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

North Sea Programme 2022-2027

Summary of revisions of main and other subjects Partial Revision (PR)

Subject	Location in text
Offshore wind energy and shipping	Chapter 9a
Sand extraction	Chapter 7.1, Chapter 10.4 and 10.5
Joint use	Chapter 10
Sustainable Blue Economy	Chapter 8
Boundary correction Borkum Reef Grounds	Chapter 9a and in MS3, appendix 1 to North Sea Programme
Protection of Southern Dogger Bank under the MSFD	Chapter 9a and in MS3, appendix 1 to North Sea Programme
Protection of North Sea infrastructure	Chapter 7.3
GNSBI	Chapter 1.7 and 9.6
Cables and pipelines	Chapter 10.7, Chapter 9a.2
Solitary wind turbines	Chapter 10.5.3
Fisheries interest	Chapter 4.3.2, Chapter 9a, Chapter 10.5.3

Reading guide deleted and added content

To clarify what has changed in this document compared to the previous version, includes both old (deleted) texts and maps, and new texts and maps. To indicate what old content is, it is **marked in this purple colour**. Newly added content is **marked in this green colour**.

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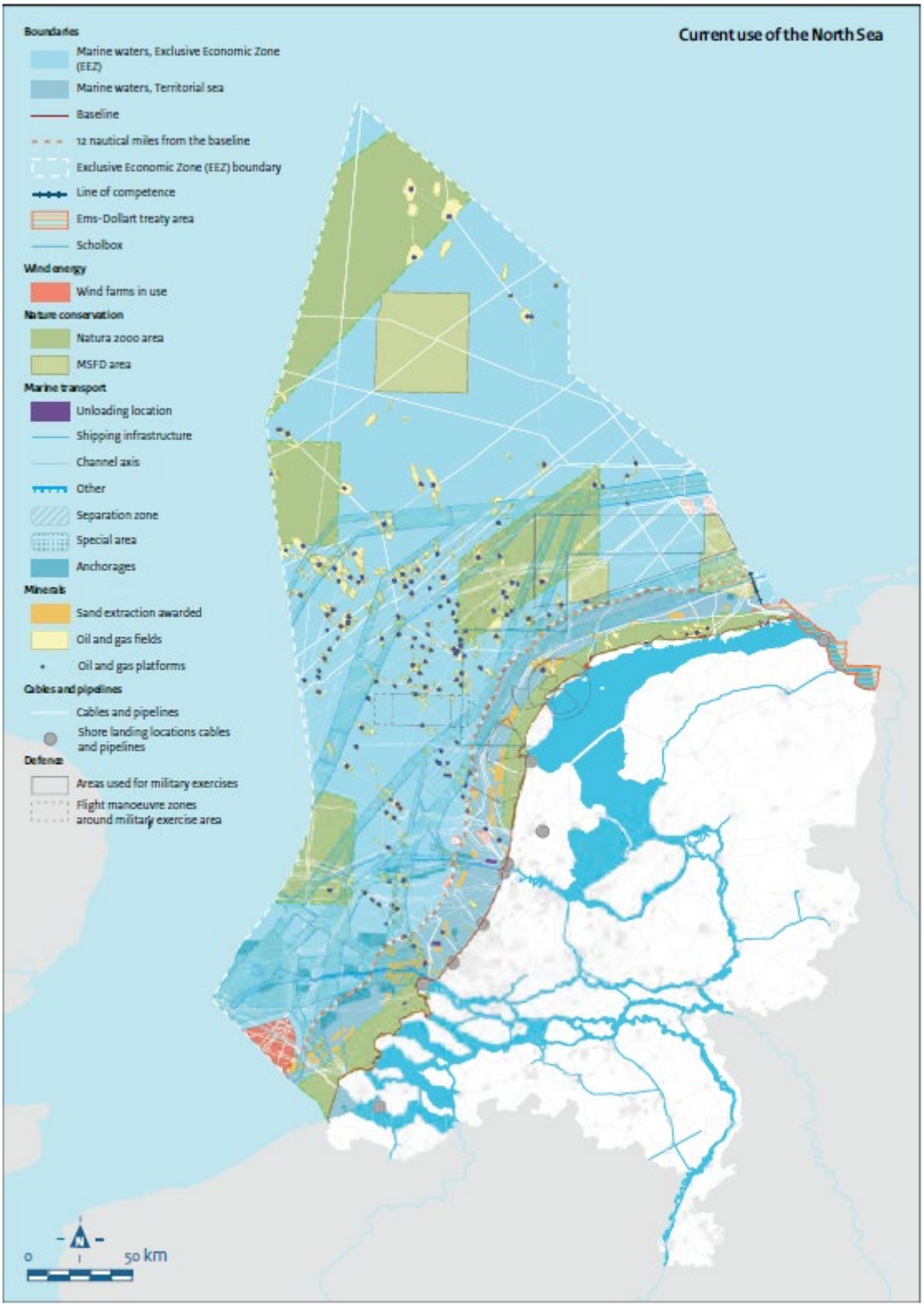

Map 1: Current use of the North Sea

Summary

The North Sea Programme, including the appendix Marine Strategy Part 3 (programme of measures) 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 preconditions 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 social balance to be able to achieve efficient and safe spatial development of the North Sea which fts within the preconditions 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. For the ecosystem and the further relevant national interests from the National Strategy on Spatial Planning and the Environment (NOVI), that framework 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 bound to national borders, and neither are policy and management. The Netherlands explicitly places the vision, ambitions and tasks for the North Sea in this international context. International vision and policy development to an important extent guide 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 Directives provide strong guidance: the Marine Strategy Framework Directive (MSFD), the Birds Directive (BD) and Habitats Directive (HD), 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 resource efficient union in 2050. The Commission wants to use it to tighten European climate policy. In addition, this Green Deal gives a new perspective to the Sustainable blue economy. In December 2020, the European leaders agreed on raising the target

for reducing EU greenhouse gas emissions to at least 55 percent by 2030. Following consent from the European Parliament and the European Council, the European Climate Act was adopted on 30 June 2021. The European Commission published the corresponding set of measures 'Fit for 55' on 15 July 2021.

National frameworks

Water Act and future Environment and Planning Act

The Water Act forms the basis for drawing up a national water plan outlining national water policy, of which North Sea policy is an integral part. When the Environment and Planning Act comes into effect, it will largely replace the Water Act. The National Water Programme 2022-2027 with the North Sea Programme 2022-2027, including the annex MSFD programme of measures, has been drawn up in the spirit of the Environment and Planning Act.

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 terms. It is therefore also included in the long-term vision in the NOVI up to 2050. 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. The tightening of the EU targets towards – and the objective in the 2021-2025 coalition agreement of – a reduction of at least 55 percent by 2030 will lead to an additional task for offshore wind energy. The Additional Task Steering Group recommends that 10 GW of offshore wind energy is needed for the required acceleration, on top of the required space for 0.7 GW still needed to reduce greenhouse gas emissions by 49 percent. To this end, wind farm zones for the realisation of a total of 10.7 GW are designated in the North Sea Programme 2022-2027.

North Sea Agreement

To safeguard strong social 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. 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. 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 designated 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 foraging and wintering area for many species, including birds. 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 designated 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 CO_2 reduction goals. The Dutch sea area which is 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 of this for the ecosystem are not yet well known.

Furthermore, this increasing claim of space will have an impact on other designated uses. With the increase of the number of wind farms, extracting fossil fuels from the seabed will be reduced 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 CO_2 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 will put 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 the 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 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 fts the preconditions of a healthy ecosystem. The concrete elaboration of this task will be based on the continuation of existing policy and new policy.

Continuation of existing policy

The policy that will be continued consists of:

- *Ecosystem*. Preserve and protect already designated Natura 2000 and MSFD areas and the marine ecosystem as a whole. In the spatial consideration of activities, also test against the preconditions 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 further sustainability of fisheries and aquaculture and balanced operations, within preconditions of the ecosystem.
- *Generate sustainable energy*. Sufficient space for the annual production of 49 TWh from offshore wind energy (pursuant to Climate Agreement) and for an additional 10.7 GW from wind farms 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, in combination with wind farms as much as 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 remove depleted platforms will be continued. Only platforms that will be reused for production and/or storage of hydrogen or CO_2 may remain.
- *CO_2 storage*. Sufficient space for the storage of CO_2 in depleted oil and gas fields or in 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 anchorage areas which can accommodate shipping safely and easily.
- *Sand extraction*. Sufficient space for sand extraction for coastal protection, to counter food risks and as fall sand on the land.
- *Defence*. Sufficient military exercise zones in the North Sea.
- *Underwater Cultural Heritage*. Government policy for managing archaeological heritage is based on the principles of the Valletta Convention.
- *Safe and healthy physical environment – recreation*. Liter cleaning and awareness campaigns.
- *Assessment framework for issue of permits 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 Natura 2000 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, and in 2030, 15 percent of the North Sea will be free of fishing that disturbs the seabed. An area of 2.8 percent of the North Sea will then be completely closed to fishing. 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 basin districts (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 conventional 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 concerns focus on innovations in the industry aimed at reducing negative effects on the ecosystem, emissions and waste. Furthermore, a warm restructuring is being pursued to bring the feet's fishing capacity back into balance with the reduction of quotas due to Brexit.[1]
- Innovations in marine food production. Encouraging aquaculture.

Transition to sustainable energy

- Areas in which wind farms have already been realised or planned, or for which (draft) site decisions are in place, or where site decisions are planned according to the 2030 Offshore Wind Energy Roadmap, remain wind farm zones in the North Sea Programme 2022-2027.
- The areas IJmuiden Ver (north) and the southern part of Hollandse Kust (west) will be confirmed as designated wind farm zones. The Hollandse Kust (northwest) and Hollandse Kust (southwest) areas no longer are wind farm zones, because of the interests of fisheries, nature and shipping. Noord Hinder has been abandoned as a wind farm zone because of its location in the approach to the port of Rotterdam and because it is too small.

[1] This restructuring is subject tot he approval of the European Commission.

- The southern boundary of the wind farm zone IJmuiden Ver has been adjusted due to the designation of the Brown Ridge as a Birds Directive area.
- Newly designated areas are wind farm zones 1, 2 and 5 (east)[2]. This designation and the reconfirmation of wind farm zones IJmuiden Ver (north) and the southern part of Hollandse Kust (west) are subject to the condition that no more than 10.7 GW of wind farms will be realised in these areas up to 2030. There is also the precondition that this development does not exceed the ecological carrying capacity. The ecological space for wind farm development must be demonstrated before wind farm site decisions are taken. The planning principle applied is adaptive, which may mean, for example, that designated wind farm zones will ultimately not be used or only in part.
- In these areas there is more space for the realisation of wind farms (a total of 16.7 GW). This 'broad' designation offers the necessary flexibility to be able to take into account limitations and interests related to other users, ecological integration and landing possibilities in the follow-up process towards taking site decisions. Related conditions and agreements are described in Section 9.3.
- 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 space required for this clearway is also taken into account to the south of IJmuiden Ver (north) and in area 1.
- Area 5 (east), which borders the German EEZ, takes into account the possible need for an extra wide safety margin between future wind farms and the adjacent shipping route. This offers the possibility of reaching congruent agreements on the relevant safety margin in consultation with Germany.
- Military exercise area EHD-41, adjacent to area 2, will not be moved until at least 2030.
- Search areas for the period after 2030 have been identified in the North Sea Programme in order to be able to designate wind farm zones with space for 17 GW[3] by means of a partial revision.
- The Assessment framework for determining the safe distance between wind farms and mining installations for helicopter fights has been supplemented. In principle, an obstacle-free zone of 5 NM all around applies to mining platforms with a helipad. It is now possible to deviate from this if it can be demonstrated that this has no unacceptable consequences for fight safety and accessibility for the location in question. However, the minimum possible obstacle distance must be assessed and coordinated for each individual location. It has been added that this also applies to the distance to installations for carbon capture and storage (CCS).
- An assessment method for the removal obligation has been developed for cables and pipelines, with leading criteria for nuisance for other uses, safety, environmental impact and costs. If these cables and pipelines are allowed to stay, they must be left in a clean and safe state.

[2] Area 1 = Nederwiek, area 2 = Lagelander, area 5 = Doordewind. Lagelander has been dropped in the revised North Sea Programme such that it is no longer either a wind farm zone or a search area.
[3] The Letter to Parliament Partial Revision of the North Sea Programme 2022-2027 of 17 May 2023 raised the task to at least 23-26 GW. Parliamentary Papers II 2022/2023, 35325, no. 8.

Maritime transport[4]

- The indicative location of a polar route (Northern Sea Route, NSR) has been put on the map as a search area. This international connecting route between Asia and Europe via the Arctic Ocean is essential to guarantee the accessibility of the Dutch seaports as a gateway to Europe in the future. Various route options are already being explored internationally. During the North Sea Programme 2022-2027, the (inter)national process to formalise an international connecting route between seaports will be continued, in coordination with interested sectors and neighbouring countries.
- Through the designated wind farm zone IJmuiden Ver (north) and area 1, space for a clearway will be kept free to guarantee safe passage for shipping. Besides the ferry connection, this future clearway will connect 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 a clearway, the international process to designate this connection as international (IMO) routing scheme can be started in collaboration with Germany and Denmark.
- The indicative location for an Esbjerg-United Kingdom clearway has also been put on the map as search area. It concerns a future clearway north of search areas 6 and 7, in order to continue to facilitate the existing shipping route between Denmark and the United Kingdom.
- The resulting clearways to the Baltic Sea and from Esbjerg to the United Kingdom, and the eventual internationally recognised shipping route NSR, will be put on the spatial development strategy map as part of the partial revision of the North Sea Programme, in coordination with interested sectors and neighbouring countries. In addition, the shape of search areas 6 and 7 (for wind energy) may also change.
- Clearways are determined in the Mining Regulations and, as soon as the Environment and Planning Act enters into force, in the Environment and Planning Regulations.

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 as a maritime country the opportunity to develop a concept 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 must result in pilot projects and ultimately in upscaling

[4] Indicative locations of intended clearways have been adjusted in the revised North Sea Programme in respect of the search area map, see Maritime Spatial Plan map in Ch9a.2.

initiatives to achieve the Sustainable blue economy and for co-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 co-use
- Assessment framework for co-use in wind farms
- Area surveys and area passport guide
- Assessment framework for use of area reserved for sand extraction
- Assessment framework for activities in the North Sea that require a permit

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 permits, 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 that require permits in the framework of legislation and regulations that apply to the North Sea in the territorial sea and in the Exclusive Economic Zone. These are the Mining Act, the Earth Removal Act, the Nature Conservation Act, the Environmental Management Act, and the Water Act - which will be incorporated into the Environment and Planning Act - a number of shipping acts and the Offshore Wind Energy Act. The assessment frameworks are mainly important for North Sea users who wish to request a permit and for permit 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 pressure factors plays a major role in research and monitoring. An important example is research into the consequences of the large-scale roll-out of offshore wind energy for ecology. Besides 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 Sea 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

As an extension to the North Sea Agreement, a permanent North Sea Consultation (NZO) between the national government and stakeholders was set up in the spring of 2021. This consultation safeguards the joint monitoring of the implementation of the North Sea Agreement 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). In this way, the consultation also plays an important role in the adaptive planning in the elaboration of the North Sea Programme. Key in the NZO is striking a balance between the energy transition, nature restoration and a future perspective for fishing, taking all users and stakeholder interests into account.

Adapted and new policy in the Partial Revision of this North Sea Programme 2022-2027

Designation of wind farm zones and space for clearways

Designation of Wind farm zone 6/7. For the rollout of wind energy in wind farm zone 6/7, a zone of 1520-1620 km^2, which divides the zone into a western and eastern section, will remain clear of wind farms. This open zone is among others important for the langoustine fishery and for nature. The size of the open zone is subject to the caveat that negative impact on the guillemot population will be sufficiently prevented. The size of the open zone in wind farm zone 6/7 can as necessary be adjusted at a later stage if this proves necessary according to ecological studies. For that reason, the rollout of wind energy will take place in phases. The rollout will start with Doordewind and the western section of wind farm zone 6/7 where there is space for an indicative 11 GW of wind farms. In total, wind farm zone 6/7, excluding the open zone, offers space for an indicative 19 GW of wind farms. In respect of the space available for joint use in wind farms in zone 6/7, the Government will concentrate on nature recovery and nature enhancing measures.

The reconfirmation of Doordewind as a wind farm zone with a modified form and expansion. Over and above the already planned 2 GW site, which is part of the Roadmap 21 GW, Doordewind offers space for approximately an additional 2 GW. For the wind farms in DDW, the operating principle is that active fishing will be permitted in this wind farm, as long as it is safe, viable and feasible. Lagelander has been dropped as a wind farm zone and is also no longer a search area due to the considerable interests of mining and fishing.

The stated quantities of wind energy (number of GW) are indicative at this stage, partly because in and around the designated wind farm zones there are (potential future) mining/drilling activities as well as other uncertainties regarding the possibility of ecological integration. For the further elaboration, conditions and agreements have been included. Before wind farm site decisions are taken and wind farm permits issued, the ecological space must be demonstrated. In its structuring choices, the Government will take into account the protection of the energy infrastructure. The Government will further elaborate measures for shipping safety during the follow-up process. With regard to wind farm zones, space has been reserved for future clearways. Also for wind farm zone 6/7, the Government will determine a clearway.

Transition to a sustainable food supply

The importance of sufficient space for sustainable fisheries, as formulated in the Vision on food from the sea and large waters, has been further elaborated. The policy aims to ensure sufficient space for a robust fishery sector with spatial considerations described for other use. This

underpins the way in which these aspects contribute to decision making on spatial planning for the North Sea.

Sand extraction for water safety and construction

The adaptation of the reservation zone for sand extraction from 12 nautical miles to 14 nautical miles and the backgrounds for that adaptation have been included.

Cyber and maritime security

The background to and the action programme within the interdepartmental Programme for the Protection of North Sea Infrastructure (PBNI) in which the Cabinet reached a decision in 2022 have been added.

International cooperation

Explanatory notes to the establishment and working methods of the strategic cross-sector cooperation between the North Sea countries in the Greater North Sea Basin Initiative (GNSBI) in relation to the marine environment and nature, energy, food, fisheries and transport.

Sustainable Blue Economy

The elaboration of the Investigation Programme for Sustainable Blue Economy has been brought better into line with the agreements on the new economy on the North Sea from the North Sea Agreement. Within this programme, the Government will investigate the potential and facilitate the development of pilots for activities in relation to food, energy and nature development. Among others, the Government will investigate how the issuing of permits can be deployed more efficiently to help achieve Good Environmental Status.

Policy and consideration frameworks for North Sea activities

- Expansion of the policy framework for free passage and joint use in wind farm zones on the North Sea with the elaboration of the management philosophy for joint use focused on the optimum structuring of policy with a view to contributing to a better balance between the three transitions on the North Sea. In this way, the Government will create the necessary conditions for facilitating initiatives for joint use. The Government will be investigating where on the North Sea, which forms of joint use have the greatest likelihood of success and how joint use can be involved earlier in the offshore wind energy process as a contributing factor in the layout of the wind farm zones. Notes explaining that the Government will investigate whether and how active fishing can be permitted in wind farms.
- The consideration framework ‘Use of areas reserved for sand extraction’ describes the conditions according to which activities of national importance can make use of the area reserved for sand extraction.
- In the consideration framework ‘Activities on the North Sea’, conditions have been included for the activity of realising one or two wind turbines, and the reservation zone for sand extraction has been adjusted (from 12NM to 14NM). It has also been noted that the importance of the fisheries must be clarified in issues regarding the spatial integration of activities.
- Addition of a consideration framework ‘Integration of cables and pipelines near shipping routes’. This will be applied for the development and assessment of new cable and pipeline routes in and around shipping routes

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 originated and how the governance of the development is organised during the planning period.

1.1 Social 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 task for the coming years is to find the right social balance to achieve the efficient and safe spatial development of the North Sea which fts the preconditions 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 required for this. The legal framework for this consists of the statutory obligations under the Water Act, which also implements the obligations of the European 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) and a management and development plan for national waters (Article 4.6). For the period 2022-2027, this obligation is implemented with the National Water Programme 2022-2027 (NWP), which follows up the National Water Plan 2016-2021 and the Management and Development Plan for National Waters 2016-2021. In terms of the spatial aspects, the National Water Programme also constitutes a spatial planning strategy as defined by Article 2.3, second paragraph, of the Spatial Planning Act.

Under the Water Act (Article 4.1, paragraph 3, under b), North Sea policy is included in the National Water Programme. As an independent appendix to the NWP, this North Sea Programme 2022-2027 supports the North Sea policy described therein. Under Article 4.6, second and third paragraphs of the Water Decree, the North Sea Programme 2022-2027 comprises the following elements of the Marine Strategy:

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

When the Environment and Planning Act comes into effect, it will largely replace the Water Act. The Environment and Planning Act is due to come into force in 2022/2023[5]. For the national government, the Environment and Planning Act features the following instruments: the environmental vision, programmes, general government rules, the environmental permit 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 the national waterways are therefore combined in one document.

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 relevant to the North Sea (see text box 'National interests NOVI' in Section 2.4)

From a European perspective, the North Sea Programme 2022-2027 implements the following obligations (see also Section 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. The North Sea Programme comprises the maritime spatial plan and the assessment frameworks for the issue of permits. The North Sea Programme is also a spatial development strategy within the meaning of the Spatial Planning act.
- 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 Sections 3.3.1, 3.3.2 and 3.3.3.

The North Sea Programme as part of the National Water Programme is adopted under the responsibility of the Minister of Infrastructure and Water Management, the Minister of Agriculture, Nature and Food Quality, the Minister for Nature and Nitrogen, and the Minister of Housing and Spatial Planning, in agreement with the Minister for Climate and Energy and the State Secretary for Economic Affairs and Climate.

1.3 Spatial integration

The North Sea Programme 2022-2027 applies to the area of the territorial seas and the Dutch Exclusive Economic Zone (EEZ) without municipal division. There is no municipal or provincial division of the North Sea from 1 km from the low water line on the coast. The management limits of the water control structures for water quality, water quantity and water management are described in Appendix III of the Water Regulations. 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 later part of the North Sea than it does over its territorial waters.

[5] On 1 January 2024, the Environment and Planning Act came into effect. Pursuant to the Implementation Act for the Environment and Planning Act, the North Sea Programme has become a programme pursuant to 3.9 (2) (c, d and e) of the Environment and Planning Act.

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 (World Heritage site) and the Eastern Scheldt are coastal waters. For all these areas, policy has been formulated in the National Water Programme. These waterways do not fall within the scope of the North Sea Programme and the implementation of the MSP and MSFD included in it.

The distribution of the airspace above the North Sea is not the same as the national borders. This must be considered in the spatial planning.

1.4 Administrative framework

Interdepartmental Directors North Sea Consultative Body

Different divisions from various ministries have policy responsibility for the North Sea. The Minister for 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 (chair, I&W), Economic Affairs and Climate (EZK), Agriculture, Nature and Food Quality (LNV), the Interior and Kingdom Relations (BZK), Education, Culture and Science (OCW), Defence, Finance, Justice and Security (J&V) and the executive organisations Rijkswaterstaat and the Coastguard.

Management

Rijkswaterstaat is the coordinating manager of the North Sea. To coordinate the various management tasks – particularly licensing and information management – the agency works together with the other managers and supervisory authorities, 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 forthcoming Environment and Planning Act, this programme contains the Management and Development Plan for National Waters (Bprw). Management by other parties is only mentioned.

Government Shipping Company

The Government shipping company of Rijkswaterstaat manages, staff 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 maters and feet management.

Enforcement and service provision

The Ministries of Justice and Security, Defence, Finance, I&W, EZK and LNV 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 stakeholders aimed at signing a North Sea Agreement. This initiative was based on the OFL report 'Exploration North Sea strategy 2030'. On 19 June 2020, the Minister of I&W submitted the final version of the North Sea Agreement to the House of Representatives[6]. The agreement contains joint principles, tasks and agreements which balance the tasks for fishing, nature 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 North Sea Programme. On 27 January 2021, the House of Representatives held a plenary debate about this agreement and the associated governance[7] advice of the OFL.

As an extension to the North Sea Agreement, a permanent North Sea Consultation (NZO) between the national government and social organisations was set up by ministerial decree of 30 June 2021.[8] This consultation safeguards the joint monitoring of the implementation of the North Sea Agreement 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). In this way, the consultation also plays an important role in the adaptive planning in the elaboration of the North Sea Programme. Key in the NZO is striking a balance between the energy transition, nature restoration and a future perspective for fishing, taking all users and stakeholder interests into account. The NZO is a consensus-based consultation under an independent chair. The conclusions have the status of important 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 use, nature and ecosystem are transnational. 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[9]. Several conventions to which the Netherlands is a party and collaborative agreements can be considered a further elaboration of the general rules contained in the UNCLOS.

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[6] Parliamentary Documents II, 2019-2020, 33450, no. 68.

[7] Overlegorgaan Fysieke Leefomgeving, Advies afspraken governance Noordzeeoverleg (NZO), 27 november 2021

[8] North Sea Consultation decree (Government Gazette 2021, 32834). The North Sea Consultation consists of representatives from the national government and the sectors energy, nature, food/fisheries and shipping; a dialogue on participation is ongoing with the fisheries sector. Part of the sector has been represented in the NZO since November 2021.

[9] The United Nations Convention on the Law of the Sea adopted in Montego Bay on 10 December 1982 (Treaty Series 1983, 83).

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
  The Biodiversity Convention (CBD)[10], the UN Sustainable Development Goals, the Paris Climate Agreement[11], and the Oceans Policy[12]. Furthermore, agreements in the framework of the International Maritime Organization (IMO), the Treaty of London and the related London Protocol of 1996[13], and finally the Valletta Treaty[14].
- European level
  Water Framework Directive (WFD)[15], Marine Strategy Framework Directive (MSFD)[16], Maritime Spatial Planning Directive (MSP)[17], Common Fisheries Policy (CFP)[18], Birds Directive (BD)[19] and Habitats Directive (HD)[20], CO_2 emission reduction targets, the European Strategy for the Sustainable blue economy, Sustainable energy policy, European strategy for plastics in a circular economy.
- Regional level
  Oslo Paris Convention for the Protection of the Marine Environment of the North-East Atlantic, including the North Sea (OSPAR)[21], mostly through MSFD implementation. Furthermore, protection of cetaceans (ASCOBANS)[22], and protection of migrating water birds, including most sea birds in the North Sea (AEWA).
- North Sea countries
  The Political Declaration of North Sea Energy Ministers (The North Seas Energy Cooperation 2020-2023, as continuation of the declaration 2016-2019) to strengthen the partnership in the development of offshore sustainable energy, including attention for spatial planning and ecology. In addition, relevant instruments adopted in the framework of the Treaty of Bonn with respect to the protection of migratory animal species and the Bonn Agreement (incident response). The North Sea Region Maritime Spatial Planning Collaboration Group, 2021, on the basis of Article 11 of the European Maritime Spatial Planning Directive between North Sea countries for the purpose of coordination to promote cross-border coherence between plans.

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[10] The Convention on Biological Diversity concluded in Rio de Janeiro on 5 June 1992 (Treaty Series 1992, 164 and 1993, 54).
[11] The Paris Agreement concluded in Paris on 12 December 2015 (Treaty Series 2016, 98 and Treaty Series 2016, 162).
[12] Parliamentary Documents II, 2016-2017, 30 196, no. 543.
[13] The Protocol to the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Mater, concluded in London on 7 November 1996 (Treaty Series 1998, 134 and Treaty Series 2000, 27).
[14] The European Convention for the Protection of the Archaeological Heritage, concluded in Valletta on January 16, 1992 (Treaty Series 2007, 126);
[15] Council Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy (PbEU 2000, L 327).
[16] Council Directive 2008/56/EG (PbEU 2008, L 164/19).
[17] Council Directive 2014/89/EU (PbEU 2014, L 257/135).
[18] Commission Regulation (EU) No. 1380/2013, (PbEU 2013, L 354/22).
[19] Council Directive 2009/147/EG (PbEU 2010, L 20/7).
[20] Council Directive 92/43/EEG (PbEU 1992, L 206).
[21] The Convention for the Protection of the Marine Environment of the North-East Atlantic concluded in Paris on 22 September 1992 (Treaty Series 1993, 16).
[22] The Agreement on the Conservation of Small Cetaceans of the Baltic, North East Atlantic, Irish and North Seas concluded in New York on 17 March 1992 (Treaty Series 1992, 137, Treaty Series 2006, 133).

- Bilateral exchange
  At government level, particularly with Belgium, Germany, the 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 among others 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 of 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 tasks 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. The Marine Strategy part 3, the programme of measures, has since also been updated and included in the North Sea Programme 2022-2027 (see Sections 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 process 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 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 given a place in the maritime spatial plan (see Chapter 9).

1.6 Procedure, participation and advice of Environmental Impact Assessment Committee[23]

Procedure

The North Sea Programme 2022-2027, including the appendix MSFD programme of measures, has been drawn as an appendix to the National Water Programme and prepared according to section 3.4 of the General Administrative Law 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 proposal to arrive at this North Sea Programme 2022-2027 was announced in the letter to the House of Representatives of 28 October 2019.[24] On 31 October 2019, the proposal to draw up the National Water Programme 2022-2027 and to produce a Strategic Environmental Assessment (SEA) and Appropriate assessment (Aa) was published in the national government Gazette and De Volkskrant[25] newspaper. 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 and the Aa.
Pursuant to Article 7.9 of the Environmental Management Act, from 1 to 28 November 2019, everyone was given the opportunity to present their opinions about both the proposal and the content of the NRD. Based on the reactions received, one point 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.

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 subject areas. 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.

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[23] The text of chapter 1.6 will be supplemented as compared with the draft Partial Revision North Sea Programme following the presentation and reaction from the EIA/SEA Committee before the Partial Revision is definitively adopted. The procedure, participation processes and the EIA procedure up to the moment of presentation are described in the participation plan and the memorandum of scope and detail level. These are available for consultation on the participation platform. When the Partial Revision North Sea Programme is adopted, this footnote will be deleted.

[24] https://www.rijksoverheid.nl/binaries/rijksoverheid/documenten/kamerstukken/2019/10/28/nationaal-water-programma-2022-2027/nationaal-water-programma-2022-2027.pdf

[25] Government Gazette 2019, no. 58883.

Local authorities were consulted at various times about choices which affect the different designated 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, the Netherlands informally coordinated the spatial plan with neighbouring countries, based on the MSP.

In autumn 2020, during various meetings of the North Sea Consultation, consensus-based consultations took place about parts of the North Sea Programme. On 16 December 2020, the full Draft North Sea Programme 2022-2027 was discussed in the North Sea Consultation. Broad information meetings about the Draft North Sea Programme were held on 30 January 2020 and 26 May 2021.

The Draft North Sea Programme 2022-2027, including the draft of the Marine Strategy part 3 and the associated SEA and the Aa were available for public consultation from 22 March 2021 to 22 September 2021 as part of the NWP. The Espoo contacts received the full version of the SEA and the Aa in March 2021. Everyone was able to present their opinions on it.
In 2021, consensus-oriented consultations were held during various meetings of the North Sea Consultation on a Supplementary Draft of the North Sea Programme for the designation of new wind farm zones. A broad information meeting about the Supplementary Draft North Sea Programme 2022-2027 took place in October 2021. From 9 November to 20 December 2021, this Supplementary Draft North Sea Programme with the accompanying supplementary SEA and the Aa were made available for public consultation, on which everyone could once again put forward their opinions.

The Espoo contact persons received the English translation of the Supplementary Draft North Sea Programme on 16 November 2021, together with the English, French and German translations of the summary of the supplementary SEA. The reaction period for neighbouring countries ran until 27 December 2021.

Received opinions

The opinions received were taken into consideration in the preparation of the North Sea Programme 2022-2027. The opinions on the Draft North Sea Programme were included in the reaction paper for the National Water Programme 2022-2027. The opinions on the Supplementary Draft North Sea Programme were included in a supplementary reaction paper. The government is grateful to all parties that took part in the participation process for their input.

Advice from the Netherlands Commission for Environmental Assessment

The North Sea Programme is a spatial development strategy under the Spatial Planning Act (Wro) and contains the frameworks for activities that are subject to the (assessment) obligation of an environmental impact assessment (EIA). The Environmental Management Act (Wm) stipulates that an EIA must be completed that culminates in a Strategic Environmental Assessment (SEA) including an Appropriate assessment under the Nature Conservation Act. The aim of a SEA is to allow the environmental aspects of the policy intentions to play a fully-fledged role in the decision-making. The environmental effects of these intentions are described and assessed in the SEA and the Appropriate assessment. This assessment was considered in preparing the ultimate intentions in the North Sea Programme. The SEA and the Appropriate assessment, together with the Draft NWP, were made available for public consultation. An additional SEA and

Appropriate assessment were made available for public consultation with the Supplementary Draft North Sea Programme. On 7 June 2021, the Netherlands Commission for Environmental Assessment (NCEA) issued assessment advice on the SEA to the NWP[26]. On 25 January 2022, the NCEA issued additional assessment advice on the North Sea Programme[27]. The NCEA has given a positive advice on the additional SEA and associated Appropriate assessment. According to the NCEA, the funnelling of search areas is easy to reproduce, and a great deal of research has been carried out, including into the cumulative effects. As such, according to the NCEA, the SEA and the Appropriate assessment provide sufficient basis for decision-making. This advice is included in the supplementary reaction paper with the reactions to the opinions submitted.

Adoption

The government adopts the National Water Programme 2022-2027 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.

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 outs 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 and via other bilateral and regional collaborative ventures.

In May 2021, the European Commission awarded a new project for Maritime Spatial Planning cooperation in the context of the Green Deal, which focuses specifically on the elaboration of the Green Deal elements. This project, ‘Emerging topics in Maritime Spatial Planning for the North and Baltic Sea Regions’, has 15 participating government organisations from countries in

[26] NCEA, National Water Programme 2022-2027, Assessment advice on the Environmental Impact Assessment, 7 June 2021, project number: 3429.
[27] NCEA, North Sea Programme, supplement search areas offshore wind, Assessment advice on Environmental Impact Assessment, 25 January 2022, project number: 3595.

the Baltic and North Sea and is coordinated by the Netherlands Enterprise Agency (RVO) in collaboration with the Ministries of I&W and LNV. The project will strengthen international cooperation and will run from September 2021 to spring 2024. The Netherlands is also investigating options for strengthening international cooperation on planning issues in the North Sea through a North Sea basin strategy. In 2021, for example, the Netherlands started to investigate the reinforcement of international and integrated collaboration between the North Sea countries in respect of spatial planning policy within the limits of the ecological capacity of the North Sea system. This initiative was started in 2023 in collaboration with the other North Sea countries and the European Commission, and is known as the Greater North Sea Basin Initiative (GNSBI). (see Section 9.6).

During the term of the North Sea Programme 2022-2027, the Dutch government may decide on an interim (partial) revision of the programme, if this contributes to achieving the desired goals. For any partial amendment to the programme, a similar procedure will be followed as for this North Sea Programme 2022-2027. In accordance with new governance agreements, 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 Reading guide

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 themes are elaborated: enhancement of the marine ecosystem, the food transition, the energy transition, shipping and ports, and further designated uses such as sand extraction, cables and pipelines, military 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, the campaigns, and finally the knowledge agenda for the coming 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. This chapter contains a spatial development strategy map with the Natura 2000 and MSFD areas, shipping routes, spatial reservations for wind energy and sand extraction, and preferred routes for cables and pipelines. In addition, this chapter contains a map with various search areas for wind energy and spatial indications for future shipping routes or clearways. This chapter also discusses land-sea interactions and international cooperation in the field of maritime spatial planning.

Chapter 10 elaborates the other relevant frameworks for spatial planning: the Policy framework for passage and co-use, Area surveys and Area Passport Guide for co-use in wind farm zones in the North Sea, the Assessment framework for co-use in wind farms, the Assessment framework for use of area reserved for sand extraction, the Assessment framework for activities in the North Sea that require a permit. This chapter also presents guiding statements for artificial offshore islands.

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

Chapter 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, ambition and tasks

This chapter describes the course of the North Sea Programme for the planning period 2022-2027, looking ahead to 2050. The national 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 the subsequent chapters, 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, certain forms of fisheries, nature enhancement by creating oyster banks, solar and tidal energy, and storage of energy and CO_2 in depleted gas fields (and possibly aquifers).

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 multiple forms of use 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 explicitly places the vision, ambitions and tasks for the North Sea in this international context. The international development of vision and policy for the North Sea is 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 preconditions to maintain a healthy ecosystem.
Relevant sub goals for the North Sea of the global sustainable development agenda focus on tackling pollution and on protecting, restoring and enhancing the resilience of ecosystems (including the designation of protected areas), 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, equal to the European commitment to marine protection.

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 principle[28]. 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

[28] Convention about the functioning of EU article 191 paragraph 2.

Biodiversity Convention[29] , OSPAR[30], Marine Strategy Framework Directive (MSFD[31])). 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.

Global agreements on sustainable shipping are made in the International Maritime Organization (IMO). This concerns, among other things, requirements for seagoing vessels to reduce the emission of environmentally polluting substances, the prevention of alien harmful organisms entering national waters via ballast water, the prevention of discharges of harmful substances, the prevention of plastic waste and the reduction of underwater noise.
In this context, the IMO has declared the North Sea a special emission management area where extra strict rules apply for the emission of nitrogen, sulphur and particulate mater.

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 Directive (BD) and Habitats Directive (BD), the Maritime Spatial Planning Directive (MSP), 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 environmental 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 timeframe 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. The MSFD will be reviewed in 2023. During the planning period, this may lead to adjustments or additions to (the implementation of) the policy of this North Sea Programme and the implementation of the MSFD as part of it.

[29] Convention on Biological Diversity, Treaty Series, 1993, no. 54.
[30] Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR Convention), Treaty Series, 1993, no. 141.
[31] 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.

The OSPAR North-East Atlantic Environment Strategy (NEAES) 2030 was adopted in October 2021[32]. This strategy comprises twelve strategic objectives that should lead to good environmental status of the North-East Atlantic. These objectives relate to:

- Clean seas: eutrophication, hazardous substances, radioactive substances, litter, including microplastics.
- Biologically diverse and healthy seas: protect and conserve biodiversity, ecosystems and their services, restore degraded habitats.
- Sustainably used seas: cumulative impacts of use, underwater noise, seafloor integrity.
- Climate change and ocean acidification: raise awareness by monitoring and analysing, considering additional pressures when developing programmes, actions and measures; and contribution of oceans to mitigation.

The OSPAR-NEAES will be operationalised and implemented by the treaty parties during this planning period. The Netherlands will contribute to this within the North Sea Programme framework, and in particular the tasks and requirements in relation to implementation of the MSFD. Where necessary, decisions in OSPAR on the elaboration of the NEAES will carry over into adjusting or supplementing (the implementation of) policy of this North Sea Programme and implementation of the MSFD as part of it.

'Blue growth' is the European long-term strategy from 2012 for more sustainable growth in specific 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 blue growth in a new perspective. The European Green Deal requires us to convert our economies into modern, resource-efficient and competitive economies in which net emissions of greenhouse gases are phased out and the natural assets of the EU are protected. In May 2021, the European Commission published its strategy for a transformation of the blue economy as a whole to fully sustainable[33]: a roadmap to make the economies of the EU member states sustainable, climate-neutral and inclusive. The central idea is that climate change and current economic activities at sea and on land form a threat for biodiversity and that unhealthy seas will negatively impact the blue economy. The government's reaction to this strategy was presented to the House on 25 June 2021[34] and discussed on 29 September 2021.

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 following 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.

[32] Strategy of the OSPAR Commission for the Protection of the Marine Environment of the North-East Atlantic 2030 (Agreement 2021-01: North-East Atlantic Environment Strategy (replacing Agreement 2010-03)) OSPAR 21/13/1, Annex 22.
[33] COM (2021) 240/2.
[34] Parliamentary Documents II, 2020-21, 22112, no. 3147.

- a zero pollution action plan.

The European Biodiversity Strategy is aimed at:

- ecological protection of in total 30 percent of European seas, a third of which strictly protected. The EU has drafted a memorandum containing definitions of 'ecological protection' and 'strictly protected'. Member states are asked to share their plans for area-based protection with the European Commission through a pledge and review process in 2022.
- nature restoration targets to be laid down by law, to be further elaborated on the basis of plans that the member states submit to the European Commission.

In the sectoral themes of the blue economy, the emphasis is on wind energy, hydrogen, CO_2 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 regional cooperation.

2.4 The National Strategy on Spatial Planning and the Environment

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 achieving the necessary sustainable energy production largely by means of wind farms in the North Sea. According to scenario studies, the installed power in wind farms on the Dutch North Sea can be between 38 and 72 gigawatts in 2050.[35] Wind farms require a lot of space. The NOVI therefore states that space in the North Sea in the 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 National interests NOVI and sections 10.3.3 and 10.5.3).

The task for the North Sea Programme 2022-2027 is to find the right social balance in the spatial development of the North Sea. That development must be efficient and safe and ft within the preconditions of a healthy ecosystem. This demands sharp, future-proof choices about combining, separating and prioritising use, about investments in sustainability and knowledge, and about adaptive policy. Also choices about commitment to international coordination, partnership and policy development are required. 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

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

opportunities. The sustainable blue economy, for example, brings opportunities for new revenue models and export possibilities. Multifunctional use of space creates opportunities for synergy. Ideas are already there, research is being conducted and the first experiments are being carried out. These involve combining wind farms with aquaculture, alternative forms of fishing, nature enhancement by creating oyster banks, solar and tidal energy, green/blue hydrogen production and storage of energy and CO_2 in empty gas fields (and possibly aquifers).

National interests NOVI

In the NOVI, 21 national interests are defined. National interests are the substantive interests for the physical living environment 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 Chapters 7.3 and 7.4).
- Limit climate change (see Chapter 5).
- Achieve a reliable, affordable and safe energy supply, which is low in CO_2 in 2050, and the required main infrastructure for this (see Chapter 5).
- Safeguard the main infrastructure for transport of substances via pipelines (see Chapter 5).
- Achieve a future-proof, circular economy (see Chapter 4).
- Safeguard food 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 fisheries (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 enhancing the ecosystem in compliance with EU legislation;
- the roll-out of wind farms up to and beyond 2030 in compliance with the Climate Agreement and including options for shipping and co-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 preconditions 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 ft within 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 limiting condition 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 transport of energy on the sea and from sea to land. This development also facilitates the reduction of CO_2 emissions. This then full one of the preconditions of the Climate Agreement and the Paris Agreement. This is a social choice, offering a careful consideration, bearing in mind the interests of the ecosystem and other designated 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, fts the new situation on the North Sea. 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 (aquaculture) that 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 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 Programme 2022-2027 is to find the right social balance in the spatial development of the North Sea. That development must be efficient and safe and ft within the preconditions 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 ft 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, fts the new situation on the North Sea and other major developments, such as Brexit. In addition, there are more and more ideas for alternative food production methods at sea (aquaculture) that 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.
- Innovation with respect to sustainable aquaculture 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 system, while they also increase the pressure on the system. This chapter describes the policy that must 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 in 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 the location, composition and structure of the seabed, the water dynamics and the various characters of the coastal areas has enabled the emergence of a variety of special habitats 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 designated 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, recreation and experience 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 HD, the Nature Conservation Act (Wnb) guarantees the conservation of the species and habitat types that fall under these Directives and, among other things, imposes strict requirements on permits - or exemptions via the Offshore Wind Energy Act - for activities that affect individuals of protected species or in relation to effects on the conservation goals of Natura 2000 areas.

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.[36] 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 CO_2 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, alien species (exotics) which have hitched a life 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

[36] Marine Strategy (part 1). Update of current environmental status, good environmental status, environmental goals and indicators (Parliamentary Documents II, 27625, no. 434).

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 CO_2 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 sea birds 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 sea bass, 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 'disappeared', another species is 'endangered', and two species are 'seriously endangered'.[37] 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' conservation 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' conservation status and habitat type 'mudflats and sandbanks' (H1140) had a 'moderate' conservation 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, discharges from the past of some hazardous substances have long repercussions.

[37] Government Gazette 2015, 36471.

The good environmental status seems to have been achieved for porpoises and seals and for minimising introductions of alien 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 HD[38]. The number of established alien 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. Measures have been taken to reduce impulsive noise during the construction of wind farms, seismic research, explosive clearance and active sonar. The number of seismic surveys for detecting oil and gas on the Dutch Continental Shelf (NCP) has been very limited in recent years. In future projects, research will be carried out in collaboration with industry into the environmental impact of impulsive noise. For now, this seems sufficient to achieve good environmental status (for impulsive noise) in the next assessment (Marine Strategy Part 1 in 2024). 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. In addition, a policy task remains for reducing continuous underwater noise. The Netherlands has taken the lead in monitoring continuous underwater noise in the North Sea through the JOMOPANS project (Joint Monitoring Programme for Ambient Noise in the North Sea). This shows that especially the southernmost part of the North Sea experiences great pressure from continuous underwater noise.

3.1.4 Future developments

Fishing, increasing CO_2 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 CO_2 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 underwater noise in operational wind farms, 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 seabed between the turbines that is no longer disturbed by nets, species and populations can develop. 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.

[38] Parliamentary Documents II, 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 preconditions 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 is 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 section 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);
- increasing sustainability of 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 preconditions 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: 'Conservation and sustainable use of 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 capacity 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.
Beter 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).

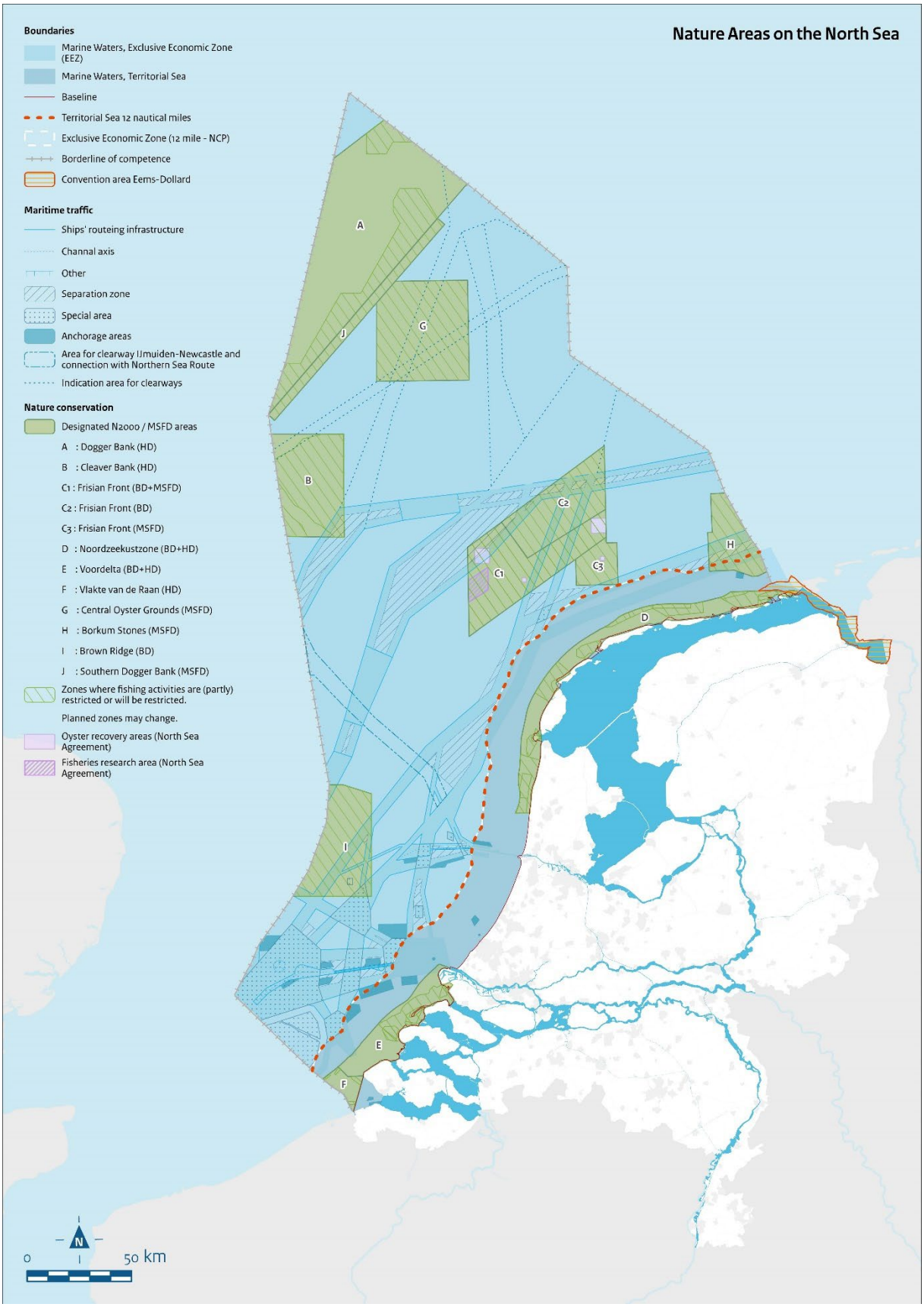
The importance of knowledge and insight certainly also apply to new or changing use, such as marine energy extraction, aquaculture and fishing without trawl nets for fish, shellfish and crustaceans. These types of use must ft within the ecological carrying capacity of the North Sea, for example in relation 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.

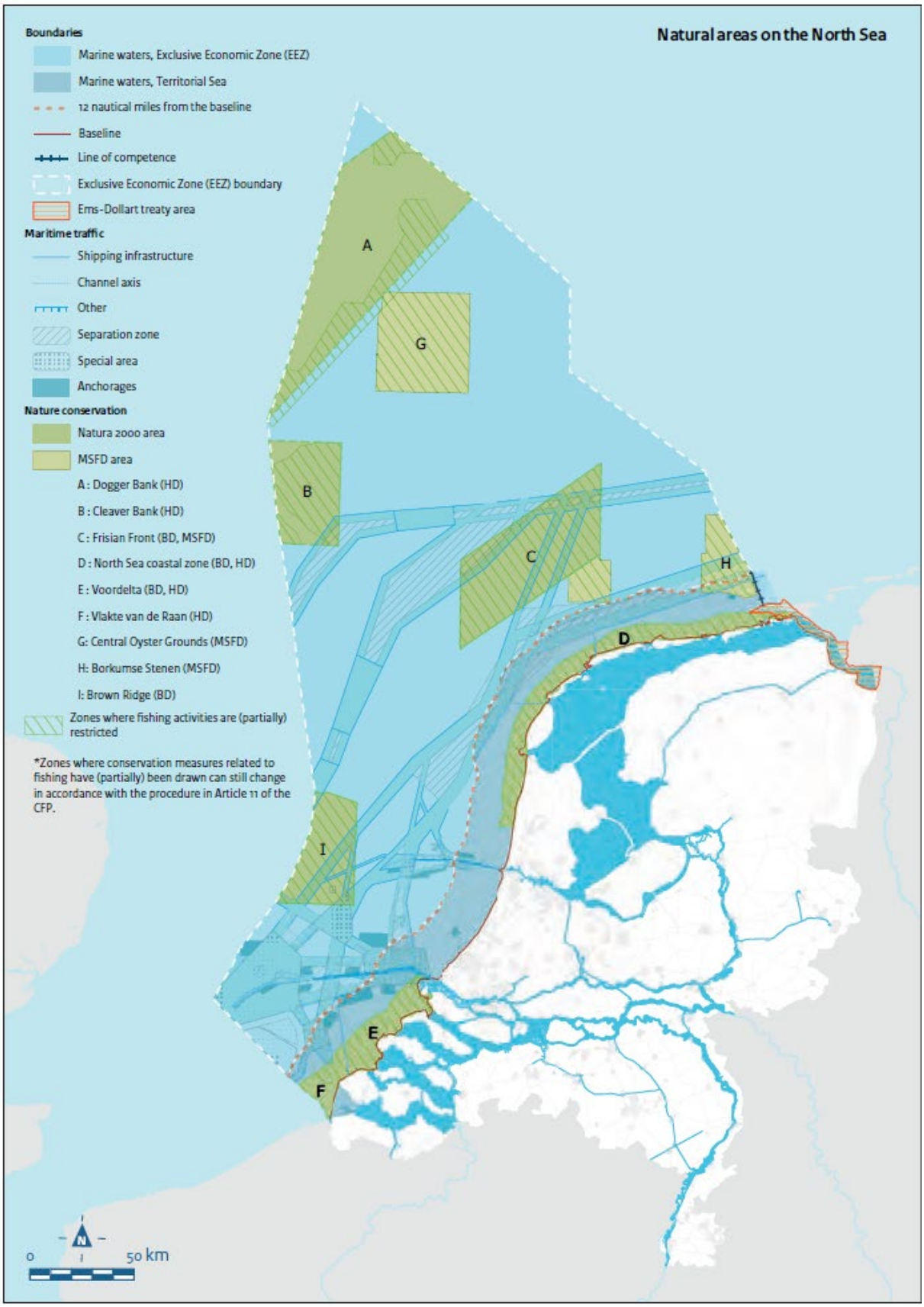
In OSPAR context, the Netherlands is working with the other North Sea countries on developing indicators and the assessment of the ecosystem. In 2023, OSPAR will publish its Quality Status Report. In the update of the Marine Strategy Part 1 in 2024 (updated integrated assessment of the environmental status of the North Sea ecosystem), this report will carry over into the review of the descriptions of good environmental status and related objectives. This serves to comply with the principle of adaptive planning.

The following sections indicate for the first four policy tracks which measures to protect and reinforce the marine environment and what development of knowledge and monitoring are 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-driven innovation programme Sustainable North Sea, research in the framework of the European Maritime, Fisheries and Aquaculture Fund (EMFAF) and the Blue Route from the National Science Agenda.



Map 2: Nature conservation areas on the North Sea



Map 2: Natural areas on the North Sea

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 maritime transport (MARPOL) and discharges following incidents or disasters. The use of tributyl- tin (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 foreseen 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 the manufacture-use chain of plastic products. To consolidate the downward trend, this policy and the resulting measures will be continued in the coming years (in adapted form) and supplemented with an extra focus on clean beaches, litter waste problems for area and water managers along rivers, dolly rope, fish lead and plastic pellets. Additional efforts are described in Appendix 1 Programme of Measures under the Marine Strategy Framework Directive.

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 I&W will, in line with the North Sea Agreement, work with industry to draw up an assessment framework for seismic survey. This is part of encouraging industry to reduce impulsive noise. A noise budget that regulates the time in which the impulsive noise is permitted may be a condition of the assessment framework. This will also have to take into account the fact that alternative methods for seismic surveys are not (yet) available. In addition to impulsive noise, continuous noise must also be reduced. This mainly concerns underwater noise caused by shipping. The IMO has adopted guidelines to reduce underwater noise caused by commercial shipping. The Netherlands is committed to improving and tightening up the guidelines, together with the EU.

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 hydrographical interventions must be studied in the environmental impact assessments, as prescribed at European level. This EU policy to prevent

changes in hydrographical 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 I&W 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 regular management.
- Implementation of the duty to deliver persistent floating cargo residue from 2021[39].
- In addition to the MARPOL legislation, the Netherlands has taken additional measures for washing the discharged tanks. The companies involved have made voluntary agreements about this. The improved prewashing procedure will be brought to the attention of the International Maritime Organization by the Ministry of I&W.
- Phasing out of conventional dolly rope, by introducing incentive measures.
- Standardisation of circular design and product chain approach of fishing gear.
- Reducing 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.
- Performing 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.
    - Exploration of a registration point for waste on beaches, with which beach visitors and users can report the waste found, such as paraffin, debris or plastic pellets, to the relevant manager.
    - Exploration of additional measures to tackle litter in inland shipping.
    - Exploration of options for PUR foam approach.
    - Exploration of possible next steps in the microplastics policy programme.
- Revision of the Implementation Framework (formerly Collaborative Agreement) to tackle Coastal Pollution RWS services (UBKR, formerly SBK), in consultation with municipalities. This is done in the wake of the 2019 disaster in which MSC Zoe lost containers, to ensure that environmental damage due to plastics will be minimised in the event of future incidents at sea. Above a threshold value to be determined, municipalities can call on Rijkswaterstaat for assistance in clearing macro-pollution after maritime incidents. Further details will be elaborated in the UBKR.
- In partnership with industry, draw up an assessment framework for seismic survey in analogy with the Framework for Assessing Ecological and Cumulative Effects (KEC).
- Efforts to improve and tighten guidelines for the reduction of underwater noise from commercial shipping.

[39] MARPOL Annex II, Regulation 13.

- Commitment within OSPAR to draw up a regional action plan (RAP) to combat underwater noise.

Knowledge agenda

The following overview contains the main knowledge questions relating to pollution and disturbance:

- What are possible additional measures that can help reduce the presence of eutrophicating substances in the Dutch part of the North Sea. At European level, model studies are being performed which, based on the effectiveness of measures and possible additional measures, could be guiding.
- The influence of the primary production capacity of the North Sea ecosystem due to the declining eutrophication
- Effect of climate change on eutrophication such as increased algal blooms.
- 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 roll-out of offshore wind energy. Are the ecological and physical parameters crucial to the system sufficiently measured or calculated?
- The consequences for the marine environment of the increased use of copper as a substitute for TBT.
- Liter: source identification, distribution routes and effects of litter.
    - Explore standardised method for source classification of waste sources, in particular, of river waste as a source of litter in the sea for a more targeted source approach.
    - Research into sources of waste in specific hotspots such as possibly at anchorages and hotspots identified by further analysis of Fishing for Liter waste.
- Ensure better alignment of methods for monitoring microplastics in saltwater and freshwater.
    - Integration of research and monitoring data on litter in water (sea, rivers and estuaries), including specific research into integrating, harmonising, comparing and exchanging research and measurement data from RWS and stakeholders of litter/plastics in rivers, bringing them together in a single data system and linking them with relevant existing measurement and model data.
- 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, paying attention not only to noise pressure but also to the particle velocity component of underwater noise.
- The effect of all cumulative (continuous and impulse) underwater sounds on populations (size, temporal and spatial distribution).
- 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 the fact that the sources move. For the assessment of impulsive noise from seismic sources, the effect distance of these sources will have to be determined. In concrete

terms, this concerns the sound propagation and the dose-effect relationships for these sources.
- Continuous underwater noise of recreational shipping.
- The effect of electromagnetic fields on some fish species, such as sharks and rays.

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), Brown Ridge (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 co-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 the 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 measures for limiting seabed-disturbing fishing in all designated and to be designated Natura 2000 and MSFD areas.
In addition, agreements about research have been made in the North Sea Agreement. Independent scientific research will be carried out before 2025 to determine whether the Hollandse Kust, the Vlakte van de Raan, the Borkum Reef Grounds, the Cleaver Bank, the Dogger Bank and the Central Oyster Grounds meet the selection criteria for designation as Birds Directive area. Areas that meet the selection criteria must then be designated as Birds Directive area as soon as possible.

In the framework of the biodiversity strategy, part of the European Green Deal, the member states are engaged in a dialogue in 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 above-mentioned relevant agreements in the North Sea Agreement form the starting point for the Dutch contribution to this elaboration.

Actions

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

- *Brown Ridge* (Natura 2000):
  - the Brown Ridge was designated a Birds Directive area in 2021[40] [41];
  - 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:
  - draft a Natura 2000 management plan;
  - the area closed for seabed-disturbing fishing will be expanded by 1,014 km^2;
  - of the area as a whole, 1,649 km^2 will become a 'no fisheries zone';
  - two sub areas of 50 km^2 and two subareas of 4 km^2 will be designated for oyster recovery;
  - a sub area of 100 km^2 will be allocated for oyster recovery;
  - on the edge, another sub area of 100 km^2 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):
  - before 2023, expansion of the Natura 2000 area aimed at increasing the area closed for seabed-disturbing fishing by 557 km^2;
  - before 2023, ban on seine fishing (flyshoot) in the 1326 km^2 management zones;
  - adaptation of the management plan.
- *Cleaver Bank* (Natura 2000):
  - before 2023, expansion of the area closed for seabed-disturbing fishing (excluding Botney Cut) by 552 km^2;
  - possible adaptation of the management plan.
- *Central Oyster Grounds* (MSFD) before 2023:
  - expansion of the area closed for seabed-disturbing fishing by 1,062 km^2.
- *Borkum Reef Grounds* (MSFD) before 2023:
  - establishing an area of 683 km^2 closed to seabed-disturbing fisheries.
- In Natura 2000 and MSFD areas, no new gillnetting is allowed. This means that no more permits can be issued, and no more space arises within existing permits.

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.

[40] For the site boundaries, the site decision for the wind farm zone IJmuiden Ver takes the designation as Birds Directive area into account.

[41] Government Gazette. 2021, 48715. Announcement of designation decision Natura 2000 area Brown Ridge, Ministry of Agriculture, Nature and Food Quality

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 may 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, Vlakte 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 as Birds Directive area by 2025 at the latest.
- From 2020, independent research must show whether the presence and distribution of honeycomb worm reefs give 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 under the Nature Conservation 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 activities in the North Sea that require a permit.

The large-scale roll-out 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 using the Framework for the Assessment of Ecological and Cumulative Effects (KEC). Assessment of the effects on the biogeographical populations, both individual and in cumulation, provides an indication of the ecological scope for offshore wind energy (see Chapter 5). This knowledge has been applied in designating new wind farm zones in this North Sea Programme (see Chapter 9) and will be applied to drawing up the additional Roadmap Offshore Wind Energy 2030. 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 co-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 as described in the Nature Conservation Act are met. 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 and bats, 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 utilisation 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), interna- tonal agreements (OSPAR, ASCOBANS, CMS, MoU Sharks), and the Framework for the Assessment of Ecological and Cumulative Effects for the roll-out of offshore wind farms (KEC, see Chapter 5).

Protection plans for species which have already been identified in the KEC as vulnerable for effects of offshore wind farms will be given priority. This applies particularly to sea bird 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.

Actions

- MSFD shark action plan. The MSFD shark action plan 2015-2021 will be evaluated in 2022 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. The aim is to have drawn up a list of species for which protection plans are also being drawn up and implemented, including a timeline for planning, no later than two years after the North Sea Agreement has been concluded.
- 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. Text box 3.1 presents the policy goals for return and recovery of flat oysters.

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 EMFAF, among others to obtain stock material for reintroductions that is free of *Bonamia*.

Knowledge agenda

In the framework of the elaboration of the MONS Programme, a knowledge agenda for monitoring and research with associated programming was adopted in the North Sea Consultation in September 2021[42].

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 identified 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 roll-out 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 designing building new wind farms nature-inclusive. 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 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[43]. These are being or will be elaborated in site decision

[42] Monitoring, Research, Nature Enhancement and Species Protection report (MONS). North Sea Consultation, October 2021. Link: https://www.noordzeeoverleg.nl/noordzeeoverleg/overige+publicaties/handlerdownloadfiles.ashx?idnv=2133902

[43] Van Duren, L.A., Gitenberger, A., Smaal, A.C., Van Koningsveld, M., Osinga, R., Cado van der Lelij, J.A. & De Vries, M.B. (2016). Rijke riffen in de Noordzee: verkenning naar het stimuleren van natuurlijke riffen en gebruik van kunstmatig hard substraat. Delft: Deltares. http://publications.deltares.nl/1221293_000.pdf; Lengkeek, W., Didderen, K., Teunis, M., Driessen, F., Coolen, J.W.P., Bos, O.G., Vergouwen, S.A., Raaijmakers, T.C., De Vries, M.B. & Van Koningsveld, M. (2017). Eco-friendly design of scour protection: potential enhancement of ecological functioning in offshore wind farms: towards an implementation guide and experimental set-up. Report no. 17-001 Bureau Waardenburg. Culemborg: Bureau Waardenburg. https://www.buwa.nl/fileadmin/buwa_upload/Bureau_Waardenburg_rapporten/17-001_Bureau_Waardenburg_report_EcoFriendly_design_scour_protection.pdf;
Kamermans, P., Van Duren, L. & Kleissen, F. (2018). Flat oysters on offshore wind farms: additional locations: opportunities for the development of flat oyster populations on planned wind farms and

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 permit holders of wind farms. It is therefore important to explore whether there are possibilities that can be incorporated in the tender phase to access this knowledge. That also contributes to the further implementation of an arrangement 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 proposal Amendment to the Offshore Wind Energy Act enables a comparative assessment (with or without financial component), making it possible by ministerial regulation to elaborate and add ranking criteria which play a one-of 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, e.g., 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) co-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 co-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. Beter carrying capacity studies offer more solid tools for the Area Passport Guide and for the Assessment framework for co-use of offshore wind farms.

The (preferred) choice of the forms of nature-inclusive construction or nature enhancement projects in a wind farm zone 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 farm zone IJmuiden could be a model for this. In wind farms nearer the coast, the focus will be more on co-use.

Actions

- Development of a framework for nature-inclusive construction, including the further concretisation of relevant nature goals and the effects to be achieved (start in 2022).
- By means of site decision requirements, stimulate a nature-inclusive approach to the construction of new wind farms.
- Explore and elaborate possibilities to encourage inter alia more nature-inclusive construction via the procedure of the ‘comparative assessment’ under the amended Offshore Wind Energy Act (results expected in 2022).

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additional locations in the Dutch section of the North Sea. Wageningen Marine Research. http://edepot.wur.nl/456358; Bos, O., Coolen, J., Van der Wal, J.T. (2019). Biogene riffen in de Noordzee Actuele en potentiële verspreiding van rifvormende schelpdieren en wormen. Wageningen University & Research rapport C058/19. Den Helder: Wageningen Marine Research. https://edepot.wur.nl/494566; Hermans, A., Bos, O., & Prusina, I. (2020). Nature-Inclusive Design: a catalogue for offshore wind infrastructure: Technical report. The Hague: Witeveen+Bos. https://edepot.wur.nl/518699.

- 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.
- Study on the recovery and protection of biogenic reefs and flat oyster banks.

Knowledge agenda

- In the framework of the elaboration of the MONS Programme, a knowledge agenda for monitoring and research with associated programming was adopted in the North Sea Consultation in September 2021[44].

3.4 Management

The management plans describe 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 Vlakte van de Raan (HD), the management plans 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 plans for these areas are being developed and will come into force in 2022. In addition, a management plan for the Brown Ridge (BD) will be adopted by 2025. Agreements about monitoring, supervision and enforcement and communication during the actual management are 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 Natura 2000 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.

[44] Monitoring, Research, Nature Enhancement and Species Protection report (MONS). North Sea Consultation, October 2021. Link: https://www.noordzeeoverleg.nl/noordzeeoverleg/overige+publicaties/handlerdownloadfiles.ashx?idnv=2133902

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 land. The transition to a sustainable food supply should contribute to long-term ecological, economic and social sustainability, as part of the Common Fisheries Policy, also paying attention to, for example, animal welfare. 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. The task for the coming years is to find the right social balance (between the three transitions) to be able to achieve efficient and safe spatial development of the North Sea which fts within the preconditions of a healthy ecosystem. As included in the North Sea Agreement, it is crucial to achieve a profitable and more sustainable fishing industry that is appropriate to the new situation in the North Sea in terms of nature and extent. This chapter describes this policy task 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 Characterisation of the food supply from the North Sea

Fishing is a sector on which fishing communities in the Netherlands are dependent. The Dutch fishing feet 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 gillnetting 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 must contribute to achieving good environmental status according to the MSFD, BD (Birds Directive) and HD (Habitats Directive). International cooperation and coordination are essential in this respect. Fisheries policy falls under the exclusive competence of the EU. A financial aspect of the CFP is the European Maritime, Fisheries and Aquaculture Fund (EMFAF), 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 EMFAF 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 feet 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, stirs the bottom and affects bottom habitats and species living there (see also Chapter 3). Depending on the soil structure and the natural values present, this may cause damage. 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[45]. 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 to ban pulse fishing 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 sector 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 trawl fishery for flatfish is mainly mixed fisheries, with several species entering the nets per fishing migration. This can lead to what is referred to as choke species, whereby full fishing of the quota of fish species A, including all by-catch undersized fish that must also be landed, blocks the utilisation of the quota of fish species B.
An exception to the landing obligation applies inter alia 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 limited results.

Preventing pollution

With the support of the Ministry of Agriculture, Nature and Food Quality, the fishing industry is working on an alternative to the propulsion of ships, such as hybrid propulsion systems, and on

[45] ICES, Special Request Advice Greater North Sea ecoregion, 20 May 2020, https://www.ices.dk/sites/pub/Publication%20Reports/Advice/2020/Special_Requests/nl.2020.03.pdf

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 to increase 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 plastics 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. There is not one ultimate alternative solution that meets all wishes, but depending on the situation, one or more solutions have been found for different types of fishing and fishing grounds. 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 Liter, a project in which fishermen can store on board waste they find 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 Liter is also a measure within OSPAR, in which the Netherlands takes on a driving role.

Shellfish policy
The shellfish decree is 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, 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. This temporariness remains a source of great uncertainty in the sector. In addition, it has been

agreed to transfer 25 percent of the value 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 leaving the 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 aquaculture (see Chapter 8). 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 squid[46]. There is a great deal of public interest in this co-use, although revenue models have not yet been developed for all pilots and ideas. 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 under way of the coast of Scheveningen. However, aquaculture in wind farms in the North Sea is still in the pilot phase and efforts are now being made to scale up experiments through public-private partnerships.

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 coming their way, many family businesses in fishing villages 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 the energy transition and nature conservation measures, fishermen want to know where they stand.

4.2 Vision, ambition and tasks

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 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 soya beans and palm oil. In 2020, almost all marine biomass has been supplied in the form of fish. During the 2022-2027 planning period, aquaculture 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 feet 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.

[46] Van den Bogaart, et al. 2019; Van den Bogaart, 2020.

In its appreciation of Ms Burger's advice for sustainable cutter fisheries in the North Sea (in common parlance referred to as the 'Cutter Vision')[47], the national government characterises fisheries as a vital, economically healthy sector that contributes to meeting the need for 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. In addition, animal welfare should be embedded more deeply in the transition to a sustainable food supply. 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 Chapter 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 aquaculture. The ambition is to stimulate this type of co-use within the preconditions of safety for the proper functioning of the wind farm as the first user of the wind farm zone. 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 demands a lot from the sector and may have consequences for the entire fish cluster, including 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, there is also a task to guarantee the liveability of the fishing communities.

In addition to the decrease in space for fishing, the fishing sector is also confronted with other major developments, such as Brexit and the landing obligation. The 2021-2025 coalition agreement stipulates that there must be sufficient room and perspective for innovation and diversification.
Work will be done on this in the coming year together with fishermen and the other partners in the North Sea Consultation, building on what has already been established within the framework of the Cutter Vision and the North Sea Agreement.

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 feet. 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 Natura 2000 or MSFD areas. Sustainable fishing also means that the target species' populations have a length and age

[47] Appreciation of Ms Burger's advice for sustainable cutter fisheries in the North Sea, 19 June 2020, Parliamentary Documents II 33 450, no. 68.)

distribution that is appropriate for a natural population. Also, it is important that the size of the feet is adapted to the space that is retained for fishing in the North Sea. This is in line with the Cutter Vision, which is related to the agreements on this in the North Sea Agreement. The Cutter Vision 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 by-catch, 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, and nature development in new wind farms. The introduction of flat oyster beds on the bottom in wind farms and of-bottom flat oyster farming in baskets in the water column could be icons for this approach.

The development of marine food production is still in its infancy. 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 ft 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 might 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 captive bred 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 authorisations before seaweed and its products are actually allowed to enter the market.

Aquaculture policy is included in the National Strategic Aquaculture Plan (2014)[48]. This plan was updated in 2021 with a duration until 2027 and is part of the EMFAF'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 is currently less of an issue for the cultivation of macro algae. It is important to stimulate innovations with regard to the commercial cultivation of algae.

[48] National Strategic Plan Aquaculture 2014-2020 (annex to Parliamentary Documents II, 2014-15, 32201, no. 75).

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.

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.
Chapter 8 contains the elaboration of the policy tasks for marine food production in the form of aquaculture 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 Chapter 5).

4.3.1 Making cutter fisheries more sustainable

In conjunction with the North Sea Agreement, the Cutter Vision 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 Cutter Vision serves the national interest and allows the fishing sector to make a transition to further sustainability of the feet. Resources have been made available via the North Sea Agreement to help make the transition to a smaller sustainable feet possible through innovation and restructuring during the 2022-2027 planning period. It has become clear that restructuring based on space limitations is not consistent with the state aid frameworks of the Common Fisheries Policy. Some of the resources come from the European Maritime, Fisheries and Aquaculture Fund (EMFAF). The necessary research and monitoring efforts, including data collection, are financed from EMFAF funds, but also partly from national research resources and resources made available for research and monitoring under the North Sea Agreement.

Innovation Agenda

Under the leadership of one or more driving forces, the Ministry of Agriculture, Nature and Food Quality will draw up an innovation agenda with the involvement of the sector and NGOs. This contains concrete goals for the development of more flexible fishing techniques and the ‘zero impact cutter’. It also contains an organisational proposal aimed at exchanging knowledge and expertise in the field of innovations and supporting fishermen in converting an idea into a project and funding the right subsidies. Monitoring progress provides insight into possible bottlenecks, so that action can be taken. The innovation agenda will form the framework for expenditure of innovation resources from 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 by-catch 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. For example, a result of fishing with a minimum mesh size has led to fishery-introduced evolution in plaice, with plaice becoming smaller and becoming sexually mature earlier than 50 years ago. 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 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 Chapter 8), the national government is stimulating innovations in marine food production. The lessons from the Wadden 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 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. Passive fishing is permitted as a form of co-use in (parts of) the wind farms under the Roadmap for Offshore Wind Energy 2023. The wind farms under the Roadmap for Offshore Wind Energy 2023 are mainly of interest for the production of food because they are close to the coast. Locations for co-use at wind farms for passive fishing and aquaculture, among other things, are included in the Area Passport Guide (see Chapter 10). For wind farms yet to be tendered, the national government is investigating which instrument will enable the desired integrated development (see also Chapters 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 Chapters 8 and 10.

4.3.2 Closed areas

The starting point remains that, in principle, fisheries have access everywhere, unless conservation measures are in force. At the wind farms, these measures apply to the current

forms of trawl fisheries and differ per Natura 2000 or MSFD area for trawl and gillnet fisheries. In addition, limitations may be imposed based on the Technical Measures Regulation[49]. Section 3.3.2 describes the conservation 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 use 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 Chapter 9. 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. Dutch fishers also make use of the waters of our neighbouring countries where, as is the case in the Dutch EEZ, pressure on space is increasing. The direct influence the Netherlands can apply is limited, which makes it all the more important that sufficient space be retained in the Dutch section of the North Sea to allow fishing to be continued. Within the Greater North Sea Basin Initiative (GNSBI), investigations are underway into how early dialogue can be organised concerning the spatial layout of the various countries' economic zones, and how the interests of fisheries can be included in this dialogue.

Although in the past there was relatively less fishing in the northern than in the southern section of the North Sea, a trend has started to emerge in recent years according to which the number of catches has grown in that section of the North Sea. Climate change, fluctuating fuel prices and fluctuating quotas, as well as the increased dividing up of the North Sea are impacting on the possibilities for fishing so that is not possible at present to predict whether this trend will continue (Deetman et al, 2024). The observed shift shows that it is important for each area to clarify the importance of the different types of fishery in that area, at the moment when a spatial consideration is made.

The reorganisation of the fishing industry in 2023 led to around one third of the cutter fleet halting its activities. A robust sector including a supply chain with sufficient economies of scale is no longer self-evident, also taking the growing pressure on space into account. However, sufficient economies of scale are essential if the sustainability challenge currently facing the fishing industry is to be overcome. Given the importance of obtaining healthy and sustainable food from nearby, in the spatial considerations, wherever possible it is important to spare valuable fishing grounds.

In addition to determining the individual impact of the closure of a particular area, and on that basis assessing whether priority should be given to its conservation, it is also valuable to take a more integrated view. The closure of one area may have a limited impact on the preservation of a robust fishery sector, but the impact of closing multiple areas may together be more substantial. It is therefore essential to consider the cumulative impact of all closed areas together. Insight into the cumulative impact on space for the fisheries is also the subject of consultation and

[49] Regulation (EU) 2019/1241 of the European Parliament and of the Council of 20 June 2019 on the conservation of fisheries resources and the protection of marine ecosystems through technical measures (OJEU 2019, L 198/105)

harmonisation with our neighbouring countries in whose waters the closure of areas is also relevant for the fishing sector, for example within the GNSBI.

That is why this aspect is considered in decision making on spatial planning for the North Sea: see chapter 9. If due to the closure of areas it is no longer possible to catch fish, and there is no alternative available to the fishing industry, mitigating measures must be taken at sector level, in the interest of the fishers. If in situ mitigating measures area not possible, such a mitigating measure could take the form of a financial contribution, for example towards innovation within the sector.

Moreover, on a European scale, the Government is working to repeal restrictive measures that currently apply to the Dutch section of the Plaice Box (Scholbox). The environmental and nature conservation organisations (list) in the North Sea Consultation support these efforts, as laid down in the North Sea Agreement.

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 Natura 2000 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 NVWA in 2019 showed that the current black box systems are insufficiently reliable, which is why a technical improvement process for the black box started in 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 Measures due to the consequences of Brexit

The UK's departure from the EU will cause the Dutch fishing sector to lose quota until 2026. This loss of quota causes the Dutch feet to lose fishing opportunities for important target species. This particularly affects the Dutch pelagic and cutter feet's. To mitigate the consequences of the quota loss, the Netherlands is focusing on three measures for the fishing sector. A restructuring scheme that restores the balance between catch opportunities (available quota) and catch capacity (the number of vessels in the feet register, expressed in gross tonnage), a laytime scheme and a liquidity scheme to absorb loss of income and allow fishermen to adapt.

Only vessels directly affected by Brexit are eligible for these measures. Because this concerns state aid, permission from the European Commission is required. The Minister of LNV is in discussion with the European Commission about the fisheries measures and expects to have clarity about permission from the European Commission in early 2022. The aim is to open up the measures for fisheries in the spring of 2022.

4.3.5 Socio-economic impact analysis

The fishing industry is facing many developments that play and influence each other at the same time. In order to gain more insight into the consequences of these developments, a socio-economic impact analysis is being carried out. The analysis focuses on the direct economic consequences of the developments for the supply sector (the cutter sector including the shrimp sector, the pelagic sector and small-scale fishing) and their impact on the rest of the fishing sector. The analysis also considers the social and cultural value of fishing for the fishing regions and the impact of developments in the supply sector on these values. In the first phase, the emphasis is on the analysis framework, a baseline measurement of the current situation and relationships within the fish cluster and mapping out the consequences of the restructuring for the fish cluster. The analysis will provide relevant information to determine whether and, if so, which measures are needed for (parts of) the fish cluster[50] to adapt to a smaller and more sustainable supply sector. The second phase involves monitoring and development of a model to simulate the consequences of policy.

4.3.6 Gillnet fishing

There are differences of opinion about the sustainability of passive (gillnet) fishing, which mainly focus on the by-catch of birds and marine mammals. The government will study various forms of gillnet 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 by-catch of marine mammals and other vulnerable animals in the North Sea region.

4.3.7 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 was worked out in more detail 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 Directive on port reception facilities (Directive (EU) 2019/883) has been revised. 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

- The national government aims at finalising the innovation agenda in early 2022. This will then form the basis for expenditure of resources under the North Sea Agreement.
- In 2022, the national government will conduct a socio-economic impact analysis of the consequences that all major developments have for the fish cluster. Monitoring will take place from 2023 and a model will be developed to simulate the consequences of policy.

[50] The extraction of fish (including shellfish) is part of so-called regional fish clusters, which also include the processing industry (auctions, transport, processing, trade), supply industry (shipbuilding, energy, etc.) and fishing communities.

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 Scholbox.
- In collaboration with the education sector, top sectors and the Community of Practice Multi Use North Sea 2030 (CoP), the national government is stimulating innovations in marine food production during the planning period.
- The national government is committed to implementing a restructuring scheme as part of the Brexit Adjustment Reserve by 2022 at the latest, subject to approval from the European Commission.
- 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 gillnet 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 by-catch 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 will be 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 on behalf of the Minister of Infrastructure and Water Management and supervises compliance with permit regulations. A permit is required for aquaculture, 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 co-use in wind farms. See Section 10.2.

5 Transition to sustainable energy

The transition to a sustainable energy system in the North Sea is one of the cornerstones of the policy to balance the major tasks referred to in Chapter 2 – CO_2-free energy supply, food security and the recovery and conservation of a robust ecosystem. The urgency of these tasks, and certainly the sustainability of the production and use of energy, exceeds our borders. It thus requires collaboration. This chapter describes the policy on how to use the space and resources of the North Sea for energy production in in order to achieve national and European CO_2 reduction targets, whilst taking into account the targets for nature and food supply. This focuses on the development of a sustainable energy system in the North Sea, which is further elaborated on the basis of the most important energy pillars: wind energy, oil and gas extraction, hydrogen, CO_2 storage and innovative technologies such as offshore power from water and the sun.

5.1 Current use and developments

5.1.1 Outline of energy extraction in the North Sea

In recent decades, all kinds of energy infrastructure has been built on the Dutch part of the North Sea, varying from oil and gas pipelines to electricity connections from wind farms and between countries. Currently, there are approximately 150 oil and gas platforms in the Dutch part of the North Sea. Due to a natural depletion of the existing gas and oil reserves in the subsurface, a considerable part of the gas and oil fields that are still producing and the associated infrastructure will reach the end of their economic life in the next 10 to 20 years. This phase-out process has started in recent years and will lead to the decommissioning and, in principle, the removal of the production platforms required for gas and oil extraction, unless it is eligible for reuse. In the North Sea Agreement, gas extraction in the North Sea is emphatically placed in the context of achieving the objectives of the Paris Agreement, opting for a gradual reduction, whereby gas is extracted for as long and to the extent that gas is still needed, and only where this can be done safely. This may take several decades.

In the field of electricity, 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 more flexibility of the electricity network, which can therefore absorb a larger share of the electricity production from fluctuating renewable
sources (mainly solar and wind). For this purpose, offshore connections with the high-voltage grids of other countries have also been made using interconnectors. The high-voltage grids of Norway and the Netherlands have been connected to each other since 2008 via the NorNed cable (700 MW). Since 2011, electricity has been traded to the United Kingdom via the BritNed cable (1000 MW).
From 2019, the Dutch and Danish high-voltage grids will be directly connected to each other via the COBRA cable (700 MW).

Until now, the systems of oil and gas pipelines and the electricity connections have been separate 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 signed the Paris Agreement, together with 194 other countries. In that agreement, 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. As a further elaboration of the Paris Agreement, it has been agreed in a European context that by 2030, the CO_2 emissions must 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 wants to tighten up European climate policy ambitions. A first step towards this was taken on 12 December 2019, when the European Council approved a tightening of the EU greenhouse gas reduction target for 2050 towards climate neutrality. In September 2020, the Commission presented a proposal for the second step: a tightening of the EU greenhouse gas reduction target for 2030 to at least 55 percent. This proposal was adopted by the European Council in December 2020[51]. In June 2021, the European member states and the European Parliament reached agreement on a European climate law, setting out the tightened greenhouse gas reduction target for 2030. Following consent from the European Parliament and the European Council, the European Climate Law was adopted on 30 June 2021[52]. In July 2021, the European Commission presented the 'Fit for 55' package with proposals to achieve the tightened target.

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.
The exact consequences of increasing the EU's greenhouse gas reduction target for 2030 to at least 55 percent compared to 1990 for the task in the Netherlands are not known yet. On 26 October 2021[53], the national government wrote that national choices about the interpretation of the new task resulting from the package have not yet been made. In anticipation of these choices, the House of Representatives carried the Van der Lee and Kröger[54] motion in 2021, requesting the government to take into account a greater task for offshore wind energy by, for example, already determining additional locations. The House of Representatives also carried the Boucke[55] motion, which requests the government to designate at least 10 GW of wind farm zones. To this end, on 9 November 2021, the government made an amended Chapter 9 of this North Sea Programme 2022-2027 available for public consultation by means of a supplementary draft, containing the intention to designate space for 16.7 GW, subject to the condition that a maximum of 10.7 GW will only be realised in the period up to and including 2030 provided that this is ecologically compatible.

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[51] Source: https://www.consilium.europa.eu/en/policies/climate-change/#
[52] Regulation (EU) 2021/1119 of the European Parliament and of the Council of 30 June 2021 establishing the framework for achieving climate neutrality and amending Regulations (EC) No. 401/2009 and (EU) 2018/1999 ('European Climate Law') (PbEU 2021, L 243/11).
[53] Parliamentary Documents II, 32813, no. 905.
[54] Parliamentary Documents II, 32813, no. 629.
[55] Parliamentary Documents II, 35668, no. 21.

To meet the climate objectives, the government, in the current 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 CO_2 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 Outlook[56]. This is discussed in more detail below.

5.2 Vision, ambition and tasks

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 later also from solar energy and electricity from water).
- The started decline in 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'), because hydrogen production at sea is also expected to take place in or near wind farms in the coming decades. This will require new gas pipelines or possible reuse of existing pipelines. This makes it possible to vary the ratio between the production of electricity and hydrogen. Hydrogen from renewable energy sources is expected to play a role because our energy needs consist not only of electricity but also other forms of energy for which coal, oil and natural gas have until now been the sources. Lastly, CO_2 that is collected at onshore industrial installations will be stored in depleted oil and gas fields (and possibly aquifers) 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 takes an integrated look at the supply of energy, transport and infrastructure, as well as the demand for energy and CO_2 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 Exploration 2030-2050[57], two extreme final pictures for 2050 were compiled, supplemented with future routes for the period 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 an import-dependent Netherlands 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 farm zones 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 image shows a self-sufficient Netherlands that tries to provide for its own energy needs

[56] Parliamentary Documents II, 32183, no. 646.
[57] Climate-neutral energy scenarios 2050: Scenario study for the integrated infrastructure exploration 2030-2050. Berenschot & Kalavasta, 2020.

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

Technology	Import-dependent	Self-sufficient
Offshore wind energy power (GW)	38	72
Energy yield (TWh)	170	325
Required growth (GW/year)[58]	1.5	3

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

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. For example, sufficient energy infrastructure must be constructed from wind farms to land 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) has been set up. The infrastructure need 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:

- Landfall at the industrial clusters of energy produced offshore. This can be in the form of electricity, or in the form of hydrogen as an energy carrier, whereby energy generated at sea is converted at sea into hydrogen and transported to the industrial clusters. 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 they do not need to be increased or expanded, or to a lesser extent. This is in line with the guiding statements from the government perspective for the National Strategy on Spatial Planning and the Environment[59].
- More flexibility through connections with the (North Sea) energy systems of neighbouring countries. This makes it possible to limit a peak 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 be facilitated by the application of interconnectors, energy hubs and hybrid projects. Interconnectors are switching points between different networks; energy hubs are nodes where energy from several surrounding wind farms and/or interconnectors comes together, possibly converted into another energy carrier, and transported from there to the mainland; hybrid projects are connections between grid connections of offshore wind farms of different countries, which serve as an interconnector and can ensure a higher degree of utilisation of the offshore energy infrastructure when there is little wind. These elements can eventually lead to a meshed

[58] This is higher than the current growth of approximately 1 GW/year (2020-2030 period).
[59] Parliamentary Document 34 682, no. 6, appendix.

grid in the North Sea, in which the energy systems of the North Sea countries are intensively linked.

- Greater flexibility through the use of other forms of sustainable energy production, other energy carriers, storage and infrastructure. A possible addition or alternative to solutions within the electricity chain is the production of hydrogen. This can be applied both onshore and offshore[60]:
    - 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, hydrogen is produced using (some of) the electricity from wind farms. This takes place on an artificial island or platform or in the wind turbine itself. In spatial terms, hydrogen transport is an attractive option: a pipeline can now connect wind farms for 10-12 GW, a direct current cable 2 GW. The footprint is about the same size. The reuse of existing offshore gas infrastructure (platforms and pipelines) may offer a solution for the transport and storage of hydrogen and for Carbon Capture and Storage (CCS).
- 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 possibly 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 as a whole and facilitating future scenarios and options. The North Sea Energy Outlook provides some tools for this:

- Designate (clusters of) large sites for offshore wind farm zones with potential for interconnection (electricity or gas). 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 hybrid projects) and offshore and onshore energy storage. Develop policy for the spatial assessment and for the realisation of artificial islands. Also develop a regulatory framework for hybrid projects.
- Contact our neighbouring countries on the North Sea and study with them the possibilities of realising cross-border projects together.

[60] 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.

- Make it possible for energy from sea 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.

5.3 Policy

Availability of sufficient energy is a condition for the functioning of society. This energy must be CO_2-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 National Strategy on Spatial Planning and the Environment, 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 Strategy on Spatial Planning and the Environment 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 these renewable forms of energy necessitates major changes to the energy system to guarantee security of supply.

According to the National Strategy on Spatial Planning and the Environment, the realisation of a reliable, affordable and safe energy supply, which must be CO_2-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 interest of a good quality of the living environment requires the installations and infrastructure to ft 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 tasks, such as nature restoration and development (nature transition), adapting the nature and size of fisheries, making use of opportunities for aquaculture (the food transition) and the preservation of sufficient space for efficient and safe maritime transport. The presence of an energy infrastructure may be beneficial for co-use, particularly if this is taken into account from the start of construction of this infrastructure.

The government is pursuing various tracks to realise this energy transition under the aforementioned conditions. For the energy system itself (5.3.1), the priorities are the coordination of energy demand and energy production, the landfall of energy produced offshore, international coordination and the development of power hubs and cross-border energy infrastructure. At the same time, attention is focused 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 CO_2 storage (5.3.5) and the stimulation of innovative technologies such as offshore energy from the sun and electricity from water (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 the land 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 energy 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, Sweden and the European Commission 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 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 sustainable energy[61].

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 later on the implementation of the Offshore Wind Energy Roadmap 2030[62], 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 farm zone, 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 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 farm zone 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 or platforms) 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 fifth list of European Projects of Common Interest (PCI) as approved by the European Commission. The PCI status

[61] EU Offshore Renewable Energy Strategy, https://energy.ec.europa.eu/index_en.
[62] Parliamentary Documents II, 33561, no. 48.

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 bilateral talks 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 production of hydrogen hereby. The intention is to also involve the German government in these consultations.

For the grid connection of the wind farm zone 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 farm zone. However, with a view to the further roll-out of offshore wind energy after 2030, the possibility of artificial islands remains explicitly open. Various market parties have shown their interest in and have ideas for such artificial islands. The government has therefore formulated guiding statements for artificial offshore islands, under the leadership of the Minister of Infrastructure and Water Management, see Section 10.6). In 2022, the government will start a preliminary exploration into the usefulness and necessity of energy hubs in the Dutch part of the North Sea. Possible construction forms are also discussed, such as platforms, floating constructions or artificial islands.

Offshore grids and landfall

Various options can be used for transporting current and future wind energy to the mainland. The choice of which route or landing point depends, among other things, on the locations of the wind farms, the location and nature of the energy demand, the options for constructing or reusing offshore energy infrastructure, the transport capacity of the high-voltage grid, and the way in which landfall combines with other interests in the area. The planning principle applied is adaptive. In the event of insufficient ecological space, for example, this can lead to the investigated routes ultimately not being taken into consideration.
The government is mapping out these factors in an Investigation of Cable Landing Points for Offshore Wind Energy (VAWOZ). This investigation is a step towards the decision-making about the set of landfall options that will be used to start a National Coordination Scheme (a project procedure under the Environment and Planning Act) for each route. The Minister for Climate and Energy, in consultation with the Minister of Housing and Spatial Planning, draws up an integration plan for the issuance of the permits for the onshore grid connections.

The VAWOZ consists of two explorations: the exploration for 2030 and the exploration for the period 2031 – 2040. In the VAWOZ 2030 it was investigated together with stakeholders where 10 GW extra offshore wind energy could be brought ashore in the Netherlands in the period around 2030, on top of the more than 11 GW already planned. Based on research and advice from the surrounding area, it seems promising (due to synergy benefits with current landfall projects) to land an additional 6 GW with power cables in 2030 and an additional 4 GW by the end of 2031.[63] Spatial procedures for this will be started in 2022. In consultation with stakeholders, a careful process will then be followed in the spatial procedures to select a preferred cable route and landing location on the basis of in-depth research.

In 2022, the exploration of promising alternatives for landing offshore wind energy in the period 2031-2040 will start. This concerns both landing via electricity and landing using molecular energy carriers such as hydrogen. Prior to the VAWOZ 2031-2040, preliminary outline explorations will be used to identify the first promising possibilities and landing points.

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 power 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 energy. Offshore wind farms are ideally suited to supply that energy. 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 or use of, for example, green hydrogen 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 CO_2 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 farm zone 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 approximately 10 years in advance.

In addition to coordinating supply and demand, the physical connection is also important. The distance between 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 electricity from the sea 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.

[63] Parliamentary Document 33561, no. 52.

Actions

- WindConnector is a project that aims to interconnect with the United Kingdom from the IJmuiden Ver wind farm zone. 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. Completion of IJmuiden Ver and, with it, this WindConnector, is for the time being scheduled for the 2028-2030 period.
- North Sea Wind Power Hub (NSWPH), a partnership of TenneT Netherlands, TenneT Germany, the Danish grid operator Energinet, and Gasunie, is striving for an internationally coordinated roll-out of the offshore grid with modular wind-hydrogen power hubs (possibly in the form of energy islands) as an alternative to individual national connections for offshore wind farms. In 2021 and 2022, NSWPH and the Ministry of Economic Affairs and Climate Policy will develop case studies for the newly designated wind farm zones. The results will be used in a preliminary exploration by the national government into the usefulness and necessity of energy hubs, in which different locations and construction types will be discussed.

Knowledge agenda

- The results of the VAWOZ until 2030 were announced at the end of 2021.
- For VAWOZ 2031-2040, the plan is that the preliminary investigation will be completed in May 2022, and the investigation as a whole will be completed by the end of Q2 2023.
- Additional studies regarding system integration have been started 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 Roadmap[64] 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 farm zones 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 government is expected to publish an addition to the Roadmap for Offshore Wind Energy 2030 in the first half of 2022, which will stipulate a planning for the greater task for offshore wind energy in 2030 in connection with the tightened CO_2 reduction target for that year, in accordance with the amended motion by Boucke et al. of 9 November 2021[65].

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

[64] Parliamentary Documents II, 33561, no. 42.
[65] Parliamentary Documents II, 35925, no. 66.

the available space efficiently, to reduce costs and to accelerate the roll-out of offshore wind energy.

In agreement with the Ministers for Infrastructure and Water Management and for Nature and Nitrogen, the Minister for Climate and Energy will take wind farm site decisions based on the Offshore Wind Energy Act setting out site-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 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 for Climate and Energy 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 is being 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 the Development framework for offshore wind energy, the minister determines the planning and the technical-functional requirements for the offshore grid. The Minister for Climate and Energy, in consultation with the Minister of Housing and Spatial Planning, 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 Birds Directive (BD) and Habitats Directives (HD). 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 Commission for Environmental Assessment. The precautionary principle is the starting point in this process. If mitigating effects is not sufficiently possible and the negative effects are significant, compensatory measures are required.

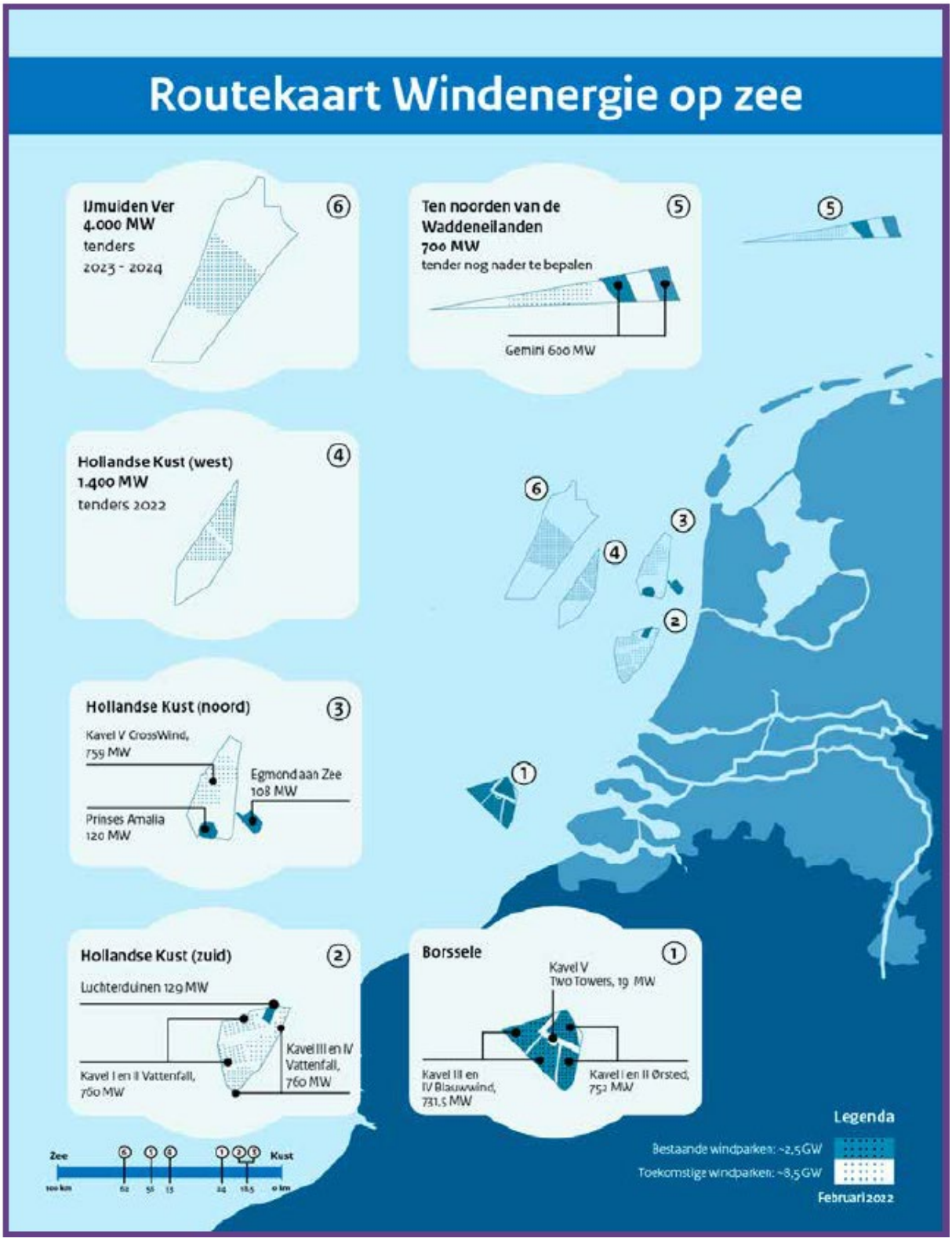

Figure 5-a: Roadmap Offshore Wind Energy

Figure 5-a: Offshore Wind Energy Roadmap

As compensatory measures at sea are often not possible, nature-enhancing measures over and above the statutory minimum can be opted for additionally. The ecological scope for wind farm development must be demonstrated before wind farm site decisions are taken. The planning principle applied is adaptive, which may mean, for example, that designated wind farm zones are ultimately not used or only in part.

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 CO_2 reduction targets. The Minister for Climate and Energy 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, as yet unknown, national and international changes.

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 CO_2 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 2030[66]. To still be able to comply with the Climate Agreement, an addition to the 2030 roadmap is therefore required. In addition, the EU has adopted the intention for a more ambitious CO_2 reduction target for 2030 (from 49 to 55 percent). The tightening of the EU targets towards – and the objective in the 2021-2025 coalition agreement of – a reduction of at least 55 percent by 2030 will lead to an additional task for offshore wind energy. In 2021, the House of Representatives carried the Van der Lee and Kröger[67] motion in 2021, requesting the government to take into account a greater task for offshore wind energy by, for example, already determining additional locations. The House of Representatives also carried the Boucke[68] motion, which requests the government to designate at least 10 GW of wind farm zones. Lastly, a shortage of emission reductions in the other sectors is expected[69]. All this is expected to lead to a government decision in 2022 to schedule the construction of additional offshore wind farms in the period up to and including 2030. That is why in this North Sea Programme wind farm zones have been designated with space for 16.7 GW, subject to the condition that a maximum of 10.7 GW of wind farms will be realised here up to and including 2030, provided that they are ecologically compatible. Chapter 9 describes these wind farm zones as part of the North Sea spatial development strategy map for the planning period 2022-2027. Also described are the search areas for designating another 17 GW wind farm zones needed for the realisation of offshore wind energy after 2030. Space for 17 GW is in line with the scenario with the lowest share of offshore wind energy (38 GW) for the year 2050[70].

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 co-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

[66] Parliamentary Documents II, 32183, no. 646.
[67] Parliamentary Documents II, 32813, no. 629.
[68] Parliamentary Documents II, 35668, no. 21.
[69] Netherlands Environmental Assessment Agency (2020) Climate and Energy Report 2020.
[70] See footnote 3 and Chapter 9a for the eventual scope of the Partial Revision.

conducted into the (cumulative) effects of wind farms on the ecosystem. Wozep focuses on effects on the species of birds, marine mammals and bats to be protected under the Birds Directive (BD) and Habitats Directive (HD), 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. The Ecology and Cumulation Framework (KEC) has been updated to calculate the expected effects on biogeographical populations. This will provide insight into whether and how the future extra offshore wind farms can be brought into line with the Nature Conservation Act, the BD and HD. 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. The application of the precautionary principle and appropriate use within the ecological carrying capacity of the North Sea are generic preconditions, which also apply to the development of offshore wind energy. The ecological scope for wind farm development must be demonstrated before wind farm site decisions are taken. The planning principle applied is adaptive, which may mean, for example, that designated wind farm zones are ultimately not used or only in part. 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 co-use, the government will in the 2022-2027 planning period investigate how certain mining platforms, CO_2 capturing installations and other energy-consuming installations in the North Sea can be supplied with wind energy. This with a view to making these platforms and installations more sustainable. This involves an amount of wind energy that matches the energy needs of the relevant user during the period in which this user 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.

In the context of co-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, alternative forms of fishing, nature enhancement, energy generation from the sun and tidal flows, energy conversion and energy storage through hydrogen production. More about these opportunities is described in Chapter 8. Space at sea to test innovations in sustainable energy production (other than with wind turbines) is therefore a point of attention for the national government during the planning period. In doing so, a trade-of is always made between different forms of co-use and their suitability for the large-scale roll-out of offshore wind energy.
The assessment framework for co-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 2022, the government will adopt an updated Ecology and Cumulation Framework (KEC) that is intended to see whether and how the future additional offshore wind farms can be brought into line with the Nature Conservation Act, the Birds Directive and the Habitats Directive. The update also makes it possible to calculate the expected cumulative effects on biogeographical populations of bird species.
- 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 Investigation of Cable Landing Points for Offshore Wind Energy 2031-2040 (VAWOZ).
- In 2023, 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 will be followed by the tenders for sites in the designated wind farm zones.

Knowledge agenda

- The government will continue the Ecological Offshore Wind Energy Programme and extend it until 2030.
- Before 2027, the government will explore how several mining platforms and other installations can be equipped with wind energy for their 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 CO_2 and hydrogen.

Decarbonisation of oil and gas extraction

To comply with European agreements on limiting CO_2 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 CO_2-free gases such as 'green gas' and 'green 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 infrastructure[71]. Domestic production also slows down the increase in 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, gas extraction

[71] 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 CO_2'.*

from small fields, especially in the North Sea, threatens to end prematurely, with all the associated consequences for the decommissioning and removal of the existing infrastructure. This would then no longer be available for the storage and transport of hydrogen or CO_2. 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 2018[72] 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 on land, whereby onshore mining companies have indicated that they will not apply this investment deduction onshore and in the Wadden Sea. The decree implementing the decision on the increased investment deduction has now been published and will be applied retroactively from 1 January 2020.

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 CO_2, for example. After that, the platforms will still be removed. Cables and pipelines that are no longer in use are left behind clean and safe, unless the State Secretary for Economic Affairs and Climate Policy orders their removal under Article 45 of the Mining Act. 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 CO_2 (see also 5.3.4 and 5.3.5). The term observed for removal will be such that platforms are not removed too quickly, thus preserving opportunities for other applications, such as conversion to electrolysis installations for hydrogen production. Ultimately, these platforms, too, will be removed after possible reuse. The removal of cables and pipelines may be desirable if they can interfere with other uses of the seabed. An assessment method has been developed for this that looks at interference with other uses, safety, environmental effects and costs. The Mining Decree and the Mining Regulations will stipulate that the State Secretary of EZK will weigh up interests on the basis of four criteria: the efficient use of space, environmental impact, offshore and onshore safety, and cost effectiveness. When deregistering a cable or pipeline, cable and pipeline owners will be asked to provide the necessary information for this assessment. To this end, the industry has developed a substantiation method together with EBN. This enables the State Secretary for EZK, if the situation arises, to require the owner to remove a cable or pipeline that has been put out of operation, 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 them and inspect them annually.

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 consistently considered whether this can be done by boat or whether transport by helicopter is unavoidable due to distance, frequency, weather conditions, etc. The possibility of deploying helicopters for manned platforms is in many cases necessary to ensure timely evacuation of

[72] Parliamentary Documents II, 33 529, no. 469.

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. It is also critical that urgent and emergency repairs on platforms can be performed in a timely manner.

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[73]. 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 fight procedures.
- In 2021, the government elaborated the procedure for the removal or reuse of platforms and other mining works in subordinate legislation.

Knowledge agenda

- Setting up a seismic research programme/relationship North Sea Agreement.
- 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 Representatives[74]. 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. It is, moreover, an energy carrier for processes that require molecules instead of electrons. 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 task lies in the upscaling and cost reduction of CO_2-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

[73] Source: https://eur-lex.europa.eu/legal-content/NL/TXT/?uri=CELEX%3A02012R0965-20160825.
[74] Parliamentary Documents II, 32 813, no. 485.

of hydrogen, as expressed in the government's vision on hydrogen[75], will be elaborated in a roadmap from 2022 that is coordinated in the National Hydrogen Programme[76].

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. However, to make the production of green hydrogen profitable, the costs of the necessary electrolysis plants will have to drop. The following development phases can be roughly distinguished. In practice, these two phases partially run in parallel to each other using existing infrastructure:

- First instance: the upscaling of hydrogen electrolysis using offshore wind energy takes place on land near the electricity landing point. The reason for this is that the electricity grid cannot transport the amounts of extra offshore wind energy at peak times. Electrolysis installations help to use the energy at those moments by producing green hydrogen. The extra demand from electrolysis installations smooths out the peaks on the high-voltage grid. The price of the electrolysis process is expected to fall during this phase.
- 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, energy storage 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. Expectations are that offshore electrolysis will not be able to play a substantial role until after 2030 because this technology has not yet been developed far enough in the coming years and is also too expensive[77]. 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. Various projects are being developed that respond to this, such as:

- PosHydon, in which TNO, Nexstep, Neptune Energy, TAQA, and EBN are collaborating on a pilot project that aims to produce offshore hydrogen using wind energy. The project received a subsidy in the summer of 2021 and is now starting its realisation phase.
- NortH2, in which Shell Nederland, RWE and Equinor are working on a feasibility study with the ambition to generate approximately 3 to 4 GW of offshore wind energy for hydrogen production on land before 2030. The study also considers the possibility of converting electricity into hydrogen offshore. The study is supported by Groningen Seaports and the Province of Groningen.
- CrossWind, an initiative of Shell and Eneco who, with a joint venture, won the tender for the plot in the Hollandse Kust (north) wind farm zone. These parties want to produce hydrogen on Maasvlakte 2 using a 200 MW electrolysis plant and green power from the

[75] Parliamentary Documents II, 32 813, no. 485.
[76] https://www.nationaalwaterstofprogramma.nl/default.aspx
[77] Parliamentary Documents II, 32 183, no. 646.

aforementioned offshore wind farm zone. The wind farm itself is also experimenting on a small scale with the production of hydrogen.
- North Sea Wind Power Hub, a feasibility study by a consortium of four partners: TenneT Netherlands, TenneT Germany, the Danish grid operator Energinet, and Gasunie. 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.
- H2opZee, a project from a consortium consisting of RWE and Neptune Energy. The aim is to gradually roll out large-scale green hydrogen production (300-500 MW) at sea. This proposal was submitted to the Groeifonds at the end of 2021.

To make developments in the field of hydrogen possible, the following maters 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. The HyWay27 report was drawn up for this. The recommendations from this report will be taken up by the Ministry of Economic Affairs and Climate Policy and Gasunie.
  A roll-out plan for the hydrogen infrastructure is currently being worked on.
- Space for hydrogen production and storage in offshore energy hubs.
- 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 and shipping routes.
- Reserve space (plots within wind farm zones) to carry out large-scale offshore pilot projects involving hydrogen activities.
- Reserve space on the coast near landing points, both existing and new, 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 and comprises research into the right instrument for subsidising green hydrogen and 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. Opening the first round of the scaling-up instrument for renewable hydrogen is expected in the summer of 2022.
- In the coming years, the Ministry of Economic Affairs and Climate Policy will investigate the roles and position of state participations and network operators in relation to setting up onshore and offshore hydrogen networks.
- The Ministry of Economic Affairs and Climate Policy is investigating the ecological effects of hydrogen production in the Dutch part of the North Sea, which makes it possible to weigh up the advantages and disadvantages of landing energy in the form of electrons versus molecules.

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 CO_2 storage

The Climate Agreement and the national government's climate and energy policy recognise the important contribution that CO_2 storage makes to making industry more sustainable. It has been agreed in the Climate Agreement that the storage of CO_2 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 Mt[78] of CO_2. That capacity is present in oil and gas fields that have been depleted. In addition, CO_2 storage in aquifers below the seabed is also an option. CO_2 is expected to be transported to the North Sea from the large industrial clusters by pipeline or by ship. In the Climate Agreement, the subsidisation of carbon capture and storage is limited to a maximum of 7.2 Mt of industrial CO_2 a year and a maximum of 3 Mt of CO_2 storage from the electricity sector a year. In 2022, the annual subsidy cap for industry may be increased by up to 2.5 Mt. In principle, the transport and storage of CO_2 in the seabed seems to combine well with other activities or uses in the North Sea. For the storage of CO_2 , the initial consideration was the empty offshore gas fields in the P and Q quadrants, at a limited distance from the coast. In principle, 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 where production will be ceased in these quadrants in the coming years, are not automatically decommissioned and removed. The removal obligation under the Mining Act can be postponed if a platform is given a different function, for example, as a CO_2 injection platform. After the storage location has been filled and closed, the platform will still 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 CO_2 and H2 transport on a case-by-case basis. In addition to storage in depleted oil and gas fields, it is also possible to store CO_2 in aquifers (water-bearing layers). To this end, aquifers must meet preconditions with regard to safety and permanent storage.

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 CO_2 transport and offshore distribution. Where possible, existing corridors can be used for the construction (on the seabed) or burial of 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 CO_2. This concerns approximately 2.5 Mt of CO_2 per year, which is stored in the P18 cluster, approximately 25 km of the coast of Hook of Holland. In view of the interest in CO_2 storage, new initiatives have arisen for transport and storage. These have been mapped out

[78] North Sea Energy Outlook, DNV GL September 2020.

in a spatial exploration of CO_2 transport and storage (October 2021). The Aramis initiative (TotalEnergies, Shell, EBN and Gasunie) aims to construct a pipeline of more than 200 km (trunkline) from the Maasvlakte to the K and L blocks in the North Sea. In combination with Porthos and initiatives for the supply of CO_2 from the southwestern delta area, this will result in the development of large-scale infrastructure with access for third parties to feed in and store CO_2. Parties in the Aramis project are also investigating the dimensions of the transport pipeline, taking into account the expected storage requirement. The study into the national CO_2 storage requirement up to 2035[79] shows that the industry has a storage requirement of 4 - 10 Mt CO_2/year in 2025, which can increase to more than 10 - 50 Mt CO_2/year in 2035. The previously planned Athos project, of the coast of IJmuiden, will not continue.

In order to use the potential of CO_2 storage to the full and develop an integrated CO_2 transport and storage system for this, good spatial integration, taking into account all other uses in the North Sea and the ecological values, is essential.

Actions

- In 2022, the government will start with the procedures for spatial integration and granting permits for subsequent CO_2 transport and storage projects.

Knowledge agenda

- In the 2022-2027 planning period, the government will work with the oil and gas sector to determine which locations in the North Sea are most suitable for CO_2 storage. Wherever possible, they will use the outcomes of previous studies for this. One of the research questions is what forms of co-use can coincide with CO_2 transport and storage.

5.3.6 Offshore electricity from water and sun

To determine the perspectives of 'electricity from water' and to form a vision on this, the government presented the Electricity From Water Exploration[80] 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 not very good. In view of these findings and the Dutch energy innovation policy, which is aimed at focus and mass, the government concludes that, for now, no government policy will be pursued on electricity from water.
The study underlying this exploration did indicate, however, that there are a number of knowledge gaps concerning different electricity from water technologies. It has been decided to conduct further research into the knowledge gaps in terms of technologies that could contribute to the energy transition nationally. Therefore, no large-scale areas for offshore tidal energy or wave energy are foreseen in this planning period, but research will initially be conducted into the potential of these technologies. This also includes consideration of side effects on ecology, shipping, food risk management and suitability.
There is room for innovation and experimentation in this field. These innovations and experiments must ft within the frameworks for co-use and the area passports or the plans for

[79] National CO2 storage needs until 2035 - An inventory of CO2 capture and storage (CCS) in the Netherlands. Royal HaskoningDHV, commissioned by the Ministry of Economic Affairs and Climate Policy. 30 September 2021.
[80] Parliamentary Documents II, 2020-2021, 32813, no. 676.

rivers, coastal regions, coastal and transitional waters, and regional energy strategies. Special attention is to be paid to effects with regard to food risk management, water quality and ecology.

The TNO study 'Stroom uit Water', which forms the basis of the Exploration, has identified a number of knowledge gaps. Together with I&W, EZK entered into discussions with knowledge institutions and the Top Consortia Knowledge & Innovation for Energy and Water Technology to determine, on the basis of a number of criteria, where more research should be conducted and what is needed to fill these knowledge gaps. This process is partly the implementation of the three motions Stofer et al.[81], Grinwis and Stofer[82] and Van der Lee of July 2021[83]. The results will be used for the review of the Integral Knowledge and Innovation Agenda (IKIA)/Multi-annual Mission- driven Innovation Programmes (MMIPs) in 2023.

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 land 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 Luchterduinen, Hollandse Kust (north) and Borssele. The Long-Term Mission-Driven Innovation Programme 2 (MMIP2) requires research into the possibilities and perspectives of the production 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 'electricity 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. As indicated on the Roadmap for Offshore Sun, solar energy pilots on the North Sea will always go hand in hand with ecological studies of their effects.[84]

Given the opportunities and uncertainties for offshore solar fields, the government has opted to support this development in the innovation phase and to remove obstacles[85]. This way, the national government is keeping the way open for growth to a marketable option as a substantial,

[81] Parliamentary Documents II, 32813, no. 797.
[82] Parliamentary Documents II, 82813, no. 793.
[83] Parliamentary Documents II, 32813, no. 787.
[84] Parliamentary Documents II, 32813, no. 665.
[85] To be elaborated in more detail in Roadmap for Offshore Sun.

cheap sustainable energy source for the more distant future. In the short term, it is especially important to facilitate large pilot projects.

Chapter 8 deals specifically with the promotion of co-use in wind farms through initiatives in the field of 'new blue economy'. This specifically concerns the elaboration of the policy tasks for

electricity 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 enhancement (see Section 3.3.4). Promoting functional combinations with wind farms is also part of the Area Passport Guide (see Section 10.2) and the Assessment framework for co-use in wind farms (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 electricity 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 'electricity from water' in designing the area passports for the wind farm zones.
- The government is investigating which knowledge gaps need to be filled for the review of the IKIA in 2023 and will facilitate further independent research into these knowledge gaps together with TKIs and TO2 knowledge institutions.

Knowledge task

- 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.

5.4 Management

5.4.1 Electricity: Wind energy

Rijkswaterstaat manages the North Sea and is the competent authority on behalf of the Minister of Infrastructure and Water Management for activities in the North Sea under the Water Act and other legislation. 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. Rijkswaterstaat, as supervisory authority, is monitoring this. Rijkswaterstaat conducts administrative checks and takes action if violations are found. Rijkswaterstaat is the point of contact for wind energy operators if they need information about the wind farm site decision and the submission of their implementation plans. Rijkswaterstaat involves the State Supervision of Mines in the assessment of the plans and asks relevant supervisors in the North Sea, such as the Coastguard, for advice. The State Supervision of Mines conducts offshore inspections and has the mandate to take enforcement action if immediate action is required. The 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 ships 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

Rijkswaterstaat is the competent authority on behalf of the Minister of Infrastructure and Water Management under the Water Act for cables and pipelines in national waters that do not fall under 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 within four weeks after a cable or pipeline is out of operation. This is to notify the State Secretary for Economic Affairs and Climate Policy that the relevant cable or pipeline is out of operation. The Mining Decree and the Mining Regulations provide for a balancing of interests on the basis of criteria relating to the efficiency of the use of space, the impact on the environment, safety and cost effectiveness. Based on this balancing of interests, the State Secretary of Economic Affairs an Climate Policy can prescribe a (partial) removal of the cables or pipelines. It should be noted here that, in principle, cables and pipes are left in a clean and safe state.

The State Supervision of Mines monitors the safe implementation of the CO_2 storage activities in the North Sea. Responsibility for managing the storage site and the monitoring of the stored CO_2 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 appears to be a stable user of the North Sea, for which everything has already been arranged in terms of policy. That picture is only partly correct. It is true that maritime transport - probably the first human use of the sea and ocean - has developed so gradually that policy, management, regulations and facilities have been able to evolve nationally and internationally. However, currently maritime transport is also facing the major task to become more sustainable. And in the relatively small and shallow North Sea, the spatial claim of emerging other uses requires the utmost care and vigilance to ensure the high standard of safety and reliability of this vital transport modality.

6.1 Current use and developments

6.1.1 Outline 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 commercial shipping, maritime transport includes various other sectors: fishing, sea towage, hydraulic engineering, offshore supply, and passenger ships and pleasure yachts. At the relatively small North Sea, route-bound and non-route-bound traffic from ships with different manoeuvring characteristics, dimensions and speeds converge.

The number of ship movements in the Dutch part of the North Sea is roughly 240 thousand per year, about 75 thousand of which have a direct relationship with a Dutch port. The port of Rotterdam is the largest in Europe and one of the largest in the world; but the ports of Amsterdam and the Scheldt area are also important. 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.[86] Periodic analyses of shipping traffic on the North Sea show an increase in the number of shipping movements and in the gross tonnages transported.[87] The diversity in the composition of shipping traffic also appears to be increasing and the dimensions of ships are still increasing. Recent studies predict volume growth of 35 to 40 percent by 2030.[88]

The transport of goods by sea is of crucial importance for the Netherlands as a distribution country. Parts of the main waterway network provide connections with important Dutch sea and inland ports, ports in neighbouring countries and economically important areas in the region. The waterway network of seaports and inland waterways is connected to other transport networks via multimodal cargo transfer hubs and forms part of a multimodal, synchromodal logistics system.

[86] NML, 2020, The Dutch Maritime cluster, monitor 2020, page 16.
[87] Marin, 2020, Network Evaluation North Sea 2018, 2019.
[88] PBL, 2018, The future of the North Sea.

6.1.2 Efficient, safe and sustainable maritime transport

The shipping industry has a common legal basis worldwide for promoting efficient and safe shipping. The regulations are laid down globally in the United Nations Convention on Law of the Sea (UNCLOS) and elaborated in agreements in the International Maritime Organization (IMO), the International Association of Lighthouse Authorities (IALA) and in many treaties. In particular UNCLOS Articles 58 paragraph 1 (freedom of navigation) and 60 paragraph 7 (conditions for the development of offshore installations) guarantee the safety and effectiveness of navigation and accessibility in the EEZ.

Efficient and safe

Safety of navigation is one of the most important conditions for seagoing vessels. Shipping safety internally (for ship, crew and cargo) and externally (for infrastructure and the environment) must be guaranteed. (International) shipping traffic 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 wind farms in the North Sea has the potential to lead to less space for manoeuvre and to densification of shipping traffic. This can increase the risk of damage to ships and crew, infrastructure and the environment. Based on the existing routing system, it was decided in 2013 to limit this risk in the planning phase of the construction of 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 initiatives such as wind farms. The width of the buffer zone depends on the standard ship 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.[89]

In addition to the design criterion, additional measures are also being taken for the Dutch part of the North Sea in order to not increase the cumulative risks of wind farms to shipping safety and to limit them where possible. It concerns, among other things, traffic management at sea, extra supervision and enforcement, extra sensors such as radar for a better up-to-date picture of traffic movements at sea, extra emergency towing assistance and more capacity for Search and Rescue (SAR) and oil spill pollution control. This raft of 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 effect of the wind farms on shipping safety and into the effectiveness of the measures taken; this is to substantiate any adjustments to the raft of measures.

Sufficient anchorages of sufficient size are essential for the proper functioning and future-proofing of the seaports. Adjacent to these anchorages, sufficient manoeuvring space (i.e., sufficient distance from wind farms) is kept free for seagoing vessels in storm situations. This is important for ships that can no longer safely anchor to have enough space to keep going during the storm.

[89] IMO resolution MSC.419(97).

Following the accident with the container ship MSC Zoe in January 2019, in which 342 containers ended up in the sea and a large amount of cargo washed ashore on the Wadden coast, the government is working on making container transport north of the Wadden islands safer. The Minister of Infrastructure and Water Management has informed the House of Representatives about this several times.[90] Since a number of measures are still under development and/or need to be coordinated in an IMO context, the Minister of Infrastructure and Water Management will continue to inform the House of Representatives about this on a regular basis.

Increasing sustainability

Maritime transport has a predominantly international character. The government is, therefore, committed to ambitious agreements about making the sector more sustainable. On a global level, this is happening in the IMO context within the framework of the International Convention for the Prevention of Pollution from Ships (MARPOL) 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 facilities[91]. On a national level, in 2019, the government concluded the Sea shipping, Inland Navigation and Ports Green Deal with the maritime sector[92]. In this Green Deal, agreements have been made to, among other things, reduce emissions into the air of harmful substances (nitrogen oxides, sulphur oxides and particulate mater) and greenhouse gases (including carbon dioxide, methane and nitrous oxide). For example, it has been established that from 1 January 2021, the measures for the North Sea NECA (Nitrogen Emission Control Area) have been introduced and will be enforced. In order to achieve this, sustainable fuels must be introduced to the market as soon as possible and rolled out further.

With regard to the maximum emissions from ships, it was agreed in 2018 within the IMO framework to lower the reduction standards for total global shipping by 50% by 2050. To this end, agreements have been made about efficiency standards via the Energy Efficiency Design Index (EEDI). In addition, other agreements are needed, such as the use of price incentives and the switch to alternative sustainable fuels. The European Commission recently presented the Fit-for-55 package, which also contains far-reaching proposals to make shipping more sustainable. In the EU context, it has been announced to bring maritime shipping under the ETS system. In light of the European Green Deal and the resulting initiatives, the government has previously expressed its commitment to the target of climate neutrality by 2050. In line with this, the Ministry of Infrastructure and Water Management also wants to work towards climate neutral international shipping by 2050. In the announced revision of the IMO climate strategy in 2023, the Netherlands will aim for a comparable global ambition.

[90] Parliamentary Documents II, 2020-2021, 31 409, no. 291, no. 308 and no. 339.
[91] OSPAR 2016, 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.
[92] Parliamentary Documents II, 2018-2019, 33 043, no. 102.

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 tasks

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.[93] Clean shipping contributes to the national importance of a good quality of the living environment in the Netherlands, and, more specifically, of guaranteeing good water quality and improving and protecting nature and biodiversity. In the Sea Shipping, Inland Navigation and Ports Green Deal, the government and the maritime sectors have agreed that CO_2 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 a more intensively 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.

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 Memorandum[94], and elaborated in the Maritime safety policy framework. In the internationally established route 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 official route systems. 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 optimised.

Another point of attention is the international cooperation to formalise routing proposals in border areas at the IMO. When it gets busier on the North Sea, additional (cross-border) routing measures are needed to continue to safely and responsibly accommodate shipping traffic on existing connections between international ports and seas. An international EU shipping group

[93] Maritime safety policy framework: Safe Future Shipping; Parliamentary Documents II, 31409, no. 307.
[94] Port Memorandum 2020-2030, Parliamentary Documents II, 31409, no. 274.

holds periodic consultations to evaluate existing international shipping routes and adapt them where necessary, and to identify and spatially safeguard the connections between seaports and access areas (sea lines of communication). And also to spatially safeguard other important shipping routes on both a national and international level.

Partly in relation to the designation of new wind farm zones, 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 within 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 a possible polar route. Chapter 9 presents new routing measures in connection with the designation of new wind farm zones in the North Sea after 2030. Section 10.1 describes the conditions under which passage through 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

- Through the designated wind farm zone IJmuiden Ver (north) and area 1, space for a clearway will be kept free to guarantee safe passage for shipping. Besides the ferry connection, this clearway connects the NSR and the ports of IJmuiden and Amsterdam.
- Northern Sea Route connection (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. In addition, space for connections has been identified for connections between seaports and NSR.
- Determine location* of Esbjerg-United Kingdom clearway north of search areas 6 and 7, in order to continue to facilitate the existing shipping route between Denmark and the United Kingdom, in conjunction with designation of wind farm zones in the partial revision and in coordination with neighbouring countries and stakeholders.
- Determine location* of clearway towards Baltic Sea connecting to German shipping route 10 (SN10). To guarantee international passage of the southern North Sea towards Denmark and the Baltic Sea, a clearway will be established in agreement with Denmark, Germany and Belgium. Various options for the design of this clearway have been examined in a Formal Safety Assessment (FSA), which also considered safety risks. This national clearway consists of connections to the SN10 and the NSR. Decision-making takes place partly in the context of a partial revision of the North Sea Programme in coordination with neighbouring countries and stakeholders.

- The FSA report concludes that search area 5 median strip scores very unfavourably from a shipping perspective (safety and accessibility). The risk of incidents with consequences for the environment at wind farms in this sub-area is high. The above conclusions from the FSA report will be passed on as an element for a future integrated assessment about the wind farm zones for the period after 2030, which will be designated in the context of the partial revision.[95]
- The development of offshore wind energy increases the demand for cables and pipelines in the North Sea. Vessels which (in the event of an emergency) could anchor on or near cables and pipelines could damage these infrastructure elements, which threatens the continuity of a critical digital/energy main infrastructure and possibly shipping safety. A generic consideration framework has been developed (see section 10.7) to ensure at an early stage, that it is possible to make sound spatial considerations on the integration of cables and pipelines in relation to shipping routes at the start of new routing projects.

* When designating wind farm zones, the space required for future clearways is also included on the spatial development strategy map during a partial revision of the North Sea Programme[96], in coordination with neighbouring countries and the mining and shipping sectors, among others. Clearways are formally established via the Mining Regulations, and, when the Environment and Planning Act comes into effect, via the Environment and Planning Regulations.

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 fag 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.

[95] In this revised North Sea Programme, see chapter 9a.
[96] The intended locations for clearways appear in this revised North Sea Programme on the Maritime Spatial Planning map in chapter 9a.2.

Nautical management

Rijkswaterstaat is responsible for managing the North Sea as a water system and waterway. 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 raft of shipping measures Offshore Wind. 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 in 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 access to Eemshaven every day. 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 seaports.

Maritime Emergency Assistance

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 free 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 of 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 just 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 food 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 living environment.

7.1 Sand extraction for food risk management and construction

7.1.1 Current use and developments

Sufficient space for sand extraction in the North Sea for climate resilience of the coastline, countering flood risks and as infill sand and sand for construction on land, is of national importance. Sand extraction takes place in the reservation zone for sand extraction; the area between the continuous - 20m isobath and 14 NM. On the landward side of the continuous -20m isobath is the coastal foundation. No sand may be extracted from this area.

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 year[97], of which half is suppletion sand and half is full 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

[97] National Committee on the Coordination of Extraction Policy.

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 Environmental Assessment of the sand extraction is studying this.[98] The results of the MEP (2018-2027) provide input for future SEA procedures for large-scale sand extraction and act as a guideline for new policy. Within the OR-ELSE programme, research is also underway into the optimisation of sand extraction from an ecological perspective.[99]

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 full 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 sea level rise which is 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.[100] If the aim is to widen dykes and knolls on land, there will also be a sharp increase in demand for full sand. The guarantee of enough sand at reasonable excavation costs for the coming fry years is already under pressure, particularly for the maintenance of the coast between Katwijk and Egmond, the coast of Texel, Vlieland and Terschelling, and the coast of 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 sea level rise. 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 full 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.

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[98] 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.

[99] https://or-else.nl/

[100] https://dp2021.deltaprogramma.nl/6-voortgang-per-gebied.html#h6_6

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 of the follow-up study in the Sea Level Rise Knowledge Programme. Although the current sand extraction strategy assumes the availability of 'sufficient sand for the coming decades', new insights have recently emerged concerning the spatial availability of sand and the growing need to be able to continue to defend the coastline against flooding.[101] New insights from the Sea Level Rise Knowledge Programme show that - depending on the sea level rise scenario - between 1-10 billion m^3 of additional sand will be needed in the period between now and 2200.[102] This volume is in addition to the current 2 billion m^3 if the current replenishment volumes (11 million/year) are extrapolated through to 2200. No matter which sea level rise scenario occurs, the availability of sand remains crucial to enable us to continue the current policy in the long term.[103] 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 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, in order to keep the Netherlands safe and maintain its quality of life also for the long term. The availability of suitable sand for sand extraction is an essential precondition for the national interests water safety and climate resilience, and infill sand for housing construction, mobility and commercial conditions. Guaranteed availability contributes to the national interests of food risk management and climate resilience and to interests relating to housing, mobility and the business climate.

Satisfying sufficient demand for sand is made more difficult by the growing spatial pressure in the coastal zone where sand extraction takes place. Although we do not expect to feel any real spatial restrictions until the medium to long term (from 2050 onwards, depending on the sea level rise scenario), today's management practice is already experiencing bottlenecks and new spatial claims are currently being made in the reservation zone for sand extraction for cables and pipelines that for the longer term will result in restrictions on sand extraction. Cables and pipelines which must necessarily cross the reservation zone for sand extraction for shore landings from wind farms will result in additional concerns regarding the reduction of the sand supply available for sand extraction over and above existing activities in the reservation zone (e.g. permitted wind farms and shipping routes).

The growing demand for sand together with the increased spatial pressure in the coastal zone will create the necessity of safeguarding sufficient sand supply to serve the national interests. We are gradually working towards this situation in the North Sea Programme and the National Water Programme, in conjunction with the Sea Level Rise Knowledge Programme and the Delta Programme.

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[101] Deltares (2023a). Suggested solutions for the available sand supplies. Vermaas & Bakx, on behalf of Rijkswaterstaat.
[102] Deltares (2023b). Sea Level Rise Knowledge Programme Sediment Demand for the Dutch coastal system in the face of increased sea level rise. On behalf of the Sea Level Rise Knowledge Programme of the Dutch Ministry of Infrastructure and Water Management / Delta Commissioner
[103] Parliamentary Papers II 2022/23, 36200-J, no. 7

The method of extracting surface minerals must be socially acceptable. The construction materials policy is based on the principle that use is economic and of high quality. This means that high-quality coarse sand and gravel may not be used for all 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 affordable remains available for sand extraction. Furthermore, not every type of sand is suitable for coastal protection so that account must be taken of the quality of the sand to ensure the best possible match with the coastal conditions, also taking ecological values into account. This principle of cost effectiveness and quality of the available sand 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 electricity and telecommunications cables. This calls for a sound balancing of interests, in which sand extraction is given priority over other interests in the reservation area for sand extraction. 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 guidance.

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 all sand, in order to be 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 additional crossings of this area by cables or pipelines. Taking account of climate change and the growing claims on space above all from activities in the field of energy generation, a reassessment of the sand extraction strategy for extraction on the North Sea is planned in the North Sea Programme 2028-2033. The reassessment of the sand extraction strategy will consider the better utilisation and protection of sand supplies, for example by structurally extracting sand at greater depth and encouraging extraction in former wind farms in the reservation zone, following dismantling. In addition, the growing restriction on space for sand extraction will also have to be considered in the broad national context in the National Water Programme 2028-2033.

To safeguard supplies as a national interest for water safety, it is essential to reserve additional space for sand extraction, to make better use of sand supplies for example by structurally extracting sand at greater depth and reassessing the sand extraction strategy. For that reason, in the Partial Revision of the North Sea Programme 2022-2027, the reservation zone for sand extraction has been expanded seaward by 2 NM from 12 NM to 14 NM from the coast. As a consequence, the reservation zone is located between -20m depth and 14 NM from the coast.

In the period 2028-2033, the Minerals information system will be expanded to include the zone between 12 NM and 14 NM, to gain a better insight into the composition of the sand in this zone.

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 of 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 fts into the applicable policy frameworks and regulations for nature and the environment after 2030. These questions could, for example, 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.[104]

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, namely to 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 removal permit 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 zones, 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 but is carried out on the initiative of commercial parties. Rijkswaterstaat is responsible for food 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 permits 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 agency acts as manager and the Human Environment and Transport Inspectorate issues the permit. Obviously, Rijkswaterstaat is then also responsible for coordinating with other designated uses.

[104] The Earth Removal Act will be incorporated into the Environment and Planning Act.

7.2 Main infrastructure for digital connectivity

The cables for the network for phone and data traffic in the sea, telecommunications cables, are different from the cables in the grid that is part of the energy system in the North Sea. The later is described in Chapter 5.

Achieving and retaining high-quality digital connectivity is a national interest. This also concerns our international connections. Where possible, these connections are made on the seabed, because the chance of disruptions is lower than with connections on land.

The first telephony cables were part of the transatlantic telecommunications connection between Europe and North America, of which the construction started in the 19th century. Since then, the number of telecommunications cables has grown steadily, to some 20 active tele-communications cables today, with a total length of 2,000 kilometres.

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) sea cables are no longer used and some have been removed. They will mostly be replaced by new cables, in order to guarantee the continuity of the connections. At the same time, growing data traffic requires more capacity and this means that many extra telecommunication cables are also being installed to meet this demand. 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 telecommunications sea 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 border control

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 border control, as well as other security tasks which are carried out by (mainly enforcing) organisations, all or partly within the Coastguard Alliance.

As processes in the North Sea increase in size and complexity, the economic increase in value is also taking of. Given the ambitions, some of these processes will become of great importance for the Dutch economy. Since the mandate for prevention, detection, enforcement and security of activities in the EEZ has its limitations, the establishment and security (‘security by design’) of vital processes necessarily becomes an (additional) point of attention for governance.

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 cyber criminality using the farms or targeting them. In terms of 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 wind farms, 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, CO_2 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 may therefore become part of the vital infrastructure. Another important point of attention is the underwater infrastructure in the North Sea, such as data and energy cables. With the development of the North Sea, the already great importance of the safety of the underwater infrastructure will also increase. Properly embedding the safe and undisturbed functioning of (work) processes 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 and non-state actors, people or groups who are intent on misuse, espionage, sabotage, terror, and international organised and subversive crime, and the protection of people, professional groups and interests that could be affected as a result. National security in the Netherlands does not stop at the low-water mark, and national and international security issues are increasingly intertwined. International developments have an increasing impact on national security. This requires a more comprehensive approach.

In 2022, the Cabinet decided to initiate a robust approach to safeguard and where necessary to improve the protection of the North Sea infrastructure, on both a national and international scale. The interdepartmental Programme for the Protection of North Sea Infrastructure (PBNI) was established to give form to the strategy for protecting the North Sea infrastructure. The Programme is the work of the Ministries of Defence, Justice and Security, Foreign Affairs, Climate and Green Growth, and Infrastructure and Water Management. The aim of the PBNI is to protect the availability, continuity, reliability?/confidentiality and integrity of the North Sea infrastructure, in a futureproof manner, in the interests of national security.

Based on an analysis of vulnerabilities, the current threat assessment and the available capacity for protecting the critical infrastructure on the North Sea, five action lines have been defined for improving the protection of the infrastructure on the North Sea:

1. Governance. Ensuring clear governance at both political-administrative (strategic) and operational-tactical level.
2. Picture building. Improving the detection and interpretation of (potential) threats on the North Sea.
3. Resilience. Increasing resilience by improving information exchange and taking measures to avoid and/or mitigate risks.

4. Crisis Management. Adequate preparation to enable a response to threats and incidents in respect of the North Sea infrastructure;
5. Cooperation. Close cooperation with public and private parties, the North Sea countries and other allies.

Each of these action lines has been further elaborated in desired attainment targets and underlying activities. The various departments are working together on achieving these targets.

With the developments on the North Sea, various national interests may also extend to the Dutch sea area. Properly embedding the safe and uninterrupted functioning of (work) processes to represent these interests then becomes more important. Prior to formulating the measures required to enhance resilience, it is therefore vital to have a good idea of the possible risks involved in the developments. In this way, it is possible to continuously assess whether the protection of national security interests is in line with developments and threats or risks that may affect national security. These risks 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 and Climate. They must then be incorporated in the National Security Profile and be further elaborated in the relevant national crisis plans, such as the current North Sea Incident Response Plan (IBN 2021).

Border control

Offshore border control 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 facility of transboundary freight traffic, aimed at protecting society from unsafe, undesired or criminal goods. Border surveillance for the Royal Netherlands Marechaussee in the North Sea focuses on passenger traffic and contributes to the effective management of the European external borders and a secure Schengen area, which is periodically evaluated in Schengen evaluations. Border control includes the prevention of illegal immigration and migration crime such as smuggling of persons, including deployment for the European Border and Coast Guard (EGKW/Frontex).

7.3.2 Vision, ambition and tasks

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 farm zones 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 border control 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 such as target practice, low flying or exercises in detecting sea mines and historic ammunition, 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[105]. 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.

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. Co-use of exercise zones is permitted in so far as this can be combined with military use. Most defence areas on and above the sea surface are unsafe when being used for shooting and/or flying activities. When no

[105] The Regulation on General Rules for Spatial Planning will be incorporated into the Environmental Regulation when the Environment and Planning Act comes into effect.

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 risk of damage is too high and the military use of these areas is limited by the presence of fixed objects.

The Marine Strategy Part 1, Annex VII (Military Activities), describes the responsibilities of the Ministry of Defence with regard to environmental protection at sea. Formally, the EU Marine Strategy Framework Directive provides for an exception for military activities. In the national implementation of the directive, the interpretation was formally left to the discretion of the Ministry of Defence. However, it was decided that where an exception applies to Defence activities, this will only be exercised if measures are incompatible with the operational management of Defence. In practice, this means that, during military exercises and basically all operations, warships refrain from dumping any materials that are not allowed under the MARPOL Convention. The use of sonar systems[106] and explosives removal[107] are subject to legislation to ensure that they are carried out in a sound manner. The Ministry of Defence invests in knowledge to safeguard responsible use in the long term. Specifically for the clearance of explosives, research is being conducted - where possible in an international context - into alternative technology to neutralise dangerous historical ammunition with less effect on sensitive species and thus ensure safe use of the sea.

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 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 are 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, which are popular among divers, in part because they often have a rich biodiversity. 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 memories. 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. Sunken warships and wrecks of military

[106] Instruction Naval Forces Command Responsible use of sonar.
[107] Working instruction Defence Diving Group Destroying Explosives at Sea, 2020 and Operation Order Beneficial Cooperation, 2020.

aircraft enjoy sovereign immunity. This means that the fag state (in the case of ships) or the state of registration (in the case of aircraft) determines what may or may not be done with them. 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, new insight is required into the nature, extent and location of items of archaeological value 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. On the other hand, in situ conservation can also benefit from other government policies, such as designating protected natural areas at sea.

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 mainly to preserve as many of the items of archaeological value in the seabed (in situ) as possible and to consider the archaeological interest in the spatial zoning and in projects. The convention must also ensure that environmental assessments and the resulting decisions take archaeological remains and their context into account. The principle is that the costs of the required archaeological research are charged to the initiator (the principle: 'the disturbers pays').

In the government letter Heritage Counts, the significance of heritage for society[108], 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, values 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 to protect the cultural heritage under water (2001)[109]. 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.

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

- *Knowledge about the archaeological stock*

[108] Parliamentary Documents II, 2017-2018, annex to 32820, no. 248.

[109] Parliamentary Documents II, 2015-2016, 34300-VIII, no. 146. By ratifying the convention in 2001, the Netherlands is committed to the principles and the annex of the convention.

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 permits 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 permit under the Water Act or the Earth Removal Act but for which no EIA needs to be performed submits a report along with the permit application, sufficiently defining the items of 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 always an archaeological expectation for finding a shipwreck. If, based on this report, it is concluded that the work could have an adverse impact on items of archaeological value, the competent authority could attach further provisions to the permit, such as a duty to take technical measures for in-situ conservation or for further analytical research and excavation work. The initiator will be required to have the work supervised by an expert in maritime archaeological preservation of monuments. For mining activities requiring an Environmental Assessment (EA), such as deep drilling and laying certain pipelines, the protection of items of archaeological and other cultural-historical value is considered in the decision as to whether to grant a permit. 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 ratified the UNESCO Convention to protect the cultural heritage under water (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 OCW (the RCE in this), 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 charts the most valuable underwater heritage, as well as any 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 coordinated with Rijkswaterstaat.

7.6 Healthy and safe living environment: recreation

7.6.1 Current use and developments

The North Sea and the coast have an important social 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, which represents as a whole 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 enough harbours with good amenities along the North Sea coast, space at sea and safety are important policy aspects. Also 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, without special measures, recreational shipping would need 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 a healthy and safe living environment. The NOVI calls this 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 and produce underwater noise. The contribution of recreational underwater noise versus underwater noise from commercial shipping is not known yet. Gaining insight into the amount of continuous underwater noise caused by recreational shipping is part of the MSFD Knowledge Agenda. In addition, 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 continuing to work with provinces and municipalities on policy for the circular economy. Various codes of conduct also apply to seagoing recreational shipping and waste facilities are prescribed in marinas.
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 passage and co-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 Section 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 7-a). 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, paragraph 3). This determines that KNMI-approved equipment may be installed on a mining installation for the purpose of meteorological and oceanographic observations.

Due to the expected decline in the number of oil and gas platforms in the North Sea (see Chapter 5, Section 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-a). This means that less meteorological data is collected on the North Sea. It is likely that users 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.

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 food risk management and climate resilience are national interests. The availability of meteorological and hydrological data and information from area-covering measuring locations in the North Sea is therefore crucial. The task is to guarantee the continuation of such measuring locations for the future.

Figure 7-a: Overview of meteorological measuring points at the North Sea.

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 issue of the connections between sensors and mainland are important points of attention.

Actions

Commissioned by the Interdepartmental Directors North Sea Consultative Body (IDON), an interdepartmental working group will draw up a proposal for a North Sea Digitalisation Implementation Programme, with an investment plan for its realisation. To this end, the future information needs of the various stakeholders and the required IV infrastructure and connectivity requirements will first be mapped out.

The scope of the North Sea Digitalisation Implementation Programme is aimed at a digitalisation task for the medium term (2030-2040) and the long term (after 2040); the information requirement will be elaborated according to these terms.

8 Sustainable blue economy

Blue Growth[110] 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 growth. The European Agenda Blue Growth from 2012, updated in 2017, lists the goals for the new EU policy: aquaculture, 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 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 and shipbuilding, 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.

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 co-use of space on the sea and coast and the planning thereof 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[111]. EU frameworks and strategies, such as for the further increase of energy from offshore wind farms[112], 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 that need attention in the blue economy are:

- Sectoral policy, including sustainable shipping.
- Roll-out of the task for offshore wind energy.
- Roadmap alternative energy forms and transport options (exploration electricity from water, and framework for ‘sun at sea’).
- Roadmap sustainable food production, including seaweed and shellfish farming.

[110] Communication from the Commission (COM(2012) 494 final): Blue growth: Opportunities for sustainable marine and maritime growth (https://eur-lex.europa.eu/legal-content/NL/TXT/PDF/?uri=CELEX:52012DC0494&from=EN)
[111] Communication from the Commission (COM(2021) 240 final): A new approach for a Sustainable Blue Economy in the EU (https://www.eesc.europa.eu/en/our-work/opinions-information-reports/opinions/new-approach-sustainable-blue-economy-eu)
[112] Communication from the Commission (2020) 741: An EU Strategy to harness the potential of offshore sustainable energy for a climate neutral future (19/11/2020)

- Attention for tourism and the leisure economy.
- Sustainability and innovative forms of fishing.
- Other opportunities, such as with blue biotechnology (see explanation in box).
- Continued support for improving sustainability of existing sectors in the blue economy, and giving new emerging sustainable initiatives a place at sea.
- Protection of biodiversity and recovery of damaged ecosystems
- 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, ambition and tasks

The United Nations Sustainable Development Goals for 2030 (SDG)[113] 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 tasks. These lie in the field of technology, cooperation, training qualified personnel and attracting investments, whilst continuously taking account of the marine and coastal ecosystem.

By combining the strengths of various top sectors in the perspective of the Sustainable blue economy, a great deal can be achieved. 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, sun at sea and electricity 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.

[113] Transforming our world: the 2030 Agenda for Sustainable Development (25/09/2015).

8.3 Policy

8.3.1 Investigation Programme 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 relates to aquaculture on the North Sea (the farming of shellfish and crustaceans, algae and seaweeds) and to alternative forms of marine energy generation. This concerns aquaculture (farming of – native species of – seaweed and shellfish as well as the passive catch of fish, shellfish and squid) and electricity from water and sun at sea. These activities must prove that they ft into the ecological carrying capacity of the North Sea, for example with respect to the nutrients present. That space is available within current and future wind farms and in joint use (see Chapter 10). In addition, outside the wind farms, there is limited space for small-scale pilots. That space can be found inside and outside (new) wind farms.
In preparation of the next North Sea Programme, investigations will be conducted into whether and if so, where space is available for aquaculture in the busy coastal zone. For investing parties, it is important to have timely insight into feasible business cases, risks, the likelihood of being granted a permit and good alignment of their activities with buyers (on land).

One outcome of the North Sea Agreement in 2021 was the launch of the Sustainable Blue Economy Investigation in the form of the Investigation Programme for the Sustainable Blue Economy. The exploration will be continued until 2027, whereby interim policy options and market opportunities will be elaborated. This Investigation Programme is focused on the development of uniform policy for the new economy, and creating space for upscaling pilots, so that initiators in the field of the new economy receive the clarity they require. The Government is investigating the potential of the combined/common blue economy (food, energy and nature development). The Investigation Programme The exploration aims to bring about the integrated realisation of the policy objectives of the North Sea Programme 2022-2027, with a focus on the new sustainable blue economy referred to above. innovations in sustainable marine food production and on policy goals around energy from wind, water and ‘sun at sea’.

Throughout, there will be a focus on opportunities for joint use with wind farms that offer possibilities for success. The implementation Permit applications for joint use will among others be based on the information from the area passports for each wind farm, which indicate for each form of joint use the preferred location in the wind farm in question (see chapter 10). Joint use of wind farms is possible for:

- nature recovery and development nature restoration and protection;
- forms of and locations for passive fishing (for example pots and baskets);
- permitted forms of and locations for Joint use by the new blue economy (for example the farming of native seaweed species, mussels and flat oysters and ‘electricity from water’, ‘offshore solar’ and energy storage).

The Community of Practice North Sea (CoP) is the flywheel for the Investigation Programme exploration and the Sustainable blue economy. The CoP is the platform where all North Sea stakeholders – representatives of governments, research and educational institutions, the business community and NGOs – meet and engage in conversation or discussion, where initiatives are created and where solutions are collaborated. September 2021 saw the launch of the Board of Support for the CoP North Sea, in which various representatives from the CoP participate, with the aim of providing impetus to the network and translating developments in the Sustainable blue economy to the CoP North Sea and its organisations.

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, for example regarding the 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 Greater North Sea Basin Initiative (GNSBI, see 9.6) and the working group on maritime spatial planning and ecology within the North Seas Energy Cooperation (NSEC)[114] and *the Support group for spatial planning*. 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 Investigation Programme Sustainable blue economy aimed at developing a roadmap for policy. The national government conducts the investigation Investigation Programme 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.
- 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 though participation in (existing European) economic joint ventures, and by means of a new joint venture[115] with North Sea and Baltic Sea countries on the theme emerging challenges & solutions in Maritime Spatial Planning, specifically focusing on the topic Sustainable blue economy.
- The Government will facilitate Promote the development of pilot projects for co-use of space in the North Sea to the level of developed starter companies ('scale-ups') and ultimately other upscaled businesses ('scalers'). These enterprises are active This

[114] https://energy.ec.europa.eu/index_en
[115] https://maritime-spatial-planning.ec.europa.eu/

development takes place, among others, through experiments nearer the coast (near-shore) and in the EEZ (offshore).) in the field of joint use in wind farms.

- The national government focuses on large-scale experiments with sustainable co-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 farm zones 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 farm zones and with the licensing regime. See the Assessment framework co-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, on the basis of existing monitoring initiatives for example relating to the MSFD, Wozep and MONS, and studies by initiators, map out the cumulative ecological impact of the (large-scale) rollout of the new sustainable blue economy. set up a monitoring programme to chart the ecological effects of (large-scale) multiple use.

The starting point for the Investigation Programme for the Sustainable Blue Economy is that initiatives must fit into the ecological capacity of the North Sea. In the awarding of permits, assessment will be based on the statutory nature frameworks according to the EU Habitat and Birds Directive and the EU Marine Strategy Framework Directive (MSFD). At present, the MSFD targets are mainly formulated in terms of quality. Assessment according to the MSFD targets will require a more quantitative set of standards. Among others, the Government is investigating how the issuing of permits can be deployed more efficiently to help achieve Good Environmental Status.

Knowledge agenda

In the framework of the mission-driven top sectors and innovation policy[116] (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 & Water. In addition, the social mission '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, ft into this approach.

[116] Knowledge and Innovation Covenant 2020-2023 (11/11/2019).

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
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 CO_2 in the coastal zone (Blue Carbon). Globally, there is increasing attention for combinations of sustainable agriculture/fish farming, coastal protection, nature restoration and CO_2capture (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, food 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 co-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) (Mission B), 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 digitalisation of (and for) water management. This will enable the Netherlands to be a model for other countries. Our knowledge and skills regarding the water sector can then be even better sold 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 (food 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 Investigation Programme Sustainable Blue Economy for the exploration 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 learn from each other and 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 or fully-fledged business cases) are:

- lack of clarity with respect to licensing, not just for the Water Act, but also for other required permits (which government department do we apply to, for what and in what phase?);
- technological requirements for working offshore, particularly in wind farms (co-use);
- scope and amount of detail of ecological research (at the front in an EA 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 frame-works and commissioning strategic research into (cumulation of) environmental effects.

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 co-use in wind farm zones in the North Sea;
- the Area Passport Guide for wind farm zones in the North Sea;
- the Assessment framework for co-use in wind farms;
- the Assessment framework for activities in the North Sea that require a permit;
- the Assessment framework artificial islands.

Other relevant legislation is covered under, among others, Environmental Act, the Water Act, Nature Conservation Act, Mining Regulation and the Fisheries Act.

It is possible that initiators initiatives in the licensing procedure have raise questions about feasibility, affordability or sufficient applicability of policy frameworks and regulations. If this means that the licensing procedure possibly will not be completed successfully, the relevant initiators can use the CoP North Sea mechanism to make this public. By sharing experiences within the Community of Practice, the viability and efficiency of permit application processes can be optimised. their proposal assessed. Rijkswaterstaat, one of the licensing institutions, is part of this.

9 Spatial Planning

Chapter 9 has been supplemented with chapter 9a. The still applicable spatial policy, in so far as not reviewed in chapter 9a, is described in chapter 9. Chapter 9a discusses interim adaptations of part of spatial policy. Where policy alterations have been made, the revised policy as described in 9a applies. To clarify this situation in chapter 9, footnotes have been added at a number of points.

9.1 Spatial layout 2022-2027

9.1.1 Balanced developments

The North Sea is a valuable and vulnerable ecosystem which, at the same time, has a large number of uses such as shipping, fisheries, wind energy, oil and gas extraction, sand extraction, defence and recreation. The Dutch section of the North Sea is among the most intensively used seas in the world. The previous chapters, 3 to 8, describe the policy and the spatial demands of the various uses and activities. Chapter 9 explains how, during this present planning period, these various uses and activities can be given a place in the area. A long-term horizon for the North Sea in 2050, when all uses have been successfully made more sustainable, is the guiding principle in that regard. The use of the North Sea must be efficient and safe, and the various uses and activities must be in line with the preconditions for a healthy ecosystem. Finding the right social balance to enable this is the main task for spatial planning on the North Sea.

The National Strategy on Spatial Planning and the Environment (NOVI) establishes the policy choice aimed at meeting the climate goals for 2030 and 2050 by achieving the required production of sustainable energy largely by means of wind farms in the North Sea. The NOVI concludes that space on the North Sea will be scarcer than ever in the future. The tension between nature conservation and restoration, food supply, offshore wind energy, maritime traffic and the other national interests contained in the NOVI means that choices, some of them difficult, will have to be made. These are choices that have either already been made or are in development, relating to merging, separating and prioritising use, to investment in sustainability and know-how, and to adaptive policy. Multiple use of space, based on the area's qualities, is conceptualised by means of area surveys, area passport guides, and the policy and assessment frameworks for passage and
co-use (see Sections 10.1 to 10.3). Exploration of the options for – and creation of – a more sustainable economy also plays a role in this respect (see Chapter 8).

The North Sea Agreement (NSA) contributes to reaching the required spatial assessment for the various uses. Central to this is finding the right balance between the transitions relating to food, nature and energy. In doing so, the interests of other users, such as maritime traffic and sand extraction, are taken into account as well. The three transitions are closely related:

- The marine ecosystem is under pressure. The use of the North Sea is set to increase during the present planning period and subsequent years, not least due to energy provision being made more sustainable and the increase in maritime traffic. Increasing use of the North Sea can solely be justified if it is accompanied by the regeneration and preservation of the North Sea's ecosystem. The ecological carrying capacity is a precondition for its individual and cumulative use. In addition, the North Sea ecosystem

is not a static concept. Objects and installations create new habitats and may make a contribution to nature itself. Also, the consequences of climate change give rise to dynamics. New knowledge, deepening of understanding and additional monitoring of the North Sea are necessary in order to be able to optimise policy and management.

- The number of wind farms and associated activities on the North Sea, such as expansion of the storage of offshore energy and transmission from sea to land, will expand considerably. This is a choice aimed at meeting the conditions of the Dutch Climate Agreement and the Paris Agreement. Careful consideration is required in view of the interests of the ecosystem and other uses. The technological dynamics associated with offshore wind energy demand an adaptive approach to planning, for instance in relation to future developments in know-how on the ecological carrying capacity, the potential of measures to help nature adapt, the use of hydrogen, the creation of artificial islands at sea and the development of alternative ways of obtaining offshore energy. Extraction of fossil fuels is being gradually phased out.
- The North Sea is crucial to the fisheries sector and firmly rooted in the socio-economic and cultural fabric of local communities. It is vitally important for the fisheries to transform the sector into a viable and sustainable industry, the nature and scope of which is in step with the new situation on the North Sea. This transition demands re-orientation and, ultimately, restructuring of the feet. This is not only an ecological necessity and an economic reality, but also a social requirement. In addition to the fisheries, increasing conceptualisation and development in the field of aquaculture is demanding space in the North Sea.

The transitions in the areas of nature, food and energy are not only mutually linked; they must also be coordinated with other uses such as maritime transport, sand extraction, defence and recreation. This chapter presents integrated solutions that are focused on social benefits in the long term, in a context of adaptive spatial planning.

9.1.2 Outline of spatial planning developments

Energy production on the North Sea

The NSA provides a framework for agreements on the increase in offshore wind energy and the space this requires. An increase in offshore wind energy is needed if emissions of CO_2 from the energy we produce are to be reduced and, accordingly, to meet worldwide, European and national climate targets. In order to meet the EU-level '49% emission reduction by 2030 compared to 1990' climate target, Dutch offshore wind farms must annually produce 49 TWh of electricity from renewable sources from that baseline year. That amounts to around 11.5 GW of installed wind power generation capacity. In April 2021, the EU targets were tightened, necessitating a 55 per cent CO_2 reduction in 2030. The Extra Opgave[117] (Extra Task) steering committee states that this acceleration requires 10 GW of offshore wind energy capacity in addition to the existing plans and wind farms. Further to this, the widely supported and adopted Boucke motion[118] has asked the Dutch government to designate space for at least 10 GW in 2021, intended for offshore wind energy. In the long term the aim is that energy supply in the

[117] Parliamentary Documents II 2020-21, 32 813, no. 683.
[118] Parliamentary Documents II 2020-21, 35 668, no. 21.

Netherlands is entirely CO_2-neutral by 2050. According to scenarios[119] drawn up by the Netherlands Environmental Assessment Agency (PBL), this requires between 38 and 72 GW of offshore wind energy (see Chapter 5).

The Roadmap Offshore Wind Energy 2030 shows previously designated wind farm zones in which wind farms could be created in order to reach 10.8 GW. In order to achieve a reduction in CO_2 of 49 per cent in 2030, there is a shortfall of 0.7 GW. This means that, in combination with the 10 GW that is required to reach a CO_2 reduction of 55 per cent until 2030, additional space is required to accommodate 10.7 GW. Accordingly, this North Sea Programme designates wind farm zones. In addition, this North Sea Programme shows the search areas for the task of further developing offshore wind energy beyond 2030, the starting point being the Netherlands Environmental Assessment Agency's 'minimum scenario' (38 GW total offshore installed wind power capacity in 2050). Above and beyond the space in the existing Roadmap 2030 (10.8 GW), plus the zones allocated in this Programme (10.7 GW), there is still a need for space for 17 GW in the period after 2030. For the designation of these future wind farm zones, the North Sea Programme 2022-2027 will be partially revised after adoption in March 2022.

The oil and gas activities that take place in the North Sea currently still play an important role in the transition to a climate-neutral energy supply. Natural gas is important in the supply of heat to homes and the industry and in the production of electricity. The government aims to transition to a climate-neutral energy supply as soon as possible. That is why efforts are being made to reduce the demand for natural gas by, for instance, encouraging energy conservation and alternative energy sources and carriers. In the NSA, gas extraction in the North Sea is explicitly placed in the context of achieving the objectives of the Paris Agreement.

Reducing the demand for natural gas takes time. Expectations are that natural gas will still be needed the coming decades. And as long as this is the case, the production of gas from small gas fields in the Netherlands – where this can be done safely and responsibly – is preferred over import, as this produces less CO_2 emissions. With imported gas, CO_2 emissions are 20-30% higher than with gas production in the Netherlands, because it involves transport over greater distances and less environmentally friendly production techniques.

It may be possible to use part of the natural gas infrastructure for the underground storage of CO_2. There currently are two concrete initiatives. The first is the Porthos project, which provides for the transport and storage of CO_2 of the coast of Zuid-Holland. A second initiative, focusing on future CO_2 transport, is Aramis. This involves a pipeline from the Maasvlakte towards storage locations to the northwest of Den Helder. A national coordination procedure has been started for this project. This procedure examines the spatial integration in conjunction with existing activities and future developments, with a view to an integrated assessment of the use of space.

It is expected that after 2030 the transport of energy with molecular energy carriers such as hydrogen will increase. This could mean that sustainable energy generation further offshore will become more cost-effective after 2030. Here, too, it may be possible to use the existing energy infrastructure. This is being studied. Several projects are planned for the period until 2030 for testing and demonstrating (large-scale) hydrogen production at sea before 2030.

[119] Climate-neutral energy scenarios, 2050: Scenario study in relation to the integrated infrastructure exploration 2030 - 2050. Berenschot & Kalavasta, 2020.

Innovations in forms of sustainable energy production other than with wind turbines are a point of attention for the national government during this planning period. These could include solar parks at sea. Given the opportunities and uncertainties for offshore solar parks, the government has opted to support this development in the innovation phase and to remove obstacles[120]. 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 facilitate large pilot projects. The government does not expect this technology to be deployed on a large scale (more than 1 GW) before 2030. Developments after 2030 depend on the outcomes of further studies and pilots. In the context of area surveys and area passports, the national government is investigating which locations within wind farm zones are suitable for other forms of sustainable energy production, weighing up the various forms of co-use and potential for integration.

Nature

The marine nature areas make a contribution to the statutory targets enshrined in the Birds Directive, the Habitats Directive and the Marine Strategy Framework Directive (MSFD), and to the development of the ecological network of nature areas (see Chapter 3). In meeting these targets, the Netherlands is contributing to the EU ambitions relating to biodiversity in 2030 as part of the European Green Deal. The spatial agreements in this North Sea Programme that are proposed on the basis of the NSA underline our national ambition. The widely supported aim for regeneration and preservation comes at a time when the effects of climate change, fisheries and large-scale creation of offshore wind farms are a cause for concern. The increase in various activities on the North Sea and the claims on physical space are only permissible if the ecosystem of the North Sea can cope with them. The 'Monitoring, Research, Nature Restoration and Species Protection' (MONS) programme is working on addressing gaps in knowledge on the strength of the ecosystem (see Chapter 11).

Food supply

The further development of offshore wind energy will result in a reduction of shale acreage. In addition, the sector has to deal with closing of areas in order to meet the statutory requirements relating to nature, and with agreements in the NSA. New traffic separation schemes for shipping could also lead to measures that restrict fishing. Routing measures of this kind are not addressed in this North Sea Programme, but will be explored in the medium-long term. A reduction of shale acreage will increase the pressure on the remaining fisheries. This displacement effect cannot be quantified specifically at present, nor can it be separated from other significant developments that have consequences for the fishing feet (such as the ban on electric pulse fishing and Brexit). Similar developments are ongoing in neighbouring countries. So it is important to consider the fisheries sector in the context of developments in the entire international North Sea region and of the EU Common Fisheries Policy.

Another form of food provision at sea is aquaculture. Co-use of the space in wind farms could create possibilities for this (see chapter 4). The coalition agreement 2021-2025 stipulates that, given the challenges for fisheries, there must be sufficient room and perspective for innovation and diversification. Work will be done on this in the coming year together with fishermen and the other partners in the North Sea Consultation.

[120] To be elaborated in more detail in Roadmap for Offshore Sun.

Maritime traffic

Maritime traffic on the North Sea is both varied and intensive. Spatial developments on the North Sea may have an impact on shipping and shipping routes. The construction of future wind farms requires extra clearway reservations and possible routing measures aimed at guaranteeing passage through international waters, safety of navigation at sea and access to sea ports. In addition, maritime navigation will increasingly be using the northern polar routes. Despite national and international efforts to restrict global warming as much as possible, these navigable routes are becoming increasingly open for international navigation due to the melting of polar ice.

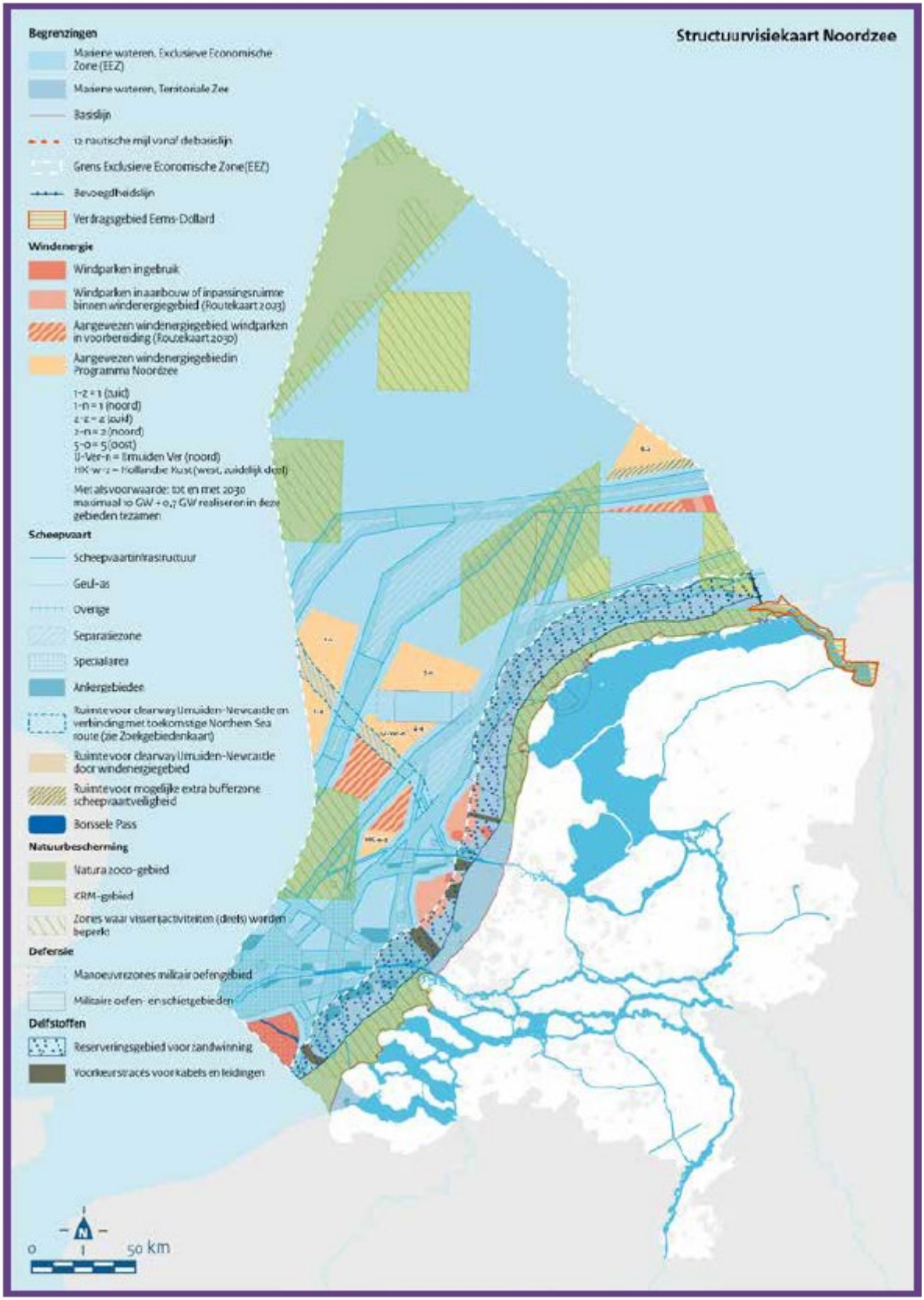
The northern shipping routes are important for connecting the polar route, as well as for the accessibility of the Scandinavian countries and the Baltic Sea. The increasing intensity of maritime traffic necessitates international agreements on ships' routeing. These routes are essential to guaranteeing the accessibility and the competitive position of the Dutch sea ports.

A consequence of wind farm development is that measures are required to be able to ensure fast and safe navigation of ships. Within wind farm zones, navigation for smaller non-route bound vessels is permitted in specially designated passages, intended for vessels with a length of up to 46 metres (see Section 10.1). Safety margins are used outside the wind farms, under the terms of the 'Assessment framework for safe distances between shipping routes and offshore wind farms', dating from 2013 (see Appendix 3).

Section 9.3.2 addresses measures for the safety of navigation in and around wind farm zones. Section 9.4 describes developments beyond 2030, for which spatial planning-related indications are shown on a map of search areas. The increasing dimensions of vessels have been taken into consideration when devising these measures (see Chapter 6). The results of research into the cumulative effects on shipping safety will be announced in 2022. This study considers both the existing wind farm zones and the search areas for the period after 2030.

9.1.3 Reading guide

Section 9.2 gives an introduction to the proposed spatial planning policy for the topics of nature, fisheries/food supply, offshore wind energy, shipping, sand extraction, cables and pipelines, and military activities. This section addresses the spatial development strategy map and the spatial planning policy. Map 3, the spatial development strategy map, visualises this policy. Section 9.3 substantiates the designation of new wind farm zones and describes the relationship with ecological carrying capacity and the implications for other functions. In this regard conditions, starting points and points for action are described which should be further addressed in the Roadmap 2030+ and subsequent wind farm site decisions. Section 9.4 describes the search areas and spatial explorations that will be under consideration in terms of wind energy and maritime traffic in the period following 2030. This will be addressed in the partial revision of this North Sea Programme, which is being prepared from 2022 onwards. Section 9.5 deals with the relevant land-sea interactions, and section 9.6 with maritime spatial planning in an international context.



Map 3: Spatial development strategy map of the North Sea this map has been replaced by the Maritime Spatial Plan map in section Chapter 9a.2

9.2 Spatial development strategy map 2022-2027

The North Sea Programme, according to article 4.1 of the Water Act, forms the spatial development strategy for the North Sea as referred to in article 2.3(2) of the Spatial Planning Act. The spatial development strategy map[121] offers an overview of all spatial planning uses on the North Sea in the policy period 2022-2027. This section focuses on spatial impact of each use. Information on fisheries is not included on the spatial development strategy map as, in principle, fisheries have access to all areas, except where there are restrictive measures in place. There are, however, considerable differences in the significance of fishing grounds.

Nature in relation to fisheries (food supply)

The NOVI forms the basis for an elaboration of the national interests 'achievement of a good-quality living environment in the Netherlands' and, as a follow-up to the Sustainable Development Goals, 'guaranteeing a good-quality living environment, while improving and protecting nature and biodiversity'. The transition to sustainable fishing practices is also listed in the NOVI as a national interest.

In order to achieve the conservation targets for Natura 2000 and MSFD areas, measures will be taken in the areas specified below in accordance with the agreements in the NSA (see also map 2: Nature areas on the North Sea, in Section 3.3)[122]:

- Brown Ridge (Natura 2000):
  - the Brown Ridge was designated a Birds Directive area in 2021.[123] [124];
  - 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) before 2023:
  - draft a Natura 2000 management plan;
  - the area closed for seabed-disturbing fishing will be expanded by 1,014 km^2;
  - of the area as a whole, 1,649 km^2 will become a 'no fisheries zone'.
  - a sub-area of 100 km^2 will be allocated for oyster recovery;
  - on the edge, another sub-area of 100 km^2 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):
  - before 2023, expansion of the Natura 2000 area aimed at increasing the area closed for seabed-disturbing fishing by 557 km^2;
  - before 2023, ban on seine fishing (flyshoot) in the 1,326 km^2 management zones ;
  - adaptation of the management plan.
- Cleaver Bank (Natura 2000):
  - before 2023, expansion of the area closed for seabed-disturbing fishing (excluding Botney Cut) by 552 km^2;

[121] The Maritime Spatial Plan map in Chapter 9a.2 replaces the structural vision map in the revised North Sea Programme.

[122] In this revised North Sea Programme, a number of corrections and adaptations have been made in accordance with the North Sea Agreement, at Borkum Reef Grounds, Frisian Front and Southern Dogger Bank, see Chapter 9a.

[123] For the site boundaries, the site decision for the wind farm zone IJmuiden Ver takes the designation as Birds Directive area into account.

[124] https://zoek.officielebekendmakingen.nl/stcrt-2021-48175.html

    - possible adaptation of the management plan.
- Central Oyster Grounds (MSFD) before 2023:
    - expansion of the area closed for seabed-disturbing fishing by 1,062 km^2.
- Borkum Reef Grounds (MSFD) before 2023:
    - establishing an area of 683 km^2 closed to bottom-disturbing fisheries (see Chapter 3)

An article 11 procedure under the terms of the Common Fisheries Policy (CFP) is started for the North Sea coastal zone, as per the VIBEG II agreement. The aim is to move the areas that are currently closed and for these spatial restrictions to apply to both Dutch – and foreign – fag fishing vessels.

As part of the MONS programme, a study has started in 2021 into the distribution of honeycomb worm reefs (Sabellaria). Independent research will be conducted before 2025 into whether the Hollandse Kust zone, Vlakte van de Raan, the Borkum Reef Grounds, the Cleaver Bank, the Dogger Bank and the Central Oyster Grounds meet the selection criteria[125] for designation as Special Protection Area under the Birds Directive (see Chapter 3). Spatial restrictions that apply under the current policy, such as in the Voordelta and the Vlakte van de Raan, will continue to apply. At international level, the aim is to overturn the applicable restrictive measures relating to fisheries in the Dutch section of the Scholbox.

The EU's biodiversity strategy includes the stipulation that in 2030, at least 30 per cent of the total sea area administered by Member States will be protected. At least one third of that area must be strictly protected. Between 2021 and 2023, the European Commission and the Member States will devise legally binding targets for the restoration of the natural environment, criteria, definitions and preconditions. The relevant agreements in the North Sea Agreement concerning these aspects will form the starting point for the Dutch standpoint in this process.

Offshore wind energy

Spatial planning in relation to offshore wind energy is a further elaboration of the national interest referred to in the NOVI, which concerns 'achieving a reliable, affordable and safe power supply that is CO_2-neutral by 2050, and the accompanying main infrastructure'. The Climate Agreement states that offshore wind energy has an important role to play in this respect. The North Sea Programme interprets spatial planning in relation to offshore wind energy for the period 2022-2027, with a long-term horizon, as follows:

Wind farm zones in which wind farms have already been constructed or are planned to be constructed, or in which there are (preliminary) site decisions, or where according to the Roadmap for Offshore Wind Energy 2030 site decisions are planned, will remain wind farm zones. The IJmuiden Ver (north) and the southern part of the Hollandse Kust (west) zones will be confirmed as designated wind farm zones.

[125] Natura 2000 Birds Directive areas – Appendix 1: selection criteria and boundary method. Link: https://www.natura2000.nl/sites/default/files/Bibliotheek/Aanwijzing%20Vogelrichtlijngebieden/Nota%20van%20Antwoord%20Vogelrichtlijn%20%282000%29%20Bijlage%201%20Selectie%20en%20begrenzing.pdf

The following applies in comparison with the Policy Document on the North Sea 2016-2021 as part of the National Water Plan 2016-2021 (see the spatial development strategy map):

- The boundary of Hollandse Kust (west) has been adjusted on the western and eastern sides to ensure that there is a fluid boundary along the adjacent shipping routes. The boundary to the north has been adjusted to make room for a clearway between IJmuiden and Newcastle.
- In the southern section of IJmuiden Ver (north), space has been reserved for a clearway (see Section 9.3.2 for the width of this).
- The southern boundary of the IJmuiden Ver wind farm zone has been adjusted due to the designation of the Brown Ridge as a Birds Directive area.
- The designation of Noord Hinder as a wind farm zone has been discarded, as this area is situated in the vicinity of the Port of Rotterdam and is too small.
- Hollandse Kust (northwest) and Hollandse Kust (southwest) have been discarded as wind farm zones, considering the interests of fisheries, nature and shipping. Designation of these areas will not be reconsidered as part of the partial revision for the period after 2030.
- Newly designated as wind farm zones are the areas 1, 2 and 5 (east)[126].
    - Area 1 is divided into the sections 1 (south) and 1 (north), between which a clearway will be created (see Section 9.3.2 for the width of this).
    - Area 2 is divided into the sections 2 (south) and 2 (north). On the map, 2 (south) is depicted as a sub-section bordered by the IJmuiden Ver (north) wind farm zone and military training area EHD41. Section 2 (north) lies to the north of EHD41.
    - Area 5 (east) borders the East-Friesland shipping route, which borders Germany. Wind farms are planned on both sides of the border, adjacent to the route for through shipping. Therefore, together with Germany an assessment is being made on the essential width of the required safety margins. Space for a wide safety margin has been outlined on the spatial development strategy map.
- The designation of wind farm zones 1, 2 and 5 (east), and the reconfirmation of wind farm zones IJmuiden Ver (north) and the southern section of Hollandse Kust (west) are subject to the condition that all these areas together generate no more than 10.7 GW until 2030. Another condition is that this development does not exceed the ecological carrying capacity. The planning principle applied is adaptive, which may mean, for example, that designated wind areas will ultimately not be used or only in part.
- There is extra space available in these areas for the creation of wind farms (potential capacity of 16.7 GW). This ‘spacious’ designation offers the necessary flexibility to be able to accommodate the limitations and interests relating to other uses, ecological values and options for landfall in the subsequent process leading to site decisions. The conditions, starting points and points for action in this regard are described in Section 9.3.
- The (sections of) wind farm zones that are rejected for the period up to and including 2030 will be reconsidered for the period after 2030. This will be done during a partial revision of this North Sea Programme, which will also involve other search areas (see Section 9.4).

[126] These areas were given a name in 2022: Area 1 = Nederwiek, area 2 = Lagelander, area 5 = Doordewind (Parliamentary Papers II, 2021-2022, 33561 no. 53). Lagelander has ben dropped in the revised North Sea Programme such that it is no longer a wind farm zone and also not a search area.

- However, Hollandse Kust (northwest), Hollandse Kust (southwest) and Noord Hinder have been discarded indefinitely as wind farm zones and will not be reconsidered in the partial revision referred to above.

Food/Fisheries

The space available for trawl fishing will continue to decrease as a result of the expansion of nature conservation areas and wind farms. In order to use the space on the North Sea efficiently and in doing so create alternative forms of food supply, the focus will shift to aquaculture and passive fishing, in areas such as wind farms. In addition, the NSA and the 'Cutter Vision' (Kotervisie) form a basis for research and innovation, in order to study effects on and possibilities for fisheries and/or developing them (see Chapter 4). The NSA also specifies that international consultation is ongoing on overturning the restrictive measures relating to fisheries in the Scholbox.

Maritime transport

Maintaining and further developing the main infrastructure for mobility, including the shipping routes, is designated as a national interest in the NOVI. The spatial development strategy map shows the existing ships' routeing infrastructure, plus existing anchorages and clearways. Section 9.3.2 describes the possible required reservations for clearways in the context of the new offshore wind farm zones. Section 9.4 elaborates on future developments, including the Northern Sea Route.

Sand extraction

Guaranteed availability of sufficient and affordable sand contributes to national interests in terms of water safety and climate resilience, and to interests in the field of residential construction, mobility and business climate. The strip of sea enclosed by the continuous NAP-20m depth line at a distance of 12 nautical miles from the coastline continues to be reserved for the extraction of sand for coastal defences and for filler sand for construction and infrastructure. The extraction of shells is permitted seawards of the NAP-5m depth line, in quantities that do not exceed natural growth.

Oil and gas extraction

The assessment framework for determining the safe distance between wind farms and mining installations for helicopter fights has been supplemented (See Appendix 4). Oil and gas production on the North Sea remains within the limits of the Climate Agreement. In the NSA, gas extraction in the North Sea is explicitly placed in the context of achieving the objectives of the Paris Agreement, opting for a gradual reduction, whereby gas is extracted for as long as and to the extent that gas is still needed, and only where this can be done safely. This may take several decades. The existing gas infrastructure is being investigated for its suitability for possible repurposing to transport hydrogen. Re-use of existing infrastructure limits the spatial impact and ecological effects of hydrogen transport. Over time, specific platforms may serve as sites for carbon capture and storage (CCS).

Temporary parking facility modernisation and new drilling platform construction

Within the framework of the Wadden Sea Region Agenda, agreement has been reached with all parties on seeking a joint solution for a temporary parking facility in the vicinity of the port of Den Helder to facilitate the modernisation and new construction of drilling platforms.

Cables and pipelines

The establishment and maintenance of high-quality digital connectivity is of national importance, as is the required main infrastructure for the establishment of reliable, affordable and safe energy supply.

Cables and pipelines are situated and constructed in such a way that they do not form a danger or impediment to other national interests. During the period in which this North Sea Programme is effective, the national government will further assess how to deal with conflicts between national interests. There is a safety and maintenance zone of 500 metres to either side of cables and pipelines in the North Sea. When creating wind farms, the principle is that a zone of 500 metres in relation to existing pipelines and electricity cables should be adhered to; this rises to 750 metres in the case of telecommunications cables. With a view to efficient use of space, maintenance zones for cables and pipelines may, where possible, be reduced.

When planning the construction of new cables and pipelines, the national government aims to route these in parallel, where possible, in consultation with the instigator. Preferential routes have been determined (see spatial development strategy map) where these cross the established sand extraction zone, taking into account the availability of sand that can be extracted and the potential locations of landing points for cables and pipelines. In order to use the space on the North Sea efficiently, electricity cables, telecommunications cables and pipelines must be bundled where possible. The assessment framework for activities on the North Sea has been expanded and tightened in order to be able to implement this bundling policy (see Section 10.5).

Spatial planning procedures for future cable routes will be based on the choices made in the Investigation of cable landing points for offshore wind energy (VAWOZ)[127]. This is done in conjunction with the drafting of a new Offshore Wind Energy Roadmap 2030+, and the preparation of site decisions.

Where initiatives at sea cover a wide area, national government may specify space to be reserved for the future routing of cables and pipelines. Moving and bundling existing cables in the area in question at a later date involves sizeable costs and is therefore not being pursued.

The envisaged increase in co-use in wind farms demands that maintenance zones must also be applied to ‘infield’ cables in a wind farm. Research has shown that there must be clearance of 250 metres available on either side of infield cables to facilitate safe maintenance. The national government has specific instructions on how new pipelines and telecommunications cables must be constructed in relation to existing wind farms and wind farm zones. Cables and

[127] Effects Analysis, Investigation of cable landing points for offshore wind energy (VAWOZ), Assessment memorandum, Ministry of Economic Affairs and Climate, September 2021.

pipelines that are no longer in use (those that fall under the Wet Beheer Rijkswaterstaatswerken (Public Works (Management) Act) and were laid after 2000) will be cleared, except where the social benefits of leaving them in place outweigh the social costs.

Military activities

Ensuring national security and offering space for military activities is a national interest covered in the NOVI. The existing areas designated for military purposes will remain in place (see spatial development strategy map). Moving EHD41 was considered, but this is not possible before 2030 due to the presence of mining platforms. This situation may change in the medium-long term. In order to create extra space for wind energy in the longer term, the possibility of moving EHD41 beyond 2030 is being explored.[128] As far as EHD42, a military exercise area that overlaps with search area 4, is concerned, the possibility of co-use is being investigated (see Section 9.4)[129]. A precondition for potential future decisions on EHD41 and EHD42 is that the operational usefulness of the exercise areas is guaranteed.

Conservation of underwater cultural heritage

The NOVI earmarks conservation and strengthening of cultural heritage as a national interest. Archaeological heritage in and on the sea bed forms part of this. The policy is that archaeological heritage in the sea bed remains in situ, where possible. By making an inventory of archaeological sites at an early stage, it is possible to rhyme maintenance in situ with spatial planning developments. Where it is not possible to conserve such artefacts in situ, it may be preferable to excavate the site of the archaeological find and, in so doing, secure its informative value (see Section 7.5).

9.3 New to be designated wind farm zones in relation to nature and other use

Wind farm zones are designated on the basis of a coherent consideration that combines ecological effects, the consequences for other uses, on-schedule completion of the planned wind farms and cost-effectiveness for society. The substantiation of choices is described in Section 9.3.1.

Conditions, starting points and points for action in terms of the subsequent process are associated with the designation and reconfirmation of wind farm zones that focus on the balanced development envisaged in this North Sea Programme. These are described in Section 9.3.2.

9.3.1 Reasoning behind choices relating to new to be designated wind farm zones

Selecting suitable search areas up to and including 2030

The Draft North Sea Programme of March 2021 identified search areas for the construction of wind farms aimed at reducing CO_2 to meet 2030 targets. An initial selection procedure determined which search areas (see map in Section 9.4) could be rejected as wind farm zones up to 2030.

[128] In the revised North Sea Programme, the nearby Lagelander has been dropped as a wind farm zone and is also no longer a search area. For that reason, research into relocation of EHD41 is no longer necessary.
[129] In the revised North Sea Programme, search area 4 has also been dropped for the long term due to the increased demand for space for military exercises.

- Search areas 3, 6 and 7 cannot be developed before 2030, as it will not be possible to establish cable landing points (for transmission of offshore energy to land) in time. Where search area 3 is concerned, its isolated position and the distance from the wind farm zone were factors that influence this as well. In relation to search areas 6 and 7, the creation of electricity infrastructure is at present either not viable or not sufficiently cost-effective. In the longer term, transmission via molecular energy carriers, such as hydrogen, may play a role in this respect.
- Search area 4 cannot be developed before 2030 as it overlaps with military exercise area EHD42. According to investigations, moving EHD42 has not been deemed possible. The possibilities of combined use demand further investigation, which cannot be completed in time for a decision on creation of a wind farm before 2030.
- Search areas 8 and 5 median strip involve increased safety of navigation risks that are currently being assessed. Further considerations on this require more time. As area 5 median strip has an impact on an international shipping route and borders on German territory, it is necessary to consult with and look into this in collaboration with Germany.

The areas referred to above are included in this spatial plan as search areas for the task of generating offshore wind energy beyond 2030, but will not be considered potential wind farm zones before 2030 (see section 9.4).

Dealing with as yet unused sections of existing wind farm zones

The National Water Plan 2016-2021 designated the as yet unused wind farm zones of IJmuiden Ver (north), Hollandse Kust (southwest) and Hollandse Kust (northwest). In addition to this, there is also space in the southern section of Hollandse Kust (west) that has not been used so far. Considerations have taken place on whether these areas need to be confirmed, and if this is possible.

- IJmuiden Ver (north), which offers space for 2 GW, may offer synergy gains in relation to the development of IJmuiden Ver. This makes IJmuiden Ver (north) relatively quick to develop. As a result, IJmuiden Ver (north) is eligible for reconfirmation.
- The southern section of Hollandse Kust (west), where there is space for the missing 0.7 GW that is key to delivering the 49 per cent CO_2 reduction target, could similarly be developed quickly and cost-effectively. So the southern section of Hollandse Kust (west) will also be eligible for reconfirmation. Moreover, in the northern section of Hollandse Kust (west) site decisions are already being prepared.

- Having considered the ecological effects[130] [131][132] [133] [134] [135], effects on other uses[136][137] [138], possibilities for cable landing[139] and cost-effectiveness for society[140] [141] [142] it has been concluded that both IJmuiden Ver (north) and the southern section of Hollandse Kust (west) can be reconfirmed as wind farm zones. This is explained in Section 9.3.2. This also covers the associated conditions, starting points and points for action for the subsequent process.
- Hollandse Kust (southwest) and Hollandse Kust (northwest) are particularly unsuited to use as wind farm zones considering fisheries, nature and shipping. As there is sufficient space to perform the task arising from the target of 55 per cent CO_2 reduction in the remaining areas, these areas will be discarded as wind farm zones. Not just in the period before 2030 but after 2030, too.

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[130] Advice on future assessment of ecosystem effects from offshore wind farms, Advice for KEC, Deltares (Van Duren), October 2021.

[131] Cumulative population-level effects of habitat loss on seabirds 'KEC 4.0' report C070/21, Wageningen University & Research (Soudijn et al.).

[132] Cumulative impact assessment of collisions with existing and planned offshore wind turbines in the southern North Sea. Analysis of additional mortality using collision rate modelling and impact assessment based on population modelling for development according to roadmap 2030 and Versnelling, Bureau Waardenburg (Potiek et al.), October 2021.

[133] (Offshore Wind Energy in accordance with the North Sea Programme. Recommendations for the avoidance of effects on populations of marine mammals due to the accelerated creation of wind farms in the period 2016 - 2030), Heinis en De Jong, October 2021.

[134] (Supplementary Appropriate Evaluation for the Amended Draft of the North Sea Programme 2022 - 2027), Pondera (Van de Bilt et al.), October 2021.

[135] Aanvullende PlanMER voor het Aanvullend Ontwerp van het Programma Noordzee 2022-2027, Pondera (Van de Bilt et al.), oktober 2021.

[136] Aanvullende PlanMER voor het Aanvullend Ontwerp van het Programma Noordzee 2022-2027, Pondera (Van de Bilt et al.), oktober 2021.

[137] Aanvullende analyse van de economische effecten van inrichtingsvarianten voor de Noordzee tot 2040/2050, Wageningen Economic Research (Roebeling et al.), June 2021.

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

[139] Effects Analysis, Investigation of cable landing points for offshore wind energy (VAWOZ), Assessment memorandum, Ministry of Economic Affairs and Climate, September 2021.

[140] Aanvullende analyse van de economische effecten van inrichtingsvarianten voor de Noordzee tot 2040/2050, Wageningen Economic Research (Roebeling et al.), June 2021.

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

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

New to be designated wind farm zones

In search areas 1, 2 and 5 (east) from the Draft North Sea Programme of March 2021, development of wind farms is possible before 2030. These areas are displayed on the spatial development strategy map as designated wind farm zones. This takes into account the retention of space for the military exercise area EHD41.

For this designation the ecological effects,[143] effects on other uses,[144] possibilities for cable landing[145] and cost-effectiveness for society[146] have been identified and carefully considered. In determining the cost-effectiveness for society, energy yield and construction costs, including

[143] Advice on future assessment of ecosystem effects from offshore wind farms, Advice for KEC, Deltares (Van Duren), October 2021.

Cumulative population-level effects of habitat loss on seabirds 'KEC 4.0' report C070/21, Wageningen University & Research (Soudijn et al.).

Cumulative impact assessment of collisions with existing and planned offshore wind turbines in the southern North Sea. Analysis of additional mortality using collision rate modelling and impact assessment based on population modelling for development according to roadmap 2030 and Versnelling, Bureau Waardenburg (Potiek et al.), October 2021.

(Offshore Wind Energy in accordance with the North Sea Programme. Recommendations for the avoidance of effects on populations of marine mammals due to the accelerated creation of wind farms in the period 2016 - 2030), Heinis en De Jong, October 2021.

(Supplementary Appropriate Evaluation for the Amended Draft of the North Sea Programme 2022 - 2027), Pondera (Van de Bilt et al.), October 2021.

Aanvullende PlanMER voor het Aanvullend Ontwerp van het Programma Noordzee 2022-2027, Pondera (Van de Bilt et al.), oktober 2021.

[144] Aanvullende PlanMER voor het Aanvullend Ontwerp van het Programma Noordzee 2022-2027, Pondera (Van de Bilt et al.), oktober 2021.

Aanvullende analyse van de economische effecten van inrichtingsvarianten voor de Noordzee tot 2040/2050, Wageningen Economic Research (Roebeling et al.), June 2021.

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

[145] Effects Analysis, Investigation of cable landing points for offshore wind energy (VAWOZ), Assessment memorandum, Ministry of Economic Affairs and Climate, September 2021.

[146] Aanvullende analyse van de economische effecten van inrichtingsvarianten voor de Noordzee tot 2040/2050, Wageningen Economic Research (Roebeling et al.), June 2021.

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

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

cable landing[147], were considered. Estimations were also made regarding possible measures for the safety of maritime traffic[148] and potential yield loss by fisheries[149].

The reformed and new areas together provide physical space to accommodate 16.7 GW. Designation of these wind farm zones is subject to the condition that a maximum of 10.7 GW is developed until 2030. Section 9.3.2 describes conditions, starting points and points for action that are associated with determining the final areas that will be used to achieve 10.7 GW within the total available space in the designated areas. These concern the ecological carrying capacity, possibilities for cable landing, dealing with other uses (shipping, mining and fisheries) and multi-functional use within wind farms (including recreation, fisheries, aquaculture and alternative sustainable forms of energy). Designating an overcapacity of space now gives the flexibility to leave wind farm zones (or parts thereof) vacant at a later stage in order to achieve optimum spatial integration, and to limit ecological effects. Sand extraction is not addressed in the conditions, starting points and points for action; the designated wind farm zones are situated too far from the coastline for that. Preparation of the site decisions will address how to deal with archaeological values, according to the legal frameworks.

Follow-up in the context of spatial adaptive planning

Designation of wind farm zones

The designation of new wind farm zones and the reconfirmation of existing zones encompasses a spatial reservation in the North Sea Programme. This is the first step in a process that after the preparation of a roadmap will result in wind farm site decisions, in which the locations of wind farms are determined in more detail. According to Article 3(2) of the Offshore Wind Energy Act, a site decision can only be taken in the duly designated wind farm zones. For the designation of wind farm zones, an integrated assessment is carried out, making use of a wide range of studies. A Strategic Environmental Assessment (SEA) and Appropriate assessment are also required.

Roadmap

The Ministry of Economic Affairs and Climate Policy will draw up the Offshore Wind Energy Roadmap in consultation with other departments, and following a participation process with various stakeholders. The roadmap species those designated wind farm zones in which site decisions are actually being prepared. This process is accompanied by an integrated assessment, making use of studies into the ecological effects and possibilities for the integration with regard to other uses.

Site decisions

On the basis of Article 3(1) of the Offshore Wind Energy Act, the Minister for Climate and Energy can take a wind farm site decision in consultation with the Ministers of Infrastructure and Water Management and for Nature and Nitrogen. In this decision, the location of a wind farm is

[147] Effects Analysis, Investigation of cable landing points for offshore wind energy (VAWOZ), Assessment memorandum, Ministry of Economic Affairs and Climate, September 2021.

[148] Aanvullende analyse van de economische effecten van inrichtingsvarianten voor de Noordzee tot 2040/2050, Wageningen Economic Research (Roebeling et al.), June 2021.

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

determined, together with the essential preconditions relating to ecological effects and other uses. This integrated assessment is supported by arguments based on detailed studies, area surveys and a project EIA, including an Appropriate assessment.

Tendering and construction
Once a site decision has been taken, this is followed by issuing the site through a tendering procedure. Based on this procedure, the future wind farm operator is selected. The operator can then prepare and implement the construction work.

Relationship with land fall
The plans for wind farm zones and site decisions on the one hand and the electricity infrastructure on the other are based on mutual consultation and coherence. Separate procedures apply to the cable routes for the offshore grid. Promising cable routes are first investigated in an informal survey process. For those routes identified as potentially successful, spatial procedures follow, in which the various alternatives/variants for cable routes are investigated. Only if there are possibilities for a cable landing point is a wind farm zone designated. A site decision is only taken for locations from which the genera ted electricity can be transmitted to shore.

Knowledge development
Within the process described above, which – including realisation – will take between 8 and 10 years, constant use is being made of the latest knowledge and insights. With regard to knowledge on the ecological effects, use is made of the Ecology and Cumulation Framework (KEC). The KEC is updated from time to time based on the most recent insights obtained through research, including in existing wind farms. This means that in the time between the spatial reservation of the wind farm zones and the actual site decisions, knowledge gaps can be addressed using the latest knowledge and new insights, considering the ecological carrying capacity, optimum spatial integration and the possibilities for multiple use.

9.3.2 Conditions and agreements for the follow-up process for offshore wind energy

The designation of wind farm zones is subject to the conditions, starting points and points for action listed below, in relation to the follow-up process. This takes into account the establishment of the Roadmap 2030+ and the preparation of site decisions. Consensus on these conditions, starting points and points for action has been reached within the North Sea Consultation body, the group of stakeholders, including national government, that deals with the implementation of the North Sea Agreement.

1. **Maximum 10 GW + 0.7 GW until 2030**

The designated wind farm zones IJmuiden Ver (north), the southern section of the Hollandse Kust (west) and wind farm zones 1, 2 and 5 (east) offer maximum space for 16.7 GW of wind energy. The underlying precondition is that of this total, a maximum of 10.7 GW will be developed until 2030. The areas in which and the order according to which the available space will be used for wind farms will be determined in the framework of the Roadmap Offshore Wind Energy 2030+. The Ministry of Economic Affairs and Climate Policy will draw up this roadmap in consultation with other departments. This will be subject to an integrated assessment. The (sub)areas not used will be reconsidered as wind farm zones for the period after 2030, whereby the search areas for beyond 2030 will also be taken into consideration. This reconsideration is part of a partial revision of the North Sea Programme.

2. **Ecological carrying capacity: research and measures for nature enhancement**

The development of wind farms is only possible within the ecological carrying capacity and subject to the application of the precautionary principle. The conditions and points for action listed below take this into account. In determining the ecological effects of wind farms in the new wind farm zones, research has shown that for the majority of species and Natura 2000 areas, the development of 10.7 GW of wind farms is possible within the ecological space.[150] [151]

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[150] Advice on future assessment of ecosystem effects from offshore wind farms, Advice for KEC, Deltares (Van Duren), October 2021.

Cumulative population-level effects of habitat loss on seabirds 'KEC 4.0' report C070/21, Wageningen University & Research (Soudijn et al.).

Cumulative impact assessment of collisions with existing and planned offshore wind turbines in the southern North Sea. Analysis of additional mortality using collision rate modelling and impact assessment based on population modelling for development according to roadmap 2030 and Versnelling, Bureau Waardenburg (Potiek et al.), October 2021.

(Offshore Wind Energy in accordance with the North Sea Programme. Recommendations for the avoidance of effects on populations of marine mammals due to the accelerated creation of wind farms in the period 2016 - 2030), Heinis en De Jong, October 2021.

(Supplementary Appropriate Evaluation for the Amended Draft of the North Sea Programme 2022 - 2027), Pondera (Van de Bilt et al.), October 2021.

Aanvullende PlanMER voor het Aanvullend Ontwerp van het Programma Noordzee 2022-2027, Pondera (Van de Bilt et al.), oktober 2021.

[151] Achtergronddocument Passende Beoordeling Aanvullend Ontwerp Programma Noordzee vogels, vleermuizen, vissen en benthos, Bureau Waardenburg (Gyimesi et al.), October 2021.

[152] For a limited number of species and aspects, this is critical – based on the current state of knowledge, and taking related uncertainties into account. Specific agreements on these issues have been included.

2.1 The studies conducted show that the ecological carrying capacity on the North Sea is limited; here the precautionary principle applies in relation to the conservation goals and achieving good environmental status according to European legal frameworks. Designation therefore takes place under the condition that the relevant knowledge gaps are addressed before irreversible steps are taken. At the moment that site decisions are taken, the necessary ecological space must have been demonstrated. Wherever necessary, mitigating measures must be taken. Nature enhancement measures can also contribute to the ecological space.

2.2 To remain within the ecological carrying capacity, the aim is to increase knowledge and to take measures to enhance nature. The uncertainties and knowledge gaps described below help set the course for the necessary research into the nature-inclusive development of offshore wind energy. We must prevent the wind farms taking up so much ecological space before 2030 that the realisation of wind farms after 2030 becomes more complicated. For that reason, the vulnerabilities relating to the wind energy task after 2030 will be further mapped out. In the framework of the Monitoring, Research, Nature Restoration and Species Protection Programme (MONS) and the Offshore Wind Ecological Programme (Wozep), the necessary research will be carried out over the coming years. An additional boost is needed in order to address the identified knowledge gaps in time.

2.3 For two species, the ecological limit has already been reached, based on the current state of knowledge and the current working standards. The species in question are the herring gull and the northern gannet.[153] There are, however, specific uncertainties about the density of the herring gull population and the extent to which the northern gannet avoids wind turbines. Further investigation into these aspects may reveal that there is still sufficient ecological space available for these two species. Before irreversible steps are taken, the relevant uncertainties will be further addressed.

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[152] Windenergie op zee 2016-2030 inclusief zoekgebieden voor versnelling aanleg, cumulatieve effecten op zeezoogdieren, Heinis, October 2021.

[153] Cumulative impact assessment of collisions with existing and planned offshore wind turbines in the southern North Sea. Analysis of additional mortality using collision rate modelling and impact assessment based on population modelling for development according to roadmap 2030 and Versnelling, Bureau Waardenburg (Potiek et al.), October 2021.

(Supplementary Appropriate Evaluation for the Amended Draft of the North Sea Programme 2022 - 2027), Pondera (Van de Bilt et al.), October 2021.

Aanvullende PlanMER voor het Aanvullend Ontwerp van het Programma Noordzee 2022-2027, Pondera (Van de Bilt et al.), oktober 2021.

Achtergronddocument Passende Beoordeling Aanvullend Ontwerp Programma Noordzee vogels, vleermuizen, vissen en benthos, Bureau Waardenburg (Gyimesi et al.), October 2021.

2.4 The development of 10.7 GW appears viable within the ecological space for the black-legged kittiwake and the great black-backed gull.[154] As yet it is uncertain whether this applies to every possible distribution of 10.7 GW over the available space. This will be further investigated during the determination of the spatial distribution of the future wind farms.

2.5 In determining the effects on marine mammals, it has become clear that harbour porpoises are the most vulnerable. On the basis of current knowledge, the development of 10.7 GW is only viable if, during the construction of wind farms, a noise standard of SELSS (750 m) = 160 dB re 1 µPa2s is applied in the IJmuiden Ver areas and the designated and reformed wind farm zones.[155] At present, the noise standard of SELSS (750 m) = 168 dB re 1 µPa2s applies. There are indications (Dähne et al. (2015) and Tougaard et, al (2017)) that in determining the effects, better account can be taken of differentiation of noise frequencies that cause hinder to porpoises. For that reason, the need to redefine the noise standard is being investigated. In this regard, it is necessary to take account of the long-term task for offshore wind energy and international developments. The wind energy sector and the North Sea Consultation are involved in all these studies and considerations.

2.6 According to estimates, area 5 (east) is more sensitive to the ecosystem effects described than other wind farm zones to be designated or reconfirmed[156]. The use of area 5

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[154] Cumulative impact assessment of collisions with existing and planned offshore wind turbines in the southern North Sea. Analysis of additional mortality using collision rate modelling and impact assessment based on population modelling for development according to roadmap 2030 and Versnelling, Bureau Waardenburg (Potiek et al.), October 2021.

(Supplementary Appropriate Evaluation for the Amended Draft of the North Sea Programme 2022 - 2027), Pondera (Van de Bilt et al.), October 2021.

Aanvullende PlanMER voor het Aanvullend Ontwerp van het Programma Noordzee 2022-2027, Pondera (Van de Bilt et al.), oktober 2021.

Achtergronddocument Passende Beoordeling Aanvullend Ontwerp Programma Noordzee vogels, vleermuizen, vissen en benthos, Bureau Waardenburg (Gyimesi et al.), October 2021.

[155] Windenergie op zee volgens Programma Noordzee, Advies voor het vermijden van effecten op populaties van zeezoogdieren door de versnelde aanleg van windparken in de periode 2016 – 2030, Heinis en De Jong, oktober 2021.

(Supplementary Appropriate Evaluation for the Amended Draft of the North Sea Programme 2022 - 2027), Pondera (Van de Bilt et al.), October 2021.

Aanvullende PlanMER voor het Aanvullend Ontwerp van het Programma Noordzee 2022-2027, Pondera (Van de Bilt et al.), oktober 2021.

Achtergronddocument Passende Beoordeling Aanvullend Ontwerp Programma Noordzee vogels, vleermuizen, vissen en benthos, Bureau Waardenburg (Gyimesi et al.), October 2021.

[156] Advice on future assessment of ecosystem effects from offshore wind farms, Advice for KEC, Deltares (Van Duren), oktober 2021.

(Supplementary Appropriate Evaluation for the Amended Draft of the North Sea Programme 2022 - 2027), Pondera (Van de Bilt et al.), October 2021.

(east) is only possible on condition of ecological integration. The vulnerability of the Wadden Sea is an important point of attention for landfall in area 5 (east).

2.7 In general, the knowledge base on ecosystem effects needs to be reinforced. The research this requires is also relevant for the long-term task with more search areas in the northern North Sea. Adjustments in wind farm layout may make it possible to mitigate ecosystem effects to some extent.

2.8 The focus on nature-enhancing measures is expected to influence the overall status of the North Sea ecosystem in a positive way, and hence also the possibilities for the growth of wind energy from an ecological point of view. In the realisation that nature is not inherently 'makeable', viability and expected effects will first be investigated. This refers for example to measures to improve the survival or breeding success of critical species in the Netherlands or in the surrounding countries. Whether the later will be feasible requires further attention. Nevertheless, the international dialogue on the necessity of a cross-border approach to the development of wind energy and other use in balance with the capacity of the ecosystem must be intensified: see also condition 10.

3. Leap to the north

The ambition in designating and using wind farm zones is to put all possible effort into a 'leap to the north'. This is because of:

a. administrative agreements with among others Groningen, to invest in and encourage electricity infrastructure in and around Delfzijl;
b. stipulations within the North Sea Agreement, against the background that wind farm development in the north has fewer effects on other uses such as fisheries and maritime traffic, and may also have less ecological impact. This will be further investigated;
c. the long-term offshore wind energy task, with economies of scale in the north after 2030 due to improved cost effectiveness and possible opportunities for transmission via molecular energy carriers (hydrogen) and connectivity with the energy infrastructure from and to other North Sea countries (energy hubs).

The intended 'leap to the north' ties in with the search areas for wind energy after 2030, almost all of which lie in the north (see section 9.4). For the period through to 2030, a possible first step could be taken by making use of wind farm zone 5 (east). This of course subject to the condition of ecological integration, as described in point 2.6.

4. Interaction with maritime traffic

4.1 Through wind farm zone 1 and IJmuiden Ver (north), a clearway between IJmuiden and Newcastle is required, also connecting with the Fair Isle Passage and with the future Northern Sea Route. The minimum necessary width for this clearway will be 6,400 metres. In particular in wind farm zone 1, the location of the clearway will be further specified. As long as mining platform K13-A remains in position, the width of the clearway through this wind farm zone will be 7,400 metres, in coherence with the safety zone required for that platform.

4.2 Wind farm zone 5 (east) shares a boundary in the south with the East Friesland shipping route, which continues through to the German EEZ, along which route wind farms are also

planned. Safety margins along this route will be determined in consultation with Germany. Against this background, space for a wide safety margin has been displayed on the spatial development strategy map. To the west, area 5 (east) shares a boundary with the international shipping route towards the Baltic Sea, known in Germany as route SN10. On the basis of the safety study (Formal Safety Assessment, FSA)[157] a connecting corridor through area 5 (east) has been decided against. The issue of dealing with the shipping route to the Baltic Sea in combination with the area 5 median strip will be addressed during the partial revision.

4.3 As a result of the construction of wind farms, the risks to shipping safety increase. These increased risks will be evaluated on the basis of model studies. Mitigating measures will be necessary in order to limit the risks as far as possible. These measures have been mapped out in qualitative terms. Over the coming years, they will be elaborated in greater detail when drawing up the Roadmap 2030+, and the site decisions to be taken. Taking the required measures is a precondition for the further development of wind farms.

5. Interaction with mining

In some parts of the designated wind farm zones – above all in wind farm zone 2 (north) – there are mining platforms that will remain in production after 2030. Research will have to show how many GW can be realised in these particular areas before 2030. Also with regard to the other wind farm zones, an assessment will be made in consultation with the mining sector of how wind energy and mining, and possibly also CO_2 storage, can be combined in time and space.

6. Interaction with fisheries

With regard to drafting this North Sea Programme, the current value for fisheries in the search areas has been determined[158]. In the framework of the North Sea Agreement, funds have been reserved for adapting the cutter feet, with improved sustainability being a key objective. The measures are elaborated in the Cutter Vision. In the context of the further roll-out of offshore wind energy, additional resources will be made available for the fishing sector. The national government will closely monitor the actual practical effects on fisheries and how fishermen will adapt their activities if there is less space to fish and, moreover, a great many developments are taking place at the same time. In 2022, the government will carry out a socio-economic impact analysis into the consequences of all major developments for the fish cluster as a whole. The analysis will provide relevant information to determine whether and, if so, which measures are needed for (parts of) the fish cluster to adapt. This will be followed by monitoring and development of a model to simulate the consequences of policy. This will be linked with, among others, the Monitoring, Research, Nature Enhancement and Species Protection programme (MONS). In that context, it is expected that a model will be developed to predict the consequences of area closures for fisheries and the ecology.

7. Multifunctional use

The starting point is that whenever possible, wind farm zones should be available for multifunctional use. This includes options for recreational boating and fishing to navigate passages, permitting forms of fishing and aquaculture, and sustainable energy generation other than with wind turbines. The national government will guide these developments by means of

[157] FSA Routing Baltic, Report no. 32774-1-MO-rev.1.0, MARIN (Koldenhof et al.), October 2021.

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

area assessments (in preparing the site decisions) and, in more detail, in the event of issuing area passport guides following the release of sites (see section 10.2). The assessment framework for co-use in wind farms is also applied for this (see Section 10.3).

8. Density of wind turbines

In determining the potential capacity that can be installed in a particular area, 10 MW per km2 has been assumed, whereby the areas are not entirely filled, with a view to further spatial integration. The density of 10 MW per km2 will remain the starting point in the further elaboration of the roadmap and in site decisions, in order to ensure an efficient use of the North Sea within the carrying capacity of the ecosystem. 10 MW per km2 is a higher density than previously adopted, which at the time was 6 MW per km2. Higher density will result in lower electricity output. Studies by Blix[159] have shown that profitable wind farms still remain possible in the designated wind farm zones. At the same time, there may be other advantages to lower densities, such as fewer ecological effects or more possibilities for multifunctional use. For that reason, the starting point of 10 MW/km2 may be altered if research shows that efficient use of space remains possible and this results in an improved balance between energy production, co-use and ecological carrying capacity.

9. Relationship with landfall

The generated wind energy must consequently be transmitted to land, for the time being via electricity cables. Based on the results of the VAWOZ 2030[160], an initial selection has been made of potentially feasible routes. Over the coming years, possible cable routes will be investigated for all new zones to be designated. It remains uncertain whether all these routes are actually viable, desirable or even permittable; this will only become clear when the studies have been carried out in the framework of spatial procedures. The planning principle applied is adaptive, which may, for example, lead to investigated routes not being put into use, or alternative routes being chosen. In distributing the maximum volume of 10.7 GW over the designated wind farm zones in the Roadmap 2030+, there will be intensive consultation with the studies into the cable routes, in order to ensure compatibility. The site decisions for wind farms and decisions on accompanying cable routes will also be implemented as a coherent process. This will ensure that for each wind farm, the offshore location and cable route are viable, so that both the construction of the wind farm and the cable landing point for electricity can be achieved.

10. International cooperation

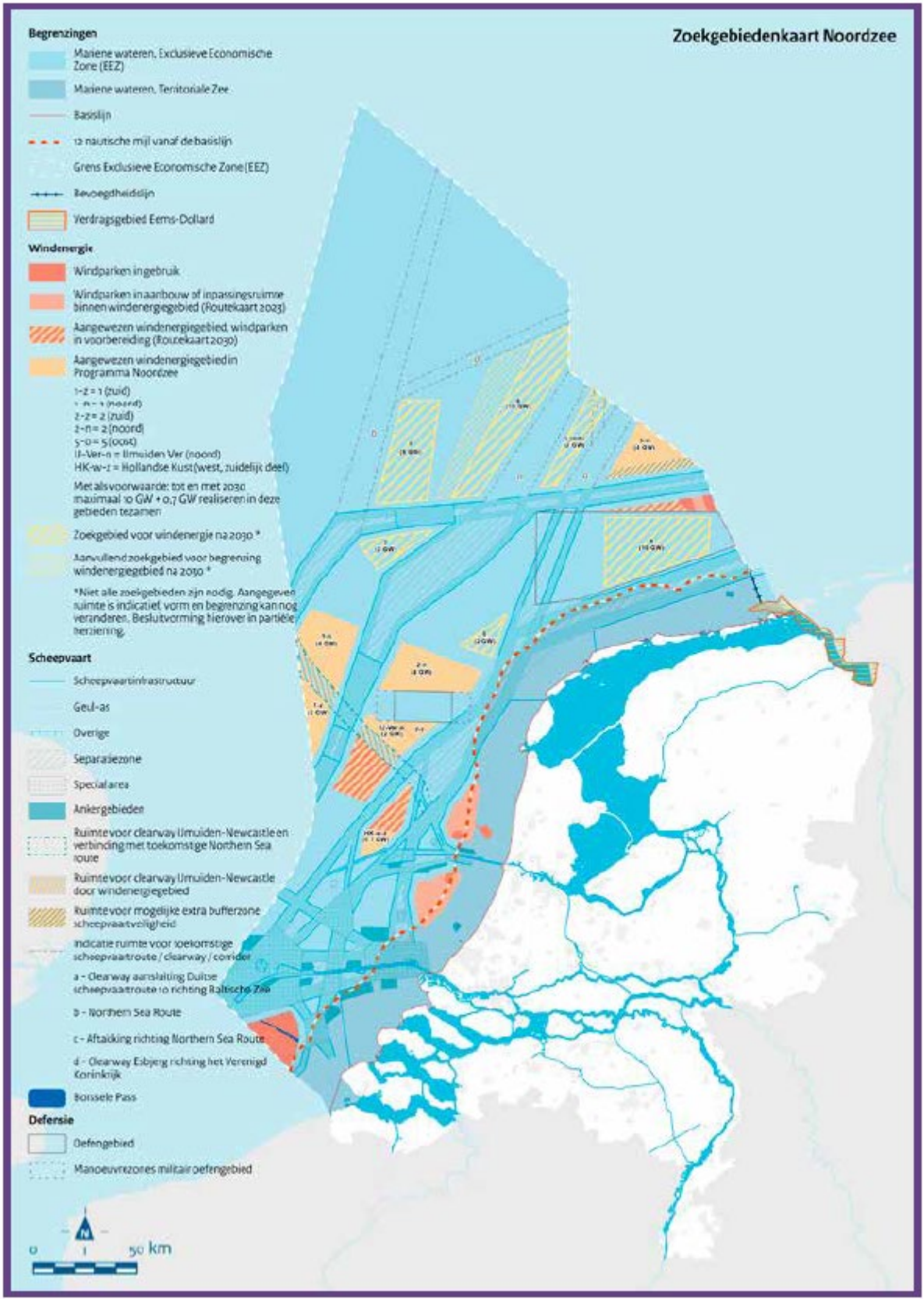
Within the planned growth of offshore wind energy, international cooperation is becoming increasingly urgent. The tension between offshore wind energy, nature objectives, fisheries and other uses is by definition a cross-border issue; other North Sea countries are also looking to find the right balance in this. Spatial developments and measures in the neighbouring countries will have effects on the ecological space in our part of the North Sea, and vice versa. There are also European frameworks and guidelines that call for international coordination in the field of achieving good environmental status and spatial planning. Ecological effects, research into those effects and measures that can be taken in order to encourage nature enhancement must therefore be seen in an international perspective. This can for example result in taking nature-

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

[160] Effects Analysis, Investigation of cable landing points for offshore wind energy (VAWOZ), Assessment memorandum, Ministry of Economic Affairs and Climate, September 2021.

enhancing measures at locations where they are most effective for good environmental status and protection of species in our country and in neighbouring countries.

Other examples of subjects that can best be viewed in the international context of the North Sea basin include: safeguarding the safe and efficient passage of international maritime traffic, international links between energy infrastructure and energy hubs and the protection of nature conservation areas. All these elements call for greater mutual consultation and coordination between the various North Sea countries in order to arrive at the balanced development of the North Sea. The match between European fisheries policy, European biodiversity policy and the elaboration of European climate goals will also require greater attention over the coming years. Against that background, the Netherlands has taken the initiative of developing a cross-border strategic approach together with the surrounding North Sea countries, so that issues such as spatial planning can be carried out in better mutual consultation. See Section 9.6.



Map 4: Search area map North Sea.

9.4 Search areas and spatial explorations

Search areas for wind energy beyond 2030[161]

Over the coming decades, considerable further growth of offshore wind energy is expected, which in turn will demand additional space. The necessary space will be designated in a partial revision of this North Sea Programme. Preparation for this revision will start following the adoption of this programme. The minimum scenario of 38 GW offshore wind energy according to the Netherlands Environmental Assessment Agency (PBL) will serve as the starting point for the scale of this task. In addition to the spatial reservations for wind energy previously made within the North Sea Programme, on the basis of the 38 GW scenario, space will be required for a further 17 GW. The search areas map (map 4) shows the potential search areas in question. Together, these offer space for around 34 GW, which amounts to twice the required total. The ecological vulnerabilities and shipping safety risks of these areas have already been partially mapped out. Other studies still have to be started. Social costs and benefits have already been investigated and may have to be further investigated given the latest insights into energy hubs and energy transmission using molecular energy carriers such as hydrogen. For the wind farms beyond 2030, these too will have to ft in with the ecological carrying capacity of the North Sea. For each search area, the following additional points of attention will have to be considered (non-exhaustive list):

[161] In this revised North Sea Programme, search areas 6 and 7, including the space between them, have been considered for the designation of wind farm zones for beyond 2032. For the longer term, search areas 4, 5 central reservation and 8 have been dropped. See Section 9a.3.1

Search area (#GW)	Points for attention and studies
3 (2 GW)	Relatively small search area, investigate the possibilities for connection with other wind farm zones.
4 (10 GW)	Overlap with military exercise area EHD42, investigate the possibilities of co-use. Shape and boundaries are to be optimised in relation to ecological effects and other uses. In the southern part, additional shipping safety risks and need for more space between shipping route and wind farm zone. In the southern part, a view from the coast may also play a role. Check whether the boundaries on the east and west side should be aligned with MSFD areas.
5 median strip (2 GW)	Shipping safety risks and routing measures of the clearway to the Baltic Sea will be further investigated in a Formal Safety Assessment. Consultation with Germany is ongoing.
6 (10 GW)	The search area map indicates additional search space (in a lighter colour). The shape and boundaries of the search area are to be optimised in relation to nature, fishing, shipping, mining activities or other uses. Possibilities of energy hubs and energy transmission via molecular energy carriers such as hydrogen are being investigated. This includes an assessment of whether the existing gas infrastructure can be used in order to limit the spatial and ecological impact.
7 (8 GW)	The shape and boundaries of this search area are to be optimised in relation to ecological effects and other uses. This area is less unfavourable for fisheries than other areas, but the social cost effectiveness analysis (MKEA) revealed negative social benefits. The possibilities of energy hubs and energy transmission via molecular energy carriers such as hydrogen are being investigated. These developments may increase cost effectiveness. The investigation will include an assessment of whether existing gas infrastructure can be used to limit the spatial and ecological impact.
8 (2 GW)	This is a relatively small search area requiring a higher density than 10 MW/km^2. Decisions will still have to be taken on the feasibility of wind farms in this area, taking account of high shipping risks, probably relatively extensive ecological effects, but fewer unfavourable effects for fisheries than elsewhere.

Maritime transport[162]

Guaranteeing safe international navigation of ships from the Dutch EEZ to the Baltic Sea and vice versa, and the need to ensure optimum use of the existing polar route led to the decision to designate the following spatial indications for shipping routes, clearways and corridors. The growing size of ships and the necessity of routing measures as a result of new wind farms beyond 2030 also play a role. On the search area map, these are spatial indications. The space required will be put on the spatial development strategy map in a partial revision of this North Sea Programme. This will be done in coordination with interested sectors and neighbouring

[162] In this revised North Sea Programme, the locations of clearways have been marked on the Maritime Spatial Plan map. These have been slightly adjusted in respect of the search areas map. See Ch9a.2

countries. The location depends on the designation of wind farm zones, the possible consequences for other uses and nature, and on the location of routes in neighbouring countries. Clearways are formally laid down in the Mining Regulations and, as soon as the Environment and Planning Act has entered into force, in the Environment and Planning Regulations.

- Northern Sea Route connection (NSR). In an international context, various routes are being explored. In the Dutch part, search space has been indicatively identified for a new route to the west of search area 7. In addition, space for connections has been identified for connections between ports and the NSR.
- Clearway Esbjerg - United Kingdom. Indicative search area for this has been mapped north of search areas 6 and 7, to continue to facilitate the existing shipping route between Denmark and the United Kingdom.
- A clearway towards the Baltic Sea that connects with German shipping route 10 (SN10). To guarantee international navigation from the southern North Sea towards Denmark and the Baltic Sea, a clearway that connects to the SN10 will be specified in consultation with Denmark, Germany and Belgium. Different options for the design of this clearway have been studied in a Formal Safety Assessment (FSA). This included a consideration of the safety risks. This national clearway consists of connections with the SN10 and the NSR.
- This FSA is an essential building block for integrated consideration in an international context in order to determine the viable potential of search area 5 median strip, including the consequences for accessibility and safety of navigation, and for the investigation of possible mitigating measures.

9.5 Land-sea interactions

The spatial decision-making process at sea and in the main water system is organised differently from the process on land. On land and in large parts of the coast on the landside of the low waterline, national government, provinces, municipalities and water authorities have a shared responsibility for spatial policy. In all cases where activities on sea and on land require a coherent decision, coordination is required between the various layers of government, while respecting the responsibilities and competences of each.

This section describes the land-sea interactions that demand attention from multiple levels of government during the planning period. This provides public authorities with a compact overview of the joint agenda for the spatial-ecological and spatial-economic decision and policy-making process on the use of the sea.

9.5.1 Ecology, biodiversity and nature

In all large waters and the surrounding areas (such as dunes and islands), there are tasks for nature, biodiversity and nature recovery/nature development. The programmes of measures for the WFD, MSFD and Natura 2000 together ensure the good ecological status of the waters that form the transitions between land and sea, including all transitional waters. The dune areas also deserve attention. The EU Biodiversity Strategy (EBS), a vital spearhead within the EU Green Deal, aims to place biodiversity in Europe on the road to recovery by 2030 at the latest. During the coming planning period, the EBS for 2030 for the Netherlands and the neighbouring countries around the North Sea has to be elaborated. The ambition is to achieve 30 percent area

protection, of which one-third strict protection, while ensuring the cross-border coherence among protected nature areas.

Based on the criteria for area protection elaborated and adopted by the EU in 2021 and the nature recovery targets to be laid down in law, clarity will be provided on which additional actions are (possibly) necessary for nature areas at the land-sea interface. This is specifically relevant with regard to migratory birds, migratory fish and their respective habitats. National government and local and regional authorities (primarily provinces) will work together on this, each from their respective responsibilities. Cooperation of this kind is also relevant in the implementation of the Zero Pollution Action Plan of the EU, in order to reduce air, water and soil pollution to levels that are not harmful to people and nature. This action plan will be further elaborated in the EU in 2021.

9.5.2 Energy: offshore production, conversion into hydrogen and connection to land

The offshore energy transition and the landfall of energy produced offshore will be a dominant focus area for national and regional governments during the planning period.

The landfall of energy, in the form of electricity or hydrogen, offers huge opportunities for the regions concerned. In the transition to a CO_2-neutral society by 2050, the availability of green energy will become increasingly important. Moreover, offshore wind energy is crucial for the Netherlands in order to achieve its climate goals and at the same time retain employment in the country. The supply of electricity from the sea is already an important reason for (foreign) companies to establish themselves in the Netherlands, and this importance is only set to grow further. Landfall regions are already responding, as reflected for example by the hydrogen ambitions of Groningen, Noord-Holland-Noord and the North Sea Canal area. Realisation of these ambitions will depend entirely on the timely availability of a substantial energy supply. Over the coming decades, this will determine the development of the region. For the regions Rotterdam, Zeeland and the North Sea Canal area as well, timely availability of energy is important to make a start on creating a hydrogen chain that could take over the role of fossil energy in these areas in the long term.

To facilitate landfall by 2030, a start must be made on the spatial procedures in good time, since the procedures themselves will take between 8.5 and 10 years. Once it becomes clear where, how much and in what form energy from the sea will be brought to land, there will also be clarity on the nature of the infrastructure that will have to be created on land and what economic effects this will bring about. Bringing the electricity from offshore wind energy to shore, mainly at locations where there is high demand, can help limit the volume of new infrastructure that has to be built on land. This could place severe demands on the municipalities close to cable landing locations near industrial clusters. In the short term, the infrastructure already in place will make certain regions more attractive than other regions but in the long term (after 2030), other potential cable landing locations will become available to make the landfall of offshore wind energy as efficient as possible.
On the road to 2040, the possibilities for the landfall of energy in the form of molecular energy carriers such as hydrogen are expected to grow. The big advantage of transport of this kind is that in part, infrastructure already installed offshore (pipelines) can be used, and that more

energy can be transmitted simultaneously through a single pipeline, thereby restricting the spatial impact both on- and offshore.

The Ministry of Economic Affairs and Climate Policy is responsible for the necessary onshore and offshore infrastructure. The main energy infrastructure and sustainable industry infrastructure programmes are collaborating with the Investigation of cable landing points for offshore wind energy (VAWOZ) on the energy infrastructure in the Netherlands, with a view to regional opportunities.

9.5.3 Carbon capture and storage (CCS) and storage and transport of hydrogen

Within the Climate Agreement there is attention for capture and storage of CO_2, including the agreement that the permanent storage of CO_2 will only take place beneath the seabed (in depleted oil and gas fields and possibly also aquifers). The aim is above all to reduce the emission of CO_2 by specific industrial sectors. In the future, storage locations in the (deep) seabed will also be relevant for the large-scale production and storage of hydrogen or the realisation of negative emissions.

The CO_2 captured at the source will be transported by pipeline or by ship from the big industrial clusters to the North Sea. An annual maximum subsidy ceiling has been set for this until 2030 in the Climate Agreement: a maximum of 7.2 Mt of industrial CO_2, supplemented by a maximum of 3 Mt of CO_2 from the electricity sector. In 2022, the annual subsidy ceiling for industry may be increased by up to 2.5 Mt. In 2020, together with Energie Beheer Nederland (EBN) and Gasunie, the Rotterdam Port Authority proved the feasibility of a robust basic infrastructure (backbone) for collecting and transporting CO_2 from companies in the port area, which can then be stored in (depleted) oil and gas fields under the sea. This is the Porthos project[163] (Port of Rotterdam CO_2 Transport Hub & Offshore Storage).
In 2021, the Ministry of Economic Affairs and Climate Policy carried out a spatial exploration for initiatives for CO_2 transport and storage. The spatial exploration shows that there are more plans for a CO_2 infrastructure in the North Sea, also further of the coast[164]. The Aramis initiative[165] is expected to provide for this by realising a CO_2 infrastructure from the Maasvlakte to depleted oil and gas fields northwest of Den Helder. It concerns a main transport pipeline that enables CO_2 storage in various locations. A national coordination procedure has been started for this Aramis project in which the effects of the construction of this new infrastructure are being investigated, including in an environmental impact assessment report. The ecological effects are also part of this. In addition, various initiatives are exploring the possibilities of reusing existing infra-structure (pipelines and platforms). The possibility of transport by ship and direct injection of CO_2 into depleted oil and gas fields under the North Sea is also being examined.

In the planning period 2022-2027, the national government will continue to consult with stakeholders in the energy domain and in the North Sea as well as with fellow authorities in order to arrive at optimal and supported decision-making about the energy infrastructure, both for CO_2 towards the North Sea and for hydrogen from sea to land.

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[163] https://www.porthosco2.nl/
[164] https://www.rvo.nl/onderwerpen/bureau-energieprojecten/lopende-projecten/overige-projecten/ruimtelijke-verkenning-co%E2%82%82-transport-en-opslag
[165] https://www.aramis-ccs.com/

9.5.4 The onshore component of more sustainable maritime traffic

Making activities at sea more sustainable, in particular the activities of maritime traffic of the coast, will be continued over the coming period. This will help reduce the acidification of the sea, and will help reduce the deposit (of substances like nitrogen) in the dune areas from activities at sea. To make it possible to achieve more sustainable maritime traffic, physical alterations will be necessary in the ports. This is a task in which national, provincial and municipal government and the port authorities have a shared role.

9.5.5 Marine protein: proteins, fish, fish farming, shellfish and shellfish farming, aquaculture and saline agriculture

More sustainable fisheries are a central element of the North Sea Agreement and of the Cutter Vision of the Ministry of Agriculture, Nature and Food Quality. The policy and policy measures for existing shellfish farming and aquaculture in inland waterways such as the Oosterschelde, in the Wadden Sea and in the coastal waters will be continued. For the production of shellfish for human consumption, protected shellfish waters have already been designated. These are the Wadden Sea, the Voordelta, Grevelingen, the Oosterschelde and the western part of the Westerschelde.

Following the North Sea Agreement, an investigation was launched in 2021 into the possibilities for a sustainable blue economy based on marine proteins. It turned out that the cultivation of fish and shellfish outside the coastal zone is complex and not (yet) economically profitable. For that reason, space at sea for testing sustainable innovations in the food production of marine proteins will be an area of attention for national government, to be tackled in collaboration with the fisheries sector(s) during the planning period. As part of the North Sea Programme, national government (Ministry of Agriculture, Nature and Food Quality and Ministry of Infrastructure and Water Management) will also be conducting research into the ecological space for large-scale production of seaweed (up to 400 km2). This research will also provide an insight into the logistics of ports from which the work can be carried out, and into the locations for processing the harvest. The Ministry of Agriculture, Nature and Food Quality will also examine the cultivation of marine proteins on land. This is possible for seaweeds and certain fish species, and may offer logistic advantages and deliver better business cases. At the land-sea interface, there are also opportunities for the cultivation of saltmarsh vegetables such as sea lavender, sea lettuce and glasswort, as well as potatoes and tomatoes. Among others in Zeeland (the aquaculture area around the Colijnsplaat/Kats) and on Texel practical testing is already underway. This could offer prospects for areas that suffer from salinisation and areas along the coast.

9.5.6 Ports

All Dutch seaports and inland shipping ports are subject to the policy outlined in the Havennota (Port Policy Document) 2020-2030[166]. With regard to the interaction between land and sea, the Port Policy Document pays specific attention to (sea) ports and the hinterland in transition. The policy efforts are structured according to eight integrated themes, including accessibility and logistics, economy and innovation, sustainability, spatial environment and labour market. Based

[166] Parliamentary Documents II 2020-21, 31 409, nr. 306.

on the characteristics of the port areas, the agenda-setting efforts of national government in the Port Policy Document are focused on the clusters mainport Rotterdam and Moerdijk, Amsterdam Noordzeekanaalgebied, Zeeland/Scheldebekken, Groningen/Eemsmond and the Dutch inland shipping ports.

In current policy, the Port of Rotterdam occupies a special position due to its economic size and scale. This means that if there is an equal social score, projects in the mainport Rotterdam take precedence over investments in the other ports of national importance. However, in part based on 'Beyond Mainports', the recommendation from the Council for the Living Environment and Infrastructure (2016)[167] which suggests broadening the vision on mainports, the Ministry of Infrastructure and Water Management intends, more than in the past, to consider the allocation of funding to the mainport in conjunction with the development of other important clusters, such as the Brainports and Greenports and the logistic system of seaports and inland shipping ports.
Other seaports such as Scheveningen, Harlingen and Den Helder are primarily of local or regional importance in terms of storage and transhipment. When it comes to investments in accessibility, these seaports receive support from local and regional governments and as such are not directly eligible for MIRT (multi-year infrastructure, spatial planning and transport programme) investments by the national government. Although in economic terms the port of Den Helder is not of national importance, given the combination of civilian and military interests, it is a national seaport of a special category. Den Helder is the homeport of the Royal Netherlands Navy and the Coastguard. The Defence Organisation is appointed as National Harbourmaster in accordance with the Shipping Traffic Act. There is potential for further development in northern Noord-Holland based on offshore wind energy and the focus on hydrogen. To reinforce maritime development in the region, the national government is willing to invest up to 5 million euros as part of the third round of Region Deals.

9.6 Maritime Spatial Planning and international cooperation

International cooperation in the maritime spatial planning process (MSP) is aimed at ensuring 'that maritime spatial plans are coherent and coordinated across the whole marine region concerned'. This is a requirement in Article 11 (2) of the MSP Directive.

To implement this requirement, an official working group, the North Sea Maritime Spatial Planning Collaboration, was established in 2020, with the task of specifying collaboration between the North Sea countries in a structural way. The cooperation includes coordinating spatial planning with the relevant Member States and the authorities in third countries in the North Sea region. Norway is a member of the working group, and the United Kingdom, Ireland and Iceland have been invited to join.

The objectives of the MSP working group are:

- to act as a platform for long-term cooperation on the cross-border aspects of maritime spatial planning;
- to draw up cross-border strategies and plans for the efficient and optimum use of the North Sea;
- to exchange and generate new data and information;

[167] https://www.rli.nl/publicaties/2016/advies/mainports-voorbij

- to exchange experiences and best practices;
- to coordinate knowledge from various bodies (hydrographic services, OSPAR, international cooperation on (wind) energy on the North Sea);
- to coordinate, initiate and harmonise new cross-border projects (co-financed by the EU) that are able to support maritime planning in the North Sea countries.

The working group also focuses on other relevant topics, such as co-use for aquaculture, alternative forms of energy and the navigability of offshore wind farms.
Cooperation between the North Sea countries is self-evident and is already taking place with regard to numerous subareas of maritime spatial planning: bilaterally, multilaterally as in the European Expert Group for MSP of the European Commission, OSPAR, IMO and ICES and in projects like North SEE Interreg, SEANSE (ecological effects of offshore wind farms) and North Seas Energy Cooperation. There are consultation meetings on (safety of) maritime traffic, environmental conditions, nature areas, fisheries, monitoring and offshore wind farm developments. There are also exchanges and consultation meetings on the plans of the various North Sea countries.

In September 2021, the EU project Emerging topics in ecosystem-based maritime spatial planning for the North and Baltic Sea Regions (eMSP NBSR) was launched. This project concerns emerging topics for cross-border MSP, such as climate change and the EU Green Deal. This project is set to run until the start of 2024, and will involve participants from all EU North Sea countries and the majority of Baltic Sea countries.

Exploring greater international cooperation in the North Sea

Section 2.3 deals with the international strategic ambitions for the North Sea. These include expanding the area of protected nature areas to include 30 percent of EU waters, with strict protection for one third of that area, nature recovery targets to be laid down in legislation, enhanced ambitions for energy from the sea within the limits of the good environmental status and the transition to a fully sustainable blue economy.

Background to the GNSBI

The implementation of the NSA, the underpinning of spatial choices regarding offshore wind energy, nature areas, fisheries and ships' routeing infrastructure, and the research to be undertaken in each of those fields, have a clear international dimension: see also Section 9.3.2, condition 10. The Netherlands shares the North Sea and its policy challenges with other North Sea countries: Belgium, France, Germany, Denmark, Sweden, Norway, the United Kingdom and Ireland. The North Sea fulfils numerous functions that bring together many different interests: fishing for food supply, shipping for the largest ports in Europe (Rotterdam, Antwerp, Hamburg), sand extraction for coastal defences, energy production for energy security, energy independence and climate mitigation (more offshore wind farms and offshore gas and oil production), the safety of the communication and energy infrastructure (internet cables), defence and nature conservation of the ecological balance. The North Sea is busy and finding space for all these functions is a major challenge. As such, spatial choices will have to be made on how to make the best use of the area.

In May 2021, the European Commission (EC) published a strategy on the transition to a sustainable blue economy. One of the objectives of the EC is to draw up a tailor-made strategy

for each European sea basin. The overarching goal is to expand strategies of this kind into neighbouring countries, with which the EU shares sea basins, living marine resources and geo-economic characteristics. Partly as a result In line with this objective, in 2021, the Netherlands started an investigation into reinforcing international and integrated cooperation between North Sea countries the countries around the Greater North Sea. With the signing of the ministerial conclusions in November 2023, this investigation took on the nature of a concrete initiative, the Greater North Sea Basin Initiative (GNSBI). The GNSBI consists of the Netherlands, Belgium, France, Denmark, Germany, Sweden, Norway, Ireland and the United Kingdom. In this initiative, the European Commission acts as an important strategic partner. The GNSBI is focused on strategic, cross-sector international cooperation in the area of the mutually related transitions for the marine environment and nature, energy, food, fisheries and transport. The initiative aims to support achieving the shared international and national targets, such as fulfilling the cooperation agreements under the Maritime Spatial Planning Directive, renewable energy targets and ambitions, the targets of the Marine Strategy Framework Directive (MSFD), such as the marine-related sustainable development goals of the UN for 2030 and the Regulation on Nature Restoration. The GNSBI is working to implement its internal working programme 2025-2027, in which progress is annually evaluated.

Added value of the GNSBI

North Sea cooperation is important for safeguarding the ambitions of the Netherlands in the busy North Sea. International cooperation increases the possibilities for finding solutions for providing space for all functions within the capacity of the ecosystem. Cooperation within the GNSBI is based on the sharing of knowledge and includes political involvement and wherever possible harmonisation of our maritime spatial planning processes.
For the Netherlands, key added values of the GNSBI include:

- early international discussion of maritime spatial planning processes;
- investigating the possibilities for arriving at a joint assessment and approach to cumulative effects on the ecosystem;
- identifying where fishing grounds and other uses come together, and identifying possibilities for mitigating the effects of joint use;
- sharing experience in the field of joint use of offshore wind farms; addressing the most urgent ecological challenges on the North Sea;
- at basin level, taking effective nature conservation measures;
- and jointly discussing emerging topics.

In addition to the GNSBI, which is focused on cross-sector international cooperation, at sectoral level the Netherlands is also cooperating with the North Sea countries.
Since 2016, for example, the Netherlands has been a voluntary participant in the North Seas Energy Cooperation (NSEC). As well as the Netherlands, participants are Belgium, France, Germany, Denmark, Norway, Ireland and the European Commission. Also since 2022 there has been cooperation within the Memorandum of Understanding between NSEC participants on the one hand and the United Kingdom on the other. In 2023, with the Ostend Declaration, the above mentioned countries expressed a joint ambition to achieve approximately 120 GW by 2030 and 300 GW by 2050. Within OSPAR, on a regional scale, the Netherlands is working to protect the marine environment against pollution and other negative effects of human activities. In the field of marine science, via the OSPAR cooperation agreement and in the International Council for the Exploration of the Sea (ICES), the Netherlands is an international cooperation partner. Within the regionalisation procedure of the Common Fisheries Policy (CFP), the EU Member States around

the North Sea and the European Commission cooperate in the Scheveningen Group. This regional group is active on such topics as landing obligations, technical measures and protected areas. The EU Member States are also working alongside the United Kingdom and Norway in the field of fisheries management, including the adoption of catch methods and technical measures.

There is coordination with other North Sea countries on cross-border issues and effects. For the future, it is important that this cooperation will be strengthened further. Spatial pressure on the North Sea is growing; the blue economy must be made sustainable, the protection and reinforcement of nature demand greater efforts, and there are opportunities for international connections for the energy infrastructure. The process of developing a North Sea basin strategy is taking place in dialogue with the other North Sea countries, the Dutch coastal provinces and the North Sea Commission. The EC will be invited to share its experiences in drawing up strategies for other sea basins. The aim is to draw conclusions on a North Sea basin strategy with all stakeholders in the first half of 2023. In the meantime, the Netherlands will work to achieve results in the shorter term through the existing North Sea collaboration bodies and within OSPAR. Examples include cooperation aimed at the harmonisation of standards, cross-border shipping routes and measures for reinforcing biodiversity and nature, as outlined in this North Sea Programme.

Section 1.6 discussed international consultation and harmonisation of this spatial plan as part of the North Sea Programme and the National Water Programme.

9a Spatial planning: revised section

Reading guide chapter 9a

Section 9a.1 discusses developments that have given rise to or which have been taken into account in adapting spatial policy. Section 9a.2 includes the Marine Spatial Plan map and provides explanatory notes. Section 9a.3 deals with the designation of wind farm zones. Within this section, Section 9a.3.1 provides the underpinning for these designations. Section 9a.3.2 describes the conditions and agreements for the further elaboration in roadmaps and wind farm site decisions. Section 9a.3.3 explains the uncertainties present in the progress towards realising wind farms. Due to these uncertainties, a phased approach is provided, as described in Section 9a.3.4. In addition, section 9a.3.4 discusses the future process necessary for recording clearways and routing measures.

9a.1 Developments

Wind energy

Offshore wind energy is necessary to provide the Netherlands, including its industry, with renewable energy, while as far as possible being independent of foreign energy supply. According to the Coalition Agreement of the Schoof Cabinet[168], the Government has expressed the ambition of generating 50 GW of offshore wind energy by 2040. In designating the new wind farm zones necessary to achieve this goal, the Cabinet first considers space for the fisheries. In addition to the Roadmap 21 GW[169], an additional 29 GW of wind farms will be necessary to achieve this ambition. Because of the long preparation times for energy infrastructure which due to economies of scale could be as much as 10-12 years, in the revised North Sea Programme 2022-2027, the Government has designated new wind farm zones with expected space for 21 GW of wind farms, whereby the necessary space for mining/drilling activities and capacity for ecological integration are uncertain factors in respect of the possibilities for realisation. This is in addition to the previously designated wind farm zones which offer space for a total of 21 GW of wind farms. In the process, as far as possible, important fishing grounds are spared.

Over and above the ambition of 50 GW by 2040, the Coalition programme considers the process of spatial consideration in the designation of wind farm zones. The first point of consideration is space for fishery, with the aim of achieving a careful balance with other activities on the North Sea, which alongside fishery also include mining, shipping and defence, all taking account of nature, coastal defences, sand extraction and maritime heritage. The rollout of wind energy will take place within the frameworks of (European) nature and environmental legislation. When it comes to considerations in relation to shipping safety, the Government will base its decisions on

[168] Parliamentary Papers II, 2024/2025, 36 471, no. 96. The name of this roadmap has been changed from Roadmap 2030 to Roadmap 21 GW.
[169] Parliamentary Papers II, 2023/2024, 33 561, no. 59.

risk analyses and legislation and regulations for safe distances between shipping routes and wind farms, taking account of the recommendations of the Dutch Safety Board[170].

With the designation of wind farm zones for an indicative 21 GW capacity, the 50 GW target remains within reach. The remaining necessary space for reaching 50 GW will be designated on the basis of integrated consideration in the next North Sea Programme 2028-2033, that will be laid down by the Government at the end of 2027.

Mining/drilling

With a view to security of supply and given geopolitical developments, the Government intends to slow down the reduction of domestic production of natural gas on the North Sea, known as acceleration[171]. The importance of natural gas will have to be reduced as fast as possible in line with the climate ambitions, but even then, for a considerable time, there will continue to be demand for gas in the energy supply. For that reason, new mining activities are expected to be developed. This will go hand in hand with demand for space for helicopter access. In addition, depleted gas fields and aquifers could be suitable for the storage of CO2. The priority remains that mining must be conducted safely and responsibly for humans, nature and the environment. In areas where the development of wind energy and mining activities could be in conflict, it will be necessary to develop and implement customised solutions.

Food production

The Vision on food from the sea and large waters (Food Vision)[172] published on 8 March 2024 emphasises the importance of space for the production of marine proteins. Sufficient space for fishing is indispensable to the future prospects for the fishing industry and the willingness of and possibilities for fishermen to invest in innovation to achieve the intended level of sustainability as described in 4.2.1 and 4.2.2. The Food Vision lays down the importance of better underpinning the need for space for fishing in spatial considerations, so that those interests can be more solidly taken into account, on the basis of better arguments, in spatial planning for all use of the North Sea. In this revised North Sea Programme, the Government lays down the first steps in better understanding the spatial interests of the fishing industry. See section 9a.3.1 for how this is implemented in the designation of wind farm zones. The Government will also implement these steps in future spatial considerations between fishing and other uses. In addition, the Government is investigating the possibilities for active fishing within wind farms, and which adaptations may be necessary to make this possible.[173]

Shipping

As a consequence of the development of wind farms, measures are necessary to be able to safeguard smooth and safe shipping passage. This will require new clearways and possibly also new routing measures. Safety margins are maintained around wind farms according to the

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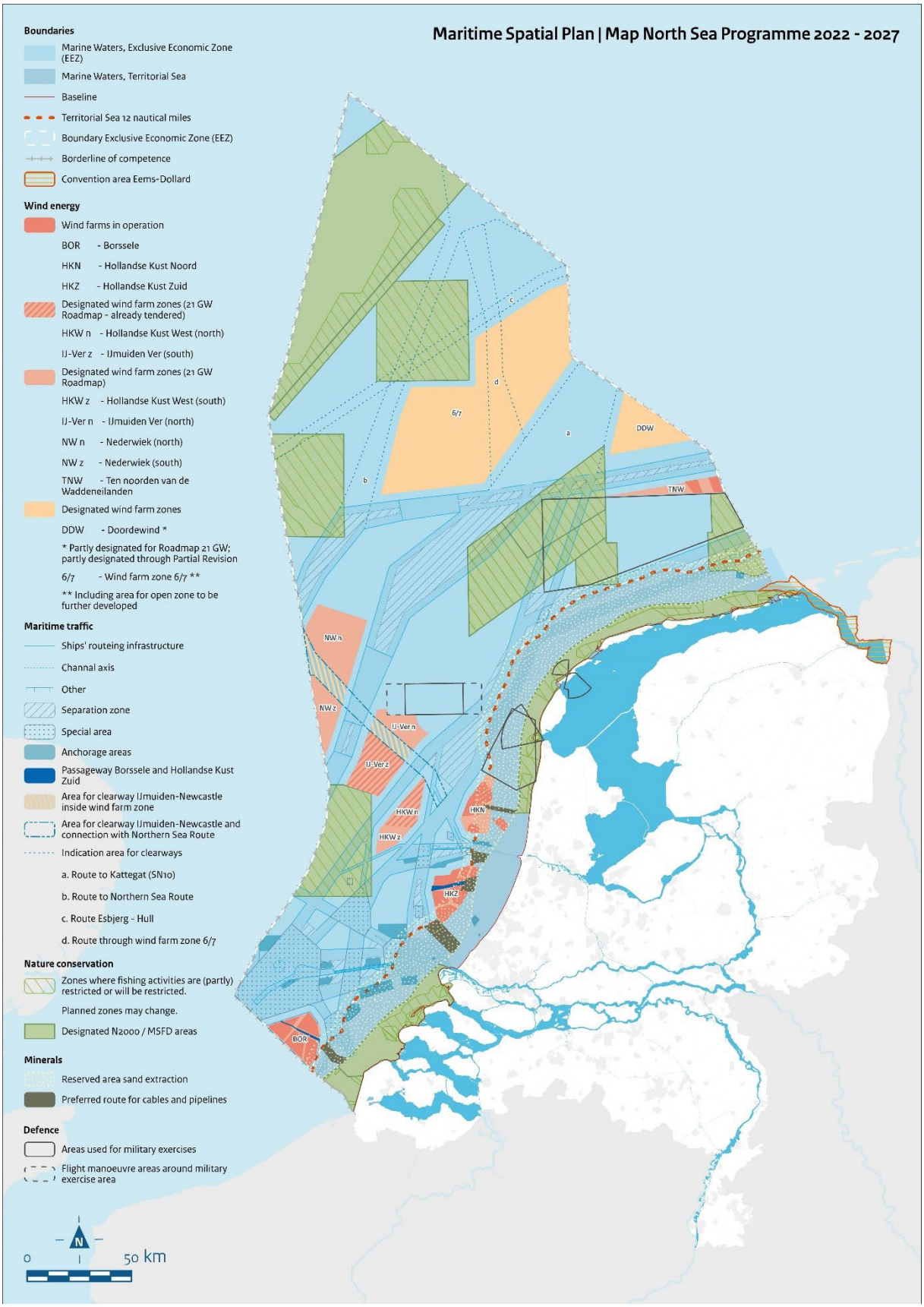
[170] Dutch Safety Board: Spatial compromise: Managing shipping safety in an ever fuller North Sea.' The Hague, 13 June 2024. https://onderzoeksraad.nl/wp-content/uploads/2024/06/Schipperen-met-ruimte.pdf.
[171] Parliamentary Papers II 2021-2022, 33 529, no. 1058.
[172] Parliamentary Papers II 2023-2024, 29 675, no. 210.
[173] Van der Plas motion: "requests the government […] and to investigate whether Offshore Wind Farms can be structured in such a way that active fishing is possible". Parliamentary Papers II, 2022-2023, 21 50132, no. 1500.

'Design criterion safe distances between shipping routes and offshore wind farms' published in 2013 (see appendix 3). The Dutch Safety Board[174] has issued recommendations among others regarding improvements to the management of shipping risks as a consequence of the placement of permanent objects at sea. Where necessary, account must be taken locally of a greater separation than the minimum distance specified on the basis of this design criterion. Nautical experts have issued advice on the affected locations[175] in the wind farm zones designated in this revised North Sea Programme. These greater distances were taken into account in the designation. In preparing wind farm site decisions in the designated wind farm zones, the Government will elaborate these requirements in more detail. In the spatial integration of new cable and pipeline routes, where necessary, account will be taken of shipping routes (see section 10.7).

Sand extraction

Sand extraction is carried out on the North Sea for sand replenishment with the aim of maintaining the climate-proofness of the coastline. Commercial extraction is also conducted for construction and infrastructure purposes. The interim results from the Sea Level Rise Knowledge Programme[176] show that to protect the coastline by means of sand replenishment, between 1-10 billion m^3 more sand will be required, than assumed in the past when the sand extraction strategy was drawn up, in the North Sea Policy Document[177]. Spatial pressure in the reservation zone for sand extraction will make it difficult to satisfy future demand for sand. Cables and pipelines for the shore landing of wind farms, telecom cables, interconnectors and pipelines for oil, gas and CCS will further increase spatial pressure. Moreover, only part of the sand available in theory can be extracted in practice. To continue to meet the growing demand for sand in the long term, it is necessary to extend the reservation zone, and the Government is working on a re-evaluation of the sand extraction strategy.

[174] Dutch Safety Board: Spatial compromise,' 2024.
[175] Arcadis, Impact of wind energy on shipping for the Partial Revision of the North Sea Programme 2022-2027, 2024
[176] Letter to Parliament Interim results Sea Level Rise Knowledge Programme 2022-2023, 36 200-J, no. 7.
[177] the Government of the Netherlands, North Sea Policy Document 2016-2021 (The Hague, Ministry of Infrastructure and the Environment, 2015). https://zoek.officielebekendmakingen.nl/blg-641415.pdf.



Map 4: Maritime Spatial Plan map 2022-2027 This map replaces the structural vision map from section 9.2

9a.2 Maritime Spatial Plan map 2022-2027

The North Sea Programme is considered a maritime spatial plan as intended in Article 3.9 (2)(d) of the Environment and Planning Act. We have therefore identified the accompanying map as the Maritime Spatial Plan map (MSP map). See the map above. This map provides an overview of all spatial functions on the North Sea in the policy period 2022-2027. This section deals with the use of space for each function. Fisheries data are not recorded on the MSP map because in principle fishing has access everywhere, on condition no restrictive measures apply. Mining/drilling data are only recorded on the map showing current use (see map 1) and not on the MSP map. The revised MSP map replaces the structural vision map in section 9.2.

The explanation below discusses the subjects for which spatial policy has changed as a result of the revision namely:

- Nature in relation to fishing: a number of updates based on agreements in the North Sea Agreement and a correction.
- Wind farm zones: designated areas for wind farms for the period beyond 2032
- Shipping: space for new clearways necessary around and through designated wind farm zones
- Sand extraction: expansion of the reservation zone
- Cables and pipelines: In relation to shipping routes, a consideration framework has been developed for sound spatial consideration and the positioning of new routes around shipping routes (see section 10.7).

Nature in relation to fishing (food production)

With the revision of the North Sea Programme, the majority of spatial designations for nature in relating to fishing have remained unchanged. These designations are described below, as unchanged. Adaptations in respect of the North Sea Programme from March 2022 are explicitly listed below.

- *Brown Ridge* (Natura 2000):
    - the Brown Ridge was designated a Birds Directive area in 2021[178] [179];
    - 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:
    - draft a Natura 2000 management plan;
    - the area closed for seabed-disturbing fishing will be expanded by 1,014 km^2;
    - of the area as a whole, 1,649 km^2 will become a 'no fisheries zone';
    - two sub areas of 50 km^2 and two subareas of 4 km^2 will be designated for oyster recovery; a sub area of 100 km^2 will be allocated for oyster recovery;
    - on the edge, another sub area of 100 km^2 will be allocated for research into the long-term impact of beam trawling and pulse trawling. Here, seabed-disturbing fishing is allowed under conditions.

[178] For the site boundaries, the site decision for the wind farm zone IJmuiden Ver takes the designation as Birds Directive area into account.

[179] Government Gazette. 2021, 48715. Announcement of designation decision Natura 2000 area Brown Ridge, Ministry of Agriculture, Nature and Food Quality

- *Dogger Bank* (Natura 2000):
    - before 2023, ban on seine fishing (flyshoot) in the 1326 km^2 management zones;
    - adaptation of the management plan;
    - before 2023, expansion of the Natura 2000 area aimed at increasing the area closed for seabed-disturbing fishing by 557 km^2.
- Southern Dogger Bank (MSFD)
    - Changes in this revised North Sea Programme: an area of 530 km^2 will be protected under the MSFD and closed to seabed fishery.
- *Cleaver Bank* (Natura 2000):
    - before 2023, expansion of the area closed for seabed-disturbing fishing (excluding Botney Cut) by 552 km^2;
    - possible adaptation of the management plan.
- *Central Oyster Grounds* (MSFD) before 2023:
    - expansion of the area closed for seabed-disturbing fishing by 1,062 km^2.
- *Borkum Reef Grounds* (MSFD) before 2023:
    - establishing an area of approx. 682 km^2 683 km^2 closed to seabed-disturbing fisheries. The number of km^2 is a correction implemented in the partially revised North Sea Programme.

Wind energy

Wind farm zones designated or reconfirmed in the North Sea Programme for 2022 and subsequently included in the Roadmap 21 GW:

- IJmuiden Ver (noord) has been reconfirmed. In the southern section of IJmuiden Ver (noord), space has been set aside for a clearway. A site of 2 GW fits in this area.
- Southern section of Hollandse Kust (west) has been reconfirmed. A site of 0.7 GW fits in this area.
- Nederwiek has been designated. This refers to parts of Nederwiek (zuid) and Nederwiek (noord) between which a clearway will be established. A total of 6 GW of wind farms are planned for this area.
- Doordewind has been designated. This refers to an area adjacent to the East-Friesland shipping route, where in the framework of the Roadmap 21 GW, a 2 GW site is planned.

Section 9.3.3 describes conditions, departure points and action points connected in the follow-up process towards realisation of wind farms in these wind farm zones.

Wind farm zones designated or reconfirmed in this revised North Sea Programme:

- In this revised North Sea Programme, the part of Doordewind that was not necessary for the Roadmap 21 GW has been reconfirmed and Doordewind (west) was additionally designated. The entire area is identified as Doordewind. In addition to the already planned 2 GW site, Doordewind offers space for an indicative 2 GW. The actually available space will depend on the space required for mining activities. Section 9a.3.3 deals with this uncertainty. The boundaries of Doordewind are shown on the MSP map. The eastern boundary is adjacent to the German EEZ. On the other sides, shipping routes including safe distances to wind farms mark the limits of the wind farm zone: on the southern side the East Friesland TSS and on the north western side the route to the SN10. The southern strip of Doordewind, which in the North Sea Programme from March 2022 was shown hatched as a possible additional buffer for shipping safety, is no longer designated as a wind farm zone and therefore serves as an additional buffer. On the north western side, the previously designated area has been expanded to include Doordewind (west). In this constellation, the Doordewind wind farm

zone ties in with future German wind farms and the clearway to SN10 connects in a continuous line with the SN10 in Germany.

- Wind farm zone 6/7 has been designated. The boundary of this area is formed by shipping routes and the buffer zones necessary for sufficient shipping safety. On the western side this includes the future clearway to the Northern Sea Route, the future clearway Esbjerg-Hull on the northern side, the clearway to the SN10 on the eastern side and the traffic separation scheme above Wadden-North on the southern side. For the rollout of wind energy in wind farm zone 6/7, a zone of 1520-1620 km^2 will remain free of wind farms; this divides the area into a western and eastern section. The size of this open zone is subject to the condition that negative effects on the guillemot population are sufficiently prevented. This is an uncertainty (see section 9a.3.3) and the reason that rollout will take place in phases (see section 9a.3.4). As a consequence, if necessary, the size of this open zone can be increased at a later stage. The rollout of wind energy beyond 2032 will take place in phases and will start in the western section, where there is space for an indicative 11 GW of wind farms. In total, wind farm zone 6/7, excluding the open zone, offers space for an indicative 19 GW of wind farms.
- The above described quantities of wind energy (number of GW) are indicative at this stage, among others because there are (possible future) mining/drilling activities in and/or around wind farm zone 6/7 and Doordewind. A greater insight into the space required for these activities will emerge in the further elaboration. The indication of the number of GW is related to the number of km^2 expected to be available. The available space for wind farms in wind farm zone 6/7 was determined without taking into account the area of the open zone through the centre of the area. This zone is among others also important for fishing and nature. In assessing the available space in both wind farm zone 6/7 and Doordewind, account has been taken of obstacle-free zones for helicopter access to (possible future) drilling platforms. Section 9a.3.3 deals in more detail with uncertainties on the space required by mining/drilling and nature in the designated wind farm zones.

Shipping

The existing shipping system and existing anchorages and clearways are shown on the MSP map. The MSP map also shows clearway reservations necessary in response to the designation of new wind farm zones in both the Dutch and the German EEZ. These reservations are:

Spatial reservation in the framework of the North Sea Programme from March 2022:

- Clearway IJmuiden-Newcastle, which crosses the wind farm zones IJmuiden Ver and Nederwiek, and has a minimum width of 6400 metres at IJmuiden Ver and 7400 metres at Nederwiek.

Spatial reservation in this revised North Sea Programme:

- Clearway The Northern Sea Route, to the west of wind farm zone 6/7.
- Clearway Esbjerg-Hull, to the north of wind farm zone 6/7.
- Clearway to the SN10, to the southeast of wind farm zone 6/7 and to the northwest of Doordewind.
- Clearway through a zone to be kept open in wind farm zone 6/7.

By appointing these clearways, obstacles in the areas in question are excluded, unless it is demonstrated in consultation with the Ministry of Infrastructure and Water Management that they are compatible with the interests of shipping[180]. In the follow-up process, the Government

[180] Environmental Quality Decree, Article 8.5 (2)

will indicate the location of the clearways more precisely, which will in principle be appointed within the contours specified on the MSP map. As far as possible, the Government will take account of existing and future drilling platforms, in consultation with the mine operators and nautical experts. As well as designating clearways, the Government will investigate the necessity of additional routing measures in the interests of safety, before subsequently promoting international agreements on these issues, as necessary. Section 9a.3.4 discusses the follow-up process for the appointment of clearways and possible routing measures.

Sand extraction

Spatial policy in PNZ from March 2022:

- Guaranteed availability of sufficient and affordable sand contributes to the national interests of water safety and climate resilience, as well as interests in the sphere of housing, mobility and business climate.
- The strip seaward of the continuous NAP-20m depth line up to 12 nautical miles off the coast remains reserved for the extraction of sand for coastal defence and for fill sand for construction and infrastructure purposes.
- Shell extraction is allowed seaward of the NAP-5m depth line in quantities corresponding to natural accretion.

Supplemented in this revised North Sea Programme:

- In this revised North Sea Programme, the reservation zone for sand extraction is extended to 14 nautical miles off the coast, to safeguard sufficient sand supply for the national interest of water safety.

Cables and pipelines

Spatial policy in PNZ of March 2022:

- When planning the construction of new cables and pipelines, the government, in consultation with the initiator, aims for as many parallel routes as possible. Preferred corridors have been determined for crossing the established reservation zone for sand extraction (see MSP map) (see structural vision map), based on the availability of extractable sand and the possible locations for landing points for cables and pipelines.
- In order to use the space in the North Sea efficiently, electricity cables, telecommunication cables band pipelines are bundled as much as possible.
- The Assessment Framework for activities in the North Sea has been expanded and tightened in order to be able to implement the bundling policy (see paragraph 10.5).
- Based on the Exploration of the landing of wind energy at sea 2030 (VAWOZ 2030)[181], Spatial procedures for future cable routes have been started for the wind farms planned in the Roadmap 21 GW. spatial procedures for future cable routes have been initiated. This is done in conjunction with the preparation of a new roadmap for wind energy 2030+ and with the preparation of plot decisions.

Supplemented in this revised North Sea Programme:

- With the extension of the reservation zone for sand extraction from 12 NM to 14 NM, the preferred corridors will be further spatially elaborated in the next North Sea Programme.

[181] Effectanalyse Verkenning aanlanding windenergie op zee (VAWOZ), Afwegingsnotitie, Ministerie van EZK, september 2024

- In relation to shipping routes, a consideration framework has been developed for sound spatial consideration and the positioning of new routes around shipping routes (see section 10.7).
- In the Exploration of Cable Landing Points for Offshore Wind Energy Programme (pVAWOZ)[182], routes will be investigated for the shore landing of wind farms in the subsequent period.

[182] Netherlands the Government Gazette 2024, 5255. Notification draft Memorandum Range and Detail level, Programme Link Cable landing point Offshore Wind (VAWOZ) 2031–2040, Ministry of Economic Affairs and Climate Policy (Economic Affairs and Climate Policy). Netherlands the Government Gazette 2024, 5255 | Overheid.nl > Officiële beke https://zoek.officielebekendmakingen.nl/stcrt-2024-5255.htmlndmakingen.

9a.3 Designation of wind farm zones for the period beyond 2032

9a.3.1 Underpinning of choices

Funnelling of areas to be considered for designation as wind farm zones

The following areas have been considered for designation as wind farm zones for the period beyond 2032 for the purposes of this revised North Sea Programme.

- Search area 6/7. This is a combination of search areas 6 and 7 as shown in the search areas map in section 9.4. These two areas have been supplemented with the area between search areas 6 and 7 to allow a better integrated consideration of wind energy in relation to other use. In respect of the search area map in 9.4, the boundaries have been adjusted because of the shifting of the indications for spatial reservations for clearways. On the western side, in comparison with the search area map from section 9.4, the space for the clearway to the Northern Sea Route has been shifted slightly to the west, to take account of a shallow area at Dogger Bank. This adjusted location also makes it possible in the further elaboration to take account of a possible future drilling platform. The space for the clearway Esbjerg-Hull has been shifted slightly to the north to take better account of possible future drilling platforms. The space for the clearway to the German route SN10 has been narrowed so as to better tie in with the narrowing of the SN10 in the German EEZ because of wind farms to be developed in that area.
- Doordewind. Doordewind will not be fully used for wind farm development in the Roadmap 21 GW. The unused space is therefore viewed as a potential wind farm zone for the subsequent period. The area has also been extended by the addition of Doordewind west, in order to tie in with the shipping route and wind farm development in Germany.
- Lagelander. Lagelander will not be used for wind farm development in the Roadmap 21 GW. Consequently, Lagelander is viewed as a wind farm zone for the subsequent period, but only as a fallback option for the event that the wind energy target cannot be achieved in the other areas. This relates to the considerable interests of fishing and mining/drilling in this area[183].

The following areas of the search area map in section 9.4 are not considered as wind farm zones for the period beyond 2032, based on the following considerations:

- Search area 3 offers space for a maximum of 2 GW. Much mining/drilling is carried out in the area adjacent to this area. This conflicts with wind energy. Mining/drilling is expected to be downscaled towards 2050. Because the area for wind energy can only be expanded after 2040, the decision was taken to not consider this area in the framework of the revision of this North Sea Programme.
- Search area 4 is located in a defence exercise area: EHD-42. (Combined) military exercises are carried out here in the air and at sea. In the light of the changing geopolitical situation and security situation, demand for space from the Defence Ministry has increased. The armed forces are focused more on protecting Dutch territory and the territory of the NATO allies. This demands more space in the Netherlands so that training is possible. This also includes exercise area EHD-42. Now and in the future, this area will be used more often and more intensively. In addition, new weapons systems will be used that require more space for them to be used safely. Joint use of space in EHD-42 and offshore wind farms is therefore unrealistic and is therefore no longer to be investigated.
- Search area 5 central reservation is located in the centre of the reserved space for shipping route SN10. It was originally believed that there could be space between two shipping lanes.

[183] As shown on the MSP map, Lagelander has been scrapped as a wind farm zone; the area is also no longer featured as a search area.

Research has shown that wind farms here go hand in hand with disproportionate safety risks in relation to shipping. Moreover, there are plans to narrow the SN10, which would only further increase the safety risks of a wind farm. Because of its unfavourable location for shipping safety and access purposes, search area 5 central reservation is no longer considered as a possible wind farm zone.

- Search area 8. A wind farm in this relatively small area located close to a bend in a shipping system would be accompanied by high shipping safety risks. For that reason this search area has been dropped.

All these areas are also important to differing extents for fishing, mining/drilling and nature, and to differing extents could have consequences for shipping. For that reason, the relevant considerations are discussed under the next heading.

Arguments regarding designation of wind farm zones in relation to nature and other use

As described above, Doordewind, Lagelander and search area 6/7 were considered for designation or reconfirmation as wind farm zones in the framework of the revision of the North Sea Programme. In the Strategic Environmental Assessment (SEA)[184] and the related background documents, these areas were investigated. Possible ecological impact of wind farms[185], possible consequences for other use such as fishing[186], mining[187] and shipping [188] and possible impact on cultural historical and archaeological artefacts[189]were mapped out for the Strategic Environmental Impact Assessment. To interpret the consequences for fishing, in addition to economic values, the socioeconomic impact of the area under investigation was considered. The text block below describes the background and the initial steps for how the interest of fishing in relation to other use was assessed in concrete terms in the spatial consideration. Investigations were also carried out into how the wind farms in the area in question contribute to the climate targets. This involved calculating the possible capacity of wind farms to be installed, the expected energy yields and emission reductions, together with the expected profitability of the intended wind farms[190]. All this information was used to support the designation of wind farm zones.

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[184] Pondera, SEA (PlanMER) and Appropriate Assessment Partial revision North Sea Programme 2022-2027, 2025

[185] Waardenburg, Impact of Offshore Wind for benthos, fish, birds and bats. Background document ecology for SEA for partial revision North Sea Programme 2022-2027, 2025;
Impact of offshore wind development on the North Sea ecosystem. Scenario study for the partial revision, 2025;
HWE. Impact of offshore wind energy on marine mammals. Background document to SEA for Partial revision North Sea Programme 2022-2027, 2025;
HWE, Partial revision North Sea Programme: Summary ecological impact instruction wind farm zones, 2025

[186] WEcR, Impact assessment of Wind farm zones on Fishing for the Partial Revision of the North Sea Programme 2022-2027, 2025

[187] To70, Helicopter access to search area 6/7, 2025

[188] MARIN, Quantitative analysis shipping frequencies in favour de Partial Revision North Sea Programme, 2024;
Arcadis, Impact of wind energy on shipping for the Partial Revision of the North Sea Programme 2022-2027, 2025

[189] Pondera, Quick Scan Archaeology, 2025

[190] Afry, Capacity, energy yield and LCoEs of search area 6/7, Doordewind and Lagelander, 2025

Determining the consequences for fishing

In 2022, the Government conducted a socioeconomic impact analysis into the consequences of all major developments for the entire seafood sector. This analysis revealed that the recent decline in the scale of the supply sector also has consequences for the subsequent chain. Given the (now limited) scale of the sector, there is a risk that the Dutch seafood sector in the future will no longer be equipped for the processing of North Sea fish and the maintenance and construction of trawlers. There are also sociocultural consequences for the communities[191]. For that reason, it is essential in assessing the impact on fishing, to look not only at the economic value of fishing grounds but also other aspects. To ensure that the national interest of 'sustainable fishing' and 'sustainable food production' [NOVI] can be included in the spatial consideration in a more transparent, clearer and more concrete manner when related to other use, an assessment of the importance of fishing was carried out on the basis of the following aspects:

- What is the relative contribution of the Dutch catches in the area in question to total Dutch food production at sea (for the form of fishing in question with the accompanying fishing technique)?
- What is the role of the area for the maintenance of a robust primary Dutch fishing sector with sufficient (regional) economies of scale?
- And what role does the area play in maintaining a robust chain and fishing communities?
- What is the cumulative impact of the proposed and planned area closures and restrictions for fishing on the primary Dutch supply sector and the chain and communities?

The models currently being developed on behalf of the Ministry of Agriculture, Fisheries, Food Security and Nature and as part of the MONS programme[192] will contribute to clarifying the impact referred to above.

For the consideration of the importance of space for fishing in designating wind farm zones in the framework of this revised North Sea Programme, the aspects referred to above have been addressed as far as possible[193] to gain an insight into the types of fishing and the accompanying chains and communities in the search areas investigated for wind energy.

[191] Social and cultural value of fishing for the fishing community; And consequences of policy changes. Wageningen, Wageningen Economic Research, Report 2023-053. 136 pp.; 20 fig.; 10 tab.; 52 ref. ISBN 978-94-6447-685-9.

[192] The programme Monitoring and Research Nature Reinforcement and Species Protection (MONS) as part of the North Sea Agreement. For the MONS programme, research is being conducted into the influence of spatial restrictions on Dutch fishing.

[193] WEcR, Impact assessment of Wind farm zones on Fishing for the Partial Revision of the North Sea Programme 2022-2027, 2025

Wind farm zone 6/7

- Wind farm zone 6/7 is designated because, due to its considerable size, the area is of essential importance in keeping the ambition of 50 GW by 2040 within reach.
- At the same time, other interests are at play in the area. At the centre of zone 6/7, therefore, in the further elaboration, an open zone will be kept free because this area is used for langoustine fishing which is highly location specific, and because less negative ecological impact will occur as a consequence. The presence of the open zone will create a western section and an eastern section of the wind farm zone, between which there is space for safe free passage. In addition, this open zone will contribute to helicopter access to a number of potential future drilling platforms.
- The size of this open zone is 1520-1620 km^2. The size of this open zone is based on spatial investigations as described in the SEA. With a free zone of this size, approximately 85% of the langoustine fishery in zone 6/7 can continue.
- The size of the open zone is subject to reservation. The intention of the open zone is to mitigate possible negative impact on birds and to prevent an ecological barrier effect between the Central Oyster Grounds and the Frisian Front. It is currently uncertain whether the agreed size is sufficient for these purposes (see section 9a.3.3). The definitive size of the open zone will be determined at a later stage. A phased approach makes this possible (see section 9a.3.4).
- Based on this open zone, wind farm zone 6/7 offers space for an indicative 19 GW of wind farms. In assessing this wind farm capacity, account has been taken of the space for helicopter access for a number of potential future drilling platforms as notified to the Government during the process in preparation of the decision. For a description of assumptions and uncertainties, see section 9a.3.3.

Doordewind

- Doordewind is reconfirmed for the period beyond 2032, because the space that remains available following completion of the 2 GW site in the framework of Roadmap 21 GW is needed for the ambition of 50 GW by 2040. Moreover, there are synergetic advantages in implementation since a site is already planned in the area in the framework of the Roadmap 21 GW.
- The shape of the Doordewind will change as compared with the designation in the North Sea Programme adopted in March 2022 due to the removal of a southern strip for shipping safety and the addition of Doordewind (west). From now onwards, the entire zone in this adapted form, including Doordewind (west) is designated as Doordewind. Due to the changes to the shape of the zone, the boundary ties in with the planned German wind farms and shipping routes, thereby reducing the shipping safety risks related to wind farms.
- The space thus created in Doordewind is expected to offer sufficient space for an indicative additional 2 GW, taking account of an obstacle-free zone for helicopter access to a drilling platform on the southern side. This will require a space-saving customised solution for helicopter approach to the platform. Research into the viability of this approach is currently underway. If this obstacle-free zone is no longer needed in the future, this may result in more space for wind energy in Doordewind.

Lagelander

- Lagelander has been dropped as a wind farm zone and is also no longer a search area due to the considerable interests of mining and fishing. In addition, wind farms at this location are accompanied by high risks to shipping safety.

9a.3.2 Conditions and agreements

The following conditions and agreements apply to the process following designation of wind farm zones via roadmaps and wind farm site decisions through to the realisation of wind farms.

Ecological capacity

A precondition for the development of wind farms and for any other activities at sea, is that they fit into the ecological capacity of the North Sea. Before wind farm site decisions are taken and wind farm permits issued, the ecological space must be demonstrated. Studies[194] show that there are uncertainties about the extent to which impact can restrict space. For seabirds, in the wind farm zones for beyond 2032, these relate for example to the impact on guillemots and northern gannets and possibly a number of gull species. The creation of an open zone through wind farm zone 6/7 could help in mitigating the impact on birds, but as yet it is uncertain whether the agreed size will be sufficient for this purpose. The expected impact on harbour porpoises is such that on the basis of the current assumptions and state of the art, not all wind farm site decisions for the wind energy targets set can be taken. In determining the ecological space, the effectiveness of possible innovations must be sufficiently demonstrated. See section 9a.3.3 for an explanation of the uncertainties.

Open zone through wind farm zone 6/7

As previously described, the open zone will measure 1520-1620 km^2. This zone divides wind farm zone 6/7 into a western and an eastern section. The open zone offers space in particular for langoustine fishing and will contribute to mitigating the impact on seabirds. As suggested in 9a.2, there are reservations in respect of the size of the open zone. Because of uncertainties about the required width of the open zone, the Government will determine its location in stages. Sections 9a.3.3 and 9a.3.4 explain this process.

Shipping safety

In the designation of the wind farm zones for the purposes of this revised North Sea Programme, 2 NM has been taken as the starting point for a safe distance between wind farms and shipping routes. In local situations, a greater separation may be necessary, for example at the corner points of wind farm zones. Nautical experts have already issued recommendations on these matters[195]. At the same time, a continuous line of wind turbines remains important. The Government intends to further elaborate the recommendations from experts in preparing the wind farm site decisions. In addition, non-spatial measures will also be necessary for shipping safety, to be elaborated by the Government in the follow-up process.

Protection of the energy infrastructure

In the light of geopolitical developments, in elaborating the designated wind farm zones, the Government will take account of the necessary protection of the energy infrastructure.

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[194] Waardenburg, Impact of Offshore Wind for benthos, fish, birds and bats. Background document ecology for SEA for partial revision North Sea Programme 2022-2027, 2025;
HWE. Impact of offshore wind energy on marine mammals. Background document to SEA for Partial revision North Sea Programme 2022-2027, 2025;
HWE, Partial revision North Sea Programme: Summary ecological impact instruction wind farm zones, 2025

[195] Arcadis, Impact of wind energy on shipping for the Partial Revision of the North Sea Programme 2022-2027, 2025

Helicopter safety and helicopter access to drilling platforms

Where spatial interests overlap, the Government strives to facilitate the various activities as far as possible in time and space. Appendix 4 describes the design process for the interactions between mining and wind energy. Helicopter safety enjoys priority in this design process. Safe access to drilling platforms requires sufficient space. Space can be created using customised solutions for realising the objectives of both mining/drilling and wind energy. One essential step in the design process is mutual consultation and investigation by mining operators, the relevant helicopter operators and the Government into the possibilities of integrating both functions through space-saving customised solutions.

Wind turbine tip highest level in respect of aviation

In connection with aviation, the Government imposes conditions on maximum tip highest level. A tip highest level higher than 304.8 metres (or 1,000 feet) can only be included in a wind farm site decision if the Government has demonstrated that this is acceptable from the perspective of aviation access and safety.

Turbine density

In assessing the attainable capacity in the wind farm zones, a density of 10.5 MW km^2 is assumed. This density is calculated for the actually expected available area, outside the open zone, without the assumed space required for drilling platforms and without the assumed space required for energy infrastructure such as cables and pipelines. These assumptions are described in the SEA and background documents[196]. The density of 10.5 MW per km^2 remains the starting point in the further elaboration of the roadmap and for wind farm site decisions, with a view to efficient use of space on the North Sea within the capacity of the ecosystem. It is argued that this capacity can be deviated from if supported by research, for example if it is demonstrated that it is necessary for a viable business case, or if it contributes to preventing consequences for nature or other use.

Joint use

The process for clarifying the possibilities for joint use in wind farms is described in chapter 10. At present, active fishing is not permitted as a form of joint use in offshore wind farms. The growing ambitions for offshore wind energy mean that the free space for fishing will further decline and as such call for a possible reassessment on the ban on active fishing in offshore wind farms. For this reason, the Government is investigating whether and if so, under what conditions forms of active fishing can in the future be permitted in wind farms, taking account of ecology and other use. This will also be a response to the revised Van der Plas motion (BBB)[197]. For the wind farms in Doordewind, the operating principle is that active fishing will be permitted on condition it is safe, viable and feasible. In addition, for the available space for joint use in the wind farms in zone 6/7, the Government will concentrate on nature recovery and nature enhancing measures. In discussion with the North Sea Consultation, the Government intends to revise the joint use policy in good time.

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[196] Pondera, SEA (PlanMER) and Appropriate Assessment Partial Revision North Sea Programme 2022-2027, 2025;
Moving Dot, Helicopter Accessibility Study Area 6/7, 2025;
Afry, Capacity, energy yield and LCoEs of search area 6/7, Doordewind and Lagelander, 2025

[197] Parliamentary Papers II, 2022-2023, 21 501-32, no. 1500.

9a.3.3 Uncertainties

In assessing the space available for wind farms, the spatial requirement for nature and other uses such as fishing, mining/drilling and shipping in the wind farm zones has been mapped out. On that basis, choices were made in this revised North Sea Programme. At the same time there are several uncertainties which means that a number of choices will have to be made at a later date. These uncertainties relate to nature and the number and locations of potential future platforms and the space required for helicopter access.

Uncertainties in respect of nature

- **Required width of open zone** It is uncertain how wide the open zone in wind farm zone 6/7 needs to be in order to prevent significant impact on among others populations of guillemots. In the spatial study described in the SEA[198], a location for the open zone has been assumed which prevents a barrier effect between the Central Oyster Grounds and the Frisian Front. Given this location of the open zone and the agreed size of 1520-1620 km^2, the zone will be 50 km long and 31 km wide. Recent studies[199] show that the disturbance distance for guillemot is greater than previously assumed. These studies suggest a disturbance distance of around 10 km or more. Further study will be needed to determine the impact on population level and the relevance for the necessary size of the open zone in wind farm zone 6/7. The Government will conduct additional studies to gain a better insight into these aspects. By phasing the rollout of wind energy, the results of these studies can be used in determining the necessary width.
- **Birds Directive area** In response to recently published bird intensity maps[200], the Government is investigating the necessity of designating parts of wind farm zone 6/7 as a Birds Directive area. The results of this study are not yet available but could influence the possibilities for realisation.
- **Impact on harbour porpoise population** Given the current assumptions in the set of modelling instruments and if current foundation techniques are used, the impact on harbour porpoise populations will lead to an exceeding of the standard for realisation of 9-12 GW from 2032 onwards (following implementation of the Roadmap 21 GW). At the same time, further studies are being conducted and innovative mitigating measures offer good prospects. As yet it is uncertain whether innovations and the inclusion of new knowledge will lead to achieving the noise standards. This creates an uncertainty for the awarding of permits. The Government will include developments of innovative pile driving techniques and mitigation measures for underwater noise as the rollout of offshore wind energy progresses. In addition, the Government will contribute actively, among others in the framework of Wozep, to supplementary research aimed at minimising the impact of underwater noise, and achieving the noise standard of 160 dB as quickly as possible. For the

[198] Pondera, SEA (PlanMER) and Appropriate Assessment Partial Revision North Sea Programme 2022-2027, 2025

[199] Auks in the German North Sea: Effects of Offshore Wind Farms (Szostek et al., 2024); Cumulative effects of offshore wind farms on common guillemots (Uria aalge) in the southern North Sea - climate versus biodiversity? Biodiversity and Conservation. (Peschko et al., 2024); High-definition bird and marine mammal aerial survey image collection in Borssele First-year report (Collier et al., 2022); Habitat loss of auks and guillemots in and around offshore wind farm Gemini. Study into the spatial distribution of seabirds via digital aircraft surveys in a large reference area and a robust statistical analysis in R-INLA (Grundlener, Leopold., 2024)

[200] Vogel R., Zoetebier D., van Winden E., Sierdsema H., Foppen R. & van den Bremer L. 2024. Updated national overview of bird species with concentrations of national and international importance. Sovon report 2024/13. Sovon Vogelonderzoek Nederland, Nijmegen.

awarding of permits, the assessment according to the conservation status will take precedence.

Uncertainties relating to mining/drilling

In assessing the attainable capacity of wind energy in the designated wind arm zones, account was taken of existing drilling platforms and potential future drilling platforms. Future opportunities (prospects) for the production of oil and gas and storage of CO2 and hydrogen have been mapped out in consultation with mining operators, Element NL and Energiebeheer Nederland (EBN). An obstacle-free zone of 5 NM around helicopter-accessible platforms is defined as the starting point in this North Sea Programme, but it is argued that this can be deviated from in the form of customised solutions. This will require a positive judgement from a safety study and the acceptance of the resultant accessibility. The Government encourages the use of customised solutions for helicopter access, for example in the form of a test project for introducing Point in Space (PinS) procedures for offshore applications. This procedure may offer opportunities of retaining flight safety and aircraft access while requiring less space. Both in Doordewind and in wind farm zone 6/7, when assessing the available physical space for wind farms, it was assumed that the PinS procedure or other space-saving flying procedures could be applied. In the spatial study described in the SEA, an area that approximately equates to a 2.5 NM obstacle-free zone and a possible approach route outside the wind farms are assumed. Whether these assumptions are tenable will have to be demonstrated. In conjunction with the number of platforms taken into account, this means:

- *More space may be needed for mining, which could result in less space for wind farms or reduced helicopter access*.
  If the study into customised solutions shows that the PinS procedure cannot be applied, and that no other space-saving flying procedures are suitable, a dilemma will arise regarding the allocation of space. In that case, it is up to the Minister of Climate and Green Growth to make a balance between wind energy and mining within the total space available for wind energy, whereby other conditions such as ecological integration and the size of an open zone through wind farm zone 6/7 will remain in force. This consideration, which will only become relevant if no customised solution is found, could lead to a) less space for wind energy, or to b) no changes to the assumed space for helicopter access resulting in reduced helicopter access. This choice could be relevant for prospects which have already been identified in the spatial analysis, and prospects which could emerge in the future.
- *Less space may be needed for mining/drilling, so that more space becomes available for wind farms*.
  If fewer prospects are actually developed than has currently been taken into account, this will result in more space for wind energy. This space can be used for wind farms, but still subject to the conditions described in section 9a.3.2. This could then relate to additional wind turbines or application of a lower density.

In summary, the assessment of the number of GW in the designated wind farm zones is based on assumptions which could be subject to change, such that the assessed quantity of wind energy is indicative. As described above, it may emerge in the follow-up process that more or less space is available for wind energy.

9a.3.4 Phased approach to rollout of wind energy and follow-up process for shipping

Due to the layout with an open zone in the centre, wind farm zone 6/7 comprises a western section and an eastern section. In this revised North Sea Programme, the entire area is designated and the outer boundaries are determined. The Government will decide in phases on the internal boundaries of the western and eastern section and as such the precise location and size of the open zone.

The first phase of the rollout of wind energy will start in the western section. The eastern section will follow at a later stage. The map below indicates the area in which the rollout of wind energy will start during the first phase. The internal boundaries of the area for phase two have not yet been determined.

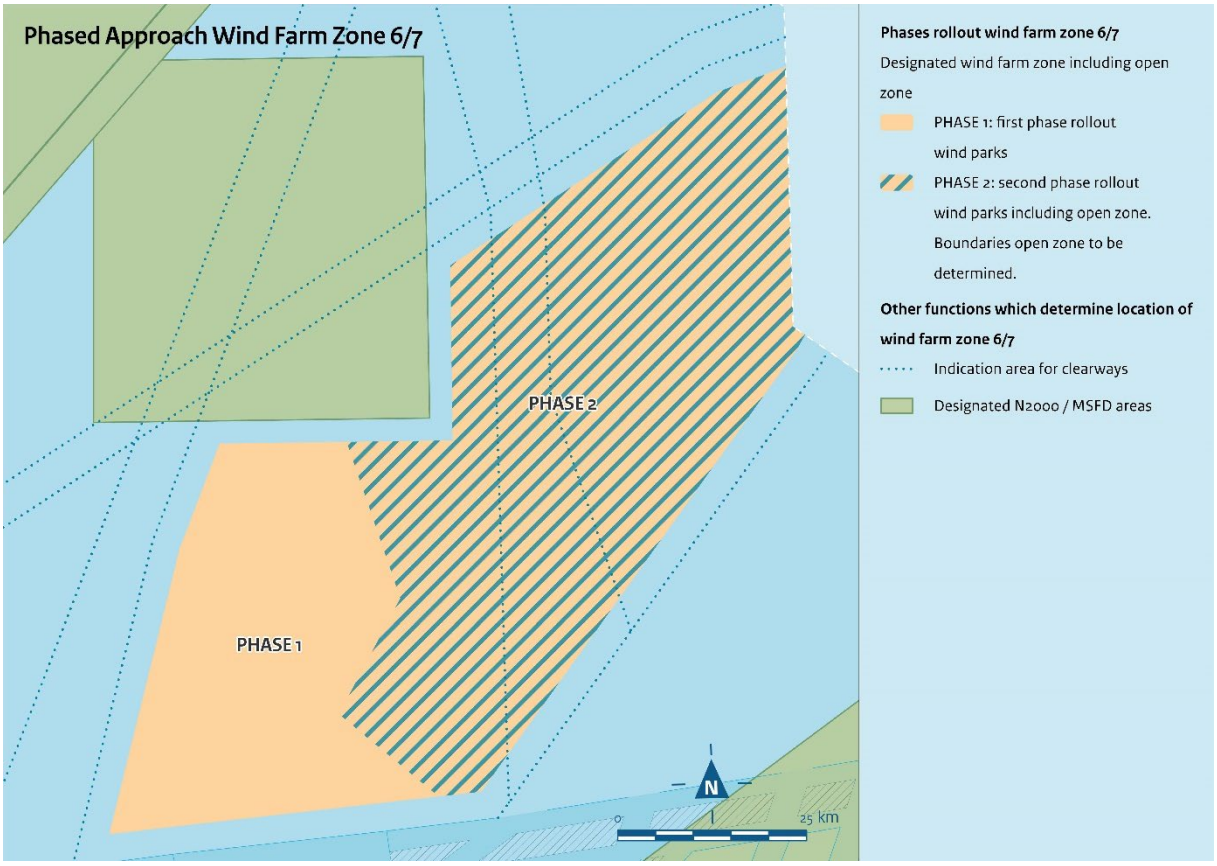

Figure 9a - A: Wind farm zone 6/7 phased approach

Notes to the location of the boundary phase one wind farm zone 6/7

In the spatial investigation described in the SEA[201] for the location of the open zone, the spatial demands for the langoustine fishery have been assumed, determined on the basis of fishery intensity maps and in consultation with fishery representatives in the North Sea Consultation. The spatial study also assumes an open zone for nature, intended among others to prevent a barrier effect and habitat loss for seabirds. As such, it forms a connection between the Central

[201] Pondera, SEA (PlanMER) and Appropriate Assessment Partial Revision North Sea Programme 2022-2027, 2025

Oyster Grounds and the Frisian Front. The boundary described above meets both spatial needs. As a consequence, the langoustine fishery is spared. The size of the open zone is subject to reservation. The phased approach means that flexibility is retained to adapt the size of the open zone as necessary when more information is available about the necessary width for mitigating the effects on guillemots (see section 9a.3.3). The planned clearway through wind farm zone 6/7 is located to the east of the boundary shown and takes account of a number of potential future platforms. In this way, the least possible spatial tension is created in the western section of wind farm zone 6/7 where the rollout of wind farms is due to start.

Phase 1: Roadmap for the first phase of wind farm zone 6/7 and Doordewind
For the first phase, the western section offers space for an indicative 11 GW. This takes into account space for a potential future drilling platform, based on the assumption that a space-saving flying procedure can be employed. If this platform is not developed, this may result in more space for wind farms. If the platform is developed and space-saving procedures for helicopter access prove non-viable, it may be that there will be less space available for wind farms. The decision will be taken by the Minister of Climate and Green Growth. In the Roadmap for phase one, the Government will specify how many sites can be realised during this phase, as well as outlining the timetable and order for the wind farm site decisions. Doordewind, which offers space for an indicative additional 2 GW over and above the 2 GW from the roadmap for 21 GW, is also part of this roadmap. The Government intends to publish this roadmap in December 2025. The Government will then take the relevant wind farm site decisions for phase one, one at a time.

Phase 2: Area elaboration and roadmap phase two for wind farm zone 6/7
Directly to the east of the western section is an open zone. The eastern boundary of this open zone will be determined in a further area elaboration for wind farm zone 6/7, on the basis of ecological studies into the necessary width and size of the open zone.

If desirable, the western boundary of the open zone can be partially optimised, in that on the basis of a weighting between the interests of nature and fisheries, the western section can offer a very limited degree of additional space for wind energy, in phase two. A decision is possible in which the section of the open zone important for langoustine fishery will also remain completely free of wind farms in phase two.

Assuming an open zone of 1520-1620 km^2, the eastern section, whether or not with a very limited additional space in the western section, will offer space for an indicative 8 GW. If the implemented studies show that the open zone needs to be larger, there will be less space for wind energy. The Government will lay down the boundaries of the open zone on the basis of the investigation results in an area elaboration, which will serve as the basis for the Roadmap for phase two. The physical space actually available for wind energy during phase two will depend not only on the size of the open zone but also on the space required for mining activities. Following publication of the Roadmap for phase two, the Government will take the wind farm site decisions for this phase, one at a time.

Follow-up process for clearways and possible routing measures
In the follow-up process, in consultation with mining operators and nautical experts, the Government will determine the precise location of the clearways, which in principle will be laid down within the designated contours of the MSP map. The definitive boundary will subsequently

be placed in the procedure for adoption in the Environmental order. This process is expected to be concluded in 2026.

To the southwest of wind farm zone 6/7, nautical experts have recommended a revision of the layout of the current TSS junction ‘Botney grounds’ in order to better facilitate shipping traffic to the Northern Sea Route. In addition, when clearways are further elaborated, it may emerge that routing measures will be necessary at other locations, too. As soon as the necessary routing measures become clear, the Netherlands will submit a proposal to the IMO in consultation with nautical experts and relevant national and international partners. The entire process through to implementation may take several years and must be concluded in good time, so that measures can be implemented in advance of the realisation of the first wind farms in the designated areas.

10 Policy and assessment frameworks

10.1 Policy framework for passage through co-use in wind farm zones in the North Sea

10.1.1 Current situation and developments

Efficient and multiple use of space has been an important policy objective for the North Sea since the National Spatial Strategy. The North Sea Policy Document 2016-2021 stipulates that from 2017, passage and co-use will, in principle, be permitted in all operational offshore wind farms, albeit subject to conditions. The implementation rules for this policy have been detailed in the Policy Rule for setting up a safety zone for offshore wind farms[202]. As of April 2018, the Luchterduinen, Prinses Amalia and Egmond aan Zee wind farms have been opened for passage and co-use. To this end, the decision of general application regarding the establishment of a safety zone was revised for each wind farm. The Gemini wind farms have not been opened up due to the high costs of properly enforcing the conditions for opening.

Evaluation of opening up offshore wind farms

In the North Sea Policy Document 2016-2021, it was agreed that policy would be evaluated two years after opening the wind farms for vessels up to 24 metres in length and co-use of smaller operational wind farms[203]. Based on the monitoring period and evaluation of all components, it can be stated that passage in the smaller operational wind farms, with the aim of sailing from A to B, has led to little or no violations and dangerous situations. During the monitoring period, the combination of co-use and passage subject to a permit could not be tested because it did not take place. Co-use subject to a permit has only taken place on a very small scale, in the form of a pilot for nature development on the seabed. This activity did not interfere with passage and also had no effect on the operation of the wind farm. The evaluation indicated that in the event of a possible change to the passage policy, the additional or new aspects will be made clear by means of research for policy exploration. The evaluation is not a good indicator for larger wind farms. The evaluation of the passive fishing pilot as a form of co-use is carried out separately by the Ministry of Agriculture, Nature and Food Quality (LNV).

10.1.2 Vision, ambition and tasks

In the NOVI, the national government provides direction for long-term developments in the North Sea, defining various national interests, including improving biodiversity, developing sustainable food production, and realising a reliable, affordable and safe energy supply. In addition, Section 8.3 of this North Sea Programme describes that the new Sustainable blue economy requires space for (upscaling) robust pilots, such as for aquaculture, passive fishing and electricity from or on water. As a result of all kinds of (new) spatial uses, it is becoming increasingly crowded in the North Sea. The demand for space for new wind farm zones is particularly high. In order to be able to continue to allocate space for all uses and needs, co-use of space and integration of tasks are necessary more than ever before. In offshore wind farm zones, this means facilitating passage and large-scale co-use.

[202] Government Gazette 2018, no. 22588.
[203] https://www.noordzeeloket.nl/@237469/evaluatierapport-bestaande-windparken/

10.1.3 Policy

Passage and co-use of wind farm zones are like communicating vessels. Where there is passage, (often) no co-use can take place with fixed structures in the water column and vice versa. Facilitating both passage and large-scale co-use makes integrated passage of the new wind farm zones impossible.

Navigating passages

Policy for the planning period 2022-2027 only allows navigation in realised wind farm zones under conditions in specially designated passages. These will be designed as a two-way traffic system where shipping can pass through the wind farm zone. The ultimate location and orientation of the new passages must be further investigated for individual wind farm zones, for instance by collecting and analysing shipping movements of fishing and recreational craft. Passages must correspond as much as possible with existing shipping routes to and from recreational shipping ports and important fishing grounds. In addition, the passages are combined as much as possible with maintenance zones for cables and pipelines, which are often oriented east-west.

The passages must have a safe design. 'Safe' means clearly marked, with sufficient distance to wind turbines and wide enough for two-way traffic. The course of the passages must lead to as few course changes as possible for passing ships. The entrances and exits of the passages should be as perpendicular as possible to the existing shipping routes. The safety study performed[204] shows that passages in wind farm zones can be navigated safely and, if necessary, (additional) safety measures will be taken. In the coming years, the Offshore Wind Energy Shipping Safety Monitoring and Research Programme (MOSWOZ) will keep a close eye on developments in shipping safety in relation to the roll-out of offshore wind farm zones and, where necessary, the current principles can be adjusted for a subsequent planning period.

The use of the passages is permitted for ships up to 46 metres in length. This makes the passages suitable for the cutter feet and a large part of the recreational feet. Ships may also use the passages at night, provided they are equipped for this. A passage is primarily intended for crossing the relevant wind farm zone quickly and efficiently. It is therefore not permitted to exhibit objectionable (sailing) behaviour that impedes passage[205]. 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 aims at unambiguous rules of passage 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. Offshore Wind Farm Egmond aan Zee and Princess Amalia Wind Farm will remain open for the time being under the current conditions laid down in the decision of general application.

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[204] Formal Safety Assessment - navigating passages in wind farms https://www.noordzeeloket.nl/publish/pages/190181/formal-safety-assessment-doorvaart-in-passages-in-windparken.pdf

[205] 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.

Co-use

Co-use[206] in realised wind farm zones should be taken to mean nature recovery and development, food production (passive fishing), aquaculture and renewable energy generation and storage (energy electricity from or on the water and installations for hydrogen production[207]).

The space within the wind farm zones of the Roadmap Offshore Wind Energy is in principle available for co-use. An Area Passport Guide is being prepared for all new wind farm zones Borssele, Hollandse Kust (south), (north) and (west), IJmuiden Ver and Ten Noorden van de Waddeneilanden. Zoning A zoning map then indicates where in a wind farm zone there is space for co-use. Excepted from co-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 co-use[208].

An Area Passport Guide is a spatial layout tool guideline in which a distinction is made for each wind farm zone between different types of co-use and which type of co-use is preferred and zone to what extent. NOVI interests (see Chapter 2) are also weighed in this. The Area Passport Guide introduces a more layered structure that gives an area-specific effect to national interests. Chapter 10.3 explains how the Area Passport works in relation to the Assessment framework for co-use in offshore wind farms. In principle, area passports are evaluated and where necessary revised every 5 years.

In addition to economic co-use, sufficient space must remain in wind farms for nature recovery and 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. Co-use activities in a wind farm zone that are not regulated under the Water Act, such as passive fishing, also require prior consent.

[206] Co-use is understood to mean all activities requiring a permit that take place within the contours of wind farms between the wind turbines, and that do not fall under the heading of offshore wind energy.
[207] For CO_2 storage, existing mining infrastructure located within a wind farm zone will most likely be reused, so this activity falls under mining legislation. Appendix 4: 'Design process: distance between mining sites and wind farms' is applied for allocation.
[208] Some non-bottom-bound forms of co-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 co-use in wind farms.

10.1.4 Management philosophy for joint use of offshore wind farms

By optimising the layout of space in offshore wind farms as far as possible, joint use can contribute to a better balance between the three offshore transitions: the nature transition, the food transition and the energy transition. In this way, the Government creates the necessary parameters for facilitating joint use initiatives. This is expected to increase the development opportunities for forms of joint use in offshore wind farms:

1) By investigating which form of joint use offers the greatest potential where, joint use can be facilitated more specifically, on a North Sea-wide scale.
2) By including joint use earlier in the offshore wind energy process as a contributory guiding factor to the layout. In this way, joint use can be better integrated in wind farms. This must not be at the expense of the healthy business case for the wind farm operator and may not lead to delays in the rollout of offshore wind energy.

For this reason, the Government will encourage joint use. The guidance towards specific forms of joint use will depend on:

1) the suitability of areas for forms of joint use in terms of such characteristics as natural conditions, possibilities for combination of functions, distance to the coast and relative suitability as compared with other areas on the North Sea.
2) the balance between the transitions to be realised (food-nature-energy) and the extent to which this specific area can contribute to those transitions.
3) the possibilities and impossibilities of combining different forms of joint use.

Based on these aspects, an initial assessment has been made of the suitability of space within wind farms for joint use (see Ch10.1.5). Area preferences for joint use can be included in the offshore wind energy process with a view to eventually achieving a preferred position in the area passport. Area preferences for joint use are also relevant to the layout of wind farm zones still to be designated, and the evaluation of area passports already adopted. The possibilities for joint use within the offshore wind energy process are described in more detail in section 10.2.1. For further clarification, a process diagram for offshore wind energy is added (see table 10.3).
Just like all other forms of use at sea, the rollout of joint use can only take place within the statutory nature conservation frameworks applicable to the North Sea. Assessment for this aspect will take place during the permit awarding procedure (see section 10.3). Any knowledge gaps relating to the ecological impact of joint use will be further investigated. The Government also intends to use this planning period to gather the ecological impact of joint use during pilot projects.

10.1.5 Forms of joint use on a North Sea-wide scale

This section describes the results of the investigation on a North Sea-wide scale for each form of joint use.

Food production (aquaculture and passive fishing)

On the basis of the available biological data and models, Wageningen Marine Research, in collaboration with Deltares, has made an assessment of opportunities for food production within wind farms (see table 10.1). This study took no account of economic factors such as sailing time to the location and the size of stocks. It is assessed that certain species (crabs, lobsters and possibly cod) will occur in all wind farms, because they are attracted by the hard structures of the wind farm.

An assessment of the suitability of wind farms for aquaculture appears in table 10.1, whereby '++' means very suitable and '--' unsuitable. With a view to passive fishing, consideration was given to the presence or expected (future) presence of various species in the wind farm zones. 'Not observed' means that the species was not or only barely observed. In that case, the opportunities for fishing are assessed as low.

At present, only passive fishing has been recognised as one of the four permitted forms of joint use. At present, active fishing is not permitted as a form of joint use in offshore wind farms. The growing ambitions for offshore wind energy mean that the free space for fishing will further decline and as such call for a possible reassessment on the ban on active fishing in offshore wind farms. For this reason, the Government is investigating whether and if so, under what conditions forms of active fishing can in the future be permitted in wind farms, taking account of ecology and other use. This will also be a response to the revised Van der Plas motion (BBB)[209]. For the wind farms in Doordewind, the operating principle is that active fishing will be permitted on condition it is safe, viable and feasible.

[209] Parliamentary Papers II, 2022-2023, 21 501-32, no. 1500.

Co-uses ▸	Aquaculture		Passive fishing				
Wind farms or wind farm zones ▾	Shellfish farming	Seaweed farming	Crabs, lobsters and possibly cod	Sole	Norwegian lobster	Southern species (sea bass, squid, cuttlefish, mullet, red gurnard)	Mackerel, Horse mackerel
Egmond aan Zee	++	++	Expected to be present	Found	Not found	Found except cuttlefish	Found
Princes Amalia	++	++	Expected to be present	Found	Not found	Found except cuttlefish	Found
Luchterduinen	++	++	Expected to be present	Found	Not found	Found except cuttlefish	Found
Buitengaats (Gemini)	++	-	Expected to be present	Found	Not found	Only mullet and red gurnard found	Not found
Zee-energie (Gemini)	+-	-	Expected to be present	Found	Not found	Only mullet and red gurnard found	Not found
Borssele	++	++	Expected to be present	Found	Not found	Found	Found
Hollandse Kust (south)	++	++	Expected to be present	Found	Not found	Found except cuttlefish	Found
Hollandse Kust (north)	++	++	Expected to be present	Found	Not found	Found except cuttlefish	Found
Ten Noorden van de Wadden	-	+-	Expected to be present	Found	Found	Only mullet and red gurnard found	Not found
Hollandse Kust (west)	++	+-	Expected to be present	Found	Not found	Found except cuttlefish	Found
IJmuiden Ver Beta en Alpha	++	+-	Expected to be present	Found	Not found	Found	Found
IJmuiden Ver Gamma	++	+-	Expected to be present	Found	Not found	Only mullet and red gurnard found	Found
Nederwiek zuid	++	+-	Expected to be present	Found	Not found	Found	Found
Nederwiek noord	++	+-	Expected to be present	Found	Found	Only mullet and red gurnard found	Found

Lagelander zuid	++	+-	Expected to be present	Found	Not found	Only mullet and red gurnard found	Found
Lagelander Noord	++	-	Expected to be present	Found	Not found	Only mullet and red gurnard found	Found

Table 10.1 Suitability of wind farm zones for a number of forms of aquaculture and passive fishing[210] on the basis of biological data and models. Other factors such as average wave height and distance to the nearest port have not been included.

[210] Wageningen Marine Research, Promising wind farm zones for mariculture and passive fishing; A quantitative assessment of the suitability of the existing, planned and still to be designated areas for seaweed farming, shellfish farming and passive fishing as a joint use function 2023

Other forms of renewable energy

With the growth of the generation of electricity from renewable energy sources, the storage of electricity and conversion into other energy carriers is becoming increasingly important. With the amendment to the Offshore Wind Energy Act in 2019, it has become possible that activities for the conversion of wind energy into alternative energy carriers within the wind farm, for example the production of hydrogen, could be permitted. It also remains possible to install separate installations in a wind farm for energy storage or the production of hydrogen as a means of implementing joint use in the category 'renewable energy generation and storage other than wind energy'. In that case, joint use activities are not permitted on the basis of the Offshore Wind Energy Act, but under the Environment and Planning Act. In the case of other forms of produced renewable energy, the future technical connection possibilities - for system integration - with the wind farm are relevant. The most efficient option is to transport the generated energy to land, via the already installed offshore grid. This is possible via a separate connection to the transformer station, via the infield cables by means of a connection to a wind turbine or via a single connection to a wind turbine. Unlike the table for food production and partially in relation to ecological values, no table has been included to indicate the degree of suitability for each wind farm or wind farm zone.

Nature assets

The further rollout of offshore wind energy will increase pressure on North Sea nature, which is already under severe pressure due to the large number of activities. The populations of the majority of seabirds, fish, marine mammals and benthic animals are in decline. By gaining an insight into the ecological assets in an area, the potential for nature in wind farm zones can be determined. This can be relevant for regulations for nature-inclusive design and possible additional measures for nature recovery or nature reinforcement. An insight into the ecological assets present can also be a determining factor for the suitability of an area for specific forms of joint use. In the process of awarding a permit for joint use activities, the impact on nature will be assessed on the basis of the most recent scientific knowledge. It should however be noted that a great deal of ecological knowledge is still absent. For that reason, the precautionary principle will be applied, whereby the current status of North Sea nature (OSPAR QSR 2023 and ICES 2024) will be taken into consideration.

In addition to negative impact on ecological assets from the construction and operation of a wind farm, a wind farm can also have positive effects, for example via initiatives for nature recovery and development or through the exclusion of other activities. We expect that due to the relative calm which is then created in (part of) the wind farm zone, nature can start to recover. The degree to which recovery will occur and for what species this applies is something that will have to be demonstrated by further research. In the preparations for the next North Sea Programme, consideration will be given to how we can better anchor 'calm' in legal terms, as part of nature recovery and development in wind farms. The Government is also investigating whether nature recovery and development in offshore wind farms can be used to realise part of the nature tasks facing the Netherlands, so that in principle more open space will remain available for fishing. In addition to the expected positive impact of calm on ecological assets, 'active' nature reinforcement and recovery measures such as the construction of artificial reefs, fish shelters and oyster beds could make a positive contribution.

Regulations for Nature-Inclusive Design (NIB) in the wind farm site decision will promote the use of suitable scour protection (boulders around turbine piles). The aim is to support specific species such as cod and flat oyster. In this way, NIB can contribute to reinforcing a healthy North Sea. NIB is specified in the wind farm site decision and as such is part of the wind permit for the

wind farm. This is not a form of joint use (for further explanatory notes see the text block Nature-inclusive Design versus joint use in section 10.3).
With regard to the distribution and (historical) occurrence of reef building benthic animals, a relatively large volume of information is available. This makes it possible to prepare an indicative potential table for the various wind farms and the likelihood that reef building species will establish or spread here (see table 10.2). In drawing up this table, the current and/or historical presence of the species was observed (on the basis of insights in 2024). Certain reef building species benefit from the relative calm that can be created in parts of the wind farm zones, while other reef building species can benefit from the addition of artificial reefs or other materials, by way of support.

reef-building benthic animals ▸ Wind farms or wind farm zone ▾	Sand mason worm(reef)	Ross worm(reef)	Flat oyster (reef-building)	Northern horse-mussel	Ocean quahog
Borssele	++	+	+	+	
Hollandse Kust (south) including luchterduinen	++	+	+		
Hollandse Kust (north)	++	+	+		
Hollandse Kust (west)	++	+	+		
Ten Noorden van de Wadden	++	+	+		+
IJmuiden Ver Beta en Alpha	++	++	+		
IJmuiden Ver Gamma	++	++	+		
Nederwiek zuid	++	++	+		
Nederwiek noord	++	++	+		
Lagelander zuid	++	++			+
Lagelander noord	++	++			+
Doordewind	++		+		+

Table 10.2 Potential for reef building species in the various wind farms in the North Sea
Score (++, +) or potential is based on current occurrence (measurement points and models), historical occurrence and expert judgement.

Tables 10.1 and 10.2 Table 10.1 shows which areas are more or less suitable for certain forms of aquaculture and passive fishing and offer potential for reef-building benthic animals. In addition

to the natural elements of the area, it is important to consider which activities should take place closer to the coast for reasons of economic feasibility. Economic feasibility will depend on various aspects such as sailing time, the degree of maintenance or monitoring of the activity, and local conditions. In On the basis of the Area Passport Guides for wind farms, it is indicated which forms of co-use are most suitable and therefore enjoy preference. examined which wind farms are most suitable for which co-use and which are given preference.

In respect of the space available for joint use in wind farms in zone 6/7, the national government will concentrate on nature recovery and nature enhancing measures. In discussion with the North Sea Consultation, the Government intends to revise the joint use policy in good time.

10.2 Area Surveys and Area Passport Guide for co-use in wind farm zones in the North Sea

The roll-out of wind energy in the North Sea is in full swing. In the planning period for this North Sea Programme, the wind farms in the wind farm zones of the offshore wind energy roadmap 2023 (Borssele, Hollandse Kust (south) and (north)) will be completed and construction in the wind farm zones for offshore wind energy roadmap 2030 (Hollandse Kust (west), Ten Noorden van de Wadden and IJmuiden Ver Beta en Alpha) will be started and/or have been largely completed. The wind farm site decisions for the abovementioned wind farm zones 2023 offshore wind energy Roadmap are irrevocable and the decision-making procedures for the 2030 offshore wind energy Roadmap have already started.

Allocation will be determined before the start of the decision-making procedures for the site decisions. This takes place almost immediately after the Cabinet has designated a wind farm zone, For the 2030 offshore wind energy Roadmap, this will be already completed in 2022 because the site allocation 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. Allocation takes into account passages for ships up to 46 metres in length, based on data on shipping traffic in the area.

In general, anticipating the possibility of co-use in a wind farm at an early stage will be more cost-effective than adding uses to a wind farm afterwards. However, for wind farm zones the 2023 offshore wind energy roadmap (Borssele, Hollandse Kust (south) and Hollandse Kust (north), Hollandse Kust (west) and IJmuiden Ver Alpha en Beta), all wind farm site decisions have already been taken and tender procedures have been completed. This means that early anticipation of co-use is no longer possible for these areas. To work in the spirit of the North Sea Agreement, two instruments have been developed: Area Survey and Area Passport Guide.

On the other hand, the tender regulations for Hollandse Kust (west) and IJmuiden Ver Alpha and Beta do include provisions for mitigating the ecological impact of the wind farm and thereby contributing to the encouragement of nature enhancement and innovative joint use.

After the design plan for the wind farms is known, the national government draws up an Area Passport Guide for all six wind farm zones from Roadmaps 2023 and 2030. After publication, initiators can discuss possible co-use with the competent authority and apply for a permit. These initiatives for co-use cannot be implemented until the wind farm has been completed.

Figure 10-a: Offshore wind energy.

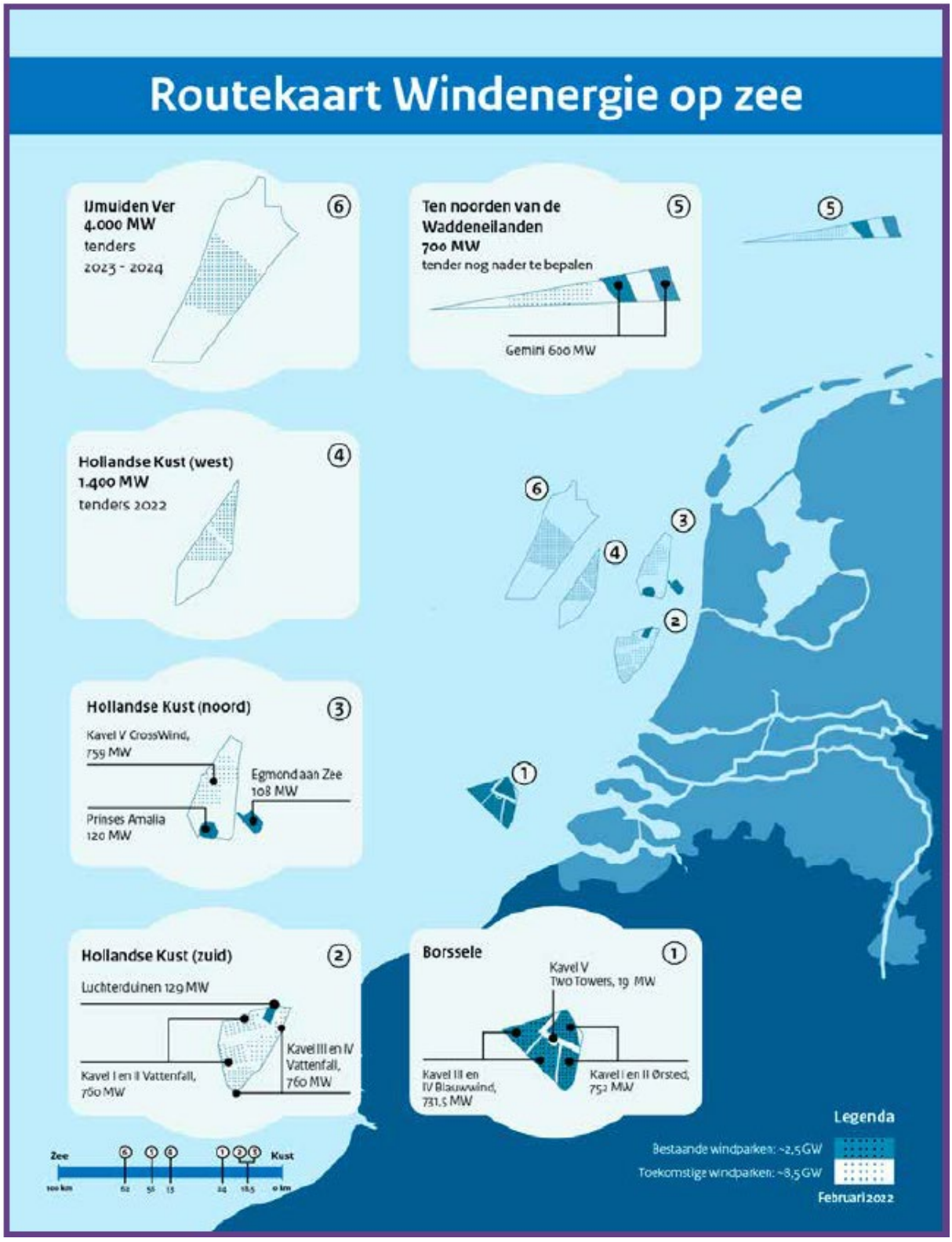

Figure 10-a: Offshore wind energy.

Steps for the roll-out of offshore wind energy	Steps for the realisation of co-use in wind farms
A. North Sea Programme 2022-2027: Designation of new wind farm zones (*formerly North Sea Policy Document 2016-2021*).	North Sea Programme 2022-2027: *Sustainable blue economy (formerly North Sea Policy Document 2016-2021).*
B. Offshore wind energy roadmaps: *When to develop which (parts of) wind farm zones.*	
C. Allocation and investigation of landing points (offshore wind energy).	**Area survey** with area-specific characteristics, such as nature values, current and future users.
D. Adoption of wind farm site decision: *Exact parameters and conditions for the site based on the EIA procedure.*	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.159	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 to indicate where and which forms of co-use have the most favourable prospects and are given preference.
G. Decision of general application (BAS) for setting the safety zone around the wind farm zone.	Legally determine passages and the rules for access to the wind farm zone.
H. Commissioning of wind farm.	*(Submission of permit application)* Co-use of the wind farm.

Table 10.3. Roll-out of offshore wind energy in relation to co-use in wind farms

Area survey wind farm zone

An Area Survey of a wind farm zone provides an inventory of all known area-specific characteristics and of the current and potential future users of the area. The Area Survey will be less specific than the Area Passport Guide. The allocation process of a wind farm zone serves to explore the orientation and location of the passages to be constructed. The Area Survey will take into account the contours of the wind farm zone and the sites and passage(s) present in it as much as possible.[211]

Area Passport Guide wind farm zone

An Area Passport Guide provides as a guideline spatial design instrument for each wind farm zone, based on area-specific characteristics, where and which forms of co-use have the most favourable prospects and can best be incorporated and are therefore preferred. Based on the Area Passport Guide, a distinction can be made in the new Assessment framework for co-use of offshore wind farms drawn up by Rijkswaterstaat between permit applications from potential co-users. If there is no need for the preferred type of co-use, the zone can be released for other co-use.

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

Spatial zoning indicates on a map where there is space for co-use in the wind farm zones.

10.2.1 Early anticipation of joint use; where is what possible in the rollout of offshore wind energy

The ecological characteristics of an area, the biotic and abiotic environmental assets and the economic and technical viability, determine the suitability of wind farm zones for various forms of joint use. Prior to the site allocation of a wind farm zone, on the basis of relative suitability and taking account of the balance between the three transitions, it is possible to consider which form or forms of joint use are viewed as preferable in which wind farm zone.

The process for offshore wind energy starts with the search for suitable areas on the North Sea (**step A** in table 10.3). The process is supported by an SEA (Strategic Environmental Assessment) procedure. Locations for offshore wind farm zones require favourable wind speeds and seabed conditions and must offer the best possible match with other activities on the North Sea. In designating wind farm zones, account is taken of ecological impact, shipping, existing infrastructure (cables and pipelines), mining/drilling, defence, sand extraction, fishing, designated protected nature conservation areas and other interests in the immediate vicinity. In the offshore wind energy roadmap (**step B**), the order is laid down in which the parts of wind farm zones will be developed.

Site allocation of wind farm zones and the area investigation (step C)

Once the wind farm zones have been designated, the next step is to determine how the individual sites will be allocated. The Government investigates how joint use can play a role in the site allocation of a wind farm zone. The site allocation process includes mapping out among others the obstacles and use functions that impose restrictions on the placing of wind turbines in the area. Based on the characteristics and the existing use of a wind farm zone, a preliminary site is mapped out. This information about the physical conditions of the site is laid down in a location study. The physical conditions include wind speed, water depth, wave height, seabed conditions, archaeology and the presence of shipwrecks and Unexploded Ordnance (UXO). This information is valuable to potential wind farm operators as a basis for their bid for the tender, but also for future joint use projects. In terms of its content, the location study partially overlaps with the area investigation, with the exception of the description of ecological assets in the area investigation. The sections below indicate for each phase of the offshore wind energy process how joint use could be integrated.

Decision making for wind farm site decisions for offshore wind farms (step D)

On the basis of the site layout, a project environment impact assessment (project EIA) is drawn up, that serves as the basis for the wind farm site decision to be taken. A wind farm site decision determines where and subject to what conditions an offshore wind farm is to be built, operated and dismantled, within the site. The wind farm site decision includes bandwidths for the number of wind turbines and their dimensions, but can also include regulations for the protection of birds and bats, and measures preventing underwater noise and in favour of nature-inclusive design. The wind farm site decision can also include regulations aimed at making the wind farm more joint use friendly. Possible examples of such regulations relate to the wind farm itself (turbines and cables) and it must be possible to technically regulate for these issues in a wind farm site decision. If these regulations relate to the laying out of offshore wind farms, this must always be set off against the effects on the electricity yield of wind farms and the (additional)

costs to the permit holder of the wind farm. The operating principle remains that any better promotion of joint use may not result in a delay in the rollout of offshore wind energy, and that a healthy business case for offshore wind farms must be maintained.

Co-use innovations arising from the Offshore Wind Energy in the tender regulations for obtaining a wind permit (Step E)

The Offshore Wind Energy Act offers four possible procedures for the awarding of a permit for the construction and operation of offshore wind farms includes four allocation methods for granting permits ('tender instruments'), including a comparative assessment. Article 14a of the Offshore Wind Energy Act specifies that the awarding of a permit will take place subject to the procedure with subsidy, a comparative assessment, a comparative assessment with financial bid, or an auction. In the event of a procedure with a comparative assessment, with or without a financial bid, ranking criteria can be elaborated and added by ministerial regulation that are location-specific or that play a one-of role at that time due to additional social considerations with regard to innovation. The ranking criteria to be added might also be criteria in the field of nature, aquaculture, fisheries, safety or shipping.[212] In the procedures with comparative assessment for Hollandse Kust (noord), (west) site VII and IJmuiden Ver Beta for example, provisions were included aimed at encouraging innovations for the benefit of the integration of future wind farms in the Dutch energy system. The licensing scheme for Hollandse Kust (north), for example, includes a provision to encourage innovations that benefit the integration of future wind farms into the Dutch energy system. These are innovations in the wind farm itself or resources directly associated with it that contribute to increasing the flexibility of the supply profile of future offshore wind farms. These include installations for other forms of renewable energy generation (e.g. offshore solar) and hydrogen production. Hydrogen production can be included in the wind farm site decisions[213] for offshore wind farms. If the hydrogen activity is not included in the wind farm site decision, including the underlying environmental impact assessment, it is also possible to implement hydrogen installation as a form of joint use. In that case, a separate Environment and Planning Act permit must be applied for. A permit must be requested for these installations if they are not directly related to the wind turbines of the wind farm.

In addition, in the procedure with comparative assessment for Hollandse Kust (west) site VI and IJmuiden Ver Alpha and Beta, provisions were included which contribute to the ecology of the North Sea. These involve encouraging and developing innovative solutions in favour of biodiversity occurring in the Dutch North Sea, and encouraging additional ecological measures on top of the compulsory mitigating measures already contained in the wind farm site decision.

These co-use innovations/activities and additional ecological measures arising from the tender regulations will be included in the wind farm design plan. Because the Area Passport Guide is drawn up after the design plan of the wind farm, the area preferences for other co-use required for these activities will automatically be taken into account. In this way the integration of joint use is possible in advance via the tender for obtaining the wind permit, but also after the event following the construction of the offshore wind farm. This means that joint use can be applied adaptively in terms of both time and space.

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[212] Explanatory Memorandum Amendment to Offshore Wind Energy Act, Parliamentary Documents II, 2018/19, 35092, no. 1-4.

[213] A wind farm site decision is taken on the basis of Article 3 of the Offshore Wind Energy Act. A wind farm site decision determines where and under what conditions a wind farm may be built, operated and removed, within a wind farm zone.

Consortia formation and combination of co-use activities

Forming consortia and the combination of co-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.

Area Passport Guide for offshore wind farm zones (Step F)

For each wind farm zone, an Area Passport Guide identifies where in the wind farm or wind farm zone which forms of joint use are considered preferable. In the initial area passports for wind farm zones Borssele and Hollandse Kust (zuid), all forms of joint use enjoyed preferential status. On the basis of the principles in Ch10.1.4 and the allocation of wind farm zones on the basis of suitability for forms of joint use, a preselection will take place earlier in the offshore wind energy process to determine which forms of joint use offer the greatest potential in specific wind farm zones, and which forms of joint use can be given a place. As such, on the scale of the entire North Sea, the maximum possible contribution will be made to the (balance between the) three transitions.

Following approval of the layout for the wind farm (the position of wind turbines, the location of cables and if applicable the locations for nature-inclusive design), the level of detail required by the initiators to submit their permit application is made available. The Area Passport Guide is therefore an instrument that is drawn up following completion of the wind farm. By aiming for joint use earlier in the offshore wind energy process, the layout of the wind farm can be designed as ideally as possible, taking account of the intended forms of joint use.

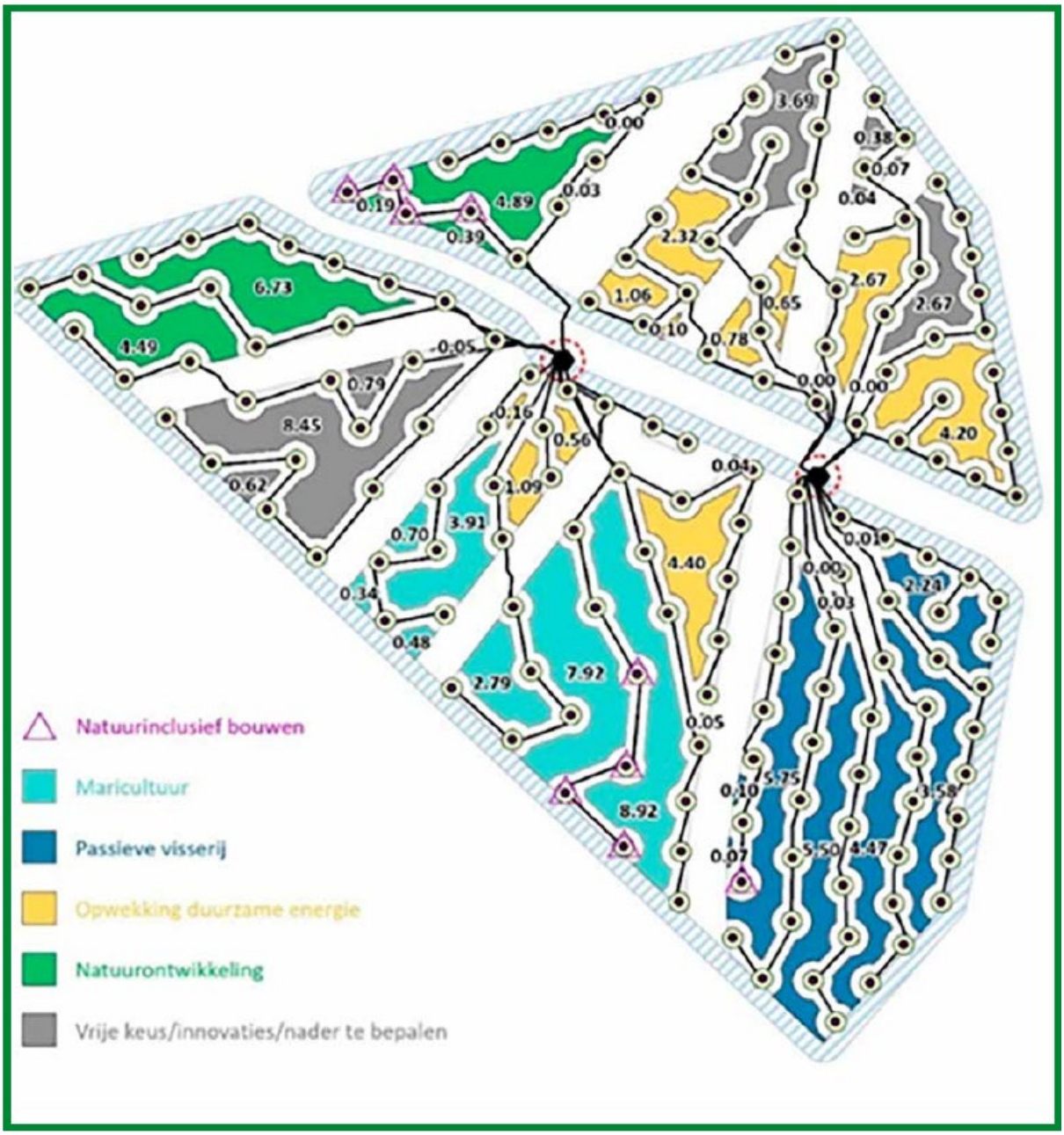

Figure 10-b: The available space for potential joint use in the Borssele Wind Farm Zone (9,800 hectares)

Via spatial zoning, areas where there is space for joint use in the wind farm zones can be recorded on a map.

The area layout takes account of balance in the transition triangle nature, food and energy within and for the ecological capacity of the North Sea. In the areas designated in the Area Passport Guide for nature recovery and development and passive fishing, no other forms of joint use activity will take place be permitted. The procedure included in the consideration framework joint use (Ch10.3) to allow deviation from the preferred form is not applied to those areas reserved for nature recovery and development and passive fishing. Within the preferred areas for nature development, it is undesirable to undertake activities which could influence the monitoring of nature-enhancing measures or could harm the nature recovery that can take place within these areas. For that reason, in the preferred area for nature recovery and development, no other forms of joint use are permitted. Because there is a knowledge gap in respect of the combination of nature-inclusive design and joint use, it will be necessary to investigate which forms of nature-inclusive design and joint use can be combined and/or can reinforce each other. The results of these studies will be included in the decision making for the new North Sea Programme 2028-2033. Within the preferred areas for passive fishery, different types of passive fishing gear can be used or set out for a short period. Fishermen who have been allocated an area are permitted to make use of that area subject to certain conditions. Other joint use activities subject to compulsory licencing involve fixed, more permanent structures within the area, do not combine well with the fishing system or the way in which the space for passive fishing is allocated. For that reason, in the preferred area for passive fishing, no other forms of joint use will be permitted.

The parties interested in joint use have access to detailed information in the form of the area passport guide, on the basis of which they are able to submit a permit application for joint use activities. The legal framework, the zoning map from the Area Passport Guide and the consideration framework for joint use (Ch10.3) together are the instruments for the permit awarding process for joint use activities within offshore wind farms.

In the area division, a balance will be aimed for in the transition triangle of nature, food and energy and the ecological carrying capacity of the North Sea. No other co-use activities will take place in the areas designated for nature development in the Area Passport Guide. If the requested co-use does not correspond to the preferred form, the term of the permit may be limited. In this way, preferred activities may over time still qualify for the use of the most suitable co-use space. This is explained in more detail in Section 10.3. If necessary, after an evaluation, the current system of area surveys and area passports can be adjusted for the next planning period.

In summary: The Area Passport Guide provides transparent information about:

- the possibilities for future co-use by current and new users, in line with the goals of co-use in the area;
- preferred form(s) of co-use;
- what space is available for co-use;
- the natural qualities and properties present in the area;
- the archaeological values known or expected to be present in the area;
- a layered structure in which national interests are elaborated in an area-specific manner.

10.3 Assessment framework for co-use in wind farms

10.3.1 Introduction

The national government sets frameworks so that the use of space in the North Sea can develop efficiently, safely and sustainably. Multiple use of space is an important starting point, offering balanced opportunities for all forms of use in the North Sea. The national government applies the Assessment framework for co-use in wind farms to consider co-use activities in offshore wind farms. Applying for a permit for shared us in a wind farm under the Assessment framework is a three-step process.

10.3.2 Scope

The Assessment framework for co-use in wind farms on the North Sea applies to all activities in offshore wind farms that are subject to a permit, based on prevailing legislation in the territorial sea and the EEZ.

A permit must be applied for to be able to realise co-use activities in wind farms in the North Sea[214]. 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.

Co-use is understood to mean all activities requiring a permit that take place within the contours of wind farms between the wind turbines, and that do not fall under the heading of offshore wind energy. The following forms of co-use are possible in offshore wind farms:

- aquaculture (including shellfish and seaweed);
- other forms of renewable energy generation and storage (including electricity from or on water and installations for hydrogen production[215]);
- 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 co-use

Not only the realisation of certain sustainable forms of co-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 farm zones 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 later 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.

[214] With the exception of passive fishing, see the box on the passive fishing procedure.

[215] If existing mining infrastructure located within a wind farm zone is reused for CO_2 storage, this falls under mining legislation. The Assessment framework for co-use in wind does not apply to this.

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 co-use.

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 farm zone. 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 co-use and which co-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 interest[216], 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 space for co-use, provided the permit holder concerned does not experience disproportionate damage or nuisance as a result.

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

Co-use outside the maintenance zones for wind turbines and infield cables

Research[217] 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[218] 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 co-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.

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 farm zone 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 farm zone. 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. There is only limited space available for passive fishing activities in a wind farm zone. 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 farm zone are included in the Area Passport Guide for the wind farm zone. 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;

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

[218] The 500 metre radius around the turbine consists of a first 250 metres maintenance zone necessary to allow regular maintenance to be carried out safely and a further additional 250 metres for safe manoeuvring space for large maintenance vessels. In the 250 metres manoeuvring space, co-use activities such as nature development or forms of passive fishing can take place on the bottom within the 250-metre manoeuvring space. nature development on the seabed or forms of passive fishing are permitted. If further research shows that passive fishing in no way hinders the safe implementation of maintenance, and that passive fishing represents no serious risk in respect of shipping safety within the wind farm and the research referred to in section 10.2 shows that the combination of nature-inclusive design and joint use leads to no objections, it is possible to investigate whether the use of the maintenance zone can be further optimised for passive fishing. These and other forms of co-use should not lead to obstruction in the manoeuvring space by, for examples, objects on the water surface.

- 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: safely manoeuvring within a wind farm;
  safely deploying the fishing gear within a wind farm;
- 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 farm zone;
- Sustainable fishing gear is used for fishing activities; causing litter should be avoided.

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 importance[219] 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.

[219] 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 consideration framework

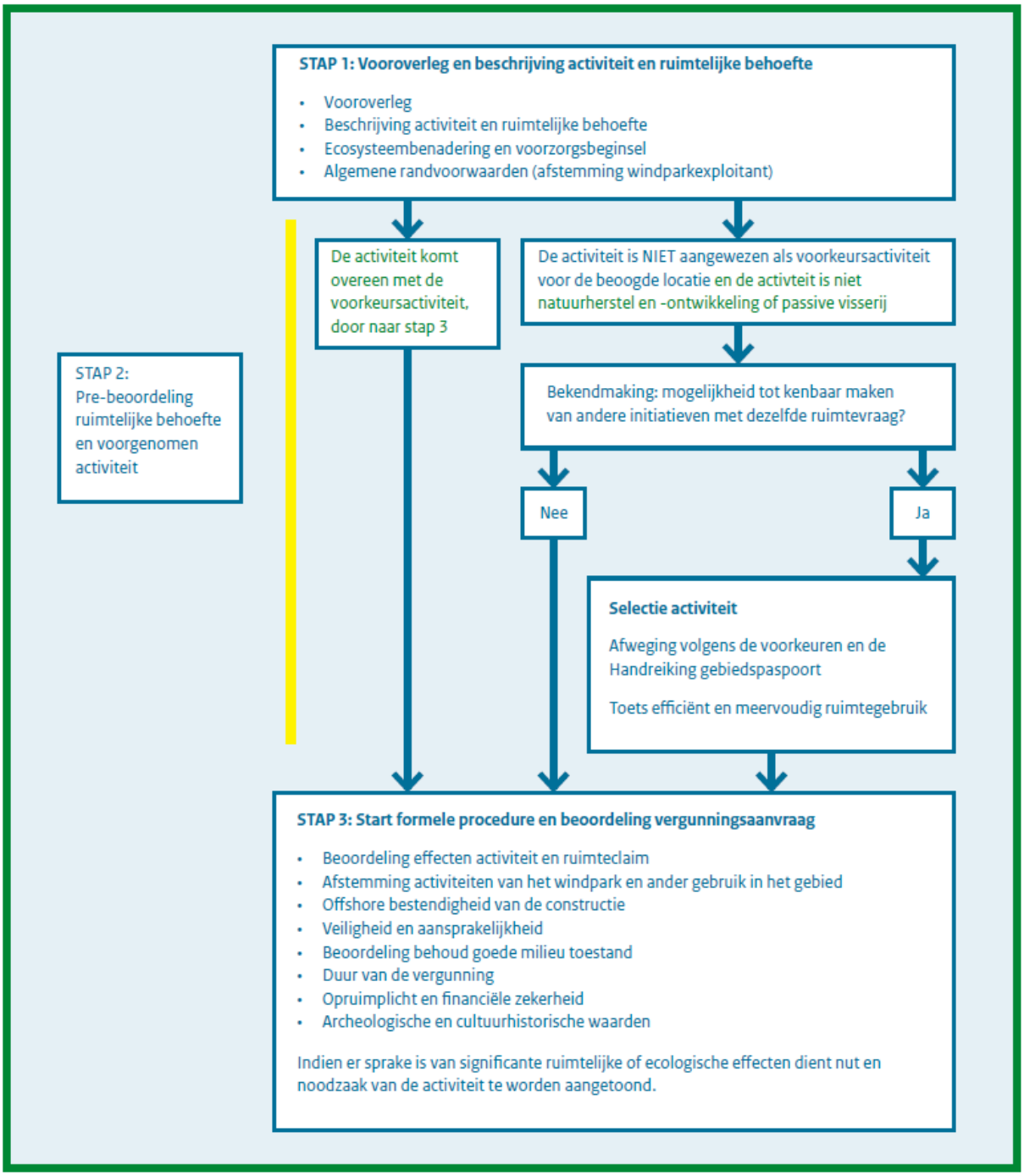

Figure 10-c: The steps of the assessment framework

10.3.5 Explanation of the steps to be taken

Steps 1 and 2 of the assessment framework are the beginning of the process, focusing 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 farm zone, 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[220] 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

Specifying the spatial need of the proposed activity entails a description to make the activity, the space claim, the possible effects of the activity and the intended location in the wind farm known. 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 Natura 2000 areas. Important aspects are the introduction of non-native species, ecological capacity, nutrient extraction or supply and effects on species (for

[220] Rijkswaterstaat (on behalf of the Minister of Infrastructure and Water Management) is the competent authority for activities on the North Sea that require a permit and fall under the scope of the Water Act (which will be incorporated into the Environment and Planning Act).

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 co-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 co-use and wind farm operator
A wind farm zone 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 co-use, the interests of the wind farm operator and possible effects on the wind farm must also be considered. The co-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 co-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, co-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 co-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 co-use activity. Coordination and cooperation between wind farm operator and initiators of co-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 farm zone 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 co-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 farm zones.
- Assessing the effects that the co-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-proof and safe

The construction or installation should be offshore-proof. A permit application must describe how the structure will be anchored or otherwise secured to prevent it from coming loose and driving. 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 proofness 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. The initiator must take measures to limit the risks in the event that a structure or installation nevertheless becomes detached or is lost or damaged. 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 co-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. From a safety viewpoint, maintenance to installations must take place during day and the area should be avoided in inclement weather. An initiator of a co-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 co-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 co-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 a permit is granted, the permitted activity must be started within three years, otherwise the permit will expire. In principle, the end of a wind farm also means the end of the permits for co-use activities in that wind farm. However, the permit may include a regulation from which it follows that the allocated space will 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 co-use activity.

Removal obligation and financial security
In principle, all installations, structures and objects associated with the co-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 hydrographical 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 farm zones, 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 farm zone.[221]

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. The underlying principle here is that the initiator must compensate the Government for the additional costs incurred because sand extraction must be moved to a different location if a potential sand extraction area in the reservation zone for sand extraction area is seized.[222] 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 the initiator wishes to pass a route through a potential sand extraction area, the initiator is required to request permission under private law from the Government as owner of the seabed of a territorial sea. This also applies in the event of a combined route through a potential sand

[221] The relevant reports with regard to archaeological sites in wind farm areas can be consulted at: https://offshorewind.rvo.nl/

[222] The adopted methodology 'Additional costs for sand extraction due to TenneT cable routes' (Morselt, 2016) based on the 2010 Blue Economy Report (Morselt et al., 2010) is used to determine the compensation costs for the route permit duration. A protocol will be drawn up with the stakeholders to formalise the compensation process.

extraction area. The request for permission under private law must be submitted to the national government Real Estate Agency, prior to an application for a permit. 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. 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.

Grounds for exemption from compensation are a route through an exhausted sand extraction area (1) or a route through an already designated preferred route (2).

10.5 Assessment framework for activities in the North Sea

10.5.1 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 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 uses in the North Sea Programme. The policy regarding the user functions is described in Chapters 3 to 8.

Activities of national importance which the government gives priority to 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 spatial development strategy map for the North Sea. These and other starting points and the scope of the assessment framework are described in this section. 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 of[223] the Water Act, the Earth Removal Act, the Nature Conservation Act, the Environmental Permitting (General Provisions) Act, the Mining Act[224] , the Offshore Wind Energy Act and several shipping laws[225] [226] [227]. The policy rule is applied by the competent authority, i.e. Rijkswaterstaat (on behalf of the Minister of Infrastructure and Water Management), the Minister for Climate and Energy, the State Secretary for Economic Affairs and Climate Policy, the Minister for Agriculture, Nature and Food Quality, and the Minister for Nature and Nitrogen. 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 requirement under the Nature Conservation Act if a permit has been or will be granted on the basis of other legislation and with due observance of Article 6, paragraphs 3 and 4 of Directive 92/43/EEC (this only applies to activities in the EEZ), or if the activities taking place in the Natura 2000 area have already been assessed and regulated in the management plan for the area concerned.
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.

[223] For more information about the national legal frameworks, see www.noordzeeloket.nl, under policy.
[224] As far as the aspects that affect the North Sea water system are concerned.
[225] Prevention of Pollution from Ships Act.
[226] Shipping Traffic Act.
[227] Territorial Seas Shipping Regulations.

Starting points

- General: Within the European and international frameworks (Water Framework Directive, Marine Strategy Framework Directive, Birds Directive, Habitats Directive and the Malta Convention), the government gives priority to activities of national importance to the Netherlands: shipping, oil and gas extraction, CO_2 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 limits.[228]

[228] 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. This does not mean that the interests safeguarded by these tests are to be disregarded: they are considered in their entirety in an assessment of the experiment based on the project description.

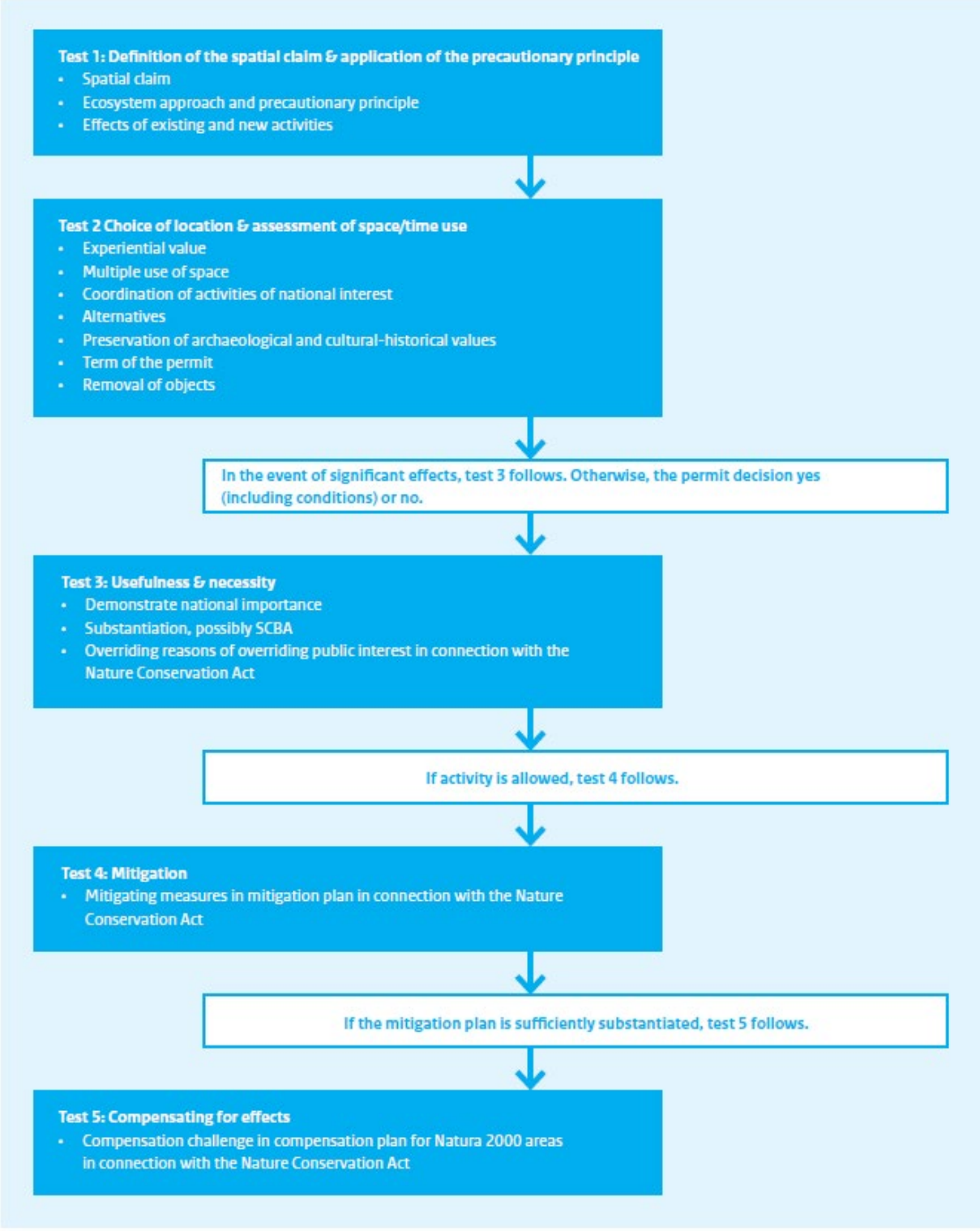

Figure 10-d: The five tests of the assessment framework.

10.5.3 The five tests of the assessment framework

Figure 10-d presents the five tests of the assessment framework. From this, it becomes clear that while the tests are completed sequentially, not necessarily all tests are completed. 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, they can become acquainted with the 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 assessment criteria for licensing 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 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 – limit 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 Environmental Assessment (EA), the EA provides sufficient insight into the effects to be tested against the precautionary principle.
In the case of activities that are not subject to EA, 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 a lack 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 EA), 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.

Within the 12-mile zone, no permanent works (structures that will be in place for six months or more) visible from the low-water mark are allowed. 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. Reuse of existing permanent mining structures for storage is possible.

Multiple use of space where possible

In areas designated for activities of national interest (see spatial development strategy 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 space for co-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 to have suffered damage from other lawful use, appeal can be submitted 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.

Activity of national interest	Precondition
Shipping	In traffic separation schemes, deep water routes, anchorages, precautionary areas and clearways, shipping takes precedence over other uses. 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.
Oil and gas production	The potential of oil and gas supplies, including 'small fields', will be utilised as much as possible. Shipping or other uses are not permitted within a safety zone of 500 metres around a mining platform. For mining platforms with a helipad, the departure point is an obstacle-free zone of 5 NM around the platform, to ensure safe helicopter traffic to and from the platform in all weather conditions. In specific situations, by applying the design process: distance between mining sites and wind farms (see Appendix 4) is assessed whether customisation is possible. New pipelines should, in principle, use preferred routes when crossing the sand extraction zone (see Section 10.4).
CO_2 storage	The potential of depleted oil and gas fields and aquifers (suitable for CO_2 storage) will be utilised as much as possible. Shipping and other uses are not allowed within a safety zone of 500 metres around a platform with installation for CO_2 storage. New pipelines should, in principle, use preferred routes when crossing the sand extraction zone (see Section 10.4). See Appendix 4.
Generation of sustainable (wind) energy	The use of the North Sea for the generation of sustainable (wind) energy in designated areas takes precedence over other uses. In the designated wind farm zones, efforts are made to achieve (early) coordination between the (future) use of the area for wind energy, on the one hand, and (future) oil and gas production, on the other. Coordination between wind energy and oil and gas extraction is tailor-made. When issuing sites, the design process 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.

Activity of national interest	Precondition
Generation of sustainable (wind) energy (continued)	No shipping is allowed in a wind farm and a safety zone of 500 metres around the park. As of 1 May 2018, three wind farms of the Dutch coast have been opened up for ships with an overall length up to 24 metres. It concerns the Egmond aan Zee Offshore Wind Farm, the Princess Amalia Wind Farm of the coast of IJmuiden and the Luchterduinen Wind Farm of the coast of Noordwijk. Of these, the Luchterduinen Wind Farm has been closed again due to the construction of nearby wind farms. The intention is to widen special passages in wind farms for ships with an overall length to 46 metres. This is subject to a Formal Safety Assessment (FSA). When designating wind farm zones, the design criterion: distance between shipping routes and wind farms applies (see Appendix 3). In principle, the distance between cables and offshore wind farms is subject to a maintenance zone of a maximum of 500 m for electricity cables, pipelines and telecom cables. New cables should, in principle, use preferred routes when crossing the sand extraction zone (see Section 10.4). The activity of realising one or two wind turbines is subject to the condition that these wind turbines contribute significantly to reducing or avoiding greenhouse gas emissions from existing and new mining works. These so-called solitary wind turbines are in principle not permitted in Natura 2000 and MSFD areas. Permitted activities are included in updates of the Framework for Ecology and Cumulation (KEC).
Sand extraction	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 14 nautical mile zone (NM) the boundary of the 12-mile zone. New cables should, in principle, use preferred routes when crossing the sand extraction zone (see Section 10.4). Outside the 12 14-mile zone, when 'stacking', other activities of national importance take precedence over those of sand extraction. No sand extraction is allowed landward of the NAP-20 isobath. 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.

Defence	Co-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.

Table 10.3: Coordination of activities of national interest.

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 10.3). This table will be worked out in greater detail so that it will also comprise conflicts between national interests from the NOVI (see Section 12.2).

Spatial consideration for fishing in a permit application:
In respect of issues on how activities can be spatially integrated, we will aim to clarify the interest of fisheries in a transparent and specified manner, within the broader Spatial Planning discussion as described in 9a.1 and 9a.3.

Offering clarity on the space available for fishing in relation to newly permitted activities and how this space can be used in the course of time is a supplementary method of optimising space for fishing on a modest scale. For that reason the interest of fishing in a specific area will be clarified the process of permit awarding, too. In this way, when selecting a location for an activity, wherever it is meaningful and reasonable (depending on the duration of the permit and the space required), it is possible to examine whether (access to) an important fishing ground can be kept free and where necessary and possible, mitigating measures taken in the interest of the fisheries (as described in 4.3.2.).

Alternatives
The competent authority may also wish to include alternative site proposals in its ecological or spatial considerations and, for activities requiring an EA, 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 archaeological record containing historic 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 has been 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 is also reflected in 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 activities that are subject to a permit requirement under the Water Act, Offshore Wind Energy Act or the Earth Removal Act, but for

which a project EIA does not have to be drawn up, the initiator will , upon request, submit a report with the permit application in which, in the opinion of the competent authority, the archaeological values in the area concerned have been sufficiently established using a desk investigation and an underwater investigation. If it is concluded on the basis of the above report that the activities may lead to damage to archaeological values, the competent authority may attach further requirements to the permit, such as the obligation to carry out further inventory studies, the obligation to take technical measures for in-situ preservation, the obligation to carry out an excavation or to provide archaeological supervision of the work by an expert in the field of maritime archaeology.

For mining activities requiring an EA, 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.

All activities on the North Sea in which an archaeological accidental discovery is made are subject to a notification obligation pursuant to Article 5.10 of the Heritage Act and the Minister of Education, Culture and Science can issue regulations or have the activities halted in whole or in part. Compensation can be agreed for the application of this competence.

Term of the permit
A permit is granted for a specific term, with the exception of permits for mining activities. 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. In doing so, they often also require financial securities 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 State Secretary for 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 bill amending the Offshore Wind Energy Act (supporting the task of offshore wind energy) includes the option of 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 and pipelines that are no longer in use must, in principle, be removed. This policy is implemented by means of permit requirements under the Water Act or the Mining Act. In each case, an assessment is made of the actual effects on, among other things, the environment, safety, the use of space and the costs involved in cleaning up. This is done on the basis of the 'Checklist removal obligation cables and pipelines' included in Appendix 5 and other applicable policy rules and/or legislation and regulations on the basis of the Water Act or Mining Act. The State Secretary for EZK can also demand removal of some old cables and pipelines that have been licensed under the Mining Act, but for which no removal obligation was included in the permit. 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 these 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 task. In the case of the Nature Conservation Act , this is an issue only after completing the ADC test.

For activities in a Natura 2000 area, there is a result obligation for compensation. For activities in the other areas that affect Natura 2000 objectives, a best efforts obligation is sufficient. 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. Artificial islands can be an essential part in particular for the future offshore energy infrastructure, for example as an energy hub for power conversion, interconnection, energy storage and 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 section presents 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 section 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 section refer to artificial islands in the territorial sea and in the exclusive economic zone, but not in areas with a municipal division (for spatial planning purposes).

The national government's directive role

In contrast to an offshore installation, an artificial island in the sea has several specific characteristics, which makes 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 safety, ecological

protection, political stability and legal order, both internationally and nationally. Moreover, an island is only built for vital or essential (energy) infrastructure, for which the government bears or has assigned 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 fall. 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 decision making, in which other ministries will also be involved.

During the exploration and development phase, the government has an initiating role and decides on the usefulness and necessity, function, location and method of management. 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 territorial seas and EEZ can only be realised for an activity of national importance, for which there is a need to take place at sea and for which there is no reasonable alternative on land. Activities of national importance 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 Chapter 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. A further elaboration will examine how this can be laid down in conditions in combination with the permanent character and the relatively long lifespan.

Follow-up actions

- The national government will start an exploration to demonstrate the usefulness, necessity and feasibility of one or more energy hubs, possibly in the form of an artificial island. This must also consider the ecological and spatial implications. And, if such usefulness and necessity is demonstrated, it will start preparations (research and explorations) during this planning period for such a hub. Stakeholders and neighbouring countries will be involved in this process at an early stage.
- (Preparation for) declaring Dutch legislation applicable to artificial islands. The bottom 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) law[229]. 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 use of land on islands (the current instruments only apply to the Territorial Sea and not within the EEZ).

[229] 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).

10.7 Consideration framework for the integration of cables and pipelines near shipping routes

The Government will apply the consideration framework 'Integration of cables and pipelines near shipping routes' for the development and assessment of routes for new cables and pipelines to be laid in and around shipping routes. Shipping routes are areas formally designated by the International Maritime Organisation (IMO) on the basis of the General Provision on Ships' Routeing (GPSR) or pursuant to the Environmental regulations and consist mainly of traffic separation schemes and clearways. Pursuant to Appendix 3 of the North Sea Programme, a safety margin is maintained between offshore wind farms and shipping routes, to serve as safe fallback space for ships. In the case of clearways, this safety margin can be an integral part of the width of the clearway.
The following framework is applied to new cable or pipeline routes to be laid in relation to shipping routes. With the exception of the crossing of fishing routes as far as possible perpendicular to the shipping route, which is always permitted, to find space for cables and pipelines, the following aspects are considered in sequence:

1. A cable or pipeline route outside a formally designated shipping route including accompanying safety margin in accordance with appendix 3 of the North Sea Programme 2022-2027;
2. A cable or pipeline route in the safety margin between shipping routes and wind farms where the risk of emergency anchoring is as small as possible, in principle at least 1 NM from the formally designated shipping route.
3. The application of customised solutions within 1 NM from the boundary of the designated shipping route or in the clearway if a solution cannot be found in the previous steps. Possibilities include technical solutions such as embedding the cables and pipelines (at greater depth) or other solutions whereby risks of damage to cables and pipelines and possible risks to shipping safety are mitigated as far as reasonably possible.

11 Knowledge development and monitoring

The task of the North Sea Programme 2022-2027 is to find the right social balance in the spatial development of the North Sea that is efficient, safe and fts 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 pressure factors 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 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 Monitoring, Research, Nature Enhancement and Species Protection programme (MONS). Over the next 10 years, the MONS Programme will conduct research in order to be able to answer all kinds of knowledge questions, as formulated in the North Sea Agreement, and to be able to use the knowledge that is developed for policy choices. The objective of MONS is to develop and provide the necessary knowledge to (be able to) ensure that the changing use of the North Sea remains within the carrying capacity of the ecosystem.

The MONS programme provides clarity about the financial resources available to the Ministries of EZK, LNV and I&W and how these are to be used for the MONS themes. The programme also presents an overview of the provisionally prioritised projects for which these funds will be used. Coordination with other programmes is important. The MONS implementing agency monitors national and international initiatives for North Sea research with a view to co-financing and linking research.

There are also European research trajectories and programmes in which relevant knowledge questions can be addressed. Examples of these processes 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 drawn up. 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 (EMFAF). The fund co-finances projects which contribute to the European objectives in 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 EMFAF 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 knowledge questions related to these objectives that will be addressed with the MONS programme are part of EU priorities 1 and 4 indicated above and, as such, are within the scope of the Dutch Operational Programme. The programme is the national implementation of the EMFAF Regulation[230].

In 2021, Rijkswaterstaat started 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.

[230] Regulation (EU) 2021/1139 of the European Parliament and of the Council of 7 July 2021 establishing the European Maritime, Fisheries and Aquaculture Fund and amending Regulation (EU) 2017/1004.

11.2 Prioritisation and coordination of research

Not all knowledge questions can be addressed in the planning period of the North Sea Programme 2022-2027. As the budget is limited, prioritisation of research is essential; this also applies to implementation of the MONS programme (2021-2030). The NZO adopted the MONS programme on 8 September 2021. 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 may be integrated based on joint consultations. An evaluation is planned during the MONS Programme (2021-2030), possibly in 2023, as it can then be embedded within the planned evaluation of implementation of the North Sea Agreement.

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, EMFAF and MONS programmes require good coordination. Also, coordination with existing research and monitoring policy is important. Coordination with existing research and monitoring programmes – including international ones – is a key task of the MONS executive office.

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 logically be answered on a regional scale. Coordination at an international level is therefore a requirement.

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 Centre[231] 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 make it easy to reuse that data. The internationally accepted 'FAIR' principle (Findable, Accessible, Interoperable, Reusable) is a good guideline for making maximum use of the data collected and used in the MONS programme for insight and management. For a good information exchange at regional and EU level, it will be necessary to also join EMODnet (European Marine Observation and Data Network).

Integrated knowledge development and retrieval will support policy for the North Sea during the planning period. Within the DigiShape programme launched in 2019, the Digital Twin for the North Sea[232] is being developed. 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. This insight into ecological and socio-economic effects is important for policymakers and

[231] https://www.informatiehuismarien.nl/
[232] https://www.digishape.nl/

stakeholders. Based on the DigiShape philosophy, both user groups are involved in the further development of the Digital Twin for the North Sea.

12 Outlines of the policy

12.1 Outlines of the policy

In the North Sea Programme, the government elaborates on national interests within the European frameworks (Water Framework Directive, Marine Strategy Framework Directive, Maritime Spatial Planning Directive, Birds Directive, Habitats Directive and Malta Convention) by continuing and adapting existing policy and through new policy:

Continuation of existing policy

Subject	Policy
Marine ecosystem	Preserve and protect already designated Natura 2000 and MSFD areas and the marine ecosystem as a whole. In the spatial consideration of activities, also compare with the preconditions of the marine ecosystem. Continue present policy efforts to reduce pollution and disruption of the ecosystem to achieve and retain the good environmental status.
Fisheries	Promote sustainable fishing and aquaculture and balanced operations, within preconditions of the ecosystem. The wind farms in the southern part of the North Sea will remain closed to bottom-disturbing fishing until further notice.
Generate sustainable energy	Sufficient space for the annual production of 49 TWh from offshore wind energy (pursuant to Climate Agreement) and, additionally, for 10 GW extra wind energy 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, in combination with wind farms wherever possible. This equates to space for 10 GW + 0.7 GW needed to achieve the 49% and 55% CO2 reduction targets.
Oil and gas	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 remove depleted platforms will be continued. Only platforms that will be reused for production and/or storage of hydrogen or CO_2 may remain.

Subject	Policy
CO_2 storage	Sufficient space for the storage of CO_2 in depleted oil and gas fields or in 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 space for sand extraction for coastal protection, to counter food 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.
Safe and healthy physical environment – recreation	Liter cleaning and awareness campaigns.
Assessment framework for licensing activities in the North Sea	Assessment framework for licensing activities in the North Sea: apply a transparent and balanced framework to assess activities on the North Sea.

Adapted and new policy

Subject	Policy choices	Section
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 rising 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 that have already been or will be designated.	3.3.2
	Species protection based on action and species protection plans.	3.3.3
	Integral nature enhancement ('nature-inclusive construction') when developing these socially desired activities 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 which contribute to the strengthening and restoration of the ecosystem.	3.3.4
Fisheries/food	Sustainability of fishing (cutter fishing, shrimp fishing, gillnet fishing): sustainable stock management, alternative fishing gear, alternative forms of fishing in wind farms, closed areas, restructuring, tackle pollution.	4.3
	Innovations in marine food production. Encouraging aquaculture.	8
	Further elaborated description of the interest of sufficient space for sustainable fishing. Policy according to which in the spatial consideration with other use, the aim is to achieve sufficient space for a robust fishing sector.	4.3.2, 9a and 10.5.3
Energy	Designate new wind farm zones to accommodate 0.7 GW + 10 GW (needed for 49% and 55% reduction in greenhouse gas emissions, respectively): wind farm zones 1, 2 and 5 (east).	9
	Reconfirm the southern part of Hollandse Kust (west) and IJmuiden Ver (north).	9
	No new confirmation of specific parts of the already designated wind farm zone Hollandse Kust (west) and the wind farm zone to the north of the shipping junction Noord Hinder.	9
	No new confirmation of Hollandse Kust (southwest) and (northwest).	9

Subject	Policy choices	Section
	Adjust the assessment framework safe distance to mining installations for helicopter fights and add that this also applies to CCS.	5
	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
	Designation of Wind farm zone 6/7. During the rollout, a zone of 1520-1620 km^2 will remain free from wind farms;	9a
	The rollout of wind energy in area 6/7 will take place in phases. The rollout will start with Doordewind and the western section of wind farm zone 6/7.	9a
	In respect of the space available for joint use in wind farms in zone 6/7, the Government will concentrate on nature recovery and nature enhancing measures.	9a
	The reconfirmation of Doordewind as a wind farm zone with a modified form and expansion.	9a
	For the wind farms in DDW, the operating principle is that active fishing will be permitted in this wind farm, as long as it is safe, viable and feasible.	9a
	Lagelander has been dropped as a wind farm zone and is also no longer considered a search area.	9a
Marine traffic	A polar route (Northern Sea Route, NSR) resulting in clearways and ultimately internationally recognised shipping routes.	6.3.1
	There will be a clearway for shipping through the designated wind farm zone IJmuiden Ver (north) and wind farm zone 1. 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
	Clearway Esbjerg - United Kingdom as an extension of the German shipping route 15 (SN15). This clearway is related to the northern boundary of search areas 6 and 7.	6.3.1
	Establishing clearways: the Northern Sea Route to the west of wind farm zone 6/7, Esbjerg-Hull to the north of wind farm zone 6/7, to the SN10 to the southeast of wind farm zone 6/7 and to the northwest of Doordewind, and through an open zone to be kept free in wind farm zone 6/7.	9a
Sustainable blue economy	Stimulate multiple use of space in wind farms for other forms of energy generation and aquaculture.	8.3

Subject	Policy choices	Section
	Investigation of potential and facilitating the development of pilots for activities in the field of food, energy and nature development. Investigating how among others the issuing of permits can be deployed more efficiently to help achieve Good Environmental Status.	8.3
Maritime safety and border control	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
	Interdepartmental Programme for the Protection of North Sea Infrastructure (PBNI).	7.3.1
Sand extraction	Alteration to the reservation zone for sand extraction from 12 nautical miles to 14 nautical miles.	7.1
International cooperation	Greater North Sea Basin Initiative (GNSBI) focused on the strategic, cross-sector cooperation between the North Sea countries.	9.6
Policy frameworks	Policy framework for passage and co-use of wind farm zones.	10.1
	Assessment framework for co-use of wind farms. Expanded with a management philosophy for joint use and parameters for facilitation.	10.3
	Area-based explorations and Area Passport guide.	10.2
	Assessment framework use of area reserved for sand extraction.	10.4
	Guiding statements on Artificial offshore islands.	10.6
	Consideration framework 'Activities on the North Sea' extended to include conditions for the realisation of one or two wind turbines, alteration to the reservation zone for sand extraction and clarifying the interest of fishing in issues on spatial integration.	10.5
	Consideration framework 'Integration of cables and pipelines near shipping routes'.	10.7

12.2 Implementation programme

	Subject	Actions	Leader	Year
1	**General**	Draw up policy theory.	IenW	2022
2		Further elaboration conflicts national interests NOVI.	IenW	2022-2027
3		Evaluation North Sea Agreement.	IenW	2023
4	**Marine ecosystem**	Implement additional measures included in programme of measures MSFD (for more details, see appendix 1).	IenW, LNV	2022-2027
5		OSPAR Quality Status Report 2023.	IenW, LNV	2023
6		Update Marine Strategy Part 1- initial assessment and description of good environmental status.	IenW, LNV	2024
7		Update Marine Strategy Part 2 - monitoring programme.	IenW, LNV	2026
8		Update monitoring programme MSFD.	IenW, LNV	Annually
9		Evaluation programme MONS.	IenW, LNV	2023
10		Brown Ridge (Natura 2000).	LNV	2021-2024
11		Frisian Front (Natura 2000 and MSFD).	LNV	2022-2027
12		Dogger Bank (Natura 2000).	LNV	2022-2027
13		Cleaver Bank (Natura 2000).	LNV	2022-2027
14		Central Oyster Grounds (MSFD).	LNV	2022-2027
15		Borkum Reef Grounds (MSFD).	LNV	2022-2027
16		Protect areas in the North Sea Coastal Zone by means of the article 11 procedure.	LNV	2022-2027
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	2022

	Subject	Actions	Leader	Year
18		Implement harbour porpoise protection plan.	LNV	2022-2027
19		Implement other species protection plans.	LNV	2023-2030
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	2022-2027
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 assessment' under the to-be-amended Offshore Wind Energy Act.	LNV	2022
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		An independent scientific investigation will be conducted to establish whether the Hollandse Kust, Vlakte van de Raan, Borkum Reef Grounds, Cleaver Bank, Dogger Bank and Central Oyster Grounds fulfil the selection criteria for designation as Birds Directive area. Areas that meet the selection criteria must be designated as Birds Directive area as soon as possible afterwards.	LNV	2021-2025

	Subject	Actions	Leader	Year
28	**Sustainable food supply**	Draw up an innovation agenda.	LNV	2022
29		Focus on revision of the European ban on pulse trawl fishing by 2025.	LNV	2022-2025
30		In European context, focus on abandoning the current limiting measures in the Dutch part of the Plaice Box.	LNV	2022-2027
31		Drive 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
32		Set up a restructuring scheme for cutter fisheries, which will be implemented during the plan period.	LNV	2022
33		Support activities to reduce litter (dolly rope).	LNV	2022-2027
PH-1		Within the *Greater North Sea Basin Initiative* (GNSBI), investigations to determine how the interests of fisheries can be included in early dialogue on this plans for spatial layout of countries.	LVVN	2025-2026
PH-2		Conducting additional research to gain better insight into disturbance distances for the guillemot in relation to population effects.	LVVN, KGG	2025-2027
PH-3		For the impact of underwater noise on harbour porpoise populations, developments of innovative piledriving techniques must be included in the progress of the rollout of offshore wind.	KGG	2025-2027
PH-4		Conducting additional research aimed at minimising the impact of underwater noise and achieving the noise standard of 160 dB as quickly as possible.	KGG, LVVN	2025-2027
34	**Wind energy**	Adoption of the updated 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.	EZK	2022
35		Prepare extra offshore wind energy by 2030.	EZK	2022
36		Draw up Roadmap 2030+.	EZK	2022
37		Draw up Investigation of Cable Landing Points for Offshore Wind Energy 2030 (VAWOZ).	EZK	2021
38		Draw up Investigation of Cable Landing Points for Offshore Wind Energy 2031-2040 (VAWOZ 2031-2040).	EZK	2022

39		Pursuant to the Offshore Wind Energy Act, during the planning period the Dutch government will establish site decisions, each supported by a mandatory Environmental Impact Assessment. This will be followed by the tenders for sites in the designated wind farm zones.	EZK	2022-2027
PH-5		Drawing up the roadmap for phase one for wind farm zone 6/7 and Doordewind.	KGG	2025
PH-6		Further area elaboration for wind farm zone 6/7 based on ecological studies to determine the eastern boundary of the open zone in wind farm zone 6/7.	IenW, LVVN, KGG	2025-2027
PH-7		Drawing up the Roadmap for phase two for wind farm zone 6/7, following further area elaboration.	KGG	t.b.d.
PH-8		Establishing clearways: the *Northern Sea Route* to the west of wind farm zone 6/7, Esbjerg-Hull to the north of wind farm zone 6/7, to the SN10 to the southeast of wind farm zone 6/7 and to the northwest of Doordewind, and through an open zone to be kept free in wind farm zone 6/7 (this last point, year still to be determined).	IenW	2026
PH-9		Investigation into the necessity of additional routing measures to the southwest of area 6/7 in the interest of safety and subsequently as necessary, aiming to achieve international agreements on this issue.	IenW	2025-2027
40	**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 fight procedures in the cockpit.	EZK	2022-2027
41	**Oil and gas production**	The Dutch government is elaborating the procedure for removing or reusing platforms and other mining works in lower regulations.	EZK	2021
PH-10		Investigating the application of customised solutions such as PinS procedures for helicopter access to drilling platforms.	KGG, IenW	2025-2027

	Subject	Actions	Leader	Year
42	**Hydrogen**	Research and develop instruments to upscale green hydrogen production in relation to implementing offshore wind energy.	EZK	2022
43		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
44	**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
45		The national government is exploring the need for and the possibilities of energy hubs in connection with vision building and development of the future energy system and in connection with the designation of new wind farm zones for the period after 2030, in a partial revision of the North Sea Programme. In doing so, it compares the use of energy islands with other construction formats, and also considers spatial integration and potential ecological effects.	EZK, IenW	2022-2023
46	**Sustainable food supply**	Socio-economic impact analysis of the development of the fisheries sector including chain.	LNV	2022-2027
PH-11		The models developed on behalf of the Ministry of Agriculture, Fisheries, Food Security and Nature and as part of the MONS programme will help to improve an understanding of the effects of planned area closures and restrictions for fishing on the primary Dutch supply sector and the chain and communities.	LVVN	2025-2027
PH-12		The Government will work to clarify the interest of fishing in spatial integration issues.	LVVN	2025-2027
PH-13		The Ministry of Agriculture, Fisheries, Food Security and Nature, together with the other departments, will investigate the possibilities of allowing active fishing within the new offshore wind farms. In wind farm Doordewind, the operating principle is that active fishing will be permitted on condition it is safe, viable and feasible.	LVVN	2025-2027
47	**Offshore electricity**	Investigate how it can be made legally possible for electricity generated in pilot	EZK	2021

	from wate and sun	projects for offshore solar energy and electricity from water to be transported over the offshore grid.		
48		The national government will include the use of space and the integration of 'offshore sun' and 'electricity from water' in designing the area passports for the wind farm zones.	EZK	2022-2027
49		The government is investigating which knowledge gaps need to be filled for the review of the IKIA in 2023 and will facilitate further independent research into these knowledge gaps together with TKIs and TO2 know-ledge institutions.	EZK	2022-2023
50	**Maritime transport**	A polar route (Northern Sea Route, NSR) resulting in clearways and ultimately internationally recognised shipping routes.	IenW	2022-2027
51		There will be a clearway for shipping through the designated wind farm zone IJmuiden Ver and wind farm zone 1. Besides the ferry connection, this clearway connects the NSR and the ports of IJmuiden and Amsterdam.	IenW	2022-2027
52		Clearway Kattegat towards Germany/Denmark.	IenW	2022-2027
53		National formalisation (adopting as clearway) of the Dutch part of the shipping route Esbjerg-Hull.	IenW	2022-2027
54		Based on the results of Coastal Genesis 2.0, explore whether custom work can be delivered at IJmuiden with respect to the position and boundaries of the desired sand extraction area.	IenW	2022-2027
PH-14		Within the OR-ELSE programme, WMR will conduct research into the optimisation of sand extraction from an ecological perspective.	IenW	2022-2028
55		For data communication cables, it will be further explored how sufficient space will remain in the planning period for market parties to land cables.	EZK	2022-2027
56		In the framework of the Environment and Planning Act, it will be explored whether granting permission for co-use of	Defence	2022-2027

		designated exercise zones should be organised in a more formal way.		
57		The Dutch government ratifies the UNESCO Convention to protect the cultural heritage under water (2001).	OCW	2022-2027
58		Elaborate sustainable solutions for collecting relevant data far at sea and the connectivity with the mainland.	IenW	2022
59		Set up and implement a Exploration Programme Long-term Exploration Sustainable blue economy aimed at developing a roadmap for policy.	LNV, IenW	2021-2027
60		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
61		Facilitate 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 ('*scalers*').	IenW, LNV	2022-2027
62		The national government focuses on large-scale experiments with sustainable co-use of wind farms.	IenW LNV	2022-2027
63		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.	LNV	2022-2027
64		By tying in with existing monitoring initiatives, mapping out the (cumulation of) Set up a monitoring programme to chart the ecological impact of the (large-scale) rollout of the new Sustainable Blue Economy multiple use.	IenW, LVVN	2025 2022 - 2027
PH-15		Among others, the Government is investigating how the issuing of permits can be deployed more efficiently to help achieve Good Environmental Status.	IenW, LVVN	2025-2027

PH-16		The Government will investigate whether and if so where there is space for aquaculture in the busy coastal zone.	LVVN, IenW	2025-2027
65	**International coordination**	Together with the other Greater North Sea Basin Initiative (GNSBI) countries, implementing the GNSBI Working Programme 2025-2027 Exploration of enhanced international collaboration.	IenW	2025 2022-2027
66		Project European Green Deal and Maritime Spatial Planning in the North and Baltic Seas.	IenW, LNV	2021-2024
67	**Passage and co-use**	Evaluation of the system of area-based explorations and area passport guide.	IenW	2022-2027
PH-17		On a North Sea-wide scale, investigating which form of joint use offers the most potential, where.	IenW, LVVN, KGG	2025-2027
PH-18		Joint use will be included earlier in the offshore wind energy process as a contributing guiding factor for the layout.	IenW, LVVN, KGG	2025-2027
PH-19		The Government will examine how 'calm' can be more effectively legally anchored as an element of nature recovery and development in wind farms. The Government is also investigating whether nature recovery and development in offshore wind farms can be used to realise part of the nature tasks facing the Netherlands.	LVVN, IenW	2025-2027
PH-20		The Government will investigate which forms of nature-inclusive design and joint use can be combined and/or reinforce one another.	LVVN	2025-2027

12.3 Financing policy

Sustainable use of the North Sea requires continuous and significant investments. Various parts of different ministries have a responsibility with regard to the North Sea. Activities in the context of designated uses are developed by both public and private parties.
North Sea policy, as described in Chapters 3 to 11 and resulting from, for example, autonomous developments or political commitments, is covered in the budgets of the Ministry of Infrastructure and Water Management, the Ministry of Economic Affairs and Climate Policy, and the Ministry of Agriculture, Nature and Food Quality. Rijkswaterstaat implements policy and receives 'assignments' with the associated budgets on the basis of the management described. In addition, the NVWA and SodM play an important role in enforcing policy. When it comes to the actions named (see Section 12.2), the basic principle is that the initiator is responsible for organising funding for this action.

The spatial choices to be made when designating wind farm zones in the North Sea Programme have financial consequences. These are partly mapped out indicatively in the SCEA 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 for landfall.
2. The consequential costs for other functions and activities at sea that take place in or near the wind farm zones, as well as consequences for nature. These are expressed, for example, in the costs of mitigating measures for shipping safety, mitigating and compensating measures for nature, and (compensating for) income losses of fisheries, and mitigating and compensating measures for fishing communities.

Up to 2030, the government will make a transition amount of 200 million euros available for implementation of the North Sea Agreement. This budget is intended for remediation and sustainability of fisheries, for nature restoration, monitoring and research, for safe passage through the wind farms to be constructed, and for extra enforcement by the NVWA. Coverage for the transition amount is already available in various departmental budgets.

In a European context, budgets are available from the EMFAF. This fund is partly used for the implementation of the North Sea Agreement. In addition, where possible, multiplication effects are used by seeking cooperation with the various European funds, including LIFE+, Interreg, and Horizon Europe.

Appendix 1
Programme of Measures under the Marine Strategy Framework Directive

The Marine Strategy for the Dutch part of the North Sea 2022-2027 (part 3), which includes the MSFD programme of measures, has been published as an independently readable appendix to this North Sea Programme.

Appendix 2
Subdivision of regimes removal obligation

	Water Act	Mining Act (new)
Pipeline and umbilicals (combination pipeline/ cable)	Removal, unless the consideration of social costs and benefits, effects on use of space, 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 in a clean and safe state, unless the State Secretary for Economic Affairs and Climate Policy requires the owner to remove them. Removal may be desirable, for example, if old cables and pipelines are in the way of other uses of the seabed. The Mining Decree and the Mining Regulations will stipulate that the State Secretary of Economic Affairs and Climate Policy will assess interests on the basis of four criteria: the efficiency of the use of space, the consequences for the environment, safety, and cost effectiveness. With regard to cables and pipelines under the Mining Act, pipeline owners will be asked to provide the necessary information for this assessment when deregistering a cable or pipeline. In such cases, the State Secretary can still oblige the owner to remove a cable or pipeline (in whole or in part) that has been put out of operation in accordance with a removal plan.
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, effects on use of space, 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 safe distances between shipping routes and offshore wind farms

For the purpose 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.

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 CO_2 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 form concerned, taking into account relevant aspects from fight safety and the interests of the future wind farm operator. Conversely, mining and/or CCS forms 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 farm zones designated under the North Sea Programme.

The procedure leading up to the establishment of a draft wind farm site decision for a wind farm is:

- All relevant interests are considered in the draft decision.
- 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. This takes into account the current status of the present prospects (as known to Ministry of Economic Affairs and Climate Policy/TNO), existing mining and CCS installations and existing transport pipelines, as well as planned or reasonably expected pipeline routes.
- 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, maters 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 firms(s) involved.
- With regard to the prospects – on the basis of all (confidential) information in the possession of the Ministry of Economic Affairs and Climate Policy/TNO – the location and conditions of the proposed wind farm site will be determined in such a way that future mining interests are affected as little as possible.

- 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 decision.
- If agreement with the mining company concerned proves impossible in the preliminary phase, the Minister for Climate and Energy will, together with the Minister of Infrastructure and Water Management (co-competent authority), prepare a draft decision on the location of and conditions for the specific wind farm. For the purposes of this decision, 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.

Appendix 5
Checklist removal obligation cables and pipelines

Criterion	Checklist
Space	Space requirement incl. work and safety zones
	Fragmentation of free space
	Barrier effect
	Interfere with other existing and future uses
Environmental consequences	Disturbance of the seafloor ecosystem
	Consequences for water quality
	Release of foreign substances
	Disruption of fish fauna
	Disruption of birds and marine mammals
	Net energy consumption
	Recycling and reuse options
Safety	In case of removal: • risks for personnel and equipment during removal.
	In case of leaving them in situ: • risks of exposure, breakage, etc. • risk for fishing • risks for shipping.
Costs	In case of removal: • Balance of clearing and processing costs and any revenues.
	In case of leaving them in situ • cleaning costs • inspection costs • liability costs • additional costs for other existing or future uses as a result of the nuisance caused.

*This checklist does not apply to wind farm cables

Colofon

Date:
April 2025

Status:
Definitive

Coordination:
Ministry of Infrastructure and Water Management, The Hague

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Status:
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