



2009 - 2015

# Policy Document on the North Sea





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22 December 2009

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# 1 Introduction

The aim of this North Sea Policy Document is to provide transparency about the central government's North Sea policy choices in the National Water Plan. This involves:

- providing insight into the considerations underlying these choices;
- giving direction to policy implementation;
- specifying the relationship with adjoining policy domains, where necessary.

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## 1.1 North Sea policy

The central government's North Sea policy provides a general framework for the reciprocal (spatial) co-ordination of users and the use of space in relation to the marine ecosystem and the experience-related value of the territorial waters and the Exclusive Economic Zone (EEZ) offshore from the municipally zoned areas. In addition, North Sea policy is specifically geared to preserving and reinforcing the quality of the marine environment. It encompasses a comprehensive framework for all specific policy choices that are to be made in the 2009-2015 planning period of the National Water Plan. The Plan is not about specific policy for individual users of the sea.

Where the North Sea is concerned, the National Water Plan supersedes the Fourth National Policy Document on Water Management and section 4.7 (North Sea) of the National Spatial Strategy as well as references to other sections it contains. This policy document is part of the National Water Plan and should be read in conjunction with it. It details and substantiates the policy choices and their implementation as contained in the main body of the National Water Plan on this subject.

## 1.2 Administrative and legal framework

The North Sea covers an area of 575,000 km<sup>2</sup>, with a Dutch section of approx. 58,000 km<sup>2</sup>, which is 10% of the entire North Sea and over one and a half times the size of the land mass of the Netherlands. Approximately one kilometre out to sea, the North Sea is outside municipal and provincial zones.<sup>1</sup> Beyond that, policy for and management of the North Sea is the direct responsibility of the central government. A distinction is made between the territorial sea (within the 12-mile zone) and the EEZ. Dutch jurisdiction with regard to the latter is more restricted than it is over the 12-mile zone. Moreover, on the North Sea, there is no question of land ownership. Users and interest groups are the primary North Sea stakeholders.

North Sea policies are largely determined by international frameworks. The United Nations Conference on the Law of the Sea (UNCLOS) is the legal framework within which all sea-related measures must be taken. Globally, agreements are made in various contexts about sea-linked activities and protection of the marine environment. The Netherlands is party to the London Convention and the accompanying London Protocol of 1996, which imposes global, stringent restrictions on the dumping and incineration of waste. The MARPOL International Convention for the Prevention of Pollution from Ships (IMO) is of importance for maritime transport. This convention regulates the pollution from shipping (e.g. oil

pollution and the use of antifouling products). A further treaty is the Ballast Water Convention concerned with preventing the introduction of 'alien species'. Moreover, the Netherlands is also party to the OSPAR Convention for the protection of the marine environment of the North-East Atlantic. At European level, the Birds and Habitats Directives (VHR), and the Marine Strategy Framework Directive (MSFD) serve as guiding frameworks. The aim of the latter is to establish good environmental conditions in the water system and to achieve a sustainable balance between economy and ecology. The Common Fisheries Policy (CFP) provides the stipulations for fishing policy at the European level.

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<sup>1</sup> The 1-km border is measured from the low-tide mark. See for the delineation: Act of 2 November 1990 containing the regulation on the provincial and municipal boundaries along the North Sea coast from the municipality of Den Helder up to and including that of Sluis, and an amendment of the Grants to Municipal Authorities Act (Bulletin of Acts and Decrees 1990, 553). The boundary at the Maasvlakte area is set at 3 kilometres. See also the Act of 8 December 1980 on the provincial layout of the Wadden Sea (Bulletin of Acts and Decrees 1980, 670) and the Act of 12 December 1985 on the municipal layout of the Wadden Sea (Bulletin of Acts and Decrees 1985, 648).

### 1.3 Elaboration of North Sea policy

The Minister for Transport and Public Works co-ordinates the integrated North Sea policy and management.<sup>2</sup> An Interministerial Consultation Body for North Sea Governance (IDON)<sup>3</sup> assists the Minister in formulating, implementing and evaluating policy, monitoring the implementation of the integrated North Sea policy. Where management is concerned, the North Sea Agency of the Directorate-General for Public Works and Water Management has a co-ordinating task. The North Sea policy in the National Spatial Strategy is specified in greater detail in the Integrated Management Plan for the North Sea 2015. Where required, this plan will be amended in 2010, after adoption of the National Water Plan.

<sup>2</sup> At the time the National Water Plan was adopted, this responsibility was vested in the State Secretary for Transport and Public Works

<sup>3</sup> Participants: Ministries of Transport and Public Works; Economic Affairs; Agriculture, Nature Management and Fisheries; Housing, Spatial Planning and the Environment; Defence.

## Document structure

This appendix is structured in the same way as section 5.6 North Sea of the National Water Plan.

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Chapter 2 describes the changing use of the North Sea, as well as new social issues and related policy developments. The social development tasks that are the starting points for the reassessment of the North Sea policy are derived from this.

Chapter 3 contains an overview of the translation of the social development tasks into North Sea policy targets and options.

Chapters 4, 5 and 6 explain and detail, where necessary, the policy options for the 2009-2015 planning period.

Chapter 7 describes the decision-making framework for activities on the North Sea.

Chapter 8 contains an overview of the 2009-2015 agenda and the funding.

The appendices give an overview of research reports, studies, literature and protocols of meetings used in formulating policy for the North Sea, and present an overview of co-ordinates of the areas shown in the framework vision map that are to be designated.

# 2 Analysis

This chapter describes the changing use of the North Sea, as well as new social issues and related policy developments. The social development tasks that are the starting points for the reassessment of the North Sea policy are derived from this.

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## 2.1 Sand extraction

### Current situation

Of all the countries around the North Sea, the Netherlands extracts most sand – in excess of 25 million m<sup>3</sup> every year.<sup>4</sup> This is approximately half of the total annual sand demand in the Netherlands. Some 12 million m<sup>3</sup>/year is extracted for coastal replenishment. Marine sand is also used as fill sand on land (approx. 13 million m<sup>3</sup>/year). Little coarse industrial sand is extracted from the Dutch section of the North Sea. Gravel as a by-product of sand is extracted in very small quantities only. Potential extraction areas for concrete and masonry sand are located in an area to the west of the islands of Zuid-Holland and Zeeland. Because this sand is located some metres below the seabed, large quantities of sand also have to be removed from the cover layer. Sand extraction for the Maasvlakte 2 area will take place at a single location. The creation of this area will result in an extremely large-scale extraction of marine sand (up to 365 million m<sup>3</sup>). In addition to sand, shells are also fished at sea.

In 2004, the added value and production value of sand extraction amounted to €11.9 million and €49.7 million a year, respectively. For 2015, these values have been estimated at €21.1 million and €91.1 million, respectively, not taking into account implementation of the Delta Committee's recommendations<sup>5</sup>.

### Possible developments

The Delta Committee<sup>6</sup> advises basing extraction work on a sea level rise of 130 cm by 2100. This should result in an increase in the quantity of replenishment sand up to 85 million m<sup>3</sup> a year. A further suggestion is to extend the coastline by one kilometre, which would result in a maximum of 40 million m<sup>3</sup> additional replenishment sand per year. If the aim is to widen the dykes and built terps on land, this would lead to a major increase in the demand for marine sand. Up to a maximum of 20 million m<sup>3</sup> of sand will be extracted for the possible construction of the Westerschelde container terminal. An increase of up to 25 million m<sup>3</sup> per year is estimated for using marine sand as fill sand on land.

### Policy

The task involves guaranteeing sufficient affordable sand for coastal safety, building activities and infrastructure, and, in the light of climate change, spatially enabling new sand extraction strategies. Sand must be extracted in a socially acceptable way. The starting point of policy on raw materials for the construction industry is an economical and high-quality use, which means that high-grade coarse sand and gravel may no longer be used for filling purposes.

Further conditions for extracting sand, gravel and shells from the sea are included in the Policy Rules for Earth Removal in National Waters. Large-scale extraction of marine sand is subject to an environmental impact assessment (MER).

## 2.2 Energy

### Current situation

At present, the North Sea makes a substantial contribution to the Netherlands' energy provision and export potential. Annual proceeds of oil and gas recovery total some €5 billion. There are 143 production facilities at sea, 92% of which are for gas extraction and 8% for oil. A third of all gas and over 80% of oil recovered in the Netherlands is sourced at sea. For the distribution of oil and gas, these facilities are linked to an extensive network of pipelines. For gas, these land in Velsen, Callantsoog and Uithuizen. Oil pipes surface at Hoek van Holland and IJmuiden. Two wind farms have been built off the Noord-Holland coast, with a total capacity of 228 MW: the Egmond aan Zee Offshore Windpark and the Princess Amalia Windpark. An additional 950 MW of wind energy is to be commissioned by 2011.

### Possible developments

#### *Oil and gas recovery*

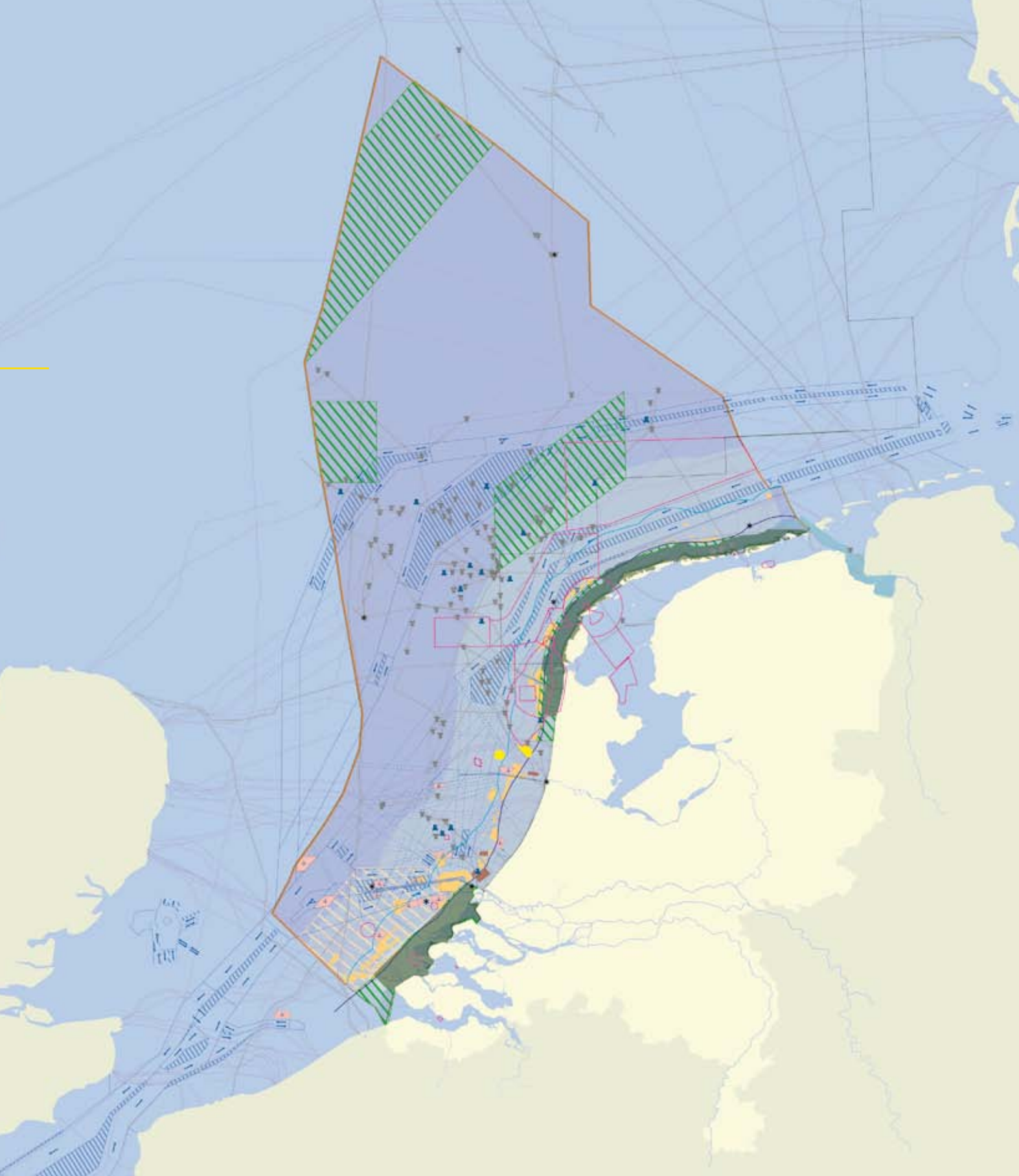
Expectations are that in the next ten years only a limited number of new extraction areas are to be developed in the North Sea (two to four a year). The rate at which existing recovery fields are being dismantled depends, among other things, on the

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<sup>4</sup> National Committee for the Co-ordination of Earth Removal Policy.  
<sup>5</sup> Exploration of economic and spatial developments in the North Sea, Ministry of Transport and Public Works (July 2008).  
<sup>6</sup> Working with Water, findings of the Delta Committee (2008)



## Current space utilisation in the North Sea



- basis**
- boundary of territorial waters (12-mile zone)
  - continuous NAP -20m line
  - Exclusive Economic Zone
  - equidistance line for territorial sea in 2009
  - Ems-Dollard treaty area 2009
- oil and gas recovery platforms**
- platform
  - underwater platform
- cables and pipes**
- electricity, telecommunications or control cables
  - pipeline
- measuring stations**
- measuring site on the North Sea for meteorological and/or oceanographic measurements
- marine ecological system**
- national ecological network [EHS]
  - designated Natura 2000 areas
  - Natura 2000 areas to be designated in 2010
- defence**
- military training areas (incl. munitions dump)
- shipping infrastructure**
- boundary of traffic separation schemes
  - clearways
  - anchoring area
  - traffic separation zone
- wind energy areas**
- wind farms
- fishing**
- outer limits of plaice box
- sand extraction and shell fishing**
- current sand extraction area
  - reserve area for concrete and masonry sand
  - reserve area for shell fishing
- dumping areas**
- dredging sludge depot



price of oil. It is expected that most fields will be closed down between 2020 and 2030 because they have been exhausted.

#### *Carbon capture and storage*

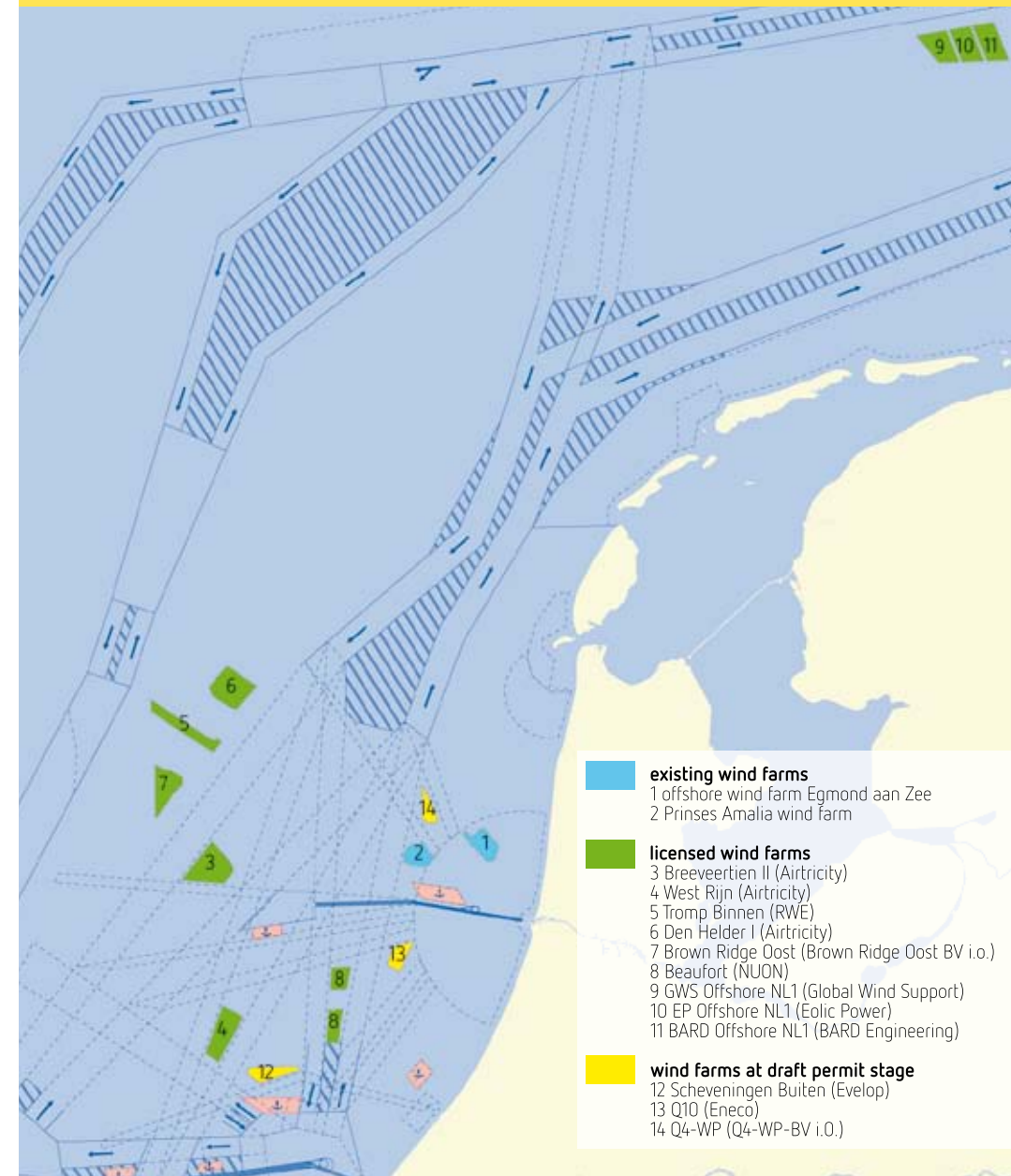
In the coming decades, fossil energy will remain an important resource but it must be cleaner. This can be achieved – as an inevitable interim step in the transition to sustainable energy management – by capturing CO<sub>2</sub> at source and transporting it to deep underground storage facilities. Depleted gas fields and their associated pipelines are potential future spaces for CO<sub>2</sub> storage, and the area to the north-west of Texel is a particular site for large-scale storage. Locations of certain underground water-retentive soil strata (aquifers) might also be used for CO<sub>2</sub> storage. However, use at this scale is not expected before 2020.

#### *Sustainable energy at sea*

The sustainable resource that offers the most promise for the coming decades is wind energy. In order to meet electricity demands using sustainable sources, the focus both on land and at sea is on this form of energy. At present, solar energy only accounts for a small fraction, but this may well increase after 2020. Solar energy will be generated primarily on land, as the corrosive North Sea environment is not eminently suitable for that.

## Overview of licensed wind farms and those at the draft permit stage

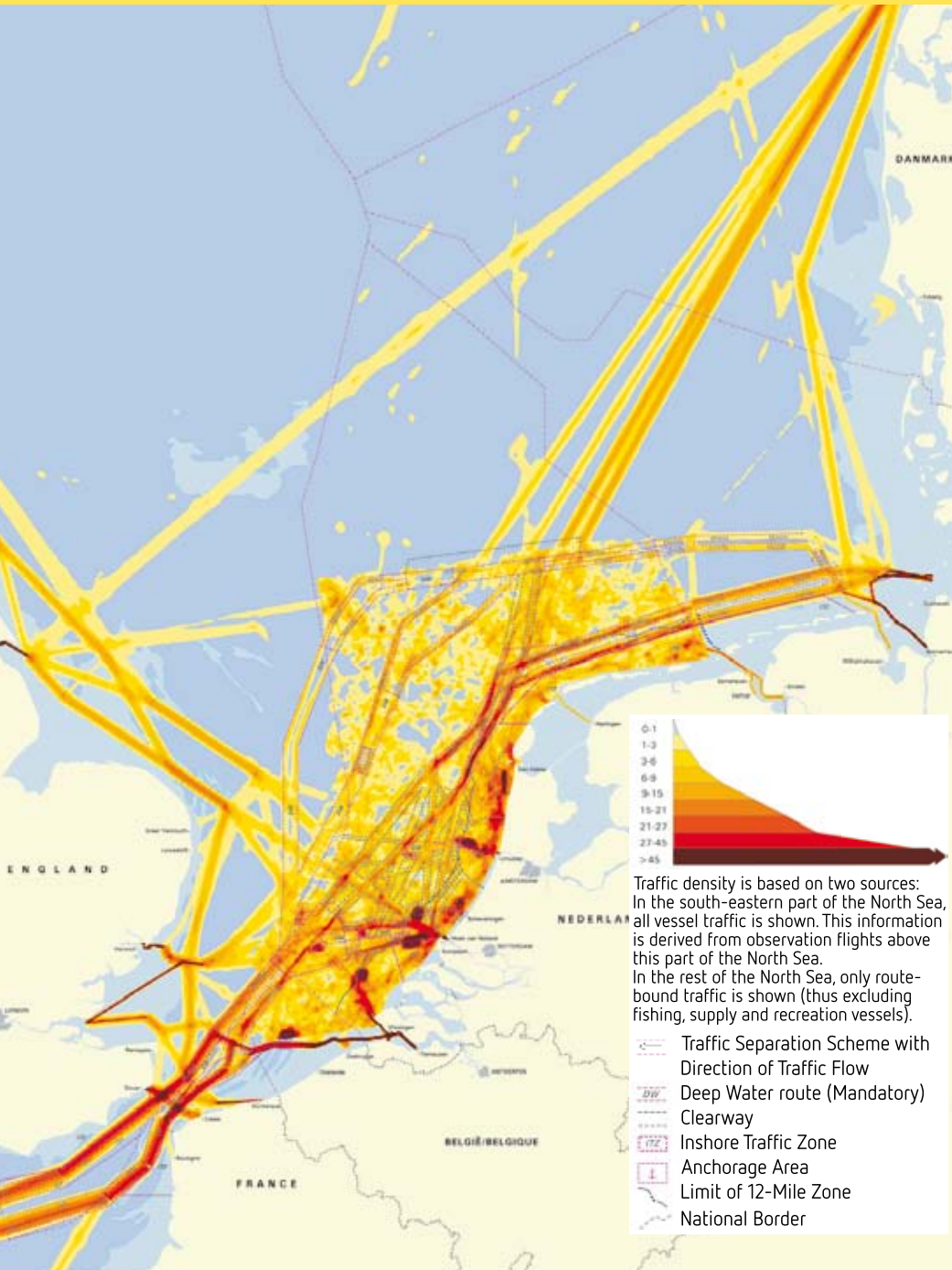
source: Directorate-General for Public Works and Water Management / North Sea Directorate



## Shipping on the North Sea

sources: MARIN, TNO-NITG, Netherlands Hydrographic Service

Traffic intensity  
in number of ships/1000km<sup>2</sup>



Ideas for building an island at sea for storing electricity are also in the pipeline. The reason for storage is to counteract the imbalance between supply and demand. Storage at sea could be combined with forms of sustainable energy.

### Policy

In the Energy Report<sup>7</sup> the Cabinet is assuming a substantial global increase in demand in the next decades. Fossil fuels will remain the key sources of energy. Policy is geared to exploiting available resources as comprehensively as possible and to maximising the contribution of ‘small fields’ (‘small field policy’).

Two pilot schemes have been envisaged for CO<sub>2</sub> storage on the Dutch coast between Rotterdam and IJmuiden in the planning period up to 2015.

The Cabinet intends to use sustainable sources to meet a substantial part of the demand for electricity. The Cabinet programme ‘Clean and Efficient’<sup>8</sup> targets a sustainable energy generation of 20% by 2020, with the target increasing to 40% by 2050. A target figure of an installed power capacity of 6,000 MW of wind

<sup>7</sup> Energy Report 2008, Lower House of the States General, session year 2007-2008, 31510, no. 1.

<sup>8</sup> Working programme Clean and Efficient, New Energy for Climate Policy, Lower House of the States General, session year 2007-2008, 31209, nr 1.

energy in the North Sea in 2020 has been formulated. In terms of space, this equals at least 1,000 km<sup>2</sup>. An additional 950 MW of wind energy will be commissioned by 2011.

Until 1 April 2008, an exclusion policy applied to the system of issuing permits for wind energy areas. With the exception of the statutory 500-metre safety zones around shipping routes and oil and gas platforms, areas outside the 12-mile zone (in connection with unobstructed views of the horizon from the coast) and the area to the south of the Euro-Maasgeul shipping channel, interested market parties could, in principle, apply for permits for building wind farms throughout the EEZ. Seventy-nine initiatives were proposed between 2005 and 2008, each of which was separately assessed in conjunction with other uses and the marine ecosystem.

The development of insights, and hence also differences of opinion between stakeholders themselves and between stakeholders and the central government with regard to the balancing of interests and the associated huge administrative burdens for all involved, led to an undesirable situation for all. The Cabinet discontinued this permit system in April 2008 and announced a new policy.<sup>9</sup> Decisions will be taken on the last applications for permits in the current system in December 2009. The Cabinet has announced that it will be designating wind energy areas as an outcome of a careful and comprehensive consideration of spatial interests in the National Water Plan by 2010 at

the latest. The system of issuing permits will also be reviewed.

The North Sea is regarded as an icon of power generation with opportunities for large-scale wind energy, but for example also the production of aquatic biomass as well as wave and tidal energy. For the long range, there are also opportunities for further growth and an international approach towards linking North Sea energy sources to a North Sea grid.

In October 2008, the central government and energy companies signed an energy sector agreement on a joint approach to achieving climate and energy targets advocated by the government. These agreements pertain, among others, to the development of wind farms at sea, in connection with which it was agreed that a joint phased plan would be drafted, indicating what is required to achieve these ambitions before 2020.

## 2.3 Shipping

### Current situation

With some 260,000 shipping movements a year, the North Sea is one of the busiest seas in the world. Over 110,000 of these movements are to and from Dutch seaports.<sup>10</sup> The economic value of ocean transport to the Dutch economy is great, mostly because of the direct and indirect significance of Dutch seaports, of which Rotterdam is one of the largest in the world.

The Dutch seaports are intersections for international goods flows and a choice site for industry and services and as such, they fulfil a key role in the Dutch economy. As transit ports for the chief economic centres of Western Europe, the Dutch seaports achieve economies of scale and scope for the transport sector (inland shipping, rail and road transport) and the suppliers of firms in the seaport area.

The importance of the seaports as a whole (including allied industries, inland transport and services) is far greater and lies somewhere in the region of €23 billion a year (approx. 7% of GNP). In 2006, some

<sup>9</sup> Amendment of policy regulation concerning application of the Public Works (Management of Engineering Structures) Act in the EEZ, in Government Gazette of 7 April 2008, no. 7, p. 23; Letter from the State Secretary for Transport and Public Works, Lower House of the States General, session year 2007-2008, 31209, no. 26.

<sup>10</sup> [www.havenraad.nl/feitenencijfers](http://www.havenraad.nl/feitenencijfers) [fact and figures].

<sup>11</sup> Exploration of economic and spatial developments in the North Sea, Ministry of Transport and Public Works (July 2008).

## Traffic systems in the Dutch part of the North Sea

The Dutch part of the North Sea is subject to three routing measures, two of which have been established internationally.

First of all, traffic separation schemes are in place as adopted by the United Nations International Maritime Organization (IMO). The purpose of these schemes is to regulate traffic to prevent the risk of collision between vessels. The indirect obligation for shipping to comply with these schemes is governed by Article 10 of the Collision Regulations (Colregs), which implies that to comply with the Colregs, any merchant vessel will have to use the nearby traffic regulation scheme.

The IMO has also adopted the international mandatory Deep-water route that tankers on the Dutch part of the North Sea have to take. This route is part of the set of traffic separation schemes on the North Sea. The reason behind establishing mandatory routes for tankers is the special international status of the Wadden Sea as a Particularly Sensitive Sea Area (PSSA). To protect PSSAs, additional measures must be

taken to safeguard them from the consequences of an oil tanker accident. The mandatory route is further off the coast, so that any oil spill resulting from an accident can be controlled before it reaches the protected area. Tankers are also obligated to travel the shortest route between harbour access and the Deep-water route and vice versa.

Finally, there are the clearways – routes defined on the basis of normal traffic flows in which no mining installations may be built. Ships are not obligated to use these routes, which have been laid down in regulations pertaining to the Mining Act for the Continental Shelf (Mijnbouwwet Continentaal Plat). By stipulating that these routes must be kept free from obstacles, these clearways are given the status of “recognised sea lane essential for navigation” as intended in Article 60, paragraph 7 of the United Nations Convention on the Law of the Sea. This means that they must, in principle, be kept free of all obstacles, including wind farms.

163,000 people were employed in the port areas, almost 2% of total employment in the Dutch economy. The direct economic value of maritime transport (ports and transshipment) was about €2.5 billion in 2004, providing employment for over 10,000 people.<sup>11</sup>

### Possible developments until 2015

Until 2015, an increase of between 14 and 30% in numbers of shipping movements compared to 2004 is expected. Various factors play a part in this:

- 1 Increase in shipping movements due to growing transport volumes;
- 2 Decrease in shipping movements due to larger ship and improved loading;
- 3 Increase in shipping movements due to shift from road transport to shipping;
- 4 Increase in shipping movements due to larger seaport capacities (e.g. Maasvlakte 2).

The available capacity of the shipping infrastructure is large enough to accommodate the expected growth in the number of shipping movements up to 2015.

### Possible developments after 2015

Shipping traffic on the North Sea will not only become busier, but also more diverse. In addition to merchant shipping, sea towage and hydraulic engineering work, this comprises fishing and

<sup>11</sup> Maritime Transport Policy Paper, Responsible Shipping and a Vital Fleet, Lower House of the States General, session year 2008-2008, 31409, no. 2.

increased pleasure boating. This means that ships with different manoeuvring characteristics, dimensions and speed all converge in a small area.<sup>12</sup>

#### *Oil transport*

Because global oil production is dropping, the transport of oil by sea will decrease in the long term. This may be compensated in part by the transport of biofuel.

#### *Liquefied Natural Gas (LNG)*

The transport of LNG is set to grow in the future. Landing points can be created in the Maasvlakte area.

#### *Containers*

The volume of container transport and transshipment is rising sharply. By 2040, the current volume will have increased by 50% up to as much as 300%, with the Maasvlakte 2 area, currently under construction, playing a key role in accommodating this growth. The scaling-up of ships is a significant development. Due to draught restrictions, a number of ports in the region will be less suitable or not suitable at all for landing containers. Rotterdam, Antwerp, Hamburg, Bremerhaven and Willemshaven will be the focus for container transport. After landing, the containers are taken on smaller ships to other seaports, and from there inland by road, rail and waterways.

#### *Ports*

The increase in the demand for space for ports until 2040 is between -9 and +30%. The seaward extension

of seaport activities would seem the most logical development.

#### **Policy**

The Dutch maritime navigation policy as established in the Maritime Transport Policy Paper 'Responsible Shipping and a Vital Fleet' (2008) has the following ambitions:

- permanently improving the safety of maritime transport, in particular on the North Sea, to prevent damage to people, the environment and the economy;
- maintaining and enhancing the maritime transport sector's contribution to the maritime cluster and hence the Dutch economy;
- permanently improving the ecological performance of maritime transport, which includes reducing emissions to the air, to ensure as low an environmental impact as possible.

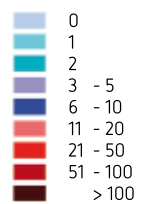
Seaport policy is laid down in the policy document Seaports: Anchors of the Economy/National Seaport policy 2005-2010. Maintaining and improving accessibility of the seaports and creating physical space for growth are key. In economic terms, this translates into providing and maintaining sufficient navigable waterways as well as entrance areas and 'access gates' (Euro-/Maasgeul and IJ-geul to the Dutch ports from Rotterdam, Amsterdam and elsewhere) with adequate draught.

International routing measures, the national clearway system, entrance areas to ports, anchoring areas and shipping-free zones around fixed obstacles have been put in place to guarantee safe and smooth shipping. Use of this system of shipping routes is not obligatory although since 1997, larger (loaded) tankers transporting oil, chemicals and gas are obliged to use the deepwater routes of the traffic separation system further out of the coast. Moreover, the government has a body of traffic tools at its disposal, including waterway marking, traffic guidance, piloting, information provision and navigation.

## North Sea Fishing

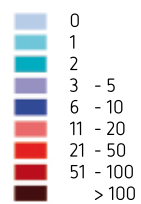
Fishing frequency, number of ships each year (average 2006-2008)

### otter trawling



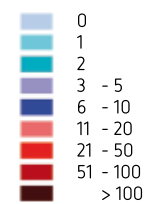
source: Imares

### beam trawl fishing



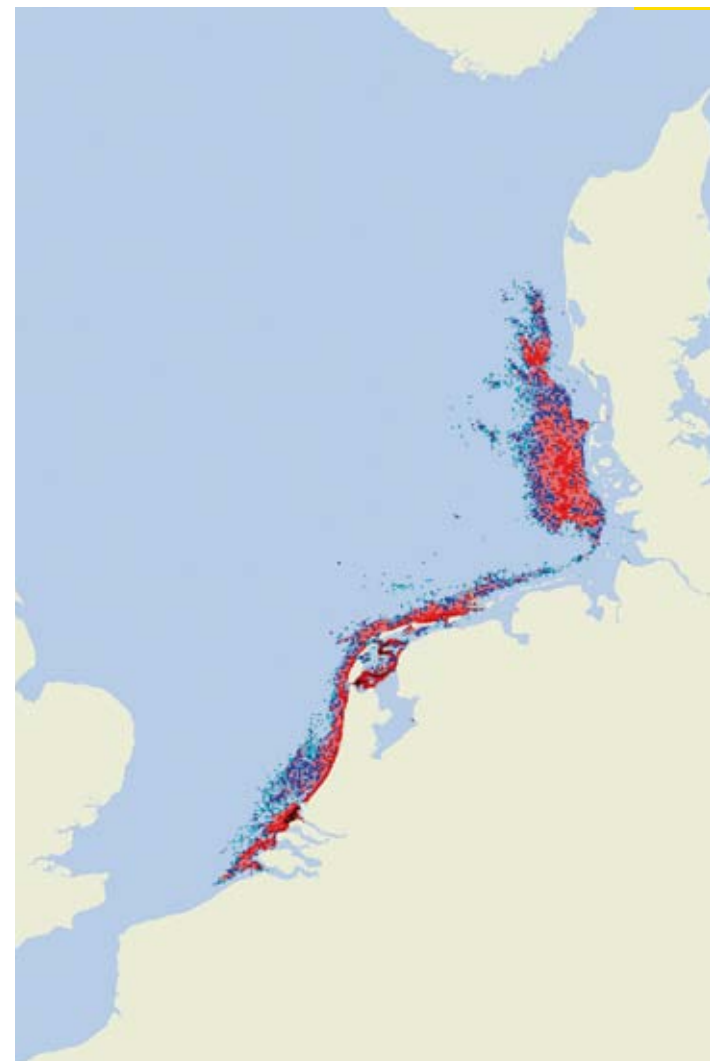
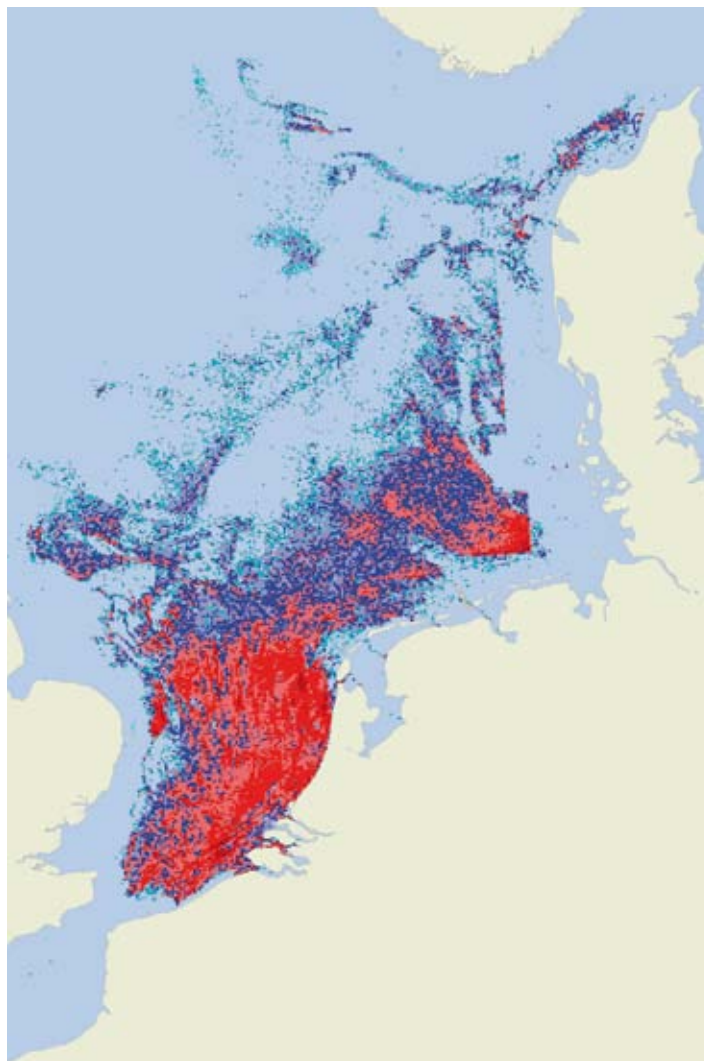
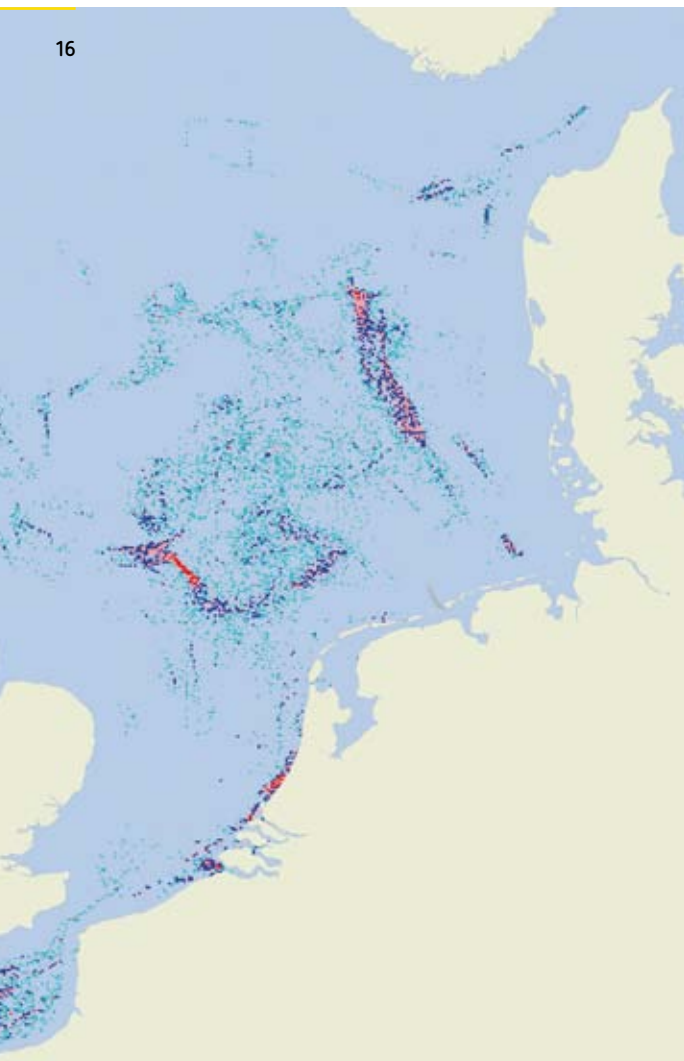
source: Imares

### shrimp fishing



source: Imares

16





## 2.4 Fishing

### Current situation

In 2006, the Dutch offshore fishing sector had some 440 vessels and over 2,000 crew. In economic terms, plaice and sole are the major types of fish for the sector and for employment (crew numbers on the fleet and on-shore employment). Herring and mackerel and fishing for similar varieties outside EU waters are the major varieties of fish in terms of catch tonnage.

Shellfish and shrimp fishing also form a substantial part of the sector and take place in the coastal waters and in the Wadden Sea. In 2006, sector turnover totalled approx. €440 million (0.1% of GNP; not including the processing industry).

In addition to its economic significance, the Dutch fishing industry has an important social and cultural significance due to its traditional alliance with the country.

### Possible developments until 2015

The Dutch North Sea fishing sector is a highly specialised entrepreneurial industry that is under increasing pressure due to a number of developments:

- Fishing methods used (beam trawling) are very energy-intensive;
- The sector has an economic overcapacity and catch yields are restricted by the Common Fisheries Policy;

- Social pressure on the sector to produce in a more eco- and animal-friendly way is growing;
- The space in the North Sea available for fishing is coming under increasing pressure.

It is expected that as a result of the above trends, there will be an 8% to 50% decrease in the economical value of fishing on the Dutch continental shelf in the 2005-2015 period. At the same time, there will be opportunities for the sector to distinguish itself by responsible fishing using ecolabels for consumers (Marine Stewardship Council, MSC).

### Possible developments after 2015

#### *Sustainable fishing*

Consumers, the Dutch government and the EU are bringing pressure to bear on the sector to produce sustainably. The process of transformation that has been initiated is, in all likelihood, set to continue after 2015.

#### *Climate change*

The consequences of climate change for the fishing sector are still largely unknown. Some fish species may move north and hence become less attractive in economical terms, and perhaps new and economically interesting species may arrive in the area.



## Policy

Policy for Dutch offshore fishing is determined in large measure by the Common Fisheries Policy (CFP), whose key target is to preserve fish stocks to enable sustainable fishing. The Common Fisheries Policy is grounded in three management considerations:

- 1 fleet management, i.e. management of its scope;
- 2 stock management, in the context of which available catches are allocated as quotas;
- 3 specific management and recovery measures for specifically protecting vulnerable stocks or stocks below the safe biological minimum.

Due to recent reforms of the CFP in 2003, major progress has been made with regard to sustainability and management of a large number of fish stocks. However, the Commission does not consider this sufficient and is now conducting an extensive evaluation of these reforms. Within the CFP, the Ministry of Agriculture, Nature and Food Quality is committed to sustainable fishing with good perspectives for both the environment and the fishing sector itself.

National policy is geared towards promoting responsible fishing and a balanced exploitation, towards achieving an equilibrium between fishing and nature and a new division of responsibilities between the government and the industry.

## 2.5 Defence

### Current situation

Some 7% of the EEZ is used as military (training) area. These areas are:

- shooting ranges;
- flying zones;
- mine testing areas;
- former munitions dumping sites.

### Possible developments

No changes regarding requirements are expected in the near future.

### Policy

To train different types of defence activities and test resources, training grounds of sufficient size at sea are needed to ensure the national safety of the Netherlands. The aim of spatial defence policy is to ensure that sufficiently large defence areas are available for military activities in the Netherlands, including those in the North Sea. In 2004, the defence grounds were laid down for a period of ten years in the Second National Structure Plan for Military Areas.<sup>13</sup> Shared use of these areas is permitted where this is compatible with military training taking place there. Reference is made to the Mining Regulations for an exact delineation of these areas.

## 2.6 Tourism and leisure activities

### Current situation

The Dutch coast is a national and international tourist attraction, primarily because of its 250 km of wide sandy beaches backed by dunes and interspersed with seaside resorts and harbours which often have a unique identity. The tourist sector accounts for 3% of GNP and 5% of jobs. Some 25% of overnight stays in the sector are along the coast.

### Possible developments until 2015

It is expected that until 2015, the sector will experience an average annual growth of 2.6%. The use made of the coast and the sea play a key role in this, although the international competitive position of the coast is declining. The importance of water sports is on the increase.<sup>14</sup> The bottleneck here is the lack of marinas along the Dutch coast. The potential of various locations (Katwijk, Hoek van Holland, Petten) as coastal marinas is being looked into.

### Possible developments after 2015

It is expected that the coast and the coastal belt will be more intensively used for a wide range of leisure pursuits. Climate change and an increase in leisure

<sup>13</sup> Key Planning Decision on the Second National Structure Plan for Military Areas, Lower House of the States General, session year 2004-2005, 28114, no. 16.

<sup>14</sup> Integrated Management Plan for the North Sea 2015, Lower House of the States General, session year 2004-2005, 30195, no. 1.

economy opens up opportunities for developing the tourist sector.

### **Policy**

Government policy<sup>15</sup> is directed towards promoting national and international tourism and improving and strengthening the industry, with innovation and sustainability as policy spearheads.

## **2.7 Cables and pipes**

### **Current situation**

An extensive network of cables and pipes has been laid in the North Sea since the development of oil and gas fields. Given the future of oil and gas recovery in the North Sea, and the existing network, it is to be expected that this situation will stabilise in the future. The building of new international gas pipelines will have to be taken into account, however.

### **Possible developments**

The first cables laid on the seabed were transatlantic telecommunications cables between Europe and North America, several decades ago. Since then, the number of telecom cables has grown steadily but has meanwhile stabilised. The opening up of the European electricity market has caused an increase in the demand for international power supply links (interconnectors). At present, the Netherlands has an interconnector across the sea, a cable between the Netherlands and Norway (NorNedkabel), and one is currently under construction between the Netherlands

and the UK. (BritNedkabel). The construction of wind farms at sea will generate an additional need for power cables between the wind farms and the Dutch coast. The government is exploring possibilities for 'power points at sea' for the benefit of large-scale wind farms.

### **Policy**

From an economic point of view, the central policy aim is to facilitate infrastructure that meets the expected demand for communications links and the transport of gas, oil and electricity.

The Cabinet's policy is to use space as efficiently as possible. Routes are to be developed in which cables and lines can be bundled where possible. Furthermore, a removal obligation for both cables and lines has been introduced in the National Spatial Strategy unless it can be proven in individual cases that the social benefits of leaving them outweigh the cost of removal. This means that, in practice, pipes remain in place and cables are removed.

Future tracks have been defined in the National Structure Plan for Pipelines. The policy proposal in the Third National Structure Plan for Electricity Supply, key planning decision part 1 (SEV III, 2008) contains a comprehensive revision of the 1994 structure plan and provides the decision-making framework for planning electricity power stations. Space is set aside in SEV III for the large-scale production and transport of electricity. New power cables must fit into routes defined in the SEV.

## **2.8 Relevant spatial developments on land**

### **Current situation**

At present, the huge pressure on space in the western part of the Netherlands is not a reason for land extension. An exception to this is the expansion of the port of Rotterdam, with the construction of the Maasvlakte 2 having started in 2008.

### **Possible developments**

In the decades to come, the spatial development of the Netherlands will be undergoing radical change. By 2040, the built-up area will have increased by 15-26%, with the Randstad urban conglomeration representing the major part of this growth.<sup>16</sup> Moreover, for a considerable time now, ideas have been developed for islands along the coast and coastal extensions for a wide range of interests and as a solution for miscellaneous social issues.<sup>17</sup>

<sup>15</sup> Policy Document on Tourism, Lower House of the States General, session year 2007-2008, 26419, no. 34.

<sup>16</sup> The Netherlands in the Future, Netherlands Environmental Assessment Agency (ISBN 500127001, 2007).

<sup>17</sup> J. Stronkhorst, Land reclamation in the North Sea (Deltares 2008).

## Policy

In its response to the Delta Committee's recommendation, the Cabinet indicated that for safety reasons it would not opt for islands in the sea. In the strategic policy document *Randstad 2040*<sup>18</sup> it also stated its intention not to use any widening of the coast or islands for residential or work purposes but does keep the option open for utilising islands for other reasons. To this end, the Cabinet has invited the business community to put forward interesting proposals. In the long-term foresight study of Amsterdam Airport Schiphol<sup>19</sup>, the Cabinet stated that an investigation of the possibilities and the impossibilities of land reclamation in sea could shed new light on the subject of an airport at sea. This option could well be opportune in the long term (after 2040).

## 2.9 Marine ecosystem

### Current situation

The North Sea is a highly complex and open marine ecosystem, shallow and rich in nutrients, that is defined by a subtle interaction between climate, sea currents, nutrients, sediments, flora and fauna and human use. The direct, open connection with the Atlantic Ocean to the north and the south, the inflow from various major catchment areas of European rivers, professional fishing and atmospheric deposition are decisive criteria for quality and quantity in the North Sea. The area is also a breeding ground for fish and important as a migratory route and wintering place for several species of bird.

Below is an overall profile of the different areas in the North Sea, based on the most recent knowledge of the area's ecosystem.

### *Dogger Bank*

The Dogger Bank is the area where the northern and southern fauna in the North Sea meet. The Dutch part of this sandbank is located at a depth of more than 20 metres. The most typical sandbank community is found in the shallowest part of the sandbank. It is a spawning ground for various species of fish, which draws seabirds and porpoises to the area to forage.

### *Klaver Bank*

This is a reef area transected by a deep trough rich in fish. There is a wide variety of benthic life, including Dead man's fingers, a type of coral. There are many sea birds and sea mammals.

### *Friese Front*

This front is the transition between shallow sandy soils and deeper silty soils. Rich in nutrients, the area attracts benthic life, fish, sea mammals and sea birds such as the Guillemot and the Great skua.

### *Bruine Bank*

Benthic fauna is not particularly rich, but there are many fish on this high sandbank surrounded by deep sea. It is a spawning ground for flatfish. There are many porpoises in the area. In winter, there are many sea birds (including Guillemots), particularly in the southeastern part.

### *Central oyster fields*

The silty soil holds a varied benthic life. In summer, large numbers of Fulmars come here to forage. It is also home to the long-living ocean Quahog, although this shell appears in larger numbers to the northeast of the area.

### *Gasfonteinen*

While gas fountains have been found in this area, the hard substrate that can form and the associated typical benthic life have not been demonstrated. Gas is also bubbling up in various locations on the Dogger Bank. Methane-loving bacteria have been found near these seeps.

### *Borkumse Stenen*

Ongoing research will have to demonstrate the presence of reef structures in this area. Several boulders have been found recently. The area is used as a feeding ground by seals, and porpoises have been sighted.

### *Zeeuwse Banken*

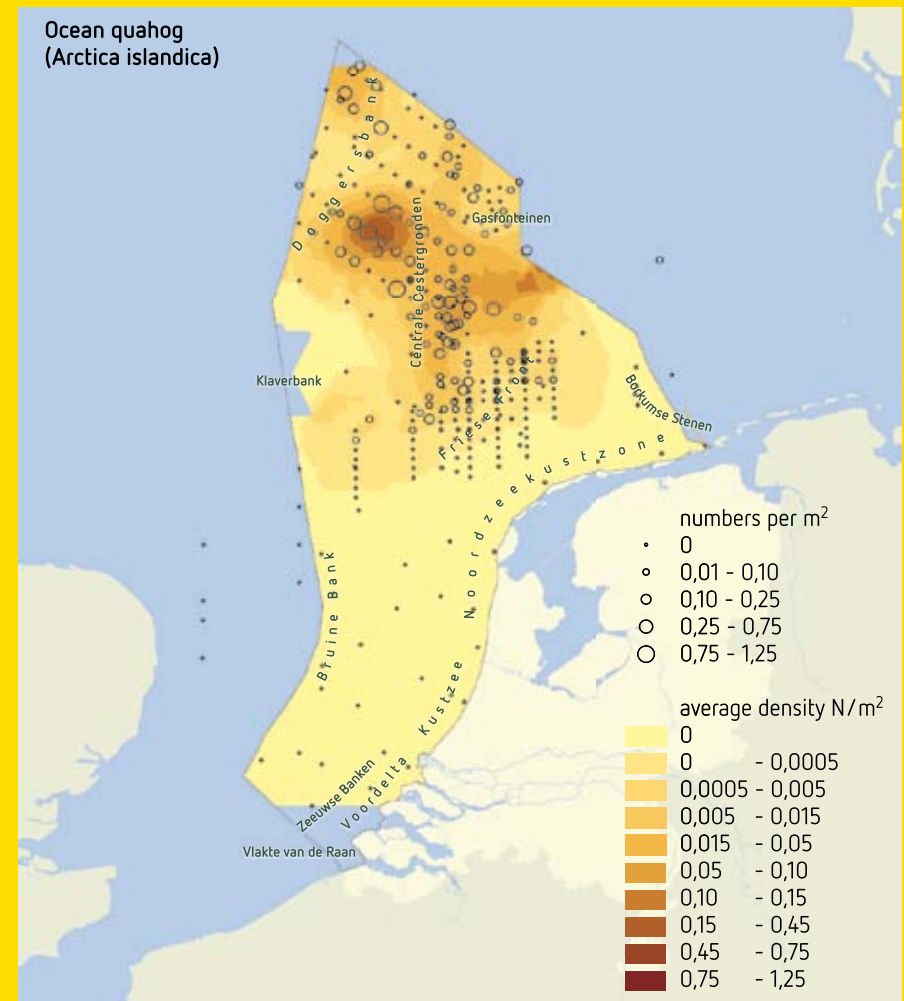
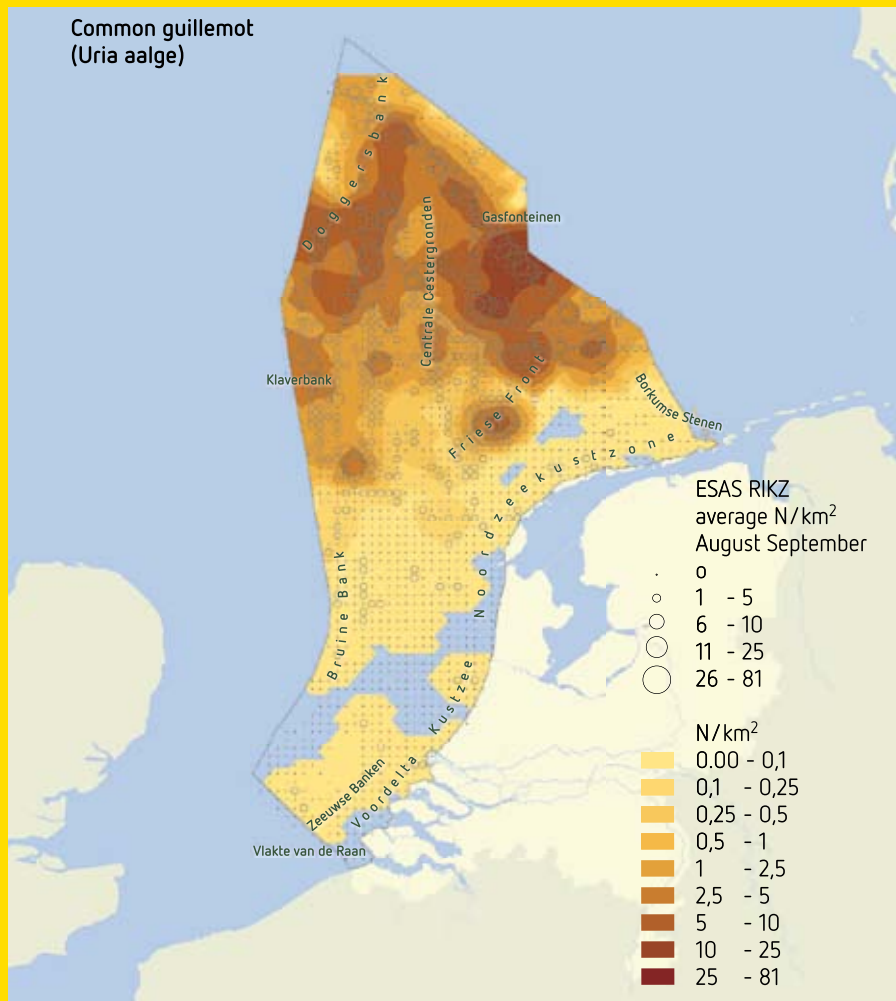
Landward, these sandbanks merge into the coastal zone. Shell deposits are typical of the area. Red-throated divers have also been seen in the area.

<sup>18</sup> Strategic policy document, *Randstad 2040*, towards a sustainable and competitive European top region, Lower House of the States General, session year 2007-2008, 31089, no. 21

<sup>19</sup> Long-term foresight study of Schiphol, Foresight Study Document, Lower House of the States General, session year 2007-2008, 29665, no. 85

## Nature values of the North Sea

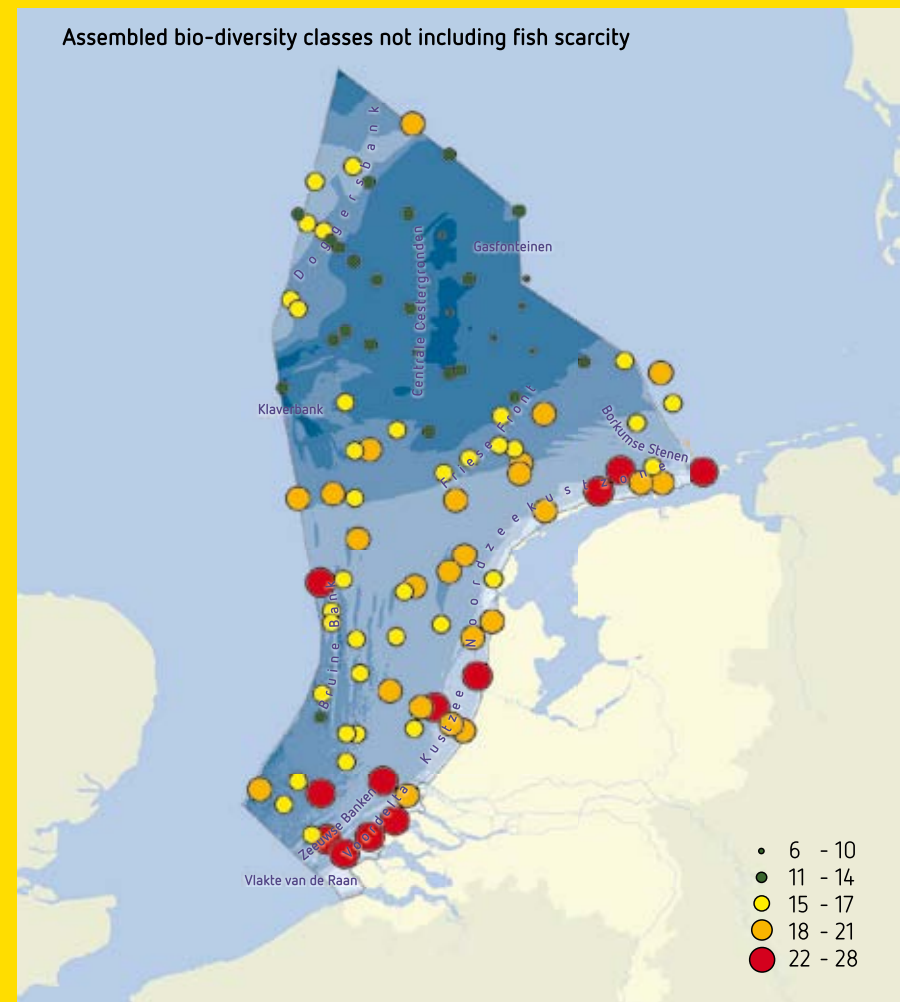
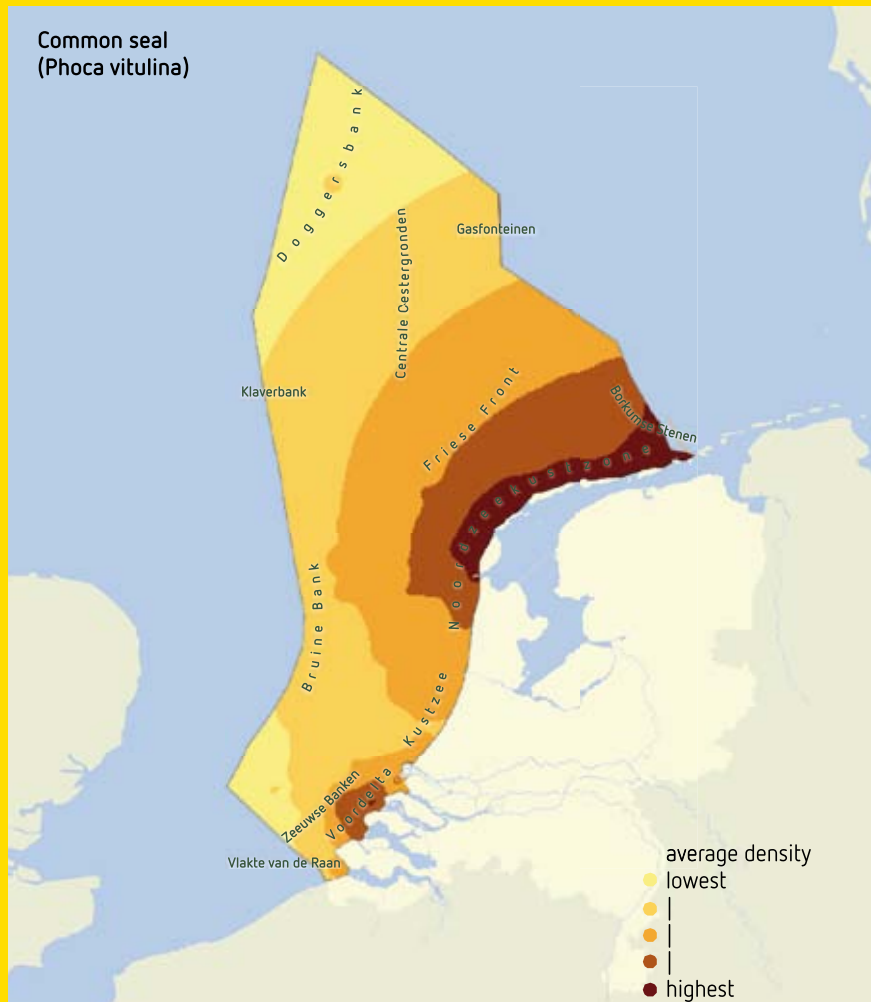
Source: Imares



## Nature values of the North Sea

Source: Imares

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### *North Sea coastal zone*

This is the coastal zone up to a depth of 20 metres. The habitat comprises permanently flooded sand-banks that are home to deposits of shells and shellfish. The coastal sea is an important area for flatfish and is used by migratory birds and summer birds such as terns and seagulls. Red-throated divers and Common scoters have been seen locally.

While the quality of the North Sea has improved in recent years, it is still deficient with regard to certain substances such as nutrients. In terms of specific parameters, the quality of the sediment, in particular along the coast, has not yet met the desired standard.

### **Possible developments**

Worldwide climate change and the resulting rise in sea levels will impact the marine ecosystem. There is uncertainty regarding the exact consequences for habitats and biodiversity. Concern is growing nationally and internationally about the effect of intensification of human activity on the marine ecosystem. All over the world, maritime biodiversity is under increasing pressure, and natural resources are being depleted. For the North Sea in particular, additional attention is being paid to growing spatial pressures. It is precisely those natural values and the sense of freedom and space, especially along the coast, that can counterbalance these growing pressures on land.

### **Policy**

Water quality policy is embedded internationally in the European Water Framework Directive, the Nitrate Directive and the OSPAR Convention. The aim is to prevent and reduce the negative effects of pollutants and an excess of nutrients, which has to be achieved by halting or phasing out discharges and loss of hazardous substances. The ultimate aim is to arrive at concentrations of natural substances in the marine environment that are close to background values and at almost zero for synthetic substances. For policy concerning the quality of swimming water, see section 5.1 Coast of the National Water Plan.

As for the sustainable development of the marine system, reference should also be made to the formulation of the Blue Paper on An Integrated Maritime Policy for the European Union, and the sustainability of the Common Fisheries Policy<sup>20 21</sup>, in addition to areas designated pursuant to the Birds and Habitats Directives (Natura 2000). Having come into force in 2008, the Marine Strategy Framework Directive details the trend adopted by the OSPAR Convention to achieve a sustainable balance between economic growth and ecology of the marine system. Key premises are the precautionary principle and the ecosystem approach. Marine spatial planning is regarded as an important tool for arriving at a sustainable use that is in balance with the marine ecosystem.

## **2.10 Conclusion: the tasks**

Global, European and national developments all impact the future use of the North Sea, both in the long and in the short term. The guiding principle is to take proactive action in respect of climate change and the depletion of oil and gas resources, and to engage in sustainable use of the marine ecosystem. Explicit demands have been made for larger areas for sand extraction for coastal replenishment and fill sand, as well as room to build wind energy with a capacity of 6,000 MW in 2020, and for further expansion after that. The other uses are upholding their spatial claims. Oil and gas recovery will be decreasing after 2015, whereas in contrast, spatial needs for CO<sub>2</sub> storage will grow after then.

Emerging from the above analysis are three central social development tasks, which will become far more manifest in the early years of the 21st century in the North Sea than in the 1990s, when the National Spatial Strategy came into effect:

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<sup>20</sup> Designation order of the Natura 2000-area Voordelta (adopted on 19 February 2008) was published on 27 February 2008 in the Netherlands Government Gazette 2008, 41.

<sup>21</sup> The announcement of draft decisions filed for public inspection concerning the 1st tranche, including the North Sea Coastal Zone (dated 13 November 2006) were published on 27 November 2006 in the Netherlands Government Gazette 2006, 231. The definitive designation order North Sea Coastal Zone will be adopted and published in December 2008 and will take effect some weeks later in January 2009.

- 1 General: a sustainable (economic) development in balance with the marine ecosystem.
- 2 Additional emphasis: setting aside sand extraction sites for coastal and flood protection purposes.
- 3 Additional emphasis: space for large-scale renewable energy.

The central government is also receptive to new ideas that would benefit a more sustainable use of the sea in the long term. This requires a crystal-clear and transparent consideration as well as a co-operative and entrepreneurial attitude on the government's part.

Providing space to address the three social development tasks in the Dutch section of the North Sea, which is already so busy, is not possible without additional measures. The North Sea policy in the National Spatial Strategy of *integrating* among existing uses *while taking into account* the marine environment is no longer an option. Developments 'in balance with' the marine ecosystem means not putting more pressure on the ecosystem than it can cope with. Given the total surface area of the Dutch North Sea, the demand for space for sand extraction and wind energy is not so great. But a cost-effective specification of sand extraction and wind energy means that the demand for space focuses mainly on the busy southern section of the North Sea, where most shipping, oil and gas recovery, leisure activities and fishing are located.

Society therefore demands a reassessment of the social decision-making concerning current usage and new social tasks, in balance with the marine ecosystem, transparent and under the direction of the government.<sup>22</sup>

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<sup>22</sup> incl. North Sea Workshop 29/5/2008; IDON Newsletter 'Integrated Management Plan for the North Sea' no. 6 (December 2007); Sustainable development of the potential of the sea, The Wadden Council, The Netherlands Council for the Rural Area, Council for Transport, Public Works and Water Management, the Dutch Council for Housing, Spatial Planning and the Environment (May 2007).



## Possible picture of the future: how things could go from here...

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As a result of climate change, the second half of the 21<sup>st</sup> century saw a global shift in climate zones, with all the consequences that entailed for the production of food, the rise in sea levels, the growing frequency of natural catastrophes and the extinction of animal species so singular to humankind. The effects of this change in climate brought about by man have made us realise that we need to be more efficient and careful with our planet. That also had an effect on the way in which man came to interact with his environment: much more aware than now.

Ultimately, the global impoverishment of the marine ecosystem through a combination of systematic overfishing and climate change led to a transition to sustainable forms of fishing and fish farming. The Netherlands was able to facilitate this development in the North Sea, the Atlantic Ocean and the seas outside Europe where Dutch vessels fish.

The Dutch seaports remained of enormous economic significance for the Netherlands as a gateway to Western Europe. The melting of the North Pole ice cap has further improved access to the Netherlands via northern routes, while further globalisation of the economy and worldwide population growth shored up the demand for transport. Forecasting how the modal split between road, rail, air, water or other modalities will develop is not easy, one of the reasons being that the external costs of transport (such as environmental effects) have already been allowed for in the price. That said, shipping remains a reliable and cost-effective means of mass transport and although they are larger, the transition to renewable energy has

since made ships much cleaner. Demand for space at sea remains as great as ever.

As a result of years of additional coastal replenishment as flood protection, the territorial sea has developed into a kilometres-long Voordelta providing something for everybody and of real ecological value. More than anything, however, it is a safety barrier against rising sea levels.

While fossil fuels are depleting, competitive renewable forms of energy are becoming available. Between 2040 and 2100, the last of the oil and gas fields will be exhausted. Their locations have meanwhile been taken up by large-scale fields for the production of renewable energy and CO<sub>2</sub> storage. Renewable energy including wind energy is of key international importance. Together with its neighbouring countries, the Netherlands has taken a leading position in its production, utilising an international renewable energy network in shallow seawater. As it says in the Energy Report: 'The Netherlands has a special rapport with energy and water. This combination offers ideal opportunities for business in the Netherlands. Not only in view of the development of the North Sea but also elsewhere in the world. The Netherlands has the chance to gain a strong position in the development of offshore wind turbines. Moreover, for businesses, a CO<sub>2</sub> infrastructure with storage in empty gas fields under the North Sea could emerge as an attractive factor for location, for instance in the Rijnmond and Eemshaven regions.'

# 3 Targets and policy choices

The flow chart below indicates how the three social development tasks have been translated into targets and policy choices for the North Sea policy. Seaward of the 1-kilometre border, the North Sea is not administered by provinces or municipalities. Policy choices are directly binding upon all parties.

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Task	Targets
<b>General:</b> <b>a sustainable (economic) development in balance with the marine system</b>	<ul style="list-style-type: none"><li>• The North Sea is a healthy, dynamic and open marine ecosystem that is used sustainably. Economic, ecological and socio-cultural values are in balance (planet, people, profit). By contributing to the formulation of an integrated policy and measures for the protection of marine biodiversity and the creation of a global network of protected marine areas, the Netherlands meets (international) goals for the marine ecosystem. The ecosystem approach and the precautionary principle are applied actively in the policy.</li><li>• The experience-related value of the North Sea for leisure pursuits and tourism is a strong international trump card. Part of this is the unobstructed views across the sea along almost the whole stretch of coastline. Archaeological values in the seabed have been well preserved.</li><li>• Sustainable fishing and marine aquaculture sustain a healthy fish population and so fishing remains the socio-economic basis for parts of the coastal region. Natural benthic life has recovered.</li><li>• The North Sea is of profound social significance for shipping. Harbours that are easy and safe to reach, and free, safe passage are guaranteed for shipping.</li><li>• Smaller oil and gas fields are dismantled where possible, and after 2020, large, freed-up gas fields have been envisaged for CO<sub>2</sub> storage.</li><li>• Electricity cables, telecommunications cables and pipes are bundled where possible.</li></ul>
<b>Additional emphasis:</b> <b>setting aside sand extraction sites for coastal and flood protection purposes</b>	Section 2.4 of the National Water Plan outlines a general, long-range target for the Netherlands as a safe, prosperous and liveable delta. An important aspect is optimum protection against flooding of rivers and the sea. Elements include a robust coast which has kept pace with rising sea levels through the addition of sand, and a combination of various types of traditional and innovative water-retaining structures, which are multifunctional if possible (e.g. submersible dykes and wide, habitable dykes). The level of the IJsselmeer is rising gradually at the same pace as the sea level, for which over time, water-retaining structures have been raised and activities along the banks adapted. The availability of sufficient sand is a basic precondition for the continuing protection of the Netherlands against flooding. The North Sea is the chief supplier of sand.
<b>Additional emphasis:</b> <b>space for large-scale renewable energy</b>	In the period after 2020, the large, freed-up gas fields are in the frame for large-scale renewable energy production. The Netherlands has taken strong action on the large-scale production of renewable energy at sea and, together with neighbouring countries, has set up an international renewable (wind) energy network in the North Sea.

## Policy choices up to 2015

- The Cabinet opts for a sustainable, spatially efficient and safe use of the North Sea that is in balance with the marine ecosystem as laid down in the Water Framework Directive, the Marine Strategy Framework Directive and the Birds and Habitats Directives. The objective is to protect and develop the marine ecosystem.
- In the context of the Common Fisheries Policy and in consultation with the Dutch fishing sector, nature conservation organisations and other EU member states, the aim is to pursue sustainable fishing in the North Sea.
- Measures to reduce pollution from shipping (merchant, fishing, offshore supply and leisure).
- Views of the horizon from the coast will remain unobstructed. In the coastal zone, space for recreation and certain forms of fishing will not be limited by permanent construction works.
- Within the above European frameworks, the Cabinet is prioritising activities that are of national importance to the Netherlands:
  - Oil and gas recovery. As much natural gas and oil as possible is to be recovered from Dutch fields in the North Sea so that the resource potential in the North Sea is used to the full.
  - CO<sub>2</sub> storage: sufficient room for storing CO<sub>2</sub> in empty oil and gas fields or aquifers
  - Sea shipping: a system of routing measures, clearways and anchoring areas that can accommodate shipping safely and smoothly.
  - Sand extraction and sustainable energy: see below
  - Defence: sufficient dedicated areas in the North Sea.
  - Search area to set up 2 CO<sub>2</sub> storage pilots
  - Bundling of cables and pipes, removal obligation
  - Decision-making framework for activities on the North Sea: existing and new users are informed which decision-making framework applies to the Dutch part of the North Sea.

- Sand extraction and replenishment: sufficient space for sand extraction for coastal protection, flood risk prevention and fill sand for use on land.
- Sand extraction at levels below 2 metres to reduce negative impact and to guarantee availability of sand between -20 metre depth and the 12-mile zone for as long as possible.
- Sand replenishment: see section 5.1 Coast, National Water Plan.

- Space for 6,000 MW of wind energy on the North Sea in 2020 (at least 1,000 km<sup>2</sup>). Create spatial preconditions for further (international) growth of renewable energy after 2020.
- Search area for an island for energy storage and production.

Where necessary, chapters 4 to 6 inclusive give a further outline of the policy choices for the 2009-2015 planning period, detailing them on the basis of the three social tasks. Chapter 4 describes policy choices that address an economic use that is in balance with the marine ecological system. Within this general framework, chapters 5 and 6 concentrate on re-evaluating spatial decision-making concerning such issues as sand extraction, renewable (wind) energy and other national interests in the southern section of the North Sea. Finally, the revised North Sea policy frameworks are embedded in the decision-making framework for activities on the North Sea.



2010

# 4 Development in balance with the system

This chapter details the policy choices that address an economic use that is in balance with the marine ecological system. First of all, the activities are explained in the context of international guidelines and conventions on the marine ecosystem. Together these provide the framework for implementing the spatial and other policy choices for the development of various designated uses, which are discussed in the subsequent paragraphs.

## 4.1 The marine ecosystem

### 4.1.1 Water quality

In the light of OSPAR (the entire North Sea as for substances, eutrophication and sea-bound use) and the European Water Framework Directive (WFD) (ecology to a maximum of one nautical mile and chemical substances to a maximum of 12 nautical miles), improvement of the water quality requires national and international efforts. For the North Sea, it is essential that measures relating to all aspects of the catchment area be considered, given that the impact on the North Sea from upstream – and that includes foreign countries – in terms of environmentally hazardous substances and nutrients is significant. In order to implement the WFD, an extensive programme of measures is being implemented for the national waters up to 2015, and looking ahead to 2027. There is an obligation to produce results to meet the standards.

According to WFD measuring and assessment methods, chemical substances (excluding nutrients) seldom exceed the WFD standards in the North Sea up to the maximum of 12 nautical miles. However, according to OSPAR standards, the sea still contains substances that do not naturally belong there (e.g. PAHS and TBT). There are two reasons for this:

- 1 The WFD prescribes that chemical substances be measured in total water. This means that environmentally hazardous substances such as

PAHs and TBT that attach to the sediment and accumulate in marine organisms are not considered problematic. At OSPAR level, it has been agreed to measure these substances in the sediment and in marine organisms as well. This measuring method enables the early detection of such environmentally hazardous substances, changes or new substances. This signalling function is especially valuable given the persistent character of pollution in the marine environment and the necessary precautions and attention to food quality (fish consumption). This is also required under the Marine Strategy Framework Directive (MSFD, see 4.1.2).

- 2 It has been agreed at OSPAR level to apply the precautionary principle with regard to the assessment of chemical substances, and hence also the assessment criteria contained in OSPAR (Environmental Assessment Criteria, EAC)<sup>23</sup>. This is a stricter criterion than the Maximum Permissible Risk (MPR) applied as standard by the WFD.

In addition, the effects of most substances, either alone or in combination with others, on organisms is not fully known. Eutrophication problems can be observed along the entire coastal zone (2008 comprehensive OSPAR report). According to the WFD, the ecology (phytoplankton and benthic life) in the one nautical mile coastal zone is not in order yet. Moreover, at EU level, the entire Dutch section of the North Sea has been designated as nitrate vulnerable zone.

The coastal waters will probably not meet the WFD's ecological objectives (especially phytoplankton) until 2027, the main reason being that in order to achieve these objectives, the coastal waters are almost entirely dependent on measures taken upstream, which includes those in foreign countries. The biggest contribution comes from the reduction of the nitrogen load.

In connection with the implementation of the MSFD, a further harmonisation between the WFD and OSPAR at this level is key.

Specific activities of maritime transport and oil and gas recovery that affect water quality (pollution) and safety are described in sections 4.2.1 and 4.2.2.

The administrator acts as enforcer when it comes to discharges caused by shipping. The administrator also has an incident organisation in place for preventing and containing environmental damage caused by disasters.

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<sup>23</sup> Agreements have been made within the framework of the OSPAR convention to aim for the background value for a series of substances that occur naturally in the environment (Chemicals for Priority Action).

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## Ecosystem approach

In recent years, the notion has taken hold that a dynamic system like the sea requires a dynamic management style.

The ecosystem approach can be described as:

“The comprehensive integrated management of human activities based on the best available scientific knowledge about the ecosystem and its dynamics, in order to identify and take action on influences which are critical to the health of marine ecosystems, thereby achieving sustainable use of ecosystem goods and services and maintenance of ecosystem integrity”. (OSPAR definition)

As a strategic policy principle, the ecosystem-driven approach was set out in the 1992 Rio de Janeiro Convention on Biological Diversity and ratified in various North Sea ministerial conferences and the Marine Strategy Framework Directive.

In outline, the detailing of the ecosystem approach for the (North) Sea comprises the following elements:

- Monitoring, analysis of measurement data, scientific research of ecological processes and evaluation as basis for management and policy;
- Developing ecological quality objectives (EcoQOs) and economic and social quality objectives;
- Involving potential ecological consequences of intended activities in decision-making about marine activities;
- Protecting the marine environment with a view to sustainable development and application of the precautionary principle;
- Adaptive management, enabling responses to economic developments and knowledge accumulation;
- Involving stakeholders in marine management.

The application of the ecosystem approach involves a solid scientific substantiation of measures, although it is recognised that cause and effect relationships are not always unequivocal. The precautionary principle is, therefore, an essential aspect of the ecosystem approach.

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## Precautionary principle

The precautionary principle, as it has been implemented in international and national policy for years now (OSPAR, Fourth Policy Document on Water Management and the National Spatial Strategy) is a crucial starting point for planning and designing intended activities at sea.

It implies that precautionary measures must be taken if there is reasonable concern that an activity will damage the marine environment, human health and/or other legitimate use, even if no conclusive evidence is available that there is a causal link between an activity and its effects. The reason behind this precautionary principle is that anything that enters the ocean system can never or only with extreme difficulty be removed and can therefore accumulate in the system.

The precautionary principle entails taking measures in advance to prevent potentially long-term, irreversible and adverse effects of activities and, if the activity appears permissible, to reduce such effects. Damage to the marine environment involves not only undesirable emissions of substances but also disruption of the ecosystem due to, for example, covering or removing sediment, noise, line-of-sight obstruction or destruction of benthic fauna. Tools used are drafting and evaluating environmental impact assessments, conducting risk analyses and risk assessment, using cleaner technologies, control systems, monitoring and management of (waste) substance flows.

#### 4.1.2 Implementation of the Marine Strategy Framework Directive

The Marine Strategy Framework Directive (MSFD) came into force in 2008. In connection with the implementation of the MSFD, the Netherlands will be using the sea without this being detrimental to a good environmental status. Premises are the application of the ecosystem approach and the precautionary principle, based on what the ecosystem is capable of absorbing. Decisions as to economic activities on the North Sea are made with due consideration of the effects on existing ecological values. The aim is to enable the recovery of biological diversity throughout the North Sea.<sup>24</sup> On the basis of the MSFD, the good environmental status of the North Sea will be defined in 2012, and subsequent objectives specified. The package of measures required will be ready in 2015, and implemented from then on. The MSFD focuses on assessing, protecting and developing the marine ecosystem in the entire North Sea at scale level, and on making its uses more sustainable.

In the context of implementation of the MSFD, the Netherlands will be focusing on an international strategy at OSPAR level. The 2010 OSPAR Quality Status report describes how the North Sea ecosystem has changed as a result of human use. The OSPAR Ministerial Conference in September 2010 will provide the opportunity for countries to enter into joint agreements concerning the regulation of certain activities to prevent negative effects wherever necessary. The regional North Sea policy approach

with regard to current and future use as laid down in the National Water Plan will be taken into consideration when defining the goals for a good environmental status.

#### 4.1.3 Marine nature reserves

The protection of marine areas of special ecological value is incorporated in the European Birds and Habitats Directives, the MSFD and the OSPAR Convention. The frameworks also include rules for granting protected status. Over time, the protection of various separate areas is to result in a cohesive network of protected marine areas. The entire Dutch section of the North Sea is, for that matter, a core area in the national ecological network (EHS).

Building on the National Spatial Strategy<sup>25</sup> and the Integrated Management Plan for the North Sea 2015, the Cabinet registered the ecologically valuable areas of Dogger Bank, Klaver Bank, the Westerschelde estuary/Vlakte van de Raan and parts of the coastal sea to the north of Bergen as Habitat Directive areas with the European Commission in December 2008. After the EC has placed these areas on the Community List at the end of 2009, the Cabinet will designate the above-mentioned areas and the Birds Directive areas of Friese Front and the coastal sea between Petten and Bergen as Natura 2000 areas in 2010, thus meeting the Netherlands' international obligations under the Birds and Habitats Directives. The Habitat areas mentioned were nominated as Marine Protected Areas (MPA) under the OSPAR Convention in early

2009. A management plan for the areas will be drawn up no later than three years after designation.

In July 2009, the Cabinet presented the bill for the expansion of the scope of the Nature Conservation Act and the 1998 Flora and Fauna Act in the Dutch EEZ for debate in the Lower House. Fishing activities in Natura 2000 areas are regulated in the EU Common Fisheries Policy. This will be implemented under the 1963 Fisheries Act.

In the coming years, research will have to show whether ecologically valuable areas other than designated Natura 2000 areas are eligible for specific protection, and if so, which. Relevant decisions will be taken as part of the decision-making process on the implementation of the MSFD and Natura 2000. A number of areas of potential ecological value are indicated on the framework vision map.

Possible effects of climate change on the status of the marine ecosystem will be taken into consideration when implementing the MSFD and Natura 2000 areas.

<sup>24</sup> According to MSFD art. 1: "develop and implement a strategy to protect and sustain the maritime environment, prevent its deterioration or, where feasible, restore marine ecosystems in those areas where they have been damaged and prevent and reduce input into the marine environment in order to gradually remove pollution so that it will not have any substantial impact or pose a significant risk for marine biodiversity, the marine ecosystems, public health or the legitimate use of the sea."

<sup>25</sup> Land Use Planning Memorandum, Creating Space for Development, Lower House of the States General, session year 2005-2006, 29435.



## 4.2 Use

### 4.2.1 Marine navigation

Policy that is focused in particular on maintaining and wherever possible improving existing safety levels at sea is to be sustained. Routing measures, anchoring areas and clearways are defined in the framework vision map. This is of national importance. The Mining Regulations contain an exact delineation of these areas. In almost all areas, the capacity of sea shipping routes will be sufficient to accommodate growth.

On shipping routes, unobstructed passage takes priority over other use such as fishing and leisure. Oil and gas platforms or other permanent individual structures are not permitted within 500 metres from these shipping routes (Water Act).

On 1 July 2008, the traffic separation scheme near Rotterdam was changed and new anchoring areas established because of the development of Maasvlakte 2. This change and the connection of the scheme to the clearway scheme are to be incorporated in the Mining Regulations and in policy regulations concerning the application of the Water Act on installations in the Exclusive Economic Zone.

The exploration of a possible widening of the Maasgeul shipping channel is to be completed in 2009. A new design for the entrance of the Eurogeul and the IJ-geul shipping channels will be implemented

in 2010. A plan study leading to the design of the widening of the Eemsgeul channel is in progress. Attempts are being made in consultation with Germany to find space for an anchoring area for LNG tankers near the harbour entrance of Eemshaven. For the 2010 supplement to the National Water Plan resulting from decisions on the designation of extra wind energy areas off the coast of Holland and north of the Wadden Islands, a decision will also be reached on the location of a new anchoring area south of the IJ-geul channel. These intended changes will allow maritime traffic to grow sufficiently and safely and keep pace with developments in Dutch seaports. Periodic dredging will be needed to provide safe and guaranteed access to the various ports. The dredged material can be dispersed in the marine system if the quality is good, otherwise it has to be stored in depots to ensure that the pollutants are not dispersed.

In the planning period, the Netherlands will focus on common international principles for spatial planning at sea regarding distances between wind farms and shipping routes. To this end, a correspondence group has been established through the IMO of which the Netherlands is a member. The group's task is to come up with a set of criteria in the first quarter of 2010 on the basis of which a risk analysis can be performed to determine what the necessary clearance between the safety zones, the wind farms and the shipping routes should be in individual situations. The Netherlands will also consult with its neighbours about whether the increasing spatial pressure warrants inter-



connecting the current traffic separation schemes in the southern part of the North Sea at some point. This could have as an advantage that shipping will be compelled to use these routes, subject to the provisions of the Regulations for Preventing Collisions at Sea.

As the largest user group, maritime traffic (merchant shipping, fishing, offshore supply and leisure) requires particular attention when it comes to reducing oil and air pollution and the generation of waste. The central government intends to develop Dutch seaports in a sustainable manner. This is detailed in the policy memorandum on sustainable seaports (*Beleidsbrief Duurzame Zeehavens (2008)*). According to the government and the seaports, the sustainable development of ports is not only vital to the environment around those ports, but also to the competitive position of the Dutch seaports. In the next few years, the focus will be on five themes for sustainability: air quality, energy, CO<sub>2</sub> and residual flows, use of space, nature conservation and development, and water quality and management. In terms of enhancing air quality and the reduction of CO<sub>2</sub> emissions, the central government and market parties in the port of Rotterdam are collaborating in the Rotterdam Climate Initiative, which specifically focuses on cleaner sea-going and inland vessels, particularly stimulating the use of cleaner engines and fuels. Another area of attention is the installation of land-based power for both inland and sea-going vessels. An international group of port managers

headed by the Havenbedrijf Rotterdam (Port of Rotterdam) is developing an international index for the uniform assessment of emissions into the air (mainly SO<sub>x</sub> and NO<sub>x</sub>, but also CO<sub>2</sub>). In terms of water quality and management, the central government and the ports are working on the implementation of the requirements from the European directive on port reception facilities (2000/59/EC) in such a manner that ships are encouraged to hand in as much ship-generated waste as possible. Means used to this end include a delivery system, monitoring and enforcement, and communication. To prevent dumping of ship-generated waste into the sea, the International Maritime Organization (IMO) is honing the conditions relating to the legal dumping of garbage (Marpol Annex V). In the international correspondence group, the Netherlands is contributing to a general dumping ban (zero discharge) of Annex V substances, with the exception of waste from food (outside the 12-mile zone).

#### 4.2.2 Oil and gas recovery

In its Energy report, the Cabinet indicated that in the period until 2030, it wished to exploit the potential of the available oil and gas supplies where possible. This is of national importance. Use is regulated primarily through licensing under the Mining Regulations. The entire EEZ is a search area for oil and gas recovery. The Water Act also applies to activities that take place within the 12-mile zone. Shipping is not permitted in a safety zone up to 500 metres around oil and gas platforms (Mining Regulations).

The Ministers for Economic Affairs, for Transport, Public Works and Water Management, and for Health, Welfare and Sports are all party to the 1995 agreement on oil and gas.<sup>26</sup> The agreement stipulates that businesses themselves will be adopting measures to reduce the environmental impact of drilling activities and constructions in their industry. Adverse environmental impact of oil and gas platforms has already been reduced thanks to measures taken over time. Incidentally, it is expected that oil and gas projects will have no adverse effects on the natural values of the North Sea in the long run. However, they can have a detrimental effect on migratory birds (disorientation due to platform lighting). Measures to mitigate the problem can be taken (e.g. the use of green light).

#### 4.2.3 Carbon capture and storage

The Cabinet's climate policy focuses on the reduction of CO<sub>2</sub>, by means of energy saving and scaling up the production of renewable energy. In the transition phase, which runs until about 2050, CO<sub>2</sub> storage will also be necessary to achieve the climate goals that have been set. Large-scale storage of CO<sub>2</sub> from 2020 is one of the Cabinet's ambitions, which is why CO<sub>2</sub> storage is regarded as an issue of national importance. The fields located in the area to the northwest of Den Helder (the K and L blocks) are probably the most eligible for this. In the years up to 2020 and due to the

<sup>26</sup> Letter of intent on implementation of environmental policy for the oil and gas recovery industry (VROM 94-530/EZ94-0312/VW 94-0527)

close proximity of sources on the mainland, depleted oil and gas fields (existing locations) in the P and Q blocks will be the first serious candidates for CO<sub>2</sub> storage from the Rotterdam region (Rotterdam Climate Initiative) and IJmuiden. In addition, certain subterranean water-retentive soil strata (aquifers) are suitable for CO<sub>2</sub> storage and thus qualify as candidates. It is currently unclear where these aquifers are located exactly, what their geological characteristics are and from which locations these aquifers can best be reached. In principle, the entire EEZ can therefore be considered a search area for CO<sub>2</sub> storage in aquifers. In addition, a new CO<sub>2</sub> pipeline infrastructure is necessary as the existing oil and gas pipelines cannot be used until they cease to transport gas or oil from the field in question to the mainland.

The framework vision map indicates that there is space off the Holland coast for at least two CO<sub>2</sub> storage pilot projects, in coordination with decision-making in the National Water Plan concerning the search area for wind energy. CO<sub>2</sub> storage is possible subject to a planning application procedure in accordance with OSPAR Decision 2007/2 and the EU directive regarding geological storage of carbon dioxide (CCS Directive). These regulations will be incorporated into national legislation.

#### 4.2.4 Defence

Military training areas are shown on the framework vision map. In 2004, these areas were laid down for a

period of ten years in the Second National Structure Plan for Military Areas. This is of national importance. Use of these areas can be and is made by others provided this can be reconciled with military training taking place there. Furthermore, the North Sea contains several munitions dumping sites with mainly old Second World War supplies. Dumping munition has been forbidden for a good length of time. Munition from on-shore shooting exercises also ends up in the sea. Reference is made to the Mining Regulations for the exact delineation of the defence areas.

#### 4.2.5 Fishing

In theory, fishing has unrestricted access as long as they do not interfere with activities of national importance. The importance of certain forms of fishing (e.g. stationary fishing lines, mussel collection, prawns) is partly the reason why the 12-mile zone is kept free from permanent construction, which is taken into account in decision-making regarding activities within the 12-mile zone. Actions that are currently being undertaken to make the fishing sector more sustainable will lead to considerably less bottom trawling and hence more possibilities for marine aquaculture. Fishing activities taking place in conjunction with other functions would, for this reason, seem a viable option. The Cabinet will be commissioning detailed studies for this. For further provisions, reference is made to the frameworks for harmonisation with the marine system (4.1.2 MSFD, 4.1.3 Natura 2000) and with

activities of national importance (4.2.1 shipping, 4.2.1 oil and gas recovery, 4.2.3 defence, 5 sand extraction and 6 wind energy).

The current fishing practice of bottom trawling has a huge impact on the marine ecosystem. Thanks to recent reforms in the Common Fisheries Policy in 2003, substantial progress has been made in the sustainability and management of a great many species. However, this is not enough in the opinion of the Commission, which is now conducting a comprehensive evaluation of these reforms. It has a policy in mind that more emphatically addresses the sustainable and responsible management of stocks. At the core of this policy is the ecosystem approach that focuses on a healthy balance between nature, economy and employment. Linked to this is the global objective adopted by the government of exploiting all stocks at the maximum sustainable yield by 2025. The intent of this objective is to determine catches such that they have no effect on the reproductive capacity of the stocks. The Commission seeks to reduce by-catches, protect vulnerable species and areas, and, where applicable, reduce overcapacity of the fleet. In addition, attention is being paid to technical measures such as ecofriendly fishing methods. For beam trawling, the development of the pulse trawl (electrical impulses) plays a key role. This works both ways: it is good for the ecosystem (less bottom trawling) and good for fishing (less rubbish in the nets, less use of oil per kilogram of fish caught, and cleaner fish). A method of using

'pinger' devices on nets (alarm signals) is being developed in gill net fishing to prevent dolphins from drowning in nets. Common Fisheries Policy must have been reviewed by 2012 at the latest.

The Netherlands is making efforts to ensure that measures are taken in the European Fishing Fund's (EFF) planning period towards sustainability in the fishing industry. The Operational Programme of the EFF and the International Policy Programme Biodiversity 2008-2011 name the results to be achieved. The core elements of the Fishing Fund's commitment are:

- Stimulating more selective fishing methods that have less impact on the ecosystem (technical measures);
- Promoting energy-saving techniques;
- Enhancing collaboration in the chain;
- Diversification of employment in fishing communities;
- Reduction of fleet capacity.

Through the EFF and national co-financing, a sum of about €120 million has been set aside up to 2013. A further €20 million has been earmarked from national funds specifically for sustainability and innovation. In 2006, the Fisheries Innovation Platform was set up to supervise this transition. It advises on how the money can best be spent, encourages active research into innovation and co-ordinates the discussion as to how cost-effective fishing can be made possible. The Platform is made

up of representatives from the fishing sector, social organisations, government and science.

The transition towards a sustainable fishing sector has been started in the Netherlands, for which EFF and national co-financing funds have been set aside. Moreover, the fishing sector (Marketing Board for Fish and Fish Products), several NGOs and the Ministry of Agriculture, Nature Management and Fisheries have concluded a 'Social Covenant' to pool their efforts:

- Certification of sustainably caught fish;
- Information to and communication with the consumer and society;
- Training courses for both prospective and experienced fishers about sustainable fishing;
- Creating protected areas in the North Sea;
- Promoting biodiversity in the North Sea ecosystems.

#### **4.2.6 Recreation**

In theory, recreation has unrestricted access within the frameworks for harmonisation with the marine system (4.1.2 MSFD, 4.1.3 Natura 2000) and with activities of national importance (4.2.1 shipping, 4.2.1 oil and gas recovery, 4.2.3 defence, 5 sand extraction and 6 wind energy) as long as it does not interfere with activities of national importance. Within the 12-mile zone, recreation and tourism represent a substantial socio-economic interest. The importance of recreation is partly the reason why the 12-mile zone is kept free from permanent construction, which is taken into account in decision-making regarding

activities within the 12-mile zone. Policy with regard to leisure activities in the coastal zone is described in paragraph 5.1 of the National Water Plan.

#### **4.2.7 Cables and pipelines**

The aim when planning to lay cables and pipes in consultation with the initiators is to construct parallel tracks (bundling) and preferably tracks through areas from which sand has already been extracted. For initiatives that take up a large surface area, the central government can prescribe a spatial reservation for future cables and pipes. With efficient use of space in mind, safety zones and maintenance zones will be reduced where possible. In theory, a removal obligation applies to cables or pipes that are no longer in use (for cables: within 24 months). This obligation is explicitly laid down in the Water Act. A similar regulation applies to pipes governed by the Mining Regulations. As a rule, the decision-making framework for activities requiring permits of the IBN 2015 applies. Policy with regard to the bundling of cables and pipes is outlined in more detail in the IBN 2015 and does not need revising in this regard.

#### **4.2.8 Islands at sea**

In recent decades, several ideas have been developed for land reclamation and islands at sea, for a variety of uses. The only project realised was the Maasvlakte port area, while the Maasvlakte 2 is under construction and the 'sand motor' along the Westland coast is under preparation. In the early years of the 21<sup>st</sup> century, new and innovative suggestions are also

being put forward for islands as possible solutions for spatial problems on land, for energy production and storage, and as alternative forms of coastal protection.

The Lower House has asked the Cabinet to specifically map the pros and cons of land reclamation and islands at sea.<sup>27</sup> Based on the Delta Committee's recommendations, the Randstad 2040 strategic policy document and a study of existing plans, the Cabinet has reached the following conclusions.<sup>28</sup>

- Artificial islands or polders in the sea are technically feasible but relatively expensive options for land reclamation. The tunnels or bridges that will be needed to connect the islands to the mainland will require extra construction and operational costs. There is also a high risk of substantial cost overruns due to, for example, additional compensatory measures or technical problems. Potential investments vary between approx. €3 billion (energy island) to €20-90 billion (airport at sea).
- Land reclamation is of little use for business parks or large-scale housing. In its Randstad 2040 policy document, the Cabinet indicated that it does not intend to use widening of the coast or islands for living or working. Urbanisation of such a coastal expansion relieves the pressure on the increase of building density in inner cities, does not provide an adequate link with the existing road and railway networks and harms the quality of the landscape and the coast's natural value.<sup>29</sup>

- Land reclamation is of little use for agriculture, because of problems with the quality of the soil and the hydrological regime, high transport costs and the availability of good alternatives on the fertile soils in Eastern Europe, where population numbers are decreasing
- In its recommendations, the Delta Committee discusses the idea of building islands off the coast from the perspective of water safety. Offshore polders or islands decrease the number of waves breaking onto the existing coasts. They may cause an increase in water levels, but could just as well ensure a (slight) decrease if they are combined with deep channels and a well-chosen location. The Committee concludes that the advantages do not outweigh the drawbacks of a diminishing coast profile stability, disruption of the natural recovery of the coast after a storm and an increase in maintenance costs of the primary water-retaining structures. Moreover, the islands themselves will also have to be protected against high water. The Delta Committee recommends focusing on the tried and tested method of coastal replenishment to guarantee the safety of the coast.
- New islands in areas covered by the Birds and Habitats Directives are only allowed if there are compelling reasons of major public importance and there are no alternative locations. This also applies if islands have a significant negative impact on these areas (external effect). In both cases, the loss of natural values will have to be offset. It is also important to allow for the possible

negative external effect of islands on areas (whether covered by the Birds and Habitats Directives or otherwise) in the coastal zone and the Wadden Sea.

Given the above conclusions, the Cabinet does not actively opt for islands at sea for the seaward urbanisation of the Randstad conglomeration, agricultural land or safety. For choices in respect of coastal expansion, see section 5.1 Coast of the National Water Plan. The Cabinet keeps its options open in respect of smaller islands for different purposes, such as economic-social uses, which include energy storage and production, and room for experimentation with innovative solutions. See Chapter 7 on the decision-making framework for activities that require permits.

The Cabinet has invited the business community to put forward ideas for an island for energy storage and production. The central government will facilitate these proposals in spatial and other terms. One idea presented by the market concerns an island for energy storage (to absorb temporary peaks in energy consumption), which requires an impermeable clay

<sup>27</sup> Budget discussion motion, Ministry of Agriculture, Nature and Food Quality, session year 2007-2008, parliament number 312000 XIV no. 112, annex 1 (motion Asthma cs).

<sup>28</sup> J. Stronkhorst, Land reclamation in the North Sea (Deltares 2008).

<sup>29</sup> Strategic policy document, Randstad 2040, towards a sustainable and competitive European top region, Lower House of the States General, session year 2007-2008, 31089, no. 21.

layer of sufficient thickness at approx. 40 metres under the water surface. These conditions only exist in two locations along the Dutch part of the North Sea: off the coast of the province of Zeeuws-Vlaanderen and in the wide vicinity of the Dogger Bank.<sup>30</sup> In terms of cost-effectiveness, the Cabinet prefers a search area off the Zeeland coast. The ultimate choice will be made at project level, taking into account the appropriate assessment of the National Water Plan based on the 1998 Nature Conservation Act and the results of the study into the natural values of the Zeeland Banks in light of Natura 2000 and MSFD.

The Cabinet stands by its decision that an airport at sea as a possible alternative to further growth of Amsterdam Airport Schiphol is not an option. This option could, however, well be opportune in the long to very long term (after 2040).

#### **4.2.9 Archaeological heritage**

The Valletta Convention (Malta) has been embedded in Dutch legislation by means of an amendment to the 1988 Monuments and Historic Buildings Act, which seeks to preserve archaeological heritage on site. To that end, archaeological aspects are taken into account early on in spatial planning processes, including environmental impact statements. As regards shipwrecks older than 50 years, a consideration will have to be made whether they will be salvaged or cleared away. Moreover, if these activities are to be performed inside the territorial

waters and the adjoining zone, they require a permit under Articles 45 up to and including 47a of the 1988 Monuments and Historic Buildings Act. Under the same act, any objects found during these activities that can reasonably be suspected to be of cultural-historic value must be reported to the National Service for Archaeology, Cultural Landscape and Built Heritage (RACM).

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<sup>30</sup> T.C. Prins, A quick scan of the possibilities for a wind farm in an ecological perspective. Deltares report Z4757 (Deltares 2008 (in prep.).



# 5 Space for sand extraction

The demand for sand is set to increase sharply in the years to come, primarily because of coastal replenishments. The Cabinet wants to explicitly offer space for additional sand extraction for coastal and flood protection purposes. This chapter gives the reasons for setting aside space for sand extraction.

## 5.1 Extraction of surface minerals

The extraction of surface minerals is of national importance. It is important to utilise the socially acceptable possibilities for extracting these minerals. The extraction of surface minerals in the North Sea includes the extraction of replenishment sand, shallow (up to a depth of two metres) and deep extraction of fill sand and concrete and masonry sand. Replenishment sand is used for coastal reinforcement through sand replenishment. Fill sand and concrete and masonry sand are used for construction and infrastructure, while fill sand is also used to prevent flood risks (in dykes or elevated industrial estates outside the dykes). At present, all replenishment sand and about a third of the fill sand for construction and infrastructure are extracted from the North Sea. Most of the fill sand is used in the western part of the Netherlands, where there is hardly any space to develop sand extraction activities.

Compelling or otherwise, the reasons of major public importance to extract surface minerals as expressed in an application for a permit or a decision to award a permit can be substantiated as follows:

- The extraction of surface minerals to prevent floods by means of coastal replenishment and for the benefit of infrastructure, housing and industry meets a key basic need for performance of Dutch society;
- Economical and high-quality use is a key principle. Nevertheless, the Netherlands requires approx.

60 million m<sup>3</sup> of sand (fill sand and concrete and masonry sand) a year. Extraction in the Netherlands limits the transfer of the spatial problems to neighbouring countries and to other environmental themes, such as transport problems and additional energy consumption that result from supply over longer distances;

- North Sea sand is the only real possibility for protecting the Dutch coast against flooding by means of sand replenishment.

## 5.2 Spatial task

Following adoption of the National Water Plan, various strategies for preventing the sea and rivers from flooding will be detailed. The task is to find sufficient space for sand extraction to be able to meet the need for sand in the Netherlands in the coming decades, even when opting for the most extreme scenarios.

It is assumed that 110 million m<sup>3</sup> of sand will be needed every year until tot 2100, totalling approx. 4 billion m<sup>3</sup> until 2040, and approx. 10 billion m<sup>3</sup> until 2100. Based on extraction up to a depth of 2 metres, the required surface area will total approx. 2,000 km<sup>2</sup><sup>31</sup> until 2040. After 2040, a substantially larger surface area will be required, unless extraction takes place at greater depths.

## 5.3 Analysis

Sand extraction can be cost effective by extracting it as close to the coastal or on-shore location of the sand requirement as possible. Every kilometre further away increases the cost of sand extraction by 4%. From the point of view of coastal safety (protection of the coastal foundation zone), sand extraction is only possible seaward of the continuous NAP -20m line, with some exceptions (which include deepening of the navigation channels). These starting points yield an area of over 5,000 km<sup>2</sup> up to the 12-mile zone, which is substantially larger than the assumed area of approx. 2,000 km<sup>2</sup>. In principle, the belt between the continuous NAP -20m line and the 12-mile zone contains more than enough sand in the period up to 2040 to meet the highest demand for sand for coastal replenishment and flood protection.

In the long term, sand extraction outside the 12-mile zone could be necessary for locations with a high sand need, such as the coast of Zeeland and Zuid- and Noord-Holland. This can be obviated by extracting at greater depths than the current 2 metres.

According to current insights, extraction up to greater depths is more effective in terms of costs and space. From an ecological point of view, too, extraction at greater depths but smaller surface areas is preferable to shallower extraction over a larger surface.

<sup>31</sup> This estimate is based on the Delta Committee's scenario in which sand replenishment follows the increase in sea level (maximum of 1.30 m up to 2100)

However, extraction at greater depths does not always produce suitable fill sand, as is the case along the Zeeland coast.

Tensions with potential wind farms located outside the 12-mile zone can be avoided by postponing sand extraction there until after wind energy production (20-year depreciation on wind turbines) or by extracting the sand next to these wind energy areas.<sup>32</sup> There is no overlap between designated Natura 2000 areas and Natura 2000 areas to be designated in the area between the continuous NAP -20m line and the 12-mile zone. However, a potentially ecologically valuable area, the Zeeland Banks, is located here.

#### 5.4 Revised spatial policy for sand extraction

The framework vision map in Chapter 7 shows the reserve areas for sand extraction for coastal replenishment and flood protection and those for fill sand and concrete and masonry sand for construction and infrastructure. This is of national importance. In these areas, sand extraction has priority over other designated uses. This zone will amply meet the demand for sand in the coming decades, which is why other functions of national importance will take precedence over those of sand extraction in the event of stacking of functions of national importance outside the 12-mile zone.

In order to limit the possible effects of sand extraction on the benthos and fishing and guarantee the availability of sand extraction in the 12-mile zone for as long as possible, the central government focuses on sand extraction at greater depths than the current 2 metres. Sand extraction off the coast of Zeeland takes account of the results of the study as part of Natura 2000 and MSFD into the natural values of the potentially ecologically valuable area of the Zeeland Banks. No sand may be extracted within an area of 500 metres on either side of cables and pipes. If sand extraction projects for coastal replenishment are unfeasible or difficult to realise as a result, studies will be conducted to determine whether the active bundling of existing cables and pipes is possible and feasible.

Deep extraction of concrete and masonry sand and fill sand is, in principle, permitted. An area off the coast of Zuid-Holland and Zeeland has been set aside for the possible future extraction of coarse sand for the production of concrete and masonry sand. The area is smaller than in the National Spatial Strategy, because the area where this sand is found is estimated to be smaller on geological grounds and because no major demand for this sand is expected in the short term.

As a result, priority in this part of the North Sea has been given (over time) to the 'Borssele' wind energy area (also see Chapter 6). The principle of economical and high-quality use of base materials for construction remains unimpaired.

Extraction landward of the continuous NAP -20m line is not permitted, except for, in principle, extraction from navigation channels, the construction of transfer depots, extraction when the removal of surface minerals from the extraction site contributes to coastal protection, and restoring the seabed of former dumping grounds to their original condition.

Apart from sand, small quantities of shells are extracted as well. Policy dictates that shells can be extracted seaward of the NAP -5m line in quantities in line with natural growth.

<sup>32</sup> Quick scan of options for wind / sand combinations, Royal Haskoning (19 September 2008).



# 6 Space for wind energy

As part of the policy aimed at sustainable, clean and economical energy generation, the number of wind turbines at sea will be drastically expanded. The Cabinet programme 'Clean and Efficient' targets a sustainable energy generation of 20% by 2020, with the target increasing to 40% by 2050. In addition, a target figure of an installed power capacity of 6,000 MW of wind energy in the North Sea in 2020 has been formulated. The Cabinet wants the installed capacity to be as cost-effective as possible before 2020 and seeks to lay the foundations for further (international) growth after 2020. Achieving this objective is of national importance. This chapter describes this Cabinet's spatial choice in terms of designating a number of wind energy areas.

## 6.1 Spatial task

The target of 6,000 MW has been translated into a spatial task of at least 1,000 km<sup>2</sup>, equivalent to approx. 1,200 5 MW wind turbines or 2,000 3 MW turbines.

## 6.2 Starting points

Detailing the spatial tasks for wind energy is based on a number of starting points which, in turn, are derived from the policy choices defined in Chapter 3:

- 1 Priority development of economic use of national importance to the Netherlands (shipping, oil and gas recovery, renewable (wind) energy, sand extraction and defence).
- 2 Efficient and safe use of the North Sea in balance with the marine ecosystem.

This results in the following starting points:

### Re 1. Spatial tension between different uses of national importance is minimised.

- *Cost-effective wind energy*
  - As close to the coast as possible and near landing points.
  - Minimum size is approx. 80 km<sup>2</sup> (400-500 MW).
  - Distributed to optimally benefit from the wind front.

- *Sand extraction*

Attempts are being made to designate wind energy areas outside the 12-mile zone wherever possible, because sand extraction is most cost-efficient inside this zone.

- *Smooth and safe shipping*

When designating wind areas, the premise for safe shipping is a distance of two nautical miles from the IMO traffic separation schemes, anchoring areas and nationally designated (Mining Regulations) clearways. This is based on practical experiences and the policy principle of application of risk analysis for safe shipping.<sup>33</sup>

Further elaboration and the application of practical experiences gained may show that specific situations need a higher degree of customisation.

- *Oil and gas recovery*

A maximum safety zone of 500 m around platforms may be required for safety reasons. For platforms with a helipad, the starting point is an obstacle-free zone of five nautical miles in order to guarantee safe helicopter traffic to and from the platforms. Further elaboration may show that specific situations need a higher degree of customisation.

- *Defence*

These areas are maintained wherever possible. While certain forms of shared use are allowed, shared use by fixed objects is not permitted for safety reasons.

### Re 2. Efficient and safe use in balance with the marine ecosystem

- *Natura 2000 areas and other potentially ecologically valuable areas*

In order to exclude any significant effects, designated Natura 2000 areas and Natura 2000 areas yet to be designated have been avoided. Other potentially ecologically valuable areas where research is being conducted as part of Natura 2000 and MSFD until 2012 will be spared wherever possible.

- *Efficient use of space*

From the point of view of cost-effective wind energy and safe shipping, as well as from the point of view of preserving the value of the open sea, the dispersed location of large wind energy areas is preferred to many smaller areas. This prevents cluttering at sea.

- Multiple use, such as sustainable non-trawl fishing, marine aquaculture and recreation, is permitted wherever possible.

- *Perception*

To preserve the unobstructed views of the horizon from the coast, wind energy areas are, in principle, not created within the 12-mile zone.

<sup>33</sup> Maritime Transport Policy Paper, Responsible Shipping and a Vital Fleet, Lower House of the States General, session year 2008-2008, 31409, no. 2.



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## Distance between shipping routes and wind farms

The general assessment of a safe distance of two nautical miles between large-scale wind farms and shipping routes is mainly based on the behaviour of shipping vessels during evasive manoeuvres, for which there must be sufficient space. An average container ship has a speed of 20 knots (nautical miles per hour). Regulations dictate that a change in course during an evasive manoeuvre must be clearly visible and must be possible in good time. An evasive manoeuvre can result in a 2.5-mile deviation from the course. Half a nautical mile is a normal minimum passing distance between ships in an orderly, clear traffic situation. It should be noted that there is no right of way at sea and that no shipping categories are exempt from the obligation to sheer away. This could mean that even the largest of tankers must get out of the way of the smallest of vessels.

Apart from these normal evasive manoeuvres, ships sometimes need to make emergency manoeuvres or an emergency stop. This may result in a deviation of as much as 90 degrees, with the ship stopping one or two nautical miles further on, depending on the vessel and its speed.

A ship can also be confronted with unexpected machine damage or engine trouble, in which case it needs time and space to respond to the situation. With a distance of two nautical miles to a wind farm, there is little risk that the ship will be pushed all the way to the wind farm by wind or currents.

A ship can also find itself in bad weather. Wind speeds of 6 Beaufort or higher occur 11% of the time on the North Sea. In these circumstances, the ship needs extra space to turn its bow against the waves to withstand a certain swell.

Finally, the distance between a shipping route and a wind farm should allow for possible line-of-sight disruption, both on the radar and visually.

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## Distance between helipads and wind farms

The five-mile obstacle-free zone around a helipad is prescribed to minimise the chance of a collision between helicopter and an obstacle. An obstacle may be a small boat, a large ship or a wind turbine or wind farm. This broad interpretation is needed because helicopters fly on instruments only and cannot clearly differentiate between various obstacles. When flying on instruments only – a situation that occurs regularly on the North Sea – the pilot cannot assume sufficient vertical separation from an obstacle until a height of 1,500 feet has been reached.

The distance of five nautical miles is the Dutch interpretation of international aviation regulations (ICAO annexes 14 and 6, and JAR OPS 3), which prescribe the minimum climbing speed of a helicopter that flies fully loaded on one of its two engines (N-1). If this situation occurs immediately after taking off from a helipad, while flying on instruments only, the helicopter must fly according to an agreed pattern up to a height of 1,500 feet before it can manoeuvre freely (also over obstacles). If the wind blows from a single direction, approaching and taking off from a platform requires only three specific sectors that must be free of obstacles over a distance of five nautical miles. If the wind blows from variable directions, the location of required obstacle-free sectors moves with the direction of the wind. This means that an obstacle-free zone of five nautical miles in all directions is required in order to safely fly to and from a platform in any given wind direction.

A wind farm located within the five-mile obstacle-free zone reduces the possibilities of approaching the platform from various directions (accessibility). This constitutes no problem for flight safety, because no flights will be made if conditions do not allow it. It will be necessary, however, to make clear agreements on the consequences for exploitation of the oil/gas platform (safety of platform and crew, costs). The daily costs of not being able to fly to a single oil/gas platform can vary from several tens of thousands of euros (if a scheduled crew transfer has to be cancelled) to over a million euros (if production comes to a standstill).

Locating (part of) a wind farm inside the obstacle-free zone will always require a customised solution, taking into account the scope and severity of the accessibility problem for the oil/gas platform on a case-by-case basis, based in part on its geographical positioning and meteorological data (e.g. prevailing wind direction).

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## Assessment of potential wind energy areas

Area	Costs	Supply grid incorporation	Connection with other uses		Possibilities	Conclusion
			Use	Considerations		
Holland coast	Relatively low, closest to the coast	6,000 MW, available from 2014 via IJmuiden and additional investment in Oterleek (priority landing points in accordance with 'Cable at Sea' project)	Shipping	Substantial use of space by wind energy may have a detrimental impact on smooth and safe access to harbours.	Search assignment	This entire area is to be considered a search area for the Holland coast. Task: prepare decision-making in 2010. Aimed at social consideration of cost-effective wind energy, smooth and safe shipping into Dutch harbours, oil and gas recovery, safe aviation to and from platforms, cost-effective sand extraction, fishing, defence area, the marine ecosystem and unobstructed views of the horizon from the coast.
			Oil and gas recovery	Taking into account possible loss of space due to prospects and existing mining installations.		
			Sand extraction	5% more expensive if extracted outside 12-mile zone.		
			Defence	n.a.		
			Fishing	Investigate possibilities for shared use by sustainable fishing.		
			Nature	May have detrimental effects on birds near Brown Bank.		
Borssele	Middle category, further offshore	1,000 MW, available between 2014-2018, depending on completion of project in southwest Netherlands. Landing points for additional capacity require additional investments.	Shipping	Increased risk of collision, but controllable.	Surface area 344 km <sup>2</sup> . This is also a search area for an energy island.	Suitable as a wind energy area, including search area for energy island. Use of south-eastern part to be defined in more detail.
			Oil and gas recovery	n.a.		
			Sand extraction	5% more expensive if extracted outside 12-mile zone.		
			Defence	n.a.		
			Fishing	Investigate possibilities for shared use by sustainable fishing.		
			Nature	May have detrimental effects in extreme south-east: Zeeland Banks.		
North of the Wadden Islands	Middle category, further offshore (northern part relatively high)	1,000 MW, available from 2018, depending on connection Eemshaven-Lelystad. Landing points for additional capacity require additional investments.	Shipping	No problem	Search area: at least 1,000 MW	This entire area is to be considered a search area north of the Wadden Islands. Task: prepare decision-making in 2010. Aimed at social consideration of different design or, possibly, relocation of defence area and installation of at least 1,000 MW of wind energy.
			Oil and gas recovery	n.a.		
			Sand extraction	n.a.		
			Defence	Military training area difficult to relocate because of low-level flying and shooting. Perhaps some room can be created for 1,000 MW directly north of the Wadden Islands with relatively minor adjustments.		
			Fishing	Investigate possibilities for shared use by sustainable fishing.		
			Nature	May have detrimental effects in extreme south-east: Borkumse Stenen.		
IJmuiden	Relatief hoog, verst van de kust	6,000 MW available from 2014 via IJmuiden and additional investment in Oterleek (priority landing points in accordance with 'Cable at Sea' project)	Shipping	No problem	Surface area: 1,170 km <sup>2</sup> . Further expansion possible in due time.	Suitable as a wind energy area. Entire area to be defined in more detail with a view to prospects and natural values.
			Oil and gas recovery	Take into account loss of space due to prospects		
			Sand extraction	n.a.		
			Defence	n.a.		
			Fishing	Investigate possibilities for shared use by sustainable fishing.		
			Nature	May have detrimental effects in extreme southern part: Brown Bank.		

### 6.3 Spatial analysis

Based on the starting points listed above, an analysis has been made of potential wind energy areas in the EEZ until 2020. For the period until 2020, areas in the central and northern part of the EEZ are not realistic, with the construction and exploitation costs being too high given the distance from the coast. The area may, however, well become opportune after 2020, when the oil and gas fields are close to depletion, the state of the art in wind energy at sea has been developed further and an international network of wind turbines at sea could be developed. The analysis of the designation of wind energy areas for a cost-effective realisation of 6,000 MW is, therefore, focused on the (busy) southern part of the EEZ, as close as possible to the landing points on shore but outside the 12-mile zone wherever possible.

Applying the starting points referred to in 6.2, the table on the page opposite assesses potential wind energy areas for 2020 in the southern part of the EEZ.

Alongside the conclusions drawn in the table for each area, it can be said that, more generally speaking, each of the areas still has certain issues in terms of harmonisation with other uses and with the marine ecosystem, which may reduce the available space for wind energy at sea. Moreover, within the wind energy areas to be designated, the Cabinet wishes to keep open the option of providing space for other innovative forms of renewable energy and shared

use, such as leisure activities, sustainable non-trawl fishing and marine aquaculture. As implementation progresses, new insights may emerge (e.g. new technologies and prerequisites from implementation of the MSFD, such as underwater noise and integrity of the seabed). These insights could place additional demands on the design of the wind farms (specific licensing conditions).

In order to ensure that the envisaged 6,000 MW of wind energy can actually be installed from a spatial point of view, the total surface area to be designated must far exceed the 1,000 km<sup>2</sup> that are strictly required for 6,000 MW of wind energy at sea. The Cabinet uses a target figure of approx. 1,500 to 2,000 km<sup>2</sup>.

Because of the water depth on site and the distance to the landing points of the electricity cables, the cost-effective use of wind at sea requires the creation of a substantial area for wind energy closer to the coast. Of all areas considered, the section off the Holland coast between Hoek van Holland and Texel proves to be the most cost-effective for the period until 2020, because turbines can be built at a relatively shallow location close to landing points where sufficient capacity will become available on the high-voltage grid in the current planning period. It should be noted, however, that this is also the busiest part of the southern half of the EEZ.

### 6.4 Revised spatial policy for renewable (wind) energy

Based on the above analysis, the Cabinet has designated the following wind energy areas in the National Water Plan (see framework vision map):

- ‘Borssele’
- ‘IJmuiden’.

The remaining spatial issues with respect to the areas to be designated do not offer the Cabinet sufficient certainty that a net area of at least 1,000 km<sup>2</sup> will remain for wind energy at sea. Moreover, the cost-effective application of wind at sea requires the creation of a substantial area for wind energy closer to the coast. Against this background, the Cabinet has initiated two search areas for additional space for wind energy at sea:

- The area off the Holland coast between Hoek van Holland and Texel;
- North of the Wadden Islands.

The decision on the designation of extra wind energy areas off the Holland coast and to the north of the Wadden Islands will be detailed in the form of a supplement to the National Water Plan’s framework vision, accompanied by a specific and detailed SEA and Appropriate Assessment for these search areas. The draft decision will be taken by the Cabinet in the course of 2010 and this decision will be adopted following a consultation round. The framework vision map also shows the search areas where the landing

points of cables to the designated wind energy areas will be selected.

During the planning period, the central government will not permit the construction of wind farms at sea.<sup>34</sup> The reasons are as follows. As indicated in section 6.3, the wind energy areas to be designated and the appointed search areas in the EEZ are the most realistic in terms of an integrated consideration of the national interests of wind energy, shipping, oil and gas recovery, sand extraction, defence, the marine ecosystem and the unobstructed views of the horizon from the coast. The designation of a few large areas prevents cluttering of the sea by several smaller farms, which also positively affects shipping safety and the efficient laying of cables. Moreover, the advance designation of wind energy areas offers maximum planning transparency to all users of the EEZ. This means that wind farm licensing procedures are more efficient and reduce the administrative burden of all parties involved.

To effectuate this policy, the policy rules on application of the Water Act for installations in the EEZ will be amended in 2010.

For the longer term, after 2020, the central government envisages the realisation of wind energy further out to sea to the northwest of Texel in the part of the EEZ that currently houses a large number of oil and gas platforms. This development is also indicated on the framework vision map.

The wind energy areas to be designated and the search areas for wind energy are explained in more detail below, including points of attention for the ultimate creation of the areas and a description of the search assignment.

#### 6.4.1 Borssele area

At least 1,000 MW can be realised in this 344 km<sup>2</sup> area.

It is a reasonably favourable area off the Zeeland coast (Walcheren): little shipping traffic, limited water depth and middle category in terms of distance to the coast. Landing provisions exist at Borssele.

##### *Points of attention for creation of the area*

Borssele wind farm

- 1 The area overlaps with a potentially ecologically valuable area in the southeast (Zeeland Banks). Although its natural values appear limited, further studies will take place as part of Natura 2000 and MSFD until 2012. Based on those studies, further conditions and/or limitations may be imposed on the construction of wind farms in this area.
- 2 There is a relatively high cable and pipe density in the area, which may mean that not the entire surface area is available for wind turbines.
- 3 Incorporation of generated capacity in the national electricity grid is limited to a maximum of 1,000 MW. The area is far removed from the electricity grid, which is extremely unfavourable for the development of the Dutch electricity grid. The realisation

of wind farms in this area will require high investments in the grid infrastructure for landing points for wind energy.

- 4 The area is also a search area for a multifunctional island for energy storage and production that may be constructed there.

#### 6.4.2 IJmuiden area

This area totals 1,170 km<sup>2</sup>.

There is little shipping here, but the water is deep and it is far removed from the coast. It partially overlaps with the Brown Bank. Cables and pipes can land in IJmuiden or Oterleek, where sufficient capacity (4,000-6,000 MW) on the high-voltage grid can be made available during this planning period.

##### *Points of attention for implementation*

- 1 Due to its distant location and deep water, this area is not very attractive in the current phase of development of energy technology, but will become more so the more this energy technology matures.
- 2 The area offers opportunities for northward growth of wind energy after 2020, when oil and

<sup>34</sup> This applies to the territorial waters and the EEZ seawards of the municipally zoned areas (also see footnote 1 for the exact delineation). Landward of this boundary, the provision from the Land Use Planning Memorandum remains in place that, if possible with a view to shipping safety, wind farms are permitted in the municipally zoned areas directly opposite the port and industry areas of IJmond and Maasvlakte near possible landing points to the on-shore high-voltage network.

gas platforms are taken out of commission and/or in connection with the development of an international North Sea Grid (after 2020).

- 3 The exact utilisation and delineation requires further study of the ecological effects. The Brown Bank will be studied as part of Natura 2000 and MSFD until 2012. Based on the findings of this study, a further consideration will be whether and to what extent more conditions are to be imposed on the creation of wind farms in this area.
- 4 Further study is also required because there are still prospects for oil and gas recovery.

#### 6.4.3 Search area Holland coast

This is the area that is most cost-effective for wind energy in the period until 2020, because turbines can be built at a relatively shallow location close to landing points where sufficient capacity (4,000-6,000 MW) will become available on the high-voltage grid in the current planning period. Wind energy can land in IJmuiden, Oterleek and deeper into the grid. However, this is also the busiest part of the North Sea, transected by shipping routes to the ports of Rotterdam and Amsterdam, with oil and gas platforms in the north and south.

The search assignment is:

*The objective of the study in the search area is to find space for one or more large-scale wind energy areas with a total surface area of 500 km<sup>2</sup> for the generation of 3,000 MW. In a broad social cost-effectiveness analysis, the study addresses this in relation to*

*possible consequences for smooth and safe shipping on the North Sea and to and from the Dutch ports, the recovery of oil and gas, safe air traffic to and from platforms with a helipad, sand extraction, fishing, defence areas, the marine ecosystem and the unobstructed views of the horizon from the coast. Based on the analysis, the Cabinet will decide on the definitive locations and total scope of the wind energy areas to be designated within the search area, and on the consequences this decision will have for other designated uses and/or values at stake.*

#### Points for attention

- 1 Safety of shipping: Based on risk analyses, a distance of two nautical miles is a safe starting point. The outcomes of the risk calculations differ for each situation and depend on how busy the routes are, the type of vessels, and what traffic must be crossed. Practical experiences must also be taken into account. The line of approach to each specific situation may lead to different measures for a safe distance between wind farms and shipping routes.
- 2 Oil and gas: The scope and severity of the accessibility problem for a specific oil/gas platform will have to be considered case by case, based in part on its geographical positioning and meteorological data (e.g. prevailing wind direction).
- 3 Unobstructed views of the horizon from the coast: A visually well-conceived positioning on the inside edge of the 12-mile zone with a suitable design may offer opportunities for customisation.



#### 6.4.4 Search area north of the Wadden Islands

Space for at least 1,000 MW of wind energy will have to be found in this search area.

This search area has limited shipping, a high average wind speed, a long distance to the coast and currently comprises mainly military training areas. Connection to the high-voltage grid in the Eemshaven is planned.

The search assignment is:

*A social consideration will be made between a change in design or, possibly, relocation of the existing defence area and the creation of at least 1,000 MW of wind energy (165 km<sup>2</sup> net) before 2020.*

##### Points for attention

- 1 This is an attractive area because, together with the other three areas, it will ensure a spatial distribution of renewable energy across the North Sea (optimum use of the wind front).
- 2 As regards distance to the coast, the costs of creating wind farms at this location can be compared to the area near Borssele.
- 3 The following two issues are of importance in respect of the on-shore electricity grid at Eemshaven:
  - Congestion in the northern part of the high-voltage grid will occur in the short term. The planned expansion of the electricity grid near Eemshaven is set aside for two newly licensed coal-fired power plants in the region. Substantial investments (not before 2018) will be required before capacity is

sufficient to be able to transport 1,000 MW of wind energy. Larger grid capacity requires an investment totalling approximately €1.5 billion.

- The longer transport distances to consumers in the Randstad require considerable investments, which means that substantial transport losses and long planning lead times must be taken into account.
- 4 The eastern part of the search area houses a potentially ecologically valuable area (Borkumse Stenen), which will be studied until 2012 as part of Natura 2000 and MSFD. Based on the findings of this study, a further consideration will be whether and to what extent more conditions are to be imposed on the creation of wind farms in this area.

#### 6.4.5 Implementation procedure

To expedite the creation of wind farms, the central government is working on an implementation procedure together with other parties. This procedure includes the following aspects:

- The formulation of a new licensing regime that optimally links the allocation of grants under the Sustainable Energy Incentive Scheme (SDE) and obtaining the required permit under the Water Act;
- Funding of the SDE grant for the (remaining part of the) 6,000 MW of wind energy at sea in 2020;
- Preparations for the decision on the principle to be taken by the Cabinet on the grid configuration needed at sea for wind energy;
- Decision-making on the landing points of electricity cables needed for wind energy at sea;
- The conditions on which shared use of wind farms

could be possible, e.g. with leisure activities, sustainable non-trawling fishing, and marine aquaculture, or with other forms of renewable energy production. This could lead to a reconsideration of the current ban on passing these types of activities.

- With a view to cost-efficiency regarding the construction and maintenance of large-scale wind farms further off the coast as well as function combinations with other forms of renewable energy, the market parties are exploring opportunities for public-private partnerships in the construction of a dedicated harbour island at sea.
- The possibilities for public-private partnerships in monitoring the effects of the construction and exploitation of wind farms on the marine system, paying attention to the international dimension.

The creation of 6,000 MW of wind energy may have a long-term impact on the ecosystem at different locations at the same time. This impact could be even worse if our neighbouring countries also implement plans for the construction of wind farms. This impact mainly comprises the cumulative effects of long-term noise pollution and possibly also the barrier effect for mammals, fish larvae and the foraging and migratory behaviour of birds. At the moment, there are a number of uncertainties where these potential negative effects are concerned. Also in view of implementation of the Birds and Habitats Directives and the MSFD, the Netherlands is focusing, at OSPAR



level, on international harmonisation to minimise the possibly international cumulative negative effects of wind farms on the marine ecosystem. The latest insights will be used for the distribution regime of wind energy areas.

On 13 November 2008, the European Commission issued a statement concerning wind energy at sea that addresses the measures required to achieve the Sustainable Energy objectives for 2020 and beyond. The Commission draws attention to the challenge of creating cohesion of the different processes in the face of a wide diversity of plans and measures instigated by the individual member states. This relates to spatial planning at sea, the timely designation of areas for offshore wind energy, balancing with the marine ecosystem and grid incorporation of large-scale wind energy at sea. The Netherlands will make an active contribution to developments at a European level aimed at creating grid configurations for the incorporation of large-scale offshore wind energy.

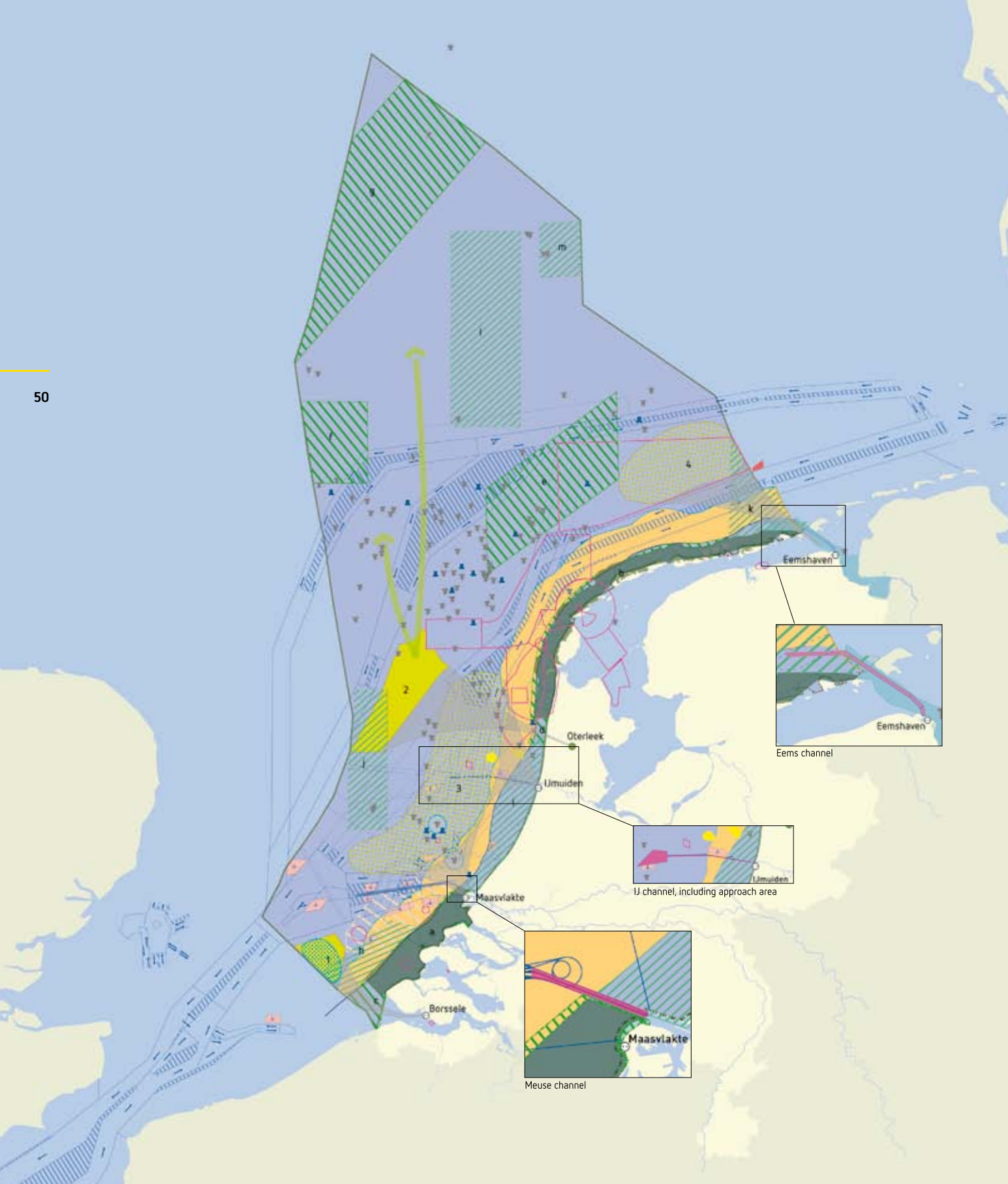
As part of the implementation procedure, the central government also focuses on any additional studies and the formulation of implementation protocols. These protocols must provide market parties with clear guidelines for the optimally ecologically sound construction of the required wind farms and dealing with related uncertainties. The aim is not to unnecessarily slow down construction and jeopardise the sustainability objective for 2020.

The implementation protocols include stipulations on permitted foundation techniques, the construction season, monitoring of effects and animal behaviour, mitigating measures and the application of the latest insights. The results of appropriate assessment of the designated (search) areas for wind energy in accordance with the 1998 Nature Conservation Act must also be incorporated into the implementation procedure.

Map 2

# North Sea policy choices

Framework vision map



**basis**  
 boundary of territorial waters (12-mile zone)  
 continuous NAP -20m line  
 equidistance line for territorial sea in 2009  
 Ems-Dollard treaty area 2009

**shipping infrastructure**  
 boundary of traffic separation schemes  
 anchoring area  
 traffic separation zone  
 clearways  
 search area for anchoring ground for Eemshaven (in the German EEZ - for information only)  
 channels: amendment in study

**oil and gas recovery platforms**  
 platforms  
 underwater platform

**sand extraction**  
 reserve area for replenishment sand and fill sand  
 reserve area for concrete and masonry sand

**defence**  
 military training areas (incl. munitions dump)

**marine ecological system**  
 national ecological network  
 Natura 2000 areas to be designated in 2010  
 designated Natura 2000 areas  
 other potentially ecologically valuable areas  
 a Voordelta  
 b North Sea Coastal Zone  
 c Vlakke van de Raan  
 d Expansion of North Sea Coastal Zone  
 e Friese Front  
 f Klaver Bank  
 g Dogger Bank  
 h Zeeland Banks  
 i Kustzee  
 j Bruine Bank [Brown Bank]  
 k Borkumse Stenen  
 l Central oyster fields  
 m Gasfontein

**wind energy areas**  
 wind farms  
 wind energy area  
 wind energy search area, to be set out in concrete terms in 2010  
 1 Borssele  
 2 IJmuiden  
 3 search area coast of Holland  
 4 search area north of the Wadden Sea islands

**wind energy landing point**  
 Borssele; Eemshaven; IJmuiden; Maasvlakte  
 Oterleek (possible landing point)  
 search area wind energy cables to landing point

**renewable energy in the long term**  
 direction of development of renewable energy after 2020  
 search area island for energy storage and production  
 pilots for CO<sub>2</sub> storage before 2015

**applicable for entire EEZ**  
 search area for oil and gas recovery  
 search area for CO<sub>2</sub> storage  
 recreation, if compatible with activities of national importance  
 fishing, if compatible with activities of national importance

# 7 Decision-making framework for activities on the North Sea

In principle, new activities are welcome in the North Sea. Based on the integrated policy framework of the National Spatial Strategy, IBN 2015 includes an elaboration of management and licensing practices in the form of an integrated decision-making framework for the North Sea as a whole. North Sea policy in the National Water Plan emphasises the elaboration of this integrated decision-making framework for all activities in the North Sea.

## 7.1 Scope of the decision-making framework

The decision-making framework for activities on the North Sea applies to all activities that require permits, including the renewal and extension of existing activities as part of the regulatory framework applicable to the North Sea. This decision-making framework also provides direction for the regulation of activities subject to international legislation and/or for which no permit is required, such as fishing, shipping and recreation. Administrators can use the decision-making framework to focus on efficient use of space, use in balance with the marine ecosystem in general and protection of regional natural values in particular. Undesirable use can be refused. The decision-making framework for activities on the North Sea interfaces with existing regulatory frameworks wherever possible, including the environmental impact assessment and the obligations under the Birds and Habitats Directives.

## 7.2 Content of the decision-making framework

### 7.2.1 Framework vision map

The framework vision map for the North Sea shows the spatial ramifications of the policy choices as outlined in previous chapters. The activities of national importance, policy on other activities, protection of the marine ecosystem and the Natura 2000 areas are spatially recorded on this map.

### 7.2.2 Decision-making framework

The framework vision map is accompanied by the following decision-making framework for existing and new activities in the North Sea:

- **General:** In its spatial consideration, the Cabinet gives priority to activities of national importance, being shipping, oil and gas recovery, CO<sub>2</sub> storage, wind energy, sand extraction and replenishment, and defence. In addition, the implementation of the BHD and MSFD are of key importance. The spatial ramifications of the above are reflected in the framework vision map. Furthermore, the aim is to retain the open and dynamic character of the North Sea and a mutually efficient and safe coordination of its use. Multiple use of the space is encouraged wherever possible.
- **Overlapping activities:** In areas that have been designated for activities of national importance (see framework vision map), other activities must not hinder this use. Whenever activities of national importance accumulate in the same area, the aim is to create combined and efficient use of space, provided that the first initiator encounters no disproportionate damage or obstruction. Furthermore, certain preconditions apply with regard to the coordination of activities of national importance: see table on page 52.

It should be noted that a holder of a licence for the specific licensed activity has the exclusive right to explore or develop the sea area in question for the relevant function, but this does not mean that they

have the exclusive right to the sole use of that area. In principle, there is space for shared use with other activities provided that this does not cause any disproportionate damage or obstruction for the primary initiator or licence holder.

### **As regards activities that require permits, the following also applies:**

- **Efficient use of space and preservation of the experience-related value:**  
Visible permanent structures (i.e. structures that remain in place for six months or longer) in the 12-(sea)mile zone are not permitted. However, based on decisions on wind energy areas inside the search area off the coast of Holland, local variations are possible by placing wind turbines along the inner periphery of the 12-mile zone. Activities of national importance may be allowed in the 12-mile zone if there are no reasonable alternative locations and no significant effects on coastal protection occur. In that case, obstruction of views to the horizon and to recreation and fishing must be minimal. In the event of soil interventions in territorial waters and the EEZ, the presence of archaeological values must be taken into account.
- **Ecological effects:**  
Activities at sea are possible provided that there are no significant effects on the marine ecosystem, applying the ecosystem approach and the precautionary principle. If there will be significant effects, proof has to be provided as to why that

Activity of national importance	Preconditions
Smooth and safe shipping	<p>In traffic separation schemes, anchoring areas and clearways, priority is given to merchant shipping over all other uses</p> <hr/> <p>Oil and gas platforms or other permanent individual construction works are not permitted within and in a 500-metre zone outside these shipping routes.</p>
Oil and gas extraction	<p>Utilise the potential of available oil and gas stocks wherever possible, including the so-called 'small fields'</p> <hr/> <p>Shipping is prohibited within a 500-metre safety zone around a mining installation</p>
CO <sub>2</sub> -storage	<p>Utilise the potential of empty oil and gas fields and aquifers (suitable for storage) wherever possible</p> <hr/> <p>Shipping is prohibited within a 500-metre safety zone around a mining installation</p>
Wind energy	<p>Build wind farms in round 2 (not shown in framework vision map)</p> <hr/> <p>Establish wind farms in the wind energy areas 'Borssele' and 'Ijmuiden' and designate additional areas within the search areas 'Holland Coast' and 'north of the Wadden Islands'</p> <hr/> <p>Shipping is prohibited in a wind farm, and in the 500-metre safety zone around it</p> <hr/> <p>The government does not permit the establishment of wind farms at sea outside the designated areas and round 2 permits</p> <hr/> <p>Within the designated wind energy areas, permission is only given for the construction of wind farms within the bounds of the wind farm legislation that is being developed (round 3)</p>
Sand extraction and replenishment	<p>Extraction of replenishment and fill sand is a priority in the reservation zone between the continuous NAP -20 m line and the boundary of the 12-mile zone.</p> <hr/> <p>In the event that activities of national importance are stacked outside the 12-mile zone, other activities of national importance take precedence over sand extraction</p> <hr/> <p>An area is reserved off the Zeeland coast and the Maasvlakte for the extraction of concrete and masonry sand</p> <hr/> <p>Sand extraction is prohibited landward of the continuous NAP -20m line</p>
Defence	<p>In military training areas, other uses are permitted as long as they are compatible with the military activities that take place there</p>

activity must take place in the North Sea. Parties involved have an obligation to perform to the best of their ability in terms of compensation. The decision-making framework also serves to protect Natura 2000 areas, as enshrined in Section 19 of the 1998 Nature Conservation Act, pursuant to which compensation is subject to the obligation to produce results. In the event of spatial interventions for activities of national importance, (compelling) reasons of major public importance need not be substantiated when applying for and granting permits. In concrete terms, this involves the detection and recovery of natural oil and gas, CO<sub>2</sub> storage, 6,000 MW of installed capacity in wind farms and the extraction of surface minerals (sand extraction). The decision-making framework may be supplemented in light of implementation of the MSFD, in that it will take into account the cumulative effects of other activities at sea, also in an international context. Based on further study, the central government will decide in 2012 whether more ecologically valuable areas qualify for specific protection under the VHR and MSFD. To avoid possible conflict of activities with designation of additional protected areas, the decision-making framework regarding potentially ecologically valuable areas indicated on the framework vision map requires special attention.

- Room for experimentation:

The central government can assign areas for experiments intended to boost sustainable development of the North Sea in the long term,

and, where possible, grant temporary exemption from stipulations of the decision-making framework.

### 7.2.3 Compensation for loss resulting from government decisions

A legitimate user of (part of) the North Sea does not have the exclusive right to the area in question. The government determines the extent to which shared use is to be accepted. If a user is of the opinion that other legitimate use causes damage, he may appeal for compensation from the competent authorities. This involves damage by individual users the costs of which they cannot in all reasonableness bear themselves and that is beyond the scope of normal social risk. If the Ministry of Transport, Public Works and Water Management has granted the permit, the Ministry's 1999 Loss Compensation Scheme may be invoked.

## 7.3 Elaboration

The decision-making framework will be elaborated at design, permit and management level, in consultation and coordination with stakeholders and interested parties. Where possible and useful, area development processes will be deployed to achieve government ambitions. Assessment of the use will be further specified using the conservation goals laid down in the BHD in Natura 2000 areas and the environmental targets set as part of the MSFD. Activities in protected areas are not excluded

in advance. The above decision-making framework also applies to new (spatial) developments that are not currently anticipated, including coordination with stakeholders and interested parties and the application of area development processes if necessary. There will be a single point of contact where individual projects will be examined together with the initiator to see whether space can be provided for them within the framework of North Sea policy.

## 7.4 Follow-up

### 7.4.1 Exploration of the safeguarding of spatial claims

The framework vision map and the accompanying decision-making framework for the North Sea provide sufficient guarantees that the various users and values in the North Sea will be balanced against one another in this planning period. Spatial pressure on the North Sea is expected to continue to increase, which is why the government will explore whether the way in which the spatial consideration is now safeguarded will continue to be effective in the long term. It cannot yet be concluded in advance whether the government zoning plan, within the context of international legislation and the way in which the sea is used, is the most effective instrument for this. The Cabinet will formulate an overview of the pros and cons of the various options by 2011.

## Examples of multiple use of space in the North Sea

### Multiple use of space already realised

- In defence areas, sand may be extracted as long as no military exercises are taking place.
- During the extraction of concrete and masonry sand, the unusable sand layer above the concrete and masonry sand is used for the construction of the Tweede Maasvlakte.
- There is a light island off Goeree-Overflakkee. No shipping is allowed within the 500-metre safety zone around it, which the Ministry of Defence uses to adjust the magnetic reels of its minesweepers
- In the Voordelta Natura 2000 area, nature is combined with recreation and fishing. Examples of recreational co-use include organised canoe trips in rest areas (Hinderplaat and Bollen van de Ooster; regulating by the canoe sector) and the kite surfing zone at the Slikken van Voorne.
- There is also limited fishing in the Voordelta. On certain conditions (small vessels, certain types of nets) fishing is also allowed in two rest areas (Hinderplaat and Slikken van Voorne).

### Possible future multiple use of space

- Different kinds of seaweeds may be grown on floating constructions on (reinforced) wind turbines. These weeds can be used for the production of biofuels (refining), methane (fermentation) and pharmaceutical and cosmetic products.
- Other forms of generation of renewable energy can also be attached to the (reinforced) wind turbine tower, such as wave rotors (wave energy) or generators powered by water currents.
- A self-contained system for fish cultivation can be attached to the (reinforced) wind turbine. This can be combined with the cultivation of weeds, algae and mussels, making the entire system nutrient-neutral. An example of a plan combining aquaculture with a mining platform is BioQ8.
- New nature can be developed in a wind park. Species that cannot survive on the sandy soils may settle on and around wind turbines. Additional hard substrate may be added to the area for these species.
- Old gas fields where production is too small to pump the gas through the pipelines with sufficient pressure can generate energy locally by means of a gas turbine and a generator. The electricity produced can be transported to land using the electricity cable installed for the wind farm.
- Recreation and wind farms can co-exist well. With the owner's consent, it may be interesting to organise visits to wind farms as a form of tourism. This can be combined with a visitors' centre at sea, information about wind energy, and exhibitions about flora and fauna in the North Sea.

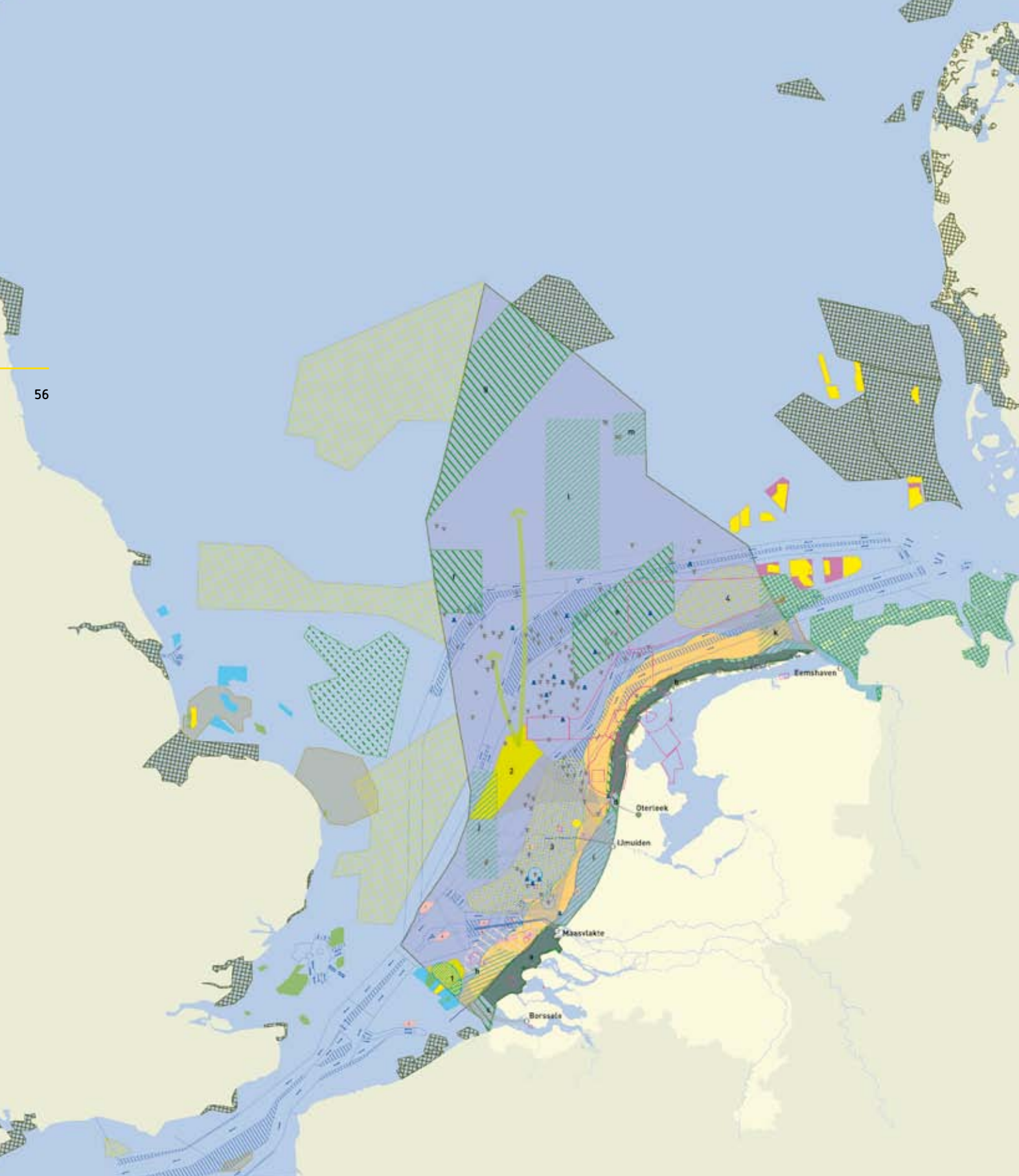
#### **7.4.2 International collaboration**

The southern part of the North Sea is of increasing international strategic importance in terms of (sustainable) economics – transport, oil and gas reserves and the opportunities for renewable wind energy – and from an ecological perspective. International collaboration will help leverage the area’s potential as well as achieve synergetic benefits. In this planning period the Netherlands will actively focus on enhancing international coordination in relation to North Sea policy. The Cabinet is aiming for a joint strategy for the southern part of the North Sea, which comprises the Belgian, Dutch, German and Danish North Sea EEZ and the British EEZ located to the west. Activities will focus on the joint formulation of a vision and principles for spatial planning, rooting in legislation, coordination with regard to implementation, design and management, and collaboration on monitoring and maintenance. This links up with the road map for Marine Spatial Planning that the European Commission issued in the autumn of 2008. The activity creates a relationship with the formulation of environmental objectives and measures as part of the MSFD and Natura 2000.

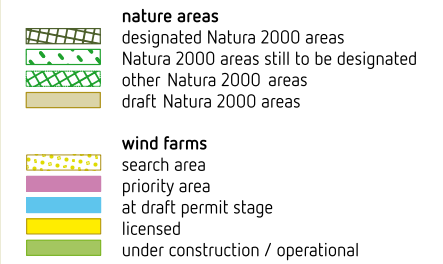
In December 2007, the EU published a ‘Blue Book’ regarding the (integrated) European Maritime Policy and an associated Action Plan. New EU maritime policy will build on marine research and technology and embed the Lisbon Agenda for more growth and more and better jobs. The starting point is that

economic development will not take precedence over the sustainability of the environment. The Blue Book contains an action plan to promote integrated maritime policy in all member states. The action plan comprises a broad range of areas such as maritime transport, energy, fishing and protection of the marine environment. Marine spatial planning is one of the instruments the Commission would like to promote in order to integrate sectoral maritime use.

The Dutch initiative to formulate an international strategy for the southern part of the North Sea links up with the integrated European Maritime Policy. The Netherlands aims for active collaboration with its neighbours in coordination with and where necessary supported by the European Commission, while applying the subsidiarity principle.



## International developments in wind energy en nature areas at sea



This legend concerns the parts outside Dutch waters. See map 2 on page 50 for the legend for the Dutch part.



# 8 Realisation and funding

The previous chapters discussed the North Sea policy in the National Water Plan. This chapter gives an overview of the activities listed in the various chapters by means of which the North Sea policy choices can be realised during this planning period. It is followed by a section addressing how this will be funded.

North Sea policy activities 2009-2015

What	Who	When
Partial review of Integrated Management Plan for the North Sea 2015	V&W, LNV, EZ, VROM	2010
Study of safeguarding the assessment of spatial claims, including the government zoning plan option	V&W, VROM, LNV, EZ	2011
Complete package of measures for the MSFD	V&W, LNV, EZ, VROM	2015
Reduction of pollution caused by shipping under the MARPOL Convention and seaport policy	V&W	2015
Stimulation of sustainable fishing in association with EFF and CFP at European level	LNV	2013
Designate Dogger Bank, Klaver Bank, the Friese Front, Westerscheldemonding/Vlakte van de Raan and parts of the coastal sea north of Bergen as Natura 2000 areas	LNV	2010
Declare the 1998 Nature Conservation Act and the Flora and Fauna Act applicable in the Dutch EEZ	LNV	2010
Management plan for Natura 2000 areas at sea	V&W, LNV	2013
Study protection of ecologically valuable areas as part of Natura 2000 and MSFD	LNV, V&W	2012
Decision-making concerning more protected areas at sea in Natura 2000 and MSFD	LNV, V&W, EZ, VROM	2012
Determine strategy and locations for the extraction of replenishment and fill sand	V&W	2010
Decision concerning the designation of wind energy areas within the search areas off the Holland coast and to the North of the Wadden Islands	V&W, EZ, VROM, LNV, Defence	2010
Changes to Water Act policy regulations with regard to changes to wind farms	V&W, EZ, LNV, VROM	2010
Public-private implementation procedure for wind energy on the North Sea	EZ, V&W, VROM, LNV, social parties	2010
Research into combining recreation, sustainable fishing techniques and wind farms	V&W, LNV, EZ, VROM	2010
Decision concerning island for energy storage and extraction	EZ, V&W, LNV, VROM, social parties	Before 2015
Two pilot projects for CO <sub>2</sub> storage	EZ, V&W, LNV, VROM	2015
Changes to the Maasgeul, Eurogeul, IJ-geul and Eemsgel channels. Decision-making concerning anchoring area for Eemshaven eventually	V&W	2010
Joint international basic principles regarding spatial planning at sea, for example with regard to distances between wind farms and shipping routes and possibly interconnecting traffic separation schemes in the southern part of the North Sea.	V&W, LNV, EZ, VROM, neighbouring countries, IMO	2014
International strategy for the southern part of the North Sea	V&W, LNV, EZ, VROM, neighbouring countries	2014



## 8.1 North Sea policy activities 2009-2015

### *Innovation agenda*

The central government will investigate whether additional action will be needed to promote sustainable use in balance with the marine ecosystem. This may result in an innovation agenda for sustainable development of the North Sea, in connection with existing innovations for sustainable fishing practices and energy, for example. This will be worked out in more detail in the partial review of the Management Plan for the North Sea 2015.

### *Organisation*

Various divisions of various ministries together administer the North Sea. Against this background, a number of interministerial partnerships have been established with respect to policy on and management of the North Sea:

- The Interministerial Consultation Body for North Sea Governance (IDON) develops strategy and visions and co-ordinates policy development.
- Administrators work together with the North Sea Agency of the Directorate-General for Public Works and Water Management as co-ordinating administrator in order to be able to provide better service to customers and co-ordinate the various administrative and management tasks (primarily licensing and information management), management and enforcement of management and policy.

- At Coastguard level, six ministries co-operate in the implementation of a number of service and enforcement tasks. Direction of the Coastguard is as follows:
  - for service tasks (nautical management and acting in response to incidents and disasters): Ministry of Transport, Public Works and Water Management;
  - for enforcement tasks (general enforcement, enforcement of environmental legislation, traffic safety and fishing): the Permanent Contact Group for Enforcement on the North Sea (PKHN), in which the Ministries in question are represented.

## 8.2 Funding

The activities are funded from the budgets of the Ministry of Transport, Public Works and Water Management and the Ministry of Agriculture, Nature and Food Quality. For the funding of coast line maintenance (extraction and replenishment), see Chapter 7 of the National Water Plan.

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# Appendix 2 Abbreviations and definitions

BHD	Bird and Habitat Directives	TBT	Tributyltin
CFP	Common Fisheries Policy	UN	United Nations
EAC	Ecological Assessment Criteria	UNCLOS	United Nations Convention on the Law of the Sea
EcoQO	Ecological Quality Objective (OSPAR)	VHR	Birds and Habitats Directives
EEZ	Exclusive Economic Zone	VIP	Fisheries Innovation Platform
EFF	European Fisheries Fund	VROM	Ministry of Housing, Spatial Planning and the Environment
EHS	National ecological network	V&W	Ministry of Transport, Public Works and Water Management
EU	European Union	Wbr	Public Works (Management of Engineering Structures) Act ('Water Act')
EZ	Ministry of Economic Affairs	WFD	Water Framework Directive
GNP	Gross National Product		
IBN 2015	Integrated Management Plan for the North Sea 2015		
IDON	Interministerial Consultation Body for North Sea Governance		
IMO	International Maritime Organisation		
LNG	Liquefied Natural Gas		
LNV	Ministry of Agriculture, Nature and Food Quality		
MARPOL	International Convention for the Prevention of Pollution from Ships		
MER, m.e.r.	Environmental Impact Assessment		
MPA	Marine Protected Area		
MSC	Marine Stewardship Council: organisation for the certification of sustainable seafood		
MSFD	Marine Strategy Framework Directive		
MTR	Maximum Permissible Risk		
MW	Megawatt, 1 million Watts		
NAP	Amsterdam Ordnance Level, reference for water level in the Netherlands		
NCP	Dutch Continental Shelf		
NGO	Non-Governmental Organisation		
NM	Nautical mile. This equals 1.852 km		
NZMC	North Sea Ministers Conference		
OSPAR	Oslo-Paris Convention. OSPAR Treaty: treaty on the protection of the marine environment in the north-eastern part of the Atlantic Ocean		
PAHs	Polyaromatic Hydrocarbons		
PKHN	Permanent Contact Group for Enforcement on the North Sea		
RACM	National Service for Archaeology, Cultural Landscape and Built Heritage		
RWS	Directorate-General for Public Works and Water Management		
SEV III	Third National Structure Plan for Electricity Supply		

# Appendix 3 Co-ordinates of the framework vision map areas to be designated

Wind energy areas to be designated (system of co-ordinates used: ED50)

Area	Point	Latitude North	Eastern longitude	Comment
Borssele	1	51°36'11.26" N	003°06'13.18" E	
	2	51°34'15.96" N	003°03'34.63" E	
	3	51°37'22.05" N	002°58'26.28" E	
	4	51°44'37.88" N	002°46'19.88" E	
	5	51°48'05.62" N	003°03'53.16" E	
	6	51°43'59.15" N	003°08'30.82" E	
	7	51°41'50.09" N	003°07'52.27" E	
IJmuiden	1	53°10'11.61" N	003°45'00.00" E	
	2	53°05'00.00" N	003°45'00.00" E	
	3	53°05'00.40" N	003°49'39.17" E	
	4	53°04'56.09" N	003°57'56.76" E	Platform = centre of 3 and 5, radius 5 NM
	5	53°00'12.58" N	003°55'15.82" E	
	6	52°58'06.69" N	003°51'07.33" E	
	7	52°39'13.65" N	003°27'19.48" E	
	8	52°39'13.65" N	003°27'19.48" E	
	9	52°37'14.73" N	003°24'51.18" E	
	10	52°37'15.88" N	003°12'44.43" E	
	11	52°37'29.46" N	003°11'28.21" E	
	12	52°38'04.44" N	003°11'32.89" E	
	13	52°53'22.41" N	003°25'02.53" E	
	14	52°54'06.47" N	003°25'27.09" E	
	15	53°01'28.18" N	003°29'34.10" E	
	16	53°03'49.00" N	003°32'19.00" E	Platform = centre of radius 500 m
	17	53°06'34.08" N	003°33'22.53" E	
	18	53°11'29.39" N	003°34'47.39" E	Platform = centre of 17 and 19, radius 5 NM
	19	53°10'28.98" N	003°42'55.96" E	
	20	53°15'09.71" N	003°45'50.48" E	Platform = centre of 19 and 1, radius 5 NM

## Area set aside for sand extraction

### *Replenishment and fill sand:*

The area set aside for the extraction of replenishment and fill sand is the area between the continuous NAP -20m line and the 12-mile boundary (outer boundary of territorial waters).

### *Concrete and masonry sand:*

(system of co-ordinates used: ED50)

Point	Latitude North	Eastern longitude	Comment
1	51°43'07.78" N	003°29'36.89" E	Point of contact of continuous NAP -20m line
2	51°43'11.19" N	003°08'41.12" E	
3	51°48'34.87" N	003°08'39.95" E	
4	51°59'30.44" N	003°21'50.69" E	
5	52°00'57.06" N	003°39'20.51" E	
6	52°04'39.60" N	003°39'23.77" E	
7	52°04'27.85" N	004°05'44.60" E	Point of contact of continuous NAP -20m

Point 6 then follows the continuous NAP -20m line and then touches point 1 again.

The continuous NAP -20m line is the landward boundary of sand extraction. The source owner of the co-ordinates of this boundary is the Ministry of Transport, Public Works and Water Management. Under the UNCLOS Law of the Sea, the 12-mile boundary is determined by the Royal Navy's Hydrographic Service.

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