



Government of the Netherlands

This plan is attached as an
annex to the Draft National
Water Programme 2022-2027

Draft North Sea Programme 2022 – 2027



Contents



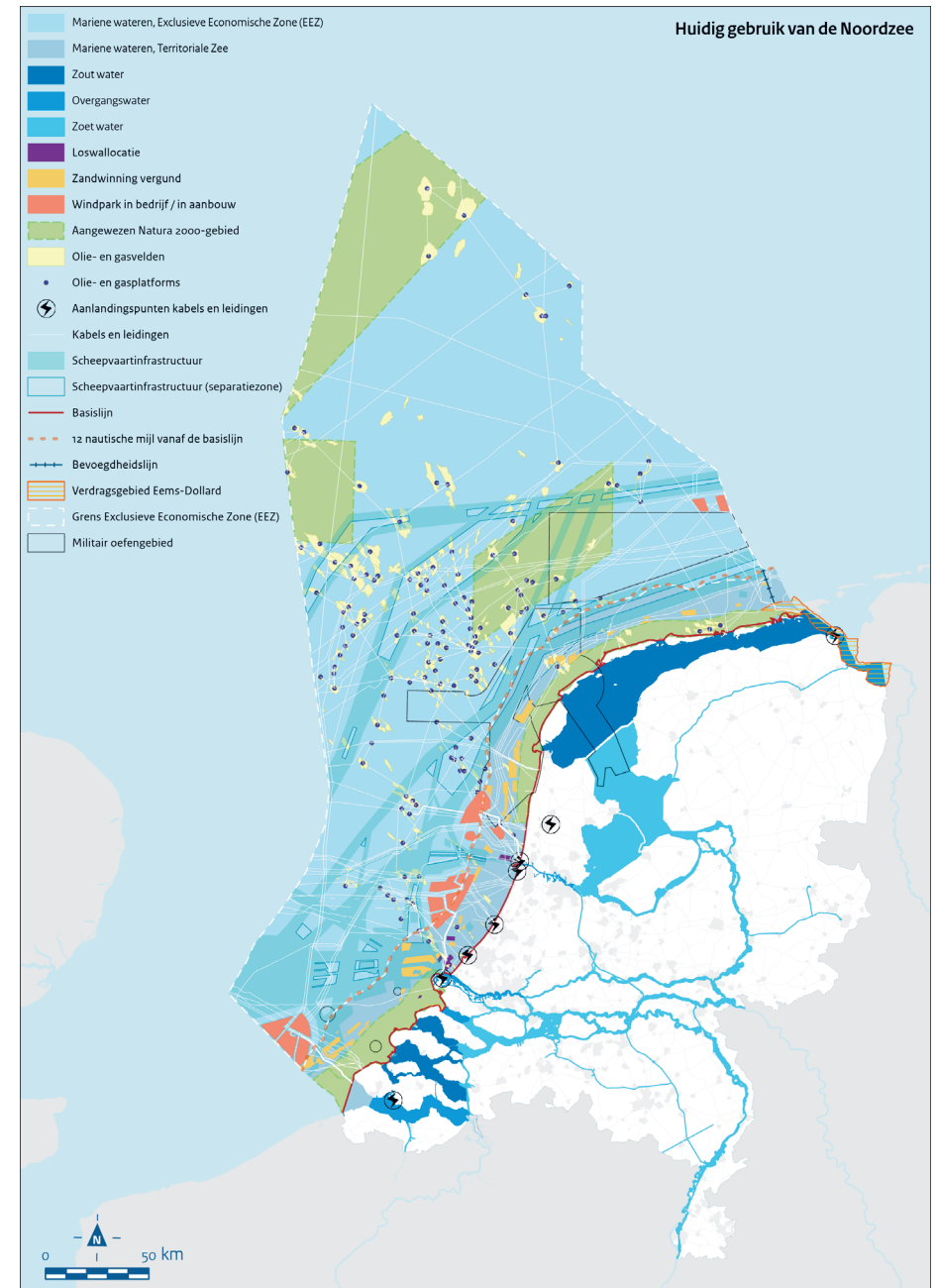


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Map 1: current use of the North Sea

Summary

The North Sea Programme, including the appendix Marine Strategy Part 3 (programme of measures MSFD) is an integral part of the National Water Programme (NWP) 2022-2027. The NWP's focus on cohesion in the water policy also applies to all the management and use of the North Sea. Various developments in and around the North Sea show a continuing trend towards increasing intensification of the use. At the same time, clear national and international conditions have been set to restore and protect the ecosystem of the North Sea. For the North Sea policy in the coming decades, the integral approach to water management, which the NWP supports, is therefore not a choice of different options but a hard necessity. The task for the coming years is to find the right societal balance to be able to achieve efficient and safe spatial development of the North Sea which fits within the prerequisites of a healthy ecosystem. With the North Sea Programme 2022-2027, the national government sets the frameworks for spatial use of the North Sea in relation to the status of the marine ecosystem, and for the policy aimed at improving the environmental status. The framework for the ecosystem and the further relevant national interests from the National Strategy on Spatial Planning and the Environment (NOVI) has been elaborated in a description of the current use, the actual and expected developments, the related future vision and tasks, the developed policy and management and, finally, the knowledge task.

International frameworks

The ecosystem and use of the North Sea are not restricted to national borders, policy and management. The Netherlands unequivocally places the vision, ambitions and tasks for the North Sea in an international context. International vision and policy development are important in providing direction to the national policy and management in the North Sea Programme 2022-2027. Globally, the UN Biodiversity Convention and the UN Sustainable Development Goals (SDGs) are important, particularly SDG 14 which specifically focuses on the marine ecosystem. At regional level, the OSPAR Convention provides direction to the protection of the marine environment from pollution and other negative effects of human activities. In addition, SDG 13 (climate action) and the associated Paris Agreement from the UN climate conference in 2015 are also vitally important. The aim of the agreement is to limit global warming to well below 2 degrees Celsius, preferably to 1.5 degrees Celsius. By constructing offshore wind farms as an alternative to fossil energy, the North Sea can make an important contribution to this objective.

In a European context, the Common Fisheries Policy (CFP) and several EU regulations and directives provide strong guidance: the Marine Strategy Framework Directive (MSFD), the Birds and Habitats Directives (BHD), the Maritime Spatial Planning Directive (MSP), and the Water Framework Directive (WFD) with subsidiary directives. In nearly all the international policy frameworks, the ecosystem approach and the precautionary principle are respected, two principles which are also leading for the sustainable management of the North Sea.

With the publication of the European Green Deal in 2019, the European Union (EU) responded to the Paris Agreement. The growth strategy of the Green Deal must transform the EU into a climate-neutral, circular and raw material efficient union in 2050. The Commission wants to use it to tighten European climate policy. In December 2020, the European leaders agreed on raising the goal for reducing EU greenhouse gas emissions to at least 55 percent by 2030. This goal will be proposed to the European Parliament in 2021. In addition, this Green Deal gives a new perspective to the Sustainable blue economy.

National frameworks

National Strategy on Spatial Planning and the Environment (NOVI)

In the national elaboration of international policy frameworks, the Dutch government has chosen a clear orientation towards a future scenario of the North Sea in which intensive use goes alongside restored nature values and a robust ecosystem. This scenario strongly determines the policy goals for the short and medium term. It is therefore also included in the long-term vision in the NOVI up to 2050. The North Sea Programme 2022-2027, including the appendix MSFD programme of measures, has been drawn up in the spirit of the Environment and Planning Act. Broad participation is an important basis for the NOVI, the National Water Programme and this policy document.

Climate Act and Climate Agreement

To fulfil its national responsibility to limit global warming, in the Climate Act in 2019 the Netherlands undertook to reduce emissions of greenhouse gases (particularly CO₂) in the country to a level that is 95 percent lower in 2050 compared to 1990. Pursuant to the Climate Act, the Dutch government published a Climate Plan, outlining the policy, including the agreements

from the Climate Agreement to reduce greenhouse gas emissions by 49 percent in 2030. During 2021, we will learn exactly how the task in the Netherlands will be affected due to the increase in the EU's goal to reduce greenhouse gas emissions by at least 55 percent in 2030 compared with 1990. This will probably lead to an extra task for offshore wind energy at sea for the period up to 2030. Based on the agreements reached in the Climate Agreement in 2019, it was determined that the extent of this extra wind energy task was expected to be around 5 to 9 GW. This task will be further elaborated based on the North Sea Agreement, among others.

North Sea Agreement

To safeguard strong societal ownership of the vision, ambition and choices in the North Sea policy for the long term, in 2020 the national government and stakeholders signed the North Sea Agreement under independent chairmanship. With agreements about choices and policy, this North Sea Agreement presents the strategic tasks for creating a concrete and long-term balance for the energy transition (from the Climate Agreement), nature restoration and a healthy future for fishing on the North Sea. In doing so, it takes other users into account, such as shipping, defence, recreation and sand extraction. Along with the international policy developments and the NOVI, the North Sea Agreement provides the basis for the policy proposals elaborated in the North Sea Programme 2022-2027.

Environmental status and functional uses

The North Sea is a valuable and vulnerable ecosystem. The shallow and nutrient-rich area is a habitat for marine mammals, a breeding ground for fish and an important migratory route and wintering area for many bird species. Pollution of the marine environment has declined in recent decades. Commercial fish stocks are growing, as are the populations of marine mammals, while the introduction of non-native species has declined. Nevertheless, the ecosystem of the North Sea is still under pressure, good environmental status has not yet been achieved and numerous knowledge questions about the functioning of the ecosystem and the cumulative effect of the use and climate change have not yet been answered.

The pressure on the ecosystem of the North Sea is partly caused by human interventions and activities in the past, and partly by the increasing intensification of functional uses such as wind energy, shipping, fishing, sand extraction, oil and gas production and recreation. The production of wind energy occupies a special position because this use contributes to achieving the global, European and Dutch CO₂ reduction goals. The Dutch sea area already in use for the first big wind farms will expand significantly in the coming decades. Development scenarios for wind energy in the Dutch part of the North Sea vary in capacity from 38 to 72 gigawatts in 2050. On the other hand,

besides taking up a lot of space, that upscaling also involves an intensification of effects and pressure factors. The consequences for the ecosystem have not yet been properly analysed. Furthermore, this increasing claim to space will have an impact on other functional uses. With the increase of the number of wind farms, extracting fossil fuels from the seabed will be phased out in the coming years. It may be possible to use some of the decommissioned installations and pipeline networks for the production, transport and storage of hydrogen. The same applies to the storage of CO₂ in the seabed, for which the first steps have been taken. The construction of wind farms, closure of protected areas for seabed-disturbing fishing, the European ban on pulse fishing and the consequences of Brexit puts extra pressure on the fishing industry. These developments force a transition which has a deep impact on the character of the fishing industry and the socio-economic structure of fishing communities.

In the period up to 2030, the volume of shipping is expected to increase by 35 to 40 percent. This will not be reflected so much in the number of ships, but in the average tonnage per ship.

The rising sea levels until around 2032 can be countered with the current annual volume of beach replenishment. For the subsequent period, another estimate will be made based on the new insights into rising sea levels.

Looking ahead to the future scenario of a healthy sea which still has great potential, the national government is focusing on a good balance between three major transitions to, respectively, renewable energy, sustainable marine food production and a restored and robust ecosystem in the North Sea. To achieve this balance, not only is extensive sustainability required for all existing forms of use, but also and particularly the social capacity to initiate, accept and implement new, innovative developments. Creative and multiple use of the scarce space in the North Sea is a crucial condition for this.

Spatial aspects and strategic task

The North Sea Programme 2022-2027 applies to the Netherlands Exclusive Economic Zone and the territorial sea which has not been administratively designated. The programme also implements the requirements of the European Maritime Spatial Planning Framework Directive. This is therefore also the Maritime Spatial Plan required by the EU. The transboundary aspects are coordinated with the neighbouring countries. For the area of the Dutch North Sea, which also falls under the responsibility of provinces and municipalities, an integral approach is required to spatial and other aspects. The many links between sea and land (including inland waterways) are obviously strongly interconnected.

The ambition is to achieve a sustainable and safe use of the North Sea that contributes to the social, economic and ecological objectives of the Netherlands. The task for the coming years is to find the right social balance to be able to achieve efficient and safe spatial development of the North Sea which fits the prerequisites of a healthy ecosystem. The concrete elaboration of this task will be based on the continuation of existing policy and new policy.

Continuation existing policy

The policy that will be continued consists of:

- *Ecosystem.* Preserve and protect already designated Natura 2000 and MSFD areas and the entire marine ecosystem. In the spatial consideration of activities, also test against the prerequisites of the marine ecosystem. Continue present policy efforts to reduce contamination and disruption of the ecosystem to achieve and retain the good environmental status (conclusion in the programme of measures of the Marine Strategy Framework Directive).
- *Fisheries.* Promote sustainable fishing and aquaculture and balanced operations, within prerequisites of the ecosystem.
- *Generate renewable energy.* Sufficient space for the annual production of 49 TWh from offshore wind energy (pursuant to Climate Agreement) and for extra production based on European agreements about tightening the climate objective in 2030, if the Dutch government decides to do so. And development of other forms of sustainable energy, in combination with wind farms wherever possible.
- *Oil and gas production.* Maximum natural gas and oil production from the Dutch fields in the North Sea so that the potential from stocks is used, within the boundaries of the Paris Agreement. The international duty to clear obsolete platforms will be continued. Only platforms that will be reused for production and/or storage of hydrogen or CO₂ may remain.
- *CO₂ storage.* Sufficient room for the storage of CO₂ in depleted oil and gas fields or in underground aquifers. This is a temporary instrument during the transition to a fully sustainable energy supply.
- *Shipping.* Achieve and maintain a single system of traffic separation, clearways and mooring areas which can accommodate shipping safely and easily.
- *Sand extraction.* Sufficient room for sand extraction for coastal protection, to counter flood risks and as fill sand on the land.
- *Defence.* Sufficient military exercise zones in the North Sea.
- *Underwater Cultural Heritage.* The government policy for managing archaeological heritage is based on the principles of the Valletta Convention.
- *Assessment framework for activities in the North Sea.* Apply a transparent and balanced framework to assess activities on the North Sea.

Adapted and new policy

The North Sea Programme 2022 – 2027 introduces new policy for several aspects.

Strengthen marine ecosystem

- Additional measures to achieve and retain good environmental status:
 - Area protection, based on both Natura2000 and the MSFD, with measures to limit fishing in the areas designated in the North Sea Agreement: Frisian Front, Central Oyster Grounds, Cleaver Bank, Brown Ridge and Borkum Reef Grounds. Pursuant to the North Sea Agreement, in 2023, 13.7 percent of the North Sea and 15 percent in 2030 will be free of fishing that disturbs the seabed. An area of 2.8 percent of the Dutch North Sea will then be limited to all fishing techniques. All percentages will be achieved in valuable ecological areas.
 - Species protection based on action and species protection plans.
 - Reduce litter at sea by additional measures to tackle the major sources of pollution, namely beaches (action: knowledge exchange, support collaborative projects), river basins (action: increase awareness of the litter problem among site and water managers along rivers), shipping (action: improved prewash procedure to prevent persistent floating substances in the environment), fishing (action: phasing out of dolly rope), and plastic products (action: implement OSPAR recommendation to tackle pre-production pellets in the environment).
 - Reduce underwater noise by introducing a noise budget for seismic survey and focusing more on the implementation of the IMO guidelines for the reduction of underwater noise caused by commercial shipping.

Transition to a sustainable food supply

- Transition to sustainable fishing. Sustainability focuses on innovations in the industry aimed at reducing negative effects on the ecosystem, emissions and waste. The size of the fleet will also be adapted to the available space at sea.
- Innovations in the marine food production. Promote aquaculture.

Transition to sustainable energy

- Designate new wind energy areas with space for further expansion by 27 GW. This expansion will partly be achieved in the period up to 2030, if required in line with European agreements about tightening the climate objective in 2030, without creating lock-ins for the period 2030-2050. When determining the areas, there are various considerations such as the interests of other users (fishing, shipping, oil and gas production), the effects on protected species and the possible landing points and the costs involved. After adopting the NWP and the North Sea Programme 2022-2027, in the further elaboration it will be determined in a roadmap which (parts of) areas will be used when for wind farms.

- When it is necessary to create extra space for offshore wind energy, defence exercise area EHD-41 can be moved as soon as enough mining platforms in the new location for EHD-41 have been removed.
- Modification of the already designated wind energy area Hollandse Kust (west) and abandoning the wind energy area to the north of the shipping junction North Hinder.
- Modification of the Assessment framework safe distance helicopter flight to mining installations from 5 NM to 2.5 NM and add that this also applies to the distance to installations for carbon capture and storage (CCS).
- For cables and pipelines, which in principle are left behind in a clean and safe state, an assessment method for the duty of removal has been developed, with leading criteria for hinder by other use, safety, environmental impact and costs.

Shipping

- A polar route (Northern Sea Route, NSR). This international connecting route between Asia and Europe via the North Pole is essential to guarantee the accessibility of the Dutch seaports as a gateway to Europe in the future. In an international context, various route options are now being explored. During the North Sea Programme 2022-2027, the (inter)national process to formalise an international connecting route between seaports will be continued. The resulting clearways and the ultimate internationally recognised shipping routes will be adopted in the Mining Regulation and (the partial revision of) the North Sea Programme.
- Through the designated wind energy area IJmuiden, a clearway will be kept free to guarantee a clear route for shipping. Besides the ferry connection, this clearway connects the NSR and the ports of IJmuiden and Amsterdam.
- Clearway Kattegat towards Germany/Denmark. Together with Germany, Denmark and Belgium, integration is being sought of the shipping routes in the northern part of the Netherlands EEZ towards the Kattegat and further northwards. This concerns the new connection towards the Danish port of Esbjerg, the traffic separation scheme 'Skagen West' and the southern part of the Norwegian traffic separation scheme. After the national designation of this connection as clearway, in collaboration with Germany and Denmark the international process can be started to designate this connection as international (IMO) routing scheme.
- National formalisation (adopting as clearway) of the Dutch part of the shipping route Esbjerg-Hull based on coordination with North Sea countries.

Other national interests

- The national safety policy focuses on monitoring the safety of the information provision and of vital objects on the North Sea, including measures to be taken when necessary.

Sustainable blue economy

Stimulate multiple use of space in wind farms for other forms of energy generation and aquaculture. The principle of the Sustainable blue economy offers the Netherlands the opportunity to develop as a maritime country with global impact. The North Sea is an ideal area in which to shape and further develop this concept. To achieve the Sustainable blue economy, a network has been set up of (central) government authorities, research institutions, NGOs, entrepreneurs, businesses and the CoP (Community of Practice) North Sea. This powerful (international) collaboration should result in pilot projects and ultimately in upscaling initiatives to achieve the Sustainable blue economy and for multiple use in the triangle of transitions for food, energy and nature.

Policy and assessment frameworks activities North Sea

The North Sea Programme 2022-2027 gives the following policy and assessment frameworks:

- Policy framework for passage and multiple use
- Assessment framework multiple use
- Area-based explorations and Guide area passport
- Assessment framework use of area reserved for sand extraction
- Assessment framework for activities in the North Sea

In addition, directive statements are made about handling artificial islands.

The assessment frameworks are the mechanism applied by the national government to assess whether offshore activities are permitted. In the assessment frameworks, relevant policy comes together. They describe how new activities are assessed within the European and other international frameworks. Assessment frameworks also outline what action to take if various activities of national importance clash. When issuing licences, the competent authority is obliged to act in accordance with the policy rules of these frameworks.

In principle, the assessment frameworks for activities in the North Sea apply to all activities which require licences in the framework of legislation and regulations which apply to the North Sea in the territorial sea and in the Exclusive Economic Zone. These include the Environment and Planning Act, the Earth Removal Act, the Nature Conservancy Act, the Environmental Management Act, the Water Act, several shipping laws, the Offshore Wind Energy Act and the Mining Act. The assessment frameworks are mainly important for North Sea users who wish to request a licence and for licence issuers. The frameworks make an important contribution to achieving and maintaining the good environmental status under the MSFD.

Research and monitoring

Filling gaps in knowledge about the carrying capacity of the ecosystem, nature enhancement and species protection, and about the impact of pressures plays a major role in research and monitoring. An important example is research into the consequences of the large-scale rollout of offshore wind energy for ecology. As well as from the North Sea Agreement, knowledge questions also emerge from the MSFD implementation. The Marine Strategy part 1 (2018) and Marine Strategy Part 3 (appendix 1) contain an overview of gaps in knowledge per descriptor. Integrated knowledge development and access will support the policy for the North Sea in the planning period. Within the DigiShape programme launched in 2019, the Digital Twin for the North Sea¹ is being developed. This digital copy of the North Sea contains and visualises all the knowledge and thus provides insight into the spatial, ecological and socio-economic impact of spatial plans on the North Sea.

Governance

With the adoption of the North Sea Agreement, a permanent North Sea Consultation (NSC) will be set up in spring 2021 between the national government and social organisations.² This consultation safeguards the joint monitoring of the implementation of the Agreement for the North Sea and the allocation of the available transition resources. This also concerns the agreements which fall within the scope of this North Sea Programme 2022-2027. In addition, the consultation offers the opportunity to discuss current developments and to review whether these should lead to further agreements or to changes in the North Sea Agreement (adaptive planning). The consultation thus also plays an important role in the adaptive planning in the development of the North Sea Programme. Key in the NSC is achieving the balance between the energy transition, nature restoration and a future perspective for fishing, taking all users and stakeholder interests into account.

¹ <https://www.digishape.nl/projecten/digitwin-noordzee>

² <https://www.rijksoverheid.nl/documenten/rapporten/2020/11/27/advies-afspraken-governance-noordzee-overleg>. In 2021, a Ministerial establishment decree will be adopted. Participants are the energy sector, shipping and port industry and nature organisations. The fishing industry is not (yet) part of the consultation.



1 Development of policy for the North Sea

This chapter describes how the North Sea Programme 2022-2027 is embedded in national and international law, how it was established and how the governance for implementation is organised during the planning period.

1.1 Societal background

A dynamic system like the North Sea that also has multiple users requires a policy and management that keeps pace with the dynamics. In their development and use of space, the energy, nature and food transitions are interwoven. Further intensification of the use of the North Sea also requires sensible use of the available space. The policy objective for the coming years is to find the right societal balance to achieve an efficient and safe spatial development of the North Sea in line with the prerequisites of a healthy ecosystem.

1.2 Legal framework

The North Sea Programme 2022-2027 replaces the Policy Document on the North Sea 2016-2021. It describes the spatial planning in the Dutch North Sea, the measures to achieve good environmental status and the management based on these measures and spatial planning. The legal framework for the North Sea Programme consists of statutory obligations of the Water Act, the pending Environment and Planning Act, the Maritime Spatial Planning Directive (MSP), and the Marine Strategy Framework Directive (MSFD).

The Water Act describes the statutory obligation to draw up a national water plan (article 4.1 (1)) and a Management and Development Plan for National Waters (Bprw, article 4.6). For the 2022-2027 period, this obligation is implemented with the National Water Programme 2022-2027 (NWP), the successor to the National Water Plan 2016-2021 and the Management and Development Plan for National Waters 2016-2021). In terms of the planning aspects, the National Water Programme also constitutes a structure vision as defined by Article 2.3(2) of the Spatial Planning Act. The Draft North Sea Programme will be adopted by the Minister of Infrastructure and Water Management and the Minister of Agriculture, Nature and Food Quality, in agreement with the Minister of Economic Affairs and Climate, and the Minister of the Interior and Kingdom Relations.

The Water Act (article 4.1 (3b)) obliges the national government to include the North Sea policy in the National Water Programme. As an independent appendix to the NWP, this North Sea Programme (2022-2027) substantiates the North Sea policy described therein. Pursuant to article 4.6 (2 and 3) of the Water Act, the North Sea Programme 2022-2027 contains the following elements of the Marine Strategy:

- the description of the good environmental status of the North Sea (MSFD article 9(1)) and the series of environmental goals and associated indicators (MSFD article 10(1))
- a programme of measures, drawn up according to the requirements described in article 13 (1 to 4, 7-8) and article 14. The Marine Strategy part 3 (updated programme of measures) is an appendix to the North Sea Programme. The Minister of Infrastructure and Water Management and the Minister of Agriculture, Nature and Food Quality are responsible for developing the Marine Strategy.

The Environment and Planning Act is due to come into force on 1 January 2022. For the national government, the Environment and Planning Act features the following instruments: the environmental vision, programmes, general government rules, the environmental licence and the project decision. Just like the overarching National Water Programme 2022-2027, in this North Sea Programme 2022-2027 the North Sea policy is drawn up 'in the spirit of' the new Environment and Planning Act. The national water policy and the description of the management and development of these waters are therefore combined in one document. The Water Act applies to the draft North Sea Programme 2022-2027 because it will be made available for public consultation before the Environment and Planning Act comes into force.

The Dutch government published the National Strategy on Spatial Planning and the Environment (NOVI) in September 2020. This integral vision contains the strategic outline of the policy for the physical living environment, including policy for water and shipping. This North Sea Programme 2022-2027 is a further elaboration of the NOVI for the parts which are relevant to the North Sea (see text box 2.1 in chapter 2).

From a European perspective, the North Sea Programme 2022-2027 implements the following obligations (see also 1.4):

- pursuant to the Maritime Spatial Planning Directive (MSP) the North Sea Programme 2022-2027 contains the framework for planning spatial use at sea.
- pursuant to the Marine Strategy Framework Directive (MSFD), the North Sea Programme 2022-2027 contains a programme of measures to achieve good environmental status of the water system. The update of the Dutch programme of measures is attached as appendix 1 of the North Sea Programme. A summary is included in paragraph 3.3.1, 3.3.2 and 3.3.3.

1.3 Spatial context

The physical management limits for the water management structures for water quality, water quantity and water management are described in Appendix III of the Water Regulation. There is no municipal or provincial division of the North Sea from 1 km from the low water line on the coast. All aspects of the policy and management of the North Sea are the responsibility of the national government. Moreover, a distinction is made between territorial waters (within the 12-nautical mile zone), forming part of Dutch territory, and the Dutch exclusive economic zone (EEZ). The Netherlands has less jurisdiction over this latter part of the North Sea than it does over its territorial waters. The North Sea Programme 2022-2027 applies to the Netherlands EEZ and the territorial sea which has no administrative division.

Based on the MSFD, the Ems-Dollart and the Western Scheldt are formally designated as transition water. Based on the Fisheries Act, the Wadden Sea and the Eastern Scheldt are coastal waters. For all these areas, policy has been formulated in the National Water Programme. These waters do not fall within the scope of the North Sea Programme and the implementation of the MSP and MSFD.

The zoning of the airspace above the North Sea does not coincide with the national borders. This must be considered in the spatial planning (see map 1 'Current use of the North Sea').

1.4 Administrative framework

Interdepartmental Directors North Sea Consultative Body

Policy responsibility for the North Sea is invested in different divisions of various ministries. The Minister of Infrastructure and Water Management is responsible for coordinating the integrated North Sea policy and management. The Interdepartmental Directors North Sea Consultative Body (IDON) is tasked with the interdepartmental coordination and implementation of the policy related to the North Sea, insofar as this coordination is not already incorporated in other frameworks. The following are represented in the IDON: the Ministries of Infrastructure and Water Management (president, IenW), Economic Affairs and Climate (EZK), Agriculture, Nature and Food Quality (LNV), Interior Affairs and Kingdom Relations (BZK), Education, Culture and Science (OCW), Defence, Finances, Justice and Security (J&V) and the implementing organisations Rijkswaterstaat [executive agency of the Ministry of Infrastructure and Water Management] and Coastguard.

Management

Rijkswaterstaat is the coordinating manager of the North Sea. To coordinate the various management tasks – particularly licensing and information management – the organisation works together with the other managers, including the Dutch Food and Consumer Product Safety Authority and the State Supervision of Mines. The North Sea Programme only describes the management by Rijkswaterstaat because, based on the Environment and Planning Act, this programme contains the Bprw. Management by other parties is only mentioned.

Government Shipping Company

The Government shipping company of Rijkswaterstaat manages, staffs and maintains around 120 ships which are available for the Customs Authorities, the Human Environment and Transport Inspectorate, the Coastguard, the Ministry of Economic Affairs and Climate and Rijkswaterstaat. The ships are used for channel markings, monitoring, enforcement and supervision and incident management. The Government Shipping Company also advises on nautical matters and fleet management.

Enforcement and service provision

The Ministries of Justice and Security, Defence, Finance, Infrastructure and Water Management, Economic Affairs and Climate Change and Agriculture, Nature and Food Quality work together in a Coastguard context to enforce and implement services in the North Sea. The Ministry of Infrastructure and Water Management directs the Coastguard for the service tasks, nautical management and responding to incidents and calamities. Guidance for the enforcement (general enforcement, enforcement of environmental legislation, traffic safety and fishing) is the responsibility of the Permanent Contact Group Enforcement North Sea (PKHN), in which these Ministries are represented.

North Sea Agreement and North Sea Consultation

Led by the Physical Environment Consultative Council (OFL), in February 2019 a North Sea Consultation was launched between the national government and civic organisations aimed at concluding a North Sea Agreement. This initiative was based on the OFL report 'Exploration North Sea strategy 2030'. On 19 June 2020, the Minister of IenW submitted the final North Sea Agreement to the House of Representatives. The agreement contains joint principles, tasks and agreements which balance the tasks for fishing, nature conservation areas and wind energy, considering the interests of other users such as shipping and sand extraction. In conjunction with the NOVI, the North Sea agreement provides a basis for the elaboration of the draft North Sea Programme. On 27 January 2021, the House of Representatives held a plenary debate about this agreement and the associated governance advice of the OFL.

Following on from the North Sea Agreement, a permanent North Sea Consultation (NSC) will be set up in spring 2021 between the national government and social organisations.³ This Consultation secures the joint monitoring of the implementation of the Agreement for the North Sea and the allocation of the available transition resources. This also concerns the agreements which fall within the scope of this North Sea Programme 2022-2027. In addition, the Consultation offers the opportunity to discuss current developments and to review whether these should lead to further agreements or to changes in the North Sea Agreement (adaptive

³ See <https://www.rijksoverheid.nl/binaries/rijksoverheid/documenten/rapporten/2020/11/27/advies-afspraken-governance-noordzeeoverleg/advies-afspraken-governance-noordzeeoverleg.pdf>. In 2021, a Ministerial establishment decree will be adopted. Participants are the energy sector, shipping and port industry and nature organisations. The fishing industry is not (yet) part of the consultation.

planning). The Consultation thus plays an important role in the adaptive planning for the implementation of the North Sea Programme. Key for the NSC is achieving the balance between the energy transition, nature restoration and a future perspective for fishing, taking all users and stakeholder interests into account. The NSC is a consensus-based consultation under an independent chair. The conclusions have the status of weighty advice to the departments responsible for policy.

1.5 Relationship with international conventions and guidelines

International partnerships and obligations

The borders of the Dutch part of the North Sea have administrative and legal significance, but the uses, nature and the ecosystem are of a transnational nature. To a large extent, international frameworks determine the policy on the North Sea. The United Nations Convention on the Law of the Sea (UNCLOS) is the comprehensive legal framework for the use of seas and oceans. Several collaborative agreements as well as conventions to which the Netherlands is a party can be considered a further elaboration of the general rules contained in the UNCLOS.

At global and regional level, agreements are made in various forums about sea-based activities, safety and the protection of the marine environment. The main international partnerships and obligations are:

- Global level
Sustainable Development Goals, Paris Agreement, Oceans policy and the Biodiversity Convention. Furthermore, agreements in the framework of the International Maritime Organization (IMO), the Treaty of London and the related London Protocol of 1996, and finally the Valletta Treaty.
- European level
Marine Strategy Framework Directive, Water Framework Directive, Maritime Spatial Planning Framework Directive, the Common Fisheries Policy (GVB), Birds Directive (BD) and Habitats Directive (HD), CO₂emissions reduction objectives, Blue Growth Strategy, Sustainable Energy Policy, European strategy for plastics in a circular economy.
- Regional level
Protection environment of the North East Atlantic Ocean System, including the North Sea (OSPAR), usually via MSFD implementation. Furthermore, protection of cetaceans (ASCOBAN), and protection of water birds, including most sea birds in the North Sea (AEWA).
- North Sea countries
The political statement of North Sea energy ministers (2020-2023, as continuation of the statement 2016-2019) to strengthen the partnership in the development of offshore sustainable energy, including attention for spatial planning and ecology. In addition, the Interreg project NorthSEE and other relevant instruments which have been adopted in the framework

of the Treaty of Bonn with respect to the protection of migratory animal species and the Bonn Agreement (incident response).

- Bilateral exchange
At government level, particularly with Belgium, Germany, United Kingdom and Denmark.

Marine Strategy Framework Directive (MSFD)

The Marine Strategy Framework Directive (MSFD) is aimed at achieving and maintaining a 'good environmental status' of the marine environment. The directive offers an integrated legal framework that obliges the EU member states to protect, maintain and restore the marine environment. In concrete terms, this means preventing, reducing and eliminating contamination, achieving a cohesive and representative network of protected sea areas and promoting sustainable use. The EU member states must also contribute to the cohesion and cooperation in the various policy areas, agreements and legislative measures that affect the marine environment. They must strive towards integration and embedding of the environmental dimension in the various policy fields. In general, the MSFD requires member states to work together with other countries in the marine region. The Marine Strategy consists of three parts. Part 1 contains the initial assessment of the environmental status and describes the good environmental status, the environmental goals, the indicators and the policy objective to achieve a good environmental status. Part 2 is the MSFD monitoring programme. The updated parts 1 and 2 were adopted in 2018 and 2020 respectively for a second policy period. Marine Strategy part 3, the programme of measures, has since also been updated and included in the North Sea Programme 2022-2027 (see paragraph 3.3.1, 3.3.2 and 3.3.3 and appendix 1).

Maritime Spatial Planning Directive (MSP)

The Maritime Spatial Planning Directive (MSP) obliges member states to apply a maritime spatial planning processes and draw up a maritime spatial plan. The directive from 2014 was implemented in the Netherlands in the Water Decree in 2016. The North Sea Programme includes the Netherlands maritime spatial planning process and the maritime spatial plan.

For cross-border aspects, the directive makes it compulsory to collaboratively monitor the coherence of the plans and coordinate with the other North Sea countries. That obligation is relevant among others to nature conservation areas, shipping routes, cables and pipelines, wind farms, as well as for the cumulation of (transnational) effects such as underwater noise or the effects of human activities on marine mammals and migrating birds. Another obligation is aimed at analysing land-sea interactions. Where relevant, these interactions must be included in the maritime spatial plan (see chapter 9).

1.6 Procedure, participation and recommendation Environmental Impact Assessment Committee

Procedure

The North Sea Programme 2022-2027, including the appendix MSFD programme of measures, is an appendix to the National Water Programme and prepared according to section 3.4 of the Environment and Planning Act (article 4.1 Water Decree). Additional procedural regulations also apply pursuant to the Water Act, the Spatial Planning Act and the Environmental Management Act. The North Sea Programme 2022-2027 replaces the Policy Document on the North Sea 2016-2021.

The intention to prepare this North Sea Programme 2022-2027 was announced in the letter to the House of Representatives of 28 October 2019.⁴ On 31 October 2019, the proposal to draw up the National Water Programme 2022-2027 and to draw up a Strategic Environmental Assessment (SEA) was published in the national government Gazette and the Volkskrant⁵. At the same time, to prepare for the SEA, the Memorandum on Scope and Level of Detail (NRD) was available for public consultation. The memorandum describes which subjects (scope) will be investigated at which level of detail in the SEA. Pursuant to article 7.9 of the Environmental Management Act, from 1 to 28 November 2019, everyone was given the opportunity to present their views about both the proposal and the content of the NRD. Based on the reactions received, one aspect of the NRD was amended.

On 31 October 2019, pursuant to the ESPOO convention for strategic environmental impact assessments (UNECE), the English translation of the NRD was sent to the ESPOO contact persons of the surrounding countries. In article 10 of the protocol of the ESPOO convention, it was determined that a party that estimates that their planning has significant effects on other parties

must share this concern as soon as possible to facilitate agreements about participation. Four reactions to the North Sea Programme were received from the neighbouring countries. In March 2021, the ESPOO contact persons received the complete SEA. The period for questions and comments extends until September 2021.

Participation

The North Sea Programme 2022-2027, including the appendix MSFD programme of measures, has been drawn up in the spirit of the Environment and Planning Act. Broad participation is therefore an important basis for the policy document. Due to the COVID-19 pandemic, the participation process took a new, almost exclusively digital form. During various (online) meetings, interested parties were given information about the process and the (interim) results of the various areas for policy development. They were able to share ideas about future locations for wind energy, the assessment of these areas and the considerations to produce a preferred variant.

Regional governments were consulted at various times about choices which affect the different functional uses. They actively contributed to producing the land-sea interaction paragraph and information and views were also shared at administrative level. In autumn 2020 and in early 2021, based on the MSP convention, the Netherlands informally agreed the spatial plan with neighbouring countries.

In autumn 2020, during various meetings of the North Sea Consultation, consensus-based discussions took place about various aspects of the North Sea Programme. Finally, on 16 December 2020 the full North Sea Programme 2022-2027 was discussed in the North Sea Consultation.

The draft North Sea Programme 2022-2027, including the draft Marine Strategy part 3 and the associated SEA was available for public consultation from 22 March 2021 to 21 September 2021 as part of the NWP. Everyone was able to present their views on it. The government will adopt the National Water Programme including the North Sea Programme 2022-2027 in March 2022. Within three months of its adoption, the MSFD programme of measures will be reported to the European Commission. As a maritime spatial plan, the North Sea Programme 2022-2027 will also be sent in its entirety to the European Commission.

⁴ <https://www.rijksoverheid.nl/binaries/rijksoverheid/documenten/kamerstukken/2019/10/28/nationaal-water-programma-2022-2027/nationaal-water-programma-2022-2027.pdf>

⁵ Government Gazette No. 58883, 31 October 2019

Public reactions

Supplement after end of public consultation procedure.

Policy development during review procedure

In the North Sea Programme 2022-2027, to be adopted in March 2022, amendments will be made to the draft version of the document. The current status concerning international decision-making will thus be incorporated, for example around the EU ambition for CO₂ reduction, the EU Green Deal Agenda and the OSPAR North-East Atlantic Environment Strategy. The latest additional information relating to (cumulative) ecological effects of wind farms, shipping safety and availability, fishing, relocation of defence areas and multiple use of wind energy areas (with defence or mining, for example) will lead to a further consideration of the designation of wind energy areas (see chapter 9). In addition, a new coalition agreement might lead to amendments. Any shortcomings in the implementation of the Climate Agreement, the availability of the Monitoring, Research, Nature Restoration and Species Protection Programme (MONS), the advice of the Commission for the environmental impact assessment and an extra task for offshore wind energy in the period up to 2030 might also lead to amendments. Finally, in the framework of the Green Deal, in May 2021 the European Commission may allocate a new MSP project.

Recommendation from the Commission for Environmental Impact Assessment

Amend after receipt advice (May 2021).

1.7 Adaptive planning and international collaboration

In principle, the integrated North Sea policy and management features adaptive planning. This means that although this North Sea Programme set out the policy for this planning period, including an implementation agenda and the management aspects to elaborate the policy, during the planning period there will be moments when amendments to the policy and management will be required. Amendments may be the result of new insights based on monitoring and new knowledge (see chapter 11), evaluation moments of specific parts of the policy, or new national and international developments which impact on the essence of the policy. The government will draw up a policy theory for the evaluation of the North Sea Programme. In the period 2022-2027, there will be various moments to study decision making and create room for adaptive planning which reflects the dynamics on the North Sea. Chapter 12 contains an implementation agenda of policy decisions, which offers insight for each theme into the main milestones in the period 2022-2027. For each of these decisions and products, stakeholders will be involved.

The Netherlands will also focus on cross-border partnerships and coordination with respect to monitoring, assessment, coherence of offshore spatial planning and measures to achieve the good environmental status. This also involves collaboration and coordination with our North Sea neighbouring countries, within the EU and the OSPAR Convention.

During the North Sea Programme 2022-2027, the Dutch government may decide on an interim (partial) review of the programme, if this contributes to achieving the desired goals. For any partial review of the programme, a similar procedure will be followed as for this North Sea Programme 2022-2027. In accordance with new governance agreement, the parties in the North Sea Consultation and other stakeholders will be actively involved in an interim amendment to the North Sea Programme.

1.8 How to use this document

Chapter 2 describes the vision, ambition and tasks of the North Sea policy. This chapter frames the course for the North Sea Programme and gives direction for the subsequent chapters.

In chapters 3 through 7, the policy themes are elaborated: strengthening of the marine ecosystem, the food transition, the energy transition, shipping and ports, and further functional uses such as sand extraction, cables and pipelines, defence exercise areas, land-sea interactions, cultural heritage under water, tourism and recreation and meteorological information provision. The elaboration contains the current use and the developments since 2016, the policy vision, task and ambition, the management, and the actions and measures, and finally the knowledge agenda for the upcoming planning period.

Chapter 8 describes the Sustainable blue economy and explores the multiple use of space in wind farms.

Chapter 9 presents the framework for the spatial planning emerging from the various policy proposals. It contains the spatial planning map for the North Sea, an explanation and a map with search areas. This chapter also addresses the land-sea interactions.

Chapter 10 elaborates the other frameworks which are important for the spatial planning. The Policy framework for passage and multiple use, Area explorations and Guide for area passports for multiple use in wind energy areas in the North Sea, the Assessment framework multiple use, the Assessment framework for use of area reserved for sand extraction, the Assessment framework for activities in the North Sea, and directive statements on artificial offshore islands.

Chapter 11 describes how the knowledge and monitoring agenda around the North Sea policy will be shaped.

Section 12 concludes with an overview outlining the policy, the actions to be undertaken during the planning period and the financing of policy.

In case of conflicting translations, the Dutch version of this policy document prevails over the English translation.



2 Vision and tasks

This chapter describes the course of the North Sea Programme for the planning period 2022-2027, looking ahead to 2050. The Government sees various opportunities and challenges for the development of the North Sea. This requires a vision to be able to give this a place in the policy for the coming years. The vision reflects the ambitions and tasks which are described in an (inter)national context in the North Sea Programme. In chapters 3 and further, this course is elaborated into the integrated policy and management until the end of 2027.

2.1 Challenges and opportunities

The North Sea is a potentially rich but also vulnerable ecosystem with an open connection to the Northeast Atlantic Ocean system. It is also one of the most intensively used seas in the world, particularly by shipping, fishing, oil and gas production, wind farms and sand extraction. The North Sea has a great economic value for the Netherlands. Activities related to the North Sea have an added value of around 25 billion euros a year (around 4 percent of the gross national product). The intensive use puts great pressure on the ecosystem in our part of the North Sea. The impact of closing river estuaries is structural and permanent. The pressure factors of the daily use of the North Sea mainly constitute the impact of fishing, contamination with plastic and underwater noise.

The pollution of the sea by chemical and organic substances is declining in many cases. However, a new concern requires attention now and in the coming decades, namely the rapid climate change caused by humans. Rising sea levels and the rapid heating and acidification of the ecosystem will have fundamental consequences, including effects on the defence of our country from the sea. At the same time, the North Sea offers great opportunities for sustainable economic developments and for responding to urgent social tasks. The construction of wind farms, for example, supports the transition to entirely sustainable energy in 2050. This all means that the use of the North Sea in the period up to 2050 will become even more intensive.

2.2 Future vision North Sea 2050

The challenges and opportunities involved in the increasing use of the North Sea require a long-term vision. With the North Sea Programme 2022-2027, the national government is taking a step towards our vision for the North Sea in 2050. The North Sea will then still be intensively used, and the nature value will be restored. Ships still sail to and from the North Sea ports. The nature of fishing has changed. The greatest visible changes are the reduction in number of oil and gas installations and the large-scale expansion of the number of wind farms and related energy infrastructure, storage and conversion facilities. Although more intensively used than ever, the North Sea ecosystem has been restored. The unobstructed view from the coast and the cultural heritage under water (among others from our rich seagoing past) have remained intact. The use of synergy effects by multifunctional and innovative use of the space has strongly contributed to this future vision of the North Sea. That particularly applies to combining wind farms with aquaculture and mariculture, nature enhancement by creating oyster banks, solar and tidal energy and storage of energy and CO₂ in empty gas fields.

This vision for 2050 can become reality, among others by elaborating the five themes mentioned in the overarching vision Policy Document on the North Sea 2016-2021 based on the North Sea 2050 Spatial Agenda: building with North Sea nature, offshore energy transition, multiple/multifunctional use of the space, connecting land and sea and accessibility/shipping. With this North Sea Programme, the Netherlands is taking a further concrete step towards achieving the vision on the North Sea in 2050.

2.3 International ambitions

The ecosystem of the North Sea is not bound to national borders. Neither are many uses of the North Sea. This implies that the policy and management must also be internationally oriented. This is explained in chapter 1. The North Sea Programme 2022-2027 is strongly framed by policy and legislation at global, regional (particularly OSPAR) and European level. The Netherlands unequivocally places the vision, ambitions and tasks for the North Sea in this international context. The international development of vision and policy development for the North Sea are therefore important in providing direction to the national policy and management.

Global

In 2015, as one of the 193 countries of the United Nations, the Netherlands adopted the Sustainable Development Goals (SDGs), as the new global sustainability agenda for 2030. This agenda has been elaborated in a global connecting vision. This has been concretised in seventeen goals addressing the themes of peace, equal opportunities, no poverty and hunger, sustainable economic development, the approach to the climate crisis, clean water and reversing the decline of biodiversity. Particularly SDG 14, with its specific focus on the marine ecosystem, gives direction to the policy and management of the North Sea. This goal states that oceans, including their surrounding seas, are global systems which also make the planet habitable for humans. We depend on the sea for our drinking water, the suitable climate, everything that our coastal zones offer, much of our food and the composition of the air we breathe. The oceans and seas, including the North Sea, are crucial for trade and transport. The core of the global vision is that, without careful management of this essential global resource, no sustainable future will be possible for humanity. In terms of policy and management, the essence is to reduce our human footprint to within the prerequisites of a healthy ecosystem.

Relevant sub goals for the North Sea of the global sustainable development agenda focus on tackling pollution and on restoring and enhancing the resilience of ecosystems (including protected areas with an area of at least 10 percent of the coastal and sea area in 2030), tackling acidification and minimising its impact, tackling overfishing and finally expanding scientific knowledge and the required research capacity. In the framework of the Biodiversity Convention, there is an objective to protect at least 30 percent of the oceans in 2030.

Key to the policy and management to achieve a sustainably managed sea which fulfils SDG 14 is the ecosystem approach, in cohesion with the precautionary principle⁶. Knowledge of the dynamics of the marine ecosystem is the foundation for this. The conceptual framework of the ecosystem approach has already been recorded in various treaties and European guidelines (UN Biodiversity Convention⁷, OSPAR⁸, Marine Strategy Framework Directive (MSFD⁹). The goal is to identify the influences which are vital to the health of the ecosystem and take appropriate action. This contributes to the restoration and maintenance of the integrity of the ecosystem and to sustainable use of ecosystem products and services.

In addition to SDG 14, other development goals affect the Dutch North Sea policy. The most prominent are SDG 13 (climate action) and the associated Paris Agreement from the UN climate conference in 2015. The aim of this agreement is to limit global warming to well below 2 degrees Celsius, with a realistic chance that the temperature rise stays below 1.5 degrees Celsius. By constructing offshore wind farms as an alternative to fossil energy sources, the North Sea can make an important contribution to this objective.

Europe

Several European guidelines set the Dutch sustainable management of the North Sea in a European framework. These are the Marine Strategy Framework Directive (MSFD), the Birds and Habitats Directives (BHD), the Maritime Spatial Planning Directive (MSP), and the Water Framework Directive (WFD) and subsidiary directives, and the Common Fisheries Policy (CFP). In this respect, the MSFD builds on the joint management of the north-eastern part of the Atlantic Ocean by the parties to the OSPAR Convention and places its importance in a formal European framework.

When adopting the MSFD in 2008, the European countries also determined that the good environment status must have been achieved and maintained in 2020. This goal has not yet been achieved. The impact of past contamination is still being felt, so 2020 could be considered too

early as a benchmark. Furthermore, the ecosystem is very damaged and dynamic. As such, a good environmental status is difficult to define and the system needs a rather unpredictable time-frame to respond to measures. Furthermore, developments in the Netherlands are related to policy developments in an international context. The Netherlands will continue to draw attention in Brussels to the role of static goals in dynamic, natural systems.

‘Blue growth’ is the European long-term strategy for more sustainable growth in the marine and maritime sectors. The strategy gives direction to the European integrated maritime policy. In this, the EU describes how the seas and oceans can boost the European economy with a great potential for innovation and growth.

The European Green Deal from 2019 places the strategy of the blue growth in a new perspective by attaching a roadmap to make the economies of the EU member states sustainable, climate-neutral and inclusive. The urgency of this is that climate change, environmental degradation and the decline of biodiversity form an existential threat for Europe and the world. The Green Deal aims to reduce the net emissions of greenhouse gases to zero by 2050, to maintain economic growth without exhausting resources and not leaving any human or region to their fate. For the North Sea Programme 2022-2027, the next objectives from the European roadmap from the Green Deal for 2030 are leading:

- at least 40 percent fewer emissions of greenhouse gases, on the way to zero percent in 2050. The Netherlands supports the initiative in the EU to raise the European objective for 2030 to 55 percent.
- ecological protection of in total 30 percent of European seas, 10 percent of which are strictly protected. The definitions of ‘ecological protection’ and ‘strictly protected’ are further elaborated in a European framework.
- a zero pollution action plan.

In the sector themes of the blue growth, the emphasis is on wind energy, ‘blue’ hydrogen, CO₂ storage and reuse, nature-based solutions and sustainability of shipping. Access to maritime knowledge and spatial planning also plays a role. Here the accent is on applying the ecosystem approach, further digitisation and strengthening of regional cooperation.

⁶ Convention about the functioning of the EU article 191 (2)

⁷ Convention on Biological Diversity, Tractatenblad (Treaty Series), 1993, no. 54.

⁸ Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR Convention), Tractatenblad (Treaty Series), 1993, no. 141.

⁹ Directive 2008/56/EC of the European Parliament and of the Council of 17 June 2008 establishing a framework for community action in the field of marine environmental policy.

2.4 De Nationale Omgevingsvisie

For the Netherlands, the international ambitions have been elaborated in the National Strategy on Spatial Planning and the Environment (NOVI). In the NOVI, the national government gives direction to the development of the living environment in the Netherlands, including the North Sea. One of the policy choices in the NOVI is to attain the climate objectives for 2050 by largely achieving the necessary sustainable energy production by means of wind farms in the North Sea. According to various scenario studies, the installed power in wind farms on the Dutch North Sea can be between 38 and 72 gigawatts in 2050. Wind farms require a lot of space. The NOVI therefore states that space in the North Sea in future will be scarcer than ever. Further expansion of offshore wind energy production and space for cables between wind farms and land is only possible if conditions are met with respect to ecology, cultural history and interfaces with the other national interests on the North Sea and on land (see text box 2.1: National interests NOVI)

The task for the North Sea 2022-2027 Programme is to find the right societal balance in the spatial development of the North Sea. That development must be efficient and safe and fit within the prerequisites of a healthy ecosystem. This demands sharp, futureproof choices about combining, separating and prioritising use, about investments in sustainability and knowledge and about adaptive policy. And choices about commitment to international coordination, partnership and policy development. These choices must be feasible over the long term and be accompanied by solid social ownership. The NOVI therefore applies several principles for achieving custom work when choosing between different interests in designing and using the physical living environment:

1. combinations of functions above single functions
2. features and identity of an area are key
3. averting negative effects is prevented.

When assessing the use of space in the North Sea, functions which compete for the same area can sometimes be combined, and certain functions can be enriched with innovative new opportunities. The sustainable blue economy, for example, brings opportunities for new revenue models and export possibilities. Multifunctional use of space creates opportunities for synergy. The ideas are there, research is being conducted and the first experiments are being carried out. These involve combining wind farms with aquaculture and mariculture, alternative forms of fishing, nature enhancement by creating oyster banks, solar and tidal energy, green/blue hydrogen production and storage of energy and CO₂ in empty gas fields.

National interests NOVI

In the NOVI, 21 national interests are defined. National interests are the substantive interests for the physical habitat whereby the national government sees a role for itself and for which the Dutch government is responsible in a political sense. These 13 national interests apply to the North Sea:

- Safeguard and strengthen transboundary and international relations (see chapters 3 through 9).
- Maintain and develop the main infrastructure for mobility (see chapter 6).
- Ensure national safety and offer space for military activities (see chapter 7.4).
- Limit climate change (see chapter 5).
- Achieve a reliable, affordable and safe energy supply, which is low CO₂ in 2050 and the required main infrastructure (see chapter 5).
- Safeguard the main infrastructure for transport of substances via pipelines (see chapter 5).
- Achieve a futureproof, circular economy (see chapter 4).
- Safeguard flood risk management and climate resilience (including vital infrastructure for water and mobility) (see chapter 7.1).
- Safeguard good water quality (see chapter 3, and the appendix MSFD programme of measures).
- Achieve and retain high-quality digital connectivity (see chapter 7.2).
- Retain and enhance cultural heritage and landscape and natural qualities of (inter) national importance (see chapter 7.5).
- Improve and protect biodiversity (see chapter 3).
- Develop sustainable fishing (see chapter 4).

In the chapters referenced, the North Sea Programme further elaborates the national interests for the period 2022-2027.

2.5 Directions for policy and management: the North Sea Agreement

To safeguard strong social ownership of the vision, ambition and choices for the long term, in 2020 the national government and stakeholders signed the North Sea Agreement under independent chairmanship. This North Sea Agreement contains agreements about choices and policy which balance the strategic tasks for the energy transition from the Climate Agreement, for nature restoration and for a healthy future for fishing on the North Sea concretely and for the long term. When seeking the balance between the tasks, the interests of other users are considered, such as shipping and sand extraction.

The agreements in the North Sea Agreement concern:

- protecting and strengthening the ecosystem in compliance with EU legislation
- the rollout of wind farms up to and beyond 2030 in compliance with the Climate Agreement and including options for shipping and multiple use
- adapt nature and extent of cutter fisheries
- the intention to achieve structural collaboration in a North Sea Consultation

In cohesion with the NOVI, the North Sea Agreement thus gives direction to the North Sea Programme 2022-2027. Agreements which fall within the scope of this policy document are elaborated in the following chapters.

The main task: finding the balance between spatial development within the prerequisites of a healthy ecosystem and reducing pollution is divided into five tasks in the North Sea Agreement. Under the title 'Extra miles for a healthy North Sea', these provided direction for the elaboration of the policy and management, as described in the following chapters. The five big tasks are:

1. *The nature transition.* The North Sea is communal property for which we are jointly responsible. Use must fit into the ecological carrying capacity of the North Sea. The marine ecosystem already needs restoration. Increasing use is therefore only responsible with restoration and maintenance of the North Sea ecosystem. To make and keep the North Sea healthy, extra effort is required. The ecological carrying capacity is a prerequisite for individual and cumulative use. This is even more

important given the decision to significantly expand the number of offshore wind farms. The nature transition also requires a transition in our ideas about marine ecosystems. The North Sea ecosystem is not a static entity. Objects and installations create new habitats and can contribute to nature. In a world marked by climate change, not only must objectives at the level of individual species be a principle, but also objectives for the pressure of human use in designated sub areas. Policy and management are complicated by a structural lack of knowledge. Continuous acquisition of knowledge, monitoring, supervision and enforcement are therefore crucial.

2. *The energy transition.* Fossil fuels are gradually being replaced by clean, sustainable energy, such as offshore wind energy. On the North Sea, this will lead to a new energy system due to the significant increase in the number of wind farms and the related activities, such as expansion of storage and the transport of energy on the sea and from sea to land. This development also facilitates the reduction of CO₂ emissions. This then fulfils one of the conditions of the Climate Agreement and the Paris Agreement. This is a societal choice, offering a careful consideration, bearing in mind the interests of the ecosystem and other functional uses. Technological dynamics demand further choices now and in the future. These include choices about the use of hydrogen as energy buffer, the construction of artificial (energy) islands and alternative ways to produce marine energy.

3. *The food transition.* For fishermen, the North Sea is vitally important and fundamentally connected with the socio-economic and cultural basis of local communities. While the developments concerning the energy and nature transitions are speeding up and involving radical changes, fishermen want to know where they stand. It is vitally important to achieve profitable and sustainable fishing which, in terms of nature and extent, fits the new situation on the North Sea. That requires re-orientation and ultimately restructuring of the fleet. This is not only an ecological necessity and a (business) economic reality, but also a social requirement. In addition, there are more and more ideas for alternative food production methods at sea (aqua and mariculture) which require space in the North Sea.

4. *Looking for cohesion and balance.* The fundamental interconnectedness of these three transitions requires a cohesive North Sea policy that prevents conflicting use of space and imbalance between the transitions themselves and with other users like shipping, sand extraction, defence and recreation. Cohesive North Sea policy must also tackle disruptions of the transitions and connections between land and sea. For optimal use of the scarce space, multifunctional use of space is a leading principle. In implementing this principle, an area-based approach is key. Where multifunctional use of space is impossible, a manageable separation of functions is required based on a transparent consideration of different interests. The challenge is therefore to safeguard a healthy and sustainable North Sea, with place for protected nature values and for

the development of safe, sustainable and responsible use. With the mutual cohesion of these transitions, the balance between different users and prioritising the ecosystem, the emphasis is placed on the solutions which increase the social benefits in the long term. This approach also offers the possibility to transcend sectoral interests.

5. *Sustainable blue economy*. Innovative initiatives with respect to aquaculture and mariculture and alternative forms of energy production require space for (upscaling of) robust pilot projects and a uniform policy with clear principles for licensing and location choice.

Tasks

The strategic task for the North Sea 2022-2027 Programme is to find the right social balance in the spatial development of the North Sea. That development must be efficient and safe and fit within the prerequisites of a healthy ecosystem. The national interests and other tasks as described in this chapter will be elaborated in the following chapters.

Nature transition (see chapter 3)

- Tackling pollution, restoring and enhancing the resilience of ecosystems.
- Apply the ecosystem approach together with the precautionary principle.
- Achieve and retain a good environmental status (GES).
- Use must fit into the ecological carrying capacity of the North Sea. In addition, the marine ecosystem needs restoration.

Food transition (see chapter 4)

- It is vitally important to achieve profitable and sustainable fishing which, in terms of nature and extent, fits the new situation on the North Sea. In addition, there are more and more ideas for alternative food production methods at sea (aqua and mariculture) which require space in the North Sea.

Energy transition (see chapter 5)

- Limit emissions of greenhouse gases.
- Develop a new sustainable energy system in which fossil fuels are gradually replaced by clean, sustainable energy, such as offshore wind energy.

Sustainable blue economy (see chapters 8 and 10)

- Work on the objectives of the European Green Deal
- Innovative with respect to aquaculture and mariculture and alternative forms of energy production require space for (upscaling of) robust pilot projects
- Clear principles for licensing and location choice.

Cohesion and balance (see chapters 3 through 10)

- The fundamental interconnectedness of these three transitions requires a cohesive North Sea policy that prevents conflicting use of space and imbalance between the transitions themselves and with other users.



3 Strengthen marine ecosystem

The current ecological status of the North Sea is worrying. Human activities in the past have significantly changed natural habitats. The entire ecological system, the biodiversity and the robustness of populations have become weakened. In terms of policy, there is the desire for ecological restoration and enhancement. Although targeted measures do generate a positive response, this response is still fragile. At the same time, several negative trends are not beneficial. The desire for restoration and maintenance comes at a time when the North Sea is generally regarded as an area which can be used much more intensively: for expansion of existing social and economic interests and particularly for a contribution to the energy transition. Increasing activities and the related claim to space is only responsible if it can be accommodated by the North Sea ecosystem, but they generate added pressure on the system. This chapter describes the policy that aims to balance these related transitions.

3.1 Current situation and developments

3.1.1 Outline of the North Sea ecosystem

The southern part of the North Sea, which includes the Netherlands Exclusive Economic Zone (EEZ), is a relatively shallow and nutrient-rich coastal ecosystem in the moderate climate zone of the northern hemisphere. The ecosystem of the entire North Sea is directly connected with the neighbouring seas on the North Atlantic region. Tidal currents and permanent water movements freely ebb and flow. Physical gradients in the sea are usually less steep and extremes are often less pronounced than on land. This means that distribution limits of marine organisms are less defined than those of land organisms.

The North Sea has great ecological potential. An important part is coastal water that is fed with nutrients by rivers. The interaction of varying physical geographical circumstances like location, composition and structure of the seabed, the water dynamics and the various characters of the coastal areas has enabled a variety of special habitats to develop for all kinds of marine life forms. The North Sea is a habitat and nursery for marine mammals, fish, shellfish and molluscs, a wintering place for many species of birds and an important link in the Northeast Atlantic migratory route for birds and bats.

The North Sea has numerous ecosystem functions. Some forms of use immediately harvest from the marine ecosystem itself, such as catching fish, shellfish and molluscs. Other functional uses, such as oil and gas production, sand extraction, shipping and offshore wind energy use physical sources or possibilities. Other functions mainly use the qualities of the space. For example, recreational activities on and around the water.

3.1.2 Integrated marine strategy for the North Sea

With its policy for a healthy sea with sustainable use, the Netherlands complies with the Marine Strategy Framework Directive (MSFD). This directive obliges every European member state with marine waters to develop an overarching strategy to achieve and retain a good environmental status (GES) in 2020 (see also chapter 1). The Dutch Marine Strategy for its own part of the North Sea is complementary to existing international policy frameworks for the protection and management of species and habitats. These frameworks are the Birds Directive (BD) and Habitats Directive (HD), the Water Framework Directive, OSPAR, the Biodiversity Convention (CBD), and the policy with respect to sustainable fishing in the framework of the Common Fisheries Policy (CFP). These frameworks are primarily in force, the Marine Strategy integrates them and supplements them where necessary. The starting point of the Marine Strategy is to put into practice the ecosystem approach and apply the precautionary principle. In this process, the directive requires international collaboration. For the elaboration of the BD and HB, the Nature Conservancy Act imposes strict requirements on licences for activities.

In 2018, the Marine Strategy part 1 was updated. The status of the North Sea environment was re-assessed. Based on that assessment, the policy goals were revised for all areas that are important for achieving a good environmental status for the Dutch North Sea.¹⁰ Here follows a summary of this status assessment from 2018, supplemented with evaluations from other relevant frameworks.

Attention is also focused on the possible cumulative effects of intensifying the use of the North Sea, in relation to causes and effects of climate change, such as the increasing CO₂ concentrations and rising temperature of seawater.

3.1.3 Current environmental status of the North Sea

The North Sea, in the densely populated, economically prosperous north-western Europe, is a dynamic system and one of the most intensively used seas in the world. Conditions constantly change, partly as a result of natural fluctuations, but also due to changes caused by human activities whose pace also seems to be accelerating. The greatest direct and indirect driver of changes caused by humans is the emission of greenhouse gases like CO₂. The considerable increase of these emissions worldwide has caused an accelerated climate change, which in turn

has generated a complex series of related indirect consequences.

All these changes are also taking place in the North Sea. This causes shifts in the ecosystem. Due to the rising temperature of seawater, some species enter the North Sea from the English Channel, while species which already lived in the North Sea are moving northwards. There are also species, including commercially fished fish species, which are migrating to other areas or deeper parts of the North Sea.

Change processes which are driven by climate change are irreversible within our time horizon. In addition, there are also changes which, strictly speaking, are partly reversible, but for which there is no real practical solution. For example, the nutrients flow and biodiversity in the Dutch North Sea have partly declined due to the construction of the Afsluitdijk and the Delta Works, whereby the open freshwater-salt gradients in the coastal zone have also been closed. Another example: trawling the extensive oyster banks between the end of the nineteenth century and the 1920s and the intensive beam trawl fishing which followed fundamentally changed and depleted the seabed habitat. And another example: the intensification of global shipping has led to the definitive establishment of invasive, non-native species (exotics) which have hitched a lift on and in sea-going ships.

The partly natural and partly human-caused dynamics makes formulating and assessing measures to achieve a good environmental status for the various components of the North Sea ecosystem a complex exercise. Simply determining a historic reference is difficult. In many cases, knowledge about the status in the past is fragmented or anecdotal. In addition, the broadly supported idea of what is original and/or natural shifts over time, the so-called *shifting baseline*. There are also many gaps in knowledge concerning the functioning of the complex dynamic North Sea ecosystem and the influences of the physical use, the increasing CO₂ concentrations and the rising temperature of the sea on the carrying capacity of this ecosystem. These effects can be direct, but also indirect and cumulative.

Given this context, the updated environmental assessment from 2018 presents the following picture. The status of seabirds is declining. Particularly breeding success has been low in recent years. The reasons for the downward trend have not yet been identified. The Dutch seabed is still substantially disturbed as a result of trawl fishing. For now, it seems clear that in the ecologically valuable areas, particularly the most vulnerable, long-lived sensitive species are less common than expected. The biodiversity in these areas is also still insufficient. Things are not only bad with vulnerable, long-lived big fish species, but also with vulnerable by-catch species such as seabass, turbot and recently also cod.

Indicative for the status of the fish population is the worrying situation of several shark and ray species. For example, in the Netherlands Red List (2015), one species of fish is listed 'disap-

¹⁰ Marine Strategy (part 1). Update of current environmental status, good environmental status, environmental goals and indicators, chamber number 27625, no. 434

peared', another species is 'endangered', and two species are 'seriously endangered'.¹¹ In the HD report of 2019, with respect to migratory fish, the Netherlands reported that out of six species, four have a 'very unfavourable' and two have a 'moderately unfavourable' status. The first signs of recovery are there, but there is still a long way to go.

The reason for various unfavourable developments is the decade-long withering of nature on the seabed of the North Sea. In 2019, the HD habitat types 'permanently flooded sandbanks' (H1110), 'estuaries' (H1130), 'big bays' (H1160) and 'reefs' (H1170) had a 'very unfavourable' status and habitat type 'mudflats and sandbanks' (H1140) had a 'moderate' status. Wild shellfish banks have not returned, or not to a sufficient extent. Furthermore, around three quarters of the international commercial fish stocks do not fulfil the conditions of the Common Fisheries Policy for sustainable harvesting and sufficient biomass of spawning aggregations (see Marine Strategy (part 1)). The status is improving but it is still not yet satisfactory over the full breadth of commercial stocks.

There are also positive trends. For example, progress has been made with reducing contaminants and (plastic) litter and in promoting sustainable management of commercial fish stocks. The amount of washed up (plastic) litter on Dutch beaches is declining. In the North Sea as a whole, however, no downward trend can be observed as yet. Current policy and numerous initiatives in society show great commitment to tackling the problem of plastics in the environment. For these sections of the marine strategy, a good environmental status seems feasible in this planning period.

For the aspect contaminants, the good environmental status is within reach. This is the result of policy aimed at emission sources on the land in industry, agriculture, shipping and traffic. The concentrations of eutrophication and contaminants in the Dutch part of the North Sea have become so low that they no longer harm organisms. However, the effects of discharging some hazardous substances have long repercussions.

The good environmental status seems to have been achieved for porpoises and seals and for minimising introductions of non-native species.

Numbers of porpoises and both common and grey seals are increasing to such an extent that there is now a good environmental status according to the HD¹².

The number of established non-native species entering the Dutch part of the North Sea, mainly via shipping, has declined significantly over the past six years.

In recent years, there has been great progress with respect to knowledge development and monitoring of impulsive underwater noise. For now, this seems sufficient to (at least for impulsive noise) to achieve good environmental status in 2020. However, the Dutch and international task to achieve sustainable energy production and new insights into the (cumulative)

effects of impulsive noise during the construction of wind farms may still lead to an additional policy task.

3.1.4 Future developments

Fishing, increasing CO₂ concentrations in air and water and the (related) climate change, accelerated rising sea levels, shifts in the composition of phytoplankton and zooplankton and the acidification of the seawater cumulatively cause permanent pressure on the ecosystem. The large-scale construction of wind farms to fulfil the global climate and CO₂ reduction agreements also produces more pressure factors, which is another cause for concern. The greatest potential bottlenecks occur in relation to marine mammals (porpoises), birds and bats. Pile-driving during the construction of wind farms can disturb porpoises and lead to them avoiding areas. Wind farms that are in operation form a barrier for birds and bats. They disturb the animals on their migratory routes and collisions with the blades can cause injuries or be fatal. There are also knowledge questions about the impact on sharks and rays of electromagnetic fields around cables, about the cumulative impact of the wind farms on wave patterns and sea currents and on the physiology of the food web as a whole.

On the other hand, to some extent wind farms offer a refuge where certain forms of underwater nature can recover and develop. On the hard substrate of the foundations and on the now undisturbed seabed, species and populations can develop between the turbines.

A completely different issue is the constant development of new contaminants which ultimately end up in the (sea) water. Pharmaceutical residues, including hormones, as well as the increased use of copper-based paint on ships, require constant attention.

¹¹ Government Gazette, 2015, 36471.

¹² Parliamentary document 26 407, no. 131

3.2 Vision, ambition and tasks

The desired future perspective for the North Sea shows a sea that may be intensively used but in which nature is restored and over which there is an unobstructed view from the coast. This picture is a result of the ambitions which have been recorded for the sustainable development of the Netherlands in the National Strategy on Spatial Planning and the Environment (NOVI). These are in line with the global Strategic Sustainability Goals (SDGs) and the European *Green Deal* (See also chapter 2). The NOVI mentions achieving a good quality living environment in the Netherlands and - more specifically - safeguarding good water quality and improving and protecting nature and biodiversity as an issue of national importance.

It is the ambition of the North Sea Programme in the planning period 2022-2027 to vigorously work towards achieving the good water quality and restored nature in the North Sea described in the NOVI. The physical pressure and pollution caused by human use on and around the North Sea must be reduced to a level within the prerequisites of a healthy ecosystem. Reducing these pressure factors creates space for recovery of the ecosystem and development into a resilient system. The principles for policy to achieve these goals are: taking the ecosystem approach and applying the precautionary principle, with – as required by the MSFD – international collaboration.

The North Sea Agreement calls this task the nature transition. In this transition, the increase in the extent and intensity of the use is only responsible if that use is more sustainable and if the restoration and maintenance of the North Sea ecosystem is safeguarded. To make and keep the North Sea healthy, extra effort is essential. The use of policy and management to deliver this effort are complicated by a structural lack of knowledge. It is therefore a key task to continuously acquire knowledge, monitor trends and developments, supervise and where necessary take enforcement action.

The North Sea Agreement emphasises that the *nature transition* also requires a transition in our ideas about marine ecosystems. The North Sea ecosystem is strongly dynamic and therefore not a static entity. This is at odds with the static definition of 'good environmental status' used by the MSFD. The Netherlands will continue to draw attention in Brussels to the role of static goals in dynamic, natural systems.

Where nature restoration cannot be achieved by itself, active protection and nature enhancement is required. In view of the current status of the North Sea ecosystem, future developments in the use of the North Sea will necessitate this enhancement of the North Sea nature. Here it is important to not only consider the pressure factors of the activities, objects and installations but also the potential contributions to nature, including creating new habitats.

3.3 Policy

The Marine Strategy (part 3), or the programme of measures of the Dutch elaboration of the MSFD, gives an overview of the measures that the Dutch government is taking in various policy areas to reduce pollution, restore habitats and species and to enhance nature. This programme of measures has been updated and as appendix 1, is an integral part of the North Sea Programme 2022-2027. This paragraph presents the policy to protect and enhance the marine environment along five tracks:

- reduce pollution and disturbance (3.3.1)
- protected areas and habitat types (3.3.2)
- protected species (3.3.3)
- integral nature enhancement (3.3.4)
- sustainability use (chapters 4, 5, 6, 7, 8 and 9)

The sectoral chapters 4 through 9 more specifically address parts of policy and management to make use more sustainable and bring it within the prerequisites of the ecosystem. That also implies attention for the new spatial policy, that seeks the balance between use and ecosystem, and for updating the assessment frameworks for licensing. This policy contributes to SDG 14: 'Conserve and sustainably use the oceans, seas and marine resources'.

The North Sea Agreement indicates that structural lack of knowledge complicates the establishment of policy for protection, restoration and sustainable use. This particularly applies to the species that are most sensitive to major transitions on the North Sea. These species are thus indicators for the impact of major changes which will take place in and on the North Sea. There is a need for an integral and systematic research and monitoring programme. In the framework of the North Sea Agreement, initiatives have been taken to set up a Monitoring, Research, Nature Enhancement and Species Protection programme (MONS). This will need to form a basis for knowledge about the functioning of the North Sea, more specifically: to obtain insight into the ecological carrying power for current and sustainable future ecosystem services and for measuring the health and development of marine and coastal bird populations, migratory birds, bats, fish (including sharks and rays), seabed animals, marine mammals and benthic and pelagic habitat types.

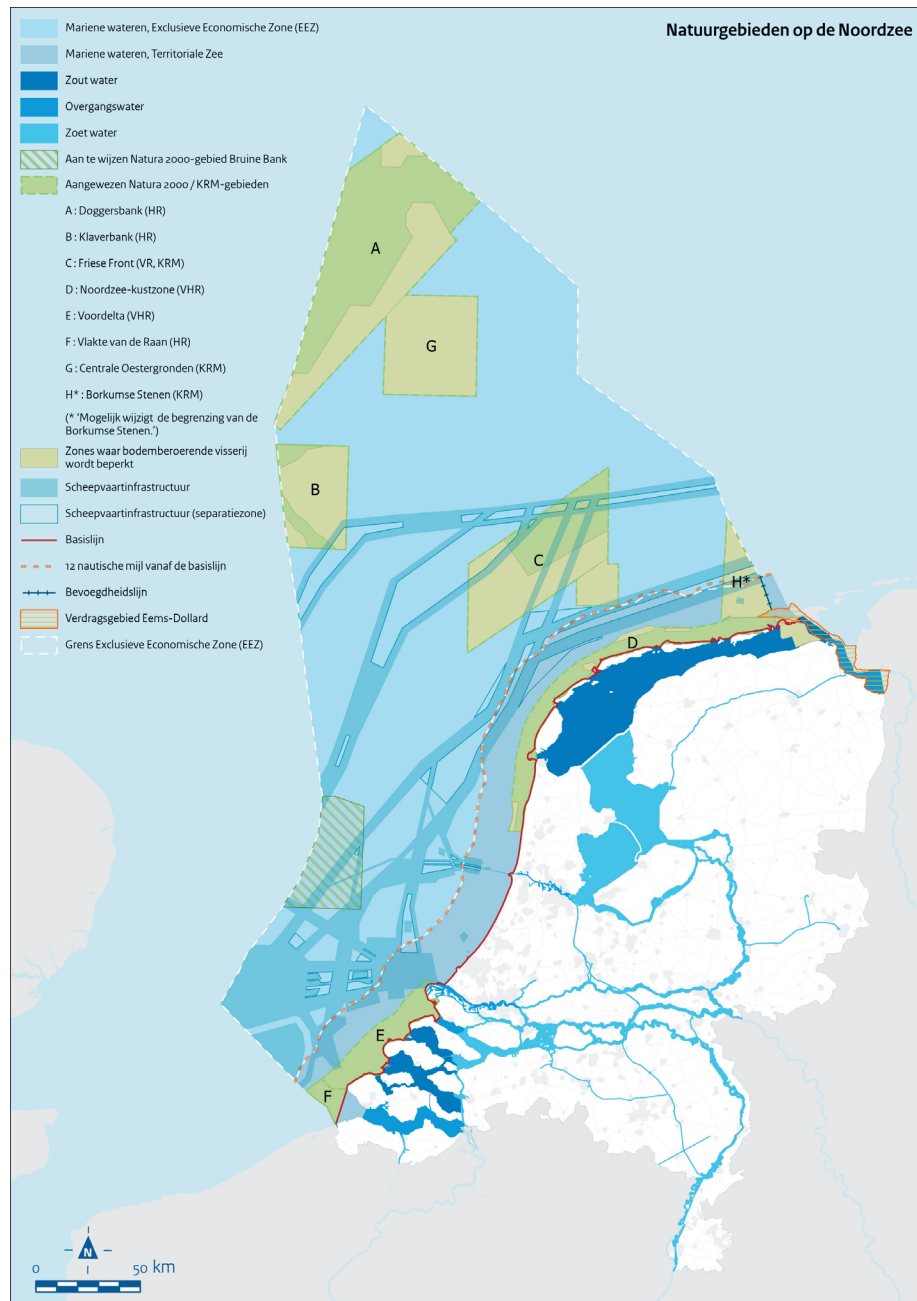
Better insight is also required into the (cumulative) impact of all human activities on these species and on the ecosystem, including physical, chemical and biological factors which also determine the functioning of the system (impact monitoring).

The importance of knowledge and insight certainly also apply to new or changing use, such as marine energy extraction, aquaculture and fishing without trawl nets for fish, shellfish and crustaceans. These types of use must fit in the ecological carrying capacity of the North Sea, for example in relation to the nutrients present, as well as for other factors like safeguarding safety.

The basis for this integral and systematic monitoring programme is the MSFD Monitoring Programme (Marine Strategy part 2), which was updated in 2020. The ambition is to complete this integration with the next update of the MSFD Monitoring Programme in 2026.

It was also agreed in the North Sea Agreement that a 'Status of the North Sea' which reports the impact and results of monitoring will be published every two years.

In OSPAR context, the Netherlands is working with the other North Sea countries on developing indicators and the assessment of the ecosystem. In 2024, pursuant to the requirement of the MSFD, an updated integrated assessment of the environmental status of the North Sea ecosystem will be published (updated Marine Strategy part 1). This assessment will be embedded in the large-scale International *Quality Status Report* of OSPAR in 2023. This assessment will be used in the updating of Marine Strategy part 1 in 2024 in the review of the descriptions of the good environmental status and the related objectives. This will fulfil the principle of adaptive planning.



Map 2: nature conservation areas in the North Sea

The following paragraphs indicate for the first four policy tracks what development of knowledge and monitoring is proposed in the planning period 2022-2027. This involves coordination and strengthening of national and international research programming and initiating new additional research and monitoring. Examples are the national, long-term, mission-riven innovation programme Sustainable North Sea, the research in the framework of the European Maritime and Fisheries Fund (EMFF) and the Blue Route from the National Science Agenda.

3.3.1 Reduce pollution and disturbance

To minimise eutrophication, the policy in the previous planning period aimed to reduce emissions through urban wastewater as well as from shipping and agriculture. The implementation of the Water Framework Directive also contributes to proportional reduction of the nutrient discharge via the rivers to the sea. Continuing this policy gives the maximum effort which is possible, working with other countries, to achieve the good environmental status.

The policy to restrict or end the environmental impact by contaminants focuses on industrial emissions, plant protection products, discharges by inland shipping, oil and gas production and shipping (MARPOL) and discharges following incidents or disasters. The use of tributyltin (TBT) is banned.

This policy has resulted in a considerable reduction in the concentrations of contaminants. What remains are usually persistent, bioaccumulating toxic substances. Because these substances are persistent and pervasive, they will be found in the marine environment for a long time to come. Additional policy is not proposed in the coming planning period.

To reduce the amount of litter in the North Sea and the Dutch rivers, in the previous planning period policy focused on prevention by means of an integral source approach, awareness and closing product chains. Measures are focused on education and awareness, cleaning beaches, the coordinated approach to litter in river basins, discharges from shipping and the fishing industry and on the manufacture-use chain of plastic products. This policy and the resulting measures will be continued in the coming years (in adapted form) and supplemented with an extra focus on the area of clean beaches, litter waste problems for area and water managers along rivers, lint, fish lead and plastic pellets.

The principle for policy and measures to tackle disturbance by underwater noise is reduction at the source. Licensing for wind farms has been adapted accordingly. The use of active sonar is regulated. Disturbance by impulsive noise has been reduced via the Code of Conduct for Explosives Disposal and via adaptation of the regulations for seismic survey. In addition, in the

planning period 2022-2027 the ministry of IenW, in line with the North Sea Agreement, will work with industry to draw up an assessment framework for seismic survey. This is part of stimulating industry to reduce impulsive noise.

The IMO has adopted guidelines to reduce underwater noise caused by commercial shipping.

Of a different order is the influence of night-time darkness by light sources on offshore platforms. This has a disruptive effect on migratory birds and bats. To reduce this effect, *guidelines* have been drawn up which can be followed on a voluntary basis.

The impact of new large-scale hydrographic interventions must be studied in the environmental impact assessments, as prescribed at European level. This EU policy to prevent changes in hydrographic conditions having permanent negative effects on the ecosystem is included in the Environmental Management Act.

Actions

In the MSFD programme of measures, the Ministry of IenW agreed to achieve the following in 2022-2027:

- Implement Clean Beaches programme. The Clean Beaches programme focuses on knowledge exchange, support for collaboration, monitoring and advice for beach municipalities.
- Put the litter problem on the agenda for site and water managers along rivers and safeguard a wide and river basin-oriented approach to litter, aimed at creating more (administrative) support for taking structural measures. The approach and prevention of litter will become part of the regular management.
- Implementation of the duty to deliver persistent floating cargo residue from 2021.
- Efforts by the Ministry of IenW to obtain approval by the Marine Environment Protection Committee (IMO) for the adapted prewash procedure for ballast water and make this improved procedure applicable for all IMO countries.
- Phasing out of lint, by introducing incentive measures.
- Reduce the use of lead in recreational fishing at sea by presenting and communicating alternatives.
- Implementing the OSPAR recommendations to tackle pollution of the environment with plastic pellets.
- Perform the following explorations relating to litter.
 - Plastic soup theme in waste programmes. An exploration of the possibilities of including plastic soup in the education programmes and thus increase awareness of the plastic problem.
 - Additional measures to tackle litter in inland shipping

- Explore possible next steps in the microplastic policy programme.
- Explore possibilities to implement standard circular processes in the chain of design, production and use of fishing gear.
- In partnership with industry, draw up an assessment framework for seismic survey in analogy with the FAECE.
- Support for the Canadian proposal to more actively follow the IMO guidelines for the reduction of underwater noise of commercial shipping.
- Amend the Collaborative Agreement to tackle Coastal Pollution RWS services (SBK) in consultation with municipalities. This is done, as a result of the disaster with the MSC Zoe, to ensure that environmental damage is minimised in the event of a future disaster involving plastics at sea. The exact change of the scope will be carefully elaborated later, in view of the shift in responsibilities that this involves.

Knowledge agenda

The following overview contains the main knowledge questions relating to pollution and disturbance. Prioritisation and programming will take place in 2021-2022.

- The possibility to further reduce the presence of eutrophicating substances in the Dutch part of the North Sea with (additional) technical measures. At European level, model studies are being performed which, based on the effectiveness of measures and possible additional measures, could be guiding.
- The effects of new phosphate-nitrogen ratios.
- The influence of the primary production capacity of the North Sea ecosystem due to the declining eutrophication.
- Contribution of climate change to eutrophication.
- The development of a method to determine the physical damage to the benthos at local level and in cumulation with effects of other activities.
- The consequences for the hydromorphological system of the North Sea in the event of the large-scale rollout of offshore wind energy. Will the ecological and physical processes crucial to the system be sufficiently measured in the monitoring programme?
- The consequences of the increased use of copper as a substitute for TBT for the marine environment.
- Litter: source identification, distribution routes and effects of litter.
 - Explore standardised method for source classification of waste sources of beach and river waste for a more targeted source approach.
- Measures: study into the effectiveness and impact of measures in the context of the EU threshold value for beach waste (number items/per 100 metres beach).
- Microplastics: the extent of the microplastics problem.

- Nanoplastics: effects of nanoplastics on safety of food from the sea.
- Monitoring:
 - The volume and trends of litter (including microplastics) that flows to the sea via rivers.
 - Develop and apply indicators within OSPAR, including alternative indicators for monitoring seabed waste and floating waste.
 - River waste monitoring: develop a standardised monitoring system for litter/macropastics in rivers (banks and water column).
- The physical aspects of underwater noise are largely understood, but there is a lack of knowledge relating to the effects of underwater noise on marine species and how these impact on the population and the ecosystem. Ecological models for this are being developed, but validation is a challenge. There has been a lot of attention for marine mammals and particularly for porpoises. In the coming years, the focus will mainly be on fish species and other types of animals.
- Combined effects of several activities (cumulation). The effects of cumulation of the same type of source for example, several wind farms, the cumulation of various source types (pile-driving, seismic survey), and finally the cumulation of different pressure factors (sound, by-catch, chemical pollution).
- With respect to the underwater noise of seismic surveys, several parameters are still unknown. These are related to the other source configuration than for pile-driving noise and parameters related to moving sources.
- Insight into continuous underwater noise of recreational shipping.
- Electromagnetic fields transport energy to the water system. Due to the construction of offshore wind farms and the associated power cables to the mainland, this form of energy will increase. The effect this will have on some fish species, such as sharks and rays, is unknown.

3.3.2 Protected areas and habitat types

Based on the Birds Directive (BD) and Habitats Directive (HD), in the previous planning periods the initiative was taken to designate special protection zones (Natura 2000 areas: BD and/or HD areas). These zones aim to safeguard a favourable conservation status for certain species of birds, marine mammals and habitat types (see also 3.3.3). This concerns the Dogger Bank (HD), Cleaver Bank (HD), Frisian Front (BD), North Sea Coastal Zone (BD and HD), Voordelta (BD and HD) and Vlakte van de Raan (HD). For the protected species and habitat types there are specific conservation objectives. The measures to regulate activities in the Natura 2000 areas will be included in a

management plan. In general, the measures involve banning certain activities in the areas, or only allowing them under certain conditions. The character of the nature values to be protected in an area provides the basis for formulating what is considered acceptable use, also taking the precautionary principle into account. Forms of multiple use, including certain forms of fishing, which do not have a significant impact on defined nature values, are permitted. Based on the MSFD, it has been decided to protect parts of the seabed ecosystem in the Frisian Front and Central Oyster Grounds. This measure was recorded in previous programme of measures (Marine Strategy part 3).

The measures to regulate fishing in the Natura 2000 and MSFD areas will be described in the management plan. The European Commission adopts them based on a proposal from the member states via a so-called article 11 procedure from the Common Fisheries Policy (CFP). In the context of the VIBEG II agreement (North Sea Coastal Fisheries Agreement) signed in 2017, representatives from the Dutch fishing industry, nature organisations and the Ministry of Agriculture, Nature and Food Quality made agreements about the protection of the North Sea Coastal Zone and Vlakte van de Raan.

Agreements about additional measures for area protection have been made in the North Sea Agreement. Pursuant to the agreement, the Dutch government established the policy goal for 2023 to exempt 13.7 percent of the area of the North Sea from seabed-disturbing fishing and to increase this to 15 percent in 2030. This goal will be achieved with limiting measures for seabed-disturbing fishing in all designated and to be designated Natura 2000 and MSFD areas.

In the framework of the biodiversity strategy, part of the European *Green Deal*, the member states are engaged in a dialogue on this planning period about an additional task for the protection and ecological robustness of the transnational network of marine protected areas. The conclusions of 23 October 2020 of the European Council of environmental ministers form the framework for elaborating these ambitions. It was agreed that in 2030, in total 30 percent of European seas will be ecologically protected, of which 10 percent are strictly protected. Between 2021 and 2023, the European Commission and the member states will elaborate legally binding nature restoration goals. The previously mentioned agreements in the North Sea Agreement form the starting point for the Dutch contribution to this elaboration.

Actions

The agreements in the North Sea Agreement produce the following actions which will be implemented:

- *Brown Ridge* (Natura 2000):
 - in 2021, designate the Brown Ridge as Birds Directive area¹³
 - draw up a Natura 2000 management plan within three years of designation.
 - possible (fishing) measures as a result of the further impact analysis.
- *Frisian Front* (Natura 2000 and MSFD) for 2023:
 - the closed area for seabed-disturbing fishing will be expanded by 1014 km².
 - of that area, part will become a 'no fishing zone' 1649 km².
 - a sub area of 100 km² will be allocated for oyster recovery.
 - on the edge, another sub area of 100 km² will be allocated for research into the long-term impact of beam trawling and pulse trawling. here, seabed-disturbing fishing is allowed under conditions.
- *Dogger Bank* (Natura 2000):
 - for 2023, expansion of the Natura 2000 area aimed at increasing the closed area for seabed-disturbing fishing by 557 km²
 - for 2023, ban on *Scottish and Danish seining* in the 1326 km² management zones
 - adaptation of the management plan.
- *Cleaver Bank* (Natura 2000):
 - for 2023, expansion of the area closed for seabed-disturbing fishing (excluding Botney Cut) by 552 km².
 - possible adaptation of the management plan.
- *Central Oyster Grounds* (MSFD) for 2023:
 - expansion of the area closed for seabed-disturbing fishing by 1062 km².
- *Borkum Reef Grounds* (MSFD) for 2023:
 - expansion of the area closed for seabed-disturbing fishing by 558 km².
- In Natura 2000 and MSFD areas, no new gillnetting fishing is allowed. This means that no more licences can be issued, and no more space exists in existing licences.

In the VIBEG agreement, it has been agreed that the areas in the North Sea Coastal Zone will be protected via the article 11 procedure, so that the protection of these national areas also applies internationally.

¹³ For the site boundaries, the site decision for the wind energy area IJmuiden Ver considers the designation as Birds Directive area.

The implementation of the North Sea Agreement contributes to (the development of) the (ecological) network of natural areas, partly with a view to the contribution of the Netherlands to the EU ambitions for biodiversity in 2030 as part of the European *Green Deal*.

Knowledge agenda

To support the additional area-protecting measures, additional research will be necessary. This also supports the preparation of the international consultation and support of measures to limit fishing. The research questions are (partially) asked in the MONS programme which is currently being developed.

Besides the concrete area-based measures mentioned, additional measures for area-based protection result from research about which agreements have been made in the North Sea Agreement:

- Before 2025, an independent scientific investigation will be started to establish whether the Hollandse Kust, Vlake van de Raan, Borkum Reef Grounds, Cleaver Bank, Dogger Bank and Central Oyster Grounds fulfil the selection criteria for designation as Birds Directive area. If this is the case, these areas will be designated Birds Directive area by 2025 at the latest.
- From 2020, independent research must show whether the presence and distribution of honeycomb worm reefs are a reason to protect relevant locations by spatial measures under the HD or MSFD.

3.3.3 Protected species

Based on the BD and the HD respectively, species of birds, marine mammals and bats found around the North Sea are protected by the Nature Management Act. The Act stipulates that these animals may not be intentionally killed or disturbed. For birds, the disturbance ban only applies if this has a significant impact on the conservation status of a species of bird. To assess this, the ecosystem approach and the application of the precautionary principle are the starting point. Chapter 10 describes how these principles are applied in the assessment framework for offshore activities requiring licensing.

The large-scale rollout of offshore wind farms requires specific attention. The diverse, possibly cumulative effects of the construction and operation of wind farms are translated into estimates of population reductions in the Framework for the Assessment of Ecological and Cumulative Effects (FAECE). Assessment of the effects on the biogeographical populations, both individual and in cumulation, gives an indication of the ecological scope for offshore wind energy (see chapter 5). This knowledge is applied in the Road Map offshore wind energy at sea 2030 and in

designating additional wind energy areas in this North Sea Programme (see chapter 9). In the period 2022-2027, these aspects will continue to require a lot of attention when taking site decisions, formulating formal requirements for the design and operation of wind farms and integrating multiple use of offshore wind farms.

Based on the Offshore Wind Energy Act, the competent authority may also grant exemptions for the construction and operation of wind farms from the ban on disturbing or killing birds, marine mammals and/or bats. Such an exemption is only granted if various specific conditions are met, described in the Nature Management Act. For birds, activities for which an exemption is granted may not result in a deterioration of the conservation status of a species of bird. For marine mammals, the criterion is that there must be no compromise on the aim to enable the population of the relevant species to continue its favourable conservation status in its natural distribution area. Further rules or limitations may be bound to the exemption in a site decision. See further in chapter 5 how the energy transition is kept in balance with other users and with the North Sea ecosystem.

The GVB and Fisheries Act arrange the operation and where necessary the protection of populations of (specific) species of fish. See chapter 4.

Species protection plans

In the North Sea Agreement, it has been agreed that for species for which there is no species protection plan, such plans will be developed based on EU directives (BD, HD and MSFD), international agreements (OSPAR, ASCOBANS, CMS, MoU Sharks), and the Framework for the Assessment of Ecological and Cumulative Effects for the rollout of offshore wind farms (FAECE, see chapter 5).

Protection plans for species which have already been identified in the FAECE as vulnerable for effects of offshore wind farms will be given priority. This applies particularly to seabird species which are not doing well, sharks and rays, marine mammals and seabed animals. Protection plans for these species must be developed by 2023 and have an implementation term through 2030. Furthermore, it has been agreed in the North Sea Agreement that action and species protection plans will be evaluated every two years. On that occasion, adjustments can be made if necessary to achieve the goals.

Acties

- *MSFD shark action plan.* The MSFD shark action plan 2015-2021 will be evaluated in 2021 and can then be continued for a new six-year period.

- *Porpoise protection plan.* The Porpoise protection plan was revised and tightened in 2020. It now also focuses on intensification of international collaboration, on strandings of porpoises and on pressure factors like by-catch and underwater noise caused by pile-driving work and seismic survey.
- *Other species protection plans.* Particularly for vulnerable species, such as sea-going breeding birds. The plans will focus on strengthening populations.
- *Biogenic reefs and flat oysters.* Marine Strategy (part 1; 2018) states as environmental goal 'return and recovery of biogenic reefs, including flat oyster beds' (D6T5). Various actions aim to relieve biogenic reefs or increase the opportunities for recovery. Box 3.1 presents the policy goals for return and recovery of flat oysters.

Knowledge agenda

In the framework of the elaboration of the MONS Programme, at the beginning of 2021, a knowledge agenda with associated programming will be adopted in the North Sea Consultation.

3.3.4 Integral nature enhancement ('nature-inclusive construction')

Due to many already existing and planned activities (including those linked with the energy transition) and climate change, the quality and the management of the North Sea is under pressure. When developing these socially desired activities - supplementary to the statutory mitigation measures - instructions, measures and actions can be taken as early as possible in the design phase which contribute to the strengthening and restoration of the ecosystem.

Due to the use of rock armour during the rollout of offshore wind farms and the fact that the farms are closed to seabed-disturbing activities, a growing undisturbed area emerges with distributed spots of hard substrate. Wind farms thus have the potential to contribute to integrated nature enhancement.

Since 2015, the policy has focused on nature-inclusive designs and building new wind farms. That offers opportunities to strengthen species populations and habitats which naturally occur in the North Sea. That also applies to implementing nature restoration projects in wind farms. This policy focuses on species and habitats from the EU Habitats Directive whose conservation status is not favourable, species on national Red Lists and species or habitats on the OSPAR List

Box 3.1: Policy objectives return and recovery of flat oyster beds:

- Cooperation with social initiatives aimed at recovery of biogenic reefs, including flat oyster beds.
- Protection of a wild bank of flat oysters in the Natura 2000 area Voordelta for a long-term study into the status and development of the bank. This is aimed at excluding disturbance of the seabed or substrate and harvest of flat oysters.
- Adaptation of Natura 2000 profiles and management plans for biogenic reefs, including flat oyster banks. To be achieved by 2022 at the latest.
- Adaptation of aquaculture legislation from 2021 to ensure that flat oysters are only bred in the North Sea that are free of the *Bonamia* parasite.
- Facilitate research such as in the mission-driven research programme and the EMFF, among others to obtain stock material for reintroductions that is free of *Bonamia*.

of *Threatened and/or Declining Species* and Habitats for which recommendations have been adopted. Nature-inclusive building is still in a development phase. Based on several studies, ecologically favourable options have been charted. These are being or will be elaborated in site decision requirements. However, it should be noted that it is not yet sufficiently clear whether and how nature-inclusive building can actually contribute to enhancing species and habitats. It is therefore necessary to further operationalise the concept and generate knowledge from acquired experiences and above all monitoring. Potential knowledge is also available among licence holders of wind farms. It is therefore important to explore whether there are possibilities can be incorporated in the tender phase to access this knowledge. That also contributes to the further fulfilling of an agreement from the North Sea Agreement to study which tender instruments might be used to achieve the desired integrated development of wind farms. In the allocation method, the proposed Amendment to the Offshore Wind Energy Act applies a comparative test (with or without financial component), making it possible in a ministerial regulation to elaborate and add ranking criteria which play a one-off role at that moment due to extra social considerations relating to innovation, for example. The ranking criteria to be added

might also be criteria in the field of nature, aquaculture, fisheries, safety or shipping. The possibilities to stimulate the desired social developments with such added ranking criteria will be further explored and elaborated.

The knowledge about the impact of (large-scale) multiple use in wind farms on the natural functioning of the North Sea is now being developed. However, there are many gaps in the knowledge, mainly about the effects of upscaling one or more forms of multiple use. Upscaling can have an impact on the North Sea system and on the carrying capacity of the relevant area, but also on the uses themselves and the relationship between several forms of use. This all requires further research in the coming period. Better carrying capacity studies offer more solid tools for the area passport Guide and for the Assessment framework multiple use of offshore wind farms.

The (preferred) choice of the forms of nature-inclusive construction or nature enhancement projects in a wind energy area or wind farm site will also be recorded in the area passport (see chapter 10). In wind farms which are located relatively far from the coast, the focus will more emphatically lie on nature development. Promoting the development of honeycomb worm reefs (*Sabellaria*) in the southern part of the future wind farm in the still to be licensed southern part of the wind energy area IJmuiden could be a model for this. In wind farms nearer the coast, the focus will more on multiple use.

Acties

- Development of a framework for nature-inclusive construction, including the further concretisation of relevant nature goals and the effects to be achieved (2021).
- By means of site decision requirements, stimulate a nature-inclusive approach to the construction of new wind farms.
- Explore and elaborate possibilities to stimulate more nature-inclusive construction via the procedure of the 'comparative test' under the amended Offshore Wind Energy Act (2021).
- Safeguard overarching or supplementary monitoring of effects emerging from site decision requirements for nature-inclusive construction.
- Stimulating introductions of flat oysters via nature-inclusive construction of offshore wind farms.
- Explore synergy possibilities such as introduction of flat oysters on the seabed (nature enhancement) and cultivation of flat oysters in the water column (aquaculture) in wind farms.

Knowledge agenda

- In the framework of the elaboration of the MONS Programme, at the beginning of 2021, a knowledge agenda with associated programming will be adopted in the North Sea Consultation.

3.4 Management

The management plans described per area what species and types of habitat are protected, what measures have been taken and under what conditions which activities are possible. The following steps are taken when drawing up the management plans. area description, goal elaboration and further impact analysis (NEA). The NEA describes activities with a possible impact on the nature values in the area which must be preserved or restored. Activities whereby significant effects cannot be excluded must first be investigated. The area description, goal elaboration and NEA constitute the substantive basis for a management plan.

For the North Sea Coastal Zone (BD and HD), Voordelta (BD and HD) and Vlake van de Raan (HD), the management proposals came into force in 2016. The three Natura 2000 areas in the EEZ: Dogger Bank (HD), Cleaver Bank (HR), and Frisian Front (BD) were designated in 2016. The management proposals for these areas are being developed and will come into force in 2022. Agreements about monitoring, supervision and enforcement and communication during the actual management disturbed were recorded in implementation plans.

Enforcement with respect to the marine ecosystem and fishing will be performed by the Dutch Food and Consumer Product Safety Authority. For the monitoring and control of fishing activities in N2000 and MSFD areas, an increased frequency of satellite data (VMS signal) is used. In an area with limited access for fishing boats, the frequency is raised to at least once in 30 minutes, in compliance with the Control regulation (Regulation (EC) No. 1224/2009).

Due to increasing use of the North Sea, the marine ecosystem is under pressure. This could endanger the safe survival of a healthy fish stock and thus the fishing industry. If that becomes reality, the Ministry of LNV may request the Dutch Food and Consumer Product Safety Authority to (temporarily) strengthen offshore enforcement activities. The Ministry can provide additional resources for that purpose.



4 Transition to sustainable food supply

The transition to sustainable food supply has a special place alongside the other transitions that are taking place in the North Sea, if only because of the complete dependence on the ecosystem. Another crucial factor is the strong interdependence with social and cultural factors on the land. The fishing industry has a long tradition and is deeply rooted in Dutch identity and culture. The development of new marine food products may in theory be promising, but their large-scale production is highly dependent on social acceptance and demand. In addition, every possible development direction for sustainable marine food production must deal with the opportunities and preconditions surrounding the energy transition and the ecosystem transition. The policy objective of balancing the three transitions is therefore a major task. This section describes this policy tasking from the perspective of the fisheries. In many respects, this shows how much the policy aimed at a sustainable food supply is linked to developments at an international, and especially European, level.

4.1 Current use and developments

4.1.1 Definition of the food supply from the North Sea

Fishing is a vital sector on which the fishing communities in the Netherlands are completely dependent. The Dutch fishing fleet can be roughly divided into four categories. Major sea fisheries focus on pelagic target species such as herring and mackerel that are mainly caught outside our part of the North Sea and in other parts of the world. Cutter fisheries mainly fish for demersal target species such as sole, plaice, mullet, Norwegian lobster (langoustine) and shrimps. The various other types of fisheries fall into the category of small sea fisheries. This includes static net and shellfish fisheries, with target species such as sea bass and Ensis spp. Other shellfish such as mussels and oysters are part of the mussel and oyster culture. The economic developments within these categories can be found at agrimatie.nl/visserij or visserijincijfers.nl.

4.1.2 Making fisheries more sustainable

The European Common Fisheries Policy (CFP) aims to conserve marine biological resources and manage the fisheries for those resources. The activities must contribute to a long-term ecological, economic and social balance. An ecosystem-oriented approach is the basis for sustainable fishing. The CFP contributes to achieving good environmental and conservation status according to the MSFD, BD (Birds Directive) and HD (Habitats Directive). International cooperation and coordination are essential in this respect. Fisheries policy is an exclusive competence of the EU. A financial aspect of the CFP is the European Maritime and Fisheries Fund (EMFF), in which the Netherlands participates. The fund was set up to provide financial support to Member States in, among other things, making the fishing sector more sustainable. It is available for the 2021-2027 period.

Partly from the EMFF budget, the government is making innovation subsidies available to stimulate the sustainability of the fishing industry. Specific and priority goals include, for example, the development of new and more selective gear for sole fishing, and the adaptation of the fleet with ships that are more sustainable and flexible in all respects. Work has already been done within the framework of this policy in recent years.

Sustainable fish stock management

A number of principles that are laid down in the CFP are guiding for the management of commercial fish stocks: drawing up multi-annual management plans such as the multi-annual North Sea plan, fishing geared to Maximum Sustainable Yield (MSY), and applying the precautionary approach for what is not covered by the two preceding principles.

Fishing gear

The beam trawl with tickler chains, a fishing gear traditionally used in flatfish trawl fisheries, causes seabed disturbance and damage to seabed habitats and species living there (see also Section 3). The effect of this bottom disturbance differs per species or per habitat. Pulse fishing is an alternative to beam trawl fishing. Research by the International Council for the Exploration of the Sea (ICES) has shown that the effects of pulse fishing on the ecosystem are significantly less than those of beam trawl with tickler chains¹⁴. This innovative fishing gear also encounters much less drag on the bottom, resulting in significant fuel savings and lower CO₂ emissions. However, with the adoption of the Technical Measures Regulation (Regulation (EU) 2019/1241), the Fisheries Council and the European Parliament (EP) have decided on a pulse ban without exceptions. Due to the ban on this technique, the sector has had to revert to the traditional beam trawl technique and is therefore back to square one with regard to the direct negative effects on the quality of the seabed and the vulnerable species that live there, on air quality, and last but not least, on the turnover of fishing companies.

Landing obligation

The landing obligation means that all catches of quota species must be landed, unless an exception applies. The landing obligation is intended to stimulate the fishing industry to develop techniques that promote selectivity in fisheries and combat food waste. The landing obligation was introduced in phases from 2015 and has been fully implemented since 2019. The landing obligation is problematic for Dutch flatfish cutter fisheries. This is because the trawl fishery for flatfish is mainly mixed fisheries, with several species entering the nets during fishing. This can lead to what is referred to as choke species, whereby the quota of fish species A, including all bycatch of under-

sized fish that must also be landed, blocks the utilisation of the quota of fish species B.

An exception to the landing obligation applies for example to rays, of which a number of species are extremely rare; these fish may be returned to the sea. Research into more selective techniques for flatfish fishing has so far yielded only very limited results.

Preventing pollution

With the support of the Ministry of Agriculture, Nature Management and Fisheries, the fishing industry is working on an alternative to the propulsion of ships, such as hybrid engines, and on the development of a zero-impact cutter. Furthermore, the National government, the fishing industry, fishing ports and nature organisations participate in the Fisheries for a Clean Sea Programme. This collaboration is aimed, among other things, at reducing litter and more recycling of fishing waste. In addition, within the DollyRopeFree project, the government is supporting research into alternatives to plastic dolly rope. To protect fishing nets that drag along the bottom from wear and tear, dolly rope is tied under the nets. This is usually made of synthetic fibres (such as nylon) that do not break down in seawater. However, it does wear out when it slides over the seabed, causing small particles of plastic to end up in the marine environment. Dolly rope is at the top of the top ten of most washed-up items on the beach. The programme of measures of the Marine Strategy Framework Directive includes a measure to stimulate the use of environmentally-friendly alternatives and to strive for a phasing out of conventional dolly rope. Some alternatives are very promising. The Single Use Plastics Directive also stipulates extended producer responsibility (EPR) for plastic fishing gear. Together with the fishing industry and other stakeholders, the National government participates in Fishing for Litter, a project in which fishermen can store on board waste they receive in their nets and deliver it to participating ports free of charge. This leads to more awareness of waste in the sea and also a cleaner seabed. The arrival of the new Directive on port reception facilities means that the project can be further formalised. From an international point of view, Fishing for Litter is also a measure within OSPAR, in which the Netherlands takes on a driving role.

Shellfish policy

The shellfish decree included in the policy decision Shellfish Fishery 2005-2020 'Room for a Salty Harvest'. This decree was updated in 2021. The Shellfish Decree focuses on shellfish fishing in coastal waters (as described in the Fisheries Act), saline inland waters, the Grevelingenmeer lake and Veerse Meer lake. The main objective of this policy decision is to offer prospects for an economically healthy industry with production methods that respect and, where possible, enhance natural values. Robust policy with a future perspective, making the sector more sustainable, simplifying policy and regulations, greater responsibility of the sector and innovation are key elements in this. Important themes are: undisturbed areas in the Wadden Sea and the Voordelta, protection of sea grass and mussel beds, developments in mussel seed fisheries,

¹⁴ https://www.ices.dk/sites/pub/Publication%20Reports/Advice/2020/Special_Requests/nl.2020.03.pdf

optimisation of mussel plots, mussel hanging cultures (MHC), mussel seed capture installations (MSCI), movement of shellfish, cockle farming and harvesting in the Zeeland Delta, manually picking shellfish (for private and commercial use), and finally oyster fisheries and shellfish fisheries in the North Sea.

4.1.3 Future developments

The future of fishing in the North Sea faces major challenges. The ban on pulse fishing and the introduction of the landing obligation have reduced turnover in the cutter sector. New developments in the field of sustainable fishing gear and the zero-impact cutter are still in their infancy. As a result of the protection of nature conservation areas and the large-scale roll-out of wind farms in the North Sea, fishing grounds are being lost. The consequences of Brexit remain an uncertain factor. At the end of 2020, it was agreed that EU fishing vessels will continue to have access to British waters for the next 5.5 years (from 2021). After that, the UK can decide on access for EU fishermen each year, as is the case for other coastal states such as Norway. In addition, it has been agreed to transfer 25 percent of the value of quota currently fished by the EU in British waters to the UK in phases over the next five years.

The consequences of rapid climate change paint a two-fold picture. Target species among the commercial fish species migrate to the north or to deeper parts of the North Sea. Various target species are therefore migrating out of current fishing areas. At the same time, (new) species are entering the Dutch North Sea from the Channel. Some of these species are unquoted and may be of commercial interest. These species can potentially be caught using methods that cause less bottom disturbance than current fisheries in the southern North Sea.

Wind farms offer space and opportunities for the development of mariculture and aquaculture (see Section 7). This creates opportunities for the cultivation of seaweed and shellfish such as mussels and flat oysters, as well as for the non-bottom-disturbing catch of fish, certain species of crabs, lobsters and squid¹⁵. There is a great deal of public interest in this multiple use, although earning models have not yet been developed for all pilots and ideas. Various pilots were in preparation at the end of 2020. At the Princess Amalia Wind Farm, experiments are being conducted with the ecological, economic and technical feasibility of fishing with pots for crabs and lobsters. A pilot for shellfish farming is being developed in the Voordelta. Experiments with the cultivation of seaweed are underway off the coast of Scheveningen. However, mariculture and aquaculture in wind farms in the North Sea are still in their infancy and the future prospects

for alternative food supplies at sea are still extremely uncertain.

The North Sea is of crucial importance to fishermen and is very closely linked to local fishing communities. In the context of the current situation and the developments that are underway, many family businesses in fishing communities have legitimate concerns as to whether the company still has a future and whether the next generation can still fish. The North Sea Agreement concludes that in the midst of the radical changes surrounding energy transition and nature conservation measures, fishermen want to know where they stand.

¹⁵ Van den Bogaart, et al. 2019; Van den Bogaart, 2020

4.2 Vision, ambition and tasking

The National Strategy on Spatial Planning and the Environment (NOVI) calls the development of sustainable food production and sustainable fishing of national importance. This concerns sustainable fisheries as well as mariculture and aquaculture that are part of sustainable food and agro-production. Protein production from the sea is part of the government's National Protein Strategy. The shift to a society in which less meat from intensive agriculture and more vegetable proteins are consumed may lead to an increase in the demand for fish, crustaceans and shellfish as a source of animal protein and that seaweed is preferred as one of the alternatives to the more environmentally-unfriendly production methods of soybeans and palm oil. By 2020, almost all marine biomass will be supplied in the form of fish. During the 2022-2027 planning period, aquaculture and mariculture will catch up. However, fish are expected to remain the main constituent of the North Sea protein source. Alternative forms of food production from the sea are an alternative to the supply by the cutter fleet to a limited extent only. The Dutch vision and ambitions for a sustainable food supply from the North Sea are in line with the Farm2Fork strategy and the idea of a sustainable blue economy of the European Green Deal.

In its vision for the future of sustainable food from the sea, the national government characterises fisheries as a vital, economically healthy sector that contributes to the supply of sustainable proteins in the Netherlands and beyond our borders. Sustainable fishing means that the impact on fish stocks and habitats and the emissions to the environment remain within the limits of the carrying capacity of the ecosystem. Protecting vulnerable species and habitats is an inherent part of the sustainable fisheries concept. This means that the transition in food production is interwoven with the regime for the protection of the ecosystem, which is part of the nature transition (see Section 3). The energy transition also has a clear impact on the space available for the transitions in food production. The NOVI and the North Sea Agreement formulate the task that the three transitions must be balanced with each other, taking into account the other use. For the fishing industry, this means a shift towards further sustainability and the prevention of waste, while the construction of wind farms and the expansion of protected nature conservation areas cause the available fishing grounds to shrink. A related task is combining wind farms with mariculture and aquaculture. The ambition is to stimulate this type of multiple use within the preconditions of safety for the proper functioning of the wind farm as the first user of the wind energy area. This use must be in balance with the carrying capacity of the ecosystem. Ecosystem degradation due to too much nutrient extraction or pollution due to the addition of too many nutrients or chemicals must be prevented.

The transition to sustainable food production has a profound impact on fishing communities. Tension can also be the result of the given context that less space for fishing is associated with the transitions in the field of nature and energy. In addition to striving for a vital sector, guaranteeing the liveability of the fishing communities is also a task. The Administrative Fisheries Platform (BPV) has offered to play a facilitating and coordinating role in this field. The Ministry of Agriculture, Nature Management and Fisheries, together with the BPV and the sector, will study the possibility and desirability of measures to be taken.

4.2.1 Making fisheries more sustainable

The ambition of a vital, sustainably operating sector with diminishing space requirements requires reorientation and, ultimately, restructuring of the fishing fleet. This is not only an ecological necessity and a (business) economic reality, but also a social demand from the fishing communities.

The national government is faced with the task of continuing to promote innovations in the sector, which will reduce negative effects on the ecosystem, such as bottom disturbance, emissions and waste. The aim is to develop new forms of fishing that are permissible within wind farms and that do not adversely affect the nature objectives of N2000 or MSFD areas. Sustainable fishing also means that the target species' populations have a length and age distribution that is appropriate for a natural population. Also, it is important that the size of the fleet is adapted to the space that is retained for fishing in the North Sea. This is in line with the vision for the future of the Dutch cutter fleet¹⁶, which is related to the agreements on this in the North Sea Agreement. The vision for the future of the Dutch cutter fleet stands for an economically healthy sector that fishes with respect for nature and the environment and is, therefore, also socially recognised. Innovation is an important pillar, for example, the development of a zero-impact cutter to achieve a fishery with less bottom disturbance, less unwanted bycatch, less greenhouse gas emissions and less waste. In the 2022-2027 planning period, work will also be carried out separately along the above lines on a future perspective for shrimp fisheries.

4.2.2 Sustainable marine food production

The ambition for innovations in marine food production, such as within wind farms, is to achieve synergy. Several combinations with added value are possible: seaweed and/or shellfish farming, nature restoration projects, catching fish, crustaceans and squid with fixed fishing gear,

¹⁶ (Appreciation to Ms Burger's advice for sustainable cutter fisheries in the North Sea, 19 June 2020)

and nature development in new wind farms. The introduction of flat oyster beds on the bottom in wind farms and off-bottom flat oyster farming in baskets in the water column could be icons for this approach.

The development of marine food production is under development. The tasks for the 2022-2027 planning period are therefore in the phase of research, pilots and building a business case for upscaling. Sustainability in seaweed or shellfish farming and sustainable catching of fish, crustaceans and squid means that the activities must fit within the limits of the carrying capacity of the natural system. Seaweed is a relative newcomer with great potential in this respect. Use for human consumption is one of the most promising of the various uses for seaweed. At the same time, seaweed cultivation still poses a number of challenges. For example, large-scale seaweed cultivation can extract a relatively large number of nutrients, which may entail limitations for the available cultivation surface and the nature around it. Through sea currents, negative effects can be identified up to the Wadden Sea. We must also make sure that species that do not originate in the Dutch North Sea or that have been improved are cultivated in open water. Unlike species of fish, crustaceans, shellfish and squid, seaweed still has a limited history of proven use for human consumption within the EU. Seaweed cultivation therefore requires extra attention with regard to regulations for food safety. For example, initiators will often first have to demonstrate themselves that the cultivation of a particular seaweed species meets the conditions of those regulations and/or must first arrange for authorisations before seaweed and its products are actually allowed to enter the market.

The mariculture and aquaculture policy is included in the National Strategic Aquaculture Plan (2014)¹⁷. This plan was updated in 2021 with a duration until 2027 and is part of the EMFF's operational programme. The most suitable strategic direction for shellfish and fish farming for the Netherlands consists of the production of exclusive and/or regional products, and the exploitation of high-quality knowledge and products at home and abroad. Exploitation of knowledge for the cultivation of macro algae is of lesser importance, although it is important to stimulate innovations with regard to the commercial cultivation of algae.

Wind farms can be optimally designed to increase the natural values, including the presence of different species of fish and shellfish in their area. The underlying idea is that a wind farm can function as a refugium and generate a spillover effect. Knowledge about such processes is of great importance for strategic decisions about strengthening the North Sea ecosystem and therefore also for the possibilities for fishing. Targeted research makes it easier to map out the aforementioned effects.

¹⁷ National Strategic Aquaculture Plan 2014-2020 (appendix to 32201, no.75)

4.3 Policy

This section discusses the policy tasks for making fishing more sustainable. This policy contributes to SDG 14 conservation and sustainable use of the oceans, seas and maritime resources. Section 8 contains the elaboration of the policy tasks for marine food production in the form of aquaculture and mariculture as described in 4.2.2, in combination with the elaboration of the policy tasks for new forms of sustainable energy in wind farms (see section 5.3.7).

4.3.1 Sustainability of cutter fisheries

In conjunction with the North Sea Agreement, the vision for the future of the Dutch cutter fleet describes how the national government, together with the sector, wants to meet all the tasks for cutter fisheries and how it intends to implement a more selective fishery. The vision for the future of the Dutch cutter fleet serves the national interest and allows the fishing sector to make a transition to further sustainability with a smaller fleet. A sum of 119 million euros has been made available via the North Sea Agreement to help make the transition to a smaller sustainable fleet possible through innovation and remediation during the 2022-2027 planning period. Of this amount, 35 million euros is planned to be sourced from the European Maritime and Fisheries Fund (EMFF). The necessary research and monitoring efforts, including data collection, are financed from EMFF funds, but also partly from national research resources and resources made available for research and monitoring under the North Sea Agreement.

Sustainable stock management

The aim is to make full use of the space that the marine ecosystem offers to fisheries in terms of maximum sustainable harvesting. The determination of fishing opportunities is based on the principles of the CFP and - where applicable - on the regional multi-annual plans.

To keep the landing obligation manageable for the fisherman and to keep cutter fisheries generally profitable, the possibility of exceptions to the landing obligation is important. After all, an exception to the landing obligation for fish A, for example, due to a high chance of survival upon release, creates room for catching fish B. The Fully Documented Fisheries (FDF) pilot project is an important part of the research into the exception to the landing obligation for bycatch of plaice in the sole fishery. The FDF project focuses on developing a system for recording (including by means of cameras) the catch and discards.

Sustainable stock management of commercial fish species also means that the target species' populations have length and age distributions appropriate to a natural population. A result of decades of fishing based on a minimum size measure, for example, has in the case of plaice resulted in young plaice growing less quickly and reaching sexual maturity earlier. This is an advantage because slow growing and early sexually mature plaice has a better chance of progeny. After all, it reaches the minimum size for fishing later. The Ministry of Agriculture, Nature and Food Quality is committed to gaining more knowledge about the length and age distribution of commercial fish stocks. In addition, research must show how much influence the infrastructure around wind farms has on the presence, reproduction and survival success of juvenile fish and on the availability of food for (commercial) fish species. This knowledge will be contributed to the description of the environmental status in the update of the Marine Strategy Part 1 in 2024.

Alternative fishing gear

The government does not support the decision of the EU parliament to ban pulse fishing and is working internationally to revise the pulse decision within five years. The nature and environmental organisations in the North Sea Agreement support the government in this respect. In addition to the pulse gear, the government also supports other innovations such as the water spray, where water jets are used to scare flatfish from the bottom. This technique also makes tickler chains superfluous. Under the leadership of one or more driving forces, the Ministry of Agriculture, Nature and Food Quality wants to develop an agenda with the sector that focuses on the exchange of knowledge and expertise in the field of innovations.

Alternative forms of fishing at wind farms

In collaboration with the education sector, top sectors and the Community of Practice Multi Use North Sea 2030 (CoP) (see also Section 8), national government is stimulating innovations in marine food production. The lessons from the Dutch Wadden Sea region with regard to aquaculture in the form of mussel seed capture installations (MSCI) and mussel hanging cultures (MHC) can form a basis for offshore mussel production in the North Sea. Experiences gained abroad, including in the United Kingdom and Belgium, also contribute to this. Research must show to what extent the traditional sector and/or new entrepreneurs are open to such innovations and how the government can facilitate this. Offshore mussel cultivation may in the longer term contribute to the transition task for the traditional bottom-disturbing mussel seed fishery in the Dutch Wadden Sea. Nearshore farming is the stepping stone to offshore shellfish farming. These concepts are still under development. A first Proof of concept at the Borssele wind farm offers opportunities to test comparable concepts that tie in with experimental space in the estuary of the Haringvliet.

After the decommissioning of Offshore Wind Farm Egmond aan Zee (OWEZ), it will be examined what the options are to make the space available for other functions, such as fishing or aquaculture. At (parts of) the wind farms under Roadmap 2023, fishing with fixed fishing gear is permitted as a form of multiple use. The wind farms under Roadmap 2023 are mainly of interest for the production of food. Locations for multiple use at wind farms for passive fishing and aquaculture, among other things, are included in the Area Passport Guide (see Section 10). For wind farms yet to be tendered, national government is investigating which instrument will enable the desired integrated development (see also Sections 3 and 5). In addition to space, innovation in marine food production also requires unambiguous policy with clear principles for granting permits and choosing a location. This policy is further described in Sections 8 and 10.

4.3.2 Closed areas

The starting point remains that, in principle, fisheries have access everywhere, unless restrictive measures are in force. At the wind farms, these restrictive measures apply to the current forms of trawl fisheries and differ per Natura 2000 or MSFD area for trawl and gill net fisheries. Section 3.3.2 describes the fishing measures in additional protected areas. In line with the various fishing regimes in protected areas, solutions are sought in the form of multi-purpose ships that can apply multiple fishing techniques.

Dutch (sole) fisheries have the highest catch proceeds in the southern North Sea (ICES-4c). To facilitate sustainable fishing for this part of the sector in the longer term, it is important – taking into account the increase in the number of wind farms – to retain sufficient space in this part of the North Sea. This interest is taken into account in the decision-making about the spatial planning of the North Sea: see section 9.1. When fishing is no longer possible due to the closure of areas and an alternative to fishing is lacking, mitigating measures are taken at sector level in the interest of the fishermen. Such a mitigating measure can consist of a financial contribution for, for example, innovation within the sector. When the final North Sea Programme is adopted in March 2022, the scope, distribution and coverage of the (consequential) costs of offshore wind energy will be agreed by the relevant ministries (see Section 12.3).

At a European level, the national government is committed to abolishing the currently applicable restrictive measures in the Dutch part of the plaice box. The nature and environmental organisations in the North Sea Agreement support this commitment.

4.3.3 Shrimp fishing

In collaboration with the shrimp sector and NGOs, the national government is working on a future perspective for the shrimp fisheries. Among other things, attention is paid to international agreements aimed at a level playing field within the protected areas in the coastal zone. In this context, it is also being studied whether a possible reorganisation of the shrimp fisheries in the North Sea can contribute to the ecological reinforcement of the coastal zone. One important aspect in this respect is the possibility to control the number of shrimp fishermen internationally.

In the North Sea Coastal Fisheries Agreement (VIBEG 2), it has been agreed, among other things, that the shrimp sector itself will contribute to compliance in N2000 areas through private monitoring and sanctions. The agreements with the sector regarding private supervision are supplementary and supportive and certainly do not replace public law supervision.

A well-functioning black box system is an important tool to make public and private controls on shrimp fisheries more efficient and effective. An audit carried out by the Dutch food and consumer product safety authority in 2019 showed that the current black box systems are insufficiently reliable, which is why a technical improvement process for the black box started mid-2019. This means that after the improvement process, halfway through 2021, all shrimp fishing vessels will be equipped with a properly functioning black box system, which monitors the location of the fishing activity, the number of fishing hours and the engine power used.

4.3.4 Remediation

Fishermen who are unable or unwilling to take the step towards sustainability are given the opportunity to stop by using a remediation scheme. This frees up space for fishermen who want to continue fishing and become more sustainable without increasing the fishing pressure on the available fishing grounds. The policy also provides for the development of the crew on the ships. The European Commission must give permission for remediation operations because government aid is involved.

4.3.5 Gill net fishing

There are differences of opinion about the sustainability of passive (gill net) fishing, which mainly focus on the bycatch of birds and marine mammals. The government will study various forms of gill net fishing that are and are not appropriate in specific (closed) areas and in relation to protected bird and mammal species. In addition, an international project is being pursued to study the bycatch of marine mammals and other vulnerable animals in the North Sea region.

4.3.6 Preventing pollution

Sustainability also includes the prevention of pollution. In 2019, the European Commission adopted the Single Use Plastics Directive (SUP Directive; Directive (EU) 2019/904), which will be developed in 2020 and 2021. This Directive affects fishing gear that contains plastic. Alternatives are deployed for the use of dolly rope. In addition to the SUP Directive, the Netherlands also has to comply with the Directive on port reception facilities (Directive (EU) 2019/883). The agreements on waste processing and delivery will change as a result. The government's task is to use these directives to reduce fishing-related waste in the North Sea.

Actions

- Together with the sector, the national government is drawing up an innovation agenda with specific goals and deadlines.
- The national government is committed to reviewing the European ban on pulse fishing by 2025 at the latest.
- At a European level, during this planning period, the national government is committed to abolishing the currently applicable restrictive measures in the Dutch part of the plaice box.
- In collaboration with the education sector, top sectors and the Community of Practice Multi Use North Sea 2030 (CoP), national government is stimulating innovations in marine food production during the planning period.
- The national government will set up a restructuring scheme for cutter fisheries by 2022 at the latest; this will be carried out during the 2022-2027 planning period.
- The national government will continue to support activities to reduce litter, such as finding alternatives to dolly rope.

Knowledge agenda

- The national government is commissioning a study into how a more natural length and age distribution can be obtained within the fished populations. The study must be completed in 2023, to update the description of the environmental status of the North Sea in the Marine Strategy Part 1, in 2024.
- The national government is commissioning a study into how much influence the infrastructure around wind farms has on the presence, reproduction and survival success of juvenile fish and on the availability of food for (commercial) fish species. The study (part of MONS) must be completed before 2027.
- In the context of species protection plans (see also Section 3.3.3.), The national government is commissioning a study into which forms of gill net fishing are and are not appropriate in specific (closed) areas and in relation to protected bird and mammal species. The study must be completed before 2027. The government is also committed to an international project to investigate bycatch in the North Sea region.
- The national government is commissioning a study into the effects of the closure of areas on fishing and what side effects there are on the zones around the closed areas, a so-called displacement study as part of the MONS.

4.4 Management

In the Netherlands, the control of fisheries and the enforcement of the regulations is the responsibility of the Dutch Food and Consumer Product Safety Authority (NVWA). The aim is to have all fishing vessels equipped with a black box system that registers fishing location, fishing activity, fishing hours and engine power by 2022. Such a certified black box system is an important tool for making private and public control more efficient and effective through monitoring and for making it easier to detect violations. Attention is also paid to innovative techniques that enable a quality leap in enforcement. In a general sense, compliance with legislation by fishermen themselves remains an important point of attention. The shrimp sector is setting up a private control and enforcement model. This model supports and supplements public control and enforcement. Until 2030, an additional 14 million euros is invested in strengthening the supervision of the North Sea by the Dutch Food and Consumer Product Safety Authority.

Rijkswaterstaat, as the manager of the North Sea, issues permits and supervises compliance with permit regulations. A permit is required for aquaculture and mariculture, where structures are anchored for longer periods. For the benefit of good collaboration between wind farms and fellow users, this North Sea Programme 2022-2027 includes an assessment framework for multiple use in wind farms. See Section 10.2.



5 Transition to sustainable energy

The transition towards a sustainable energy system in the North Sea is one of the cornerstones of the policy aimed at balancing the major tasks referred to in Section 2 - CO₂-free energy supply, food security and the recovery and maintenance of a robust ecosystem. The urgency and transborder nature of these tasks, in particular the sustainability of the production and use of energy, requires collaboration. Chapter 5 describes the policy on how to use the space and resources of the North Sea for energy production in line with national and European CO₂ reduction targets, taking into account targets for nature and food supply. It focuses on the development of a sustainable energy system in the North Sea and elaborates on its main pillars: offshore wind energy, oil and gas extraction, hydrogen, CO₂ storage and innovative technologies such as offshore solar and hydro power.

5.1 Current developments

5.1.1 Definition of energy extraction in the North Sea

In recent decades, several types of energy infrastructure have been built on the Dutch part of the North Sea, varying from oil and gas pipelines to electricity connections from wind farms to shore and between countries.

Currently, there are approximately 150 oil and gas platforms in the Dutch part of the North Sea. However, due to a natural depletion of the existing gas and oil reserves in the subsurface, a considerable part of the oil and gas fields and required infrastructure that are currently in use will reach the end of their economic life cycle in the next 10 to 20 years. The phase-out process of oil and gas extraction in the North Sea has started in recent years and will ultimately lead to the decommissioning and removal of the infrastructure, unless it is eligible for re-use.

With regard to electrical offshore systems, the past decade has seen an integration of the electricity markets and high-voltage grids with those of neighbouring countries. This ensures greater liquidity on the electricity market with stable, more uniform prices and flexibility of the electricity network. This then allows for a larger absorption of fluctuating electricity production from renewable sources (i.e. solar and wind). For this purpose, offshore connections with the high-voltage grids of other countries have also been made using interconnectors. Since 2008 the high-voltage grids of Norway and the Netherlands have been connected via the NorNed cable (700 MW). Since 2011, electricity has been traded to the United Kingdom via the BritNed cable (1000 MW). From 2019 on, the Dutch and Danish high-voltage grids are directly connected via the COBRA cable (700 MW).

Thus far, the systems of oil and gas pipelines and the electricity connections have been separated systems, each of which provides for the transport of different forms of energy (electrons or molecules) towards consumers.

5.1.2 Current policy for making energy more sustainable

In December 2015, the Netherlands was among the 194 countries that signed the Paris Agreement, in which it was agreed to limit global warming compared to the pre-industrial era to well below 2 degrees Celsius and to aim for a maximum warming of 1.5 degrees. Under the Paris Agreement, European countries agreed that by 2030 CO₂ emissions would be reduced by at least 40 percent compared to 1990 emissions, and that the share of renewable energy in the EU must be at least 32 percent. In 2019, the European Union (EU) published the European Green Deal. Under the Green Deal, the Commission aims to raise its EU climate ambition and goals. A first step towards this was taken on 12 December 2019 and the European Council approved increasing the EU greenhouse gas reduction target for 2050 towards climate neutrality. In September 2020, the Commission presented a proposal for the second step: an increase in the EU greenhouse gas reduction target for 2030 to at least 55 percent. This proposal was adopted by the European Council in December 2020 and will be presented to the European Parliament in 2021.

To fulfil its national responsibility to limit the global temperature rise, in the Climate Act in 2019, the Netherlands agreed to reduce the emissions of greenhouse gases in the Netherlands to a level that will be 95 percent lower in 2050 than in 1990. In accordance with the Climate Act, the government has drawn up a Climate Plan that includes the outlines of the policy, including the agreements from the Climate Agreement to reduce greenhouse gas emissions by 2030 to a level that is 49 percent lower than in 1990.

In the course of 2021, it will become clear what the exact consequences are for the task in the Netherlands of increasing the EU's greenhouse gas reduction target for 2030 to at least 55 percent compared to 1990. This will most likely lead to an additional task for offshore wind energy for the period up to and including 2030. Based on what has been determined in the Climate Agreement, the scope of this extra task is expected to be approximately 5 to 9 GW.

To meet the climate objectives, current government policy focuses on an integrated energy system in the North Sea, in which the realisation of additional wind energy and decarbonisation of the current gas system, including the stimulation of CO₂ storage and the production of renewable hydrogen, are key elements.

5.1.3 Future developments

The future development towards a sustainable energy system in the North Sea has been mapped out and scientifically substantiated in the North Sea Energy Outlook¹⁸. This is discussed in more detail below.

¹⁸ Parliamentary document 32183, no. 646

5.2 Tasking and vision

In the coming decades, energy production, energy transport and energy-related activities in the North Sea will change:

- Energy production will increasingly take place from renewable energy sources (mainly electricity from wind energy and possibly at a later stage, also from solar energy and energy from water).
- The started phasing out of oil and gas extraction will continue. The speed of this largely depends on market developments.
- The transport networks for electricity and gases will become more intertwined ('system integration'), in which, for example, electricity is converted into hydrogen. The latter is necessary because our energy demand not only consists of electricity, but also of other forms of energy, such as chemical energy (molecules). And because the conversion of electricity into certain molecules can also ensure flexibility of our energy system, as molecules are easier to store.
- Lastly, CO₂ that is collected at onshore industrial installations will be stored in empty gas fields in the North Sea.

The North Sea Energy Outlook provides a scientifically based overview of the possibilities that the North Sea can offer for a sustainable Dutch energy supply in 2050. The report uses an integrated approach to look at the supply of energy, transport and infrastructure, as well as the demand for energy and CO₂ storage. The starting point for the North Sea Energy Outlook is the forecast for 2030, based on current policy as described in the Climate Agreement. Subsequently, based on scenarios from the Integrated Infrastructure Outlook 2030-2050¹⁹, two extreme final pictures of 2050 were compiled, supplemented with future routes that describe the way between 2030 and 2050. The minimum and maximum required quantities of sustainable energy production in the North Sea are also explored with both final pictures. One final picture shows that the Netherlands is import-dependent, with insufficient energy production of its own to meet demand. In this picture, the Netherlands relies on international energy exchange. The designation of new wind energy areas with sufficient space for 27 GW in the National Water Programme corresponds with this final picture. Together with the approximately 11 GW for 2030 planned in the Offshore Wind Energy Roadmap, this will generate a total of 38 GW of offshore wind energy by 2050. The other picture shows a self-sufficient Netherlands that tries to provide for its own

¹⁹ Climate-neutral energy scenarios 2050: Scenario study for the integrated infrastructure outlook 2030-2050. Berenschot & Kalavasta, 2020.

Technology	Import-dependent	Self-sufficient
Offshore wind energy power (GW)	38	72
Energy yield (TWh)	170	325
Required growth (GW/year) ²⁰	1,5	3

Table 5.1 Final pictures of renewable energy 2050 in the North Sea Energy Outlook

energy needs as much as possible. This final picture requires a total offshore wind energy capacity of 72 GW in 2050.

In both final pictures, offshore wind energy will be an essential energy source in 2050. To fully utilise the potential of this energy source, system integration and coordination of offshore and onshore infrastructure planning are necessary. It will be important, for example, to construct sufficient energy infrastructure from wind farms to shore in time. And the onshore energy infrastructure must be capable of transporting large amounts of green energy to consumers in the form of electrons or molecules. To this end, the onshore Energy Main Structure Programme (PEH), which will be ready in 2021, has been set up. The infrastructure's demand for energy transport will become clear from this programme. The Regional Energy Strategies (RESs) make an important contribution to this. In addition, the industrial clusters in Cluster Energy Strategies (CESs) will also announce their plans and needs for energy infrastructure.

Broadly speaking, the development of a sustainable North Sea energy system will take place along the following lines:

- Direct landfall at the industrial clusters of energy produced offshore. Most industry is located on or near the coast. By delivering the energy directly to large-scale consumers, supply and demand are brought together as closely as possible and no transport capacity is required from the existing onshore energy networks. This means there is little or no need for grid reinforcement or expansion. This is in line with the guiding statements from the government perspective for the National Environmental Vision²¹.
- More flexibility through connections with the (North Sea) energy systems of neighbouring countries. This enables limiting peak shaving in wind production and the associated pressure on the network by exchanging with other countries, or vice versa - in the case of limited production of energy from wind and solar - to obtain energy from abroad. This exchange can

²⁰ This is higher than the current growth of approximately 1 GW/year (2020-2030 period)

²¹ Parliamentary document 34 682, no. 6, appendix.

be facilitated by the application of interconnectors, energy hubs and wind connectors. Interconnectors are switching points between different networks; energy hubs are artificial islands where energy from several surrounding wind farms and/or interconnectors comes together, possibly converted into another energy carrier, and transported from there to shore; wind connectors are connections between grid connections of offshore wind farms of different countries, which serve as an interconnectors when there is little wind. These elements can eventually lead to a meshed grid in the North Sea, in which the energy systems of the North Sea countries are intensively linked.

- More flexibility through the use of other energy carriers, storage and infrastructure. A possible addition or alternative to solutions within the electricity chain is conversion to hydrogen. This can be applied both onshore and offshore²²:
 - Onshore electrolysis can be used efficiently to solve regional limitations in connection and transmission capacity for electricity. This solution can also bring synergy benefits in the form of heat supply. On land, however, there may be limitations in the space available for the necessary cable corridors, dune penetrations and the integration of electrolysis installations in industrial clusters.
 - During offshore electrolysis, (some of) the electricity from wind farms, for example, is converted into hydrogen. This takes place on an artificial island or platform. Any spatial limitations must also be taken into account for the necessary hydrogen transport pipelines to the coast. The reuse of existing offshore gas infrastructure (platforms and pipelines) may offer a solution for the transport and storage of hydrogen.
- Local solutions, such as grid reinforcement, congestion management and energy storage.

Many technologies to improve scale and cost level are still under development. It is also not sufficiently clear which existing energy infrastructure can be reused, under which conditions and costs. This makes a 'blueprint' for the development of a sustainable North Sea energy system impossible. It is, therefore, important to allow this development to take place in an adaptive way by always looking ahead, tackling issues with a holistic approach and facilitating future scenarios and options. The North Sea Energy Outlook provides some tools for this:

- Designate (clusters of) large sites for offshore wind energy in border areas with potential for interconnection (electricity or gas). Areas near the borders with the United Kingdom, Denmark and Germany are most suitable. This creates sufficient scale and flexibility in time to continue the roll-out of offshore wind energy in the short term and to implement optimal solutions for the longer term, such as energy hubs on artificial islands.

- Do not only focus on the further expansion of the offshore grid, but also investigate the possibilities of transporting the energy produced offshore via other energy carriers (such as hydrogen). Look at the construction of new hydrogen infrastructure and the reuse and preparation of existing gas infrastructure for the transport of hydrogen as an alternative or supplement to the offshore grid. Develop policy for the construction of hydrogen infrastructure and the reuse of suitable gas infrastructure.
- Enable the construction of energy hubs, cross-border connections (interconnectors and/or wind connectors) and offshore and onshore energy storage. Develop policy for spatial assessment and for the realisation of artificial islands. Also develop a regulatory framework for making the transport capacity of wind connectors available.
- Reach out to our neighbouring countries on the North Sea and study the possibilities of realising cross-border projects with them.
- Enable offshore energy to be supplied directly to industrial centres on or near the coast, so there is no need to use onshore energy transport networks for this.

²² In addition, the Guidehouse study into integrated tenders (appendix to Parliamentary document 32 183, no. 646) shows that offshore electrolysis could play a role after 2030, but that pilots are already significant before 2030.

5.3 Policy

Availability of sufficient energy is a condition for a well-functioning society. This energy must be CO₂-neutral by 2050. The European Green Deal emphasises the importance of offshore wind energy for meeting the EU's 2030 and 2050 climate and energy targets. In the <http://www.denationaleomgevingsvisie.nl>, the government states that the installation of a large number of wind turbines in the North Sea is necessary to complete the transition to sustainable energy generation by 2050. After all, the onshore possibilities are limited. The ambition laid down in the National Environmental Vision is therefore to achieve the climate targets for 2050 by realising the majority of energy production through wind farms in the North Sea. The more weather-dependent nature of this necessary transition to renewable forms of energy necessitates major changes to the energy system to guarantee security of supply.

According to the National Environmental Vision, the realisation of a reliable, affordable and safe energy supply, which must be CO₂-neutral by 2050, including the necessary main infrastructure, is of national importance. Other national interests directly linked to this are safeguarding the main infrastructure for the transport of substances via pipelines, the maintenance and development of the main infrastructure for mobility, and the development of sustainable fisheries. The national importance of a good quality of the living environment requires the installations and infrastructure to fit in within the preconditions of ecology, cultural heritage and the human experience of the physical living environment. This means that the energy transition and the extra space required for this at sea are closely intertwined with other tasking, such as the restoration and development tasking for nature (nature transition), adapting the nature and size of the fishery, making use of opportunities for aquatic culture and mariculture (the food transition) and the preservation of sufficient space for efficient and safe shipping traffic.

The government is pursuing various tracks to realise this energy transition under the aforementioned conditions. For the energy system itself (5.2.1), the priorities are the coordination of energy demand and energy production, the landfall of energy produced offshore, international coordination and the development of artificial islands (hubs) and cross-border energy infrastructure. At the same time, the focus is on the necessary development of the most important energy carriers in this new system: wind energy (5.3.2), oil and gas extraction (5.3.3), hydrogen (5.3.4), and also CO₂ storage (5.3.5) and the stimulation of innovative technologies such as offshore energy from water and the sun (5.3.6).

5.3.1 North Sea energy system

To be able to fully utilise the potential of the North Sea for the new energy system, system integration and coordination of offshore and onshore infrastructure planning are necessary. The limits to what is possible physically and on the energy market using the current system are in sight. This requires the timely construction and/or redesign of sufficient energy infrastructure to connect wind farms to shore or to be able to export energy. Also, the onshore energy infrastructure must be able to transport large amounts of green energy in the form of electricity or sustainable gas to customers. Lastly, matching supply and demand, especially in the industrial clusters, is crucial. This task has been addressed in the Energy Main Structure Programme (PEH).

International coordination and hubs

The North Seas Energy Cooperation (NSEC) was founded in 2016, under the presidency of the Netherlands. Currently, Belgium, Denmark, France, Germany, Ireland, Luxembourg, the Netherlands, Norway and Sweden are participating in this cooperative venture. The aim is to promote the cost-effective use of renewable energy produced offshore (in particular wind energy) and the interconnection between the countries in the region. The NSEC supports and facilitates offshore grid development and the utilisation of the region's great renewable energy potential. This is a long-standing energy priority for the EU and the countries concerned. The European Green Deal emphasises the importance of offshore wind energy for meeting the EU's 2030 and 2050 climate and energy targets, as well as the importance of regional cooperation. The NSEC work programme for 2020-2023 places particular emphasis on the development of specific offshore cross-border wind and maritime network projects (hybrid projects), which have the potential to reduce costs and space demand of offshore developments. The work of the NSEC also makes a valuable contribution to the Commission's communication on offshore renewable energy.

The work programme of the NSEC includes two initiatives that are in different phases of research in the Dutch part of the North Sea:

- **WindConnector**, a project investigating the possibilities of interconnection with the United Kingdom from the IJmuiden Ver offshore wind farm. In his letter on the implementation of the Offshore Wind Energy Roadmap 2030²³, the Minister of Economic Affairs and Climate Policy asks TenneT to come up with a proposal for even more efficient use of the envisaged grid infrastructure in the IJmuiden Ver wind energy area, by also using it as an interconnector with the United Kingdom, via the scheduled offshore British wind farms near IJmuiden Ver or directly to the mainland. When the offshore wind energy development framework was

²³ Parliamentary document 33561, no. 48

updated in 2020, the Minister of Economic Affairs and Climate Policy determined that TenneT must design the intended platforms for the offshore grid for the IJmuiden Ver wind energy area in such a way that they are suitable for a WindConnector to the United Kingdom. On 22 September 2020, TenneT and National Grid Ventures, the commercial development arm of National Grid plc, announced a collaboration agreement for a feasibility study into the connection of Dutch and British wind farms to the energy systems of both countries.

- **North Sea Wind Power Hub** (NSWPH) strives for an internationally coordinated roll-out of the offshore grid with modular wind hydrogen power hubs (energy islands) instead of individual national connections for offshore wind farms. An analysis conducted by the European Commission has demonstrated that this hub and spoke concept yields significant cost savings compared to the current conventional approach with point-to-point connections and individual connections for offshore wind farms. The consortium that is jointly investigating the possibilities for this North Sea Wind Power Hub consists of TenneT (the Netherlands and Germany), the Danish grid operator Energinet and Gasunie. The NSWPH consortium is on the fourth list of European Projects of Common Interest (PCI) as approved by the European Commission. The PCI status allows the consortium to apply for funding from the Connecting Europe Facility (CEF) for studies to further develop the concept and to bring a first hub and spoke project one step closer. On 1 October 2020, the NSWPH consortium was awarded 14 million euros from the CEF funds.

In line with the NSEC and the aforementioned projects, the Netherlands is conducting a bilateral dialogue with neighbouring North Sea countries about the joint exploration and possible development of cross-border energy projects in the North Sea. In 2019, for example, the German Federal Ministry of Economic Affairs and Energy and the Dutch Ministry of Economic Affairs and Climate Policy signed a Declaration of Intent on the Energy Transition, in which, among other things, the parties agree on cooperation for the development of cross-border offshore wind energy projects and in the field of hydrogen.

In December 2020, a Memorandum of Understanding to endorse cooperation on offshore energy islands was concluded with the Danish government. This is in response to the Danish coalition agreement, which, among other things, announces an energy island on the Danish part of the North Sea for the year 2030. Together with the Danes, the Ministry of Economic Affairs and Climate Policy is studying, among other things, the possibilities for connecting the proposed Danish energy island with the Dutch energy system, and the possibility of conversion to hydrogen. The intention is to also involve the German government in these consultations.

For the grid connection of the wind energy area IJmuiden Ver in the context of the Offshore Wind Energy Roadmap 2030, the government has studied the possibility of using an artificial

island. Based on this study, the Minister of Economic Affairs and Climate Policy decided in 2019 to use the usual platforms for the grid connection of this wind energy area. However, considering the further roll-out of offshore wind energy after 2030, the possibility of an artificial island remains explicitly open. Various market parties have shown their interest in and have ideas for such artificial islands. The government has therefore developed a policy framework for artificial offshore

Offshore nets and landfall

Various options can be used for transporting current and future wind energy to the mainland. The choice of which depends, among other things, on the locations of the wind farms and landfall points, the location and nature of the energy demand, the options for constructing or reusing offshore energy infrastructure and the way in which landfall is associated with the local ecosystem. The government is mapping out these factors in an Offshore Wind Energy Landfall Exploration (VAWOZ). This exploration is a step towards the decision-making about the set of landfall options that will be used to start a National Coordination Scheme (RCR) for each route. The Minister of Economic Affairs and Climate Policy, in consultation with the Minister of the Interior and Kingdom Relations, draws up an integration plan for the issuance of the permits for the grid connections to the mainland.

The approach from an integrated energy system is also increasingly visible in the design of the offshore grid. For example, in the spring of 2020, the Minister of Economic Affairs and Climate Policy, via the offshore wind energy development framework, instructed grid manager TenneT to take into account the sustainability of nearby gas platforms in the grid connection of the Hollandse Kust (Noord) wind farm. These must be able to connect to the offshore grid. TenneT has also been commissioned to design the offshore grid in IJmuiden Ver in such a way that an electricity connection with the United Kingdom can be realised from that location.

In addition, in connection with the future landfall, the Offshore Wind Energy Landfall Exploration is exploring electrical connection options and power-to-x options (conversion to hydrogen or heat) and it also includes a possible additional task for the roll-out of offshore wind energy before 2030. The Offshore Wind Energy Landfall Exploration 2030 started at the end of 2020 and will be designed in consultation with the fellow parties (governments, companies and social organisations). This exploration forms the link between the North Sea Programme that designates the wind energy areas and the Energy Main Structure Programme of the Ministry of Economic Affairs and Climate Policy. The exploration for landfall in the period 2030-2040 will start in the summer of 2021.

Coordination of supply and demand

Creating offshore wind farms is not an end in itself. The purpose of the generated electricity is to replace the electricity that is currently mostly produced from coal and gas, and, to the greatest possible extent, electrify processes in industry, mobility, agriculture and the built environment that are now based on gas and/or oil. This requires an enormous amount of electricity. Offshore wind farms are ideally suited to supply that electricity. The coordination between supply and demand of energy is of great importance in this respect. Wind farms cannot be built and operated profitably if there is insufficient demand for them. Conversely, companies are unlikely to switch to electrification of production processes if they are not assured of sufficient supply. Supply and demand must, therefore, go hand in hand. Industry, mobility, the agricultural sector and the built environment are facing major sustainability tasks and will have to take significant steps in the coming years to reduce their CO₂ emissions, so the Netherlands can achieve its emission reduction targets. To assure these sectors there is sufficient electricity available to convert their current processes into the use of electrical energy, they need a roadmap that clearly indicates which wind energy area will be developed in which year. In view of the lead times for laying offshore cables and pipelines, and the investment cycles of companies that could switch, this roadmap must provide clarity at least 10 years in advance.

In addition to coordinating supply and demand, the physical connection is also important. The distance between the location where wind energy makes landfall and where it is used should be kept as small as possible. Landfall in or near industrial clusters is therefore desirable. This way, the consequences of feeding the national electricity grid with offshore electricity are limited as much as possible, and thus also the otherwise considerable investments in the necessary reinforcement of the Dutch electricity grid. The physical coordination between supply and demand in the emerging market for green hydrogen is also important. Hydrogen is 'green' only when it is made using electricity that comes from renewable energy sources.

Actions

- *WindConnector* is an NSEC project that aims to interconnect with the United Kingdom from the IJmuiden Ver wind energy area. The Minister of Economic Affairs and Climate Policy has asked TenneT to further develop this connection with the relevant British parties and to make the provided offshore grid platforms suitable for this. As things stand, completion is scheduled for the 2028-2030 period.
- *North Sea Wind Power Hub* (NSWPH), a NSEC partnership of TenneT Netherlands, TenneT Germany, the Danish grid operator Energinet, Gasunie and the Rotterdam Port Authority, is striving for an internationally coordinated roll-out of the offshore grid with modular wind-hydrogen power hubs (energy islands) as an alternative to individual national connections for offshore wind farms. In 2021, NSWPH and the Ministry of Economic Affairs and

Climate Policy will develop case studies for the newly designated wind energy areas on the use of energy islands in comparison with traditional platforms. The Ministry of Economic Affairs and Climate Policy involves the results of this in the Offshore Wind Energy Landfall Exploration process and will deliver them in 2022.

Knowledge agenda

- The results of the Offshore Wind Energy Landfall Exploration up to and including 2030 are expected in the summer of 2021.
- The results of the Offshore Wind Energy Landfall Exploration 2030-2040 are expected in early 2022.
- Additional system integration studies will start in 2021.

5.3.2 Wind energy

In the Dutch situation, the construction of wind farms in the North Sea plays a major role in making the energy supply more sustainable. In the Energy Agreement of 2014, it was agreed that by 2023, approximately 3.5 GW of extra wind power will be installed offshore. Between 2016 and 2023, the wind farms of the Offshore Wind Energy Roadmap will be completed and connected to the high-voltage grid. In 2018, the government expanded the Offshore Wind Energy Roadmap²⁴ with a share for the years 2024 to 2030. The wind farms of this expansion will be completed between 2024 and 2029. They will be located in wind energy areas designated in the North Sea Policy Document 2016-2021, part of the National Water Plan. This development will lead to a total capacity of approximately 11.5 GW of offshore wind energy in 2030 (see the map below).

The Energy Agreement stipulates that the government will ensure a robust legal framework for achieving the agreed target for offshore wind energy. For example, the Offshore Wind Energy Act was established in consultation with the wind sector. This act provides the instruments for directing the allocation of wind energy sites in the North Sea. The set of instruments makes it possible to carefully weigh interests, to meet the requirements of a healthy ecosystem, to use the available space efficiently, to reduce costs and to accelerate the roll-out of offshore wind energy.

Pursuant to the Offshore Wind Energy Act, the Minister of Economic Affairs and Climate Policy takes wind farm site decisions within a designated area, laying down the location-specific conditions for the construction of a wind farm on that site. An important part of the wind farm site decision is the assessment of the nature aspects on the basis of the Nature Conservation Act. The

²⁴ See Parliamentary document 33561, no. 42

integrated implementation of the assessment of the nature aspects is further elaborated in Articles 5 and 7 of the Offshore Wind Energy Act. As a result, no separate exemption or permit is required under the Nature Conservation Act. When preparing a wind farm site decision, the Minister of Economic Affairs and Climate Policy also examines the physical conditions of the water and floor of the site in question and the prevailing climatic conditions in the area. The results of this research, together with the other information in the wind farm site decision, form important starting points on which market parties can base their bids via a subsidy tender. The party to whom the site is awarded will be given the exclusive right to build a wind farm within the site.

The grid that connects the offshore wind farms with the onshore high-voltage grid was developed under the Electricity Act (1998). In September 2016, the Minister of Economic Affairs and Climate Policy designated TenneT as the manager of the offshore grid on the basis of this act. On the basis of a development framework for offshore wind energy, the minister determines the planning and the technical-functional requirements for the offshore grid. The Minister of Economic Affairs and Climate Policy, in consultation with the Minister of the Interior and Kingdom Relations, draws up an integration plan for the issuance of the permits for the grid connections. This integration plan also contains an appropriate assessment for the effects on nature. Parallel to this, the provinces and municipalities concerned will take the relevant permit decisions.

The research and monitoring of the effects of wind farms on the marine ecosystem takes place in the Ecological Offshore Wind Energy Programme (WOZEP). Possible effects on animal species are thus identified at an early stage. The results of the research can lead to measures that limit negative effects as much as possible (mitigation), in accordance with the requirements of the Bird and Habitats Directives (BHD). The national government applies the results in decision-making on wind farm site decisions and permits and in their design. This procedure runs through the Ecology and Accumulation Framework (KEC), the environmental impact study, the appropriate assessment and the assessment advice of the Environmental Impact Assessment Committee. The precautionary principle is the starting point in this process. If mitigating effects is not sufficiently possible, compensatory measures may be appropriate.

The national government has opted for an adaptive roll-out of offshore wind energy in the substantial expansion of offshore wind energy capacity to meet the CO₂ reduction targets. The Minister of Economic Affairs and Climate Policy is drawing up a Roadmap for offshore wind energy for this development. This approach allows for a major roll-out, but can also respond to future, currently still unknown, national and international changes.

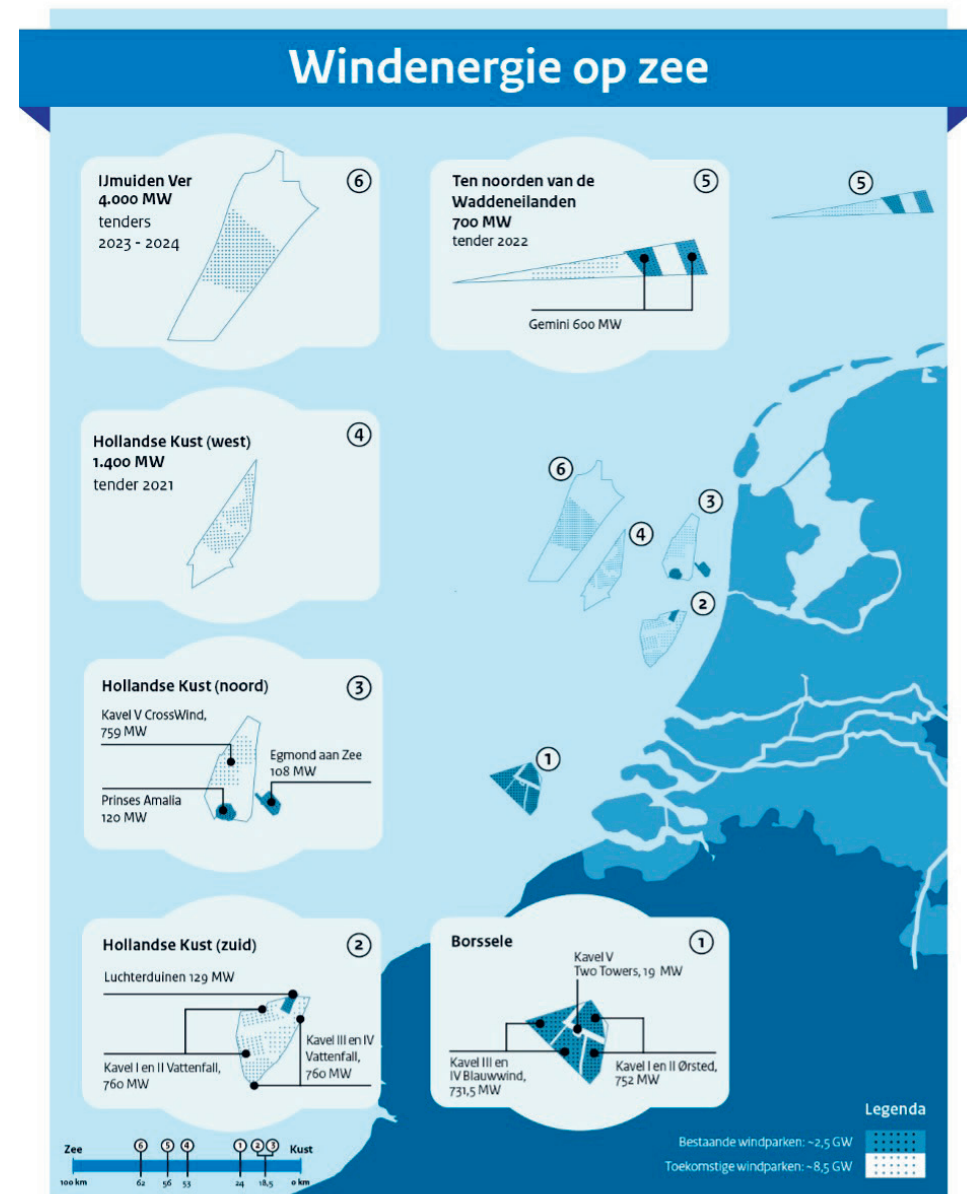


Figure 5-a: Route map 2030

The Offshore Wind Energy Roadmap for the period up to and including 2030 is currently being implemented. The Climate Agreement specifies 2021 as the reference year for deciding whether an additional contribution from offshore wind energy is needed in the period up to and including 2030 to achieve the CO₂ reduction target of 2030. At the end of 2020, it became clear that the planned roll-out of the Offshore Wind Energy Roadmap 2030 shows a deficit of 0.7 GW to achieve the contribution of 49 TWh, agreed on in the Climate Agreement, in 2030²⁵. To still be able to comply with the Climate Agreement, an addition to the 2030 roadmap is therefore required. In addition, the European Council has adopted the intention for a more ambitious CO₂ reduction target for 2030 (from 49 to 55 percent). Based on what has been determined in the Climate Agreement in 2019, the scope of this extra task is expected to be approximately 5 to 9 GW. Lastly, a shortage of emission reductions in the other sectors is expected²⁶. All this is expected to lead to a government decision in 2021 to schedule in the construction of additional offshore wind farms in the period up to and including 2030. It is important that the already designated offshore wind energy areas remain available for this purpose, or that alternative new areas are designated in good time to realise the additional tasking and compensation for the existing shortage. The Climate Agreement and the North Sea Agreement contain agreements on this.

For the period after 2030, the scenarios referred to in Section 5.1 show a possible need for wind energy capacity that could be between 38 and 72 GW in 2050. In anticipation of this need, it has been agreed in the North Sea Agreement that space must be found for the installation of 20 to 40 GW of extra offshore wind energy. It has also been agreed that the national government will investigate whether alternative areas are available for the already designated but hitherto unused wind energy areas Hollandse Kust (south west), Hollandse Kust (west), Hollandse Kust (north west) and IJmuiden Ver. This is due to the negative effects of wind farms in these areas on fishing, shipping and/or ecology. At the same time, it has been agreed that these already designated areas may be necessary for any additional tasking in the period up to 2030 and will remain available until alternative areas are available.

Section 9.1 describes the new designated wind energy areas as part of the integrated spatial map for the North Sea for the 2022-2027 planning period. The additional areas have space for installing a production capacity of a total of at least 27 GW in extra wind energy. Added to the 11 GW of the existing roadmap realised in 2030, this results in a production capacity of approximately 38 GW in the Dutch part of the North Sea. This quantity corresponds to the scenario with the lowest share of offshore wind energy (38 GW) for the year 2050. The preparation of the necessary decisions, the

permit procedures and the construction time of the wind farms and associated infrastructure takes a total of 8.5 to 10 years. To enable an uninterrupted roll-out of offshore wind energy after 2030, additional wind energy areas in the North Sea Programme must be designated. This designation gives a new government the opportunity to include the new areas in the Offshore Wind Energy Roadmap for the period after 2030.

This approach also contributes to the balance between the development of the energy transition, the nature transition, the food transition and other uses. In the realisation of wind farms, the options for passage and multiple use receive increasing attention. The realisation of offshore wind energy must take place within the limits of the Nature Conservation Act. Within the Ecological Offshore Wind Energy Programme (WOZEP), therefore, research is being conducted into the (cumulative) effects of wind farms on the ecosystem. The Ecological Offshore Wind Energy Programme focuses on effects on the species of birds, marine mammals and bats to be protected under the Bird and Habitats Directives (BHD), as well as on habitats; in addition, also on the effects of large-scale offshore wind energy on the North Sea ecosystem itself, such as destratification or turbidity of the seawater. In the context of the North Sea Agreement, the financing of the Ecological Offshore Wind Energy Programme will be extended up to and including 2030. Parallel to the Ecological Offshore Wind Energy Programme and the expansion of the Offshore Wind Energy Roadmap, the government is updating the Ecology and Cumulation Framework (KEC), to see whether and how the future additional offshore wind farms can be aligned with the Nature Conservation Act and the Bird and Habitats Directives. Decision-making on mitigating and, if necessary, compensating measures for new wind farms is part of the expansion of the Offshore Wind Energy Roadmap for the periods up to and including 2030. Any necessary compensatory measures must be implemented before the wind farms are put into use. Mitigating measures are prescribed in the wind farm site decisions for the relevant wind farms. Section 3.3.4 describes the policy with regard to the cumulative effects of wind farms and other uses on the ecosystem as a whole, and the role that wind farms can play in the restoration of nature and the ecosystem.

With regard to multiple use, the government will in the 2022-2027 planning period investigate whether areas within 1 km of certain mining platforms, CO₂ collecting installations and other energy-consuming installations in the North Sea can be designated as wind energy areas, aiming to making these platforms and installations more sustainable. This involves generating an amount of wind energy that matches the energy demands of the relevant users during the period in which he actually consumes energy. The North Sea is an ideal place to conduct large-scale tests and experiments with drones for, for example, defence purposes, enforcement and technical inspection of the wind farms. At the moment, these tests do not have to be taken into account when building and positioning wind turbines.

²⁵ Parliamentary document 32183, no. 646

²⁶ PBL Netherlands Environmental Assessment Agency (2020) Climate and Energy Exploration 2020. URL: <https://www.pbl.nl/publicaties/klimaat-en-energieverkenning-2020>

In the context of multiple use, the government is also looking at the opportunities that wind farms offer to the ‘new blue economy’. After all, wind farms are drivers of innovative techniques and lend themselves well to multifunctional use of space, which can also bring synergy benefits. Functions that, in principle, can work alongside wind farms include: aquaculture and mariculture, alternative forms of fishing, nature improvement, energy generation from the sun and tidal flows, energy conversion and energy storage through hydrogen production. More about these opportunities is described in Section 8.

The assessment framework for multiple use of wind farms is described in Section 10.3. In this context, in accordance with the National Strategy on Spatial Planning and the Environment (NOVI) and agreements in the North Sea Agreement, the government is implementing the balancing principle that a combination of functions takes precedence over single functions.

Actions

- In 2021, the government will update the Ecology and Cumulation Framework (KEC), to see whether and how the future additional offshore wind farms can be brought into line with the Nature Conservation Act and the Bird and Habitats Directives.
- In 2022, the government will publish an extension of the Offshore Wind Energy Roadmap for the period up to and including 2030.
- In 2022, the government will publish an Offshore Wind Energy Landfall Exploration (VAWOZ).
- In 2022, the government will publish an extension of the Offshore Wind Energy Roadmap for the period after 2030.
- Under the Offshore Wind Energy Act, the government will adopt wind farm site decisions during the 2022-2027 planning period, each substantiated by a mandatory environmental impact assessment. This is followed by the tenders for sites within the designated wind energy areas.

Knowledge agenda

- The government will continue the Ecological Offshore Wind Energy Programme and extend it until 2030.
- Before 2027, the government will explore whether it can designate areas within 1 km of several mining platforms and other installations as wind energy areas for its own use.

5.3.3 Oil and gas extraction

The most important developments in oil and gas extraction are the decarbonisation of the sector and the mapping and facilitation of the possibilities for reuse of the gas infrastructure for the transport and storage of CO₂ and hydrogen.

Decarbonisation of oil and gas extraction

To comply with European agreements on limiting CO₂ emissions, the government is working on the decarbonisation of the current gas system in two ways. First of all, by reducing energy demand through savings. Secondly, by replacing natural gas, if technically and economically feasible, with alternatives such as hydrogen, electricity and heat supply via a heat network. For the remaining gas demand, the government is committed to gradually replacing natural gas with CO₂-free gases such as ‘green gas’ and sustainably produced hydrogen. In the transition phase from fossil to other energy carriers, the government prefers gas extraction from the small Dutch onshore and offshore fields, rather than importing natural gas. This is better for the climate, employment, the economy and the preservation of knowledge of the deep subsurface and the existing gas infrastructure²⁷. Domestic production also slows down the increasing dependence on imports from other countries.

At the same time, the government has noted a sharp downward trend in investments in exploration and extraction of natural gas. Due to the poor investment climate, there is a risk that investors will end gas extraction from small fields, especially in the North Sea, before end of life, with all the associated consequences for the decommissioning and removal of the existing infrastructure. These will then no longer be available for the storage and transport of hydrogen or CO₂. The government is therefore committed to offering sufficient economic prospects in the offshore gas sector and to slow down the excessively declining extraction. In the letter of 30 May 2018²⁸ regarding the importance of natural gas in the energy transition, it has been proposed to improve the current investment deduction of 25 percent, which, under certain conditions, can be applied to investments in the exploration and extraction of small gas fields in the Dutch part of the North Sea. This intention has been elaborated in a bill to amend the Mining Act, in which an investment deduction of 40 percent is proposed for all investments for the exploration and extraction of natural gas and oil, both on the Dutch part of the continental shelf and onshore,

²⁷ See Letter to Parliament dated 19 February 2020 regarding *Answers to questions about the article ‘The Netherlands will have to import much sooner and much more gas than previously thought’, and the Letter to Parliament dated 6 March 2020 regarding Answers to questions about the message ‘Stopping gas actually results in more CO₂’*

²⁸ Parliamentary document 33 529, no. 469

where mining companies have indicated that they will not apply this investment deduction onshore and in the Wadden Sea. This bill was passed by the House of Representatives on 17 December 2020²⁹.

Gas infrastructure

In the Mining Act and the Mining Decree, the standard is that oil and gas platforms that have been decommissioned are always removed, unless they are reused for the storage of hydrogen or CO₂, for example. After that, the platforms will be removed. Cables and pipelines that are no longer in use are left behind clean and safe, unless the Minister of Economic Affairs and Climate Policy orders their removal under <https://wetten.overheid.nl/jci1.3:c:BWBR0014168&artikel=45&g=2020-10-14&z=2020-10-14>. During this planning period, it will be investigated which empty fields, platforms and infrastructure could be reused for the storage and transport of hydrogen and CO₂ (see also 5.3.2 and 5.3.5). Ultimately, these platforms will also be removed after possible reuse. The removal of cables and pipelines may be desirable if they can interfere with other uses of the seabed. The removal takes place on the basis of weighing up the social costs and benefits, the environmental effects and the safety aspects associated with both the abandonment and removal. An assessment method has been developed for this that looks at interference with other uses, safety, environmental effects and costs. This method will become applicable by adjusting the Mining Decree and the Mining Regulations. Based on this assessment framework, the Minister of Economic Affairs and Climate Policy may oblige the owner to remove a cable or pipeline that has been decommissioned in accordance with a removal plan. In practice, cables and pipelines often remain in place; in 2020, there were approximately 600 km of deserted pipelines in the Dutch exclusive economic zone (EEZ). Any owner who does not remove his decommissioned pipelines must clean and inspect them annually.

In addition, the platforms have an important safety function for air connections. Oil and gas platforms and wind farms are and will often remain dependent on the use of helicopters to move personnel. For the transport of people and goods to gas platforms it is considered whether this can be done by boat or whether transport by helicopter is unavoidable. The possibility of deploying helicopters for manned platforms is in many cases necessary to ensure timely evacuation of personnel in the event of emergencies. It is therefore of crucial importance that in such cases the accessibility of the offshore platforms by air is guaranteed, even under bad weather conditions.

The policy for the North Sea is to keep the network of connections between the airports and the offshore platforms (the Helicopter Main Routes) available at all times, even under the most

adverse weather conditions. During the construction of offshore wind farms, the accessibility of offshore platforms by air is analysed. One of the factors that must be taken into account when designating wind farms is aviation safety. The requirements for this are set out in EU regulation 965/2012 *Aircraft Operations*³⁰. This regulation sets requirements for, among other things, minimum obstacle distances for the arrival and departure of helipads, and requirements that the helicopter pilots concerned must meet. It is necessary to coordinate the degree of impact and its acceptance in advance with the operators of the platforms.

Actions

- Make arrangements with the helicopter industry and provide an accurate database of wind turbine locations for use in the cockpit during flight procedures.
- In 2021, the government will elaborate the procedure for the removal or reuse of platforms and other mining works in subordinate legislation.

Knowledge agenda

- Setting up a seismic research programme/NZA relationship.
- During this planning period, the government investigates the technical possibilities for reusing existing oil and gas infrastructure for hydrogen and CCS, among other things.

5.3.4 Hydrogen

The Climate Agreement sets out the ambition for upscaling electrolysis to approximately 500 MW installed capacity by 2025 and 3 to 4 GW installed capacity by 2030. In addition, the European Commission presented a separate European hydrogen strategy in July 2020. The European ambition is enormous: 6 GW electrolysis by 2024 and 40 GW electrolysis by 2030. In March 2020, the government's vision on hydrogen was presented to the House of Representatives³¹. This describes the indispensable role of this gaseous energy carrier for the realisation of a sustainable energy system that is reliable, clean, affordable, safe and spatially suitable. Hydrogen can be regarded as a storage and transport medium that, in a future of purely renewable energy sources, provides the necessary flexibility to continue to match the supply and demand of energy. In view of the wind potential and the existing gas infrastructure, the North Sea is an excellent area for realising these ambitions. The offshore production of hydrogen with wind energy (power to gas) can support the integration of sustainable energy from offshore wind farms, and can also contribute to making industry and mobility more sustainable. The challenge lies in the upscaling

³⁰ Source: <https://eur-lex.europa.eu/legal-content/NL/TXT/?uri=CELEX%3A02012R0965-20160825>

³¹ Parliamentary document 32 813, no. 485

²⁹ Parliamentary documents 35 462, no. 2

and cost reduction of CO₂-free hydrogen production. In addition to the Netherlands, many other European countries and the European Commission also recognise the importance of hydrogen as an economic engine for Europe. Hydrogen plays a central role in the European Green Deal announced in December 2019. The objectives for the generation and use of hydrogen, as stated in the government's vision for hydrogen³², will be elaborated in a national hydrogen programme from 2022.

The production of hydrogen using wind energy will develop step by step. Green hydrogen production can increase in scope as the large-scale production of green electricity continues to develop. Wind energy plays an important role in that process. To make the production of green hydrogen profitable, the costs of the electrolyzers needed, however, will have to drop. The following development phases can be roughly distinguished:

- *First instance:* the upscaling of hydrogen electrolysis using offshore wind energy takes place on land near interchanges of the electricity grid and gas infrastructure. The price of the electrolysis process is expected to fall during this phase. Wind farms closer to the coast play a pre-eminent role in the upscaling of green hydrogen production.
- *Second instance:* wind farms further out to sea are becoming important for green hydrogen production. It may be more beneficial economically and also in terms of space, to bring energy from wind farms located more than 100 km offshore to land in the form of hydrogen instead of electricity. In the more distant future, it is mainly the non-electrical energy demand and the replacement of fossil raw materials for the chemical industry that require 'green molecules'.

During this planning period, combined tenders for offshore wind energy and onshore electrolysis will be developed to support the roll-out. Offshore electrolysis will not be able to play a role until after 2030 because this technology will not be mature enough in the coming years and is also too expensive³³. To make offshore electrolysis possible after 2030, the national government will (help) set up one or more pilot projects.

Also, there are initiatives by market parties and research institutes to jointly build up knowledge about offshore hydrogen production and to carry out pilot projects for this, such as:

- *PosHydon*, in which TNO, Nexstep, Neptune Energy, TAQA, EBN and NAM are collaborating on a pilot project that aims to produce offshore hydrogen using wind energy.
- *NorthH₂*, in which Gasunie, Groningen Seaports and Shell Nederland are working on a feasibility study with the ambition to generate approximately 3 to 4 GW of offshore wind

energy for hydrogen production before 2030. The study also considers the possibility of converting electricity into hydrogen offshore.

- *CrossWind*, an initiative of Shell and Eneco which, with a joint venture, has won the tender for the plot in the Hollandse Kust (north) wind energy area. These parties want to produce hydrogen on Maasvlakte 2 using a 200 MW electrolyser and green power from the aforementioned offshore wind energy area.
- *North Sea Wind Power Hub*, a feasibility study by a consortium of five partners: TenneT Netherlands, TenneT Germany, the Danish grid operator Energinet, Gasunie and the Rotterdam Port Authority. The parties strive for an internationally coordinated roll-out of an offshore energy grid, with modular wind-hydrogen energy hubs instead of individual national connections.

To make developments in the field of hydrogen possible, the following matters must be investigated and arranged in the short term:

- Space for new wind farms that produce hydrogen offshore, in their own installation or via linked platforms.
- Reuse of existing gas infrastructure for the production of hydrogen on platforms, storage of hydrogen in empty gas fields (if necessary), and transport of hydrogen to land via existing pipelines.
- Space for hydrogen production and storage on artificial offshore energy islands.
- Reserve space for wide corridors from the coast to future offshore wind farms for the possible construction of new power cables and/or hydrogen pipelines, also in relation to sand extraction.
- Reserve space (plots within wind energy areas) to carry out large-scale offshore pilot projects involving hydrogen activities.
- Reserve space near landfall points on the coast for electrolysis installations, compression and transport of hydrogen.

Actions

- The Ministry of Economic Affairs and Climate Policy is researching and developing a set of instruments to initiate the upscaling of green hydrogen production in relation to offshore wind energy. This process started in 2020: the inclusion of green hydrogen in the SDE++ and research into combined tenders for offshore wind energy and hydrogen. The government will incorporate the insights from this process into a new approach to offshore wind energy, to be presented in 2022.
- In the coming years, the Ministry of Economic Affairs and Climate Policy will investigate the roles and position of state enterprises and network operators in relation to setting up onshore and offshore hydrogen networks.

³² Parliamentary document 32 813, no. 485

³³ Parliamentary document 32 183, no. 646

Knowledge agenda

- Research into technical possibilities for the reuse of existing (gas) infrastructure in the North Sea for the production, storage and transport of hydrogen. This includes reuse of existing pipelines, offshore platforms, empty gas fields, salt layers, booster platforms and cable networks.
- Investigate the possibilities of storing hydrogen offshore and explore whether this could reduce the land take burden onshore.

5.3.5 CO₂ storage

It has been agreed in the Climate Agreement that the storage of CO₂ only takes place in the seabed.

In the coming decades, capacity will be available under the North Sea for the storage of approximately 1,600 Mt³⁴ of CO₂. That capacity is present in gas fields that have been exhausted. CO₂ is expected to be transported to the North Sea from the large industrial clusters by pipeline or by ship. Until 2030, this is estimated to involve a maximum of 7.2 Mt of industrial CO₂, supplemented with a maximum of 3 Mt of CO₂ from the electricity sector.

In principle, the storage of CO₂ in the seabed seems to go well with other activities or uses in the North Sea. The total use of space is limited to a few of the existing gas extraction locations. For the actual storage of CO₂, the initial consideration is the empty offshore gas fields in the P and Q quadrants, at a limited distance from the coast. The suitability of a storage location outweighs the distance to the coast, which means that timely preparation for expansion to the K and L quadrants is necessary to (continue to) meet the demand. It is therefore important that the production facilities at the gas fields that will be exhausted in these quadrants in the coming years are not automatically dismantled and removed. The removal obligation under the Mining Act can be postponed if a platform is given a different function, for example, as a CO₂ injection platform. After the storage location has been filled and closed, the platform will be removed.

Under the Mining Act, existing pipelines may, in principle, be left clean and safe after use. These are assessed for their suitability for reuse for CO₂ transport on a case-by-case basis. It is plausible that, to meet the need for transport capacity, new pipelines will have to be constructed for the main infrastructure from land to the storage locations. Hubs can be developed to facilitate large-scale CO₂ transport and offshore distribution. Where possible, existing corridors can be used to bury new pipelines. These pipelines will also be removed in time.

Porthos, in the Rotterdam port area, is the first in the Netherlands to develop a transport and storage project for CO₂. This concerns approximately 2.5 Mt of CO₂ per year, which is stored in the P18 cluster, approximately 25 km off the coast of Hook of Holland. If there is sufficient interest, a second phase of the project may start in the coming years. A CO₂ main infrastructure with offshore storage is also being developed in the industrial area around the North Sea Canal. This so-called *Athos* project is still in an exploratory phase to map out how much CO₂ can be stored and which locations in the North Sea qualify for this.

Actions

- By 2021, the government will develop a secondary legislation procedure for the removal or reuse of platforms and other mining works, including for CO₂ storage.

Knowledge agenda

- In the 2022-2027 planning period, the government will work with the oil and gas sector to determine which old oil and gas fields in the North Sea are most suitable for CCS. One of the research questions is what impact this can have on other offshore activities, such as hydrogen, islands, offshore wind energy and forms of multiple use.

5.3.6 Offshore energy from water and sun

To determine the perspectives of 'energy from water' and to form a vision on this, the government presented the Electricity From Water Exploration³⁵ in early 2021. Conducting this exploration is an important step in policy-making and political decision-making about this possible contribution to the further development of sustainable offshore energy production. The exploration highlights a lack of cost-effective energetic potential. Also, resources are limited and geographic and oceanographic conditions are suboptimal. In view of these findings and the Dutch energy innovation policy, which is aimed at focus and mass, the government concludes that no government policy will be pursued on energy from water.

Therefore, no large-scale areas for offshore tidal energy or wave energy are planned during this planning period. There is, however, room for innovation and experimentation in this field. This could involve underwater turbines and cables, underwater flyers, or floats (with flywheel and generator), which could potentially be installed at wind farms between the wind turbines. These innovations and experiments fit within the frameworks for shared use and the area passports.

³⁴ Include reference to the latest study by TNO and EBN (2020) (still draft)

³⁵ <https://www.rijksoverheid.nl/documenten/kamerstukken/2021/02/02/kamerbrief-over-routekaart-zon-op-water>

The national government considers the production of electricity from offshore solar energy as the most interesting option besides offshore wind energy. Offshore solar fields can, as their surface area increases, produce significant electrical power and thus make a valuable contribution in the medium term. However, it is not yet clear whether this will indeed be an attractive option in the long term. The first pilot project in the North Sea started in the autumn of 2019. The Hollandse Kust (north) wind farm will also start to experiment with offshore solar energy. In addition to the EU's ambitions for offshore solar energy and the request from the House of Representatives for a roadmap, these developments give rise to thorough research into the opportunities and limitations thereof.

For offshore solar fields, the space between wind turbines offers the most logical location. The infrastructure to transport the generated electricity to shore is already available. This means efficient use of space, but also efficient use of the existing infrastructure for energy transport. After all, periods with plenty of sun and a lot of wind do not often coincide, but alternate, so it is expected that the offshore grid will be able to dissipate electricity from wind turbines, as well as from solar fields in between. The first large-scale pilot projects (1 MW with growth to 100 MW) are expected in the 2022-2027 planning period, probably within the Egmond aan Zee Offshore Wind Farm, the Princess Amalia Wind Farm, Luchterduinen, Hollandse Kust (north) and Borssele. The Long-Term Mission-Driven Innovation Programme 2 (MMIP2) requires research into the possibilities and perspectives of the extraction of solar energy with installations on water. The main challenges in the development of 'offshore sun' are, for the time being, further reducing the cost price and properly mapping out possible ecological effects. In the case of both 'energy from water' and 'offshore solar energy', it must be investigated whether connection to the offshore grid is possible, without this reducing the transport capacity for the energy that offshore wind farms produce.

Given the opportunities and uncertainties for offshore solar fields, the government has opted to support this development in the innovation phase and to remove obstacles³⁶. This way, the national government is keeping the way open for growth to a marketable option as a substantial, cheap sustainable energy source for the more distant future. In the short term, it is especially important to make large pilot projects possible.

Section 8 deals specifically with the promotion of shared use in wind farms through initiatives in the field of 'new blue economy'. This specifically concerns the elaboration of the policy tasks for energy from water and offshore sun, in combination with the elaboration of the policy tasks for marine food production (see Section 4.2.2) and nature improvement (see Section 3.3.4). Promoting

functional combinations with wind farms is also part of the Area Passports Guide (see Section 10.2) and the assessment framework for multiple use (see Section 10.3).

Actions

- In 2021, the Ministry of Economic Affairs and Climate Policy will investigate how it can be made legally possible for electricity generated in pilot projects for offshore solar energy and energy from water to be transported over the offshore grid.
- The national government will include the use of space and the integration of 'offshore sun' and 'energy from water' in designing the area passports for the wind energy areas.

Knowledge statement

- In 2021, the Ministry of Economic Affairs and Climate Policy and stakeholders will investigate whether it is necessary to include 'offshore sun' in the MOOI scheme, or whether the position of 'offshore sun' in the DEI+ and HER+ schemes is adequate.
- In 2021, the Ministry of Economic Affairs and Climate will investigate how knowledge of the ecological effects of offshore solar farms can be gained and whether space can be found for this in existing research programmes.

³⁶ To be elaborated in more detail in Roadmap for Offshore Sun (PM)

5.4 Management

5.4.1 Electricity: Wind energy

Rijkswaterstaat is the manager of the North Sea and grants permits for activities in the North Sea, such as the construction and operation of wind farms, on the basis of, among other things, the Water Act. The 'general rules for offshore wind farms' (Water Decree) and the wind farm site decisions (Offshore Wind Energy Act) require an operator to include detailed information about the construction and operation of the wind farm in implementation plans. The work must be carried out according to these plans. This is monitored by Rijkswaterstaat. Rijkswaterstaat conducts administrative checks and takes action if violations are found. Rijkswaterstaat is the point of contact for a wind energy operator if he needs information about the wind farm site decision and the submission of his implementation plans. Rijkswaterstaat involves State Supervision of Mines in the assessment of the plans and asks relevant supervisors in the North Sea, such as the Coastguard, for advice. State Supervision of Mines conducts offshore inspections and has the mandate to take enforcement action if immediate action is required. State Supervision of Mines can combine offshore inspections with inspections in the context of working conditions regulations. This way, the government also supervises internal offshore safety (safety of ship and persons on board or of installations and employees). Employees must be able to work in a safe and healthy environment, with safe products, whether this is during construction, during maintenance of the wind turbines or during the demolition of a wind farm.

5.4.2 Gas: Mining platforms and infrastructure

Based on the Water Act, Rijkswaterstaat is the competent authority for cables and pipelines in national waters that are not covered by the Mining Act. This includes issuing water permits for cables and pipelines, checking whether the permit holder complies with the regulations and assessing and checking reports. Bundling and clearing of cables and pipelines in the North Sea to the greatest possible extent is the starting point. In the preliminary phase of a permit application, Rijkswaterstaat, in consultation with the initiator, explores various possible routes and makes the consequences of each variant transparent for other users and interests. The initiator indicates a preferred variant in the final permit application. It is up to the competent authority to make a decision on the route that can be permitted. In addition, Rijkswaterstaat advises the Ministry of Economic Affairs and Climate Policy on pipelines that fall under the Mining Act.

The Mining Act requires the owner to report a cable or pipeline within four weeks of the decommissioning of a cable or pipeline. This is to notify the Minister of Economic Affairs and Climate Policy that the relevant cable or pipeline is out of operation. The Minister of Economic Affairs and Climate Policy will then have the opportunity to oblige the owner to remove a cable or pipeline in accordance with the assessment framework drawn up for this purpose. When an obligation to remove has been imposed, an exemption can be applied for with a view to reuse. As soon as the reuse is terminated, the person who is then the owner has an obligation to remove. The Mining Decree and the Mining Regulations further elaborate on this.

State Supervision of Mines monitors the safe implementation of the CO₂ storage activities in the North Sea. Responsibility for managing the storage site and the monitoring of the stored CO₂ initially rests with the permit holder. After a certain period, approximately twenty years after the storage location is closed, the permit is returned to the State and the State becomes responsible. No supervisory body has yet been appointed for hydrogen (storage).



6 Maritime Transport

Compared to the large, dynamic themes that demand attention, energy, food and nature, maritime transport or sea-going shipping appears to be a stable user of the North Sea, for which everything already seems to be arranged in terms of policy. That picture is only partly correct. It is true that sea-going shipping - probably the first human use of the high seas and other maritime zones - has developed so gradually that policy, management, regulations and facilities have been able to evolve nationally and internationally. Currently, the shipping industry is facing a major challenge to become more sustainable. And in the relatively small, shallow and intensively used North Sea, the spatial claim of emerging other uses requires the utmost care and vigilance to ensure the high standards of safety and reliability of this vital international transport modality of sea-going shipping.

6.1 Current use and developments

6.1.1 Definition of maritime transport in the North Sea

Worldwide, 90 percent of freight transport is carried out by sea. Maritime transport has a strong international character and connects ports in various countries and continents via routes that are as efficient and safe as possible. The North Sea is one of the most intensively navigated seas in the world. In addition to international commercial shipping, maritime transport includes various other sectors: fishing, sea towage, hydraulic engineering vessels, offshore supply, support and construction, passenger ships and pleasure yachts. At the relatively small and shallow North Sea, both route-bound and non-route-bound traffic flows of ships are observed, all having different manoeuvring characteristics, dimensions and speeds converge.

The number of ship movements in the Dutch part of the North Sea is roughly 240.000 per year, about 75.000 of which have a direct relationship with a Dutch port. The port of Rotterdam is the largest port in Europe and one of the largest in the world; but the ports of Amsterdam and the Western Scheldt estuary are also of significant importance to connect the European hinterland with the North Sea. The economic value of maritime transport and sea ports for the Netherlands is high; the total added value of the Dutch ports to the gross national product is approximately 8.6 billion euros, and for the maritime cluster as a whole 24.7 billion euros.³⁷ Periodic traffic analyses of shipping at the North Sea shows an increase in the number of shipping movements, as well as the total tonnage transported.³⁸ The diversity in the composition of shipping traffic also appears to be increasing as also the size of ships is still increasing. Recent studies predict volume growth of 35 to 40 percent by 2030.³⁹

³⁷ NML, 2020, The Dutch Maritime cluster, monitor 2020, page 16

³⁸ Marin, 2020, Network Evaluation North Sea 2018, 2019 Insert a footnote/reference for this

³⁹ PBL Netherlands Environmental Assessment Agency, 2018, The future of the North Sea

The transport of goods via the high seas and other connected maritime zones is of crucial importance for the Netherlands as a distribution country. Parts of the complex routing system and approaches to the ports provide connections with important Dutch estuaries, rivers, sea- and inland ports, ports in neighbouring countries and economically important areas in the region. The network of sea and riverports and inland waterways is connected to other transport networks via multimodal cargo transfer hubs and forms part of a multimodal, synchromodal logistics system.

6.1.2 Efficient, safe and sustainable ocean shipping

The international shipping industry has a common legal basis to facilitate efficient and safe shipping worldwide. The laws and regulations are laid down internationally in the United Nations Law of the Sea (UNCLOS) and elaborated in conventions by the International Maritime Organization (IMO) and its member states and supporting associations such as the International Association of Lighthouse Authorities (IALA). In particular but not exclusively, UNCLOS Articles 58 paragraph 1 (freedom of navigation) and article 60 paragraph 7 (conditions for the development of offshore installations) should guarantee the safety, effectiveness freedom of navigation and safe passage through maritime zones and accessibility of ports by international ships.

Efficient and safe

Safety of navigation is one of the most important conditions for seagoing vessels. Shipping safety on board of the ship (for the ship, crew and cargo) and externally (for the coastal state, objects at sea and the marine environment) must be guaranteed. (International) shipping in the Dutch part of the North Sea is facilitated by means of a coherent, internationally recognised routing system. The increase in the number of offshore wind farms in the North Sea leads to less space for manoeuvring, recovery actions, emergency repairs and salvage operations. Less navigational space also leads to densification of shipping traffic within routing systems. This will increase the risk of collisions and allisions resulting in damage to ships and crew, objects at sea and the marine environment. Based on the existing routing system, it was decided in 2013 to limit the increased risk in the planning phase prior to the construction of offshore wind farms by applying the so-called 'Assessment Framework for safe distances between shipping routes and offshore wind farms' (see Appendix 3). The safe distance is a buffer zone between the shipping routes for commercial shipping and large-scale offshore wind farms. The width of the buffer zone depends on the calculated standard ship length in the route and, in addition to serving as a safe fall-back space for these ships, also serves as a sailing area for non-route-bound traffic (sailing, fishing, offshore work vessels). Aiming for internationally shared principles for the regulation of distances between wind farms and shipping routes, the Netherlands submitted this

national initiative for a design criterion to the IMO in 2016. The IMO has adopted it as a global starting point in spatial planning.⁴⁰

In addition to the design criterion, additional measures are being taken for the Dutch part of the North Sea in order to decrease the cumulative risks of wind farms to shipping safety and to mitigate those risks as much as possible. It concerns, among other things, traffic management at sea, extra supervision and enforcement, extra nautical sensors such as radar, AIS and VHF for a better up-to-date picture of traffic movements and communication with ships at sea, emergency response and towing vessels and extra capacity for Search and Rescue (SAR) and oil spill pollution control. This package of risk mitigating measures has been agreed on for all wind farms that will be built in the context of the 2023 and 2030 roadmaps.

Also, the 'Shipping safety in relation to offshore wind energy' monitoring and research programme was started in 2020. The aim of this research programme is to provide insight into the effectiveness of mitigating measures in relation to the risk caused by offshore wind farms on safety of navigation to substantiate any adjustments to the raft of measures.

Sustainability

Maritime transport has a predominantly international character. The government is, therefore, committed to ambitious agreements about making the sector more sustainable. On an international level, this is organised by the IMO members, specifically by the applicable framework for Maritime Pollution, the so-called MARPOL Convention and the IMO Ballast Water Management Convention. On a European level, the Netherlands has worked in an OSPAR context to reduce illegal pollution of the marine environment from ships and to improve facilities for collecting waste from ships. As a result of the OSPAR collaboration, a background document was published in 2016 on the improvement of the ISO standard in relation to the port reception facilities⁴¹. On a national level, in 2019, the government concluded the Clean Shipping Green Deal with the maritime sector⁴². In this Green Deal, agreements have been made to, among other things, reduce emissions of harmful substances (nitrogen oxides, sulphur oxides and particulate matter) and greenhouse gases (including carbon dioxide, methane and nitrous oxide) in line with MARPOL. For example, it has been agreed that from 1 January 2021, the measures for the North Sea NECA (Nitrogen Emission Control Area) are introduced and will be enforced.

⁴⁰ IMO resolution MSC.419 (97)

⁴¹ Background document "on improving the implementation of ISO standard 21070-2013 in relation to port reception facilities" can be found at: <https://www.ospar.org/documents?v=35420>

⁴² C-230 Green Deal Shipping, Inland Shipping and Ports can be found at: [https://www.greendeals.nl/sites/default/files/2019-11/230 Green Deal on Maritime and Inland shipping and Ports](https://www.greendeals.nl/sites/default/files/2019-11/230%20Green%20Deal%20on%20Maritime%20and%20Inland%20shipping%20and%20Ports.pdf)

6.1.3 Future developments

Shipping to and from offshore locations (mainly for the construction and maintenance of offshore wind farms) will increasingly change the traffic patterns. The emergence of autonomous merchant shipping will probably also play a role in the future. Robust and reliable connectivity (including 5G) is essential for this.

6.2 Vision, ambition and task

The maintenance and development of the main infrastructure for mobility, including shipping routes, has been designated as a national interest in the NOVI. Uninterrupted networks for the whole of the Netherlands and their connection with other countries must be guaranteed. In the future perspective for the North Sea, it must be guaranteed that maritime shipping traffic remains efficient and safe and that the seaports that are important to the Dutch economy are fully accessible. The current safety level of shipping must be maintained as a minimum and improved where possible.⁴³ Sustainable shipping contributes to the national importance of a good quality of the living environment in the Netherlands, and, more specifically to guaranteeing a good water quality and improving and protecting the environment and biodiversity. In the Clean Shipping Green Deal, the government and the maritime sectors have agreed that CO₂ emissions from shipping will be reduced by at least 70 percent by 2050, compared to 2008.

The ambition in the 2022-2027 planning period is therefore to secure efficient and safe shipping traffic and access to the sea ports in an increasingly used North Sea. The emissions to air, water and underwater noise remain within the carrying capacity of the ecosystem according to the MSFD. The North Sea Agreement specifies the specific task of spatial planning of shipping routes for current and future shipping traffic in conjunction with the designation of areas for the growth of wind energy in the North Sea after 2030.

⁴³ Parliamentary document 31409-307. Maritime safety policy framework: Safe Future Shipping

6.3 Policy

6.3.1 Efficient and safe shipping

The current policy for efficient and safe shipping will be continued in the 2022-2027 planning period. This was announced in the Port Memorandum⁴⁴, and elaborated in the Maritime safety policy framework yet to be published. In the internationally established routing system in the North Sea, the unimpeded and safe passage of commercial shipping takes precedence over any other use, such as fishing, recreation and the construction of areas for renewable energy. Oil and gas platforms or other permanent structures are not allowed in the commonly used international shipping routes. When optimising the shipping routing system in the North Sea, the focus is on 'safe and functional', i.e. on applying the design criteria drawn up in 2013 to existing systems, and on applying the IMO principles for distances between wind farms and shipping routes. The ships' routing systems in the North Sea are monitored and tested in terms of functionality, capacity and applied design criteria. Where necessary, the systems are amended and optimised accordingly.

Another point of attention is the international cooperation to formalise routing proposals in border areas at the IMO. Due to additional users of marine resources at the North Sea, additional (cross-border) routing measures are required to facilitate international safe passage of ships and to continue safe and responsible navigation within the existing, connecting sea areas between international ports and seas. An international North Sea shipping group holds periodic consultations to evaluate existing international shipping routes and adapt them where necessary. This in order to identify and spatially safeguard safe passage of ships in view of the accessibility of the connections between seaports and access areas (sea lines of communication). And finally to spatially safeguard other important shipping routes on both a national and international level.

Partly in relation to the designation of new wind energy areas, it has been agreed in the North Sea Agreement to keep the north-eastern connection from Dutch and German ports to the Kattegat (including Esbjerg) free until definitive agreements have been made in this regard at the international level of the IMO. The connection between the Dutch seaports and the north-western traffic separation system must also be safeguarded, and it must be possible to accommodate the expected increase in shipping traffic via the indicated Northern Sea Route (West and East). Chapter 9 presents new routing measures in connection with the designation of new offshore wind energy

areas in the North Sea after 2030. Chapter 10.1 describes the conditions under which passage through offshore wind farms is or will be permitted.

An evaluation of the measures taken for 2025 is on the agenda of the 'Shipping safety in relation to offshore wind energy' monitoring and research programme. This programme will also conduct research into new and innovative measures, the effectiveness of which is still unknown and it will address various research questions about which there are still knowledge gaps.

In the further development of offshore wind energy, timely and sufficient attention must be paid to the integration of mitigating measures for the benefit of shipping safety. This is very important to be able to continue to accommodate international shipping traffic in the Dutch EEZ and to minimise the risk of incidents as much as possible.

Actions

- A polar route (Northern Sea Route, NSR). This international connection route between Asia and Europe via the North Pole is essential for guaranteeing the accessibility of the Dutch seaports as a gateway to Europe in the future. Various route options are already being indicated internationally. During the course of the North Sea Programme 2022–2027, the national and international process to formalise an international connection route between seaports will continue. The resulting clearways and the eventual internationally recognised shipping routes will be laid down in the Mining Regulations and (the partial revision of) the North Sea Programme.
- To guarantee safe passage for shipping, a clearway is kept free by the designated wind energy area of IJmuiden. This clearway is located next to the ferry connection, the connection between the NSR and the port of IJmuiden and Amsterdam.
- Clearway Kattegat towards Germany/Denmark. Together with Germany, Denmark and Belgium, an attempt is being made to integrate the shipping routes in the north-eastern part of the Dutch EEZ towards the Kattegat and the north. This concerns the new connection to the Danish port of Esbjerg, the "Skagen West" traffic separation scheme and the southern Norwegian traffic separation scheme. After nationally designating this connection as a clearway, in cooperation with Germany and Denmark, the international process can be started multilaterally by the involved North Sea countries to designate and propose this connection as an international (IMO) routing scheme.
- National formalisation (recording as clearway) of the Dutch part of the Esbjerg-Hull shipping route based coordination with North Sea countries.

⁴⁴ Parliamentary document 31409-274. Port Memorandum 2020-2030

6.3.2 Making shipping in the North Sea more sustainable

The Ministry of Infrastructure and Water Management will support the development of zero-emission ships by removing regulatory obstacles. In that context, the national government expects the broad and ambitious approach of the European Green Deal to offer opportunities to accelerate investments in sustainable alternative fuels and propulsion technologies, contributing to SDG 13 Climate action.

6.4 Management

The management tasks in the North Sea in the field of efficient, safe and sustainable shipping are carried out under the flag of the interdepartmental partnership of the Coastguard. The Coastguard also has service tasks, enforcement tasks and tasks in the field of maritime security. Coastguard service tasks include Search and Rescue (SAR), Disaster and Incident Control (RIB) and nautical management. Enforcement tasks are intended for road safety at sea and for compliance with environmental legislation. Maritime security in a general sense includes protection against malicious acts, including acts of terrorism. The assignment to the Coastguard is formulated annually in the Combined Annual Plan (GJP). This is a bundling of the service, enforcement and maritime security plan. The Coastguard Council adopts the Combined Annual Plan. The Ministry of Infrastructure and Water Management is the coordinating principal and chairman of the Council. Rijkswaterstaat acts as delegated principal, is chairman of the executive committee (KW4/7) and draws up the service plan for the Coastguard.

Nautical management

Rijkswaterstaat is responsible for managing the North Sea as a coordinating water system and waterway manager. The management tasks, partly carried out by Rijkswaterstaat itself, include: waterway marking (commissioned by the Coastguard), monitoring and network analyses, crisis and incident control, maintenance and depth maintenance (for example dredging) of the access channels to the ports and the removal of objects from the seabed at anchorages. Also, in the coming planning period, Rijkswaterstaat will implement, monitor and investigate the total package of shipping measures to mitigate offshore wind farm risks on the safe navigation of ships. Examples are: nautical sensors, marking and identification of wind turbines, extra emergency towing assistance and vessel traffic management (VTM) in the vicinity of the wind farms at the North Sea.

Information provision

Nautical information provision is vital for safe and efficient shipping traffic. This information is partly static, such as sea charts, but to a large extent also dynamic, such as the reporting on traffic situations in access channels, the weather and water levels and the current reports to seafarers. The Hydro Meteorological Centre of Rijkswaterstaat's Water Management Centre calculates the tidal gates for the Euro-Maasgeul, IJ-geul and, in the near future, also for access to Eemshaven. Tidal gates are the periods around high tide during which the deep draft ships can safely enter and exit the access channels. The admission policy to the Scheldt estuary ports is internationally regulated in the Scheldt Conventions and the associated implementing decrees. This Dutch-Flemish admission policy is called Joint Nautical Management (GNB). The Joint Nautical Authority (GNA) implements the policy at the Scheldt Coordination Centre in Vlissingen. The Coastguard is the operational nautical manager of the North Sea, with the exception of the approach areas to and from the seaports.

Maritime Emergency Assistance (Search and Rescue)

Maritime emergency assistance includes locating and rescuing people in distress, providing emergency towing assistance, providing refuge to ships in distress, providing assistance to prevent large-scale evacuations in the event of fire on board ships and providing medical advice to seafarers. The Coastguard carries out these tasks. The Search and Rescue task of the Coastguard also extends over municipal areas (the first kilometre off the coast), where the Coastguard carries out these tasks on behalf of the security regions. The care standards and the associated emergency assistance are laid down in the Policy letter maritime and aeronautical emergency assistance in the North Sea.



7 Other national interests in the North Sea

National interests are more important than interests which do not have this status. However, particularly with respect to national interests, it is about finding the right balance between the social and economic use of the North Sea and the objectives aimed at restoring and preserving a healthy and robust ecosystem. Obviously, important interests cannot be subordinated or pushed aside. A greater effort in terms of policy is therefore required to enable them to coexist harmoniously. The keyword here is sustainable use. This is the essence of the vision of the Dutch government which is expressed in the National Strategy on Spatial Planning and the Environment (NOVI) and, by extension, the North Sea Agreement. Sustainability as the guiding principle for all designated functions can lead to a North Sea which is still intensively used in 2050, but in which the nature values have been restored.

In the previous chapters, three national, strongly interrelated interests which are undergoing a long-term transition were described: CO₂-free energy supply, sustainable fishing and the conservation and restoration of a robust ecosystem. These transitions interact with national interests relating to maintaining and developing the main infrastructure for mobility, including shipping routes. Chapter 7 describes the policy for integrating the other national interests in the integral scenario of the North Sea in 2050. Those other national interests are sand extraction for flood risk management and construction, the main infrastructure in the North Sea for digital connectivity, national security, military activities, cultural heritage and landscape quality, and a healthy and safe physical habitat.

7.1 Sand extraction for flood risk management and construction

7.1.1 Current use and developments

Sand and shells are surface minerals. When extracting sand, a distinction is made between suppletion sand, fill sand and concrete and masonry sand. The North Sea already provides all the suppletion sand and around a third of the fill sand for construction and infrastructure in the Netherlands. Of the countries bordering the North Sea, the Netherlands extracts the most sand. Not including occasional projects, it extracts over 25 million m³ per year⁴⁵, of which half is suppletion sand and half is fill sand. This concerns an area of roughly 60 to 90 km² every five years. Occasional large-scale sand extraction in addition to the regular suppletion programme may be necessary for the local reinforcement of our North Sea coast. Fill sand is mostly destined for the western Netherlands. Here, in the urban area, there is limited space available for sand extraction and the sand in the ground is mainly beneath clay and peat layers.

Offshore sand extraction is categorised as 'shallow' (< 2 metres) and 'deep' (> 2 metres) extraction. In recent years, sand has regularly been extracted from below a depth of 2 metres, among others for the Sand Engine. For the construction of Maasvlakte 2, sand was even extracted to a depth of 20 metres. Extraction to a greater depth is preferred so long as the risk of delayed recolonisation of seabed creatures and oxygen depletion is minimised and the gradient of the pit remains limited. In the case of excavation down to a depth of 2 metres, the recovery period for life on the seabed is between four and six years. For excavation down to a depth of 6 to 8 metres, a similar recovery period is assumed, because such depths naturally occur in the seabed. The Monitoring and Evaluation Programme (MEP, 2018-2027) which emerged from the Strategic

⁴⁵ National Committee on the Coordination of Extraction Policy.

Environmental Assessment of the sand extraction is studying this.⁴⁶

Potential areas for the extraction of concrete and masonry sand lie to the west of the Zuid Holland islands and Zeeland. This type of sand is several metres below the seabed. The large amount of sand from the cover layer, which needs to be removed first, can be used as suppletion or fill sand. At sand extraction sites for the construction of Maasvlakte 2 several years ago, the concrete and masonry sand is now nearer the surface.

The rising sea levels which are expected as a result of climate change has an impact on the amount of suppletion sand required. The Coastal Genesis 2.0 research programme studied how much sand is required to keep the sandy system of the coast in balance with rising sea levels. This study will also indicate when and where the sand must be deposited.⁴⁷ If the aim is to widen dykes and knolls on land, these there will also be a sharp increase in demand for fill sand. The guarantee of enough sand at reasonable excavation costs for the coming fifty years is already under pressure, particularly for the maintenance of the coast between Katwijk and Egmond, the coast off Texel, Vlieland and Terschelling, and the coast off Walcheren and Kop van Schouwen. In the other areas, there is no shortage of sand.

In the Coastal Genesis 2.0 knowledge programme, extensive research was also conducted into the behaviour of sediment flows in the Dutch coastal zone in relation to the expected rising sea level. Urgent knowledge questions included: How much sand is required for the period after 2020? Where can suppletion sand be best (strategically) placed? When are turning points expected for the suppletion policy? How should suppletion (probably) best be done in the future? Based on this research, a preferred strategy for suppletion was elaborated for the period up to 2035. An impression was also drawn up for the period up to 2100, assuming faster rising sea levels.

The required amount of suppletion sand until 2032 is expected to be 11 million m³ per year, based on current insights into the speed of rising sea levels (third review Delta Programme). The need for fill sand continues to be around 15 million m³ per year. After 2032, a new estimate will need to be made, based on the new insights into rising sea levels. This may mean an increased need for suppletion sand from 25 to 35 million m³ per year in the second half of this century. The speed at which sea levels rise and the extent of the coastal foundation zone are important factors for determining the suppletion volume required for coastal maintenance. These factors are part

⁴⁶ Kleijberg, R. (2018) Monitoring- en Evaluatieplan Zandwinning Noordzee (2018-2027). Plan van Aanpak. Rijkswaterstaat Zee en Delta en Stichting La MER Arcadis rapport 079885268 0.1 29 June 2018, Arcadis B.V.

⁴⁷ https://dp2021.deltaprogramma.nl/6-voortgang-per-gebied.html#h6_6

of the follow-up study in the Knowledge Programme for rising sea levels.

In the North Sea, specialist companies extract shells from sediment layers which mainly consist of residue from dead shellfish. These are used for various purposes, for example in drainage systems and for insulation and paving.

7.1.2 Vision, ambition and tasks

The availability of sufficient quantities of affordable sand for coastal safety, construction activities and infrastructure must be safeguarded, also for the long term. Guaranteed availability contributes to the national interests of flood risk management and climate resilience and to interests relating to housing, mobility and the business climate.

The method of extracting surface minerals must be socially acceptable. The construction materials policy is based on the principle that use is economical and high quality. This means that high-quality coarse sand and gravel may not be used for fill purposes.

Considering the total surface area of the Dutch North Sea, sand extraction does not take much space. For cost-efficient management, it is desirable that the area where sand can be extracted most affordably remains available for sand extraction. This principle of cost effectiveness means that the demand for space is mainly focused on the busy southern part of the North Sea. This is also where there is a concentration of shipping, oil and gas production, recreation and fisheries. In the areas with the most cost-efficient sand stock and where sand extraction has top priority, the pressure also increases due to the construction of wind farms and laying of electricity cables. This means that interests must be carefully considered. In view of climate change and the increasing claim to space, particularly by activities related to energy production, a review of the sand extraction strategy will be necessary in the long term. This could be included as part of the third review of the Delta Programme, with options for spatial direction.

7.1.3 Policy

The policy is aimed at reserving sufficient offshore sand stocks which can be extracted for acceptable and reasonable costs as suppletion and fill sand. This will ensure that we are prepared in the short and long term for the tasks for which this surface mineral is required.

Actions

Based on the results of Coastal Genesis 2.0, between 2022 and 2027, an exploratory study will examine whether custom work can be delivered at IJmuiden to determine the position and boundaries of the desired sand extraction area. This will be necessary if there are plans for the area to be crossed by more cables or pipelines.

Knowledge agenda

More insight is required into the growth scenarios for sand extraction and suppletion in relation to the various climate scenarios and associated rising sea levels. This is a knowledge task. The coast spatial consequences and possible bottlenecks, shortages and extra costs (for extraction further off the coast, for example) must also be included in the study. The development of other use (such as wind energy, cables and pipelines) is a given context here.

Sand extraction disturbs life (and the habitat) on the seabed. Furthermore, sludge is produced during sand extraction, which can have an impact on the primary and secondary production. The growth scenarios for sand extraction and suppletion must therefore also indicate whether and how this impact fits into the applicable policy frameworks and regulations for nature and the environment after 2030. These questions could be addressed in the framework of the second review of the Delta Programme.

7.1.4 Management

The statutory framework for the extraction of construction materials in national waters is provided in the Earth Removal Act, the associated Earth Removal in National Waters Decree and the Earth Removal in National Waters Regulation. In addition, Rijkswaterstaat has drawn up 'Policy rules for earth removal in national waters' to support licensing and enforcement. The Earth Removal Act will be incorporated in the Environment and Planning Act on 1 January 2022.

The licensing procedure for sand extraction (both commercial and coastal management) will be assessed via a SEA. In recent years, sand has been extracted at deeper depths, so 8 metres, and down to 20 metres for major projects like Maasvlakte 2. The area of the seabed that is disturbed every year has therefore reduced and is now an average 16 km² a year. Sand extractors now also consider the sludge level in the sand and the presence of hard substrate, such as stones and shell banks populated by *Ensis* and *Spisula* species. They avoid these areas.

The earth movement licence imposes the duty to investigate the assumptions and impact described in the SEA. In partnership with Foundation LaMER, which represents the interests of all commercial sand extractors, Rijkswaterstaat has drawn up an action plan for the Monitoring and Evaluation programme (MEP) Sand Extraction North Sea 2018-2027. This plan describes,

among others, the approach to research into the (ecological) recolonisation of sand extraction disciplines, the presence of shellfish banks and the impact of the fine sediment released on the ecology.

The actual extraction of construction materials is not a government task. Rijkswaterstaat is responsible for flood risk management and healthy water and smooth and safe traffic over water. Based on these tasks, it regulates the extraction of construction materials with licensing and enforcement. In doing so, Rijkswaterstaat also considers other use functions and conditions, such as cultural-historical values.

Rijkswaterstaat grants licences for the extraction of construction materials in the national waters based on the Earth Removal Act and tests applications against the relevant frameworks. If Rijkswaterstaat initiates coastal maintenance, the organisation acts as manager and the Human Environment and Transport Inspectorate issues the licence. Obviously, Rijkswaterstaat is then also responsible for coordinating with other designated uses.

7.2 Main infrastructure for digital connectivity

The cables for the network for phone and data traffic are different from the cables in the energy grid in the North Sea. This is described in Chapter 5.

Achieving and retaining high-quality digital connectivity is a national interest. In the seabed of the Dutch North Sea, around 2200 km of cables for communication and electricity are currently in use. The first cables were part of the transatlantic telecommunications connection between Europe and North America, the first of which were laid early in the 19th century. Since then, the number of telecom cables has grown steadily. For a long time, phone cables had a core of copper wire. Now, glass fibre cables are the standard for telephone and data traffic. Outdated copper cables are no longer used and some have been removed.

Most of the infrastructure of glass fibre cables for telecommunications was laid around twenty years ago and needs replacing. At the same time, the growing data traffic requires more capacity. Three new telecommunications cables with high capacity are currently being laid between the Netherlands and the United Kingdom. New telecom cables are expected to be laid in the coming years.

The policy, management and duty to remove telephony and data cables is the same as for electricity cables. For these aspects, see chapter 5. Chapter 9 describes the policy relating to spatial integration.

7.3 National security: maritime safety and boundary monitoring

7.3.1 Current use and developments

Security on the North Sea is concerned with public order, criminal law enforcement, maritime security, including *cyber security*, crisis control and disaster management and boundary monitoring, as well as other security tasks which are all or partly carried out by (mainly enforcing) organisations or within the Coastguard Alliance.

The construction of offshore wind farms can have an impact on public order and law enforcement at sea, both inside and around the farms. The safety of shipping is at risk, as is the possibility of subversive criminality, including smuggling. Another risk is cybercriminals which use the farms or target them. In terms of security (both *safety* and *security*), wind farms therefore have a clear relationship with (shipping) safety, maritime and *cyber security*, enforcement and detection. For the further development of offshore windfarms, risk assessments, including the usual risk scenarios, are therefore essential.

There is less and less space available for shipping in the North Sea. In the future, it will be possible for ships up to 46 metres in length to pass through wind farms. These developments increase the probability of shipping violations and collisions between ships or with offshore installations. The security domain is also facing rapid, innovative developments in the North Sea, such as autonomous sailing, production and storage of hydrogen, CO₂ storage and the dismantling of installations for oil and gas production. The safety aspects involved in these developments also require a proactive policy and resulting investments.

Cyber and maritime security

In the long term, Dutch society will become strongly dependent on energy generated in the North Sea. This part of the energy sector therefore belongs to the vital infrastructure. Embedding the safe and undisturbed functioning of (work) processes to a reasonable extent is thus a point of attention.

Not everyone endorses or supports the national interests in, on and around the North Sea in the same way. The clearer and more concrete the future plans for the North Sea become, the clearer the policy initiatives on and in the North Sea become for supporters and opponents. This is a good thing. Social and political dialogue then gets more substance. Unfortunately, we also need to consider the threat from state actors, people or groups who are intent on misuse, espionage, sabotage or terror, and protection the people, professional groups and interests which could be affected as a result.

With the developments on the North Sea, various national interests also extend to the Dutch sea area. A reasonable degree of embedding the safe and uninterrupted functioning of (work) processes to represent these interests then becomes more important. Prior to formulating measures, it is therefore vital to have a good idea of the possible risks involved in the developments. These must be addressed and weighed before they can be an integral part of plans relating to the vital infrastructure of the Ministry of Economic Affairs (EZK). They must then be incorporated in the National Security Profile and be further elaborated in the relevant national crisis plans.

Boundary monitoring

Offshore boundary monitoring is a task of the Royal Netherlands Marechaussee and the Customs which they perform in a Coastguard Alliance. Customs border activities are focused on the security, integrity and fiscality of transboundary freight traffic, aimed at protecting society from unsafe, undesired or criminal goods. Boundary monitoring for the Royal Netherlands Marechaussee on the North Sea involves preventing illegal migration and migration-related criminality such as human trafficking.

7.3.2 Task and vision

The government consistently focuses on the security of shipping on the North Sea, among others in the framework of the IMO, for example by installing security equipment in and near wind energy areas and by extending the basic capacity for offering emergency response and rescue. The government also takes measures to bring cyber security to an acceptable risk level. These measures are related to people (awareness and training), organisation and processes (work instructions, protocols and escalation lines), and technology (reducing technical vulnerability). Within the security domain, the use of digital resources will be intensified and their efficient use will be promoted.

7.3.3 Policy

The policy focuses on monitoring the safety of the information provision and of vital objects on the North Sea, including any necessary measures to be taken.

With respect to the security aspects of public order, criminal law enforcement and boundary monitoring on the North Sea, the Public Prosecution Service, the services working in the Coastguard Alliance and the Coastguard organisation itself have made agreements about the elaboration of the policy plans. The focus will mainly be on governance relating to public order at sea, including its international aspects. The possible increase in reports of incidents at sea and how to anticipate them will also receive extra attention.

In 2020, the cluster 'maritime security' was added to the tasks of the Coastguard. Under pressure from the developments on the North Sea, this responds to the necessity to identify security threats in the maritime domain in good time and to implement a satisfactory response to prevent disruptive damage by deliberate acts such as terror attacks.

Both the direct and indirect impact of the transitions on security will require attention. In the framework of subversive criminality, the Public Prosecution Service has therefore decided to conduct a further investigation into the relevant sectors.

7.3.4 Management

Rijkswaterstaat has a *Security Operation Centre* (SOC). Through monitoring and detection, the SOC protects the information provision and industrial automation of Rijkswaterstaat from cyber threats.

7.4 Military activities

7.4.1 Current use and developments

The army uses the North Sea wherever it is suitable for training purposes. For specific activities like target practice, low flying or exercises in placing and detecting mines, formal military areas have been designated. The boundaries for the designated areas are set in the Mining Regulation and via the aviation regulation. The boundaries are published on aviation maps as well as in the Notices to Mariners and through the General Rules (Spatial Planning) Decree. When the Environment and Planning Act is implemented in 2022, the latter decree will be converted into a regulation under the Environmental Quality Decree. In general, the boundaries of areas designated for military purposes are also shown on the map on which the current use is presented (see map 1).

The intensity of the use for military exercises varies. In some areas, shots may be fired from aircraft and/or ships. In a few designated areas, shots are fired from land. Some of these are exercises, others involve testing military systems. Areas designated for specific use may overlap to some extent. The need for space for military use is stable. No significant changes are expected in this planning period.

gebruik is stabiel. In deze planperiode worden geen wezenlijke veranderingen verwacht.

7.4.2 Vision, ambition and tasks

Military exercise zones at sea are necessary to ensure that the armed forces remain well trained and prepared. An army that is prepared for its tasks is a national interest. Reserving sufficiently large areas for the various military activities is a permanent task, even if the use of the North Sea for other functions increases.

7.4.3 Policy

Sufficient exercise zones must be available in the North Sea. In principle, multiple use of exercise zones is permitted insofar as this can be combined with the military exercises. The Minister for Defence will decide in the first instance. Most defence areas on and above the sea surface are unsafe when being used for shooting and/or flying activities. When no exercises are taking place, these areas can be used for other activities. No permanent objects like drilling platforms or wind turbines may be located in military exercise zones. The probability of damage is too great and the military use of the zone could be restricted.

In the Designation Naval Forces Command, the Ministry of Defence focuses on responsible use of active sonar for a code of conduct for the clearance of explosives, aimed at minimising the impact of underwater noise on marine mammals.

Actions

In the framework of the Environment and Planning Act, an investigation will be launched to see whether granting permission for multiple use of designated exercise zones should be organised more formally.

7.5 Cultural heritage and landscape quality

7.5.1 Current situation and developments

A rich cultural heritage exists in and on the seabed of the North Sea, such as shipwreck remains which have been preserved as time capsules. The North Sea was not always sea. Around ten thousand years ago, hunter-gatherers lived in this area. Their traces can also be found in the seabed of the North Sea. These archaeological remains are an important source of knowledge about the past. As long as they remain covered in the seabed, they can survive for thousands of years or longer. When they come to the surface, they become more vulnerable to natural erosion.

Plundering wrecks for their valuable cargo or, in more recent wrecks, for their metal value, endangers our underwater cultural heritage. Modern tracing and salvage techniques make it much easier to locate and reach shipwrecks. These wreck sites are popular with recreational divers. The rule is that wrecks may be visited but no parts or content of the (ship)wreck may be taken.

Offshore spatial developments related to the energy transition, raw material extraction, fishing and aquaculture also increase the likelihood of valuable heritage being lost, particularly during operations in the seabed. On the other hand, these developments also provide opportunities for archaeological and geological research, which can produce new knowledge about the past.

7.5.2 Vision, ambition and tasks

The cultural heritage in the North Sea has an important socio-cultural and historic significance for the Netherlands. It is an important source of knowledge, experience and memory of our past. The commemorative value of wrecks and aircraft from the First and Second World Wars is important both to society as a whole and to surviving relatives. In the National Strategy on Spatial Planning and the Environment (NOVI), retaining and enhancing cultural heritage and landscape and natural qualities of (inter)national importance are formulated as a national interest.

The task is to preserve the underwater cultural heritage, where possible in situ (where it is found) and to increase our knowledge about the past. This can conflict with other national interests on the North Sea, such as sand and gravel extraction, the construction of wind farms and fishing. For that reason, up-to-date insight is required into the nature, extent and location of archaeological sites and of the (landscape) zones where they may be found. Drawing up an inventory in good time makes it possible to integrate archaeological sites and to combine them with other use of space. If this is not possible, the scientific value can at least be secured by studying the archaeological sites.

7.5.3 Policy

In the North Sea, the government is responsible for the results of cultural heritage policy. The government policy for managing archaeological heritage is based on the principles of the Valletta Convention. This convention covers the protection of archaeological heritage as a source of the European common memory and for historical and scientific studies. The aim is to preserve the archaeological heritage, preferably where it is found (in situ) and to consider the archaeological interest in spatial zoning procedures and planning projects. The convention must also ensure that environmental assessments and the resulting decisions take archaeological remains and their context into account. The costs of the required archaeological research are charged to the initiator (the 'the polluter pays' principle).

In the government letter "Heritage Counts, the significance of heritage for society"⁴⁸, the Dutch government announced that it would give extra priority to looking after the maritime archaeological heritage. This will be done in the Netherlands Maritime Heritage Programme by the Cultural Heritage Agency of the Netherlands (RCE), which monitors, assesses and physically protects underwater archaeological remains. Looking after our underwater heritage is a shared task, involving other government authorities, knowledge institutions, enforcement agencies, social organisations and volunteers. The increasing attention for underwater cultural heritage is also expressed in the announcement that the Dutch government will ratify the UNESCO Convention on the Protection of the Underwater Cultural Heritage (2001)⁴⁹. This convention aims to combat the plundering of our underwater archaeological heritage, particularly shipwrecks. The convention is a legal instrument, which also provides an important mechanism for international collaboration in this field.

⁴⁸ Session 2017-2018, appendix to Parliamentary document 32820, no. 248.

⁴⁹ Session 2015-2016, document 34300-VIII, no. 146. By ratifying the convention in 2001, the Netherlands is committed to the principles and the annex of the convention.

The policy for managing the archaeological heritage of the North Sea extends along the following lines:

- *Knowledge about the archaeological archive*

To be able to manage and protect the cultural heritage in the North Sea, we must know what archaeological heritage is present in the seabed and where it is located. Information about wrecks is available via Geoweb, to which the RCE shipwreck database and the object data of Rijkswaterstaat and the Hydrographical Department are linked. Updating this information is a continuous process. Furthermore, together with Rijkswaterstaat and TNO, the RCE has developed an archaeological-geological map for the entire continental shelf with zones where intact prehistoric landscapes are expected to be found. The map will be refined with new information from recent and future studies. The above-mentioned knowledge products help policymakers and initiators assess whether and to what extent they will encounter items of archaeological value in a spatial development.

- *Licensing*

Items of archaeological and cultural-historical value are taken into consideration in granting licences for projects in the North Sea. Analysing the impact on these items is a compulsory part of the strategic environmental assessment. The initiator of activities that require a licence under the Water Act or the Earth Removal Act but for which no EIA needs to be performed submits a report along with the licence application, sufficiently assessing the archaeological interest in the area according to the competent authority. Research into the presence of wrecks is nearly always requested. Ships may obviously have sunk anywhere at sea. This means that there is potential for historical shipwrecks. If, based on this report, it is concluded that the work may have an adverse impact on archaeological values, the competent authority could attach further provisions to the licence, such as a duty to take technical measures for in-situ conservation or for an archaeological assessment and archaeological excavations. The initiator will be required to have the work supervised by an expert in maritime archaeological preservation of monuments. For mining activities requiring an EIA, such as deep drilling and laying certain pipelines, the archaeological interest and other cultural-historical values are considered in the decision as to whether to grant a licence. Finally, before salvaging or clearing wrecks with a cultural historic value, a further assessment must be made. In this assessment, the principles of the annex to the 2001 UNESCO convention are guiding.

Actions

- The Dutch government ratifies the UNESCO Convention on the Protection of the Underwater Cultural Heritage (2001).

Knowledge agenda

- The archaeological-geological map of the entire continental shelf will be refined with new information from recent and future studies.
- The RCE performs research to chart the impact of work on the underwater heritage.

7.5.4 Management

Rijkswaterstaat is the coordinating manager of the North Sea for cultural heritage. Together with the other government bodies concerned, the Ministry of Defence and the Ministry of Education, Culture and Science (the RCE acting on behalf of the latter), the manager views the management aspects of cultural heritage for each situation. The RCE advises the competent authority about management measures required to preserve the cultural heritage.

The Netherlands Maritime Heritage Programme identifies the most valuable underwater cultural heritage, as well as possible threats. This overview is leading for decision making based on an assessment framework about the measures to secure the heritage. This might include periodical monitoring of the physical status, covering a wreck to protect it from erosion or securing the information value by means of an excavation. The desired measures are recorded in management plans of the RCE and discussed with Rijkswaterstaat.

7.6 Healthy and safe physical environment: recreation

7.6.1 Current use and developments

The North Sea and the coast have an important societal value which is expressed, among others, in the number of recreational visitors to the sea and coast. The 250-km long Dutch sandy beach and the dunes behind it draw tourists from home and abroad. Along the coast, there are resorts and marinas. The coastal area provides around 25 percent of the overnight stays in the tourist industry, representing 3 percent of the gross national product and 5 percent of employment in the Netherlands.

Recreational shipping with private yachts, motorboats and charter boats are important activities on the North Sea. For recreational shipping, the accessibility of sufficient harbours with good amenities along the North Sea coast, space at sea and safety are important policy aspects. Anglers (recreational fishing with rods) are increasingly active at sea. They fish from the shore, from small boats and from chartered boats. For recreational divers, shipwrecks are popular destinations. Close to the coast, a range of recreational activities have emerged: sailing, surfing, water-skiing and swimming as well as many beach activities. Use of the sea and coast for various recreational purposes is expected to intensify in the future.

Recreation on the North Sea will be influenced by (increasing use of space by) other designated uses. Due to the location of the wind farms, if there would be no special measures, recreational shipping would be obliged to use routes for commercial shipping. Before ships cross military exercise zones, skippers must listen to the shipping reports.

7.6.2 Vision, ambition and tasks

Recreational use of the coast and the North Sea is an important motive to promote and safeguard these areas as a healthy and safe physical environment. The NOVI identifies this as a national interest. However, recreational use also creates several pressure factors. In the spatial planning of the North Sea, it is important to take sea and coastal recreation into account. The general sustainability task requires a reduction in disturbance and pollution of the North Sea

ecosystem by recreational activities. The increasing numbers of cruise ships will also create tasks relating to logistics and the environment.

7.6.3 Policy

Increasing recreation at sea and on the coast can have an impact on the marine ecosystem. Recreational vessels and cruise ships emit greenhouse gases. Recreation can lead to litter that ends up in the dunes and sea. For this reason, awareness and clean-up campaigns are being implemented and the national government is working with provinces and municipalities on policy for the circular economy.

With the Coastal Pact, the government authorities and social organisations involved with the coast are striving to find a balance between coastal development and protecting its core qualities and collective values. The Coastal Pact and the housing policy ensure that vulnerable nature in the coastal regions is protected and that no building takes place there. The nature policy at regional and local level is the responsibility of provinces and municipal councils.

The national government, entrepreneurs and market and knowledge institutions work together in a network to facilitate and stimulate tourism and the recreational sector. Local and regional government authorities are usually active in a similar context on and near the coast. The national government consults local and regional government authorities and other parties when spatial planning or other policy developments on the North Sea impact maritime and coastal recreation.

The policy for recreational shipping as a participant in shipping traffic is described in chapter 6. Chapter 9 describes the spatial planning of the North Sea, taking the interests of recreation into account. Chapter 10 specifically addresses the policy framework for shipping and multiple use of wind farms.

Sustainability of tourism and recreation is shaped via various policy terrains. Reducing pollution, among others by agreements with the sectors in the *Green Deal Clean Beaches*, is described in chapter 3. That chapter also addresses the protection of natural areas, including the reduction of disturbance by recreation. As part of shipping, small recreational boats right up to cruise ships are subject to (international) policy and regulations to prevent pollution caused by shipping, as described in chapter 6. To preserve cultural-historic values, measures have been taken to protect shipwrecks, see paragraph 7.5.

7.7 Meteorological and hydrological information provision

7.7.1 Current use and developments

Some oil and gas platforms in the North Sea have sensors which collect data for government services. For example, KNMI has installed measuring instruments on fourteen oil and gas platforms for meteorological and oceanographic observations (see figure x). The Coastguard, Netherlands Air Traffic Control (LVNL) and Rijkswaterstaat also have sensors on such platforms. This data collection is relevant for different users, including the general public, the government, tracing and rescue services, shipping and different types of aviation. The basis for this construction lies in the Mining Act (article 52 (3)). This determines that equipment may be installed on a mining installation to do observations.

Due to the expected decline in the number of oil and gas platforms in the North Sea (see chapter 5, paragraph 5.1.1), the current measuring network risks becoming eroded. In 2020 and 2021, three platforms which were used for taking measurements were dismantled (F16A, 2020; Hoorn-A, 2021; and D15-FA-1, 2021; see figure 7.2). This means that less meteorological data is collected on the North Sea. It is likely that buyers of KNMI products will more frequently encounter risky weather conditions, for which it is difficult to provide sufficient or timely warning. Furthermore, there could be disruption in the long-term measurement series in the framework of research into the impact and interpretation of climate change. Alternatives are therefore being sought for the southern part of the North Sea.⁵⁰

7.7.2 Vision, ambition and tasks

The increasing use of the North Sea, particularly the southern part, is expected to produce a growing need for data and advice, for example with respect to shipping and aviation near wind farms. Safeguarding and promoting a healthy and safe habitat and safeguarding flood risk management and climate resilience are national interests. The availability of meteorological and hydrological data information from area-covering measuring locations in the North Sea is

therefore crucial. The task is to guarantee the survival of such measuring locations for the future.

7.7.3 Policy

Taking an increasing need for data into account, the policy is focused on continuity in the extent and quality of the information provision, based on satisfactory observations at measurement locations on the Dutch Continental Shelf. The data need from Rijkswaterstaat, LVNL and the Coastguard for the medium term must also be explored. The cohesion between all these needs and the problem of the connections between sensors and mainland are important points of attention.

Actions

In consultation with all involved, sustainable solutions will be developed for collecting relevant data far out at sea and the connectivity with the mainland.

7.7.4 Management

Rijkswaterstaat, the Coastguard, the KNMI, the Dutch air traffic control and the Netherlands Oil and Gas Exploration and Production Association (NOGEPa) are elaborating the future information need. As coordinating manager of the North Sea and developer of the Offshore Expertise Centre, Rijkswaterstaat plays an important coordinating and implementing role.

⁵⁰ However, there was no clarity when the North Sea Programme was being drafted



Figure 7-a: overview meteorological measuring points North Sea



8 Sustainable blue economy

*Blue Growth*⁵¹ is the long-term strategy of the European Commission to support the development of sectors in the maritime industry which have great potential for sustainable employment and sustainable growth⁵². The European Agenda *Blue Growth* from 2012, updated in 2017, lists the goals for the new EU policy: aqua and mariculture, marine and coastal tourism, renewable offshore energy production, blue biotechnology and the exploration of the deep sea.

The Netherlands has developed *Blue Growth* under the name Sustainable blue economy (DBE) and thus ensured wider integration in the existing and proposed policy. Besides the emerging industries mentioned with respect to *Blue Growth*, the term used in the Netherlands, Sustainable blue economy, covers all the other areas of marine and maritime industry, including fishing, shipping, supply companies and the offshore in the wide sense. Thus, Sustainable blue economy has become a powerful driver and process environment for many, until recently, ad hoc initiatives focused on sustainability. The EU is following this Dutch approach, also with respect to determining the extent of the blue economy and the related employment. The design of the Netherlands Maritime Monitor is reflected in the annual Blue economy report by the European Commission.

⁵¹ Communication from the Commission (COM(2012) 494 final): Blue growth: Opportunities for sustainable marine and maritime growth

⁵² <https://eur-lex.europa.eu/legal-content/NL/TXT/PDF/?uri=CELEX:52012DC0494&from=EN>

8.1 Current use and developments

In autumn 2020, the European Commission started a procedure that, in conjunction with the ambitions of the *Green Deal*, results in a new approach to the Sustainable blue economy. The European Commissioner for the Environment, Oceans and Fisheries gave instructions for this integrated new approach to be elaborated and implemented in this planning period. Sustainable multiple use of space on the sea and coast and the planning based on the ecosystem is part of this new approach. The Netherlands will actively contribute to the development, elaboration and implementation of this strategy for the Sustainable blue economy. EU frameworks and strategies, such as for the further increase of energy from offshore wind farms⁵³, are important for the economy, the ecological recovery, the protection of nature values and for research and innovation in the Netherlands. European cooperation in these aspects is important for the Dutch industry and the government in terms of scale increase, upscaling activities, a *level playing field*, *research and development* and innovation, as well as *human capital* and financing.

Themes which need attention in the blue economy are:

- Sectoral policy, including sustainable shipping
- Rollout of the task for offshore wind energy
- Roadmap alternative energy forms and transport options (roadmap energy from water, and framework for 'sun at sea')
- Roadmap sustainable food production, including seaweed and shellfish farming
- Attention for tourism and the leisure economy
- Sustainability and innovations in fishing
- Other opportunities, such as with blue biotechnology (see explanation in box)

⁵³ Communication from the Commission (2020) 741: An EU Strategy to harness the potential of offshore renewable energy for a climate neutral future (19.11.2020)

- Continued support for improving sustainability of existing sectors in the blue economy, and giving new emerging sustainable initiatives a place at sea
- Continue the Community of Practice North Sea.

Marine biotechnology

Marine life has adapted to thrive in extreme habitats in the sea. Blue biotechnology is concerned with the exploration and exploitation of various marine organisms to develop new products. Exploration of the biodiversity in the sea could enable us to develop new medication or industrial enzymes which are resistant to extreme conditions and which therefore have a high economic value. In the long term, it is expected that the sector will offer employment to a highly qualified workforce and provide many opportunities further up the chain.

8.2 Vision and tasks

The United Nations Sustainable Development Goals for 2030 (SDG)⁵⁴ dating from 2015 strive towards achieving sustainable interaction with our planet and the welfare of its inhabitants. The conservation and sustainable use of the seas (SDG 14) can help achieve these goals and is an integral part of the Sustainable Development Agenda. The blue economy can thus also contribute to the ambitions for 'Zero Hunger' (SDG 2) and 'Affordable and Clean Energy for all' (SDG 7). Sustainable energy also contributes to SDG 13 'Climate action'. Clean shipping is one of the cornerstones for a Sustainable blue economy and offers opportunities for the Netherlands.

We want to maintain the internationally strong position of the Netherlands in the global blue economy in a sustainable way. This means that we need to focus on a smart interaction between national activities and international opportunities. The sustainability of the current activities in the blue economy and the development of new economic sectors offers the Netherlands the opportunity to stay competitive and innovative as a maritime country. Building and achieving this ambition for a Sustainable blue economy poses various challenges. These lie in the field of technology, cooperation, training qualified personnel and attracting investments, whilst monitoring the marine and coastal ecosystem.

By combining the strengths of various top sectors in terms of the sustainable blue economy, we can achieve a great deal. The cooperation between the Dutch food industry and the maritime industry can lead to successful business cases, as can cooperation between the offshore industry in terms of oil and gas, offshore wind energy and energy from water. Furthermore, nature-inclusive design and building with nature, in conjunction with nature restoration projects, can lead to a sustainable profile of the Dutch blue economy. The North Sea itself is an ideal area in which to shape and further develop this concept.

⁵⁴ Transforming our world: the 2030 Agenda for Sustainable Development (25/09/2015)

8.3 Policy

8.3.1 Exploration Sustainable blue economy

The new blue economy in the North Sea requires space for (upscaling) robust pilot projects and a uniform policy with clear principles for licensing and choice of location. This concerns mariculture and aquaculture (farming of - native species - seaweed and shellfish as well as the passive catch of fish, shellfish and squid and energy from and on water. These activities must prove that they fit into the ecological carrying capacity of the North Sea, for example with respect to the present nutrients. That space can be found inside and outside (new) wind farms. For investing parties, it is important to have timely insight into feasible *business cases*, risks, the likelihood of being granted a licence and good alignment of their activities with buyers (on land).

In 2021, the Exploration 'Sustainable blue economy' from the North Sea Agreement started. The exploration will be continued until 2027, whereby interim policy options and market opportunities will be elaborated. The exploration is aimed at an integral implementation of the policy goals of the North Sea Programme 2022-2027, with a focus on innovations in sustainable marine food production and on policy goals around energy from wind, water and 'sun at sea'. In all this, there is attention for promising ways to allow multiple use of wind farms. The implementation is based on the information from the area passports per wind farm, in which the following are considered:

- nature development, nature restoration and protection
- forms of and locations for fishing with fixed gear (for example baskets and traps)
- permitted forms of and locations for multiple use by the 'new blue economy' (for example farming of native seaweed species, mussels and flat oysters and 'energy from water' and 'sun at sea').

The *Community of Practice* North Sea (CoP) is the flywheel for the exploration and the DBE. The CoP is the platform on which all North Sea stakeholders meet and debate, where initiatives are forged and where people work together on solutions.

8.3.2 North Sea wide collaboration

It is particularly relevant for the emerging economic sectors to work together, combine knowledge and skills and acquire and share experiences. Innovative pilots and projects in the countries bordering the North Sea can contribute to the Netherlands Sustainable blue economy. Various European help mechanisms (project financing, research and *matchmaking* programmes around the Sustainable blue economy) require transboundary collaboration. For the development of the Sustainable blue economy in the Netherlands, it is therefore important to align with Brussels policy and the development in other (EU) countries.

Upscaling economic activities at sea has a range of transboundary effects, such as efficiency and safety of the use of space in relation to passing shipping. As well as an impact on the marine environment and possible socio-economic effects. Based on European guidelines, consultation with respect to such transboundary effects is compulsory. It is also in the interest of the Netherlands to review the developments in the sustainable use of the North Sea in conjunction with developments in other North Sea countries. This prevents any conflicts and ideally creates synergy, which helps use the potential of the North Sea for sustainable economic development. Good examples of such cooperation in the North Sea area are the *North Seas Energy Cooperation* (NSEC)⁵⁵ and the *Support group for spatial planning*⁵⁶. The *North Seas Energy Cooperation* supports and facilitates the development of offshore grid development and the great potential for renewable energy in the region. With the NSEC partners, collaboration will be sought in the planning period for the relevant subjects, such as projects which can be implemented in wind farms. The participants of the *Support group for spatial planning* work together on coordination, knowledge exchange and best practices, aimed at the development of offshore wind and network projects

Actions

- Set up and implement a long-term study Sustainable blue economy aimed at developing a roadmap for policy. The national government conducts the study together with entrepreneurs, NGOs and knowledge institutes form the *Community of Practice* North Sea. The study follows the PETER principle (Production, Economy, Technology, Ecology, and Risks & Regulation, which shows which parties are experts in which parts. The study must provide clarity about whether and what added value there will be for the blue economy if a Social Long-Term Innovation Programme and a Top Consortium Knowledge and Innovation is specifically set up for this.

⁵⁵ https://ec.europa.eu/energy/topics/infrastructure/high-level-groups/north-seas-energy-cooperation_en

⁵⁶ Implementation of the Political Declaration on energy cooperation between the North Seas Countries

- Strengthen the connection with other (EU) countries in the field of the Sustainable blue economy based on the exchange of knowledge and intensification of knowledge relationships. This is done through participation in (existing European) economic joint ventures, and by means of a new joint venture⁵⁷ with North Sea and Baltic Sea countries on the theme *emerging challenges & solutions in Maritime Spatial Planning*, specifically focusing on Sustainable blue economy [possible allocation of EU subsidy March/May 2021].
- Promote the development of pilot projects for multiple use of space in the North Sea to the level of developed starter companies ('scale-ups') and ultimately other upscaled businesses ('scalars'). This development takes place, among others, through experiments nearer the coast (*nearshore*) and in the EEZ (*offshore*).
- The national government focuses on large-scale experiments with sustainable multiple use of wind farms (innovative food and energy production, sometimes in combination with nature development). The scale of such experiments will need to offer a good basis for continued development. The wind energy areas Borssele, Hollandse Kust (south) and Hollandse Kust (north) will be considered first for these experiments. Depending on the results and environmental conditions, a gradual upscaling may be possible to wind farms to be built further in the future. At the same time, nearer the coast (*nearshore*), several pilot projects in areas other than wind farms are planned. The national government is working with the partners involved on good connections with initiatives in wind areas and with the licensing regime. See the Assessment framework multiple use.
- The innovation platform and network *Community of Practice North Sea* is the instrument to promote the Sustainable blue economy and to produce concrete initiatives. For collaboration, alignment will also be sought with European partners, such as national maritime clusters.
- The national government wishes to set up a monitoring programme to chart the ecological impact of (large-scale) multiple use.

Knowledge agenda

In the framework of the mission-driven top sectors and innovation policy⁵⁸ (see also the Knowledge and Innovation Covenant (KIC)), in 2019 the Dutch government recorded its policy ambitions as principles for policy goals around several big social themes in missions. Several missions, including the related policy themes and long-term, mission-driven innovation programmes (MMIPs), are essential for the development of the Sustainable blue economy in the North Sea. Only the relevant parts for the Sustainable blue economy of those missions are referred to below. These are long-term social innovation programmes from the Knowledge and Innovation Agenda (KIA) Agriculture, Water, Food of the Top sectors Agro & Food, and Maritime

⁵⁷ <https://www.msp-platform.eu/>

⁵⁸ Knowledge and Innovation Covenant 2020-2023 (11/11/2019)

& Water. In addition, the Social challenge energy transition *and sustainability* of the Top Sector Energy focuses in the longer term on a wider spectrum of forms of sustainable energy production than wind energy alone. Different forms of 'blue' energy, such as sun at sea, fit into this approach.

Mission A Circular agriculture

A4 Protein provision from (new) plant-based sources

The relevant part of this MMIP is:

- The development of sustainable, healthy for the consumer, attractive plant-based end products.

A5 Biodiversity in circular agriculture

The aim of this MMIP is to boost the development, distribution and effect of knowledge and innovation for the restoration and use of biodiversity in circular agriculture. This objective covers all the aspects relating to the terms biodiversity and circular agriculture, and the different types of knowledge and innovation required to achieve the goal.

Mission B Climate-neutral agriculture and food production

B4 E11D Increase carbon capture in woods and nature

B4 E11D Increase carbon capture in woods and nature

More knowledge is required about the biomass chain in the coastal zone. Where does biomass come from (marine production), how are the chains organised (role of manager, producers, buyers, end users), what are the different biomass flows now used for and how can this use be optimised from a sustainability perspective?

The relevant knowledge and innovation task in this mission is:

3) management of ecological systems in shellfish production in the Wadden Sea and the waters of Zeeland, but also specifically the opportunities for nature development (ecosystem services) linked to biomass production and capture of CO₂ in the coastal zone (Blue Carbon). Globally, there is increasing attention for combinations of sustainable agriculture/fish farming, coastal protection, nature restoration and CO₂ capture (Blue Carbon Solutions).

B6 E12B Production and use of biomass

Sub themes which contribute to the sustainable blue economy are:

- 1) increase biomass production with doubled photosynthesis in 2050 and seaweed farming.

Mission C is not relevant for the North Sea Programme 2022-2027.

Mission D Valued, healthy and safe food

Mechanisms like value creation and earning capacity can be used to increase appreciation for food from the North Sea and for boosting confidence in the relevant food production industry (LNV vision Valuably Connected). It is also necessary to continue focusing on food safety. This is essential for the production and consumption of food from the North Sea.

Mission E Sustainable and safe North Sea, oceans and inland waterways

In 2030, in the Netherlands the ecological carrying capacity, flood risk management and water quality of marine waters are in balance with the demand for renewable energy, food, fishing and economic activities. In 2050, this also applies - including the fresh water supply - to the rivers, lakes and tidal areas (estuaries and mudflats).

E1 Sustainable North Sea

The MMIP Sustainable and safe North Sea focuses on developing sustainable and safe multiple human use of a robust North Sea ecosystem and on deepening insight into the yield point of this ecosystem. The focus here lies on multiple use of activities for nature development, food production, shipping and other economic activities in the space designated for renewable energy production and the required infrastructure. Separate MMIPs 'Fisheries' (Mission E) and 'Bio-based raw materials' (Mission B) have been developed. These three MMIPs cannot be considered separately.

E5 Fisheries

The MMIP Fisheries focuses on the development of ecological and socio-economic sustainable coastal and sea fisheries on the North Sea to promote a dynamic fishing industry, a good standard of living for fishing communities and a good status of fish stocks and the marine environment. Together with the separately elaborated MMIPs 'Sustainable and safe North Sea' (Mission E) and 'Bio-based raw materials' (including seaweed), this MMIP forms an integrated whole.

Mission F The Netherlands is and remains the best protected and liveable delta

In the next century too, the Netherlands will be the best protected and liveable delta in the world. However, rising sea levels and the strong fluctuations in river discharges will require a new approach.

F3 Netherlands Digital Waterland

The MMIP 'Netherlands Digital Waterland' shapes the ambition of the Netherlands to (continue to) lead the field in the digitisation of (and for) water management. This will enable the Netherlands to be a model for other countries. It will then be even easier to sell our water knowledge and skills abroad.

The focus of this MMIP is therefore: bring cohesion to the development and application of data collection, management, analysis and display (visualisation) in relation to the physical system (water and land), its infrastructure and use (water flood defences, smart water systems, autonomous sailing, energy production, traffic and transport, etc.) Management and maintenance tasks can therefore be performed more sustainably, efficiently and reliably. Even more than usual, a cross-sector approach is required for the implementation of this MMIP, including a connection with the key technology ICT. It is evident that the developed digital systems are resilient to cybercrime.

The MMIP 'NL digital water land' covers the development of knowledge, concepts, supporting technology and maximum implementation in practice (upscaling of existing and new pilots to concrete applications).

Key technologies

Continued development of several key technologies is crucial for the success of the missions which facilitate the Sustainable blue economy.

Community of Practice North Sea

The *Community of Practice* is the flywheel for the study Sustainable blue economy. It is a platform supported by RVO on which all North Sea stakeholders meet and debate, where initiatives emerge and where people work together on solutions. The aim is to align sustainable initiatives from the market with the procedures required for licensing.

Some issues which have emerged when developing new projects (pilots pilot projects or fully-fledged *business cases*) are:

- lack of clarity with respect to licensing, not just for the Water Act, but also for other required licences (which government department do we apply to, for what and in what phase?)
- technological requirements for working offshore, particularly in wind farms (multiple use)
- scope and amount of detail of ecological research (at the front in a SEA and in terms of monitoring)
- lack of certain legal or policy frameworks (for example landfall of electricity from other sources than offshore wind farms)
- forms of financing (with or without subsidies from the Dutch government) for certain phases in the project/project development to market maturity
- export support via specific regulations and creating a reference project in the Netherlands.

Initiators continue to be ultimately responsible in the *Community of Practice* for developing their *business cases*, risks and investment decisions. The government is responsible for facilitating licensing, at appropriate moments, by creating frameworks and commissioning a strategic investigation into (cumulation of) environmental impact.

8.4 Management

In chapter 10, the North Sea Programme 2022-2027 describes different policy instruments which have a direct relationship with the Sustainable blue economy:

- the Policy framework for passage and multiple use in wind energy areas in the North Sea
- the Guide area passports for wind energy areas in the North Sea
- the Assessment framework multiple use
- the Assessment framework artificial islands.

The Water Act, Nature Conservancy Act, Mining Regulation and the Fisheries Act fall under the other relevant legislation.

It is possible that initiatives in the licensing procedure raise questions about feasibility, affordability or sufficient applicability of policy frameworks and regulations. If this means that the licensing procedure is not completed successfully, the relevant initiators can use the CoP North Sea mechanism to have their proposal assessed. Rijkswaterstaat, one of the licensing institutions, is part of this.



9 Spatial planning

9.1 Spatial plan 2022-2027

The Dutch North Sea is one of the most intensively used seas in the world. The North Sea is a valuable and vulnerable ecosystem with many designated uses, such as shipping, fishing, wind energy, oil and gas production, sand extraction, defence and recreation. Chapters 3 to 8 describe the policy and space claims of the various functions and activities. This chapter explains how the various functions and activities during this planning period are integrated in the North Sea. A look ahead to the North Sea in 2050, when all the designated uses have been successfully made sustainable, provides a guide. The use of the North Sea must be efficient and safe and fit within the prerequisites of a healthy ecosystem. Finding the right societal balance to facilitate this is an important task for the spatial planning of the North Sea.

In the National Strategy on Spatial Planning and the Environment (NOVI), the policy choice is to attain the climate objectives for 2030 and 2050 by achieving the necessary sustainable energy production primarily by means of wind farms in the North Sea. These objectives are the driving force for offshore spatial planning, along with, for instance, the protection of nature conservation areas. The NOVI states that space in the North Sea will be scarcer than ever in future. In the forcefield between nature conservation and restoration, food supply, offshore wind energy, shipping and the other national interests from the NOVI, choices have sometimes been made or are being prepared about combining, separating and prioritising use, about investments in sustainability and knowledge, and about adaptive policy. Multiple use of space appropriate to the qualities of the area is planned based on the area studies and area passport guides, and the policy and assessment frameworks for passage and multiple use (see Chapters 10.1 to 10.3). Exploring and further implementing a Sustainable blue economy also plays a role here (see Chapter 8).

The North Sea Agreement gives direction to the spatial planning process. Achieving a balance between the transitions related to food, nature and energy is key, taking the interests of other uses such as shipping and sand extraction into account. The three transitions are closely related:

- The marine ecosystem is under pressure. The use of the North Sea will increase during the coming planning period and the subsequent years, also as a result of the improved sustainability of the energy supply and growing volume of shipping. Increasing use is only responsible if combined with restoration and protection of the North Sea ecosystem. The ecological carrying capacity is a prerequisite for individual and cumulative use. Moreover, the ecosystem of the North Sea is not a static environment. Objects and installations create new habitats and can contribute to nature. Furthermore, the consequences of climate change also create dynamics. New knowledge, deeper insight and additional monitoring of the North Sea are therefore essential to be able to optimise policy and management.
- The number of wind farms in the North Sea and the related activities, such as expansion of storage and the transport of energy on the sea and from sea to land, will increase significantly. This is a societal choice to fulfil the prerequisites of the Climate Agreement and the Paris Agreement. Bearing in mind the interests of the ecosystem and other designated uses, a careful assessment is required. Technological dynamics with respect to offshore wind energy demand adaptive planning now and in the future. These include the use of hydrogen, the construction of artificial offshore islands and the development of alternative ways to produce marine energy. The production of fossil fuels will be gradually phased out.
- For fishermen, the North Sea is vitally important and fundamentally connected with the socio-economic and cultural basis of local communities. It is vitally important to convert the fishing industry into a profitable and sustainable industry which fits the new situation in the North Sea in terms of its nature and extent. That requires re-orientation and ultimately restructuring of the fleet. This is not only an ecological necessity and a (business) economic reality, but also a societal requirement. Besides fishing, increasing ideas and developments in the field of aquaculture and mariculture claim space in the North Sea.

The transitions relating to nature conservation areas, food and energy must not only be coherent but also be aligned to other uses such as shipping, sand extraction, defence and recreation. This chapter presents an initial step towards integrated solutions aimed at societal benefits in the long term.

With respect to content, several aspects need to be considered with respect to the various themes.

Offshore wind energy

The North Sea Agreement includes agreements about the further development of offshore wind energy and the required space. The continued development of offshore wind energy is necessary to reduce the CO₂ emissions of our energy supply and thus achieve the global, European and national climate objectives. To achieve the European climate objective to 'reduce emissions by 49 percent in relation to 1990' before 2030, Dutch offshore wind farms must generate 49 TWh of sustainable electricity annually in that reference year. That amounts to around 11.5 GW in installed wind capacity.

The current Road Map provides for 10.8 GW, leaving a 0.7 GW shortfall if we are to achieve the reduction objective of 49 percent. In 2020, the European climate objective for CO₂ reduction in emissions has been increased to 55 percent in relation to 1990. This change still needs elaborating but is likely to involve building more wind farms in the period up to 2030. Indicatively, this involves 5 to 9 GW as an additional task for 2030. The long-term goal is that the Dutch energy supply will be totally CO₂-free by 2050. According to PBL scenarios,⁵⁹ this will require 38 to 72 GW offshore wind energy (see Chapter 5). In the framework of the North Sea Programme 2022-2027, additional production of 27 GW is required. On top of the already available 11 GW, this will help achieve the minimum scenario of 38 GW.

Nature

The offshore nature conservation areas contribute to the statutory objectives of the Birds Directive, the Habitats Directive and the Marine Strategy Framework Directive, and to the development of the ecological network of nature conservation areas (see Chapter 3). By achieving these objectives, the Netherlands contributes to the EU ambitions for biodiversity in 2030 as part of the European Green Deal. The spatial agreements proposed in this North Sea Programme based on the North Sea Agreement are more ambitious. The widely supported drive towards restoration and conservation comes at a time when the consequences of climate change, fishing and the large-scale construction of offshore wind farms are giving cause for concern. The increase in various activities, and the associated spatial claims, are only admissible if they can be borne by the ecosystem of the North Sea. Gaps in knowledge concerning the carrying capacity of the ecosystem are being addressed in the Nature Restoration and Species Protection (MONS) Programme (see Chapter 11).

⁵⁹ Climate-neutral energy scenarios 2050: Scenario study for the integrated infrastructure exploration 2030-2050. Berenschot & Kalavasta, 2020.

Food production

The further roll-out of offshore wind energy means a further reduction in the area available to fishing. Furthermore, some areas are closed to fulfil legal obligations relating to nature conservation and agreements in the North Sea Agreement. Expansion of shipping routes can also lead to measures that restrict fishing. The decline in fishing areas leads to an increase in fishing in other areas. These displacement effects cannot currently be quantified. Similar developments are taking place in neighbouring countries. It is therefore important to place the interests of the fishing industry in the context of developments in the entire international North Sea Region.

Wind farms offer space and opportunities for the development of mariculture and aquaculture (see Chapter 4).

Shipping

In the future, shipping from and to Asia will increasingly use polar routes, since, as a result of global warming, transport via the North Pole is becoming more feasible. The maritime connections via the polar routes are essential to guarantee the accessibility and competitive position of Dutch seaports. In addition, the construction of wind farms requires extra routing measures to guarantee safety and accessibility. The increasing size of ships must also be considered here (see Chapter 6).

For the transit of ships with a length up to 46 metres, logical passages will be created in wind farms (see Chapter 10.1).

Reading guide for Chapter 9

Chapter 9.2 explains the proposed spatial policy for the themes nature conservation areas, offshore wind energy, shipping, sand extraction, cables and pipelines, and military activities. Map 3 illustrates this policy. There are no fishing data on this map because, in principle, the fishing industry has access everywhere, so long as no limiting measures apply.

Chapter 9.3 looks at the spatial explorations that will be continued in 2021 in connection with designating new wind energy areas, reserving space for new shipping routes and the possible modification of defence exercise areas. The search areas for these activities are shown on map 4. Chapter 9.4 describes the subsequent procedure and the associated assessments in the designation procedure for new offshore wind energy areas and in the decision making about shipping routes. Chapter 9.5 discusses the relevant land-sea interactions and Chapter 9.6 looks at the maritime spatial planning in the international context.

9.2 Spatial development strategy map 2022-2027

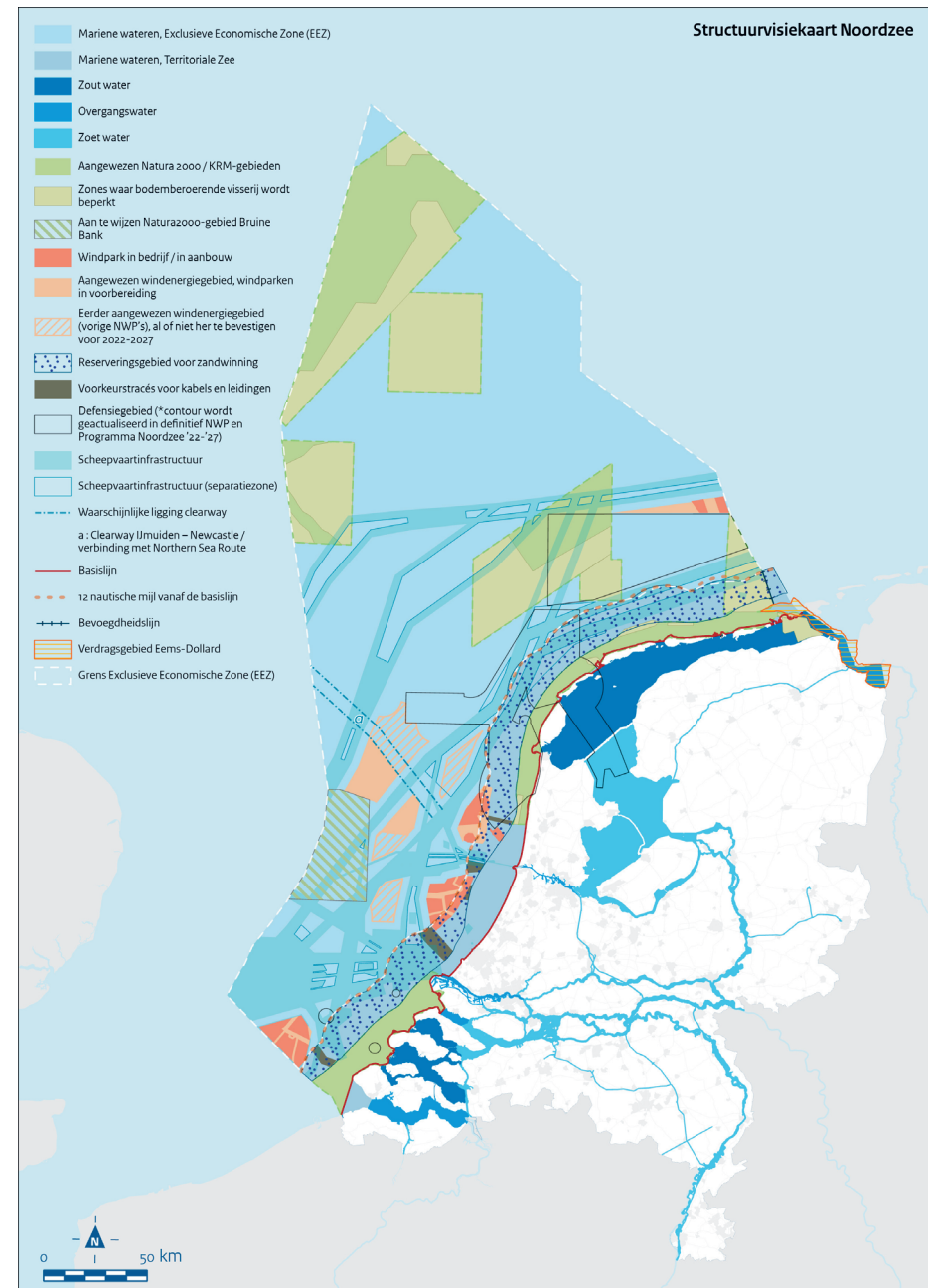
Nature conservation areas and fishing (food supply)

Based on the NOVI, the national interests of 'achieving a good quality living environment in the Netherlands', and – also in line with the Sustainability Development Goals – 'safeguarding a good quality living environment and improving and protecting nature and biodiversity' will be further elaborated. The NOVI also mentions the change to sustainable fishing as a national interest. The national measures that apply in the North Sea Coastal Zone are converted by means of the Article 11 procedure from the Common Fisheries Policy (CFP) into international measures that are subject to other spatial restrictions.

The agreements in the North Sea Agreement produce the following actions for other nature conservation areas:

- **Brown Ridge (Natura 2000):**
 - in 2021, designate the Brown Ridge as Birds Directive area⁶⁰
 - draw up a Natura 2000 management plan within three years of designation.
 - possible (fishing) measures as a result of the further impact analysis.
- **Frisian Front (Natura 2000 and MSFD) for 2023**
 - the area closed to seabed-disturbing fishing will be expanded by 1,014 km².
 - of that area, part will become a 'no fisheries zone' 1,649 km².
 - a sub area of 100 km² will be allocated for oyster recovery.
 - on the edge, another sub area of 100 km² will be allocated for research into the long-term impact of beam trawling and pulse trawling. Here, seabed-disturbing fishing is allowed under conditions.
- **Dogger Bank (Natura 2000):**
 - by 2023, expansion of the Natura 2000 area aimed at increasing the closed area for seabed-disturbing fishing by 557 km²
 - by 2023, ban on flyshoot in the 1,326 km² management zones.
 - adaptation of the management plan.

⁶⁰ For the site boundaries, the site decision for the wind energy area IJmuiden Ver takes the designation as Birds Directive area into account.



Map 3: spatial development strategy map North Sea

- *Cleaver Bank* (Natura 2000):
 - by 2023, expansion of the area closed for seabed-disturbing fishing (excluding Botney Cut) by 552 km².
 - possible adaptation of the management plan.
- *Central Oyster Grounds* (MSFD) by 2023:
 - expansion of the area closed to seabed-disturbing fishing by 1,062 km².
- *Borkum Reef Grounds* (MSFD) by 2023:
 - expansion of the area closed to seabed-disturbing fishing by 558 km km².

From 2021, an independent investigation will be conducted into the distribution of *Sabellaria spinulosa* reefs. Before 2025, an independent scientific investigation will study whether the Hollandse Kust, Vlake van de Raan, Borkum Reef Grounds, Cleaver Bank, Dogger Bank and Central Oyster Grounds fulfil the selection criteria for designation as Birds Directive area (see Chapter 3). Spatial limitations that apply under the current policy, such as in the Voordelta and the Vlake van de Raan, will be continued. At international level, the objective is to reverse the limiting fishing measures in the Dutch part of the plaice box.

The EU's biodiversity strategy stipulates that in 2030, at least 30 percent of the total sea area of the member states will be protected. At least a third of that must be strictly protected by then. Between 2021 and 2023, the European Commission and the member states will elaborate legally binding nature restoration goals. The relevant agreements in the North Sea Agreement form the starting point for the Dutch contribution to this elaboration.

Because there is less space for fishing with towed gear, the aim will be to boost food production with aquaculture and forms of fishing which do not or barely disturb the seabed, such as passive fishing. The North Sea Agreement and the Cutter Vision also form a basis for research and innovations to study the effects and/or develop possibilities for fishing.

Offshore wind energy

Designation of wind farm areas is needed to elaborate the national interest mentioned in the NOVI of 'achieving a reliable, affordable and safe energy supply, which must be CO₂-neutral in 2050, including the necessary infrastructure'. The Climate Agreement stipulates that offshore wind energy plays an important role in this.

Wind energy areas where wind farms have already been constructed or are planned, where there are already (draft) site decisions or where, according to the Road Map offshore wind energy 2030, site

decisions are planned, will remain wind energy areas. In this draft North Sea Programme, search areas for wind energy have been identified for the climate objectives for 2030 and beyond, so that decision-making on the designation of wind farm areas can be prepared in the subsequent process (see Chapters 9.3 and 9.4)

Compared with the Policy Document on the North Sea 2016-2021:

- The boundary of Hollandse Kust (west) has been adjusted on the west and east sides to ensure a fluid boundary along the surrounding shipping routes. On the north side, the boundary has been adjusted to make room for a clearway IJmuiden-Newcastle.
- The southern boundary of the wind energy area IJmuiden Ver has been adjusted due to the proposed designation of the Brown Ridge as a nature conservation area.
- Noord Hinder is no longer a wind energy area.
- The areas IJmuiden Ver (north), Hollandse Kust (northwest and southwest), as well as the southern part of the Hollandse Kust (west) are mapped as search areas for wind energy, that may or may not be confirmed at a later stage as part of the additional draft North Sea Programme. See Chapter 9.3.

The principle is to use wind farms in a multifunctional way and allow as many other uses as possible. The national government gives direction to this by drawing up area passports, based on area explorations to be performed in the phase of planning and designating sites.

Shipping

The maintenance and development of the main infrastructure for mobility, including shipping routes, has been designated as a national interest in the NOVI. The spatial development strategy map shows the existing shipping system, as well as the existing anchorages and clearways. Chapter 9.3.2 provides further details about future developments including the Northern Sea Route and possible routing measures in connection with new offshore wind energy areas.

Sand extraction

Guaranteed availability of sufficient and affordable sand contributes to the national interests of flood risk management and climate resilience and to interests relating to housing, mobility and the business climate. The area seawards of the NAP-20m isobath up to 12 nautical miles from the coast is reserved for sand extraction for coastal defence and fill sand for construction and infrastructure. This is necessary to guarantee enough sand for flood risk management and

climate resilience of the Netherlands and to provide construction and infrastructure with the necessary raw materials. Shell extraction is permitted seawards from the NAP-5m isobath in quantities that correspond with the natural growth.

Oil and gas production

Under certain conditions, the safe distance of helicopter flights to mining installations can be adjusted from 5 NM to 2.5 NM. Oil and gas production in the North Sea takes place within the frameworks of the Climate Agreement and will be phased out. With respect to the existing gas infrastructure, the possible reuse for the transport of hydrogen will be investigated. In the long term, specific platforms may be used for carbon capture and storage.

Cables and pipelines

Achieving and retaining high-quality digital connectivity is a national interest, as is the required infrastructure for achieving a reliable, affordable and safe energy supply.

Cables and pipelines are situated and positioned in such a way that they do not endanger or obstruct other national interests. During the term of this North Sea Programme, the national government will further elaborate how to deal with conflicts between national interests. On either side of cables and pipelines in the North Sea, there is a 500-metre safety and maintenance zone. When building wind farms, in principle a 500-metre zone should be adhered to for pipelines and electricity cables and a 750-metre zone for telecommunications cables. With a view to efficient use of space, maintenance zones for cables and pipelines can be reduced where possible.

During the planning process for laying new cables and pipelines, the national government consults with the initiator with the aim of having routes run in parallel. To cross the established sand extraction zone, preferred routes have been determined (see spatial development strategy map), based on the availability of extractable sand and the possible locations for cable landfall sites. To efficiently use the space in the North Sea, electricity cables, telecommunication cables and pipelines are bundled together wherever possible. The assessment framework for activities in the North Sea has been extended and tightened to be able to implement the bundling policy (see Chapter 10.5).

For offshore initiatives that take up a lot of space, the national government can prescribe a spatial reservation for the passage of future cables and pipelines. Placing and bundling existing cables in the relevant area is expensive and is therefore not planned.

The expected increase of multiple use in wind farms means that maintenance zones must also be adhered to for infield cables of the wind farm. Research has shown that to safely perform the required maintenance around the infield cables, there must be 250 metres of free space on both sides of the cables.

In the case of new pipelines and communication cables, the national government prescribes how these cables and pipelines must relate to existing wind farms and wind energy areas.

Decommissioned cables and pipelines will be removed unless the benefits to society outweigh the costs.

Military activities

The NOVI stipulates that ensuring national safety and offering space for military activities is a national interest. The existing areas designated for military purposes will continue to be used (see spatial development strategy map). To create more space for wind energy, the options for relocating and/or multiple use of the military exercise areas EHD-41 and EHD-42 will be explored. A prerequisite is that the operational usability of any relocated exercise zone continues to be guaranteed (see 9.3).

Preserving the underwater cultural heritage

In the NOVI, preserving and enhancing cultural heritage are formulated as a national interest. This includes the archaeological heritage in and on the seabed. The policy is that the archaeological heritage is preserved in the seabed (in situ) wherever possible. By listing archaeological sites at an early stage, in-situ preservation and spatial developments in the North Sea can usually be combined. If in-situ preservation is not possible, it may be preferable to excavate the archaeological sites to safeguard their information value (see Chapter 7.5).

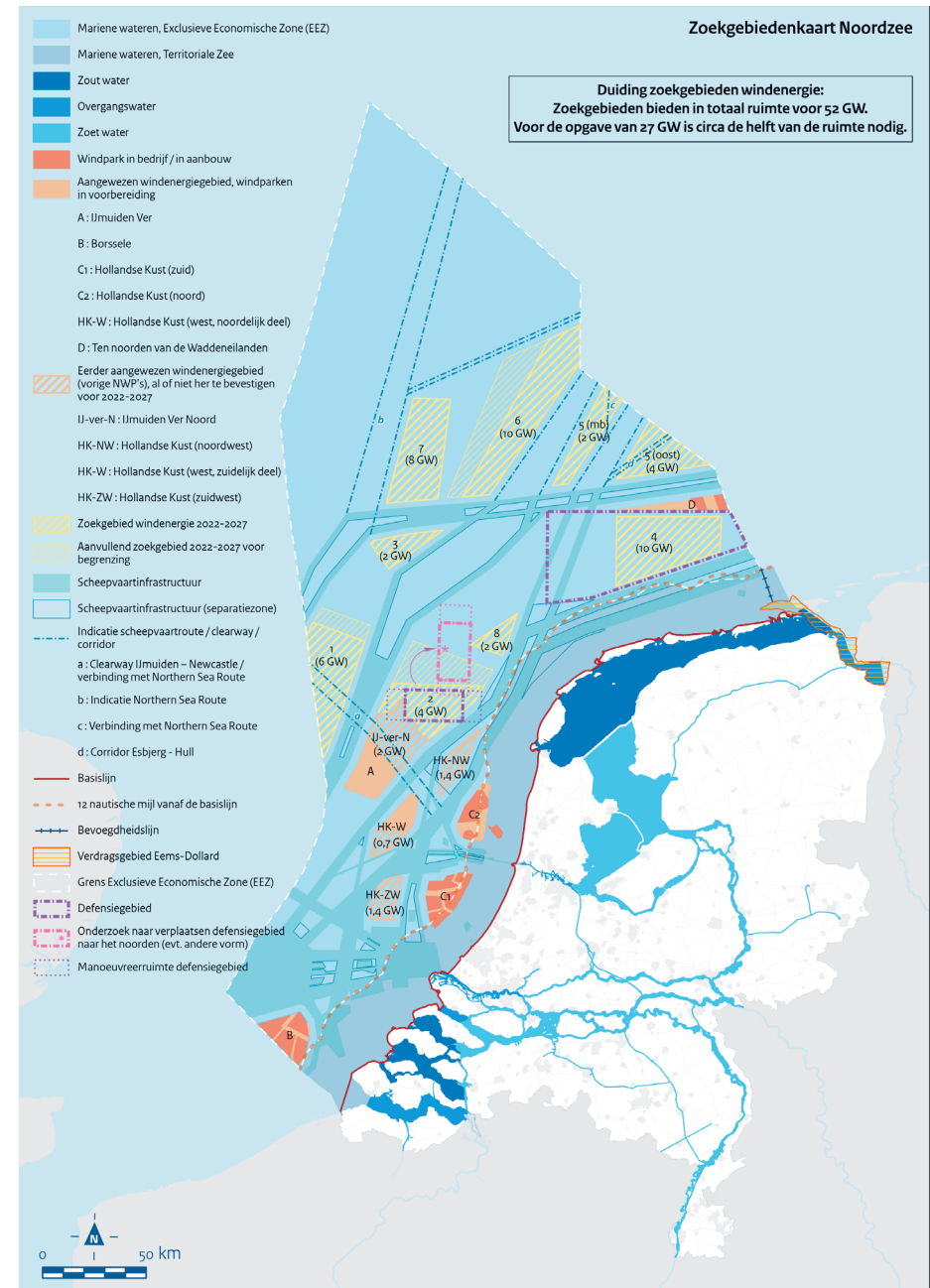
9.3 Search areas and spatial explorations

Space in the North Sea is scarce. In the coming decades, significant growth in offshore wind energy is expected, for which extra space must be reserved. Two new routes are planned for shipping, the Northern Sea Route and the route towards Kattegat. It is vitally important to connect these with existing routes and ports. As ships increase in length, it may be necessary to widen routes. To be able to exempt 15 percent of the Netherlands seabed from seabed-disturbing fishery by 2030, potential new nature conservation areas will be explored (see Chapter 3). Besides these new claims to space, sufficient space must continue to be available to fishing, defence and other users of the North Sea. All this must also fit the ecological use of space of the North Sea. In balance with other users, an integrated assessment must therefore be made when designating new wind energy areas, shipping routes and any new nature conservation areas. After designation, there will be a further elaboration and specification of locations and (mitigating) measures, as part of which an integrated assessment of interests will still be required.

Map 4 shows search areas for wind energy, indications for shipping routes and routing measures, and possible adjustments to military exercise zones. For purposes of orientation, nature conservation areas and existing shipping routes are also shown on the map. Chapter 9.3.1 addresses the starting points for identifying search areas and for an integrated assessment for the designation. Chapter 9.3.2 describes the search areas for wind energy, and Chapter 9.3.3 gives the spatial indications for new shipping routes and routing measures. Chapter 9.3.4 indicates what investigations are required to achieve solutions for current spatial tensions.

9.3.1 Search areas for wind energy

When identifying search areas for 27 GW installed capacity in wind energy, around twice as much space is classified as search area. Further studies and spatial assessments are needed in order to decide which areas are to be designated as a wind farm area. The locations of the search areas are shown on map 4. In some search areas, additional search space is shown on the map in a lighter colour. In the process of defining wind offshore wind energy areas, this makes it possible to optimally choose the boundary of the wind energy area in relation to nature or other uses, such as fishing, shipping, mining or defence. Current research may be a reason, see also Chapter 9.4.



Map 4: Search area map North Sea

Many of the search areas for wind energy are in the northern part of the North Sea. This enables the implementation of agreements from the Groningen administrative agreement and is also needed because space is most scarce in the southern part of the area. Nevertheless, search areas for wind energy have been identified in the southern part as well, because these are closer to the energy demand and can therefore be developed more cost efficiently and more quickly. In that case, the construction of the electricity infrastructure has less onshore impact. When identifying the search areas for wind energy, based on the North Sea Agreement, any areas designated or to be designated as nature conservation areas are avoided. The search areas are also located outside existing shipping routes. For this, the framework 'Design criterion distance between shipping routes and wind farms' is used (see appendix 3). In addition, specific safety studies are conducted that help to determine future boundaries for wind energy areas (see Chapter 9.4). Zones with multiple mining platforms that will remain in place for a longer period have been avoided wherever possible. However, in the future increasing opportunities are identified for combined use by mining and wind energy.

Eight new search areas for wind energy have been identified. In addition, there are four previously designated wind energy areas whose designation for the coming policy period may or may not be reconfirmed. These areas are IJmuiden Ver (north), Hollandse Kust (northwest and southwest) and the southern part of the Hollandse Kust (west). These areas will continue to be available for implementing the plus variant of the Climate Agreement (55 percent CO₂ reduction in 2030) unless other areas are designated where wind farms can be built quickly enough.

When determining the potential in GW, 10 MW per km² has been assumed, whereby the search areas have not been totally filled for further spatial zoning. That is a considerably higher density than the 6 MW per km² used in the Policy Document on the North Sea 2016-2021 when designating wind energy areas: future wind farms are 40 percent smaller for the same capacity. This results in a more efficient use of space in the North Sea. On the other hand, the compaction results in a reduction in electricity production because wind turbines capture more of each other's wind than in the case of 6 GW per km². In terms of money, that reduction in production over the entire lifespan of the total 27 GW which is designated in the follow-up programme in this policy period comes to around 7 billion euros⁶¹.

Tables 9.1 and 9.2 below describe the search areas in the southern and northern parts of the Netherlands North Sea. The following aspects are addressed:

- the potential of the area in GWs based on results from a study by Blix Consultancy BV.

⁶¹ Determination of the cost levels of wind farms (and their grid connections) in new offshore wind energy search areas, WOZ2180096. BLIX Consultancy BV & partners. 15 December 2020.

- aspects that are important for rapid development or for the hub function of wind energy areas
- considerations with respect to ecological effects based on expert sessions with ecologists⁶², the Strategic Environmental Assessment (SEA)⁶³ and the Appropriate Assessment⁶⁴ carried out on the Draft National Water Programme.
- considerations with respect to spatial implications for other use. Here too, recommendations from the SEA were considered when describing the search areas and formulating subsequent studies
- social cost-effectiveness, based on studies carried out by Wageningen Economic Research⁶⁵, Wageningen Marine Research⁶⁶ and Blix Consultancy. In these studies, the costs and benefits of the construction and operation of wind farms, the follow-up costs of mitigating the increased shipping risks and the revenue and operational costs for fishing were calculated in the relevant areas. The follow-up costs for mitigating effects on nature and additional costs for combined use with mining will be calculated at a later stage. The added value of fisheries, as shown in the table below, is based on the value of the fish caught per year in the search areas as shown on map 4. The socio-economic impact on the chain and in fishing communities was not included in this - as was also the case for shipping and wind energy. In the framework of the North Sea Agreement, research was carried out into the economic value in the fisheries chain.

The considerations described are not exhaustive. In the process, other aspects may play a more prominent role in the assessment. For example, (ecological and archaeological) soil surveys prior to designating sites may still lead to location adjustments, after which combining mining and wind farms may then be elaborated in more detail.

⁶² Verbinding en duiding werksessies (verbindend verslag), ecologische beoordeling zoekgebieden wind-energie, onderdelen vogels en vleermuizen, zeezoogdieren, ecosysteemeffecten, Royal Haskoning DHV, M. de Haan, S. Mulder, J. Odinga, October 2020

⁶³ PlanMER Nationaal Waterprogramma 2022-2027, Arcadis (Dotinga et al), 20 January 2021.

⁶⁴ Passende beoordeling voor Nationaal Water Programma 2022-2027, Arcadis (S. Versteeg), 20 January 2021

⁶⁵ MKEA kentallenanalyse aanwijzing windenergiegebieden, Wageningen Economic Research (Roebeling et. al), memo 18 November 2020.

⁶⁶ Inzicht in de sociaaleconomische waarde van de zoekgebieden windenergie op de Noordzee 2030-2050 voor de Nederlandse visserij, Deetman et.al, Wageningen Marine Research, December 2020.

Search area	Description of search area in southern part of Netherlands North Sea
Search area 1	<p>Search area in the west of the NCP, near the border with the North Sea part of the United Kingdom. The area potentially has space for 6 GW. The area is bordered by shipping routes and an intensive mining area. On the south side of this area, space is available for a clearway used by the ferry from IJmuiden to Newcastle and for the connection between the port of Amsterdam and the future Northern Sea Route. Due to this connection, more space will be required for the clearway than for the ferry alone. On the northern side of the search area, an extra strip with search space for the boundary has therefore been added (however, there are more mining platforms here).</p> <p>Considerations for nature: seabirds (common guillemots, auks, little gulls, northern gannet, great skua, great black-backed gull due to the neighbouring Brown Ridge), coastal birds (black-legged kittiwake), migrating bats and marine mammals (harbour porpoise).</p> <p>Estimated added value energy (revenue – operational costs) = 66 m€/yr. in the entire area, 2.5 m€/TWh.</p> <p>Consequential costs for shipping mitigation = 11.6 m€/yr. (at 6 GW).</p> <p>Important area for sole fishing with an added value fisheries (revenue - costs) = 0.90 m€/yr.</p>
Search area 2	<p>Search area is to the north of IJmuiden Ver (north). The area potentially has space for 5 GW, but 4 GW has been used in the calculation due to spatial zoning for shipping, defence and mining. The area can be developed quickly if the defence exercise zone EHD41 can be moved to the north. There is a bottleneck here because one of the present mining platforms will be operating until 2035. A further investigation into the costs and benefits of EHD41 will be conducted in 2021. This will look at whether it is meaningful and feasible to phase out mining platforms earlier or to make them subsea. For this reason, the area to the north of the basic search area has been expanded with a search area for the boundary. Compared with other search areas, there are quite a lot of mining platforms in search area 2. This will require extra coordination in the follow-up phase. It may be possible to develop this area together with IJmuiden Ver (north) around an energy hub (artificial energy island). For this, it has the necessary (extensive) size, the possibility for a connection with the energy system of the United Kingdom and the opportunity for re-use of neighbouring gas infrastructure.</p> <p>Considerations for nature: coastal birds (black-legged kittiwake), seabirds, migrating bats and marine mammals (harbour porpoise) and sand eel.</p> <p>Estimated added value energy (revenue – operational costs) = 88 m€/yr. in the entire area, 3.4 m€/TWh.</p> <p>Consequential costs for shipping mitigation = 18.5 m€/yr. for 4 GW.</p> <p>Important area for sole fishing with an added value fisheries (revenue - costs) = 0.53 m€/yr.</p>

Search area	Description of search area in southern part of Netherlands North Sea
IJmuiden Ver (north)	<p>IJmuiden Ver (north) was designated a wind energy area in the NWP 2009-2016 and 2016-2021 and may or may not be reconfirmed in the definitive North Sea Programme. There is space for 2 GW here. This area is necessary for the timely achievement of the goals from the Climate Agreement and the Rutte III coalition about the contribution by 2030 of 49 TWh from offshore wind energy (49 percent CO2 reduction goal). In the development of wind farms, synergy advantages can be achieved with the current development of IJmuiden Ver (middle). On the south side of this area, space is available for widening a clearway for shipping from IJmuiden to Newcastle and for the connection between the port of Amsterdam and the future Northern Sea Route. In 2021, a study will be conducted into what this means for the boundary of IJmuiden Ver (north).</p> <p>Considerations for nature: coastal birds (lesser black-backed gull), seabirds, migrating bats and marine mammals (harbour porpoise) and sand eel.</p> <p>Estimated added value energy (revenue – operational costs) = 16 m€/yr. in the entire area, 1.9 m€/TWh.</p> <p>Consequential costs for shipping mitigation = 5.4 m€/yr.</p> <p>Added value fisheries (revenue - costs) = 0.43 m€/yr.</p>
Hollandse Kust areas	<p>This involves three areas designated in the NWP 2016-2021, of which Hollandse Kust southwest and northwest (HK-SW and HK-NW) are not yet used for wind energy, and Hollandse Kust west (HK-W) partially. These areas may or may not be reconfirmed in the definitive NWP 2022-2027. There is total space here for 3.5 GW. These areas are very cost effective for offshore wind energy and can be developed quickly for 55 percent CO2 reduction goals. Possible alternatives will be explored. After designating HK-SW and HK-NW in the NWP 2016-2021, further research into shipping safety revealed high safety risks. It is uncertain whether these can be mitigated.</p> <p>Considerations for nature: coastal birds, seabirds, migrating birds, migrating bats, and marine mammals (seals and harbour porpoises due to migration routes). These areas are in the migration routes of all migratory species.</p> <p>Estimated added value energy (revenue – operational costs) = 48 and 38 m€/yr. for NW and SW, resp., and 7.2 and 5.9 m€/TWh for NW and SW, resp.</p> <p>Consequential costs for shipping mitigation = 18.1 for NW and 22.2 m€/yr. for SW. Important areas for sole fishing, added value for fisheries (revenue - costs) = 0.26 and 0.25 m€/yr. for NW and SW, resp.</p>

Table 9.1: Search areas wind energy in southern part of the North Sea

Search area	Description of search area in northern part of Netherlands North Sea
Search area 3	<p>Smaller area to the north, bordered by shipping routes and intensive mining area. The area potentially has space for 2 GW.</p> <p>Considerations for nature: seabirds (auks, common guillemot), coastal birds (black-legged kittiwake), migrating bats. Estimated added value energy (revenue – operational costs) = 22 m€/yr. in the entire area, 2.5 m€/TWh.</p> <p>Consequential costs for shipping mitigation = 10.6 m€/yr.</p> <p>Added value fisheries (revenue - costs) = 0.17 m€/yr.</p>
Search area 4	<p>Search area to the north of the Wadden Islands. There is potentially room for 10 GW. According to international agreements, the entire area is currently a defence exercise zone. The exercises take place during 50 to 100 hours a year. It will be explored whether the exercise zone can be combined with wind energy farms, or whether it can be moved. Wind farms in the southern part of this area lead to extra high shipping safety risks.</p> <p>Considerations for nature: seabirds (terns), coastal birds, migrating bats, marine mammals (due to neighbouring Wadden Sea, the Borkum Reef Grounds and Borkum Riffgrund in Germany), possible ecosystem effects on Frisian Front.</p> <p>Estimated added value energy (revenue – operational costs) = 136 m€/yr. in the entire area, 3.1 m€/TWh.</p> <p>Consequential costs for shipping mitigation = 13.2 m€/yr. for 7 GW and 37.8 m€/yr for 10 GW.</p> <p>Added value fisheries (revenue - costs) = 0.20 m€/yr.</p>
Search area 5	<p>Search area near the border with the German North Sea. There area potentially has space for 6 GW. The area consists of two sub areas, one larger area (5 east), where there is space for 4 GW, and an area in the 'central reservation' of the adjacent new clearway for shipping to the Kattegat, where there is space for 2 GW. In area 5 east, there is also a potential shipping corridor to Esbjerg, but it is not yet certain whether this is necessary here. In partnership with Germany and Denmark, the feasibility of the 'central reservation' will be explored further (see Chapter 9.4.2).</p> <p>Considerations for nature: seabirds (terns, common terns), coastal birds (due to neighbouring Wadden Sea, the Borkum Reef Grounds and Borkum Riffgrund in Germany), possible ecosystem effects on Frisian Front (destratification).</p> <p>Estimated added value energy (revenue – operational costs) = 90 m€/yr. in the entire area, 3.3 m€/TWh.</p> <p>Consequential costs for shipping mitigation = 11.7 for east and 30.7 m€/yr. for east and middle section.</p> <p>Added value fisheries (revenue - costs) = 0.62 m€/yr.</p>

Search area	Description of search area in northern part of Netherlands North Sea
Search area 6	<p>Search area in the north, to the west of search area 5. The area potentially has space for 10 GW. The search area consists of a strip adjacent to the new clearway for shipping to the Kattegat, bordered on the north by an indicative location for a new clearway between Hull and Esbjerg. More search space has been added to the search area for the possible adjustment of boundaries for other usage or for nature. This area may be suitable for an energy hub (artificial energy island) due its extent, the possibility to connect with the energy systems of Germany and Denmark and the re-use of neighbouring gas infrastructure.</p> <p>Considerations for nature: destratification, long-lived species on the seabed (including ocean quahog), more information required about birds.</p> <p>Estimated added value energy (revenue – operational costs) = 41 m€/yr. in the entire area, 0.9 m€/TWh.</p> <p>Consequential costs for shipping mitigation = 19.0 m€/yr. (at 10 GW).</p> <p>Added value fisheries (revenue - costs) = 0.43 m€/yr.</p>
Search area 7	<p>Search area 7 potentially has space for 8 GW. A vertical position was chosen because a search area has been identified to the west of this area for a future Northern Sea Route. This area is furthest away from the mainland, so the costs of the connections to transport the produced energy to land will be extremely high. This means that generating offshore wind energy in this area will have negative social costs and benefits.</p> <p>Considerations for nature: long-lived species on the seabed, destratification.</p> <p>Estimated added value energy (revenue – operational costs) = -8 m€/yr. in the entire area, -0.2 m€/TWh.</p> <p>Consequential costs for shipping mitigation = 23.1 m€/yr. for 8 GW.</p> <p>Added value fisheries (revenue - costs) = 0.24 m€/yr.</p>
Search area 8	<p>Search area 8 lies to the west of the NCP, north of the existing wind energy areas and in between the shipping routes. The search area is bordered by shipping routes and an intensive mining area. It potentially has space for 2 GW, so long as a higher density of around 13 MW per km² is applied. In this area, the shipping risks are high due to shipping passing on all sides. More alternative approaches are therefore required. It is uncertain whether these risks can be mitigated.</p> <p>Considerations for nature: coastal birds (common guillemot, lesser black-backed gull due to neighbouring Texel), seabirds (terns), marine mammals (seals), effects on Frisian Front. Estimated added value energy (revenue – operational costs) = 25 m€/yr. in the entire area, 2.9 m€/TWh.</p> <p>Consequential costs for shipping mitigation = 16.9 m€/yr.</p> <p>Added value fisheries (revenue - costs) = 0.01 m€/yr.</p>

Table 9.2 Search areas wind energy in northern part of the North Sea.

9.3.2 New shipping routes, clearways and corridors

The need for a polar route, an increase in the size of ships, and the need for routing measures resulting from the construction of wind farms are the reasons for the following spatial indications for shipping routes, clearways and corridors.

- Polar route (Northern Sea Route, NSR). In an international context, various routes are being explored. In the Netherlands part, search space has been identified for a new route to the west of search area 7 for wind energy. In addition, space for connections has been identified for connections between ports and the NSR.
- Clearway Esbjerg-Hull, to the north of search areas 6 and 7 for wind energy.
- Clearway Kattegat towards Germany/Denmark. For the passage from the southern North Sea to the Kattegat, a clearway that connects to the German route SN10 will be established in consultation with Denmark, Germany and Belgium. Different options for the form of this route in the Netherlands EEZ are currently being explored (including safety risks) in a Formal Safety Assessment (FSA). Part of this national clearway system are connections of the German clearway system with that of the Netherlands and the NSR. These connections partially cross search area 5 for wind energy. See Chapter 9.4.2. for more information about the FSA.
- Widening of the already planned shipping corridor of 2.87 NM to a clearway of 3.5 NM between IJmuiden Ver and IJmuiden Ver (north) is necessary for the future shipping connection between the NSR and the seaports of IJmuiden and Amsterdam. This will be included in the further spatial exploration over the boundary of IJmuiden Ver (north) and search area 2 in relation to the exercise zone of the Royal Netherlands Navy and the oil and gas platforms in the area. Starting points for this exploration are that widening of the clearway is possible, that at least 2 GW offshore wind energy can be achieved and that the exercise zone of the Royal Netherlands Navy can be incorporated.

9.3.3 Fisheries

The effects on fishing are also considered in the assessment of which of the search areas will be designated as wind energy areas in the follow-up process. The demand for the feasibility of the (accelerated development of) wind energy areas in the north is prompted by the higher fishing revenue in the southern North Sea (sole fishing). On the other hand, there is less added value of wind energy in the northern search areas. Tables 9.1 and 9.2 present the available data of a social cost-effectiveness analysis for each search area.

In the North Sea Agreement, resources have been reserved to help transform fisheries into a smaller, more sustainable and profitable industry in a changing North Sea. The measures have

been elaborated in the Cutter Vision. In the framework of the further roll-out of offshore wind energy, it will be considered what additional resources are needed for mitigating or compensating measures. The consequential costs and how they will be covered will have been analysed when the definitive North Sea Programme is adapted.

9.3.4 Military exercise zones

EHD41 and EHD42 are designated military exercise zones in the aviation regulation. On both sides of the longitudinal direction at EHD41, there are manoeuvre areas where aircraft can bank. A further assessment about these areas will be conducted, for which further study is required. EHD41 is relatively near Den Helder (in search area 2), so that exercises can take place on one day. With this limitation, turning the area in a north-easterly direction seems the only possibility for relocation (see map 9.2). The condition for this is that the new area is sufficiently free of obstacles (such as mining platforms).

Search area 4 is in EHD42. The possibility to move this exercise zone will be explored⁶⁷, among others in international consultation. Another possibility being explored is combined use of the area, whereby wind turbines are placed in (parts of) the exercise zone. A limiting condition here is that the operational use of any relocated exercise zones remains guaranteed if these areas are moved.

9.3.5 Temporary parking facility modernisation and new build of drilling platforms

In the Agenda for the Wadden Area, all parties have agreed to look for a jointly supported solution for a temporary parking facility near the port of Den Helder to facilitate the modernisation and new build of drilling platforms.

⁶⁷ Parliamentary document 33561, no. 46

9.4 Follow-up process

9.4.1 Supplementary design and partial review

The ambition in the follow-up process is to designate wind energy areas according to an adaptive, phased planning. The national government plans the following steps.

Step I: Complete additional draft North Sea Programme to adopt definitive North Sea Programme in NWP 2022-2027⁶⁸,

- Reconfirm wind energy areas that had already been designated in the North Sea Policy Document 2016-2021, needed for fulfilling the current government ambition of 49 percent CO₂ reduction by 2030. In addition, and if necessary, adopt the related space reservations for shipping.
- Designate wind energy areas where an additional 5 to 9 GW can be achieved by 2030⁶⁹, due to the new EU ambition of 55 percent CO₂ reduction by 2030. If space is found for 5-9 GW, (some of the) areas designated in the North Sea Policy Programme 2016-2021 that are unfavourable for other sectors and/or nature may not be reconfirmed. Their status as wind energy area is cancelled from the definitive adoption of the North Sea Programme in 2022.

Step II: partial review North Sea Programme

- This step involves designating the rest of the wind energy areas that together with the areas from Step I offer space for a total 27 GW. However, this requires more research than fits in the planning for a supplementary design. After the adoption of the North Sea Programme as part of the NWP, the partial review can start in April 2022 and be completed in March 2023. In relation to the wind energy areas, the additional clearways and routes for shipping will be determined and, if necessary, adjustments to defence zones will be made. After international coordination, definitive space can also be reserved for the Northern Sea Route. If the critical timeline of additional research and decisions - discussed in step I - cannot be followed, the planned decisions will also be taken in the framework of the partial review.

Aspects in the assessment

Assessing the designation of wind energy areas involves the following aspects:

- Ecological carrying capacity of the North Sea ecosystem. The ecological effects are included as an important element early in the consideration. Natura 2000 areas and MSFD areas are

avoided and the effects on the biogeographical populations are viewed both individually and in a cumulative context. This is done based on the Framework for the Assessment of Ecological and Cumulative Effects

- Options for energy transport toward energy infrastructure on land, and consequences for the onshore energy infrastructure and the associated costs.
- Size of areas, so that a multiple of the technical standard of platform or hub solution for the grid connection can be achieved (such as 700 MW alternating current, 2 GW direct current or a new future hub standard).
- Possibilities for system integration and for connection of international wind farms as interconnector.
- The effect on differing use, including fishing, shipping, mining and defence.
- Risks for shipping safety and effects on accessibility, possibilities for mitigating measures and routing measures and related costs.

Effects on sand extraction are not an issue in the identified search areas. Issues like accessibility and spatial zoning in relation to cables and pipelines will be addressed at a later stage closer to site designation. Where necessary, solutions will then be sought in the form of multiple use, such as oil and gas production inside a wind farm, or fishing-friendly wind farms.

9.4.2 Research and explorations

Prior to decision making in a supplementary design and/or partial review, several investigations and explorations will be conducted. These are necessary to obtain facts and figures that support balanced considerations related to the scarce space at sea and the prerequisites for a healthy ecosystem. Parallel to the research prior to the definitive adoption of the North Sea Programme, it is important to chart mitigating measures and consequential costs, together with the required resources and their coverage. This concerns mitigating or compensating measures with respect to shipping, nature conservation, fishing and fishing communities, for example. The process works from rough to refined. For example, the exact costs of mitigating measures for nature conservation can only be specified at a later stage when sites are designated. At that moment, it will also be clear what use combinations in wind farms are possible. When establishing the definitive North Sea Programme, the consequential costs and how they will be distributed and covered will be agreed based on the information available at that time.

⁶⁸ Whether this is successful depends on the completion of nature conservation studies with a critical planning

⁶⁹ Reference Climate Agreement

More specifically, the following studies are planned in 2021:

1. Ecological studies focused on the cumulative ecological effects of wind farms, including loss of habitat and the effects on populations, and an estimate of the effects on Natura 2000 areas (quantitative) and MSFD areas (qualitative).
2. Safety studies focused on the clearway system that creates the connection with the German shipping route SN10 towards the Kattegat and the Baltic Sea, including the branches towards the future Northern Sea Route and Esbjerg, for which the effects and possibilities of a central reservation in combination with shipping in search area 5 will also be studied. This Formal Safety Assessment (FSA) will be conducted in an international context. This FSA is an essential building block for an integral consideration in and international context to determine the potential of wind energy in search area 5, including the consequences for accessibility and safety, and possible mitigating measures.
3. The potential spatial organisation at IJmuiden Ver (north) and search area 2 in relation to the relocation of the exercise zone EHD41 of the Royal Netherlands Navy, any mining platforms present and the required widening of a clearway, intended for traffic to the United Kingdom and the connection between the port of Amsterdam and the Northern Sea Route. The possibility of relocating the exercise zone of the Royal Netherlands Navy and a solution for (any) mining platform(s) are essential for the possible development of wind farms in search area 2 by 2030.
4. Exploring the possibilities to relocate the use of search area 4 for wind farms or to combine it with the function of the defence exercise zone EHD42. This research may continue in 2022.

In parallel, studies into options for transport of energy towards land will be conducted in the VAWOZ programme (Analysis of Landfall Options for Offshore Wind Energy). This will provide insight into the feasible space for the development of wind energy areas. The results of the already conducted social cost-effectiveness analysis will be included in the assessments in order to consider costs and benefits. Additionally aspects related to social acceptance, safety, ecology and feasible space will be taken into account. For the longer term, research will be performed into hub functions, possibilities of artificial energy islands, transport via molecular energy carriers, etc.

9.5 Land-sea interactions

Spatial decision-making at sea and in the main water system is organised differently than on land. On land, including large parts of the coast landward of the low water line, the national government, provinces, municipal councils and Water Boards share responsibility for the spatial planning policy. In all cases requiring a cohesive decision for activities on sea and land, the various levels of governance must coordinate this, respecting each other's responsibilities and authorisations.

In this paragraph, the land-sea interactions that require attention from several levels of governance in the planning period are brought together. This gives other government authorities a compact overview of the joint agenda emerging from and connected with the spatial-ecological and economic decision-making and policy-making about the use of the sea.

Ecology, biodiversity and nature

In all major waters, and nearby areas such as the dunes and on the islands, there are tasks for nature, biodiversity and nature restoration/nature development. Together, the programmes of measures for WFD, MSFD and Natura 2000 ensure a good ecological status in the waters that form the transitions between land and sea, including the transition waters. The dune areas also deserve attention. The European Biodiversity Strategy (EBS) is an important cornerstone of the European Green Deal and aims to put biodiversity on the road to recovery in Europe by 2030. In the coming planning period, the EBS for 2030 will be developed for the Netherlands and its neighbouring countries around the North Sea. The ambition is to achieve 30 percent area protection along the lines of transboundary cohesion of protected nature areas, a third of which will be strictly protected.

Based on the criteria for area protection and statutory goals for nature restoration elaborated in 2021 and adopted in the EU, it will become clear what additional actions are or may be necessary for the nature conservation areas on the interface of land and sea. This is particularly relevant with respect to migratory birds, fish and their habitats. The national government and other authorities (primarily provinces) will work together on this from their respective responsibilities. Such cooperation is also relevant in the implementation of the EU action plan for a Zero Pollution ambition for air, water and soil for a healthy planet and healthy people. In the EU, this action plan will be further elaborated in 2021.

Energy: offshore extraction, conversion into hydrogen and connection on land

The offshore energy transition and onshore connection of energy produced offshore is a dominant area of attention for the national government and regions for the planning period.

The landfall of energy in the form of electricity or hydrogen offers great potential for the relevant regions. In the transition to a carbon-neutral society in 2050, the availability of green energy is becoming increasingly important. Furthermore, offshore wind energy is crucial to enable the Netherlands to meet its climate goals, whilst retaining employment here. The supply of electricity from the sea is already an important reason for (foreign) companies to settle in the Netherlands, and this importance will only grow. Landfall regions in our country are already responding, as evidenced by the hydrogen ambitions in Groningen. Achieving this depends on timely availability of a substantial supply of electricity and will have an important impact on the development of the region in the coming decades. For the regions of Rotterdam, Zeeland and the North Sea Canal area, timely availability of electricity is also important so that a start can be made with creating a hydrogen chain that can eventually replace fossil energy in these areas.

To make landfall possible in 2030, the spatial procedures must be started in time, as this takes 8.5-10 years. Clarity in the short term about where, how much and in which form offshore energy comes on land has a positive economic impact and consequences for the necessary infrastructure which must be created onshore. By onshoring electricity from offshore wind energy in places where demand is high, wherever possible, the amount of new infrastructure to be created on land can be limited. This can put great pressure on municipalities near landfall locations at industrial clusters. In the short term, the existing infrastructure will mean that some regions are more attractive than others. In the long term, however, (after 2030), other potential landfall locations can be considered to optimise the efficiency of that method of onshoring offshore wind energy.

Towards 2040, the options for onshoring energy in the form of molecular energy carriers like hydrogen will increase. The main advantage of such transport is that there is already (some) offshore infrastructure (pipelines), and that more energy can be transported at the same time through the same pipeline. This limits the amount of space required, both at sea and on land.

The Ministry of Economic Affairs and Climate is responsible for the necessary infrastructure at sea and on land. This is done via the Energy Main Structure Programme, the Sustainable Industry Infrastructure Programme and the Exploration for onshoring offshore wind started at the end of

2020. Together, these three programmes are working on creating an energy infrastructure that leverages regional opportunities.

Carbon Capture and Storage (CCS) and storage of hydrogen

In the Climate Agreement, a role has been allocated to the capture and storage of CO₂, on condition that CO₂ will only be stored under the seabed. The main aim is to limit CO₂ emissions from certain industrial sectors. In the long term, however, storage locations in the (deep) seabed are also relevant for the large-scale production and storage of green/blue hydrogen or achieving negative emissions.

The CO₂ captured at the source will be transported by pipeline from the big industrial clusters to the North Sea. A maximum (ceiling) has been established in the Climate Agreement: until 2030, a maximum 7.2 Mton of industrial CO₂, supplemented by a maximum of 3Mton of CO₂ from the electricity sector. In 2020, together with EBN and Gasunie, the Rotterdam Port Authority proved the feasibility of a robust basic infrastructure (backbone) for collecting and transporting CO₂ from companies in the port area, which can then be stored in (empty) oil and gas fields under the sea. This was the Porthos project⁷⁰ (*Port of Rotterdam CO₂ Transport Hub & Offshore Storage*). The projects for CCS Athos/NZKG (IJmuiden Noordzeekanaal), Aramis (Den Helder), Clean Underground Sustainable Transport (CUST, North Sea port) are the subject of study and possible implementation. All three sites are possible.

The parties involved will need to conduct further consultations in the planning period 2022-2027 for optimal and supported decision-making, both for CO₂ towards the North Sea and for hydrogen from sea to land.

Sustainability of shipping has an onshore component

In the coming period, offshore activities, and particularly shipping off the coast, will become more sustainable. This will help combat acidification of the sea as well as limit any depositions (such as nitrogen) from offshore activities in the dunes. To make shipping more sustainable, physical adjustments in the ports will be necessary. This is a task in which the national government, provinces, municipalities and port authorities will operate jointly.

⁷⁰ <http://www.porthosco2.nl/>

Marine protein: proteins, fish, fish farming, shellfish and crustacean farming, aquaculture and saline cultivation

Sustainable fishing is a key issue from the North Sea Agreement and the Cutter Vision of LNV. For existing shellfish farming and aquaculture in inland waters like the Eastern Scheldt, the Wadden Sea and in the coastal waters, policy and policy measures will be continued. Protected shellfish waters have already been designated for the farming of shellfish for human consumption. This concerns the Wadden Sea, the Voordelta, Grevelingen, Eastern Scheldt and the western part of the Western Scheldt.

Pursuant to the North Sea Agreement, a study was launched in 2021 into the new blue economy related to marine proteins. It showed that the farming of fish, shellfish and crustaceans outside the coastal zone is difficult and not (yet) economically viable. Space at sea to test sustainable innovations in the food production of marine proteins is therefore an attention point for the national government in partnership with the fishing industry in the planning period. As part of the North Sea Programme, the national government (LNV/I&W) will also conduct research into the ecological space for large-scale farming of seaweed (up to 400 km²). This research will also provide insight into the ports that can be used for this and the sites where processing of the harvest can take place. In the process, the Ministry of Agriculture, Nature and Food Quality (LNV) will also look at the farming of marine proteins on land. This is possible for seaweed and certain fish species and may offer benefits in logistics and in business cases. In addition, saline cultivation may be possible at the interface of sea and land. Saline cultivation, involving lamb's lettuce, sea lettuce and samphire as well as potatoes and tomatoes, already takes place in Zeeland (aquaculture area around Colijnsplaat/Kats) and on Texel, and will increase in salinised areas of land and along the coast. A strategy for food from the sea will be developed in the coming planning period.

Ports

All the Dutch sea and inland harbours are subject to the policy included in the Port Policy Document 2020-2030⁷¹. In relation to the interaction between land and sea, the Port Policy

Document specifically devotes attention to (sea)ports and a hinterland in transition. The focus of policy is on eight integral themes, including Accessibility and Logistics, Economy and Innovation, Sustainability, Spatial Environment and Labour Market. Based on characteristics of the port areas, the focus of the government in the Port Policy Document is on the following clusters: mainport Rotterdam and Moerdijk, Amsterdam North Sea Canal area, Zeeland/Scheldebekken, Groningen/Eemsmond, and Dutch inland ports.

In the current policy, the Port of Rotterdam occupies a special position due to its economic size and scale. This means that projects for the Rotterdam mainport have priority over investments in the other nationally important ports with an equal social score. But also considering the advice "Beyond Mainports" by the Council for the Living Environment and Infrastructure (July 2016) to broaden the view of mainports, I&W wants to view the allocation of resources to the mainport more in cohesion with the further development of other important clusters, such as the Brainports and Greenports and the logistics system of sea and inland harbours.

Other seaports like Scheveningen, Harlingen and Den Helder are primarily of local or regional importance when it comes to storage and transshipment. When investing in accessibility, these seaports receive support from local and regional authorities and are therefore not directly eligible for MIRT investments from the national government. Although Den Helder is not a port of national economic importance, it is a special category seaport in view of the combination of civil and defence interests. The port of Den Helder is the home base of the Royal Netherlands Navy and the Coastguard. The Ministry of Defence has been designated Government Harbour Master pursuant to the Shipping Traffic Act. With offshore wind energy and the focus on hydrogen, there is potential for further development in the Kop van Noord-Holland. To strengthen the maritime development in the region, the national government is investing a maximum of €5 million as part of the third series of Regional Deals.

⁷¹ <https://www.rijksoverheid.nl/documenten/kamerstukken/2020/03/30/aanbieding-ontwerp-havennota-2020-203>

9.6 Maritime Spatial Planning Directive: international collaboration

International collaboration in the maritime spatial planning process is focused on guaranteeing 'the coherence and coordination of the maritime spatial plans in the entire marine region'. In this respect, collaboration is focused on coordinating with the relevant member states and the authorities in third countries in the North Sea region.

To supplement the requirement to structurally establish collaboration between the EU members states around the North Sea (art. 11(2) of the MRP directive), a North Sea Maritime Spatial Planning collaboration working group was set up in 2020. Norway is a member of the working group and the authorities in the United Kingdom as well as Ireland and Iceland have been invited to join. Objectives of the working group are:

- to act as a platform for sustainable collaboration about transboundary aspects in the field of maritime spatial planning.
- to work on achieving coherent strategies and plans across borders for the efficient and optimal use of the North Sea.
- to work together for exchanging and generating new data and information, relevant to transboundary aspects that occur in maritime planning (for example the network of environmentally protected areas, shipping routes and routing measures, determine safe distances between users at sea, cables and pipelines).
- to share experiences and best practices.
- to coordinate relevant groups at policy level on aspects in existing forums (such as the work of the hydrographic services, the progress of work in relation to the MRP cycle within the framework of OSPAR, and the international collaboration on (wind) energy in the North Sea).
- to coordinate, initiate and align new (EU-funded) transboundary projects which can support maritime planning in the North Sea countries.

Collaboration between North Sea countries is self-evident. This has taken place in many different areas of MRP and in various frameworks (bilaterally, multilaterally, for example in the European

Expert Group for MRP of the European Commission, OSPAR, IMO and ICES) as well as in projects. Examples of projects are the North SEE Interreg project, the SEANSE project completed in 2019 focusing on the ecological impact of offshore wind farms and how to assess this in strategic environment assessments, and the political cooperation project: North Seas Energy Cooperation.

There are agreements about shipping (safety), environmental conditions, natural areas, fishing, monitoring and offshore wind farm developments. There are also exchanges and consultations about previous plans by the various North Sea countries. Chapter 1.6 addresses the international consultation and coordination of this spatial plan as part of the North Sea Region Programme 2022 – 2027.



10 Policy and assessment frameworks

10.1 Policy framework for passage through and multiple use in wind energy areas in the North Sea

The North Sea is becoming increasingly crowded due to all kinds of spatial claims. This also applies to the increasing spatial claims for new wind energy areas. To be able to continue to allocate all functions and needs, there is an increasing need to switch to multiple use of space and integration of challenges. For offshore wind energy areas, this means the facilitation of ‘passage and multiple use’.

Passage and multiple use are like communicating vessels. Where there is passage, (often) no multiple use can take place with fixed structures in the water column and vice versa. To facilitate both passage and multiple use, the new wind energy areas can no longer have integrated passage.

Passage

The policy for 2022-2027 only allows passage in wind energy areas in specially designated passageways. That means a two-way traffic system where shipping is subject to conditions can pass through the wind energy area. The final location and orientation of the new passages must be further investigated for each wind energy area, among other things by collecting and analysing navigation movements of fisheries and recreational shipping. Also, passages to the

greatest possible extent correspond with existing shipping routes to and from ports, important fishing grounds and with the routes of recreational shipping. In addition, the passages are to the greatest possible extent bundled with maintenance zones for cables and pipelines, which in most situations are also oriented east-west.

The passages must be designed safely. ‘Safe’ means clearly marked, with sufficient distance from wind turbines and with sufficient width for two-way traffic. The design of the passage serves as the basis for the safety study. The course of the passages must lead to as few course changes as possible for passing ships. And the entrances and exits of the passages must to the greatest possible extent connect perpendicular to the existing shipping routes. The safety study currently under way will eventually show how best to pass through the passages. If necessary, (additional) security measures will be taken for this.

The use of the passages is permitted for ships up to 46 metres. They are suitable for the fishing cutter fleet and a large part of the recreational fleet. Ships may also use the passages at night, provided they are equipped for this. The passage is primarily intended to facilitate passing the wind energy area as quickly and efficiently as possible. It is therefore not permitted to exhibit objectionable (sailing) behaviour that impedes passage⁷². Under varying (weather) conditions, skippers must adhere to the principle of good seamanship to determine whether it is safe to navigate through a passage.

The national government attaches great importance to unambiguous passage rules for shipping in the Dutch North Sea, even if these have not yet been harmonised internationally. This means that the starting points for passage do, in principle, apply to all wind farms, with the possibility of deviating from this under special circumstances. The Passage Research & Monitoring Programme can help to adjust the current starting points for a subsequent implementation period. The rules for passage in passages apply as an obligation immediately after the completion of the wind farm. This prevents confusion among users.

⁷² Rod fishing as referred to in Article 1, paragraph 5, of the Fisheries Act 1963, may be permitted in the passages, provided that it is safe and does not impede other vessels in the passages.

Multiple use

Multiple use in wind energy areas refers to nature development, food (passive fishing, mariculture) and forms of sustainable energy generation other than wind energy, such as solar panels and tidal energy.

An Area Passport Guide will be drawn up for all six wind energy areas of Route Map 2023 and 2030 (Borssele, Hollandse Kust (south), (north) and (west), IJmuiden Ver and Ten Noorden van de Waddeneilanden). Zoning then indicates where in a wind farm there is space for multiple use. Excepted from multiple use are: passages, maintenance and safety zones around platforms, wind turbines, infield cables and the logical routes to them. The remaining space is available for multiple use.⁷³

Using an Area Passport Guide, a distinction is made between different types of multiple use forms for each wind energy area, while it is also indicated to what extent which type of multiple use is preferred for each wind farm. Interests of the National Strategy on Spatial Planning and the Environment (NOVI) (see Section 2) are also taken into account in this guideline. The Area Passport Guide introduces a more layered structure that gives an area-specific effect to national interests. Section 10.3 explains the operation of the area passport in relation to the Assessment Framework for multiple use in offshore wind farms.

In addition to economic multiple use, sufficient space must remain in wind farms for nature development to achieve a healthy and sustainable North Sea. From the ecosystem approach, the focus remains on the balance between functions, which should prevent industrialisation of the North Sea. Prior permission is also required for multiple joint use activities in a wind farm that are not regulated by the Water Act, such as passive fishing.

In addition to economic multiple use, sufficient space must remain in wind farms for nature development to achieve a healthy and sustainable North Sea. From the ecosystem approach, the focus remains on the balance between functions, which should prevent industrialisation of the North Sea. Prior permission is also required for multiple joint use activities in a wind farm that are not regulated by the Water Act, such as passive fishing.

⁷³ Some non-bottom-bound forms of multiple use, such as nature development and passive fishing, can, if they do not impede maintenance, be allowed in some of the maintenance zones. See the explanation with the assessment framework for multiple use in wind farms

	seaweed	mussel	flat oyster	cuttlefish	Edible crab	European lobster
Egmond aan Zee	+	++	+	0	++	-
Prinses Amalia	+	++	+	1	+	-
Luchterduinen	+	+	+	1	++	0
Buitengaats (Gemini)	0	0	+++	0	++	+
Zee-energie (Gemini)	0	0	+++	0	+++	+++
Borssele	+++	+++	+++	1	++	+++
Holl. Kust (zuid)	+++	+	+	1	+	-
Holl. Kust (noord)	+	++	+	1	+	-
Holl. Kust (west)	+	++	-	1	++	+
Ten Noorden van de Wadden	0	0	+++	0	+	-
IJmuiden Ver	+	0	-	1	+	0

Table 10.1 Suitability of wind energy areas for a several forms of mariculture and passive fishing⁷⁴

The table above shows that certain areas are to a greater or lesser extent suitable for certain forms of mariculture and passive fishing. Not only the natural elements are taken into account when determining the potential of an area, but also the distance to the coast. This can affect the economic feasibility of activities. Various facets influence this, such as sailing time, the degree of maintenance or monitoring of the activity and conditions on site. Based on the Area Passports Guide, it will be examined which wind farms are most suitable and preferred for which multiple use function.

Innovations arising from the Offshore Wind Energy Tender Scheme

The tender scheme for Hollandse Kust (Noord) includes a provision to stimulate innovations that benefit the integration of future wind farms in the Dutch energy system. It concerns innovations in the wind farm or in the directly related resources that contribute to increasing the flexibility of the supply profile of future offshore wind farms. Examples include installations for other forms of extraction or storage of sustainable energy. Permit applications must be submit-

⁷⁴ Wageningen Marine Research, Suitability of offshore wind farms for mariculture and passive fishing; A quantitative assessment of the likely success of the areas for the potential productivity of a selection of commercially interesting species, 2020

ted for these installations, if they are not directly related to the wind turbines of the wind farm. These innovations are preferred in the wind energy area to initiatives for other multiple use. It is expected that for the tenders for the Hollandse Kust (west), Ten Noorden van de Waddeneilanden and IJmuiden Ver wind energy areas, provisions for such innovations will also be included.

Consortia formation and combination of multiple use activities

Forming consortia and the combination of multiple use activities can ensure efficient use of space and possibly also cost savings. Initiators could share facilities, for example, the seeding and harvesting vessels, and they could use the electricity infrastructure. In addition, synergy can arise between different combinations. Consortia for combined initiatives can apply for a so-called umbrella permit.

10.2 Area surveys and Area Passports Guide for multiple use in wind energy areas in the North Sea

In 2020, the roll-out of wind energy in the North Sea is in full swing. The Borssele wind energy area is physically under construction and the Hollandse Kust (south) and Hollandse Kust (north) have already been tendered (phase F in table 2). The wind farm site decisions of these wind energy areas (*Roadmap 2023*) are already irrevocable.

The subsequent wind energy areas (*Roadmap 2030*) Hollandse Kust (west), Ten Noorden van de Waddeneilanden and IJmuiden Ver are already under development (phase D). Allocation is already well advanced because it is related to the locations of the platforms for the offshore grid. The permit procedures for these platforms have a long lead time and therefore start early. The allocation takes into account passages for ships up to 46 metres, based on data on shipping traffic in the area.

In general, anticipating the possibility of shared use in a wind farm at an early stage will be more cost-effective than adding functions to a wind farm afterwards. However, all decisions for *Routemap 2023* (Borssele, Hollandse Kust (south) and Hollandse Kust (north)), have already been taken and are irrevocable. This means it is too late to prepare an area survey prior to the allocation for the areas from *Routemap 2023*.

The allocation of the wind energy areas for *Routemap 2030* (Hollandse Kust (west), Ten Noorden van de Waddeneilanden and IJmuiden Ver) is already advanced, but it still offers the opportunity to carry out an area survey for the wind energy area.

After the development plan for the wind farms is known, an Area Passport Guide will be drawn up and published for all six wind energy areas from *Roadmap 2023* & *2030*. Initiators for possible multiple use can then enter into dialogue with the competent authority. These initiatives for multiple use cannot be implemented until the wind farm has been completed.

Area survey wind energy area

An area survey of a wind energy area provides an overview of all known area-specific characteristics and the current and future users of the area. The area survey will be less specified than the Area Passport Guide. During the area survey of a wind energy area, the possible orientation and location of the passages to be constructed will also be investigated.

Area Passport Guide Wind energy area

An Area Passport Guide uses area-specific characteristics to indicate for each wind energy area where and which forms of multiple use have the most favourable perspective and are best suited and are, therefore, preferred. Based on the Area passports guide, in the new Assessment Framework for multiple use of offshore wind farms drawn up by the executive agency of the Ministry of Infrastructure and Water Management (Rijkswaterstaat), a distinction can be made between permit applications from potential co-users. If there is no need for the preferred type of multiple use, the zone can be released for other multiple use. The Area Passport Guide is primarily a guideline.

Sequence of things roll-out offshore wind energy	Sequence of things multiple use
A. North Sea Programme 2022-2027: <i>Designation of new wind energy areas (formerly North Sea Policy Document 2016-2021)</i>	North Sea Programme 2022-2027: <i>Sustainable blue economy (formerly North Sea Policy Document 2016-2021)</i>
B. Offshore wind energy roadmaps: <i>When to develop which (parts of) wind energy areas.</i>	
C. Allocation and survey of landfall (<i>offshore wind energy</i>)	Area survey with area-specific characteristics, such as nature values, current and future users.
D. Adoption of wind farm site decision: <i>Exact parameters and conditions for the site based on the EIA procedure.</i>	In the run-up to the tender, (optional) consortia formation between co-users and/or with the wind farm operator.
E. Tendering of the wind farm ⁷⁵	After tender result, coordination co-user with winning wind farm operator
F. Construction of a wind farm in accordance with work plans (including design plan (layout) of the wind farm by the operator)	Area Passport Guide based on area-specific characteristics indicate where and which forms of multiple use have the most favourable perspective by the national government (Ministry of the Interior and Kingdom Relations) and are preferred.
G. Order of general application (BAS) for setting the safety zone around the wind energy area	Legally establishing passages and contains the rules for access to the wind energy area.
H. Commissioning of wind farm	(<i>Submission of permit application</i>) Multiple use of the wind farm

Table 10.2 Roll-out of offshore wind energy in relation to multiple use

⁷⁵ Several tender options are included in the Offshore Wind Energy Act; the procedure with subsidy, comparative test (with or without financial component) or auction.

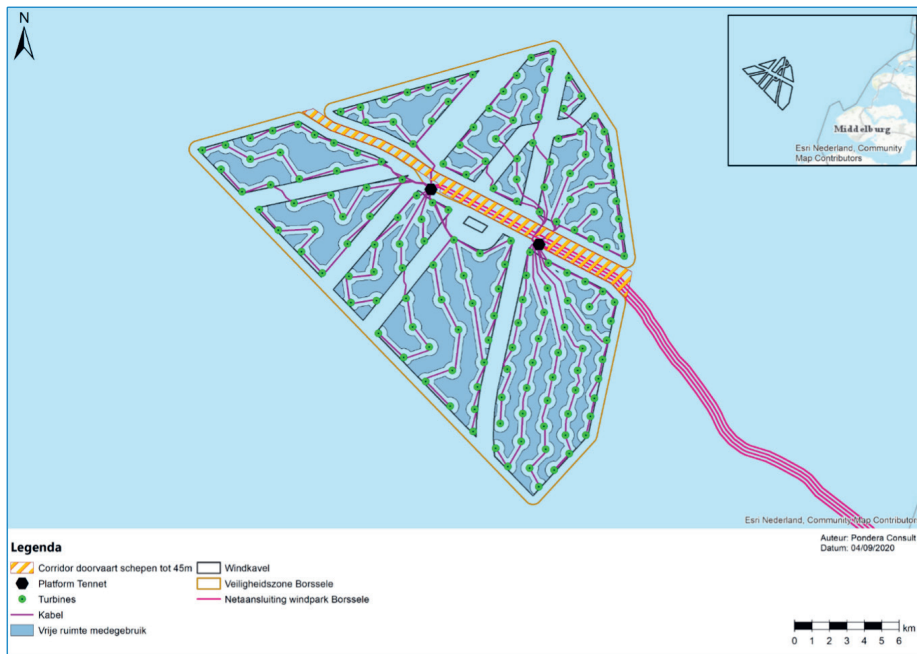


Figure 10-a: The available space for potential multiple use in the Borssele wind energy area (9,800 hectares).

Spatial zoning indicates on a map where in the wind farms there is space for multiple use.

The national government prefers integrated forms of multiple use (efficient multiple use of space) and the stacking of functions as much as possible. It is important to find the right balance between realising sufficient scale and leaving room for diversification (several forms of multiple use) within a wind farm when this seems promising.

Industrialisation of the North Sea must be prevented. That is why in addition to economic multiple use, sufficient space must remain in wind farms for nature development to achieve a healthy and sustainable North Sea. The area layout considers balance (the triangle of nature, food and energy) and the carrying capacity of the North Sea. The term of a multiple use permit can be limited if it does not correspond to the preferred multiple use. In the long run, for example, preferred activities may still qualify for the use of the most suitable multiple use space.

This is explained in more detail in Section 10.3.

In short, the Area Passports Guide provides transparent information about:

- the possibilities for future multiple use by current and new users, in line with the goals of shared use in the area;
- preferred form(s) of multiple use;
- shows which space is available for multiple use;
- the natural qualities and properties present in the area;
- a layered structure in which national interests are elaborated in an area-specific manner.

10.3 Multiple Use Assessment Framework

10.3.1 Introduction

The national Government sets frameworks so the use of space in the North Sea can develop efficiently, safely and sustainably. Multiple use of space is an important starting point. It offers balanced opportunities for all forms of use in the North Sea. The Assessment Framework for multiple use in wind farms is the mechanism that the national government applies to assess whether certain initiatives for multiple use activities in offshore wind farms can be permitted. The three steps of the assessment framework are followed to obtain a permit for multiple use in a wind farm.

10.3.2 Scope

The Assessment Framework for multiple use in wind farms in the North Sea applies to all activities in offshore wind farms requiring a permit within the framework of the applicable laws and regulations in the territorial sea and the EEZ.

A permit must be applied for to be able to realise multiple use activities in wind farms in the North Sea⁷⁶. The assessment framework for this is intended, on the one hand, for permit issuers, to enable them to assess permit applications for these activities in offshore wind farms and to properly weigh up the interests. On the other hand, the framework provides permit applicants with insight into the steps to be taken to obtain a permit and the required documentation and resources.

Multiple use is understood to mean all activities requiring a permit that take place within the parameters of wind farms, between the wind turbines, and that do not fall under offshore wind energy. The following types of multiple use are possible in offshore wind farms:

- mariculture (including shellfish and crustaceans, and seaweed)
- other forms of sustainable energy generation and storage (including solar or tidal energy)
- nature-promoting projects (e.g. oyster recovery, shelters for fish, artificial reefs)
- passive fishing (including pots for catching crabs and lobsters)

Nature-inclusive construction versus multiple use

Not only the realisation of certain sustainable forms of multiple use, but also nature-inclusive design and construction can directly or indirectly contribute to the conservation and sustainable use of native species and habitats in the Netherlands, for example, because certain organisms can benefit from the materials used. The wind farm site decisions for the Borssele and Hollandse Kust (south) wind energy areas therefore include a best-effort regulation for the construction of offshore wind farms to promote nature-inclusive construction. The regulation is more specific for Hollandse Kust (north). In the latter case, the regulation implies that the wind farm operator, who uses stones or other materials as erosion protection around the foundations of wind turbine piles, must take measures in the form of small and/or large holes and crevices and settlement substrate to enlarge the suitable habitat for naturally occurring species in the North Sea. These are in particular ‘umbrella species’ such as cod and flat oysters.

By building them in a nature-inclusive way, wind farms actively contribute to strengthening a healthy sea and enhancing the conservation and sustainable use of species and habitats that occur naturally in the Netherlands.

Nature-inclusive design or construction forms an integrated part of the wind farm. To be able to build wind farms in a nature-inclusive way, operators must submit a work plan before construction starts. If additional installations or structures are erected separately from the wind turbines and erosion protection, a water permit must be applied for, just as for activities of multiple use.

⁷⁶ With the exception of passive fishing, see the box on the passive fishing procedure

Procedure with regard to passive fishing

Fishing activities in the North Sea are regulated through the fishing regulations and are, therefore, not subject to a permit under the Water Act. Under (European) fisheries legislation and regulations, fishing activities require a fishing permit for the vessel and the fishing gear. In principle, fishing is possible in the entire Dutch part of the North Sea, except in areas where this is prohibited, such as in the safety zones of offshore installations. A safety zone has been established around a wind energy area and within this zone, access is limited and specific rules apply in connection with safety and the installations to be protected. A fishing permit does not grant access to a wind energy area. Access to this area outside the passages will only be granted to fishermen who have been allocated space by the government to be able to engage in passive fishing activities. The space available for passive fishing activities in a wind energy area is limited. This scarce space is allocated through a registration whereby entrepreneurs, preferably in a consortium or other partnership, register for one or more specific spaces. The available spaces for passive fishing within a wind energy area are included in the Area Passport Guide for the wind energy area. When registering, the entrepreneur must in any case meet and take into account the following conditions:

- The entrepreneur holds a fishing permit against which the fishing gear and fishing vessel to be used are registered;

- The fishing gear to be used falls under the category of passive gear, defined as techniques where the fish catches itself by catching a hook or swimming into a cage or net;
- The fishing gear may touch the bottom but, in accordance with the terminology customary in fisheries policy, not stir it;
- The entrepreneur is responsible for minimising the loss of the fishing gear;
- The entrepreneur is responsible for using a method in which no birds are attracted;
- The fishing activity should not affect on the maintenance and continuity of the wind farm;
- The entrepreneur has demonstrable knowledge and skills with regard to:
 - het veilig manoeuvreren binnen een windpark;
 - het veilig uitzetten van het vistuig binnen een windpark;
- The vessel must have the appropriate characteristics for this purpose.
- The entrepreneur is insured against potential damage to the turbines and the infield cables from the wind farm and against any consequential damage;
- The vessel that is used to carry out the fishing activity must be registered with the Netherlands Coastguard prior to entering the wind energy area;
- -Sustainable fishing gear is used for fishing activities; causing litter should be avoided.

10.3.3 . Starting points

A fixed legal procedure is followed when assessing the admissibility of the activity. The assessment framework offers tools to be able to steer towards efficient and multiple use of space in wind farms. In part, the first come, first serve principle is applied and the initiative lies with the market.

Among other things, the following factors will be taken into consideration during the assessment of the permit application: the spatial aspects, safety, effects of the activity on ecology and the environment and other effects on the uses in and around the area. A permit will be refused if the objectives of water management oppose the granting of permits and there is no possibility to sufficiently protect the interests of water management by means of regulations or restrictions. Also, a permit can only be issued if it is in accordance with the London Protocol and the OSPAR Convention.

Area Passport Guide and preferred activities

An Area Passport Guide is drawn up for each wind energy area. The Area Passport Guide describes the area-specific characteristics, sets out the national goals and priorities for the area, shows which space is available for multiple use and which multiple use activities are preferred. Activities are preferred if they are in line with the sustainable ambitions of the energy, food and nature transition. The application of the steps in the assessment framework enables some form of spatial control. Activities that correspond to the policy preferences are referred to as 'preferred activities' in the assessment framework.

Multiple use of space where possible

In areas designated for activities of national interest⁷⁷, other activities must not interfere with this use. It should be noted that while a permit holder for the specific activity for which the permit was issued has the exclusive right to carry out exploration or exploitation for that activity in the relevant sea area, he does not have the exclusive right for the full use of the area concerned. In principle, there is room for multiple use, provided the permit holder concerned does not experience disproportionate damage or nuisance as a result.

Multiple use outside the maintenance zones for wind turbines and infield cables

Research⁷⁸ has shown that to safely carry out the necessary maintenance around the wind turbines and infield cables, a 500-metre radius of space must be kept free around the wind turbines and 250 metres on both sides of the infield cables. Adhering to the maintenance zones creates a certain degree of zoning in the area and it becomes clear where multiple use could occur. The maintenance zones can also be used as approach routes for maintenance vessels heading for the various installations. Maintaining fixed maintenance zones creates transparency for all parties who use the area and ensures a safer situation in wind farms.

Usefulness and Necessity

If a proposed activity has significant negative spatial and/or ecological effects, it must be demonstrated why the activity must take place in the North Sea. Some activities are of national importance⁷⁹ explicitly laid down in government policy. The social importance of these activities does not need to be substantiated again. All other tests from the assessment framework are applied to these activities.

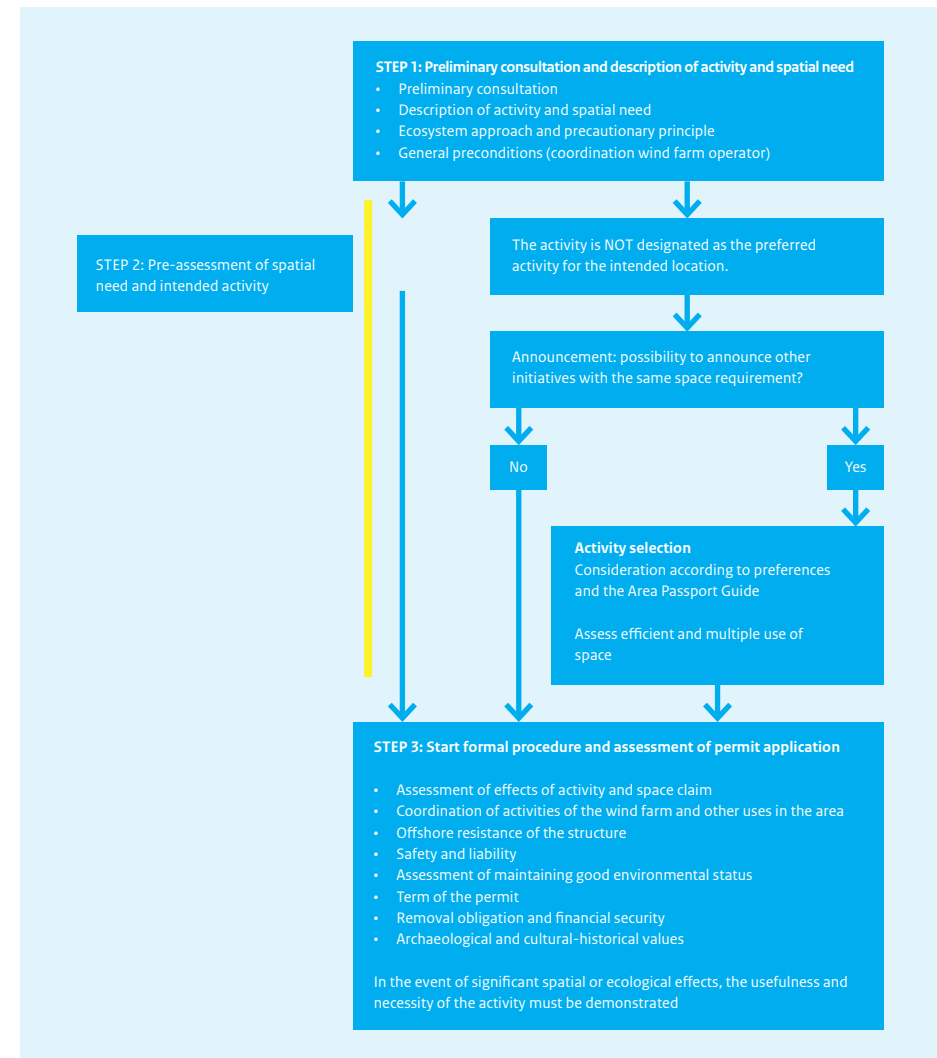
The initiator must demonstrate the usefulness and necessity of all other activities that cause significant negative spatial and/or ecological effects. The initiator must substantiate why the activity must take place at that location and why this is not reasonably possible at another location, including on land. In the case of doubt about the usefulness and necessity of a new activity, the competent authority can ask the initiator to conduct a social cost-benefit analysis (SCBA). Based on this, the competent authority makes a final assessment. If usefulness and necessity have been successfully demonstrated, the remaining tests from this assessment framework must still be completed.

⁷⁷ This refers to the twelve National Strategy on Spatial Planning and the Environment interests that are put into effect under the North Sea Programme. Renewable energy, including wind energy, is of national importance.

⁷⁸ BMT Netherlands B.V., *Report on the space required for maintenance of wind turbines within wind farms*, March 2020.

⁷⁹ This refers to the twelve National Strategy on Spatial Planning and the Environment interests that are put into effect under the North Sea Programme.

10.3.4 The steps of the assessment framework



Figuur 10-b: the steps of the assessment framework

10.3.5 Explanation of the steps to be taken

Steps 1 and 2 of the assessment framework form the start of the process, with a focus on preliminary consultation. After Step 2, the formal permit procedure begins.

Thanks to the preliminary consultation, the adopted policy and the Guide Area Passport for each wind energy area, the initiator is able to take into account all spatial interests and preferences in the plan area in advance. This provides the initiators and wind farm operators with clarity in advance and it is expected to lead to fewer legal proceedings after the formal permit application. Also, an initiator can become acquainted with the formal assessment criteria and procedure for granting a permit at an early stage.

STEP 1: Preliminary consultation and description of activity and spatial need

The preliminary consultation

Before an initiator submits a permit application for a multiple use activity, it is recommended to first enter into preliminary consultations with the competent authority to discuss the proposed activity. The preliminary consultation can be seen as the start of a process aimed at optimal integration of the activity in a wind farm. If necessary, other stakeholders such as the wind farm operators are also involved.

Description of activity and spatial need

Making the spatial need of the proposed activity specific constitutes a description to announce the activity, the space claim, the possible effects of the activity and the intended location in the wind farm. This information is necessary to assess whether the initiative corresponds with the policy preferences (described, among other things, in the Area Passport Guide for the relevant wind farm) and for the further process of the permit application.

In addition to the basic information for the spatial claim, the information provided by the applicant must include the following elements:

- a description of the natural values in the area (based on the ecosystem approach) and the location of the activity;
- a description of the effects that the activity may have on its own and in combination with other activities;
- an assessment of these potential effects based on the best available knowledge.

Ecosystem approach and precautionary principle

The ecosystem approach is applied for sustainable development and sustainable use of the North Sea. This means that not only the effects on individual species apply, but also and especially those on the complete cohesion of communities and their habitat. Existing laws and regulations give substance to the ecosystem approach, among other things by means of a preliminary assessment of the effects on nature and the environment and by applying the precautionary principle. This principle has had a place in international and national policy for years (OSPAR, NWP, MSFD and Natura 2000). The preliminary assessment specifically examines the effects on the ecosystem and Natura2000 areas. Important aspects are the introduction of non-native species, ecological capacity, nutrient extraction or supply and effects on species (for example, the extra risks that arise for birds if activities in wind farms attract them). After completing the preliminary assessment, it will become apparent whether an appropriate assessment is necessary and/or an exemption from the Nature Conservation Act must be applied for or whether no further action is required. If multiple use takes place on a larger scale and large-scale effects cannot be ruled out, the competent authority can choose to order an environmental impact assessment.

Relationship initiator multiple use and wind farm operator

A wind energy area is primarily designated for the generation of wind energy. The generation of wind energy, including the necessary cables, is seen as an activity of national importance. This means that when assessing a permit application for multiple use, the interests of the wind farm operator and possible effects on the wind farm must also be considered. The multiple use activity should not prevent the generation of wind energy in such a way that the generation and supply of electricity becomes impossible. Also, the multiple use must not hinder or make the necessary maintenance work on the wind farm impossible. The accessibility of the assets within the wind farm must be guaranteed and maintenance must be carried out safely. To ensure this, multiple use activities may only take place outside the maintenance zones for wind turbines and the infield cables.

It may be beneficial for the correct integration of multiple use activities in the wind farm to consult with the wind farm operator early in the process. This will also help to identify potential effects and prevent the wind farm operator from objecting to the permit for the multiple use activity. Coordination and cooperation between wind farm operator and initiators of multiple use is highly desirable, if not necessary.

STEP 2: Pre-assessment of intended activity and spatial need

The competent authority assesses the activity according to the preferences determined for each wind energy area in the policy and the Area Passport Guide. After the assessment, there are two options:

1. The intended activity has been designated as the preferred activity for the area and the intended location; in that case, step 3 follows immediately. The formal permit procedure can start.
2. If the proposed activity is not designated as a preferred activity, the competent authority will announce there is an intention to issue a permit for the specific location. Other initiators can then make it known and demonstrate within 6 weeks that they too want to develop multiple use activities in the area in the short term. If no other initiators come forward within 6 weeks, step 3 follows and the formal permit procedure can start. If a candidate registers with a preferred activity for the intended location within 6 weeks, it will be discussed in consultation whether there is room for both initiatives and whether, in that case, the activities can be combined. If it concerns one or more initiatives that are not preferred activities, the principle of first come, first serve applies and the initial activity takes precedence. This can then proceed to step 3. However, whether multiple use of space is possible (can it be done together?) will be examined and, in consultation, consideration will also be given to a different location in the area for the initiatives that have made a request for space after the announcement.

STEP 3: Assessment of effects of activity and choice of location

After submitting the formal permit application, the process with legal deadlines starts. The application will be assessed based on the assessment criteria described below.

Assessment criteria

Assessment of the spatial and operational effects on the wind farm and other activities in the area

- Assessing the space claim in relation to the area passport for wind energy areas
- Assessing the effects that the multiple use activity may have on its own and in combination with other activities
- Assessing these potential effects based on the best available knowledge.

The lack of sufficient knowledge about the consequences of an activity should not be an argument for that activity to continue. The permit issuer can then decide:

- not to allow the activity;
- to allow the activity, but on the condition that the initiator limits and/or compensates for the effects;

- to have further research carried out (for example, monitoring) and to grant the permit for a fixed period (duration of the research);
- to impose other restrictions, such as the 'hand on the tap' condition, whereby the activity may take place until a certain standard is exceeded.

Installations are offshore and safe

The construction or installation is considered to be offshore-proof. When submitting a permit application, it must be described how the structure is anchored or otherwise secured to prevent it from detaching and drifting. After all, a detached construction or installation can cause damage to the infield cables, wind turbines or structures/installations of other co-users. In addition to the description of the anchorage, the offshore resistance can be demonstrated by means of, among other things, research results and risk analysis, strength and force calculations and testing of the structure. The structures or installations must remain in position under circumstances (including wind force, wave heights, currents) that can occur in the North Sea, and specifically in the area in question, so they do not cause any damage. In the event of detachment, loss and/or damage to its structure or installation, the initiator must take measures to limit risks. Requirements for this can be included in the permit, such as a duty to report in the event of an emergency or the use of a tracker that alerts the permit holder when the structure moves uncontrollably and that enables the permit holder to find the object when it is lost.

Safety and liability

The installations or structures that are used for multiple use activities must be designed in such a way that the risk to humans and the (marine) environment is acceptable throughout their life cycle. Strict safety requirements apply within a wind farm. To be able to make an assessment against these requirements, the permit holder must submit a safety plan for offshore work with the permit application. For safety reasons, maintenance of the installations should take place during the day and the area should be avoided in bad weather. An initiator of a multiple use activity must take into account costs arising from possible damage to a turbine and/or the infield cables, which may be caused by the multiple use activity or the vessel used for it. The initiator must have taken out good liability insurance that offers sufficient cover for damage that may result from the permitted multiple use activity within a wind farm. In the assessment of the permit application, possible (safety) risks will be weighed up and - if necessary - regulations will be included to exclude the risks as much as possible or to reduce them in such a way that the permit can be granted. To increase nautical safety, it may be necessary to apply markings on or around the installations or structures. The Coastguard will assess whether this is necessary. The costs for such marking are borne by the initiator.

Term of the permit

A permit is always granted for a specific period. After the permit is granted, the permitted activity must have started within three years, otherwise the permit will lapse. In principle, the end of a wind farm also means the termination of permits for multiple use activities in the wind farm in question. However, the permit may include a regulation from which it follows that the allocated space will also continue to be used. If not, the permit will expire after a certain period and other initiators may be given the opportunity to submit an application for a multiple use activity.

Removal obligation and financial security

In principle, all installations, structures and associated with the multiple use activity must be removed after the permit period has expired. This obligation stems from the ban on dumping at sea and to protect the environment. In addition, the removal obligation ensures that the area becomes available and usable for other activities. The removal obligation also applies to structures and objects that are placed in the context of nature development. If new valuable nature develops in a wind farm that contributes to a healthy state of the North Sea, it can be examined whether this can be left after the wind farm is decommissioned. To ensure that the removal obligation is complied with, a requirement is included in the permit and a financial security is required. The financial security covers the costs of removing the objects if the permit holder does not do this, for example, due to bankruptcy, and the water manager has to remove the objects.

Good environmental status and precautionary principle

The North Sea Programme 2022-2027 contains an assessment framework for the objectives arising from the Water Framework Directive (WFD) and the Marine Strategy Framework Directive (MSFD). The description of the environmental consequences must be drawn up in such a way that assessment can be carried out in accordance with the assessment framework in the North Sea Programme 2022-2027.

Qualitative descriptive elements for the description of good environmental status are:

1. Biological diversity is maintained. The quality and occurrence of habitats, and the distribution and density of species are in accordance with prevailing physiographic, geographic and climatic conditions.
2. Alien species introduced by human activities occur at a level whereby the ecosystem does not change.
3. Populations of all commercially exploited species of fish, crustaceans and shellfish remain within safe biological limits and exhibit an age and size structure that is characteristic of a healthy stock.

4. All the elements of the marine food chains - insofar as these are known - occur in normal densities and diversity and at levels which guarantee the density of the species in the long term and the preservation of their full reproduction capacity.
5. Human-induced eutrophication has been minimised, in particular its harmful effects such as loss of biodiversity, degradation of the ecosystem, harmful algal blooms and lack of oxygen in the waterbed.
6. Seabed integrity is such that the structure and functions of the ecosystems are safeguarded and that benthic ecosystems in particular are not disproportionately affected.
7. Permanent alteration of hydrographic properties does not harm marine ecosystems.
8. Concentrations of pollutants are such that no pollution effects occur.
9. Pollutants in fish and other fishery products for human consumption do not exceed the limits set by Community legislation or other relevant standards.
10. The properties and amounts of marine litter do not cause damage to the coastal and marine environment.
11. The input of energy, including underwater noise, is at a level that does not harm the marine environment.

Archaeological and cultural-historical values

Items of archaeological and cultural-historical value are taken into consideration in granting permits for activities in the North Sea. When assessing a permit application, any effects on archaeological sites are weighed according to the principles of the Valletta Convention. For the wind energy areas, within the framework of the environmental impact reports to be drawn up for the wind farm site decisions, reports have been drawn up that map out the archaeological sites in a wind energy area.⁸⁰

⁸⁰ These reports can be consulted at <https://offshorewind.rvo.nl/>

10.4 Assessment framework for use of area reserved for sand extraction

If other activities of national interest wish to make use of the area reserved for sand extraction, the following framework will be applied to find a solution. When looking for space for cables and pipelines (including interconnector and telecommunication cables), taking into account the connection on the landward side, it is checked successively whether:

1. a route is possible through an area exhausted for sand extraction, if not, whether
2. a route is possible in the already designated preferred routes for cables and pipelines, if not, whether
3. a route is possible in which the new cables and pipelines are bundled with existing cables and pipelines, if not, whether
4. a route is only possible through a potential sand extraction area. If that is the case, the initiator must compensate the national government for the extra costs incurred because the sand extraction must be diverted to another location.
5. For areas with a scarce sand supply (the coast from Katwijk to Egmond, and the coast before Texel, Vlieland, Terschelling, Walcheren and Kop van Schouwen) compensation does not provide an adequate solution. In such cases, a solution will in principle have to be found within steps 1 to 3.

10.5 Assessment framework for activities in the North Sea

10.5.1 Introduction

The national government sets frameworks to ensure efficient, safe and sustainable spatial development in the North Sea. Multiple use of space is an important starting point. It offers balanced opportunities for all forms of use of the North Sea. The assessment framework is the mechanism used by the national government to assess the permissibility of activities at sea. Activities are projects for which a permit is requested or a project decision can be made. Collections of such activities are referred to as human uses in the North Sea Programme. The policy regarding the user functions is described in Sections 3 to 8. Activities of national importance which are prioritised by the government have been identified. The assessment framework brings together relevant policy and describes how, within the European and international frameworks, the assessment is made for new activities. It also outlines what action to take if various activities of national importance clash. During the term of this North Sea Programme, the national government will further elaborate how to deal with conflicts between national interests as formulated in the National Strategy on Spatial Planning and the Environment. The spatial impact of policy choices for activities of national importance is shown on the structural vision map for the North Sea. These and other starting points and the scope of the assessment framework are described in this paragraph. The assessment framework consists of five tests that work from rough to fine and are followed in sequence, but not necessarily all of them are applicable.

10.5.2 Scope and starting points of the assessment framework

Scope

The assessment framework for activities in the North Sea applies to all activities and project decisions requiring a permit within the framework of the legislation and regulations applicable to the North Sea in the territorial sea and the EEZ, insofar as it concerns aspects that affect the water system of the North Sea. The assessment framework of the Nature Conservation Act is integrated in that as far as possible. Activities requiring a permit also include existing use for which the permit is extended or

expanded. For functions that do not require a permit (shipping, some military use and recreation), the aspects of the assessment framework only come into the picture when policy is revised or when new policy is introduced. Another exception concerns fishing in the EEZ. This is regulated through the CFP of the European Union. A fixed procedure is followed when assessing the admissibility of an economic activity. The following are considered: the spatial aspects, safety and the consequences for ecology and the environment. This may lead to conditions and restrictions being attached to a permit. When going through the assessment framework, it is also checked whether the activity meets the objective of the MSFD. The precautionary principle and the use of the ecosystem approach are important in that respect.

Status and application of the assessment framework

The assessment framework is a policy rule that obliges the competent authority to act in accordance with this framework when granting permits. The assessment framework is therefore especially important for the competent authority and for North Sea users who wish to apply for a permit on the basis of⁸¹ the Water Act, the Earth Removal Act, the Nature Conservation Act, the Environmental Permitting (General Provisions) Act, the Mining Act⁸², the Offshore Wind Energy Act and several shipping laws^{83, 84, 85}. The policy rule is applied by the competent authority, being Rijkswaterstaat (on behalf of the Minister of Infrastructure and Water Management), the Minister of Economic Affairs and Climate Policy and the Minister of Agriculture, Nature and Food Quality⁸⁶. The assessment framework as described here is a continuation of the assessment framework in the North Sea Policy Document 2016-2021.

Relationship with the Nature Conservation Act

As indicated, the assessment framework also applies to activities for which a permit or exemption is required under the Nature Conservation Act.

This is the case if:

- activities may have significant negative effects on a Natura 2000 site, or;
- activities have potential effects (killing, trapping, disturbing) on protected native animal and plant species, or;

- activities result in the destruction, damage or disruption of breeding sites, habitats and resting places.

Activities are not subject to a permit under the Nature Conservation Act if a permit has been or will be granted on the basis of other laws, and with due observance of Article 6, third and fourth paragraphs of Directive 92/43/EEC (this only applies to activities in the EEZ), or the activities that take place in the Natura 2000 area have already been assessed and regulated in the management plan for the area in question.

If significant effects of a plan or project cannot be ruled out, the Nature Conservation Act requires the application of the ADC test. This test makes it possible for plans or projects that must be realised for imperative reasons of overriding public interest, to be permitted even in the absence of alternative solutions. The condition is that the initiator takes all necessary compensatory measures in advance to ensure that the overall coherence of Natura 2000 is preserved.

Starting points

- General: within the European and international frameworks (Water Framework Directive, Marine Strategy Framework Directive, Bird and Habitats Directives and the Malta Convention) the government gives priority to activities of national importance to the Netherlands: shipping, oil and gas extraction, CO₂ storage, generation of sustainable (wind) energy, sand extraction and suppletion and defence. Multiple use of space is promoted as much as possible.
- Room for experimentation: for small-scale experiments that aim to strengthen the sustainable development of the North Sea in the longer term, the national government can designate room for experimentation and if possible deviate temporarily from this assessment framework. Based on restrictions and/or conditions, the permit issuer guarantees that the experiment does not endanger the safety of other existing uses. Adverse effects on other uses must be within reasonable limits⁸⁷.

⁸¹ For more information about the national legal frameworks, see www.noordzeeloket.nl, under policy.

⁸² As far as the aspects that affect the North Sea water system are concerned

⁸³ Prevention of Pollution from Ships Act.

⁸⁴ Shipping Traffic Act.

⁸⁵ Territorial Seas Shipping Regulations.

⁸⁶ Matrix competent authority (which usage function, which law, which counter and which competent authority) on www.noordzeeloket.nl, under spatial management, permits.

⁸⁷ The precautionary principle remains in force. The 'choice of location and use of space' (test 2), 'usefulness and necessity' (test 3) and 'compensation' (test 5) tests are no longer required.

10.5.3 The five tests of the assessment framework

Figure 1 shows the five tests of the assessment framework. From this, it becomes clear that the tests are followed sequentially, but not necessarily all. An explanation of the tests is given in the following sections.

Test 1: Definition of the spatial claim and application of the precautionary principle

Defining the spatial claim is effectively not a real test, but describes the activity in question. This information is needed for the other tests. During and after consultation with the competent authority, the initiator follows a fixed format for the description, which includes at least the following sections: nature and purpose of the activity, start and duration, claim on space and intended location, the potential effects and one or more alternatives. In particular, the space claim and the potential effects must be elaborated in detail by the initiator and, where necessary, substantiated with results from research.

Determining the spatial claim

Informal preliminary consultation with the competent authority can be seen as the start of a process aimed at optimal integration, in which other stakeholders are also involved if necessary. The starting point for the competent authority is the policy to stimulate and enable new activities at sea within the set frameworks, by applying a development-oriented approach in which user functions are sustainable and integrated or coordinated with each other. Thanks to the preliminary consultation, the initiator is able to take into account all spatial interests in the plan area in advance. This is expected to lead to fewer legal proceedings after the formal permit application. Also, an initiator can become acquainted with the formal assessment criteria and procedure for granting a permit at an early stage. For each initiative, there is one counter where the competent authority, together with the initiator, examines whether space can be offered within the framework of the North Sea policy. The formal process starts after the formal permit application. The formal assessment criteria for the awarding of permits are described below.

Ecosystem approach and precautionary principle

The ecosystem approach is applied for sustainable development and sustainable use of the North Sea. This means that not only the effects on individual species apply, but also those on the complete cohesion of communities and their habitat. Existing laws and regulations give substance to the ecosystem approach, among other things by means of an assessment of the effects on nature and the environment and by applying the precautionary principle. This principle has had a place in international and national policy for years (OSPAR, NWP, MSFD and Natura 2000). It is a crucial starting point in the development and planning of offshore activities. The principle implies

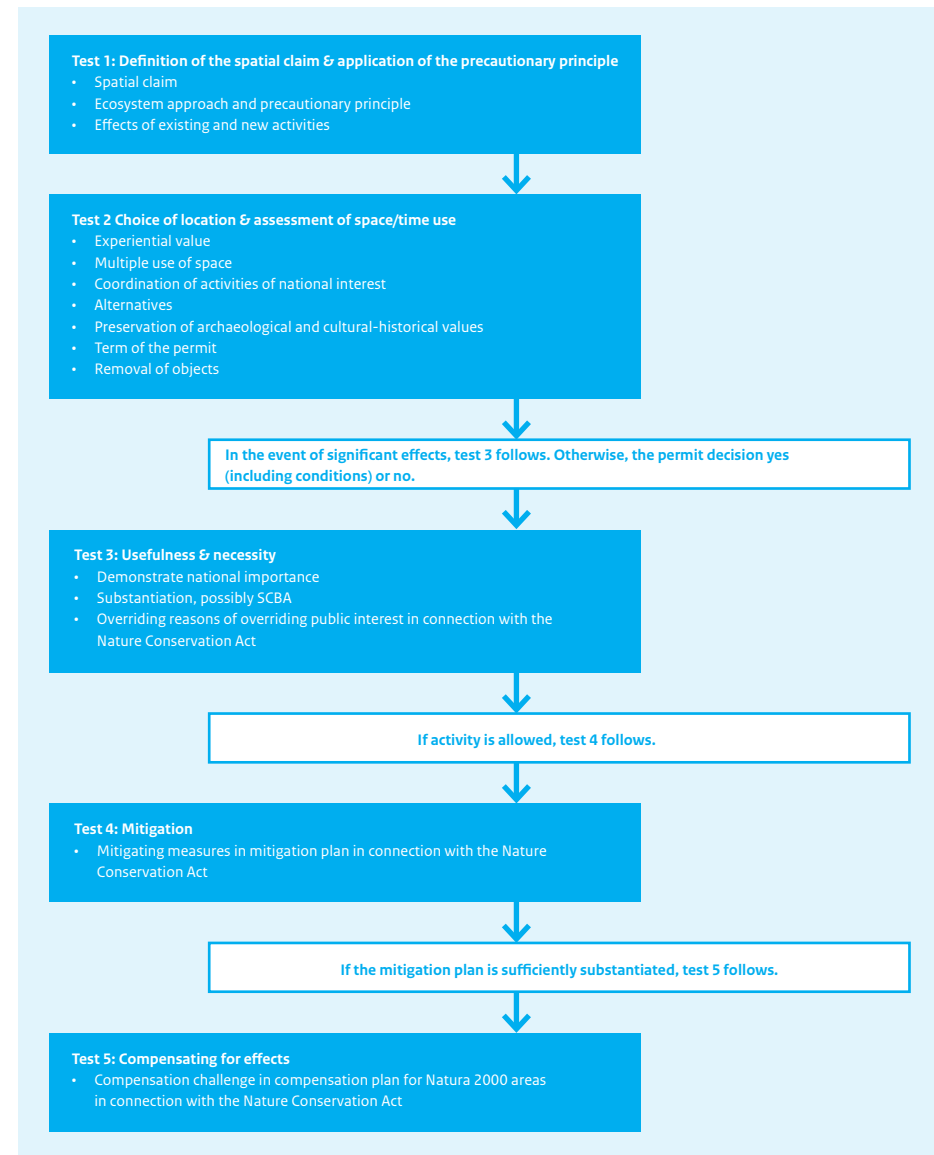


Figure 10-c: The five tests of the assessment framework

that a user should take preventive measures if there is reasonable ground for concern about possible irreparable damage the activity could cause to the marine environment, human health and/or other legitimate uses. No conclusive evidence of a causal relationship between the activity and its effects is needed. The preventive measures must prevent or – if they cannot be avoided – reduce the long-term, undesirable and irreversible effects of activities. Examples of preventive measures are: zoning in time, application of clean techniques, implementation of control systems and management of flows of (waste) substances.

Effects of existing and new activities

How the precautionary principle is applied depends on whether it concerns an activity of an existing or a new use. After all, policy and regulations are already in force for existing use, while there are more questions and uncertainties surrounding new use. If new activities of existing functions are subject to EIA, the EIA provides sufficient insight into the effects to be tested against the precautionary principle.

In the case of activities that are not subject to EIA, the competent authority applies the precautionary principle on the basis of existing policy, existing regulations and common practice. If there are no new insights regarding ecological effects, or effects on human health or other legitimate uses, the application of the precautionary principle is met. If new insights do give cause to do so, the competent authority will request the permit applicant to provide further information about the possible effects and to take preventive measures if necessary.

In addition to the basic information for the spatial claim, the information provided by the applicant must include the following elements:

- a description of the natural values in the area (based on the ecosystem approach) and the location of the activity;
- a description of the effects that the activity may have on its own and in combination with other activities;
- an assessment of these potential effects based on the best available knowledge.

In the event of sufficient knowledge about the consequences of an activity, this should not be an argument for that activity to continue. The permit issuer can then decide:

- not to allow the activity;
- to allow the activity, but on the condition that the initiator limits and/or compensates for the effects;
- to have further research carried out (for example, monitoring) and to grant the permit for a fixed period (duration of the research);
- to impose other restrictions, such as the ‘hand on the tap’ condition, whereby the activity may take place until a certain standard is exceeded.

Impact mitigation measures must be established at the time of the permit decision. If during the assessment of a permit application (whether or not including the EIA), sufficient certainty has been obtained that there is no chance of significant negative effects, the rest of the assessment framework does not need to be followed, with the exception of the test on the choice of location (test 2).

Test 2: Choice of location, assessment of use of space and permit term

For each permit application, the competent authority assesses whether the initiator’s claim for space is realistic or whether a more efficient spatial integration is possible based on the aspects detailed below.

No visible permanent works (structures that have been in place for six months or more) are permitted within the 12-mile zone. Exceptions to this are permanent works associated with activities of national interest. These may be allowed in the 12-mile zone, when there are no reasonable alternative locations and there is no significant impact on coastal protection. Damage to the free horizon, recreation and fishing should in that case be as limited as possible.

Multiple use of space where possible

In areas designated for activities of national interest (see structural vision map), other activities must not interfere with this use. It should be noted that while a permit holder for the specific activity for which the permit was issued has the exclusive right to carry out exploration or exploitation for the permitted activity in the relevant sea area, he does not have the exclusive right for the full use of the area concerned. In principle, there is room for multiple use, provided the permit holder concerned does not experience disproportionate damage or nuisance as a result. The effects on other sectors, including fisheries, must also be considered. The competent authority ultimately makes the assessment and decides on the conditions under which other initiatives in the same area are possible. If a user believes that he has suffered damage from other lawful use, he can appeal to the competent authority for compensation. This only concerns damage to individual users, which they cannot reasonably bear themselves and which falls outside the normal social risk. If the Ministry of Infrastructure and Water Management is the permit issuer, use can be made of the compensation scheme for loss resulting from administrative acts under the Water Act. The Compensation for Loss Resulting from Administrative Acts Policy Rule Infrastructure and the Environment 2019 gives substance to this.

Coordination of activities of national interest

When activities of national interest are stacked in the same area, the starting point is again that a combined and efficient use of space is sought. Several specific preconditions do apply (see table 1).

Activity of national interest	Precondition
Shipping	<p>In traffic separation systems, deep-water routes, anchorages, precautionary areas and clearways, shipping takes priority over any other use.</p> <p>Mining installations and other permanent individual structures are prohibited for safety reasons within shipping routes and within a zone of 500 metres on either side of these shipping routes.</p>
Oil and gas	<p>The potential of oil and gas reserves, including the 'small fields', is exploited as much as possible.</p> <p>Shipping or other uses are not permitted within a safety zone of 500 metres around a mining platform.</p> <p>For mining platforms with a helicopter deck, the starting point is an obstacle-free zone of 2.5 NM around the platform, to guarantee safe helicopter traffic from and to the platform in all weather conditions. In specific situations, by applying the design process: distance between mining sites and wind farms (see Appendix 4) consider whether a customised solution is possible.</p> <p>In principle, new pipelines should use preferred routes when intersecting the sand extraction zone (see paragraph 10.4).</p>
CO₂ storage	<p>The potential of depleted oil and gas fields and aquifers (suitable for CO₂ storage) is used as much as possible.</p> <p>Shipping or other uses are not permitted within a safety zone of 500 metres around a mining platform with a CO₂ storage installation.</p> <p>In principle, new pipelines should use preferred routes when intersecting the sand extraction zone (see paragraph 10.4).</p>
Generation of sustainable (wind) energy	<p>The use of the North Sea for the generation of sustainable (wind) energy in designated areas takes precedence over other uses.</p> <p>In the designated wind energy areas, the aim is for (early) coordination between the (future) use of the area for wind energy on the one hand and (future) oil and gas extraction on the other. Oil and gas extraction is a tailor-made exercise. When issuing sites, the design process is: distance between mining sites and wind farms applies (see Appendix 4). Coordination with the co-user can lead to a changed layout of the wind farm.</p>

Activity of national interest	Precondition
Generation of sustainable (wind) energy (continued)	<p>No shipping is allowed in a wind farm and a safety zone of 500 metres around the park. Since 1 May 2018, three wind farms off the Dutch coast have been accessible to ships with an overall length of up to 24 metres. It concerns the Egmond aan Zee Offshore Wind Farm, the Princess Amalia Wind Farm off the coast of IJmuiden and the Luchterduinen wind farm off the coast of Noordwijk. The intention is to widen the passage of wind farms in special passages to ships with a length overall up to 46 metres. This is subject to a Formal Safety Assessment (FSA).</p> <p>When designating wind energy areas, the design criterion distance between shipping routes and wind farms applies.</p> <p>In principle, a maintenance zone of up to 500 m for electricity cables, pipes and telecommunication cables must be applied between cables and offshore wind farms.</p> <p>In principle, new cables should use preferred routes when intersecting the sand extraction zone (see paragraph 10.4).</p>
Sand extraction	<p>Sand extraction for coastal defence and embankment has priority in the reservation zone between the continuous isobath 20 m below Amsterdam Ordnance Datum and the boundary of the 12-mile zone.</p> <p>In principle, new cables and pipelines should use preferred routes when intersecting the sand extraction zone (see paragraph 10.4).</p> <p>Outside the 12-mile zone, when 'stacking', other activities of national importance take precedence over those of sand extraction.</p> <p>No sand extraction is allowed landward of the continuous isobath 20 m below Amsterdam Ordnance Datum. An exception to this is, in principle, extraction from shipping channels, the construction of transshipment pits, extraction in which the removal of surface minerals from the extraction location contributes to coastal defence and restoring the seabed of former landfill areas to its original condition.</p>
Defence	<p>Multiple use is permitted in defence areas insofar as this can be reconciled with the exercises there. The Minister for Defence will decide in the first instance.</p>

Table 10.3 Coordination of activities of national interest.

Alternatives

The competent authority may also wish to include alternative site proposals in its ecological or spatial considerations and, for activities requiring an EIA, ask the initiator to conduct (additional) research with regard to both the preferred location and the alternative locations, certainly to prevent possible significant ecological effects.

Archaeological and cultural-historical values

The North Sea has a special seabed archive containing historical shipwrecks, drowned prehistoric landscapes and other archaeological sites. In the case of soil interventions on the Dutch continental shelf, the obligation to preserve (information about) archaeological and cultural-historical values according to the Malta Convention must be taken into account. This convention was implemented by means of the Archaeological Heritage (Protection) Act in, among other things, the Heritage Act, the Earth Removal Act and the Environmental Management Act, and it also has an effect on other legislation, such as the Water Act and the Offshore Wind Energy Act.

Items of archaeological and cultural-historical value are taken into consideration in granting permits for projects in the North Sea. Mapping the effects on these values is a mandatory part of the environmental impact assessment for projects. For those activities that require a permit under the Water Act, the Offshore Wind Energy Act or the Earth Removal Act but for which no project EIA has to be drawn up, the initiator submits desk research and an on-the-water study along with the permit application, sufficiently defining the items of archaeological interest in the area in the opinion of the competent authority.

If based on the above report, it is concluded that the activities may cause damage to archaeological values, the competent authority may attach further provisions to the permit, such as the obligation to take technical measures for in-situ preservation, the obligation to carry out an excavation or archaeological supervision of the work by an expert in the field of maritime archaeology.

For mining activities requiring an EIA, such as deep drilling and laying of certain pipelines, the protection of items of archaeological and other cultural-historical value is taken into account in the decision as to whether to grant a permit. Based on the mining regulations, research data for the placement of a mining installation or the construction of a pipeline must also be made available to the Minister of Education, Culture and Science, insofar as this data can provide information about the presence of archaeological monuments or of suspected archaeological monuments in or at the bottom of the territorial sea or the continental shelf. The mining regulations also provide for the regulation of accidental discoveries when performing mining activities.

For all activities in the North Sea during which an archaeological accidental find is made, a notification obligation applies on the basis of Article 5.10 of the Heritage Act and the Minister of Education,

Culture and Science can issue regulations or have all or some of the activities halted. Compensation can be agreed for the application of this power.

Term of the permit

A permit is always granted for a specific period. Offshore activities are usually of a temporary nature, partly due to the great dynamics of the sea. It is regularly examined whether the consideration regarding the use of space still corresponds with the actual situation. This also prevents the claim on space from remaining in effect without the space being used. The competent authority sets a term when granting permits; sometimes, this is required by law. Phasing in time offers the possibility to combine multiple activities in a specific area.

Removal of objects

The starting point is that objects are removed after a permit period has expired in connection with the ban on landfilling to protect the environment. This removal obligation ensures that more space becomes available. The competent authority notifies the initiator of the removal obligation before granting the permit and records details of the removal obligation in the permit. Financial securities are also required to cover the removal costs.

- *Platforms for oil and gas extraction:* The removal of installations that are no longer in use is regulated in Article 44 paragraph 1 of the Mining Act. The Minister of Economic Affairs and Climate Policy can limit this obligation to a certain depth below the bottom of the surface water. Removal to the same depth as the wells (six metres below the seabed) is in that case the most obvious.
- *Wind farms:* The current permits for wind farms have a maximum permit period of 30 years. This corresponds to an operational period of approximately 25 years. This term is based on the lifespan of the turbines. The term can be extended. Due to the ever-increasing lifespan of wind turbines, the legislative proposal Amendment to the Offshore Wind Energy Act (supporting the offshore wind energy challenge) includes the possibility for a maximum permit period of 40 years (corresponding to an operational period of 35 years). To ensure that the turbines can be removed after the permit period has expired, a bank guarantee for the disposal costs is required when the permit is issued.
- *Cables and pipelines:*
 - Cables that are no longer in use should, in principle, be removed. This policy is effected by means of permit requirements under the Water Act. A case-by-case basis assessment is made of the actual effects on the environment, safety, the claim on space and the removal costs. This is done based on the 'checklist for the removal of cables and pipelines'. Cables for the transport of electricity from wind farms are subject to the same removal obligation as for the farms. This removal obligation also applies to new control and telecommunication cables.

- In principle, pipelines that fall under the Water Act must also be removed. The same checklist applies.
- For old cables and pipelines under the Mining Act, the minister may require removal. The same checklist is used.

Test 3: Usefulness and necessity

In the event of significant negative spatial and/or ecological effects, it must be demonstrated why the activity must take place in the North Sea.

Some activities are of national importance explicitly laid down in government policy. The social importance of these activities does not need to be substantiated again. All other tests from the assessment framework are applied to these activities.

The initiator must demonstrate the usefulness and necessity of all other activities that cause significant negative spatial and/or ecological effects. He must substantiate why the activity must take place at that location and why this is not reasonably possible at another location, including on land. In the case of doubt about the usefulness and necessity of a new activity, the competent authority can ask the initiator to conduct a social cost-benefit analysis (SCBA). Based on this, the competent authority makes a final assessment. If usefulness and necessity have been successfully demonstrated, the remaining tests from this assessment framework must still be completed.

In accordance with the Nature Conservation Act, no new activities with a risk of significant ecological effects are permitted in or near areas with special ecological values (the designated Natura 2000 areas), unless there are no realistic alternatives and there are compelling reasons of overriding public interest. If both conditions are met, the competent authority can weigh the public interest against the nature interest. If the permit issuer allows the activity, the initiator must take measures to limit (mitigate) or compensate for the negative effects (see tests 4 and 5).

Test 4: Mitigation

If an activity has unavoidable significant negative ecological effects, the initiator must take measures to limit it in accordance with the Nature Conservation Act.

The initiator submits a plan of measures, detailing:

- which (aspects of the) activities cause negative effects when and under what circumstances;
- what those effects are in terms of nature, size, time and place;
- which measures will prevent the negative effects as much as possible (effect, implementation and ultimate result).

The competent authority assesses whether the mitigation plan is sufficiently substantiated.

Test 5: Compensating for effects

Damage to the North Sea water system that cannot be prevented despite mitigation must be compensated as well as possible in accordance with the Nature Conservation Act.

Compensatory measures are part of the conditions under which the permit is granted. Based on monitoring data, the competent authority assesses whether the proposed compensatory measures are sufficient. It is therefore important that the monitoring is in line with the compensation challenge. In the case of the Nature Conservation Act, this is an issue only after passing the ADC test.

For activities in a Natura 2000 area, compensation is subject to a result obligation. A best efforts obligation is sufficient for activities in the other areas that have an effect on Natura 2000 objectives. The following starting points apply when taking compensatory measures:

- compensation is only required for significant effects that remain after restrictive/mitigating measures;
- compensatory measures must be taken before the proposed activity takes place;
- where possible, compensation should be made in kind, preferably in or otherwise directly adjacent to the North Sea;
- the initiator draws up a compensation plan that must be approved by the competent authority.

10.6 Artificial islands in the sea

Various developments at sea may require artificial islands in the sea in the near future. Particularly for the future offshore energy infrastructure, artificial islands can be an essential part, such as islands for power conversion, interconnection, energy storage, hydrogen production or the assembly and maintenance of wind turbines. The realisation of artificial islands involves long preparation times. Even if no artificial islands are built within the planning period of this North Sea Programme, it may still be necessary to make preparations and make decisions in the coming years. That is why this paragraph makes guiding statements about how to deal with artificial islands, and specifies follow-up actions for further elaboration.

Characterisation of an artificial island in the sea

An artificial island as referred to in this paragraph is an area in the territorial sea (TS) or economic exclusive zone (EEZ) with land reclamation surrounded by the sea, or a large-scale work or platform (semi) permanently anchored to the seabed, not being an installation or structure for which rules have been set by or pursuant to the Environment and Planning Act, such as for a mining installation or wind farm.

Area

The statements in this paragraph concern both artificial islands in the territorial sea and in the economic exclusive zone, but not the 1-km zone (for spatial planning).

The national government's directive role

In contrast to an offshore installation, an artificial island in the sea has several specific characteristics, which means that the national government wants to play a directive role in any development, construction, management and exploitation. The national government is the initiator because, according to international legislation, the state is responsible for guaranteeing safety on the island in the broadest sense of the word. This concerns territorial, physical economic security, ecological protection, political stability and international legal order, both internationally and nationally. Moreover, an island is only constructed for vital or essential (energy) infrastructure, for which the

government bears a legal responsibility. In addition, an artificial island has a (semi) permanent character and it may be desirable to adjust its functions during its lifespan. The national government will therefore have demonstrated the usefulness and necessity of the island, taking into account the then applicable research and participation obligations, make a (project) decision and determine which spatial functions the island will fulfil. The conditions under which an artificial island can be constructed are outlined below. The Minister of Infrastructure and Water Management has a coordinating task in the decision-making, and other ministries will be involved.

During the development phase, the national government has an initiating role and decides on usefulness and necessity, function, location and management method. It is examined whether the conditions can be met (see general conditions). The creativity and expertise of market parties will be involved in the knowledge development that is required from the development phase to generate ideas and develop plans. During the exploitation phase, the national government will remain responsible for, among other things, the water management of the island and it will retain control over the method of exploitation.

General conditions

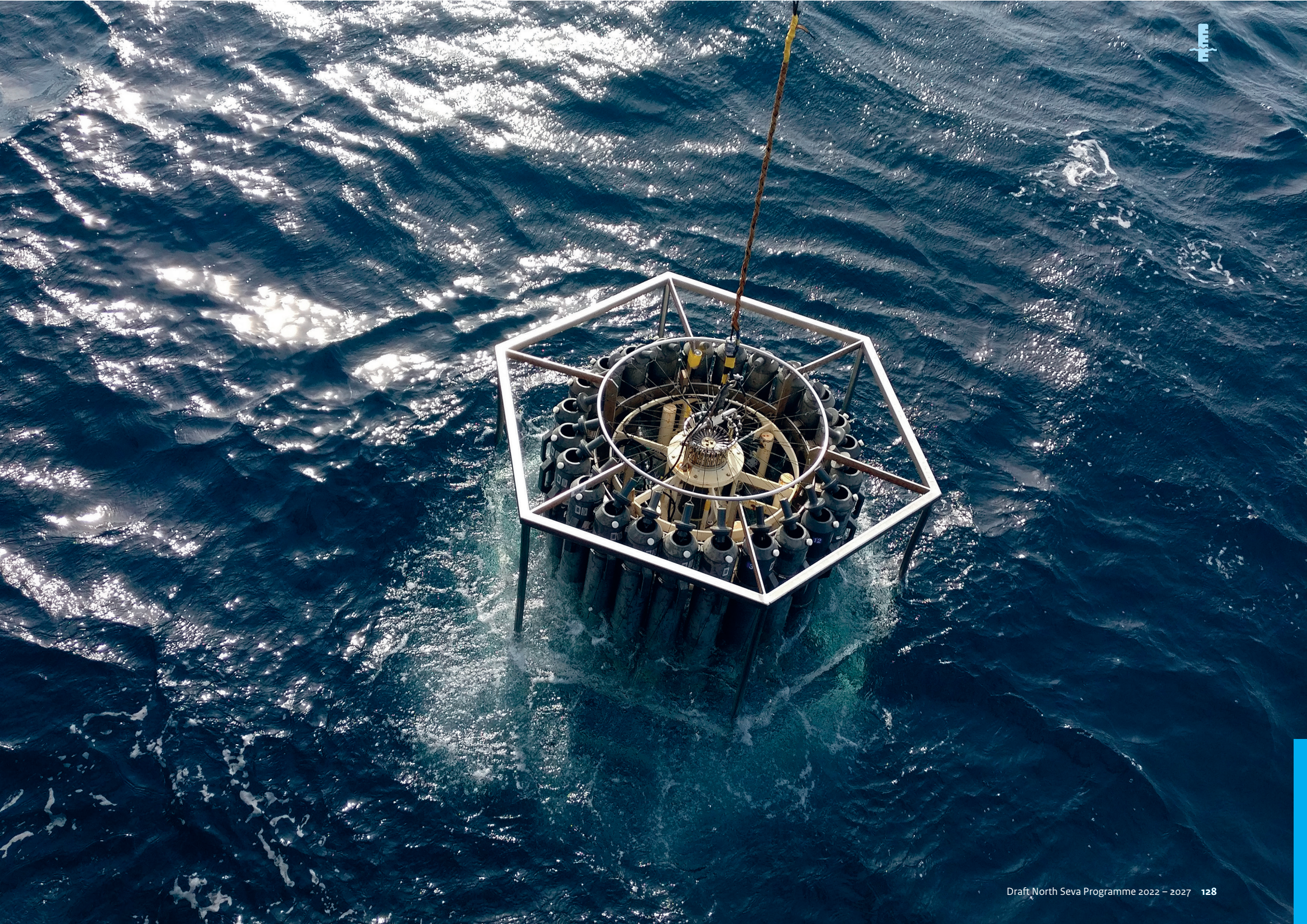
- An artificial island in the TS or EEZ can only be realised for an *activity of national interest*, for which a *need* exists that this takes place offshore and for which *no reasonable alternative* is available on land. Activities of national interest are activities referred to in the National Strategy on Spatial Planning and the Environment. The national interests relevant to the North Sea are described in Section 2.
- Location, function and management method must meet national and international safety criteria. Risk analyses are required that are in line with the National safety strategy.
- The national government determines the location of an island and strives for efficient use of space. This involves testing for ecological effects, application of the precautionary principle arising from the Marine Strategy Framework Directive and Natura 2000, the effects on other uses and archaeological and cultural-historical values. Locations that are currently excluded from installations such as clearways and anchorages are also excluded for an artificial island in the sea. In principle, a removal obligation applies to all structures. It will be examined in more detail how this can be laid down in conditions in combination with the permanent character and the relatively long lifespan.

Follow-up actions

If the construction of an artificial island is deemed necessary after 2030, preparations must already commence during this planning period (studies and explorations leading to a project decision). Also, the following is currently considered, among other things:

- (Preparation of) the application of Dutch legislation to artificial islands. The seabed of the EEZ is not owned by the Dutch state. The Netherlands has the sovereign right and exclusive jurisdiction to construct an artificial island in the EEZ. To exercise this jurisdiction, it is necessary to declare Dutch legislation applicable to artificial islands in the EEZ. To this end, a (project) law must be drawn up in which, for example, Dutch criminal law and the Dutch Civil Code are declared applicable to the island. The principles of land allocation or granting concessions can also be elaborated in the (project) law⁸⁸. In this context, it will be examined whether additional safety standards are needed with regard to water safety and the external safety of infrastructure on islands or whether this can be laid down for each island in the project decision.
- (Preparation of) the development of adequate legal instruments, specifically intended for the allocation of land on islands (the current instruments only apply to the TS and not within the EEZ).

⁸⁸ Following the example of the Act of 3 December 1964, containing provisions with regard to installations at the bottom of the North Sea (North Sea Installations Act), the Act of 31 October 2002, containing rules with regard to the research into and extraction of minerals and with regard to activities related to mining (Mining Act) or the Act of 24 June 2015, containing rules regarding offshore wind energy (Offshore Wind Energy Act).



11 Knowledge development and monitoring

The challenge for the North Sea Programme 2022-2027 is to find the right societal balance in the spatial development of the North Sea that is efficient, safe and fits within the preconditions of a healthy ecosystem. Filling in knowledge gaps about the carrying capacity of the ecosystem, about nature enhancement and species protection, and about the effects of pressures plays a major role in research and monitoring. One important example is research into the consequences of the large-scale roll-out of offshore wind energy. In addition to the knowledge questions from the North Sea Agreement, knowledge questions arise from the MSFD implementation. The marine strategy part 1 (2018) and marine strategy part 3 (Appendix 1) contain an overview of knowledge gaps per descriptor.

11.1 Research and monitoring

There are various existing programmes in which research and monitoring take place, such as the MWTL (National Surface Water Monitoring Programme), the WOT (statutory research tasks), Wozep (Offshore Wind Ecological Programme) and the strategic research programmes of the knowledge institutions. Knowledge questions can also be financed through the National Scientific Agenda of the Netherlands Organisation for Scientific Research (NWO), the programme of the top sector Water and Maritime, and the mission-driven research programme Agriculture, Water and Food.

In addition to these programmes, as agreed in the North Sea Agreement, an integrated research and monitoring programme is being elaborated, the programme Monitoring-Research-Nature Reinforcement-Species Protection (MONS). This programme analyses the key knowledge questions for the three central MONS themes carrying capacity, nature reinforcement and species protection, and effects of pressures. The prioritised knowledge questions are tackled on the basis of a work programme.

There are also European research trajectories and programmes in which relevant knowledge questions can be addressed. Examples are the Horizon Europe programme (the EU's framework programme for research and innovation that started in 2021), LIFE+ and Interreg. One instrument under Horizon Europe is 'Partnership'. For the marine domain, a Partnership Blue Economy has been formed. The Netherlands will take part in this programme as a partner.

Also important for the knowledge questions surrounding North Sea policy is the European Maritime Fisheries and Aquaculture Fund (EMFF). The fund co-finance projects which contribute to the European objectives for these themes. These European objectives are set out in four EU priorities:

1. Promoting sustainable fisheries and conserve marine biological resources;
2. Contributing to food security in the Union through competitive and sustainable aquaculture and markets;
3. Enabling the growth of a sustainable blue economy and fostering prosperous coastal communities;
4. Strengthening the international ocean management and facilitating safe, secure, clean and sustainably managed seas and oceans.

The EMFF resources reserved for the implementation of the North Sea Agreement will be used to achieve European framework-related objectives of the North Sea Agreement (from June 2020) and the Vision for Trawler Fisheries (from October 2019). The North Sea knowledge questions are part of the Operational Programme, the national implementation of the EMFF regulation⁸⁹.

In 2021, the executive agency of the Ministry of Infrastructure and Water Management (Rijkswaterstaat) will start a long-term monitoring and research programme aimed at providing more insight into the effects of wind farms on shipping safety, for example, with regard to the risk of collisions, but also the possible consequences of incidents for persons on board, equipment and the environment. Based on the new knowledge, the programme will advise and substantiate any adjustments to safety measures for the further roll-out of offshore wind energy. The programme also studies options for international coordination of knowledge, agreements and measures. The monitoring and research will be used for a policy evaluation in 2025 assessing the effectiveness of the measures taken, adjusting or improving them if necessary, for example to respond to innovations. All this, of course, to guarantee or improve safety at sea in relation to wind energy.

In addition to this programme, the further development of offshore wind energy will have to be anticipated when designating new areas in the North Sea Programme 2022-2027. This means additional research is required for the areas where international shipping routes and future wind farms interfere. For shipping, further research will be required into what exactly is needed for safe shipping traffic and accessibility of international seaports, in combination with wind farms. New elements are that no traffic separation systems have yet been designed in this area and that, for example, the weather conditions in the north are very different from those in the southern North Sea. The development of offshore wind energy at the EEZ border with Germany and the United Kingdom also plays a role in international shipping connections.

11.2 Prioritisation and coordination of research

Not all knowledge questions can be addressed in this planning period. As the budget is limited, prioritisation of research is essential. The draft EMFF Operational Programme is expected to be presented to the House of Representatives by the Minister of Agriculture, Nature and Food Quality in February 2021. In the spring of 2021, the North Sea consultation adopted the Monitoring-Research-Nature Reinforcement-Species Protection Plans (MONS) programme. This programme contains a prioritisation of knowledge questions, the associated budget, and a phasing in time. The MONS programme is an adaptive programme: new knowledge questions that arise are incorporated in joint consultation. An evaluation is planned halfway through the term of the MONS programme (2021-2030).

Coordination of research and monitoring is important to prevent overlap, to use limited financial resources efficiently, and to strengthen the added value of scientific research. For example, the MSFD, EMFF and MONS programmes require good coordination. Also, coordination with existing research and monitoring policy is important.

Simultaneously with the development of the Dutch knowledge agendas for the North Sea, OSPAR and the European Commission have also identified the most important knowledge questions. European Member States with a sea area have similar policy tasks and often have to contend with the same knowledge gaps. Furthermore, many knowledge questions can only be answered on a regional scale. Coordination at an international level is therefore a requirement.

⁸⁹ Referral EMFF OP upon adoption of the North Sea Programme.

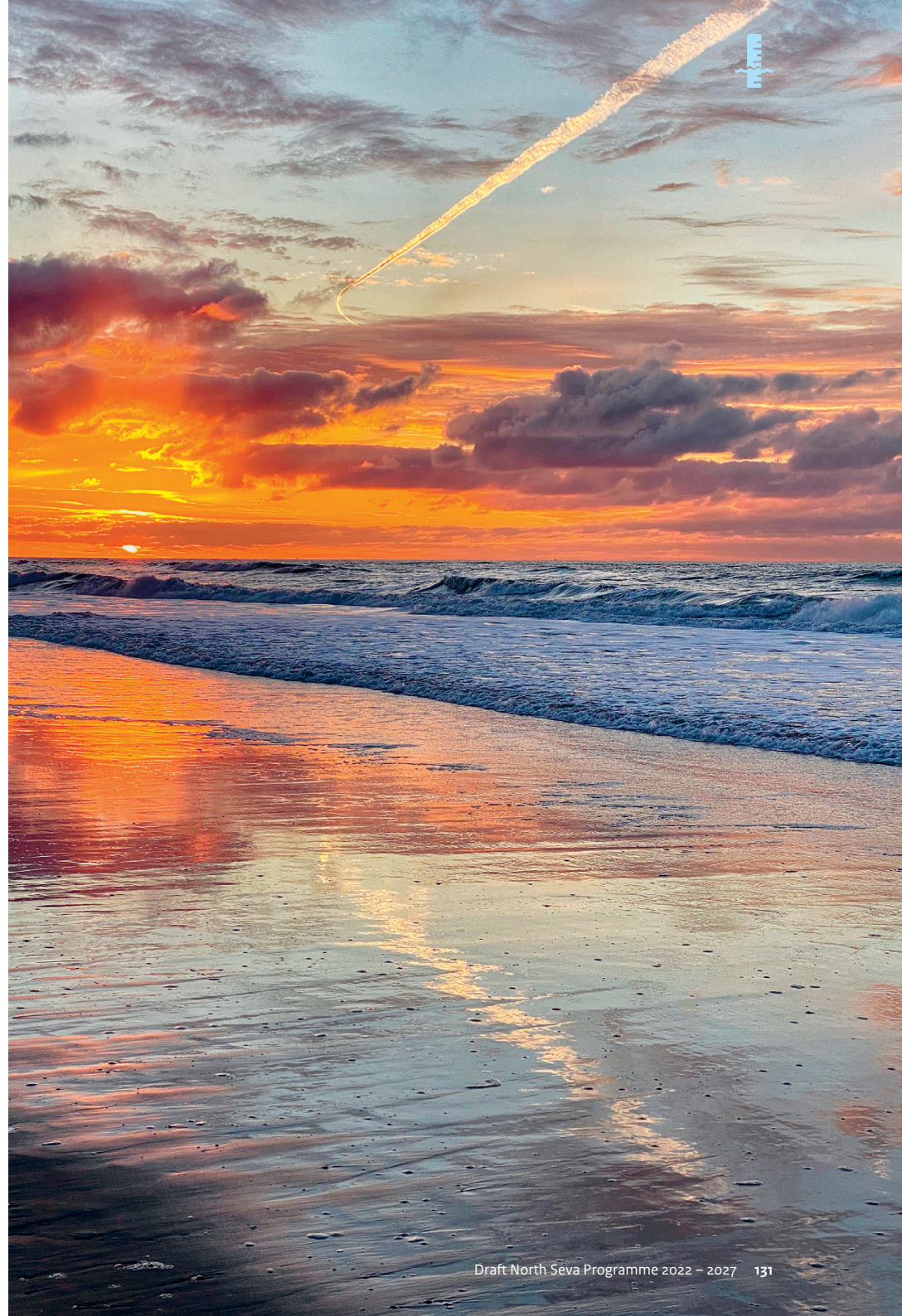
11.3 Information retrieval: the Marine Information Centre (IHM) and the Digital Twin North Sea

Data, information, knowledge and spatial-ecological and economic modelling support North Sea policy. The Marine Information Centre⁹⁰ was set up to provide access to national data on the North Sea. The ambition is to create a platform where both public and private parties can share data about the North Sea, Wadden Sea and Delta. The national government makes its data about the North Sea available in accordance with open data standards and based on European data legislation to facilitate reuse of that data.

Integrated knowledge development and disclosure will support policy for the North Sea during the planning period. Within the programme DigiShape started in 2019, the Digital Twin for the North Sea⁹¹ is in development. This instrument is aimed at the development of a digital toolbox for making predictions and scenario analyses related to the (multifunctional) use of the North Sea. With the digital copy of the North Sea, all knowledge is built in and visualised, to provide insight into the spatial, ecological and socio-economic effects of spatial plans on the North Sea.

⁹⁰ <https://www.informatiehuismarien.nl/>

⁹¹ <https://www.digishape.nl/projecten/digitwin-noordzee>



12 Outlines of marine policy

12.1 Outlines of the policy

Within the European frameworks relevant for the North Sea Programme, (Water Framework Directive, Marine Strategy Framework Directive, Maritime Spatial Planning Directive, Birds and Habitats Directive and Valletta Convention), the Dutch government elaborates national interests by continuing existing policy and through adapted and new policy:

Continuation of the existing policy

Subject	Policy
Marine ecosystem	Preserve and protect already designated Natura 2000 and MSFD areas, and marine ecosystem as a whole. In the spatial consideration of activities, compare with the prerequisites of the marine ecosystem. Continue current policy efforts to reduce pollution and disruption of the ecosystem to achieve and maintain the good environmental status.
Fisheries	Promote sustainable fishing and aquaculture and balanced development, within the prerequisites of the ecosystem.
Generate renewable energy	Sufficient areas for the annual production of 49 TWh from offshore wind energy (pursuant to Climate Agreement) and for extra production based on European agreements about tightening the climate objective in 2030, if the Dutch government decides to do so. Development of other forms of sustainable energy, as much as possible in combination with wind farms.

Subject	Policy
Oil and gas production	Maximum natural gas and oil production from the Dutch fields in the North Sea so that the potential from stocks is used, within the boundaries of the Paris Agreement. The international duty for decommissioning of platforms will be continued. Only platforms that will be reused for production and/or storage of hydrogen or CO ₂ may remain.
CO₂ storage	Sufficient areas for the storage of CO ₂ in depleted oil and gas fields or in underground aquifers. This is a temporary instrument during the transition to a fully sustainable energy supply.
Shipping	Achieve and maintain a single system of traffic separation, clearways and mooring areas which can accommodate safe and swift shipping.
Sand extraction	Sufficient areas for sand extraction for coastal protection, to counter flood risks and as fill sand on the land.
Defence	Sufficient military exercise zones in the North Sea.
Underwater Cultural Heritage	The government policy for managing archaeological heritage is based on the principles of the Valletta Convention.
Assessment framework	Assessment framework for licensing activities in the North Sea: applying a transparent and balanced framework to assess activities on the North Sea.

Adapted and new policy

Subject	Policy choices	Paragraph
Marine ecosystem	MSFD programme of measures. Additional measures related to area-based protection, species protection, litter and under-water noise	3.3.1 and appendix 1
	Area-based protection: in 2023, 13.7 percent of the North Sea increasing to 15 percent in 2030 will be free of fishing that disturbs the seabed. This goal will be achieved with limiting measures for seabed-disturbing fishing in all Natura 2000 and MSFD areas designated and to be designated.	3.3.2
	Species protection based on action plans and species protection plans.	3.3.3
	Integral nature enhancement ('nature-inclusive construction') when developing activities to meet societal demands in the North Sea, supplementary to the statutory mitigation measures, present instructions, measures and actions that can be taken as early as possible in the design phase and thus contribute to the strengthening and restoration of the ecosystem.	3.3.4
Fisheries/food	Sustainability of fishing (cutter fishing, shrimp fishing, gill net fishing): sustainable stock management, alternative fishing gear, alternative forms of fishing in wind farms, closed areas, compensatory remediation, tackle pollution.	4.3
	Innovations in the marine food production. Promote mariculture.	8
Energy	Designate new offshore wind energy areas to accommodate a minimum 27 GW.	5.3.1
	When it is necessary to create additional space for offshore wind energy, defence exercise zone EHD-41 can be moved. This can be done when enough mining platforms in the new location for EHD-41 have been removed.	9
	No new confirmation of specific parts of the already designated wind energy area Hollandse Kust (west) and the wind energy area to the north of the shipping junction North Hinder.	9
	Modification of the assessment framework safe distance helicopter flight to mining installations from 5 NM to 2.5 NM and add that this also applies to CCS.	5

Subject	Policy choices	Paragraph
	For cables and pipelines, which in principle are left behind in a clean and safe state, an assessment method for the duty of removal has been developed.	5.3.2
Shipping	A polar route (Northern Sea Route, NSR) resulting in clearways and ultimately internationally recognised shipping routes.	6.3.1
	Through the designated wind energy area IJmuiden, there will be a clearway for shipping. Besides the ferry connection, this clearway connects the NSR and the ports of IJmuiden and Amsterdam.	6.3.1
	Clearway Kattegat towards Germany/Denmark.	6.3.1
	National formalisation (adopting as clearway) of the Dutch part of the shipping route Esbjerg-Hull.	6.3.1
Sustainable blue economy	Stimulate multiple use of space in wind farms for other forms of energy generation and mariculture and aquaculture.	8.3
Maritime safety and boundary monitoring	Monitor the safety of the information provision and of vital objects in the North Sea, including measures to be taken when necessary.	7.3.3
Policy frameworks	Policy framework for passage and multiple use.	10.2
	Assessment framework multiple use.	10.4
	Area-based explorations and Guide area passport.	10.3
	Assessment framework use of area reserved for sand extraction.	10.5
	Artificial offshore islands.	10.6

12.2 Implementation programme

	Subject	Actions	Leader	Year
1	General	Draw up policy theory.	I&W	2021
2		Further elaboration conflicts national interests NOVI.	I&W	2022-2027
3		Evaluation North Sea Agreement.	I&W	2023
4	Marine ecosystem	Implement additional measures included in programme of measures MSFD (for more details, see appendix 1).	I&W, LNV	2022-2027
5		OSPAR Quality Status Report 2023.	I&W, LNV	2023
6		Update Marine Strategy Part 1 - initial assessment and description of good environmental status.	I&W, LNV	2024
7		Update Marine Strategy Part 2 - monitoring programme	I&W, LNV	2026
8		Update monitoring programme MSFD	I&W, LNV	Annual
9		Evaluation programme MONS.	I&W, LNV	2023
10		Brown Ridge (Natura 2000).	LNV	2121-2024
11		Frisian Front (Natura 2000 and MSFD).	LNV	2023
12		Dogger Bank (Natura 2000).	LNV	2023
13		Cleaver Bank (Natura 2000).	LNV	2023
14		Central Oyster Grounds (MSFD).	LNV	2023
15		Borkum Reef Grounds (MSFD).	LNV	2023
16		Protect areas in the North Sea Coastal Zone by means of the article 11 procedure.	LNV	2023-2024
17		The MSFD shark action plan 2015-2021 will be evaluated in 2021 and can then be continued for a new six-year period.	LNV	2021 and then every six years
18		Implement harbour porpoise protection plan.	LNV	2022-2027
19		Implement other species protection plans.	LNV	2022-2027

	Subject	Actions	Leader	Year
20		Restore and protect biogenic reefs and flat oyster banks.	LNV	2022-2027
21		Develop a framework for nature-inclusive construction, including the further concretisation of relevant nature goals and the effects to be achieved	LNV	2021
22		Promote nature-inclusive construction of new wind farms by means of site decision requirements.	LNV	2022-2027
23		Explore and elaborate possibilities to stimulate more nature-inclusive construction via the procedure of the 'comparative review' under the to-be-amended Offshore Wind Energy Act.	LNV	2021
24		Safeguard overarching or supplementary monitoring of effects of nature-inclusive construction emerging from site decision requirements.	LNV	2022-2027
25		Stimulate introductions of flat oysters via nature-inclusive construction of offshore wind farms.	LNV	2022-2027
26		Explore synergy possibilities such as introduction of flat oysters on the seabed (nature enhancement) and cultivation of flat oysters in the water column (aquaculture) in wind farms.	LNV	2022-2027
27	Sustainable food supply	Draw up an innovation agenda with concrete goals and terms.	LNV	2022
28		Work towards a review of the European ban on pulse trawl fishing by 2025.	LNV	2022-2025
29		In a European context, revoke the current restrictive measures in the Dutch part of the plaice box.	LNV	2022-2027
30		Boost innovations in the marine food production in cooperation with education, top sectors and with the Community of Practice Multi Use North Sea 2030 (CoP).	LNV	2022-2027

	Subject	Actions	Leader	Year
31		Draw up a compensatory remediation regulation for cutter fishing which will be implemented during the planning period.	LNV	2022
32		Support activities to reduce litter (lint).	LNV	2022-2027
33	Wind energy	Update the Framework for the Assessment of Ecological and Cumulative Effects (KEC) to see whether and how extra future offshore wind farms can be brought in line with the Nature Conservancy Act and the Birds and Habitats Directives.	EZK	2021
34		Prepare extra offshore wind energy by 2030.	EZK	2021
35		Draw up a roadmap offshore wind energy for the period after 2030.	EZK	2022
36		Draw up Exploration Landfall Offshore Wind Energy (VAWOZ).	EZK	2021-2022
37		Pursuant to the Offshore Wind Energy Act, during the planning period the Dutch government will establish site decisions, each supported by a mandatory Strategic Environmental Assessment. This will be followed by the tenders for sites in the designated wind energy areas.	EZK	2022-2027
38	Connections through the air	Reach agreements with the helicopter sector and make available an accurate database of the locations of wind turbines for use during flight procedures in the cockpit.	EZK	2022-2027
39	Oil and gas production	The Dutch government is elaborating the procedure for removing or reusing platforms and other mining works in lower regulations.	I&W	2022-2027
40	Hydrogen	Research and develop instruments to upscale green hydrogen production in relation to implementing offshore wind energy.	EZK	2022
41		Research into the roles and position of state participations and network managers in relation to creating hydrogen networks on land and sea.	EZK	2022-2027
42	North Sea energy system	Develop a proposal (from Tennet) for WindConnector, an NSEC project that aims at interconnection with the United Kingdom from offshore wind farm IJmuiden Ver.	EZK	2022-2027

	Subject	Actions	Leader	Year
43		North Sea Wind Power Hub (NSWPH) aims at an internationally coordinated rollout of the offshore grid with modular wind-hydrogen-power hubs (energy islands) as an alternative for individual national connections of offshore wind farms. Together with EZK, in 2021 NSWPH elaborates case studies for the newly designated wind energy areas about the use of energy islands compared with traditional platforms. EZK uses the results in the VAWOZ trajectory and delivers it in 2022.	EZK	2022
44	CO₂ storage	Elaborate a procedure in lower regulation for removing or reusing platforms and other mining works, among others for CO ₂ storage.	EZK	2022-2027
45	Offshore energy from water and sun	Research into how it can be legally facilitated for the electricity that is generated in pilot projects for 'sun at sea' and 'energy from water' to also be transported over the grid at sea.	EZK	2021
46		The national government involves the use of space and the integration of 'sun at sea' and 'energy from water' in designing the area passports for the wind energy areas.	EZK	2022-2027
47	Shipping	A polar route (Northern Sea Route, NSR) resulting in clearways and ultimately internationally recognised shipping routes.	I&W	2022-2027
48		Through the designated wind energy area IJmuiden, there will be a clearway for shipping. Besides the ferry connection, this clearway connects the NSR and the ports of IJmuiden and Amsterdam.	I&W	2022-2027
49		Clearway Kattegat towards Germany/Denmark.	I&W	2022-2027
50		National formalisation (adopting as clearway) of the Dutch part of the shipping route Esbjerg-Hull.	I&W	2022-2027
51	Sand extraction	Based on the results of Kustgenese 2.0, explore whether custom work can be delivered at IJmuiden with respect to the position and boundaries of the desired sand extraction area.	I&W	2022-2027

	Subject	Actions	Leader	Year
52	Military exercise zones	In the framework of the Environment and Planning Act, it will be explored whether granting permission for multiple use of designated exercise zones should be organised in a more formal way.	Defence	2022-2027
53	Cultural heritage and landscape quality	The Dutch government ratifies the UNESCO Convention to protect the cultural heritage under water (2001).	Defensie	2022-2027
54		OC&W	OCenW	2022-2027
55	Meteorological and hydrological information provision	Elaborate sustainable solutions for collecting relevant data far at sea and the connectivity with the mainland.	I&W	2022
56	Sustainable blue economy	Set up and implement a Long-term Exploration Sustainable blue economy aimed at developing a roadmap for policy.	LNV	2021-2027
57		Strengthen the connection with other (EU) countries in the field of the sustainable blue economy based on the exchange of knowledge and knowledge relationships.	LNV	2022-2027
58		Promote the development of pilot projects for multiple use of space in the North Sea to the level of developed starter companies ('scale-ups') and ultimately further upscaled businesses ('scalars').	LNV	2022-2027
59		The national government focuses on large-scale experiments with sustainable multiple use of wind farms.	LNV	2022-2027
60		The innovation platform and network <i>Community of Practice</i> North Sea forms the instrument to promote the Sustainable blue economy and to produce concrete initiatives. For collaboration, alignment will also be sought with European partners, such as national maritime clusters.	LNV	2022-2027
61		Set up a monitoring programme to chart the ecological impact of (large-scale) multiple use.	LNV	2022-2027

12.3 Financing policy

Sustainable use of the North Sea requires continuous and significant investments. Different divisions from various ministries have policy responsibility for the North Sea. Both public and private parties are developing activities in connection with the designated uses.

The policy in the North Sea, as described in chapters 3 through 11 and which emerges from autonomous developments or political agreements, is covered by the budgets of the Ministry of Infrastructure and Water Management, the Ministry of Economic Affairs and Climate, the Ministry of Agriculture, Nature and Food Quality, and the Ministry of the Interior and Kingdom Relations. Rijkswaterstaat implements the policy and receives 'assignments' with the associated budgets based on the described management. In addition, the NVWA and the SodM play an important role in enforcing policy. Where this pertains to the actions specified (see section 12.2), the fundamental principle is that the instigator is responsible for organising financing for the relevant action.

The spatial choices to be made when designating wind energy areas in the North Sea Programme have financial consequences. In part, these are indicated in the MKEA and underlying reports.

The financial consequences consist of two components:

1. The costs of the wind farms to be developed and the associated energy infrastructure to land.
2. The subsequent costs for other functions and activities at sea, which take place in or near the wind energy areas, as well as the consequences for nature. These are expressed for example in costs of mitigating measures for shipping safety, mitigating and compensating measures for nature, and (compensating measures for) loss of income in the fishing industry, and mitigating and compensating measures for fishing communities.

In this Draft North Sea Programme, a reservation is made for the feasibility of offshore wind energy with respect to financing. When establishing the definitive North Sea Programme in March 2022 at the latest, extent, division and coverage of the (subsequent) costs of offshore wind energy will be agreed by the departments involved. This may mean that ambitions are phased and/or adjusted in the definitive North Sea Programme (early 2022).

For the implementation of the North Sea Agreement, the Dutch government is making transition means of 200 million euros available until 2030. This budget is intended for remediation and sustainability of the fishing industry, for nature restoration, monitoring and research, for

safe passage through the new wind farms and for additional enforcement by the NVWA. For the transition means, coverage is already available in various departmental budgets.

At European level, budgets are available from the EMFF. This fund will partially be used to implement the North Sea Agreement. In addition, where possible use will be made of multiplication effects due to seeking collaboration among the various European funds, including LIFE+, Interreg, and Horizon Europe.



Appendix 1

Programme of Measures under the Marine Strategy Framework Directive

Separate document

Appendix 2

Subdivision of removal obligation regimes

	Water Act	Mining Act (new)
Pipeline and umbilicals (combination pipeline/cable)	Removal, unless the consideration of social costs and benefits, environmental effects and safety aspects of leaving them in place or removing them turns out differently. In that case, the pipeline can remain in place, but there will still be an inspection and maintenance obligation.	The standard is that these are left clean and safe, unless the Minister of Economic Affairs and Climate Policy requires the owner to remove them. Removal may be desirable if old cables and pipelines are in the way of other uses of the seabed. An assessment method has been developed for this that looks not just at interference with other uses but also at safety, environmental effects and costs. This method will be applied by means of an amendment to the Mining Decree and the Mining Regulations. For new cables and pipelines under the Mining Act, this tightening up of the removal obligation can be taken into account in advance.
Telecommunication cables	Removal obligation under the Water Act permit and within the territorial sea via the Telecommunications Act.	
High-voltage cables	Removal, unless the consideration of social costs and benefits, environmental effects and safety aspects of leaving them in place or removing them turns out differently. In that case, the cable can remain in place, but there will still be an inspection and maintenance obligation.	
Platforms	In the case of a platform, there is always a removal obligation. A bank guarantee applies for this.	In the case of a platform, there is always a removal obligation. This can be postponed if a platform is given a different function, for example, as a CCS injection platform.
Other objects	In principle, all installations, structures and objects used for an activity must be removed after the permit period has expired. A bank guarantee applies for this.	

Appendix 3

Assessment Framework for distances between shipping routes and wind farms

For the purposes of reserving space, the 'reference ship' is important. Depending on the route, the reference ship measures 300 or 400 metres in length. The routes to Amsterdam, for example, have a reference ship of 300 metres long.

The largest manoeuvre a ship must be able to make, and hence for which there must be sufficient space, is the so-called round turn. Six ship lengths are required for this. An extra 0.3 NM evasive manoeuvre is necessary on the starboard side prior to a ship executing the round turn, because an initial effort will be made to avoid performing a round turn. The overall space required on the starboard side is therefore 0.3 NM + six ship lengths. Moreover, a safety zone of 500 metres around single objects (wind turbines) is in force. Within this zone no passage is possible at present. The requisite safe distances for shipping are therefore:

- In the case of ships 400 metres in length: 1.87 NM on the starboard side and 1.57 NM on the port side;
- In the case of ships 300 metres in length: 1.54 NM on the starboard side and 1.24 NM on the port side.

For the clearways, the connecting routes between the formal routes, these distances have been included in the width of the clearway path. For anchorages and precautionary areas, the same safe distances can be maintained as for a traffic separation scheme.

Appendix 4

Design process: distance between mining sites and wind farms

The policy-based starting point is that both the extraction of oil and gas and the storage of CO₂ and wind energy production can take place in the Dutch North Sea. This requires early consultation when these activities come close to each other in space and time. The starting point is multiple use of space, whereby the aforementioned activities can take place side by side.

The properties of a mining or CCS installation (including platforms), the location and shape of a wind farm and the possibilities for multiple use of space will differ from location to location. That is why, for each location and/or installation, the interaction between mining and/or CCS installations on the one hand and the wind farm in question on the other, and the consequences thereof for (helicopter) accessibility, among other things, must be investigated. Prior to adopting a draft wind farm site decision, the Ministry of Economic Affairs and Climate Policy will consult with the mining and/or CCS firm concerned, taking into account relevant aspects from flight safety and the interests of the future wind farm operator. Conversely, mining and/or CCS firms will consult with the Ministry of Economic Affairs and Climate Policy and/or the relevant (future) wind farm operator in the event of possible or proposed new activities and/or possible or proposed changes to existing activities within wind energy areas designated under the North Sea Programme.

The procedure leading up to the establishment of a draft plot decree for a wind farm is:

- All relevant interests are considered in the draft decree.
- Specifically for mining and/or CCS, sites are sought within the areas where the new wind farm can be built where the spatial planning tension with mining and/or CCS is kept to a minimum. In addition, consideration is paid to the current status of the prospects present (as these are known to the Ministry of Economic Affairs/TNO), existing mining and CCS installations and transport pipelines in place.
- If the distance between the location of the proposed wind energy plot and the existing mining or CCS platform is less than 5 NM or if this site encroaches upon the maintenance contour of a transport pipeline present, issues will be fine-tuned with the mining or CCS firm(s) concerned. In addition, an investigation can be conducted into the possibilities of offering space for the installation of wind turbines with an acceptable restriction of the

(helicopter) accessibility of the mining or CCS platform. The starting point is customisation because every situation is unique and must be discussed with the mining or CCS firm(s) involved.

- With regard to the prospects, the location of and conditions for the proposed wind energy plot will – based on all information (confidential or otherwise) in the possession of the Ministry of Economic Affairs/TNO – be established in such a way that they will have minimal impact on future mining interests.
- Bilateral fine-tuning will be done with individual mining firms that hold a prospecting or extraction permit covering areas within 5 NM of the site for the proposed wind energy farm, in part keeping in mind any prospects present and work plans in place.
- In addition to the ‘customisation in terms of space’ described here, the options for ‘customisation in terms of time’ will also be taken into consideration for the purposes of a specific wind energy plot.
- When looking for a customised solution, efforts are geared towards jointly coming up with a safe and practicable solution for all parties. If an agreement is reached on the customised solution with the mining and/or CCS firm(s) concerned during the preparatory phase, the relevant provisions will be legally enshrined in, for example, the draft decree.
- If such agreement with the mining firm(s) concerned proves impossible during the preparatory phase, the Minister for Economic Affairs and Climate Policy will, together with the Minister for Infrastructure and Water Management (jointly competent authority), establish a draft decree on the location of and conditions for the specific wind energy plot. For the purposes of this decree, consideration will be given to the interests of the wind farm site on the one hand and the consequences of this for the mining or CCS firm involved on the other hand.

Colofon

Date:

March 2021

Status:

Concept

Coordination:

Ministry of Infrastructure and Water Management. The Hague

Photography:

Maria Kolossa (cover, p.20); Dirk Maalsen (p.2, p.131); Bram du Saar (p.11); Udo van Dongen, Bureau Waardenburg: begroeide 3-d geprinte rifstructuur in Voordelta. ARK Natuurontwikkeling en WWF-NL “kick-starten” schelpdierriffen in natuurgebieden om zo de Noordzeenatuur weer robuust te maken (p.27); Maarten de Jong (p.40, p.65); Rijksdienst voor Ondernemend Nederland (p.49); Rijksdienst voor Cultureel Erfgoed (p.72); North Sea Farmer&UNITED-project EU (p.84); Kustwacht (p.91, p.107); Jan Macher (p.131)

Translation:

Powerling, Amsterdam, Netherlands

Design:

Tappan, The Hague, The Netherlands

All hyperlinks in this document are accessible in the digital version of this document, available on www.platformparticipatie.nl/nationaalwaterprogramma

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This is a joint publication by
Ministry of Infrastructure and Water Management
Ministry of Agriculture, Nature and Food Safety
Ministry of Economic Affairs and Climate Policy
Ministry of the Interior and Kingdom Relations

March 2021