



About the Councils for the Environment and Infrastructure

The Councils for the Environment and Infrastructure (Raden voor de Leefomgeving en Infrastructuur, RLI) advise the Dutch government and Parliament on strategic issues that are concerned with our overall living and working environment. Three separate councils work together under the RLI umbrella: the Council for Rural Areas; the Council for Transport, Public Works and Water Management; and the Council for Housing, Spatial Planning and the Environment. The Councils are independent, and offer solicited and unsolicited advice on long-term issues of strategic importance to the Netherlands. Through their advice, the Councils aim to contribute to a broadening and deepening of the political and public debate, and to greater quality in decision-making.

The Councils operate according to a joint work schedule and are supported by the RLI Secretariat.



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A sea

Strengthening the North Sea's significance to society

of opportunity



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Part 1 Recommendations

A sea of opportunity

Background: The Marine Strategy Framework Directive

The Marine Strategy Framework Directive (which is part of the European Union's Integrated Maritime Policy) came into effect on 15 July 2008. The Directive requires EU member states to draw up a marine strategy covering all marine waters under their jurisdiction, which in the Netherlands' case means the North Sea. The Netherlands has opted to legally implement the Directive by amending its previously agreed upon Decree on Water Management (Waterbesluit).

The Netherlands is in the process of implementing the Marine Strategy Framework Directive at the policy-making level. The country is expected to report on the initial assessment of the current condition of its marine environment, and explain what it considers 'good environmental status' in 2012. Each member state will then use its report to formulate its environmental aims and the associated indicators in the same year. The Netherlands aims to develop a set of measures designed to maintain or achieve good environmental status by 2015 at the latest.

Since the challenges posed are of a supranational nature, the Directive stipulates that member states making up a particular marine region should develop their marine strategies with the closest possible co-operation, using existing collaboration structures where possible.

Map 1. Functions on the North Sea



Table 1. Activities on the North Sea

Primary scale	Function	Dutch government authority involved
Global	Shipping	National government (Ministry of Infrastructure and the Environment)
European	Cultural heritage	National government (Ministry of Education, Culture and Science)
	Nature	National government (Ministry of Economic Affairs, Agriculture and Innovation)
	Fisheries	National government (Ministry of Economic Affairs, Agriculture and Innovation)
National	CO ₂ storage	National government (Ministry of Economic Affairs, Agriculture and Innovation; Ministry of Infrastructure and the Environment)
	Energy	National government (Ministry of Economic Affairs, Agriculture and Innovation; Ministry of Infrastructure and the Environment)
	Cables and pipes	National government (Ministry of Economic Affairs, Agriculture and Innovation; Ministry of Infrastructure and the Environment)
	Coastal protection and extension	National government (Ministry of Infrastructure and the Environment), provincial and local authorities, water control boards
	Coast guard	National government (Ministry of Economic Affairs, Agriculture and Innovation; Ministry of Infrastructure and the Environment; Ministry of Defence, Ministry of Security and Justice; Ministry of Finance; Ministry of Foreign Affairs)
	Military activities	National government (Ministry of Defence)
	Tourism and recreation	National government (Ministry of Economic Affairs, Agriculture and Innovation; Ministry of Infrastructure and the Environment), provincial and local authorities
	Sand mining	National government (Ministry of Infrastructure and the Environment)

Make the North Sea's significance to Dutch society a primary concern

The main objective of the Marine Strategy Framework Directive is to achieve healthy marine ecosystems throughout Europe. A healthy North Sea ecosystem is of great importance to Dutch society, as witnessed by the fact that the Netherlands signed the 1992 United Nations Convention on Biological Diversity, thus committing itself to conserving and promoting biodiversity.

However, the North Sea is important to Dutch society for more than its ecosystem alone. For instance, the ‘openness of the North Sea’ was described as being of great societal importance in the 2006 National Spatial Strategy ‘Creating Space for Development’. In addition, the North Sea is of vital importance to the Dutch economy, among other reasons because of the revenue generated from shipping and the exploitation of seabed resources. The Netherlands’ proximity to the sea has greatly influenced the country’s history and has shaped many Dutch people’s identities, thus making the sea of great socio-cultural significance as well. Finally, the North Sea is a major source of food, for instance seafood, and is increasingly used as a source of sustainable energy.

Given the North Sea’s importance to Dutch society, the Dutch national government is responsible for the promotion of a sustainable utilisation of the sea. Its challenge is to implement a well-balanced approach to ecological, economic and socio-cultural interests on the one hand and long-term food and energy generation on the other hand. The Councils for the Environment and Infrastructure feel that the implementation of the Marine Strategy Framework Directive should be used to address the various challenges in North Sea governance in co-operation with the other member states involved, thus tying the implementation of the Marine Strategy Framework Directive at the national level in with the European Union’s Integrated Maritime Policy.

Actively pursue sustainable development

It is our distinct impression that the Netherlands’ current maritime policy seems largely geared to facilitating existing activities and moving offshore those activities which are regarded as undesirable on-shore. No explicit account is taken of the links between maritime policy and the North Sea’s significance to Dutch society. Each sector seems keen to defend its own interests. As a result, the various industries are increasingly competing for marine territory, marine ecosystems are under great pressure, suboptimal choices are being made with regard to targets to be pursued, and new opportunities are not being utilised.

It is the Councils’ recommendation that the central government, in addition to issuing permits and protecting the sea, actively steer national policy towards an optimal and sustainable utilisation of the marine environment, and that it create scope for new initiatives. All activities undertaken in the North Sea must be in keeping with the sea’s natural state and its societal significance in terms of ecology, economy, socio-cultural

aspects, and food production and energy generation. For instance, we would like to see some support for the current developments in combined fishing and aquaculture practices. Both the National Water Plan and the North Sea Policy Document provide useful starting points for a genuine push towards integrated and sustainable development of the North Sea.

At the same time, we feel that the central government should allow the various stakeholders in North Sea-based activities to assume shared responsibility for the way in which the sea is managed and exploited. By allowing the various parties concerned to be more actively involved in North Sea governance, the Dutch government will create a broadly-based perspective on how to utilise the sea. Needless to say, stakeholders from other EU member states having borders on the North Sea marine region should be actively involved in this process.

Combine national and international approaches to the North Sea

Exploitation of the North Sea poses challenges which are not restricted to the Dutch Exclusive Economic Zone. Sustainable utilisation of the North Sea requires co-operation between neighbouring states, which means that the Netherlands will have to pursue an international approach. However, a mediating role for the Netherlands on the international stage means that the central government will have to present a very thorough national North Sea policy first. Therefore, it is our recommendation that the government adopt a two-track policy with regard to the North Sea:

- Formulate a programme for the sustainable exploitation of the Dutch Exclusive Economic Zone, under the terms of national legislation.
- Define an international mediating role for the Netherlands in the sustainable exploitation of the North Sea as a whole.

Both tracks are described in more detail below.

Formulate a North Sea development programme

We recommend the establishment of an ongoing North Sea development programme. To this end, we advise the central government to draw up a 'North Sea Development Plan' outlining detailed proposals for sustainable exploitation of the North Sea. The North Sea Development Plan should outline each sector's objectives which are then integrated into common objectives, taking into account the significance of the North Sea to Dutch society. Ideally, the targets would be fully defined in terms of end results, but stakeholders would be given a fair bit of latitude in deciding how to go about attaining them. Needless to say, this would require sufficiently concrete targets so as to guarantee accountability. In addition, it would require a clearly delineated timetable with scheduled assessment points.

It is our opinion that sustainable exploitation of the North Sea can only be achieved if coherent and integrated targets are formulated for all sectors involved. This means that targets should not be geared towards nature conservation alone, but to the North Sea's potential for new initiatives and for optimal utilisation of the marine environment in a way which respects its ecosystem. It bears mentioning that this, in turn, will determine the interpretation of 'good environmental status' and environmental targets, which will have to be formulated soon under the Marine Strategy Framework Directive. The targets themselves will have to be realistic and create equilibrium between the ecological, economic and socio-cultural interests which the development programme strives to protect. It is vital that the environmental targets not be defined in a way which is likely to prevent stakeholders from seizing opportunities or developing projects which are deemed useful to the general public.

It is our recommendation that the central government should not hesitate to formulate challenging but realistic ambitions in its North Sea Development Plan. For instance, the plan could inquire into the possibility of:

- Heating two million residences in the Randstad area through the use of seawater
- Using the North Sea as a large-scale heat exchanger
- Increasing production of food and other types of high-quality organic materials harvested from the North Sea, while simultaneously reducing overfishing and pollution
- Increasing seaside tourism and sea-based recreational activities to enhance the national economy, while simultaneously realising significant conservation and development of the marine ecosystem

The table of contents of the North Sea Development Plan could look as follows:

Possible table of contents for the North Sea Development Plan

- Fully integrated objectives
 - Ecology
 - Economy
 - Socio-cultural aspects
 - Food production
 - Power generation
- Preconditions for achieving objectives
 - Attaining good environmental status
 - Compliance with the Common Fisheries Policy
 - Compliance with the UN Convention on Law of the Sea
- Establishment of a study agenda and identification of promising developments
- Identification of developments which are to be prioritised
- Establishment of a set of measures to be taken, including Marine Strategy measures
- Establishment of a timetable and assessment points

The completion of the North Sea Development Plan should not be considered an end product, but rather the starting point for an ongoing development programme for the sea. We recommend that the North Sea Development Plan be completed by the end of 2012.

Rijkswaterstaat (the executive arm of the Dutch Ministry of Infrastructure and the Environment) is currently revising the Integrated North Sea Governance Plan. According to the rough draft of this revised Integrated Governance Plan, Rijkswaterstaat is adopting a more proactive and guiding *modus operandi*. We welcome this new approach to North Sea governance, and feel that the revised Integrated North Sea Governance Plan should serve as a stepping stone to the North Sea Development Plan. As such it should present draft outlines for the Development Plan. We recommend that the government follow a special procedure to get the North Sea Development Plan approved, i.e. with the Cabinet and both Houses of Parliament involved in both the preparation of and decision making on the plan.

Responsibility for the sustainable exploitation of the North Sea requires a more active role on the part of the central government. We therefore recommend that the central government actively focus on conservation and optimal utilisation of the marine environment in the proposed ongoing development programme, and that it endeavour to stimulate new initiatives. It is vital that the central government develop and employ policy instruments which are in keeping with the integrated objectives and do justice to the dynamic and complex nature of the marine environment. As far as we are concerned, new planning and extensive regulation of the North Sea (e.g. through the introduction of a North Sea zoning plan) do not fit into this approach. We recommend using existing and new instruments, namely:

- Room for experimentation
- A flexible permitting system
- An area reservation and zoning system
- A targeted investment policy
- Improved industry policy
- A more detailed North Sea marine strategy

Invest in a shared knowledge base

Although the North Sea is attracting a healthy amount of research, there is much that we do not know about the processes which take place within the marine environment. The various stakeholders, the central government and scientific institutes are all conducting their own research, which means that knowledge development is largely restricted to certain sectors, each of which has its own ideas on how things should be done and what goals should be achieved. Since each of the parties engaged in North Sea research has its own frame of reference, it will be hard to conduct a proper debate on the overall future of the North Sea.

We, the Councils, believe that it will be impossible to formulate integrated objectives for the utilisation of the North Sea unless the various parties liaise and share insights. At the very least, the government and the stakeholders should endeavour to make a joint analysis of the North Sea marine environment and arrive at a common understanding of the various parties' interests, as well as a commonly accepted definition of the central government's responsibilities with regard to the North Sea.

If the North Sea is to be utilised in a sustainable fashion, it is essential that there be more co-operation. It is not enough that the government liaise with stakeholders; the stakeholders should also liaise with each other. This being the case, we recommend establishing a publicly accessible place where all information and research on the North Sea can be stored, thus building a common knowledge bank and shared research agenda for government agencies and stakeholders alike. We also recommend communicating the resulting knowledge and research agenda to other EU member states having borders on the North Sea marine region, so as to improve international co-operation.

Clearly allocate responsibilities at the national level

Appoint one member of government as the national liaison for all matters pertaining to the North Sea

At present, all government responsibilities pertaining to the North Sea are co-ordinated by the State Secretary for Infrastructure and the Environment, who is responsible for the Netherlands' general North Sea policy. However, several other members of government carry responsibility for individual subsets of North Sea policy, e.g. power generation, fishing, ecology and archaeology. Consultations regarding policy and governance currently occur at a lower level, i.e. at meetings of the Interdepartmental North Sea Directors, co-ordinated by the Ministry of Infrastructure and the Environment. We believe that a fully integrated North Sea policy requires more than such meetings. In addition to co-ordinating policies, someone must step up to ensure that the policies are actually implemented. Therefore, it is vital that one government official be appointed as 'North Sea Advocate' (i.e. national North Sea liaison), and that this official be made responsible for all activities undertaken in the North Sea. We further recommend that the position of the coordinating member of government be strengthened, thereby making this person solely responsible for North Sea plan development and target attainment. The government member in question should be charged with effecting sustainable exploitation of the North Sea, based on a shared perspective on what makes the sea important to Dutch society. In addition, he/she should be the national and international liaison for all matters pertaining to the North Sea, as well as the mediator between the various North Sea-based industries, so that stakeholders participating in the policy-making process would always know to whom to address their queries.

In addition to a National Liaison, a Government Commissioner could be appointed to direct the North Sea Development Plan. This Government Commissioner would be

responsible for the progress made under the development programme, and would liaise with all the government departments, industries and stakeholders involved.

The position of the National Liaison could be strengthened by granting the aforementioned Government Commissioner executive authority to perform tasks officially assigned to other government officials in charge of North Sea-related issues. Alternatively, one could consider combining all North Sea-related legal powers under the jurisdiction of one single member of government, for instance by appointing a so-called 'Programme Minister' (a minister who is not assigned a ministry) for North Sea governance. However, this would require several amendments to the law. Moreover, it should be pointed out that reassigning administrative authority in such a way might cause problems in respect of activities which have both an on-shore and offshore component, e.g. energy generation and nature conservancy. If there is to be one government member responsible for all North Sea-related matters, special attention will have to be paid to establishing boundaries at the administrative level.

Give stakeholders shared responsibility

In our opinion, the central government should not be the only party responsible for a sustainable utilisation of the North Sea. The various stakeholders in the North Sea should be co-responsible for North Sea governance, as should local authorities in those fields where offshore activities come under on-shore legislation. Therefore, we recommend that greater emphasis be placed in the participative process on joint development of knowledge and policy. Encouraging the various parties to participate in identifying the challenges ahead and determining appropriate objectives will result in a commonly accepted view on how best to utilise the North Sea.

As far as shared responsibility is concerned, we advocate the establishment of a North Sea partnership comprised of government authorities, stakeholders and scientists. Such a partnership should focus on the exchange and optimal utilisation of each party's knowledge, while at the same time giving stakeholders the opportunity to be co-responsible for policy development and North Sea governance. We recommend that each sector's future contribution to the sustainable exploitation of the North Sea be laid down in covenants, so as to ensure that policies are turned into practical measures. The aforementioned Government Commissioner would be a good person to chair such a partnership.

Create an integrated executive, governance and enforcement agency

Important steps towards creating a single agency for North Sea governance have been made at the administrative level, especially in the field of permit issuing. However, the actual issuing of permits and concessions is still administered by several government departments, co-ordinated by Rijkswaterstaat. We recommend that Rijkswaterstaat's current co-ordinating role be expanded, thus creating a single, fully integrated organisation in charge of the implementation of all legislation and policies covering the North Sea, both those pertaining to specific sectors and the more general and all-encompassing ones. This organisation could also be in charge of co-ordinated enforcement.¹ It bears mentioning that an initiative is underway to establish a joint enforcement agency administered by the Coast Guard.

International co-operation

As mentioned above, the Netherlands should not be content to focus its efforts only on domestic issues, but endeavour to play an active role in international policy development as a mediator, so as to ensure that the interests of Dutch society (which is largely dependent on the North Sea) are served properly. Given the supranational nature of the challenges faced, sustainable utilisation of the North Sea can only be achieved if addressed in combination with other countries having borders on the North Sea marine region. Under the Marine Strategy Framework Directive, EU member states are obliged to liaise with neighbouring states on their North Sea policies. We feel that such mandatory liaison should be used for the drawing-up of an integrated North Sea development programme supported by all states having borders on the North Sea marine region. Since the various states having borders on the North Sea all have their own views on how best to govern the sea, it is vital that the Netherlands liaise extensively with neighbouring countries so as to adopt best practices and incorporate these into the Netherlands' own development programme.

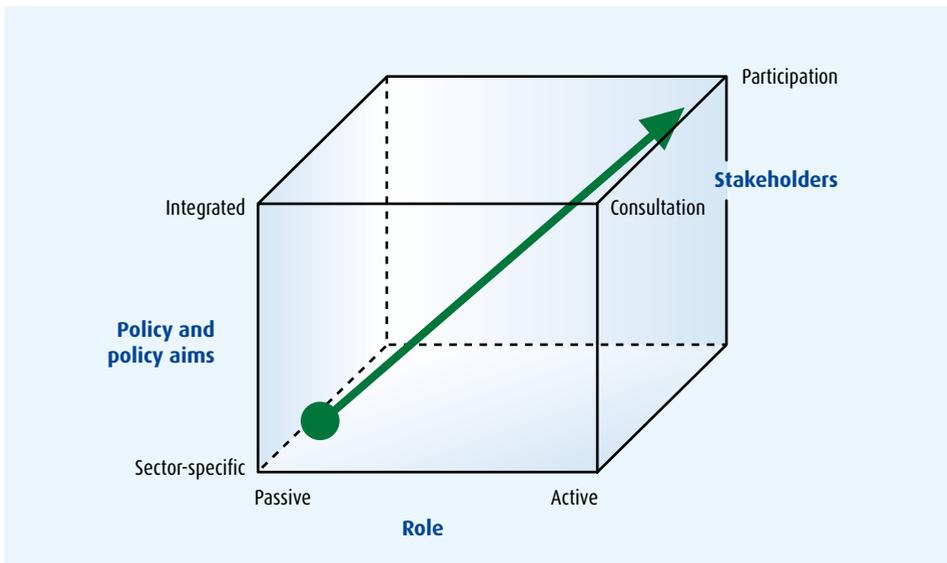
We applaud the aim stated by the government in its North Sea Policy Document, which is to play an active part in further harmonisation of policies between the various states having borders on the southern North Sea. We recommend doing so by increasing the

¹ In establishing such a single governance agency, one could follow the example of the Regional Supervisory Agencies, which are responsible for the regional supervision of spatial and environmental planning projects which come under the jurisdiction of several ministries and/or provincial/local authorities.

amount of liaising and co-operating at the operational/official level, only to aim for regulation at the administrative level at a later date. Building closer co-operative ties will take time, but given the many policy developments occurring both domestically and abroad, it is vital that the first steps towards close international co-operation be taken now. To see how such close co-operation between member states having borders on the southern North Sea could be effected, we recommend having a look at the collaborative work undertaken since about 1950 to protect the River Rhine. Although the challenges posed by the Rhine differ from those posed by the North Sea, we feel that important lessons could be learned from the history of the International Commission for the Protection of the Rhine, in terms of how to effectively establish international collaboration. Success factors for co-operation between the countries situated along the Rhine included the following (Dieperink, 1999):

- The countries made an effort to determine mutual interests
- The Dutch government played an active role and led the proceedings
- Civil-society organisations were given the opportunity to get involved
- Institutional changes were made gradually, over the course of many years

Figure 1: Towards an active, integrated and participation oriented approach to North Sea utilisation



The Councils' recommendations

We recommend utilising the implementation of the Marine Strategy Framework Directive as an opportunity to determine how best to achieve a fully integrated and sustainable exploitation of the North Sea. The central government should play an active role in this process, working in close conjunction with both domestic and foreign stakeholders to establish a commonly accepted perspective on North Sea development, without ever losing sight of just how important the sea is to Dutch society.

Our exact recommendations are as follows:

- Follow two parallel tracks towards an integrated and sustainable utilisation of the North Sea: (1) draw up a development programme for the Dutch Exclusive Economic Zone, and (2) be prepared to take the lead on the international stage, acting as a mediator between all the countries having borders on the southern North Sea marine region.
- Decide on a North Sea Development Plan by the end of 2012. Provide a rough outline of a development programme in the revised Integrated North Sea Governance Plan.
- In the North Sea Development Plan, formulate all-encompassing objectives designed not just to conserve the marine environment, but to promote innovation and the sustainable use of the North Sea. Provide a timetable with scheduled assessment points.
- Establish an ongoing development programme for the implementation of the North Sea Development Plan.
- Build a publicly accessible knowledge bank where government agencies and stakeholders can develop a common knowledge base.
- Make stakeholders partly responsible for North Sea governance and encourage them to get actively engaged in identifying the challenges ahead and finding ways to address them.
- Develop policy instruments which contribute to the sustainable exploitation of the North Sea.
- Appoint one government member to be in charge of the implementation of the North Sea Development Plan and strengthen his/her position, possibly by having a Government Commissioner assist him/her.
- Establish an integrated agency to implement, govern and enforce North Sea-related legislation.



Part 2 Analysis

The Marine Strategy Framework Directive from an administrative and institutional point of view

1

The Marine Strategy Framework Directive provides a common framework which will help us meet the challenges facing us in the marine environment. However, the framework is not an isolated directive. Rather it is part of the European Union's Integrated Maritime Policy, and as such it has much ground in common with the Common Fisheries Policy. In addition, it has links to several conventions, including but not limited to the OSPAR Convention. The European Commission and European Parliament, in conjunction with various stakeholders, are currently assessing the need for further legislation regulating marine environmental planning and co-ordinated governance of coastal areas. The outcome of the assessment was unknown at the time of writing.

box 1

How does the Wadden Sea fit into all of this?

The Dutch government has chosen to leave the Wadden Sea outside the scope of the Marine Strategy Framework Directive, but will incorporate whatever new regulations emerge from the Directive into its current Wadden Sea policy. Since this recommendation does not just concern the implementation of the Marine Strategy Framework Directive, but seeks to place into context the sustainable exploitation of the North Sea in its entirety, we have chosen not to incorporate the Wadden Sea into this recommendation. We feel that this choice is justified because the Wadden Sea's development perspective is significantly different from the North Sea's, among other reasons because it is a protected area. However, the Wadden Sea Council was involved in the preparation for the recommendation at hand, and may in future issue recommendations on the consequences of the implementation of the Marine Strategy Framework Directive for the Wadden Sea, and on the relationship between the Wadden Sea and North Seas.

1.1 The European Union's Integrated Maritime Policy

The European Commission has recognised that seas are a major contributor to Europe's prosperity and well-being. The ways in which we interact with our seas have become more intense and more varied than ever, and as a result, the sea is becoming increasingly important to European societies. Thanks to technological advances and increased know-how, we are able to derive great value from the sea, at the expense of the marine environment and its considerable resources. Since many issues relating to European seas and oceans are strongly interlinked, the European Commission emphasises the importance of addressing the various challenges together.

Given the environmental and economic value of the oceans and the seas, the European Commission's 2005-2009 strategic objectives saw fit to point out that 'there is a particular need for an all-embracing maritime policy aimed at developing a thriving maritime economy and the full potential of sea-based activity in an environmentally sustainable manner. Such a policy should be supported by excellence in marine scientific research, technology and innovation (European Commission, 2005).' The approach resulting from this objective should be based on two interconnected pillars: (1) the Lisbon Strategy, whose aim is to stimulate growth and create better jobs in the European Union, and (2) improved care for the marine environment.

On 10 October 2007, the European Commission released its Communication on the Integrated Maritime Policy of the European Union, the so-called Blue Book. This Blue Book laid the foundation for the governance framework and cross sectoral policy instruments necessary for a European Union Integrated Maritime Policy. In addition, the Blue Book identified five areas which would contribute to an all-embracing maritime policy, the main one being optimising the sustainable utilisation of our oceans and seas. Other areas singled out for special attention by the European Commission were building a knowledge and innovation base for maritime policy-making, delivering high-quality of life in coastal regions, promoting Europe's leadership in international maritime affairs, and raising the visibility of maritime Europe.

1.2 The Marine Strategy Framework Directive

Against a backdrop of growing concern about the condition of Europe's oceans and seas, the European Commission presented a thematic strategy for the protection and conservation of the marine environment in October 2005. The aim of the strategy was

to maximise the sustainable use of the sea and the conservation of marine ecosystems. The strategy reflects the increased awareness that marine ecosystems are both important and vulnerable, and that thorough protection of the marine environment is an absolute precondition if we are to make optimal use of the economic potential provided by our seas and oceans. In recognition of this fact, the European Parliament and the European Council agreed upon the Marine Strategy Framework Directive, which came into effect on 15 July 2008.

Under the Marine Strategy Framework Directive, all EU member states are required to draw up a strategy designed to achieve, by 2020, good environmental status in all marine waters under their jurisdiction (see boxed text 2).

Legal implementation

In the Netherlands, the Directorate-General for Water Affairs, which is part of the Ministry of Infrastructure and the Environment, is the party responsible for the implementation of the Marine Strategy Framework Directive. The Directorate-General has opted to amend the 2009 Decree on Water Management to facilitate the legal implementation of the Directive. To this end, the Directorate-General is currently in the process of drawing-up its initial assessment and defining the 'good environmental status' concept, which is to be reported on in 2012. The European Commission has given its member states some binding criteria and methodological standards to help them meet this requirement (European Commission, 2010a). Like all EU member states, the Netherlands is free to determine its own level of ambition, provided that the measures taken are in line with the Directive's general objectives. The Directorate-General expects draft versions of the initial assessment, definition of 'good environmental status' and associated targets and indicators to be completed in 2011, leaving ample time for the final versions to be completed by mid 2012.

Implementing the policies

The Marine Strategy Framework Directive stipulates that each EU member state shall establish environmental targets and develop a monitoring programme and a programme of measures designed to achieve good environmental status. Together, these elements shall make up the marine strategy which every member state has been asked to develop, and which is due for completion by 2015. The Marine Strategy Framework Directive also stipulates that such national strategies must be developed in consultation with other member states and (foreign) stakeholders in the marine region concerned.

box 2

Good environmental status

‘Good environmental status’ means the environmental status of marine waters where these provide ecologically diverse and dynamic oceans and seas which are clean, healthy and productive within their intrinsic conditions, and the use of the marine environment is at a level that is sustainable, thus safeguarding the potential for uses and activities by current and future generations, i.e.:

- a) The structure, functions and processes of the constituent marine ecosystems, together with the associated physiographic, geographic, geological and climatic factors, allow those ecosystems to function fully and to maintain their resilience to human induced environmental change. Marine species and habitats are protected, human induced decline of biodiversity is prevented and diverse biological components function in balance.
- b) Hydro morphological, physical and chemical properties of the ecosystems, including those properties which result from human activities in the area concerned, support the ecosystems as described above. Anthropogenic inputs of substances and energy, including noise, into the marine environment do not cause pollution effects.

Good environmental status shall be determined at the level of the marine region or subregion as referred to in Article 4, on the basis of the qualitative descriptors in Annex I. Adaptive management on the basis of the ecosystem approach shall be applied with the aim of attaining good environmental status.

Source: Article 3(5) of the Marine Strategy Framework Directive (Directive 2008/56/EC)

box 3

Building a marine strategy

The Marine Strategy Framework Directive stipulates that each member state's marine strategy must contain at least the following elements:

- Integration, by 15 July 2010, of the Directive into the legislative and administrative regulations required under EU legislation
- An initial assessment, to be completed by 15 July 2012, of the current environmental status of each member state's territorial waters and the environmental impact of human activities thereon
- A determination, to be established by 15 July 2012, of good environmental status for the waters concerned on the basis of eleven qualitative descriptors listed in the Directive²
- Establishment, by 15 July 2012, of a series of environmental targets and associated indicators
- Establishment and implementation, by 15 July 2014, of a monitoring programme for ongoing assessment and regular updating of targets
- Development and implementation, by 2015 or 2016, of a programme of measures designed to achieve or maintain good environmental status

1.3 The Common Fisheries Policy

The European Commission's Integrated Maritime Policy defines the framework for the development of the member states' own maritime policies. Each member state has a great deal of latitude in determining the ways in which it is to realise the objectives listed in the framework, except in matters relating to fishing. The so-called Common Fisheries Policy is designed to achieve a healthy and sustainable fishing industry in Europe's marine waters.

Since the EU member states have conferred the majority of their authority in the field of fishing to the European Union, the drawing-up of a European fishing policy is an

2 (1) Biological biodiversity, (2) non indigenous species, (3) populations of all commercially exploited fish and shellfish, (4) marine food webs, (5) human induced eutrophication, (6) sea-floor integrity, (7) permanent alteration of hydrographical conditions, (8) concentrations of contaminants, (9) contaminants in fish and other seafood, (10) marine litter, (11) introduction of energy, including underwater noise.

exclusive right reserved for the EU. Put in concrete terms, decisions on structural measures regarding fishing outside territorial waters can only be made by the EU Council of Ministers.

Many of the qualitative descriptors listed in the Marine Strategy Framework Directive relate to fishing. Therefore, the EU member states' marine strategies in the making are inextricably linked to their fishing policies. However, since setting fishing policy is an exclusive right reserved for the European Union, member states are not authorised to implement measures of their own. Thus, it is vital that thorough attention be paid to the relationship between the Marine Strategy Framework Directive and the Common Fisheries Policy when the Common Fisheries Policy is reviewed in 2012. Since the Marine Strategy Framework Directive is the overarching legal framework governing all developments in the field of marine environment policy and governance, any future measures designed to render fisheries more sustainable will have to adhere to the trend towards an ecosystem oriented approach put forward by the Marine Strategy Framework Directive.

1.4 Legal context

The United Nations is a major player internationally. The United Nations Convention on the Law of the Sea provides a comprehensive legal framework governing all activities taking place at sea. Under the Convention, the North Sea is divided into several zones over which the coastal states have jurisdiction. The Netherlands' sovereign territory in the North Sea covers approximately 57,000 km², which amounts to about 10 per cent of the entire North Sea. The belt of coastal waters extending less than one kilometre from the Dutch coastline comes under the jurisdiction of municipal and provincial authorities. The belt of water extending up to twelve nautical miles from the coast is considered 'territorial waters'. The central government exercises similar authority within this twelve mile strip of territorial waters as it does on Dutch soil in matters of policy-making and governance.

Outside territorial waters, per the Law of the Sea, the Netherlands has sovereignty and jurisdiction over its portion of the continental shelf, the so-called Exclusive Economic Zone, which is to say that the Netherlands is legally entitled to explore and utilise these waters, conserve and govern the living and non-living resources in them, and engage in activities such as generating energy; building and using artificial islands,

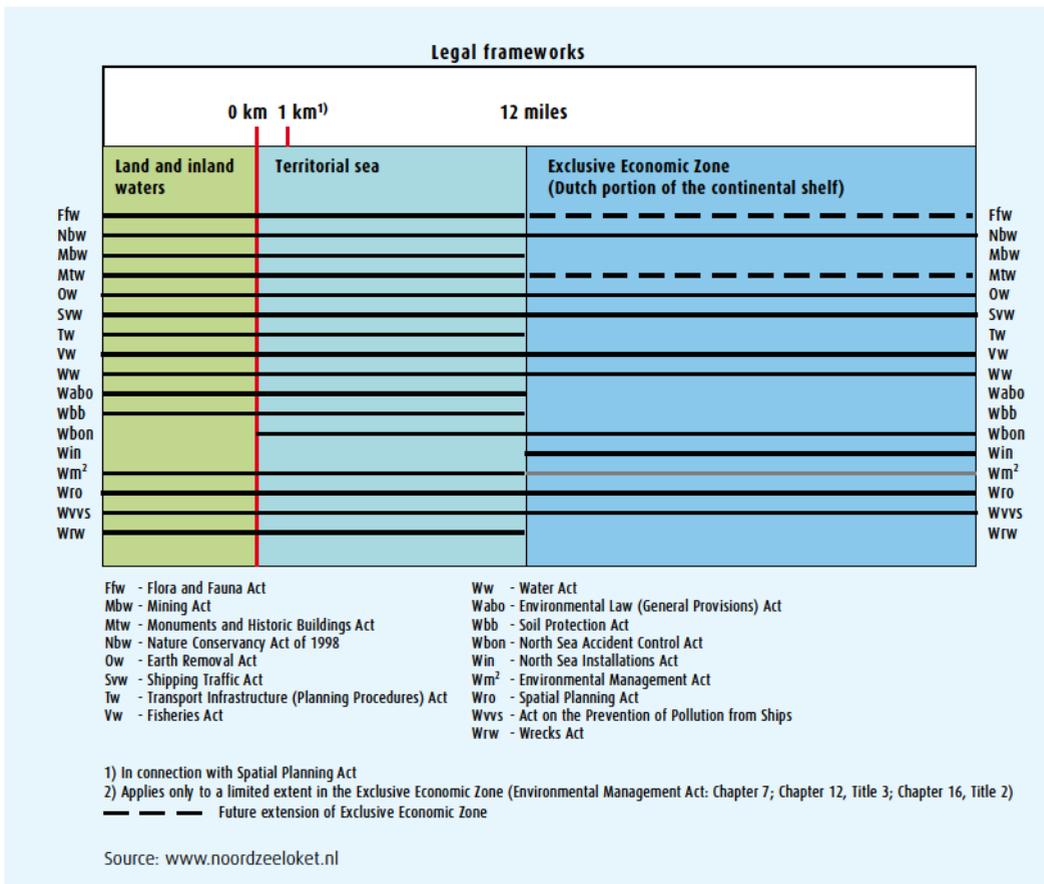
Map 2. Legal borders on the Dutch part of the North Sea



installations and structures; conducting marine scientific research; and protecting and conserving the marine environment. At the same time, the Law of the Sea restricts the Netherlands' authority outside its territorial waters in some respects. For instance, the Law grants ships and aircraft from other states the right of passage, and authorises the installation of submarine cables and pipelines in other states' Exclusive Economic Zones (Dotinga and Trouwborst, 2008).

In addition, certain matters (e.g. environmental protection and shipping regulations) are subject to global and regional agreements, and the North Sea as a whole is subject to several European regulations. These agreements and regulations have been stated in treaties and directives which are required to be implemented in each member state's national legislation (see figure 2).

Figure 2. National legal frameworks for the North Sea



One legal instrument which is particularly relevant to the Marine Strategy Framework Directive is the OSPAR Convention. The OSPAR Convention is the overarching legislative instrument regulating marine environmental protection in the north-eastern region of the Atlantic Ocean (which includes the North Sea), and comprises, among other things, general requirements to adopt programmes and measures designed to protect the marine environment. As such, the OSPAR Convention replaces the 1972 Oslo and 1974 Paris Conventions. In practice, the OSPAR Convention is mainly used by the signatories to exchange knowledge and information on the condition of the North Sea and on the latest developments in North Sea governance. Furthermore, the signatories use the OSPAR Convention to align their policies and strategies for the prevention of marine environmental pollution and the promotion of a sustainable utilisation of the sea.

The Marine Strategy Framework Directive contains an article stipulating that for the purpose of establishing their marine strategies, member states shall make every effort to co-ordinate their actions with third countries having jurisdiction over waters in the same marine region or sub region. The article also stipulates that where practical and appropriate, member states shall use existing institutional co-operation structures to co-ordinate their actions. This makes the OSPAR Convention an important instrument in the establishment of a North Sea marine strategy.



Taking the North Sea's societal significance as a starting point

2

The National Water Plan supports a 'sustainable, space efficient and safe utilisation of the North Sea with due attention to maintaining the equilibrium of the marine ecosystem, in accordance with the Water Framework Directive, the Marine Strategy Framework Directive, the Birds Directive and the Habitats Directive'. This is illustrated by its designation of several so-called 'activities of national significance', e.g. sand mining, beach nourishment, sustainable (wind) energy generation, extraction of oil and gas, carbon capture and storage (CSS), ocean shipping and national defence. The activities of national significance are derived from a list of activities outlined in the North Sea Policy Document as being activities which are currently undertaken in the North Sea, or activities which are currently undertaken on Dutch soil but would be better suited to being undertaken offshore. In other words, the analysis presented in the North Sea Policy Document is based on the ways in which the North Sea is currently being utilised. No explicit mention is made of the extent to which these activities could enhance the societal significance of the North Sea. We feel that the government's plans for the North Sea should not be based on current activities, but rather on activities which enhance the North Sea's societal significance and on development opportunities. In our opinion, only a focus on the North Sea's societal significance can help policy makers make responsible choices designed to promote a sustainable use of the North Sea.

2.1 The North Sea's societal significance

The North Sea has great significance to Dutch society in several ways. At the most basic level, the North Sea represents the following to Dutch society:

- ecological significance
- economic significance
- socio-cultural significance

box 4

National Water Plan

In accordance with the Dutch Water Act, a new National Water Plan is produced every six years. The National Water Plan is the government's official plan for the nation's water policy. The first National Water Plan covers the 2009-2015 planning period. North Sea policy features heavily in the plan. Pursuant to the Spatial Planning Act, the National Water Plan has the status of a so-called 'structural vision document' (structuurvisie) as far as its spatial planning aspects are concerned.

North Sea Policy Document

The North Sea Policy Document is an annex to the National Water Plan in which the Netherlands' North Sea policy is outlined in greater detail. The document also provides an insight into the policy's interplay with other, associated policies. The North Sea Policy Document formulates three societal development challenges based on an analysis of the North Sea's functions for Dutch society, and explains and describes in greater detail choices which have been made with regard to Dutch North Sea policy.

Integrated North Sea Governance Plan

The Integrated North Sea Governance Plan presents an overview of the ways in which the central government governs the North Sea. The plan has the status of a policy guideline and provides an elaboration of the National Water Plan and the various laws and treaties governing the North Sea. Since current North Sea governance is still based on the 2006 National Spatial Strategy 'Creating Space for Development', the Integrated North Sea Governance Plan is currently being reviewed.

Ecological significance

The North Sea is of ecological significance because of the intrinsic value of its ecosystems. The North Sea is rich in nutrients and is home to a great variety of life forms. The North Sea's ecological significance to the Netherlands is largely due to this great biodiversity, a fact further underlined by the fact that the Dutch government signed the 1992 United Nations Convention on Biological Diversity, thus committing itself to maintaining and strengthening biodiversity. Biodiversity is vital to the regulation of the climate system, the recycling of nutrients and photosynthesis. Caring for biodiversity will help us maintain or increase the resilience of the marine environment. However,

it is not just about nature conservation. Of equal ecological significance are scenic concerns – in other words, what the Ministry of Infrastructure and the Environment called ‘the openness of the North Sea’ in 2006. Last but not least, the sea is of ecological significance because it yields tangible products, e.g. pharmaceutical ingredients and food, and because it attracts tourism.

Economic significance

There is no doubt that the North Sea is vital to the Dutch economy, in terms of activities undertaken at sea and those related to the sea in some way. A large chunk of the Dutch economy is to some extent dependent on or affected by the Netherlands’ location on the shores of the North Sea (see boxed text 5).

Socio-cultural significance

The socio-cultural significance of the North Sea is rather less tangible. People have lived along the North Sea coast ever since the sea came into being, some 13,000 years ago. The North Sea has brought the Netherlands much prosperity over the centuries. Seaports towns and fishing villages came into existence and prospered along with their hinterland. However, while the sea has been the source of much that is good, the Dutch have also had to protect themselves from the dangers that it poses. In this regard, the North Sea can be said to have helped shape the national identity (see boxed text 6).

The North Sea also has socio-cultural significance in that it attracts many tourists and holiday-makers, who are drawn by its scenic beauty. In addition, parts of the North Sea hold special value for archaeologists, who have discovered several sites of archaeological interest on the seabed (see boxed text 7).

A source of food and energy

While it is useful to take the aforementioned three pronged approach (ecological, economic and socio-cultural) to analysing the North Sea’s impact on Dutch society, we feel that special attention should be paid to two other aspects which will increasingly impact on Dutch national prosperity and well-being:

- The significance of the North Sea as a source of food
- The significance of the North Sea as a source of sustainable energy

box 5

Economic value

Activities directly related to the North Sea comprise approximately 3.9% of the Netherlands' Gross Domestic Product (source: Statistics Netherlands, 2010). The major contributors are shipping, fishing, the extraction of oil and gas, sand mining and the generation of wind energy. The table and pie charts below provide an overview of the added economic value and employment provided by each of these activities for the year 2007.

Activity	Added value (in millions of euros)	Employment (in FTEs)
Shipping	1,208	6,000
Fishing	45	200
Oil and gas extraction	5,866	2,800
Sand mining	17	154
Wind energy generation	11	Not available

Source: Statistics Netherlands (2010)



Port activities are the most lucrative of those Sea-related activities which are not actually undertaken at sea. The Dutch seaports contribute an estimated 45 billion euros per year to the Dutch economy, 30 billion of which represents direct added value. In addition, the Dutch seaports employ some 300,000 people, including 170,000 direct employees (Ecorys, 2010).

Estimates of the annual added value of coastal tourism range from 770 million euros (Ecorys, 2010) to 2.6 billion euros (Netherlands Board of Tourism and Conventions, 2010). The Dutch leisure industry as a whole employs some 110,000 people, including 80,000 direct employees. It is unknown how many of these people are employed in positions related to coastal tourism (Ecorys, 2010).

box 6

The North Sea in the Dutch Canon

On 16 October 2006 the Van Oostrom Committee presented the so-called 'Dutch Canon', a list of fifty eventful chapters in Dutch history. The Canon identifies several historical developments in which the North Sea plays a major part. Overseas trade has brought the Netherlands much prosperity over the centuries, first through the Dutch East India Company, then through the Port of Rotterdam. However, the sea has also been known to pose a threat to the Netherlands, e.g. the disastrous flood of 1953 and the naval battles Michiel de Ruyter fought against the English. Moreover, in the seventeenth century the Blaeu family of Amsterdam was renowned the world over for its world maps, while Hugo de Groot achieved fame for his treatise on 'the free sea' (Mare Liberum), which is still the basis for current international maritime law. Last but not least, the Canon contains several chapters on events which cannot be attributed directly to the North Sea, but are tangentially related to it, e.g. slavery in the New World, the colonisation of Indonesia and Surinam, and Max Havelaar, Multatuli's famous novel indicting corrupt Dutch rule in Indonesia.

Source: www.entoen.nu

box 7

Cultural heritage in the North Sea

The North Sea is an important site for cultural historians. Not only does it boast interesting shipwreck sites, but it also features traces of ancient human activities, left behind when the North Sea was land (historically, the area currently covered by the North Sea was dry for longer periods than it has been wet). Due to the dynamic nature of the sea-floor, conservation of cultural heritage in the North Sea requires great care. The Ministry of Education, Culture and Science and Rijkswaterstaat (the executive arm of the Dutch Ministry of Infrastructure and the Environment) have concluded unequivocal agreements on the management of national heritage on Dutch soil, but there is still much uncertainty regarding responsibilities and policy priorities in the management of maritime cultural heritage.

If Dutch society is to meet the increasing demand for food and energy in the long-term, it will have to find alternative food and energy sources. It is obvious that the sea is an increasingly important food and energy source, and it has the potential for generating even more food and energy in future. The marine environment provides us with high-quality fish and seafood. In addition to being a source of fish and seafood, the sea has tremendous potential for the farming of seaweed and other high-quality organic materials. South East Asians have eaten seaweed for centuries, mostly because it contains proteins which have many health benefits. Since it is rich in phosphate, seafood is used to fertilise soil in some countries. It is also used to generate green energy (biogas).

The sea has also been recognised as a great source of sustainable energy, with several offshore wind farms already constructed and several more in the planning stages. Among the ambitions listed in the National Water Plan was the aim of generating, by 2020, 6,000 MW of wind energy through offshore wind farms. In addition, experiments are underway to generate energy from sea currents. Last but not least, scientists are looking into the large-scale power-generating potential of osmotic power (energy released at the point where seawater meets fresh water).

2.2 The importance of integrated objectives

As noted before, the focus of the North Sea Policy Document seems to be on current ways of utilising the North Sea, as well as new activities which are deemed unsuitable for operation on land. As a result, policy makers seem to be mainly concerned with protecting these activities, which includes protecting the ecosystems. Relatively little attention appears to be paid to maximising the North Sea's potential or tapping its potential for new initiatives. A sustainable exploitation of the North Sea will require objectives which are concerned with more than just protection. The Netherlands' objectives should be geared towards maximising existing uses of the North Sea, as well as creating scope for new initiatives which are in line with marine ecosystems. To this end, the ecological, economic, socio-cultural and food- and energy-generating objectives must be integrated into overarching objectives covering all the relevant industries.

However, setting integrated objectives requires that fishing-related objectives be incorporated, which may not be possible, as the right to make decisions on fishing policy is largely reserved for the European Union. In order to incorporate fishing policy into the integrated policy framework proposed above, the relevant parties in the Netherlands

and the European Union will have to investigate the potential for synergy between the Common Fisheries Policy and integrated North Sea policy.

Focus on optimal utilisation of the marine environment

Many types of activities take place in the North Sea, some of which are more dependent on the sea than others. While some industries (e.g. wind energy generation, CCS) merely utilise the sea's vast expanses, some are highly dependent on the sea itself because they require its water (e.g. shipping, military uses). Other industries utilise natural resources hidden in the seabed (extraction of oil and gas, sand mining), whereas yet others owe their very existence to the North Sea's ecosystem (e.g. the fishing industry).

All the above mentioned activities add value to Dutch society, be it ecologically, economically, socio-culturally or through the provision of food or energy. However, it is only fair to point out that these activities may also have a harmful effect, both on the sea's ecosystem and on each other. For instance, overfishing in the North Sea may result in the decline of fish and seafood species which are fished for commercial profit. In addition, it is quite possible for one North Sea-based activity to have a harmful effect on another. The shipping industry is a case in point. By dumping ship waste streams, discharging oil and emitting combustion gas, the shipping industry is having a harmful impact on marine ecosystems. This may not be much of an issue for the shipping industry itself, but it does negatively affect nature, fishing and opportunities for coastal recreation.

On the other hand, marine activities may also have a positive impact on the marine ecosystem or other sea-based or Sea-related activities. For instance, improved coastal ecosystems and scenery may well attract more tourists and water sport lovers to the seaside. By the same token, offshore oil and gas platforms may have a positive impact on biodiversity in that they provide hard substrate to the marine ecosystem. Matters could be improved if the various parties utilising the North Sea made clear agreements to prevent overlapping territorial claims. For instance, it is perfectly possible to install wind turbines in an area where sand has been mined, but it is impossible to start mining sand in an area once a wind farm has been constructed there.

box 8

The Sand Engine

In March 2011, Rijkswaterstaat, in co-operation with the Zuid-Holland provincial authorities, began to create an artificial peninsula consisting entirely of sand near the small seaside town of Ter Heijde. The peninsula is designed to 'produce' sand which will be picked up by natural currents and deposited ashore, thus helping protect the Dutch coastline. In addition to having protective qualities, the so-called 'Sand Engine' is expected to attract great numbers of sightseers and animals, which means it may have a significant impact on nature and tourism, as well.

Source: www.dezandmotor.nl

We have stated repeatedly that we advocate 'maximising the potential uses of the marine environment', by which we mean focusing on activities which increase the North Sea's societal significance, always keeping in mind that many marine activities are interconnected, and that one should therefore be mindful of the ecosystem and other activities taking place at sea before acting. However, in practice little attention appears to be paid to the various activities' potential for synergy, or to combining activities for greater efficiency. In the current system, multifunctional use of marine zones is allowed where practicable, but only on the condition that the initiator or primary licensee involved does not suffer any disproportionate disruptions or damage from the other party's activities. Since there is little incentive for entrepreneurs to investigate the potential for synergy with other, possibly new marine based companies, the sea's potential for optimal utilisation often remains untapped. We feel that integrated objectives may contribute to optimised utilisation of the North Sea.

Incentives for new initiatives

Humankind has been using the North Sea and its coastal areas for centuries. Several stakeholders have carved out niches for themselves in the North Sea, having been granted permission to undertake their activities for reasons of logistics, the demand

box 9

Optimising and suboptimising electricity infrastructure

Several wind farms subsidised by the German government have recently been constructed just off the German coast. The power cable which transports electricity between Germany and the Netherlands is situated nearby. Both the owners of the cable and the operators of the wind farms agree that it would be efficient to connect the wind farms to the cable. However, since the cable is not on German soil, such a project would be ineligible for subsidy, which would make exploitation of the wind farms economically unviable. This being the case, the power generated by the wind farms is currently diverted to the German mainland and connected to the German power grid (source: *Financieele Dagblad*, 2011). Yet there are those who have proposed other solutions. A plan drawn up by the Office for Metropolitan Architecture (OMA) proposes that a ring of cables connecting the seven countries having borders on the North Sea be installed, linking offshore wind farms, thus creating a stable network which is tied to the mainland at certain points. Several other parties have developed similar ideas for such a 'super grid', i.e. a network of power cables connecting far away wind turbines like a 'socket at sea' (Woyte *et al.*, 2008).

for natural resources, looming conflicts over space or current legislation. The various industries have divided the available space according to their own requirements in an autonomous fashion. Very few of the ways in which the sea is currently exploited are the result of careful, science based considerations with regard for the interplay between the various activities (Agardy, 2011).

A licensing regime is currently in place for new activities to be undertaken in the North Sea, its main criteria for assessment being spatial planning concerns and environmental impact. The licensing system, while not exactly dismissive of new initiatives, does not provide much incentive for innovation. In addition, protection of vested interests often results in deadlock (Council for the Ministry of Housing, Spatial Planning and the Environment, 2009). Due to the daunting licensing system and the protection of vested interests, new initiatives do not always get the attention they deserve, let alone the much-needed room for experimentation.

box 10

Farming seaweed and algae

World annual seaweed production currently amounts to approximately 18 million tonnes. Seaweed is used as an ingredient in (animal) food, chemicals, cosmetics and pharmaceutical products. It is also currently under consideration as a potential source of biomass, a renewable energy source (Reith *et al.*, 2005). Last but not least, the aviation sector is experimenting with the use of biofuel partly produced from algae (www.algae.wur.nl, www.algaelink.com). Seaweed is traditionally popular in Asian countries such as China, Japan and Korea, but the demand for seaweed and its many uses is also growing in the United States and Europe (McHugh, 2003).

The North Sea could be used for seaweed farming, but for now this remains a small scale activity. If seaweed were to be farmed on a larger scale in the North Sea, it might be beneficial to do so in combination with wind farming. Not only would such double usage of a wind farm be cost effective, but further financial benefits might be reaped from sharing management and maintenance of the offshore installations. In addition, the risk of ships colliding with seaweed farming structures would be reduced because wind farms are off limits to ships. The prohibited areas could potentially serve as mating zones for fish, as well, which would help combat the decline in fish stocks (Reith *et al.*, 2005).

However, before society can start investing in the above mentioned synergies, it is essential that the use of seaweed be promoted. Although there is a growing interest in using seaweed as an ingredient in food and medicine, actual use of seaweed in production is still limited, largely because there is much uncertainty about the demand for and availability of marine biomass (TNO, 2006). In order to encourage combined wind farming and aquaculture, the government should harmonise the issuing of permits for dual offshore wind and aquaculture farms, and ensure that such projects submit combined applications for environmental impact assessment (Reith *et al.*, 2005).

box 11

Innovative combinations in power generation

A Dutch company called Smart Energy Solutions has been granted permission to extract gas near the Princess Amalia Wind Farm just off the coast of IJmuiden. The company intends to convert the gas it extracts into electric power at sea, then transport the power generated back to the mainland by means of a power cable. Converting gas into electric power by means of high-efficiency reciprocating engines not only yields cost savings, but using the residual capacity of the power cable (60%) will also help the company save money. If the results of a recent seismic test are favourable, a test shaft will be sunk in 2013.

Source: www.energieraad.nl

We find that the North Sea is dominated by existing activities, a situation further exacerbated by the fact that societal development tasks are drafted on the basis of an analysis of mainly existing activities. As a result, Dutch North Sea policy is inevitably biased towards existing activities. We feel that the central government, rather than just allowing new initiatives in the North Sea, must actively encourage such initiatives. The establishment of overarching objectives for the exploitation of the North Sea may contribute to this process.



Towards a broadly-based perspective on the exploitation of the North Sea

3

In order to be able to implement the development programme proposed in the previous chapters, the central government's responsibilities will have to be clearly defined. In our opinion, the best way to convert the North Sea's societal significance into integrated objectives would be by engaging stakeholders in North Sea exploitation and local authorities in an open and collaborative process, with the central government deciding which objectives are to be prioritised in the end.

3.1 The necessity of stakeholder participation

Allowing stakeholders and local authorities to participate in the drafting of objectives for the North Sea is vital for several reasons. Firstly, it is important that the knowledge and expertise of all the parties involved be fully utilised. Secondly, it is essential to conduct an open debate with all the parties involved because it will make the implementation of a development programme easier. In our opinion, it will be hard to establish coherent, all-embracing and commonly accepted objectives for the exploitation of the North Sea unless all parties share knowledge and insights. Therefore, the participation process should be designed in such a way as to help the authorities and stakeholders arrive at:

- A common knowledge-and-information level
- A jointly developed analysis of the North Sea marine environment
- A common understanding of the various parties' interests
- A commonly accepted definition of the central government's responsibilities with regard to the North Sea

In order to achieve all this, the central government, stakeholders and local authorities will have to be open minded and take a proactive approach to assuming their share

of responsibility for the sea and the interaction between the sea and the mainland.³ However, in practice it often turns out to be hard to get stakeholders as actively involved as they should. Not all parties engaged in North Sea exploitation are interested in playing an active part in policy development. Moreover, those parties which are interested in participating in the policy development process tend to be interested only in defending the interests of the sector they themselves represent.

Over the last few years, the central government has gained considerable experience with stakeholder participation in the field of water management, generally with favourable results. For instance, thorough consultation of all the parties involved resulted in commonly accepted proposals for the '21st-Century Water Management' and 'Room for the River' programmes.

Likewise, the government is making a great effort to get stakeholders to participate in the development of the National Water Plan and the implementation of the Marine Strategy Framework Directive. In such projects, initial discussions generally take place in the Water and North Sea Consultative Body, a platform allowing the central government to exchange ideas with civil-society organisations. In addition, the platform hosts meetings on specific issues where they can be discussed and knowledge can be exchanged. The implementation of the Marine Strategy Framework Directive has been the subject of such meetings.

We are glad to see that so much attention is being paid to stakeholder input in the development of the Netherlands' North Sea Policy. However, we get the impression that in its current incarnation, 'stakeholder participation' amounts to little more than reviewing policy proposals put forward by the Minister of Infrastructure and the Environment. Take, for instance, the way in which the Consultative Body has phrased the intended end result of the discussions: 'an insight into the positions held by all the parties involved' and 'an understanding of which proposals made by the Minister are supported by other parties, and which policy proposals are likely to alienate certain parties'.⁴ The same is true for stakeholder participation in the formulation of the nation's Marine Strategy Framework Directive, which seems to be largely limited to exchanging

3 Under Dutch law, the belt of coastal waters extending less than 1 km from the coastline is considered part of the municipal and provincial governments' territory, which means that, like the central government, municipal and provincial authorities have certain legal powers in this zone. Only the central government holds jurisdiction over the coastal waters outside the 1-kilometre zone (within Dutch territorial waters and the Dutch Exclusive Economic Zone).

4 <http://www.overlegvenw.nl/organisatie>, consulted on 21 March 2011

information, rather than jointly formulating tasks to be undertaken and measures to be taken (Van Hoof, 2010).

For this reason, we recommend that the government be even more persistent in its attempt to get stakeholders in the North Sea region actively engaged in formulating the challenges at hand and the objectives which should follow from these challenges. Local authorities in charge of the 1-kilometre coastal zone with a vested interest in a harmonious interplay between sea and land should be similarly engaged in the policy-making process, which could be run either like the successful programmes mentioned above or be based on the principles of a general exploratory stage as proposed by the Elverding Committee.⁵

3.2 The guiding principle: integrated area development

Under the current version of the Integrated North Sea Governance Plan, it is a statutory requirement for parties engaged in North Sea-based activities to apply the precautionary principle, which is to say that those wishing to undertake new activities in the North Sea are legally required to prove that they will not harm the most highly prized aspects of the sea. The Governance Plan also stipulates that, where practicable, parties interested in undertaking new activities in the North Sea must make an effort to see if their activities can be combined with other initiatives.

The development programme proposed by the Councils is designed to achieve optimised sustainable use of the North Sea. We feel that each proposed new initiative should be assessed for its potential for more fully integrated area development. This is not to say that each new initiative should by definition contribute to integrated area development.

The search for opportunities for collaborative efforts is a responsibility shared by the initiator and the competent authorities alike. Using the general exploratory stage proposed by the Elverding Committee may be an important step towards integrated area development. The first step in a general exploratory stage is the joint formulation of a problem, along with several ideas for potential solutions, which may or may not involve preconditions for optimised use of space or multi functional use of available space, in

5 Commission for Faster Decision Making in Infrastructure Issues, *Sneller en Beter*, April 2008

box 12

Room for the River

The 'Room for the River' programme, whose objectives were based on clearly defined standards, is regarded as an efficient way to link the realisation of government objectives to area development. Under the programme, a set of measures has been formulated, to be implemented by Rijkswaterstaat by 2015. The government has earmarked some 2 billion euros for implementation of the measures. Pursuant to the Key Planning Decision for the 'Room for the River' programme, local and provincial authorities are allowed to devise their own ways of attaining the objectives set by politicians. In some cases, such alternative strategies not only help realise river related objectives, but create added spatial value, either because they link river related objectives to other area development objectives (for instance, in the fields of transport, spatial planning, agriculture, ecology, nature conservation or recreation) or because they propose a different way of managing existing values. If such alternative area development plans are viable, the central government may choose to swap its 'own' strategy for a particular region for a locally produced alternative strategy, and use the funds earmarked for that particular part of a river to implement this strategy. This process is known as the 'swap decision' procedure.

The 'Room for the River' programme is dedicated to increasing environmental quality in spatial planning. The central government has invested a great deal of time and energy in identifying existing values (i.e. making knowledge available). Environmental quality also figures prominently in determining the initial set of measures (the initiator assumes responsibility for environmental quality in spatial planning). Furthermore, the central government has appointed a team to supervise the drawing-up of land use plans and more detailed plans. It bears mentioning that the central government is not solely responsible for creating environmental quality in spatial planning. Additional uses, as well as the measures which add value to regional plans, must be funded regionally, either by the public sector or the private sector.

In total, the 'Room for the River' programme is being implemented in 39 places in the Netherlands. Since each river bank is unique, the programme places a strong emphasis on collaborating with local authorities and residents. Rijkswaterstaat has charged its programme management team with monitoring the progress of the entire programme. The team also assesses proposed solutions to safety issues.

line with the new governance philosophy outlined in the draft Integrated North Sea Governance Plan. Here, too, the government's experience with stakeholder participation in the 'Room for the River' policy-making process may prove instructive. The 'Room for the River' project involved a so-called 'swap decision'⁶, which is to say that the central government made a basic decision which clearly stated the goals to be achieved. Other parties were then allowed to propose alternative strategies of their own, designed to achieve the same results, with a possibility of the strategy proposed by the government being swapped for the alternative strategy. We feel that using this instrument to achieve sustainable utilisation of the North Sea might encourage other parties to get actively involved in the formulation of better, more fully integrated solutions to the challenges at hand, not least because it will prevent protests, interference or new developments from stopping the implementation of whichever decision the government ends up making.

3.3 The importance of joint knowledge development

The marine environment is always changing, so it is essential that we adapt ourselves to changing conditions and learn to live with uncertainty if we are to achieve a sustainable utilisation of the North Sea. Likewise, it is essential that we keep assessing and reassessing the assumptions which underpin our policies and new developments taking place at sea. This being the case, we recommend ongoing research into the North Sea marine environment as an integrated system.

A fair bit of research is already being conducted on the North Sea. For instance, environmental impact assessments and monitoring programmes are being carried out for certain activities which require a permit. In addition, several scientific institutions are engaged in research into the North Sea's ecosystem, all with different perspectives (e.g. fishing, biodiversity, geomorphology). We recommend that the various research programmes and studies designed to promote the development of marine knowledge be combined where practicable, so as to ensure that those deciding on the future of the North Sea all share the same knowledge and information level. Several European initiatives to that effect already exist (e.g. Marine Knowledge 2020). It will probably be worthwhile to join them.

6 See the 'Future Spatial Policy' letter of recommendation (Councils for the Environment and Infrastructure, 2011)

We regard the central government as the body primarily responsible for co-ordinating the development of knowledge on the North Sea. However, in our opinion, responsibility for the actual conduct of the research studies should be partially borne by those looking to undertake new activities on the North Sea and those administering the North Sea. Therefore, the integration of research programmes and studies should be the joint responsibility of stakeholders and the central government. Furthermore, we are of the opinion that the results of previously conducted studies should be collected in a publicly accessible database to which new results can be added later. In this regard, useful lessons could be learned from the joint fact finding process used by the Coastal Areas sub-programme of the Delta Programme. In the long-term, this process could be developed into a single integrated North Sea research programme, supported by all affected stakeholders. The Marine Information House, which received a mention in the draft version of the revised Integrated North Sea Governance Plan and which pools GIS and monitoring data, could be the starting point of such an enterprise.

3.4 A partnership for the North Sea

There is a clearly discernible trend towards increased stakeholder participation in policy-making and governance in the fishing industry (Mahon *et al.*, 2010). For instance, amendments to the Common Fisheries Policy resulted in the establishment of several so-called Regional Advisory Councils, including a Regional Advisory Council on the North Sea, in 2002. The Advisory Councils make recommendations to the European Commission and the relevant member states with regard to fishing policy and governance. The councils are mainly comprised of representatives of the fishing industry, but they also have members who represent other interest groups affected by European fishing policy.

We feel that the establishment of a partnership might be desirable for the implementation of the proposed development programme. Ideally, such a partnership would join with existing co-operative structures. It would have an advisory capacity in formulating targets with measurable indicators. The partnership would serve as a network in which government agencies, stakeholders and scientists are represented. The 'Better Is Faster' recommendation issued by the Advisory Council for Transport, Public Works and Water Management in 2010 advocates not just formulating challenges together when developing areas on land, but designing plans to solve these challenges together, as well. We believe this approach would provide added value in the development of the North

Sea, too. For instance, the partnership could serve as a brainstorming group for further implementation of the North Sea development programme and North Sea governance. In addition, it could contribute significantly to the creation of a shared databank and the promotion of collaboration between the public and private sectors, and between the various parties from the private sector.

To encourage the participative nature of the partnership, we recommend that the parties involved in the partnership examine the experiences gained in the '21st-Century Water Management' and 'Room for the River' programmes. Likewise, the experiences gained by the Schiphol, Lelystad and Eindhoven airports under Hans Alders' leadership might help the parties involved in the exploitation of the North Sea determine how to conduct a successful partnership (see boxed text 14). What is worth noting is that the central government was just one of many parties involved in the Alders Forum debates, with very good results. We believe that a similar forum-like approach might be beneficial to the development of North Sea policy. The chair of the partnership to be established would consult the various parties involved so as to achieve a widely accepted proposal for sustainable North Sea utilisation. A Government Commissioner could be appointed to chair the partnership.

The composition of the partnership should be considered very carefully. It is vital that membership of the partnership not be restricted to parties currently engaging in North Sea-based activities. Membership should be open to representatives of companies who may in future undertake new activities on the North Sea, so as to enable the development of new initiatives. The composition of the partnership may differ from issue to issue. Although the aim of the partnership would be to develop a commonly accepted proposal, there would be no need for stakeholders to attend every single meeting on every single subject. Ultimately, the composition of the partnership would be determined by the chairperson.

3.5 Binding agreements

To ensure that a commonly accepted proposal is actually implemented in practice, it is important that each sector commit to binding agreements on its contribution to the utilisation of the North Sea. The fishing industry has gained some valuable experience with this, with covenants signed by the government, industry representatives and civil-society organisations (see boxed text 15).

box 13

Examples of partnerships

Beaufort Sea Large Ocean Management Area

Stakeholder consultation is a guiding principle of the Beaufort Sea Large Ocean Management Area in Canada. The Beaufort Sea Partnership is a platform where stakeholders meet to exchange information, build networks and advise the co-ordinating authorities – the Regional Co-ordination Committee – on how to govern the marine region. Both the Beaufort Sea Partnership and the Regional Co-ordination Committee are supported by working groups which share knowledge on specific subjects.

Marine Resources Committees

The former Dutch colonies of Bonaire, Saba and St. Eustatius became ‘special municipalities’ of the Netherlands on 10 October 2010. On the same date the three islands signed a management plan for the sustainable development of the Dutch Caribbean Exclusive Economic Zone. As part of this management plan, a so-called Marine Resources Committee was established. The Committee is made up of stakeholders (including fishermen) and will play a major role in the implementation of the management plan. The Committee was established to provide legislation from the bottom up rather than from the top down.

box 14

‘Alders Forum’

A consultative forum under the leadership of former Minister of Public Housing, Spatial Planning and the Environment Hans Alders was established in December 2006 in response to the review of the government’s plans for Amsterdam Schiphol Airport. The forum’s main topic of discussion was the Cabinet’s plan to ensure that Schiphol remained one of Europe’s main traffic hubs and to create more room for the further development of the airport. As an independent chairman, Alders consulted with government officials, airlines, regional and municipal authorities and residents, and came up with a commonly accepted recommendation on the short term development (up to 2010, inclusive) of Schiphol Airport and surrounding areas. The forum’s final recommendation was released in June 2007.

It is vital that the government emphasise that the right to be party to discussions on the future exploitation of the North Sea comes with the duty to actively put forth proposals. Binding agreements cannot be successful unless the central government is willing to use alternative (regulatory) instruments if the negotiations prove unsuccessful (Bressers and Bruijn, 2005). Participants in the debate should be aware from the start that all the pros and cons will have to be weighed and that the final result may not be entirely favourable for them. It is important that stakeholders understand that they will be legally bound to accept the final decision, whatever it is, which in its turn makes it vital that the stakeholders' representatives have the full support of the groups they represent. Each party to the debate is responsible for keeping its supporters informed and involved in the debate, which is not always easy.

box 15

Covenants in the Dutch fishing industry

The central government, the fishing industry and civil-society organisations have signed several covenants in recent years. The signatories of the covenants have voluntarily committed to achieving a number of aims, including making trawling in the North Sea more sustainable and rendering fishing in general sustainable in the Wadden Sea. Although each covenant is different in scope and outcome, they all have one thing in common – they mark a transition towards more sustainable fishing methods. What is notable is that the government is using the covenants to seek private initiatives to attain its policy targets, rather than using traditional instruments such as legislation and enforcement.

Source: Who rules the waves (Van Hoof, 2010)



Policy and governance instruments for a development oriented approach

4

Steering the North Sea development programme in the right direction will require specifically designed policy instruments. Sustainable use of the North Sea, with a balanced equilibrium between ecological, economic and socio-cultural concerns on the one hand and ample opportunity to catch fish and seafood and generate power on the other hand, can only be achieved if policy is actively guided towards such an equilibrium. At the moment this is done mainly by means of assessment procedures for activities which require a permit, and spatial zoning within the Dutch Exclusive Economic Zone. In other words, the government is taking a reactive approach which seems to be geared towards protecting the marine environment from the harmful effects caused by activities undertaken on the North Sea. While we agree that such protection from harmful effects is vital for sustainable utilisation of the North Sea, we would like to emphasise that it is equally important that the government press for efficient and optimal use of the sea. The government recognised the shortcomings of its current approach in the draft version of the revised Integrated North Sea Governance Plan, which is a first step towards a philosophy of governance in which area specific stakeholder involvement plays a more important role. In this regard, we feel that it is important that the government do more than facilitate optimal use of space. It should also look into the potential for ecological, economic and socio-cultural functions, not to mention food production and power generation, to either strengthen each other or follow on from each other.

The following new and existing policy instruments may be effective in this regard:

- Room for experimentation
- Flexible permitting system
- Reservation and zoning of areas
- Targeted investment policy
- Improved sectoral policy
- Development of a North Sea marine strategy

4.1 Room for experimentation

In our opinion, all activities undertaken in the North Sea should aim to contribute to sustainable and optimal utilisation of the North Sea. By this we mean that the activities must conform to the way in which the marine environment works, which is admittedly complex. Much remains unknown about the processes taking place in the marine environment. Therefore, the Councils recommend that the government allow companies to learn by trial-and-error. Dutch policy should facilitate experiments into new ways of using the sea, even if there are still some uncertainties about the exact impact of such experiments.

In the Councils' opinion, the following instruments could be used to facilitate such trial-and-error learning:

Designate special areas for experimentation

The National Water Plan provides scope for designating parts of the North Sea as zones for experimentation. So far, the government has not availed itself of this opportunity. We recommend that the Dutch part of the North Sea be divided into zones and that certain zones be designated for marine experiments, e.g. new fishing technology or new forms of aquaculture or electricity generation (see boxed text below). Such experimental zones will require thorough scientific research, and the maximum duration of each experiment will have to be determined beforehand.

Hold a competition for the most innovative ideas

The government could consider holding competitions for the most innovative ideas for sustainable and optimal use of the North Sea which do justice to the North Sea's significance to Dutch society. Such competitions are a frequently used instrument in architecture, and are increasingly common in water management and North Sea governance (see boxed text below). The Councils recommend holding a competition for innovative ideas for the development of the North Sea. The competition could have an international component, focusing on the entire southern North Sea rather than the Dutch Exclusive Economic Zone alone, thus increasing the chance of producing innovative ideas and improving opportunities for international collaboration at an early stage. An important thing to keep in mind when announcing an ideas competition is that the brief must be crystal clear, so as to increase chances of the competition producing winning ideas which can actually be implemented.

box 16

Experimenting with sea generated electricity

Seawater heating

Some 600 homes in the Duindorp neighbourhood of the seaside town of Scheveningen are currently heated by generating heat from seawater. Water is pumped from the sea and transported to a so-called 'seawater power station' through a network of pipes. A heat exchanger in the power station extracts warmth from the seawater and pumps this to individual homes, where residents use a water pump rather than a central heating boiler to heat their home.

Osmotic power

Osmotic power (also known as salinity gradient power) is energy generated by mixing seawater and river water. Studies conducted by Wageningen University have shown that osmotic power is more efficient than either solar or wind power. Wageningen University's studies mainly focused on the Netherlands' own Lake IJssel, a former inland sea turned into a lake by the construction of the Afsluitdijk Dam in 1932. However, the results of the studies may also be of interest to other places where fresh water meets seawater. One of the major advantages of osmotic power is that it does not produce any waste, apart from small amounts of brackish water.

4.2 Flexible permitting system

Temporary permits

Permits should not hinder innovation. It should always be possible to take advantage of new knowledge and changing insights. One of the policy guidelines laid down in the Integrated North Sea Governance Plan 2015 stipulates that 'a permit is therefore only valid for a limited period of time'. This rule was instituted to prevent permits from remaining valid indefinitely without actually being used. Under the Water Act, the Environmental Law (General Provisions) Act and the Mining Act, permits can be revoked if they are not used within a certain time frame. Moreover, the Environmental Law (General Provisions) Act provides for the possibility of issuing permits valid for a limited time only.

box 17

Competitions: a couple of examples

'Turn the Tide' innovations competition

The 'Turn the Tide' innovations competition was held in 2002 with the aim of promoting and demonstrating radical water management ideas. The competition was designed to develop new concepts, methods and collective demonstration projects, with a view to finding solutions to water issues. Innovators were invited to submit ideas in three categories:

- Innovation in sea-based activities
- Liveable river banks
- Innovative use of polders

Eventually, some of the proposals are integrated into the corporate innovation programme of Rijkswaterstaat.

Competition on using space in multiple ways

Rijkswaterstaat held an ideas competition in 2010 in the hope of challenging the market to come up with a proposal as to how designated areas of the North Sea may be used to support multiple industries in future. The judges' panel was presented with five interesting entries. The winner, who presented a plan for a sea-based farm combining algaculture, aquaculture, fishing and possibly wind turbines, was announced on 22 March 2011. The next challenge is to convert the winning entry into a feasible business plan (with Rijkswaterstaat's help) and realising a small scale test farm.

The Councils are of the opinion that plans and progress should be re evaluated before extending previously issued permits which are currently being used. This will serve more than one goal. Not only will it prevent the existence of unused permits, but it will prevent a situation whereby current activities block the introduction of new and innovative activities. It bears mentioning in this context that there is a risk that those considering applying for a permit for a new initiative will be scared off by temporary permits, as they increase the risk of not earning back the funds invested in an initiative. To encourage people to apply for permission, the permits should be valid for a sufficient period to allow investors to recover the funds invested in a scheme.

Temporary permits also offer opportunities for new and experimental applications and activities. This means that activities which are believed to help safeguard and develop Dutch interests, but whose exact methods and impact on the North Sea are as yet unknown, can be given the green light, albeit with requirements regarding the development of currently unavailable knowledge, designed to eliminate some of the uncertainties. Once the temporary permit expires, the results of the temporary activities are assessed, after which the activities concerned will be continued, ceased or expanded.

Allow the particulars of an application for a permit to be changed

The current North Sea licensing regimes administer activities undertaken in the North Sea on an ad hoc basis (De Gier et al., 2011). Essentially, the government plays a passive and reactive role in the issuing of permits. This may change in future, now that a new philosophy of governance has been outlined in the draft version of the revised Integrated North Sea Governance Plan. However, at the moment it is individual applications for permits, rather than the societal aspects of North Sea development, which determine what happens in the North Sea. The current official procedures do not encourage considerations of optimising the use of the sea or combining activities where possible. Indeed, under the Mining Act and the Environmental Law (General Provisions) Act, the authorities who issue the permits are not even allowed to take such broader concerns into consideration. The Water Act and the Earth Removal Act do allow for a broader justification of new initiatives, but only to a limited extent (De Gier et al., 2011).

It is our opinion that initiators of new activities should always be obliged to substantiate how their initiative contributes to Dutch society, regardless of the permit being applied for. Such explanations should always demonstrate how the potential of the sea is to be realised and how utilisation and governance of the North Sea could be improved. Nearly all activities undertaken in the North Sea nowadays require an environmental

impact assessment, which means that the environmental impacts (in the broader sense of the word, including natural, economic and to some extent socio-cultural aspects) of the activities in question are known, as are the various alternatives. Once all that information has been submitted, the authorities issuing the permits are in a good position to judge not merely whether certain activities are lawful, but whether they make optimal use of the sea while respecting its societal significance. If this is not the case, the authorities should perhaps suggest that the activities in question be undertaken elsewhere or in a different form. In the current system, alternatives are discussed during the environmental impact assessment process, and again as part of preliminary consultations with the authorities. However, once an application for a permit has been submitted, none of the particulars of the application may be altered. We recommend that this rule be changed, thus enabling the authorities to grant permission for a certain activity, but at a different location or in a different manner than the one originally applied for.

4.3 Reservation and zoning of areas

Zoning of marine areas is a measure which helps implement the results of spatial planning processes. In many cases maps are used to designate these zones. One example of such zoning, along sectoral lines, is the designation of shipping routes. In response to the National Spatial Strategy 'Creating Space for Development', the Integrated Governance Plan 2015, the Water Plan and the North Sea Policy Document, the Dutch authorities have implemented a form of zoning in the Dutch Exclusive Economic Zone. Such zoning can help optimise use of an area, and is often the end result of a process involving consultation with stakeholders. A zoning system may also include reservation of particular areas, generally with the aim of protecting or improving certain activities (or combinations thereof) in the said areas. At the moment, most zones are allocated for marine nature conservation purposes.⁷

Reservation of specific areas may help attain targets related to nature conservation, as well as nature development, certain types of fishing, recreation and even socio-cultural aspects. Furthermore, reservation of areas may be used to enable smart combinations of activities, e.g. protecting archaeological heritage while at the same time increasing

7 Both the EU and OSPAR protection regimes are upheld in the Dutch Exclusive Economic Zone. The protected areas mostly serve to protect the marine ecosystem and test the acceptability of other activities.

biodiversity. The Councils recommend looking into the possibility of several degrees of area reservation,⁸ taking into account the possibility of allowing different activities to be undertaken at different times in a given area. When designating certain parts of the North Sea as reserved areas, it is vital that the objectives of the designation be clearly understood by all parties involved and that monitoring and data collection be in line with these objectives (Lindeboom, 2008).

Having said that, we advise against over-regulation in the issuing of permits for reservation and zoning of North Sea areas. Drawing-up a zoning plan for the Dutch part of the North Sea would be an example of such over-regulation. If a zoning plan were to be drawn up for the Dutch Exclusive Economic Zone, both the Environmental Planning Act and the Environmental Planning Decree would come into effect, with all the attendant administrative law appeals against judgements. Moreover, zoning plans might be unsuitable because they tend to be designed to get plans authorised, whereas we hope to realise an active *development* programme. Zoning plans are a useful instrument when developments in spatial planning can be predicted with reasonable accuracy. However, this is not the case in the highly dynamic environment of the North Sea (Van der Cammen, 2005).

4.4 Targeted investment policy

It cannot be taken for granted that the market will develop activities which allow sustainable use of the marine environment's and are in line with the societal interests represented by the North Sea. This requires the combined efforts of the business community and a proactive government – combined efforts which must be geared towards innovation and sustainability. The central government must actively contribute to the development and promotion of new ideas, and must make targeted investments. For instance, it should invest in companies which need a start up boost for new and innovative activities, and in companies which are trying to introduce innovative methods in their current activities.

8 This idea was also mentioned by the North Sea Foundation in its 2011 publication entitled *Zoning the North Sea to Benefit Nature and Fisheries*, which suggests introducing several degrees of zoning for the fishing industry.

box 18

The Wadden Sea Fund

The Wadden Sea Fund was established in 2006 for the purpose of safeguarding the long-term protection and development of the Wadden Sea nature reserve. The Fund finances measures which, unlike regular governance and maintenance projects, are designed to achieve or contribute to:

- Enhanced nature and scenery in the Wadden Sea region
- A reduction or complete removal of external threats to the natural resources of the Wadden Sea
- Sustainable economic development of the Wadden Sea region, or a substantial transition to a sustainable energy economy in the Wadden Sea region and surroundings
- The establishment of a Wadden Sea databank, thus increasing knowledge of the region

The Wadden Sea Fund aims to support a proactive approach towards Wadden Sea policy, for instance by promoting pilot projects, encouraging stakeholders to be ambitious and strengthening collaborative ties between interest groups.

The Advisory Council for Transport, Public Works and Water Management suggested in its 2005 recommendation 'Investing in the North Sea' that the government establish an investment fund for the North Sea. The Councils believe that such a fund would be likely to contribute to the successful implementation of the North Sea development programme. The fund's financial resources should be obtained primarily from certain types of taxes levied on activities undertaken in the North Sea, e.g. legal dues, levies and other fees. We recommend that the government undertake a thorough investigation of the potential for a North Sea investment fund, and of possible methods for financing the fund. The Wadden Sea Fund might serve as a useful example (see boxed text 18).

box 19

Encourage industries to make their methods more sustainable

Electric pulse trawling (a method less damaging to the ecosystem and biodiversity than beam trawling) is becoming increasingly common in bottom fishing in Dutch waters, as fishers are increasingly opting for this type of innovative technology (Ministry of Transport, Public Works and Water Management, 2009b).

In addition, the development of metallic foam has enabled the construction of ships and boats (of nearly all types) 20 to 30 per cent lighter than they used to be. Reduced weight means reduced carbon emissions, since lighter vessels need less fuel to move (source: www.schut-tevaer.nl).

The European Commission stipulated in its White Paper on Transport that the European Union, in co-operation with the International Maritime Organization and other international organisations, must strive for the universal application and enforcement of high standards of safety and environmental protection. The environmental record of shipping can and must be improved by both new technology and cleaner fuels and operations. Overall, the EU emissions from maritime transport should be cut by 40 per cent by 2050.

4.5 Improved sectoral policy

It is commonly accepted that certain methods and procedures used by the various sectors active in the North Sea have a negative impact on the marine environment. Measures to counteract this negative impact generally have to be implemented at the sectoral level (see boxed text below). When implementing such measures, it is important to take into account the entire marine environment, and not just the part directly affected. In formulating sustainability targets for each sector, one must always consider an activity's impact on the ecosystem and other activities undertaken in the North Sea, and vice versa.

We feel that the use of less damaging methods could be encouraged by subsidising from the above mentioned investment fund. An incentives policy could be implemented to speed up the transition to methods with less environmental impact. Moreover, the Councils are of the opinion that the government should not hesitate to impose injunctions and prohibitions in its attempt to promote the use of methods which is demonstrably superior, and/or to eliminate threats to the environment.

4.6 Development of a North Sea Marine Strategy

The Ministry of Infrastructure and the Environment is currently developing several scenarios for the determination of 'good environmental status', an important step in the implementation of the Marine Strategy Framework Directive. The determination of good environmental status dictates the degree to which the North Sea's ecosystem is protected, thus creating the necessary preconditions for sustainable utilisation of the North Sea.

'Good environmental status' can be interpreted in different ways. The Councils have found that the various stakeholders have widely divergent ambitions, even though the definition of 'good environmental status' provided in the Directive is unambiguous in its description of the intended situation and it should not be too hard for EU member states to apply this ambition to their own sections of the marine region or sub region to which they belong. Therefore, we recommend close adherence to the definition put forward in the Directive and a primary focus on applying this definition to the North Sea and the Netherlands' specific situation. The environmental targets to be established must be realistic and in line with the active push for sustainable utilisation of the North Sea, which is to say that they must allow for the development of the ecological, economic and socio-cultural aspects of the North Sea. What must be avoided is a situation whereby the environmental targets are so ambitious that they become an insurmountable obstacle for parties looking to capitalise on opportunities and developments which are considered to be of general interest. Therefore, 'good environmental status' and environmental targets should not be determined by ecologists only. Other stakeholders must be party to the process, as the eventual decision will need to have political support.

box 20

Natura 2000 and the black backed-gull

Pursuant to Natura 2000 legislation, the black-backed gull is a protected species in the Netherlands, even though it is not in other European countries. This means that the Netherlands is obliged to help the black-backed gull achieve certain population targets. The black backed gull largely survives on the bycatch of beam trawling. This is problematic, because beam trawling is known to take a very high toll on the marine environment. Given the European Union's ambitions in matters of marine protection, it is not unlikely that beam trawling will be banned or heavily regulated in future, which may negatively affect the black-backed gull population.

The Directive provides detailed qualitative descriptors for determining good environmental status, featuring eleven characteristics and the criteria for their assessment. However, much is as yet unknown, and it may well be currently unknown factors which will prove most relevant in future. In this regard, a good look at the experiences obtained with Natura 2000 may be instructive (see boxed text 20).

We feel that some restraint is advisable when dealing with subjects of which little is known at present. Marine ecosystems and food chains are so complex that stringent quantitative targets tend not to have the intended effect, and may even be counterproductive. In some cases it may be more effective to push for qualitative objectives, which allow for changes in policy when the situation requires it. Likewise, it is important that targets be kept flexible, so as to enable off-setting and compensation. We believe that if targets are flexible and based on qualitative rather than quantitative objectives, we will be able to realise European ambitions for the marine environment while preventing the pursuit of incorrectly set targets.

Map 3. The Southern North Sea



Sustainable utilisation of the North Sea: the international approach

5

Since the North Sea is a unified system which does not end at the boundaries of the Dutch Exclusive Economic Zone, it is not enough that the Netherlands implement its own North Sea development programme. There is much scope for co-operation with the other EU member states having borders on the North Sea. The Councils would like to see the establishment of an international co-operative structure for the implementation of joint North Sea policy. Such a co-operative structure should be allowed to develop step by step, starting at the practical and operational level, and culminating in actual legislation. The story of the evolution of the International Commission for the Protection of the Rhine in the second half of the twentieth century (see boxed text 21) could serve as a guideline.

Factors contributing to the success of the ICPR include the fact that the member states actively sought to define common interests, the active mediating role played by the Dutch government, the involvement of civil-society organisations, and a keen eye for developments at the institutional level (Dieperink 1999). Although the challenges posed by the Rhine environment are rather different from those posed by the North Sea, we are of the opinion that the states bordering on the southern North Sea could glean several useful tips from the evolution of the ICPR, especially in terms of how to co-operate effectively.

5.1 Common interests as the guiding principle

The Dutch Exclusive Economic Zone is largely situated in the southern North Sea, which is an interesting environment for several reasons. In addition to having several hydrographical characteristics which are worthy of note, the southern North Sea is characterised by intense usage (including but not limited to shipping, fishing, the extraction of oil and gas, and the generation of wind energy). In addition, the southern North Sea

kader 21

Co-operation between states in the Rhine watershed

In the mid twentieth century the states in the Rhine watershed became increasingly concerned about the pollution of the Rhine and its attendant problems. Over the course of time, their collaborative efforts in improving the condition of the Rhine grew into an effective co-operative structure which managed to bring pollution under control.

1950

At the initiative of the Netherlands and Switzerland, the International Commission for the Protection of the Rhine (ICPR) was founded in 1950. Initially, the ICPR served as a platform where civil servants from states in the Rhine watershed could discuss Rhine-related issues in an informal and relatively unstructured setting.

1963

In 1963 the ICPR's mandate was expanded with the Berne Convention, thus making the Commission more than an informal liaison organisation. The ICPR was granted the power to prepare policy measures for and agreements between signatory nations.

1972

Initially, the signatory nations mainly co-operated at the technical level. The year 1972 saw the first Conference of Ministers, which gave the ICPR nations a platform for political negotiations.

1976

In 1976 the ICPR nations signed several conventions, concluding agreements on the manner in which to tackle pollution by chlorides and chemical pollution in the Rhine (among other things).

boasts a rich ecosystem with great biodiversity. Considering the specific characteristics of the ecosystem and the fact that the various EU member states having borders on the southern North Sea all share similar interests, we feel that the Netherlands would be served well by co-operating with these other member states. Needless to say, this would require keeping a close eye on developments in neighbouring territories, so as to be able to anticipate events.

From a Dutch point of view, it is important that the following countries be involved in the drawing-up of a development programme for the North Sea: Belgium, Denmark, Germany and the United Kingdom. Each of these countries has its own North Sea legislation and governance structure (see annex 1).

In drafting its own development programme for the North Sea, the Dutch government must have a good understanding of policy developments and existing governance structures in other states having borders on the southern North Sea, so as to fully understand how the various interests and challenges relate to one another. Once we have a good understanding of the administrative and institutional context, we can seek to identify shared and conflicting interests, which will help us determine how to change or improve things. For this to work, it is essential that we establish good contacts with the other countries having borders on the southern North Sea.

5.2 Play an active part in international co-operation

The North Sea Policy Document recognises the importance of the southern North Sea to Dutch society. In recognition of this significance, the Netherlands has indicated an interest in playing an active role in the development of an international maritime strategy, under the terms of the EU's Integrated Maritime Policy (see boxed text below). The Councils applaud the Dutch government's ambition to take a proactive approach in improving collaboration with other states having borders on the southern North Sea, and therefore approve of the Netherlands' participation in the NSCOGI⁹ and MASPNOSE¹⁰ projects.

9 The North Seas Countries' Offshore Grid Initiative (NSCOGI) is a collaborative structure in which ten states having borders on Europe's northern seas have committed to collaborate on the development of offshore wind farms.

10 Maritime Spatial Planning in the North Sea (MASPNOSE) is an EU subsidised project in which European states and knowledge banks liaise in order to learn from each other's experiences in marine spatial planning.

box 22

International co-operation as outlined in the north sea policy document

The increasing strategic importance of the southern North Sea is largely due to (sustainable) economic reasons (e.g. shipping, oil and gas reserves, potential for sustainable wind energy), but also due to ecological reasons. International co-operation may help the parties involved make the most of the North Sea's potential, with synergy likely to produce good results. The Netherlands will actively pursue improved international co-operation in North Sea governance in the period covered by the North Sea Policy Document. It is the Dutch Cabinet's ambition to achieve a common strategy for the development of the southern North Sea, which comprises the Dutch, Belgian, German and Danish Exclusive Economic Zones, as well as the section of the British Exclusive Economic Zone which is situated to the west of the aforementioned four nations' zones. The focus will be on formulating a common vision and set of principles for marine spatial planning, legislation, harmonised implementation and governance, and co-operation in monitoring and enforcement.

Source: North Sea Policy Document (Dutch Ministry of Infrastructure and the Environment, 22 December 2009)

The North Sea Policy Document also notes that the activities undertaken to realise an international strategy are well aligned with the formulation of environmental targets and measures for the Marine Strategy Framework Directive and Natura 2000. We applaud the architects of the document for recognising the interconnectedness of the various policies, and recommend using current collaboration under the Marine Strategy Framework Directive and Natura 2000 programme as a stepping stone to continued and more intense international co-operation.

The Dutch government has indicated that the Netherlands will seek consultation with and support from the European Commission in drafting its strategy, but will also apply the subsidiarity principle. We recognise the importance of liaising at the European level, but would like to emphasise that the member states themselves should have primacy over their collaborative efforts. A co-operative structure designed to solve issues in the southern North Sea should be based on the notion that there are only a small number of countries bordering on the southern North Sea which have common interests. Therefore, the exact nature of the collaborative efforts should in our view be determined from the bottom up, rather than from the top down.

We would advise an initial approach of developing a commonly accepted view on the southern North Sea. Particular attention should be paid to consulting both national and international stakeholders and getting them actively involved in the discussion.

Once agreement has been reached on the nature of the international interests involved in the southern North Sea, the next step will be to achieve a set of integrated objectives. This will require a thorough investigation of the nature of the issues, so as to be able to determine at what level and scale the various parties involved should co-operate. Again, we would like to emphasise that it is important that subsidiarity be applied in this process. Supranational policy alignment is important, but not in all matters.

5.3 Get civil-society organisations involved

In drafting the international strategy for the development of the southern North Sea as proposed in the North Sea Policy Document, we believe that it is important to develop a common view of which fields should come under the responsibility of the international community. The Councils are of the view that it is vital that civil-society organisations be allowed to contribute to international co-operation. For one reason, such organisations can enhance the urgency placed upon addressing these challenges. For another reason, civil-society organisations tend to have the kind of knowledge which will improve the quality of the decision making process, which in turn will result in greater public support.

Initially, national governments will dictate the nature of co-operation between the various member states. However, non-governmental organisations are also likely to make a significant contribution to the development of an effective international co-operation regime. Take, for instance, the history of the International Commission for the Protection of the Rhine. Civil-society organisations proved essential in focusing attention on the problems the Rhine was facing, for instance by influencing public opinion and pressing for high-ranking government officials to get involved. Political and legal conditions were vital to the success of civil-society organisations in the Rhine debate, in that they allowed for an open dialogue between all the parties involved, regardless of whether they were governmental or non-governmental (Dieperink, 1997).

5.4 A step by step approach to achieving international legislation

The OSPAR Convention is currently used by member states to exchange knowledge and align their policies. The Councils believe that OSPAR plays a valuable role in the international administrative context and that the international co-operation established under the Convention has already produced some results of note. However, it seems that OSPAR collaboration is mainly concerned with combating threats to the marine environment and promoting sustainable economic exploitation of the sea. In addition, OSPAR is concerned with the entire north-eastern Atlantic, of which the southern North Sea is merely a part, and a fairly small one at that.

Our advice is to kick start the collaborative process by strengthening operational ties between member states which have borders on the southern North Sea. Once close ties have been established, a decision can be made as to whether it is desirable to broaden the scope of the co-operation and work towards administrative implementation of the arrangements. It takes time to get an international co-operative structure off the ground, and its only chance for success is to pursue genuine common interests. This being the case, we would like to emphasise that the best approach in establishing a co-operative structure is a gradual one requiring an ongoing reassessment of needs and requirements. In other words, co-operation must always serve a functional purpose, and one should be careful not to establish new co-operative structures just for the sake of doing so.

Having said that, we do feel that there may eventually arise a need for a separate forum (in addition to OSPAR) where states bordering on the southern North Sea can meet and discuss the harmonisation of their policies at the administrative level. It is not inconceivable that this will be a necessary step towards a correct determination of the international interests represented by the southern North Sea. Considering the considerable societal significance of the southern North Sea, we are of the opinion that the minister responsible for North Sea governance should be in charge of this project. Furthermore, we consider that the trilateral efforts by Germany, Denmark and the Netherlands in protecting the Wadden Sea are a good example of the type of co-operative structure that developed because of common interests (see boxed text 23).

kader 23

Trilateral co-operation in the protection of the Wadden Sea

Scientists have agreed since the early 1970s that the Wadden Sea is a unified system in ecological terms, and that its protection requires a joint effort, rather than disjointed actions undertaken by individual member states. Therefore, the first Wadden Sea Conference was convened in 1978, giving politicians from the three countries bordering on the Wadden Sea the opportunity to discuss a joint approach to protecting the Wadden Sea. The third Wadden Sea Conference was held in 1982 and saw the signing, by the three ministers involved, of a Declaration bringing about a co-ordinated approach to the protection of the Wadden Sea. This Declaration, along with the 1997 Wadden Sea Governance Plan, was brought up to date at the most recent Wadden Sea Conference, held in 2010. At this conference, a proposal was submitted for a new organisational structure designed to establish a new Wadden Sea Committee. This newly established committee is responsible for the implementation of the now up to date Declaration and other decisions made at the trilateral Conferences of Ministers.

Although international co-operation at the Wadden Sea still leaves room for improvement, the trilateral Conferences of Ministers have created a platform where co-ordinated Wadden Sea policy can be discussed at the ministerial level. We recommend examining the experiences gained in the trilateral Wadden Sea protection structure to decide whether the establishment of such a platform might be useful in the protection of the southern North Sea.

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Annex 1 Outline of the institutional framework in other North Sea countries

Belgium

Legal framework

Pursuant to the requirement of the United Nations Convention on the Law of the Sea, Belgium declared an Exclusive Economic Zone in the North Sea in 1999. The same year also saw the passing of the Marine Environment Protection Act, which provides an overarching legal framework for Belgian marine environmental law, and as such outlines measures taken for sustainable governance and enforcement. Royal and ministerial decrees relating to the implementation of the Act include the designation of marine reserves, the implementation of a permitting procedure (including mandatory environmental impact assessments and evaluation thereof) and species protection.

Policy and responsible agencies

Since 2003 one government official has been in charge of Belgium's North Sea policy, although this official's authority has recently been limited to the protection of the marine environment. Some parts of the Belgian zone of the North Sea come under federal jurisdiction, while others come under Flemish jurisdiction. Those aspects of the fishing industry which have not been placed under the European Union's jurisdiction come under Flemish jurisdiction. Altogether, 17 federal and Flemish government agencies currently have authority over the North Sea. In 2005, the federal and Flemish governments signed a co-operation agreement designed to allow both parties to discharge their North-Sea-related duties in close co-operation, on an equal footing and with respect for each other's legal authority.

Denmark

Legal framework

Denmark declared an Exclusive Economic Zone in 1996. It includes parts of the Skagerrak and Baltic Sea, as well as a part of the southern North Sea.

Policy and responsible agencies

Maritime policy is a shared responsibility of the Danish Maritime Authority (an agency which comes under the Danish Ministry of Economic Affairs) and the Ministries of the Environment and Defence. Marine spatial planning is covered by the local authorities' jurisdiction, with basic guidance from the central government. In 2010 the Danish government presented an integrated maritime strategy outlining all the maritime-policy-related projects to be initiated, as well as the intended role of the government. The strategy also discusses the implementation of the Marine Strategy Framework Directive.

Germany

Legal framework

Germany declared an Exclusive Economic Zone in 1995. The year 2004 saw the passing of an amendment to the federal Spatial Planning Act, placing marine spatial planning in the German Exclusive Economic Zone under the authority of the federal government. This resulted in a 2009 spatial plan for the German sections of the North and Baltic Seas, outlining the spatial planning objectives and principles for the German Exclusive Economic Zone.

Policy and responsible agencies

The German Constitution grants a considerable degree of autonomy to the country's sixteen federal states. Therefore, the coastal states are largely free to determine their own priorities in the field of coastal area governance. However, the federal government is working on an integrated maritime policy for all of Germany, which is largely based on the maritime development plan drawn up by the Federal Ministry of Transport, Construction and Urban Development. This development plan is designed to establish a common perspective on economic and social opportunities and challenges, while at the same time ensuring the protection of the marine environment. Similar concerns are discussed in the national strategy for sustainable use and protection of the seas, drawn up by the Federal Ministry of the Environment, Nature Conservation and Nuclear Safety.

In addition, the importance of the maritime sector for the German economy has led to the appointment by the federal government of a co-ordinator, who is part of the Federal Ministry of Economic Affairs and Technology and is responsible for ensuring the implementation of a coherent policy for Germany's maritime economy.

United Kingdom

Legal framework

The UK Marine and Coastal Access Act came into effect on 12 November 2009 and created one Exclusive Economic Zone adjacent to the coastlines of the United Kingdom, in accordance with the United Nations Convention on the Law of the Sea. Prior to the creation of the Exclusive Economic Zone, different sea-based activities (fishing, nature conservation, renewable energy, CCS) each had their own maritime zones. The Marine and Coastal Access Act created the framework for effective governance of the UK's marine regions, by establishing common principles for marine spatial planning, licensing systems and the designation of nature reserves (among other things). In addition, the Act changed the way in which the fishing industry was regulated at both the local and national levels, and also helped improve public access to coastal areas.

Policy and responsible agencies

The Marine and Coastal Access Act set in motion the establishment of the Marine Management Organisation (MMO), whose stated aim is to make a significant contribution to the sustainable development of the UK's marine regions. As a non departmental public body, the MMO has an independent board of directors and has the power to carry out certain tasks and make decisions on behalf of the UK government, as long as it follows established policy frameworks. Ultimately, the Secretary of State for Environment, Food and Rural Affairs is responsible for the tasks carried out by the Marine Management Organisation. One of the main functions of the MMO is to implement a new marine spatial planning system based on the UK Marine Policy Statement. In addition, the MMO is charged with developing a new licensing system in accordance with rules laid down in the Marine and Coastal Access Act. The MMO works closely with Natural England and the Joint Nature Conservation Committee in the creation of a network of marine protected areas. Furthermore, the MMO has incorporated the work of the former Marine and Fisheries Agency, the agency which used to govern the shipping sector. Last but not least, the MMO responds to marine emergencies, conducts inspections and enforces marine legislation.

Given its central position in the implementation of marine policy and governance of the UK marine regions, the Marine Management Organisation looks set to become an important source of information in the field of maritime affairs. This makes the MMO a key adviser to other agencies responsible for making strategic decisions.

Annex 2 Development of this recommendation

The consulting process commenced in March 2010, after which the Council Commission convened on thirteen occasions. A stakeholder meeting was held where representatives of several organisations joined in the debate. Furthermore, we met with individual representatives of interested parties. Both the stakeholder meeting and the meetings with the individual representatives provided a wealth of useful information which was used in the writing of this recommendation.

Composition of the Council Commission

Prof. N.S.J. Koeman (Chair, member of the Council for the Ministry of Housing, Spatial Planning and the Environment)

P.J.H.D. Verkoelen, member of the Council for Rural Areas

M.A.J. van der Tas, associate member

Prof. Th.A.J. Toonen, associate member

N.J. Westdijk, associate member

External experts

Prof. F. Fleurke, Wadden Sea Council (until 31 December 2010)

Prof. J.G. Lammers, University of Amsterdam

Prof. H.F.M.W. van Rijswijk, Wadden Sea Council (since 1 January 2011)

Supporting staff

B. Swanenvleugel, project manager (since January 2011)

Dr N.W.M. van Buren, project manager (until January 2011)

M. Huisman, project member

M.F. Leopold, external project member (until 1 December 2010)

C.I.A. de Vries, BC, project assistant

D. Visser (trainee from 1 September 2010 until 1 March 2011)

Participants in the stakeholder meeting

P.R. Altena (Royal Association of Netherlands Shipowners)
 G.E. van Berkel (LaMer Foundation)
 T. Grijzen (Greenpeace)
 A.H. Hof (Netherlands Sand Miners' Association)
 J.P.M.H. Knippels (DCMR Environmental Protection Agency)
 Dr M.L. Kraan (Dutch Fish Product Board)
 E. Leemans (North Sea Foundation)
 A. van Mannekes (Netherlands Oil and Gas Exploration and Production Association)
 A. Vermeulen (Netherlands Board of Tourism & Conventions)
 B. Veerman (KIMO Netherlands and Belgium)
 W. Visser (VisNed)
 C.A. Westra (We@Sea Offshore Wind Power Research)
 J. Wiersma (Netherlands Association of Hydraulic Engineers)
 J.W. Wijnstroom (Netherlands Amateur Anglers' Association)
 P.C.B. de Wit (Port of Rotterdam Authority)

Participants in other meetings

A.L. Abspoel (Ministry of Infrastructure and the Environment)
 S. van den Akker (North Sea Foundation)
 Dr J.M. Bavinck (MARE Centre for Maritime Research)
 E. Bogaard (PROSEA Marine Education)
 A.E. van Bokhorst (Ministry of Infrastructure and the Environment)
 H. Dotinga (Utrecht University)
 P.M. van Egmond (PBL Netherlands Environmental Assessment Agency)
 M. Eisma (Port of Rotterdam Authority)

M. Harte (Ministry of Infrastructure and the Environment / Rijkswaterstaat)
 Dr L.J.W. van Hoof (IMARES Institute for Marine Resources & Ecosystem Studies)
 P.A. van Hoorn (PBL Netherlands Environmental Assessment Agency)
 R. de Jong (Wadden Sea Council)
 S. de Jong (Ministry of Infrastructure and the Environment / Rijkswaterstaat)
 Dr M.L. Kraan (Dutch Fish Product Board)
 J.W. Nieuwenhuis (Ministry of Economic Affairs, Agriculture and Innovation)
 H.R. Offringa (Ministry of Economic Affairs, Agriculture and Innovation)
 A.D.C. Otte (National Agency for Cultural Heritage)
 R. Peters (Ministry of Infrastructure and the Environment)
 T. Rammelt L.L.M (North Sea Foundation)
 R. de Rooij (Ministry of Defence)
 P. Salz (Framian)
 A. Svoboda, MSc (Ministry of Infrastructure and the Environment / Rijkswaterstaat)
 S.M.A. Twickler (Centre for Marine Policy and Wadden Sea Council)
 Dr M. Verweij (PROSEA Marine Education)
 Dr R.J.H.M. van der Veeren (Ministry of Infrastructure and the Environment / Rijkswaterstaat)
 J. van de Ven Msc (Ministry of Infrastructure and the Environment)
 Dr R.E. Waterman (former Provincial Councillor for the province of Zuid-Holland)
 J. Westinga (Wadden Sea Council)
 F.G. Wortelboer (PBL Netherlands Environmental Assessment Agency)
 P.C.B. de Wit (Port of Rotterdam Authority)
 C. van Zwol (Ministry of Infrastructure and the Environment)

Annex 3 Overview of 2010-2011 publications

2011

Time for flood safety

Published September 15 2011

Open doors, closed doors

Published June 16 2011

Future of spatial policy in the Netherlands

Published June 8 2011

European Agricultural Policy as Catalyst for Transformation of Agriculture and Horticulture

Published June 7 2011

2010

Make room for renewal, investments and spending cuts in the physical domain

Published July 13 2010

A sea of opportunity

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p. 2: Nationale Beeldbank

p. 4: Lex Broere

p. 18: Martijn de Jonge, Hollandse Hoogte

p. 28: beeldbank.rws.nl, Rijkswaterstaat, Sander de Jong

p. 40: beeldbank.rws.nl, Rijkswaterstaat

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