly work hours of self-employed with 37 or more normal weekly hours (in the same branch of industry).

Production / Output: The value of all goods produced for sale, including unsold goods, and all receipts for services rendered.

Intermediate consumption: All goods and services used up in the production process in the accounting period, regardless the date of purchase. This includes for example fuel, raw materials, semi manufactured goods, communication services, cleansing services and audits by accountants.

Value added: The difference between output and intermediate consumption.

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Explanation of symbols

.	Data not available
*	Provisional figure
**	Revised provisional figure (but not definite)
x	Publication prohibited (confidential figure)
–	Nil
–	(Between two figures) inclusive
0 (0.0)	Less than half of unit concerned
empty cell	Not applicable
2013–2014	2013 to 2014 inclusive
2013/2014	Average for 2013 to 2014 inclusive
2013/'14	Crop year, financial year, school year, etc., beginning in 2013 and ending in 2014
2011/'12–2013/'14	Crop year, financial year, etc., 2011/'12 to 2013/'14 inclusive

Due to rounding, some totals may not correspond to the sum of the separate figures.

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