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**Investigation framework for the strategic
environmental assessment for the revision
of the maritime spatial plans in the German
Exclusive Economic Zone of the North Sea
and Baltic Sea**

– unofficial translation –

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List of abbreviations

ASCOBANS	Agreement on the Conservation of Small Cetaceans of the Baltic and North Seas
BBergG	Federal Mining Act
BfN	Federal Agency for Nature Conservation
BGBI	Federal Law Gazette
Birds Directive	Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds
BMI	Federal Ministry of the Interior, Building and Community
BMUB	Federal Ministry for the Environment, Nature Conservation and Reactor Safety
BNatSchG	Act on Nature Conservation and Landscape Management (Federal Nature Conservation Act)
BNetzA	Federal Network Agency
BSH	Federal Maritime and Hydrographic Agency
CMS	Convention on the Conservation of Migratory Species of Wild Animals
EEG	Renewable Energy Sources Act
EEZ	Exclusive Economic Zone
EIA	Environmental impact assessment
EUROBATS	Agreement on the conservation of European bat populations
FEP	Site development plan
FFH	Habitats Directive
GW	Gigawatt
HELCOM	Helsinki Commission
MARPOL	International Convention for the Prevention of Pollution from Ships
MSP	Maritime spatial plan
MSFD	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 (Marine Strategy Framework Directive)
NSG	Nature reserve
OSPAR	Oslo-Paris Convention (Convention for the Protection of the Marine Environment of the North-East Atlantic)
R&D	Research and development
ROG	Spatial Planning Act
SPEC	Species of European Conservation Concern
StUK4	Standard "Investigation of the effects of offshore wind turbines".
SEA	Strategic Environmental Assessment
SEA Directive	Directive 2001/42/EC of the European Parliament and of the Council of 27 June 2001 on the assessment of the effects of certain plans and programmes on the environment (SEA Directive)
TFEU	Treaty on the Functioning of the European Union
UBA	German Federal Environment Agency
UVPG	Environmental Impact Assessment Act
UVS	Environmental impact study
WTG	Wind turbine
WindSeeG	Offshore Wind Energy Act

1 Introduction

1.1 Legal bases and tasks of the environmental assessment

Maritime spatial planning in the German Exclusive Economic Zone (EEZ) is the responsibility of the Federal Government under the Spatial Planning Act (ROG)¹. In accordance with Section 17 subsection 1 of the ROG, the competent Federal Ministry, the Federal Ministry of the Interior, Building and Community (BMI), in agreement with the federal ministries concerned, draws up a maritime spatial plan for the German EEZ as a statutory instrument. In accordance with Section 17 subsection 1 sentence 3 ROG, the BSH carries out the preparatory procedural steps for drawing up the maritime spatial plan with the consent of the BMI. When drawing up the maritime spatial plan, an environmental assessment is carried out in accordance with the provisions of the ROG and, where applicable, those of the Environmental Impact Assessment Act (UVPG)², the strategic environmental assessment (SEA).

The obligation to carry out a strategic environmental assessment, including the preparation of an environmental report, arises for the updating, amendment and repeal of the existing maritime spatial plans from 2009 in accordance with Sections 7 subsection 7, 8 ROG in conjunction with Section 35 subsection 1 number 1 UVPG in conjunction with number 1.6 of Annex 5.

According to Article 1 of the SEA Directive 2001/42/EC, the aim of the strategic environmental assessment is to ensure a high level of environmental protection in order to promote sustainable development and to contribute to ensuring that environmental considerations are adequately taken into account during the preparation and adoption of plans well in advance of the actual project planning. According to Section 8 ROG, the strategic environmental assessment has the task of determining the probable significant impacts of the implementation of the plan and to describe and evaluate them in an environmental report at an early stage. It serves to ensure effective environmental precautions in accordance with the applicable laws and is performed according to uniform principles and with public participation. Pursuant to Section 8 subsection 1 ROG, all protected assets are to be considered:

- Humans, including human health,
- Animals, plants and biodiversity,
- Land, soil, water, air, climate and landscape,
- Cultural assets and other material goods and
- The interactions between the above-mentioned protected assets.

In the context of maritime spatial planning, designations are mainly made in the form of priority and reservation areas and other objectives and principles.

The requirements and content of the environmental report which is to be prepared are specified in Annex 1 to Section 8 subsection 1 ROG.

¹ Of 22 December 2008 (BGBl. I p. 2986), last amended by Article 159 of the Ordinance of 19 June 2020 (BGBl. I p. 1328).

² In the version promulgated on 24 February 2010, BGBl. I p. 94, last amended by Article 2 of the Act of 30 November 2016 (BGBl. I p. 2749).

Accordingly, the environmental report consists of an introduction, a description and assessment of the environmental impacts identified in the environmental assessment pursuant to Section 8 subsection 1 ROG and additional information.

According to number 2d) of Annex 1 to Section 8 ROG, other planning options that may be expressly considered should also be named, taking into account the objectives and the geographical scope of the maritime spatial plan.

1.2 Definition of the scope of the assessment

At the start of the strategic environmental assessment, the scope of the assessment, including the required scope and level of detail of the information to be included in the environmental report, is defined (see Section 8 subsection 1 sentence 2 ROG). The public bodies whose environmental and health-related tasks may be affected by the environmental impacts of the maritime spatial plan must be involved in this process.

According to Section 8 subsection 1 sentence 3 ROG, the environmental assessment refers to what can reasonably be required on the basis of the current state of knowledge and generally accepted assessment methods and the content and level of detail of the maritime spatial plan.

The present draft framework applies equally to the environmental reports for the North and Baltic Sea EEZs. For the first draft plan, two environmental reports will be prepared separately for the North Sea and the Baltic Sea.

1.3 Outline of the content and main objectives of the maritime spatial plan

According to Section 17 subsection 1 ROG, the maritime spatial plan for the German EEZ must, taking into account any interaction between land and sea as well as safety aspects, make specifications for

1. Ensuring the safety and efficiency of navigation
2. Other economic uses,
3. Scientific uses and
4. Protection and improvement of the marine environment.

According to Section 7 subsection 1 ROG, maritime spatial plans for a specific planning area and a regular medium-term period must contain designations in the form of **objectives and principles** for the development, organisation and safeguarding of the space, in particular for the uses and functions of the space.

Pursuant to Section 7 subsection 3 ROG, these designations may also refer to areas. For the EEZ these may be the following areas:

Priority areas intended for certain spatially significant functions or uses and excluding other spatially significant functions or uses in the area where these are incompatible with the priority functions or uses.

Reservation areas, which are reserved for certain spatially significant functions or uses, to which particular weight is to be given when weighing them up against competing spatially significant functions or uses.

Suitability areas in which certain spatially significant functions or uses do not conflict with other spatially significant interests, whereby these functions or uses are excluded elsewhere in the planning area.

In the case of priority areas, it may be stipulated that they also have the effect of suitability areas under Section 7 subsection 3 sentence 2 number 4 ROG.

According to Section 7 subsection 4 ROG, maritime spatial plans should also contain those spatially significant plans and measures of spatial significance by public bodies and persons under private law under Section 4 subsection 1 sentence 2 ROG which are suitable for inclusion in maritime spatial plans and which are necessary for the coordination of spatial claims and which can be secured by the objectives or principles of spatial planning.

2 Relationship to other relevant plans, programmes and projects

In Germany there is a tiered planning system for use in maritime spatial planning for the coordination of all spatial requirements and concerns arising in a given area. It is implemented by the regional policy of the Federal Government as well as by federal state and regional planning policies so that, in accordance with Section 1 subsection 1 sentence 2 of the ROG, different claims on space are coherent so that conflicts arising at the respective planning levels can be balanced out while provisions can be made for individual uses and functions of the given area.

The tiered system allows plans to be further specified by the successive planning levels. According to Section 1 subsection 3 ROG, the development, organisation and safeguarding of subspaces should be integrated into the conditions and requirements of the overall space, and the development, organisation and safeguarding of the overall space should take into account the conditions and requirements of its subspaces.

The Federal Ministry of the Interior, Building and Community (BMI) is responsible for maritime spatial planning at federal level in the EEZ. By contrast, the respective federal state is responsible for state planning for the entire area of the state, including the respective territorial sea.

In addition to maritime spatial planning in the respective areas of responsibility, there are sectoral plans based on sectoral laws for certain specific planning areas. Sectoral plans serve to define details for the respective sector, taking into account the requirements of maritime spatial planning.

2.1 Maritime spatial plans in adjacent areas

In the interests of coherent planning, coordination processes with the plans of the coastal federal states and neighbouring states are advisable and must be taken into account in the cumulative assessment of impacts on the marine environment. At present, the spatial plans of both Lower Saxony and Schleswig-Holstein are being updated. Regional spatial planning programmes of the coastal regions will be taken into account, provided that significant designations are made for the territorial sea.

2.1.1 Lower Saxony

The spatial development plan for the Federal State of Lower Saxony, including the territorial sea of Lower Saxony, is the Federal State Spatial Planning Programme (LROP). The Ministry of Food, Agriculture and Consumer Protection of Lower Saxony, as the highest state planning authority, is responsible for drawing up and amending it; the final decision on the LROP is the responsibility of the state government. The LROP is based on an ordinance from 1994 and has been revised several times since then, most recently in 2017. At the end of 2019, the procedure for a revision was initiated.

2.1.2 Schleswig-Holstein

In Schleswig-Holstein, the State Development Plan (LEP S-H) is the basis for the state's spatial development. The Ministry of the Interior, Rural Areas, Integration and Equality in Schleswig-Holstein (MILIG) is responsible for its drafting and amendment. The current LEP S-H 2010 forms the basis for the spatial development of the federal state until 2025. Schleswig-Holstein has initiated the procedure for revising the LEP S-H 2010 and carried out a participation procedure in 2019.

2.1.3 Mecklenburg-Western Pomerania

In Mecklenburg-Western Pomerania, the highest state planning authority is the Ministry for Energy, Infrastructure and Digitisation of Mecklenburg-Western Pomerania. It is responsible for spatial planning at the state level, including the territorial sea.

The current State Spatial Development Programme of Mecklenburg-Western Pomerania (LEP M-V) came into force on 9 June 2016.

2.1.4 Netherlands

The Netherlands is in the fourth revision cycle and is currently preparing the planning phase. The plan is binding and covers a single planning area.

2.1.5 United Kingdom

England comprises eleven planning areas and each area is to receive its own plan. These are to be set out for a long-term period of about 20 years and updated every three years. It is envisaged that all plans will be in place by 2021.

The Scottish Plan is currently being revised and is in its second cycle. The consultation on the revision of the first plan has just been completed. Scotland has one national marine plan and eleven regional planning areas. The marine plans are also binding in Scotland.

2.1.6 Denmark

Denmark is at an advanced stage of the maritime spatial planning process. Denmark is currently drafting the first maritime spatial plan as a comprehensive plan for the North Sea and the Baltic Sea, which will be binding and cover a time frame up to 2050.

2.1.7 Sweden

Sweden is in the final phase of its first maritime spatial plan. This plan is divided into three planning areas and refers to two different levels, the national level and the local authority level. The Swedish plans have more of a management character and are not binding.

2.1.8 Poland

In Poland, the first maritime spatial plan is currently being prepared and is also in its final phase. The Polish plan covers a planning area with three regions. The planning horizon of the binding plan is 2030.

2.2 MSFD programme of measures

Each member state must develop a marine strategy to achieve good environmental status for its seas, in Germany for the North Sea and the Baltic Sea. The key to this is the establishment of a programme of measures to achieve or maintain good environmental status and the practical implementation of this programme of measures. The establishment of the programme of measures (BMUB, 2016) is regulated in Germany by Section 45h of the Federal Water Act (WHG). Under Objective 2.4 "Oceans with sustainably and carefully used resources", the current MSFD Programme of Measures mentions maritime spatial planning as a contribution to existing measures to achieving the operational objectives of the MSFD. In addition, the catalogue of measures also formulates a concrete review mandate for the updating of the maritime spatial plans with regard to measures for the protection of migratory species in the marine area. Both the environmental objectives of the MSFD and the MSFD programme of measures are taken into account in the maritime spatial plan.

2.3 Management plans for nature reserves EEZ

On 17 November 2017, the Federal Agency for Nature Conservation (BfN) initiated the participation procedure under Section 7 subsection 3 of the Ordinance on the Establishment of the "Borkum Riffgrund" Nature Conservation Area (NSGBRgV)³, Section 7 subsection 3 of the Ordinance on the Establishment of the "Doggerbank" Nature Conservation Area (NSGDgbV)⁴ and Section 9 subsection 3 of the Ordinance on the Establishment of the "Sylt Outer Reef - Eastern German Bight" Nature Conservation Area (NSGSylV)⁵ on the management plans for the nature reserves in the German North Sea EEZ. On 13 May 2020, the management plans "Borkum Riffgrund"⁶, "Doggerbank"⁷ and "Sylt Outer Reef - Eastern German Bight"⁸ were published in the Federal Gazette.

For the Baltic Sea EEZ, the ordinances on the designation of the nature reserves "Fehmarnbelt" (NSGFmbV), "Kadetrinne" (NSGKdrV) and "Pommersche Bucht - Rönnebank" (NSGPBRV) came into force in September 2017. According to the ordinances, the measures necessary to achieve the conservation objectives for the nature reserves are to be presented in management plans. These plans are drawn up by the Federal Agency for Nature Conservation (BfN) in consultation with the neighbouring federal states and the technically affected public agencies, and with the participation of the interested public and the nature conservation associations recognised by the Federal Government.

³ Of 22 September 2017 (BGBl. I p. 3395).

⁴ Of 22 September 2017 (BGBl. I p. 3400).

⁵ Of 22 September 2017 (BGBl. I p. 3423).

⁶ Published on 17 April 2020, BAnz AT 13.05.2020 B9.

⁷ Published on 13 May 2020, BAnz AT 13.05.2020 B10.

⁸ Published on 13 May 2020, BAnz AT 13.05.2020 B11.

On 16 June 2020, BfN initiated the participation procedure under Section 7 subsection 3 NSGFmbV, Section 7 subsection 3 NSGKdrV and Section 11 subsection 3 NSGPBRV on the management plans for the nature reserves in the German Baltic Sea EEZ. As part of the participation procedure, a hearing on the drafts was held on 17 August 2020.

2.4 Tiered planning procedure for offshore wind energy and power lines (central model)

For some uses in the German EEZ, such as offshore wind energy and power cables, a multi-tier planning and approval process - i.e. a subdivision into several stages – is in place. In this context, the instrument of maritime spatial planning is at the highest and superordinate level. The maritime spatial plan is the forward-looking planning instrument which coordinates the most diverse interests of users in the fields of industry, science and research as well as demands of nature conservation. A strategic environmental assessment must be carried out when the maritime spatial plan is drawn up. The SEA for the maritime spatial plan is related to various downstream environmental assessments, in particular the directly downstream SEA for the site development plan (FEP).

The next level is the FEP. Within the framework of the so-called central model, the FEP is the control instrument for the orderly expansion of offshore wind energy and electricity grids in a tiered planning process. The FEP has the character of a sectoral plan. The purpose of the sectoral plan is to plan the use of offshore wind energy and the electricity grids in a targeted manner and as optimally as possible under the given framework conditions - in particular the requirements of maritime spatial planning - by defining areas and sites as well as locations, routes and route corridors for grid connections or for transboundary submarine cable systems. A strategic environmental assessment must be carried out to accompany the establishment, updating and amendment of the FEP.

In the next step, the areas for offshore wind turbines defined in the FEP are pre-examined. If the requirements of Section 12 subsection 2 WindSeeG are met, the preliminary assessment is followed by the determination of the suitability of the site for the construction and operation of offshore wind turbines. The preliminary assessment is also accompanied by a strategic environmental assessment.

If the suitability of an area for the use of offshore wind energy is established, the area is put out to tender and the winning bidder or the person entitled accordingly can submit an application for approval (planning approval or planning permission) for the erection and operation of wind turbines on the site specified in the FEP. As part of the planning approval procedure, an environmental impact assessment is carried out if the prerequisites are met.

While the sites designated in the FEP for the use of offshore wind energy are being pre-examined and tendered, this is not the case for designated sites, routes and route corridors for grid connections or transboundary submarine cable systems. Upon application, a planning approval procedure including an environmental assessment is usually carried out for the construction and operation of grid connection lines. The same applies to transboundary submarine cable systems.

According to Section 1 subsection 4 of the UVPG, the UVPG also applies where federal or state legislation does not specify the environmental impact assessment in more detail or does not refer to the essential requirements of the UVPG.

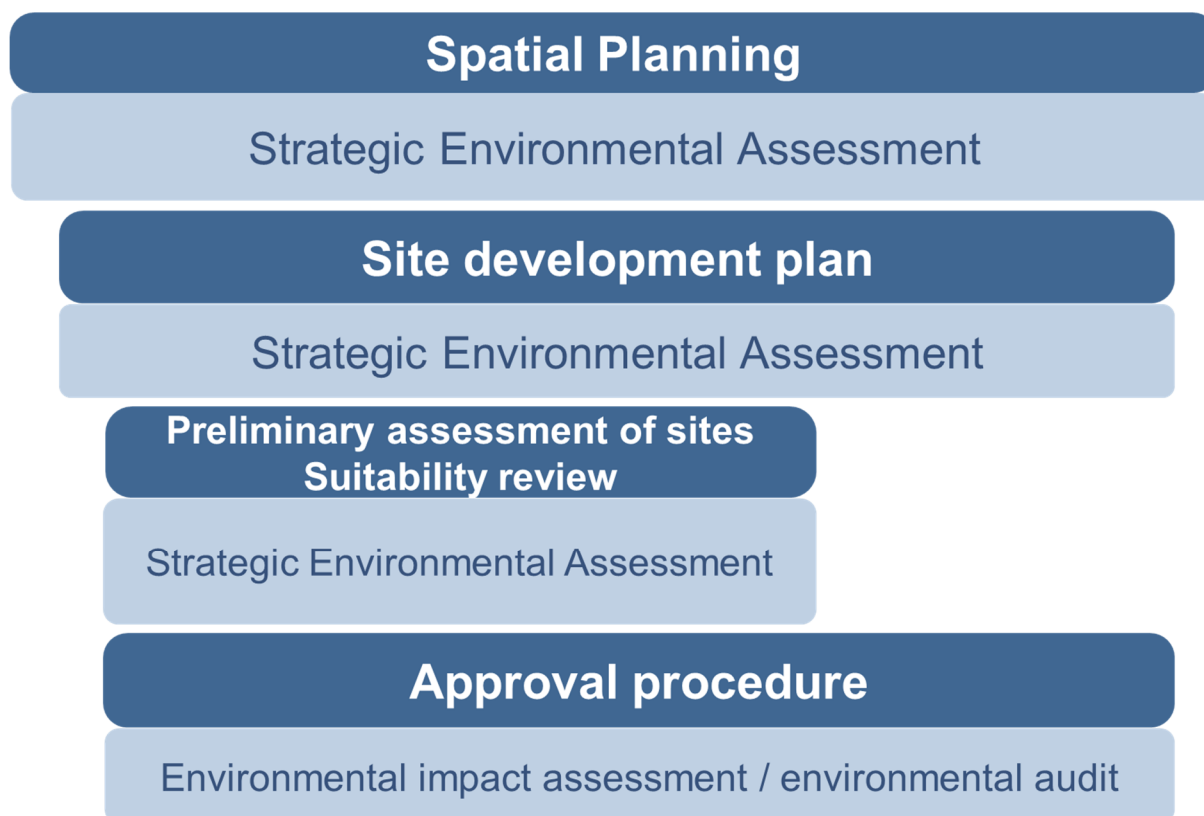


Figure 1: Overview of the tiered planning and approval process in the EEZ.

In the case of multi-tier planning and approval processes, it follows from the relevant legislation (e.g. Spatial Planning Act, WindSeeG and BBergG) or, more generally, from Section 39 subsection 3 UVPG that, in the case of plans, it should be determined at the time of defining the scope of the study at which of the stages of the process certain environmental impacts are to be assessed. In this way, multiple assessments are to be avoided. The nature and extent of the environmental impacts, technical requirements, and the content and subject matter of the plan must be taken into account.

In the case of subsequent plans and subsequent approvals of projects for which the plan sets a framework, the environmental assessment pursuant to Section 39 subsection 3 sentence 3 UVPG is limited to additional or other significant environmental impacts as well as to necessary updates and more detailed studies.

As part of the tiered planning and approval process, all assessments have in common that environmental impacts on the protected assets specified in Section 8 subsection 1 ROG and Section 2 subsection 1 UVGP are considered, including their interactions.

According to the definition in Section 2 subsection 2 of the UVPG, environmental impacts within the meaning of the UVPG are direct and indirect impacts of a project or the implementation of a plan or programme on the protected assets.

According to Section 3 of the UVPG, environmental assessments comprise the identification, description and assessment of the significant impacts of a project or a plan or programme on the protected assets. They serve to ensure effective environmental protection in accordance with the applicable laws and are carried out according to uniform principles and with public participation.

In the offshore sector, the legally specified protected assets of animals, plants and biodiversity have been differentiated into the specific assets of avifauna (seabirds, resting and migratory birds), benthos, biotope types, plankton, marine mammals, fish and bats.

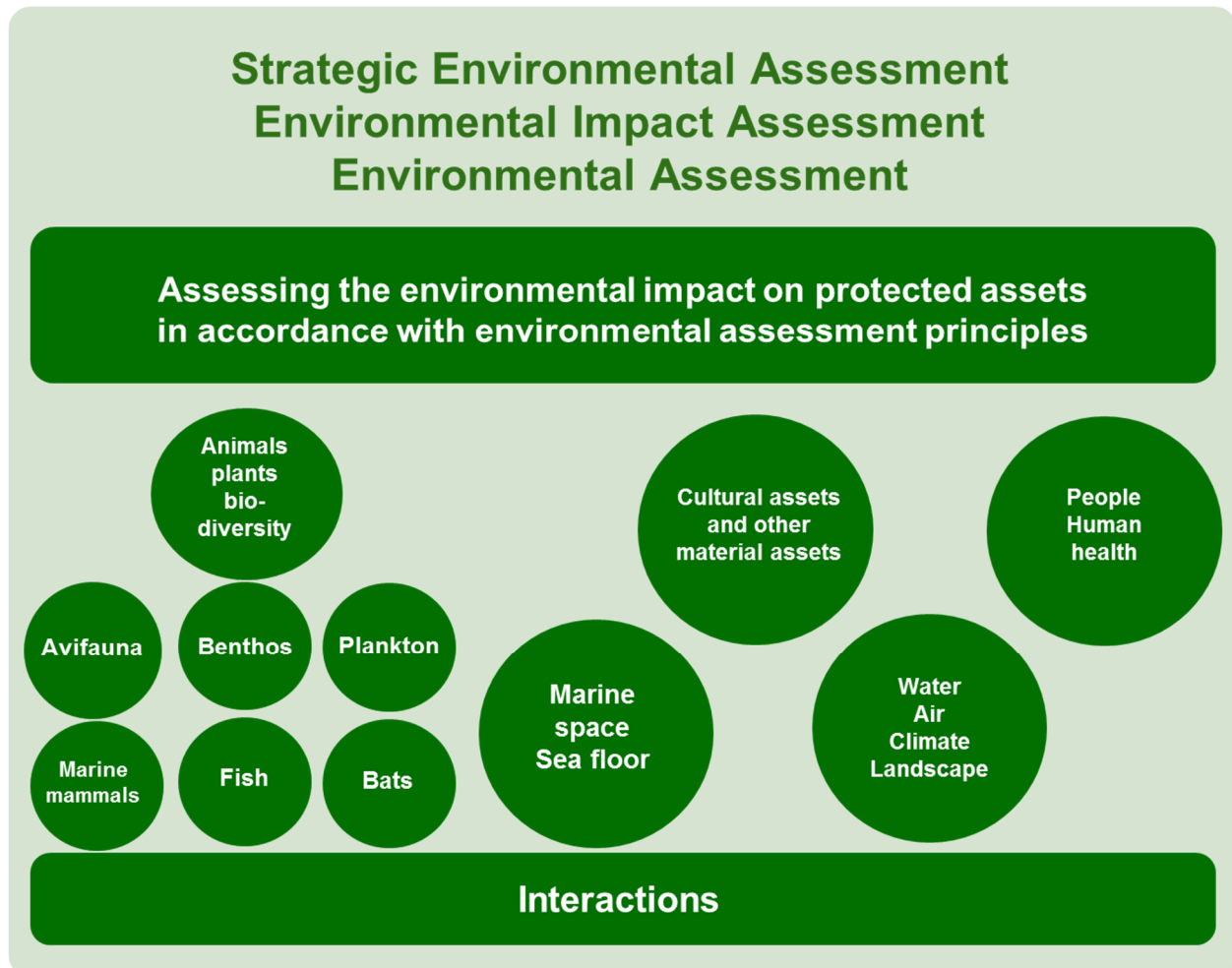


Figure 2: Overview of the protected assets in the environmental assessments.

In detail, the tiered planning process is as follows:

2.4.1 Maritime spatial planning (EEZ)

At the highest and superordinate level is the instrument of maritime spatial planning. For sustainable spatial development in the EEZ, the BSH prepares a maritime spatial plan on behalf of the competent Federal Ministry, which comes into force in the form of statutory orders.

The maritime spatial plans should, taking into account possible interactions between land and sea and safety aspects, create **designations**

- to ensure the safety and efficiency of navigation,
- in respect of other economic uses,

- in respect of scientific uses and
- for the protection and improvement of the marine environment.

In the context of maritime spatial planning, designations are mainly made in the form of priority and reservation areas and other objectives and principles. According to Section 8 subsection 1 ROG, when drawing up maritime spatial plans, the body responsible for the maritime spatial plan must carry out a strategic environmental assessment in which the probable significant impacts of the respective maritime spatial plan on the objects to be protected, including interactions, must be identified, described and evaluated.

The **aim of** the instrument of maritime spatial planning is to optimise comprehensive planning solutions. A wider spectrum of uses and functions is considered. Fundamental strategic questions should be clarified at the beginning of a planning process. Thus the instrument primarily functions, within the framework of the legal provisions, as a guiding planning instrument for the planning authorities to create a framework for all uses which is as compatible as possible with space and the natural environment.

In maritime spatial planning, the **depth of assessment** is generally characterised by a greater breadth of study, i.e. a fundamentally greater number of planning options to be analysed, and a lesser depth of study in terms of detailed analyses. Above all, regional, national and global impacts as well as secondary, cumulative and synergetic effects are taken into account.

The **focus** is therefore on possible cumulative effects, strategic and large-scale planning options and possible transboundary impacts.

2.4.2 Site development plan

The next level is the FEP.

The **designations** to be made in the FEP and to be examined within the framework of the SEA result from Section 5 subsection 1 WindSeeG. The plan mainly specifies areas and sites for wind turbines as well as the expected capacity to be installed on these sites. In addition, the FEP also specifies cable routes, route corridors and sites. Planning and technical principles are also laid down. Although these also serve, among other things, to reduce environmental impacts, they may in turn lead to impacts, so that an assessment is required as part of the SEA.

With regard to the FEP's **objectives**, it deals with the fundamental questions of the use of offshore wind energy and grid connections on the basis of the legal requirements, especially with the need, purpose, technology and the identification of sites and routes or route corridors. The plan therefore primarily has the function of a steering planning instrument in order to create a spatially and, as far as possible, environmentally compatible framework for the implementation of individual projects, i.e. the construction and operation of offshore wind turbines, their grid connections, transboundary submarine cable systems and interconnections.

The **depth of the assessment** of likely significant environmental effects is characterised by a wider scope of study, i.e. a larger number of alternatives and, in principle, a lesser depth of study. At the level of sectoral planning, detailed analyses are generally not yet performed. Above all, local, national and global impacts as well as secondary, cumulative and synergistic impacts in the sense of an overall view are taken into account.

As with the instrument of maritime spatial planning, the **focus** of the assessment is on possible cumulative effects as well as possible transboundary impacts. In addition, the FEP focuses on

strategic, technical and spatial alternatives, especially for the use of wind energy and power lines.

2.4.3 Suitability assessment as part of the preliminary assessment

The next step in the tiered planning process is the suitability testing of sites for offshore wind turbines. In addition, the power to be installed is determined on the site in question.

In the suitability assessment, it is examined in accordance with section 10 subsection 2 WindSeeG whether the construction and operation of offshore wind turbines on the site is not subject to objections for the defining of a site in the site development plan in accordance with Section 5 subsection 3 WindSeeG or, insofar as they can be assessed independently of the later design of the project, with the interests relevant for the plan approval in accordance with Section 48 subsection 4 sentence 1 WindSeeG.

Both the criteria of Section 5 subsection 3 WindSeeG and the concerns of Section 48 subsection 4 sentence 1 WindSeeG require a study of whether the marine environment is endangered. With regard to the latter concerns, it must be examined in particular whether pollution of the marine environment within the meaning of Article 1 subsection 1 number 4 of the United Nations Convention on the Law of the Sea will not occur and whether bird migration is not endangered.

The preliminary study with the suitability assessment or suitability identification is thus the instrument connected between the FEP and the individual approval procedure for offshore wind turbines. It refers to a concrete area designated in the FEP and is thus much smaller than the FEP. It is distinguished from the plan approval procedure by the fact that an assessment approach is to be applied which is independent of the later concrete type of installation and layout. Thus, the impact forecast is based on model parameters, e.g. in two scenarios or ranges of scenarios which are intended to represent possible realistic developments.

Compared to the FEP, the SEA of the suitability assessment is thus characterised by a smaller study area and a greater **depth of study**. In principle, fewer and spatially limited alternatives are seriously considered. The two primary alternatives are the determination of the suitability of a site on the one hand and the determination of its (possibly partial) unsuitability (see Section 12 subsection 6 WindSeeG) on the other. Restrictions on the type and extent of development, which are included as specifications in the determination of suitability, are not alternatives in this sense.

The **focus** of the environmental assessment within the framework of the suitability assessment is on the consideration of the local impacts of a development with wind turbines in relation to the site and the location of the development on the site.

2.4.4 Approval procedure (planning approval and planning approval procedure) for offshore wind turbines

The next step after the preliminary study is the approval procedure for the installation and operation of offshore wind turbines. After the site under study has been put out to tender by the BNetzA, the winning bidder can, with the acceptance of the bid by the BNetzA, submit an application for planning approval or - if the prerequisites are met - for planning permission for the construction and operation of offshore wind turbines including the necessary ancillary installations on the site under study.

In addition to the legal requirements of Section 73 subsection 1 sentence 2 VwVfG, the plan must include the information contained in Section 47 subsection 1 WindSeeG. The plan may only be established under certain conditions listed in Section 48 subsection 4 WindSeeG, and only if, inter alia, the marine environment is not endangered, in particular if there is no cause for concern about pollution of the marine environment within the meaning of Article 1 subsection 1 number 4 of the Convention on the Law of the Sea and if bird migration is not endangered.

Under Section 24 UVPG, the competent authority prepares a summary

- Of the environmental impacts of the project,
- Of the characteristics of the project and of the site, which are intended to prevent, reduce or offset significant adverse environmental effects,
- Of the measures to prevent, reduce or offset significant negative environmental impacts, and
- Of the compensation measures for interventions in nature and the landscape.

Under Section 16 subsection 1 of the UVPG, the project developer must submit a report to the competent authority on the expected environmental impacts of the project (EIA report), which must contain at least the following information:

- a description of the project, including information on the location, nature, scale and design, size and other essential characteristics of the project,
- a description of the environment and its components within the project's sphere of influence,
- a description of the characteristics of the project and of the location of the project to exclude, reduce or offset the occurrence of significant adverse environmental effects of the project,
- a description of the measures planned to prevent, reduce or offset any significant adverse effects of the project on the environment and a description of planned replacement measures,
- a description of the expected significant environmental effects of the project,
- a description of the reasonable alternatives, relevant to the project and its specific characteristics, that have been considered by the developer and the main reasons for the choice made, taking into account the specific environmental effects of the project; and
- a generally understandable, non-technical summary of the EIA report.

Pilot wind turbines are only dealt with in the context of the environmental assessment in the approval procedure and not in prior upstream stages.

2.4.5 Approval procedure for grid connections (converter platforms and submarine cable systems)

In the tiered planning process, the establishment and operation of grid connections for offshore wind turbines (converter platform and submarine cable systems, if applicable) is examined at the level of the approval procedures (planning approval and planning permission procedures) in implementation of the regional planning requirements and the specifications of the FEP at the request of the respective project executing agency - the responsible TSO.

According to Section 44 subsection 1 in conjunction with Section 45 subsection 1 WindSeeG, the construction and operation of facilities for the transmission of electricity require planning approval. In addition to the legal requirements of Section 73 subsection 1 sentence 2 VwVfG, the plan must include the information contained in Section 47 subsection 1 WindSeeG. The plan may only be approved under certain conditions listed in Section 48 subsection 4 WindSeeG and only if, inter alia, the marine environment is not endangered, in particular if there is no cause for concern about pollution of the marine environment within the meaning of Article 1 subsection 1 number 4 of the Convention on the Law of the Sea and no threat to bird migration.

Moreover, according to Section 1 subsection 4 UVPG, the requirements for the environmental impact assessment of offshore wind energy installations, including ancillary installations, apply accordingly to the performance of the environmental assessment.

2.4.6 Transboundary submarine cable systems

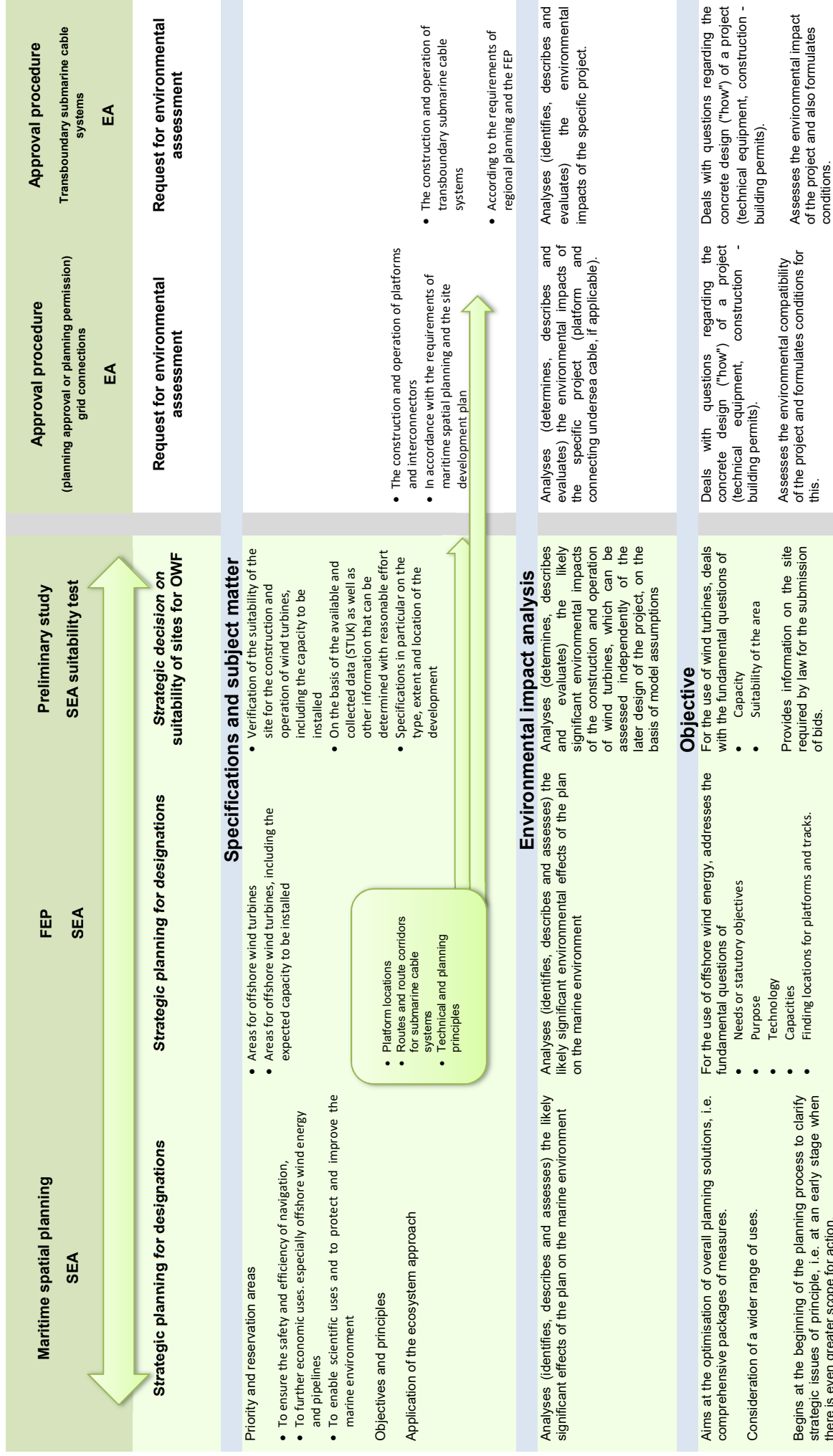
According to Section 133 subsection 1 in conjunction with subsection 4 BBergG, the construction and operation of an underwater cable in or on the continental shelf requires a permit

- from a mining point of view (by the competent federal state mining authority) and
- concerning the organisation of the use and exploitation of waters above the continental shelf and the airspace above these waters (by the BSH).

Pursuant to Section 133 subsection 2 BBergG, the above-mentioned permits may only be refused if there is a risk to the life or health of persons or material goods or an adverse effect of overriding public interests which cannot be prevented or compensated for by a time limit, conditions or requirements. An adverse effect on overriding public interests exists in particular in the cases specified in Section 132 subsection 2 number 3 BBergG. Pursuant to Section 132 subsection 2 numbers 3b and 3d BBergG, an adverse effect on overriding public interests with regard to the marine environment exists in particular if the flora and fauna would be impaired in an unacceptable manner or if there is reason to believe that the sea will be polluted.

According to Section 1 subsection 4 UVPG, the essential requirements of the UVPG must be observed for the construction and operation of transboundary submarine cable systems.

Tabular overview of environmental audits: Focus of the investigations



Searches for environmentally sound packages of measures without absolutely assessing the environmental compatibility of the planning.

Essentially functions as a controlling planning instrument of the planning administrative bodies to create an environmentally compatible framework for all uses.

Acts mainly as a steering planning instrument to create an environmentally sound framework for the realisation of individual projects (wind turbines and grid connections, transboundary submarine cables)

Searches for environmentally sound packages of measures without assessing the environmental compatibility of the specific project.

Acts as an instrument between the FEP and the approval procedure for wind turbines on a specific site.

Serves primarily as a passive assessment instrument that reacts to requests from the project developer.

Serves primarily as a passive assessment instrument that reacts to requests from the developer.

Assessment depth

Characterised by a wider scope of study, i.e. a larger number of alternatives to be assessed, and less depth of study (no detailed analyses)

Takes into account local, national and global impacts as well as secondary, cumulative and synergistic impacts in the sense of an overall view.

Characterised by a smaller assessment area, greater depth of study (detailed analyses).

The determination of suitability may include specifications for the subsequent project, in particular with regard to the type and extent of the development of the site and its location.

Characterised by a narrower scope of study (limited number of alternatives) and greater depth of study (detailed analyses).

Assesses the environmental compatibility of the project and formulates conditions for this.

Considers primarily local impacts in the vicinity of the project.

Characterised by a narrower scope of study (limited number of alternatives) and greater depth of study (detailed analyses).

Considers primarily local impacts in the vicinity of the project.

Focus of the assessment

Local effects in relation to the site and its location.

Cumulative effects
Overall perspective
Strategic, technical and spatial alternatives
Possible transboundary effects

Cumulative effects
Overall perspective
Strategic and large-scale alternatives
Possible transboundary effects

Environmental impacts of turbines, construction and operation

Turbine dismantling

Study in relation to the specific installation design.

Intervention, compensation and replacement measures.

Environmental impacts of turbines, construction and operation

Turbine dismantling

Study in relation to the specific installation design.

Intervention, compensation and replacement measures.

Approval procedure (plan approval or plan permit) for wind turbines/EIA

Assessment subject

Environmental impact assessment on request for

- The installation and operation of wind turbines
- The site defined and pre-examined in the FEP
- According to the designations of the FEP and the specifications of the preliminary study.

<p>Environmental impact assessment</p> <p>Analyses (determines, describes and evaluates) the environmental impacts of the specific project (wind turbines, platforms and internal cabling of the wind farm, if applicable)</p> <p>Under Section 24 UVPG, the competent authority prepares a summary</p> <ul style="list-style-type: none"> • Of the environmental impacts of the project, • Of the characteristics of the project and of the site, which are intended to prevent, reduce or offset significant adverse environmental effects, • Of the measures to prevent, reduce or offset significant negative environmental impacts, and • Of the replacement measures in the event of interference with nature and landscape (note: exception under Section 56 subsection 3 BNatSchG)
<p>Objective</p> <p>Addresses the questions of the specific design ("how") of a project (technical equipment, construction).</p> <p>Serves primarily as a passive assessment instrument that reacts to requests from the tender winner/project developer.</p>
<p>Assessment depth</p> <p>Characterised by a narrower scope of study, i.e. a limited number of alternatives, and greater depth of study (detailed analyses).</p> <p>Assesses the environmental compatibility of the project on the site under study and formulates conditions for this.</p> <p>Considers mainly local effects in the vicinity of the project.</p>
<p>Focus of the assessment</p> <p>The main focus of the assessment is formed by:</p> <ul style="list-style-type: none"> • Environmental impacts from construction and operation. • Assessment in relation to the specific installation design. • Installation dismantling.

Figure 3: Overview of key aspects of environmental assessments in planning and approval procedures.

2.5 Cables and pipelines

The instrument of maritime spatial planning occupies the upper level. Areas or corridors for pipelines and data cables are defined as part of this framework.

According to Section 8 subsection 1 ROG, the probable significant impacts of designations on the protected assets must be determined, described and evaluated.

According to Section 133 subsection 1 in conjunction with subsection 4 BBergG, the construction and operation of a transit pipeline or underwater cable (data cable) in or on the continental shelf requires a permit

- From a mining point of view (by the competent state mining authority) and
- Concerning the organisation of the use and exploitation of waters above the continental shelf and the airspace above these waters (by the BSH).

Pursuant to Section 133 subsection 2 BBergG, the above-mentioned permits may only be refused if there is a risk to the life or health of persons or material goods or an adverse effect on overriding public interests which cannot be prevented or compensated for by a time limit, conditions or requirements. An adverse effect on overriding public interests exists in particular in the cases specified in Section 132 subsection 2 number 3 BBergG. Pursuant to Section 132 subsection 2 numbers 3b and 3d BBergG, an adverse effect on overriding public interests with regard to the marine environment exists in particular if the flora and fauna would be impaired in an unacceptable manner or if there is reason to believe that the sea will be polluted.

Under Section 133 subsection 2a BBergG, the construction and operation of a transit pipeline, which is also a project within the meaning of Section 1 subsection 1(1) UVPG, is subject to an environmental impact assessment in the licensing procedure with regard to the organisation of the use and exploitation of the waters above the continental shelf and the airspace above these waters in accordance with the UVPG.

Under Section 1 subsection 4 of the UVPG, the essential requirements of the UVPG must be observed for the construction and operation of data cables.

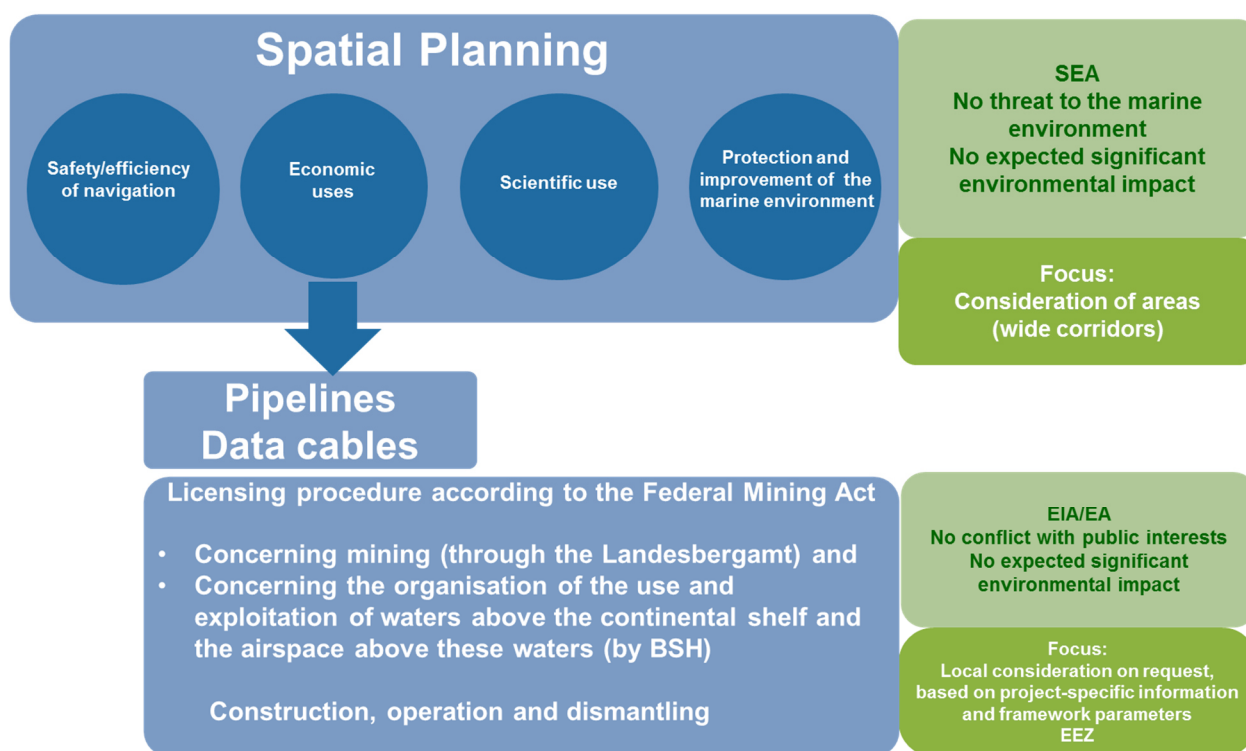


Figure 4: Overview of the focal points of the environmental assessment for pipelines and data cables.

2.6 Raw material extraction

In the German North and Baltic Seas, various mineral resources are prospected for and extracted, e.g. sand, gravel and hydrocarbons. As a superordinate instrument, maritime spatial planning deals with possible large-scale spatial designations, possibly including other uses. The anticipated significant environmental impacts are reviewed (see also Chapter 5.5).

During implementation, the extraction of raw materials is frequently divided into different phases - exploration, development, operation and after-closure phase.

The purpose of exploration is the locating of raw material deposits in accordance with Section 4 subsection 1 BBergG. In the marine area it is regularly carried out by means of geophysical surveys, including seismic surveys and exploration drilling. In the EEZ, the extraction of raw materials includes the extraction (loosening, release), processing, storage and transport of raw materials.

In accordance with the Federal Mining Act, mining permits (concession, licence) must be obtained for exploration in the area of the continental shelf. These grant the right to explore for and/or extract mineral resources in a defined field for a specified period of time. Additional permits in the form of operating plans are required for development (extraction and exploration activities) (see Section 51 BBergG). For the establishment and management of an operation, main operating plans must be drawn up for a period not normally exceeding 2 years, which must be continuously updated as required (Section 52 subsection 1 sentence 1 BBergG).

In the case of mining projects requiring an EIA, the preparation of a general operating plan is mandatory, and a planning approval procedure must be carried out for its approval (Section 52

subsection 2a BBergG). Framework operation plans are generally valid for a period of 10 to 30 years.

Pursuant to Section 57c BBergG in conjunction with the Ordinance on the Environmental Impact Assessment of Mining Projects (UVP-V Bergbau), the construction and operation of production platforms for the extraction of oil and gas in the area of the continental shelf requires an EIA. The same applies to marine sand and gravel extraction on mining sites of more than 25 ha or in a designated nature reserve or Natura 2000 area.

The licensing authorities for the German North Sea and Baltic Sea EEZ are the federal state mining authorities.

2.7 Shipping

In the context of maritime spatial planning, designations for the shipping sector regularly take the form of areas (priority and/or reservation areas), objectives and principles. There is no tiered planning and approval process for the shipping sector, as is the case for the offshore wind energy sector, grid connections, transboundary submarine cables, pipelines and data cables.

With regard to the consideration of the expected considerable effects of the designations on the shipping sector, reference is made to Chapter 5.5

2.8 Fisheries and marine aquaculture

Fisheries and aquaculture are considered as concerns in the context of maritime spatial planning. There is no tiered planning and approval process.

With regard to the consideration of the expected considerable impacts, reference is made to Chapter 5.5

2.9 Marine scientific research

Marine scientific research is a concern in the context of maritime maritime spatial planning. There is no tiered planning and approval process.

With regard to the consideration of the expected considerable impacts, reference is made to Chapter 5.5

2.10 National and NATO defence

National and NATO defence is considered a concern in the context of maritime spatial planning. There is no tiered planning and approval process.

With regard to the consideration of the expected considerable impacts, reference is made to Chapter 5.5

2.11 Leisure

The issue of leisure is also considered. There is no tiered planning and approval process.

With regard to the consideration of the expected considerable impacts, reference is made to Chapter 5.5

3 Presentation and consideration of environmental protection objectives

The maritime spatial plan and the SEA will be drawn up and implemented with due regard for the objectives of environmental protection. These provide information on the environmental status that is to be achieved in the future (environmental quality objectives). The objectives of environmental protection can be found in an overview of the international, EU and national conventions and regulations dealing with marine environmental protection, on the basis of which the Federal Republic of Germany has committed itself to certain principles and objectives. The environmental report will contain a description of how compliance with the requirements is assessed and what specifications or measures are taken.

3.1 International conventions on the protection of the marine environment

The Federal Republic of Germany is a party to all relevant international conventions on marine environmental protection.

3.1.1 Globally applicable conventions that are wholly or partly aimed at protecting the marine environment

- 1973 Convention for the Prevention of Pollution from Ships, as amended by the 1978 Protocol (MARPOL 73/78)
- 1982 United Nations Convention on the Law of the Sea
- Convention on the prevention of marine pollution by dumping of waste and other matter (London, 1972) and the 1996 Protocol

3.1.2 Regional agreements on marine environmental protection

- Trilateral Wadden Sea Cooperation (1978) and Trilateral Monitoring and Assessment Programme of 1997 (TMAP)
- 1983 Convention concerning Cooperation between the North Sea States to combat pollution of the North Sea by oil and other harmful substances (Bonn Convention)
- 1992 Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR Convention)
- 1992 Convention on the Protection of the Marine Environment of the Baltic Sea Area (Helsinki Convention)

3.1.3 Agreements specific to protected goods

- 1979 Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention)
- 1979 Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention)

Under the Bonn Convention, regional agreements for the conservation of the species listed in Appendix II were concluded in accordance with Article 4 number 3 of the Bonn Convention:

- 1995 Agreement on the Conservation of African-Eurasian Migratory Waterbirds (AEWA)
- 1991 Agreement on the Conservation of Small Cetaceans of the Baltic and North Seas (ASCOBANS)
- 1991 Agreement on the Conservation of Seals in the Wadden Sea

- 1991 Agreement on the Conservation of European Bat Populations (EUROBATS)
- 1993 Convention on Biological Diversity

3.2 Environmental and nature protection requirements at EU level

The following must be taken into account as relevant EU legislation:

- Directive 2014/89/EU of the European Parliament and of the Council of 23 July 2014 establishing a framework for maritime spatial planning (MSP Directive)
- Council Directive 337/85/EEC of 27 June 1985 on the assessment of the effects of certain public and private projects on the environment (Environmental Impact Assessment Directive, EIA Directive)
- Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora (Habitats Directive)
- 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 (Water Framework Directive, WFD)
- Directive 2001/42/EC of the European Parliament and of the Council of 27 June 2001 on the assessment of the effects of certain plans and programmes on the environment (Strategic Environmental Assessment Directive, SEA Directive)
- 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 (Marine Strategy Framework Directive, MSFD),
- Directive 2009/147/EC of the European Parliament and of the Council on the conservation of wild birds (Birds Directive).

3.3 Environmental and nature conservation requirements at national level

There are also various legal provisions at national level, the requirements of which must be taken into account in the environmental report:

- Act on Nature Conservation and Landscape Management (Federal Nature Conservation Act - BNatSchG)
- Water Resources Act (WHG)
- Environmental Impact Assessment Act (UVPG)
- Ordinance on the establishment of the nature reserve "Sylt Outer Reef - Eastern German Bight", ordinance on the establishment of the nature reserve "Borkum Riffgrund", and the ordinance on the establishment of the nature reserve "Doggerbank" in the North Sea EEZ
- Ordinance on the designation of the "Fehmarnbelt" nature reserve, ordinance on the designation of the "Kadetrinne" nature reserve and ordinance on the designation of the "Östliche Deutsche Bucht - Rönnebank" nature reserve in the Baltic Sea EEZ
- Management plans for nature conservation areas in the German North Sea EEZ
- Management plans for the nature conservation areas in the German Baltic Sea EEZ (participation procedure not yet completed)
- Energy and climate protection targets of the Federal Government

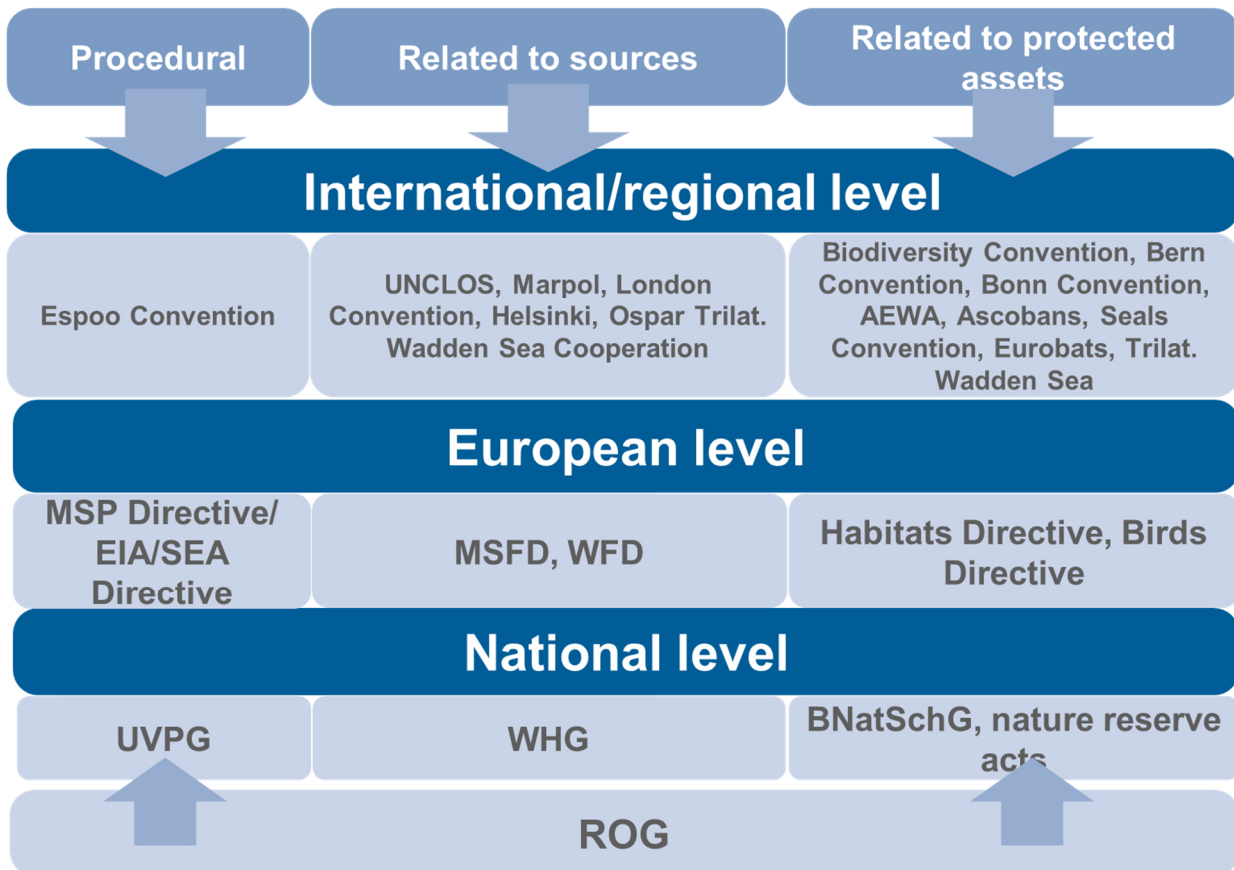


Figure 5: Overview of the levels of standardisation of the relevant legal acts for SEA.

3.4 Support for the objectives of the Marine Strategy Framework Directive

Maritime spatial planning can support the implementation of individual objectives of the MSFD and thus contribute to a good environmental status in the North Sea and Baltic Sea.

The following environmental objectives (BMUB 2016) are taken into account when defining objectives and principles:

- Environmental objective 1: Oceans unaffected by anthropogenic eutrophication: to be taken into account in the objectives and principles for ensuring the safety and efficiency of navigation.
- Environmental objective 3: Oceans without deterioration of marine species and habitats due to the impact of human activities: consideration in the objectives and principles relating to offshore wind energy and nature conservation
- Environmental objective 6: Oceans without adverse effects from anthropogenic energy inputs: consideration in the objectives and principles for offshore wind energy and, cables and pipelines

In the environmental assessment, avoidance and mitigation measures are formulated to support objectives 1, 3 and 6.

In addition, the maritime spatial plan counteracts the deterioration of the environment by making certain uses possible only in geographically defined areas and for a limited period of time. The principles of environmental protection must be taken into account. At the permit level, the

design of the use is specified in detail, if necessary with conditions, in order to prevent negative impacts on the marine environment.

An essential basis of the MSFD is the ecosystem approach regulated in Article 1 subsection 3 of the MSFD, which ensures the sustainable use of marine ecosystems by managing the overall burden of human activities in a way that is compatible with the achievement of a good environmental status. The application of the ecosystem approach is outlined in Chapter 4.3.

4 Process and approach

4.1 Integration of the SEA into the planning process

The SEA is seen as an integral part of the overall planning process (see figure below). Parallel to the consultation on this draft framework, the publication of the status report on the continuation of maritime spatial planning in the German EEZs in the North and Baltic Seas will take place. In addition to the evaluation of the 2009 maritime spatial plans, the status report also includes a chapter on the plan-accompanying monitoring of the plans. This analysis served as a starting point for the integrated planning and SEA process. In addition to the publication of the draft framework for the study, a preliminary assessment of selected environmental aspects of the planning options (A, B, C) developed in the concept for updating the plans is carried out in the sense of an early assessment of alternatives (see also Chapter 4.2).

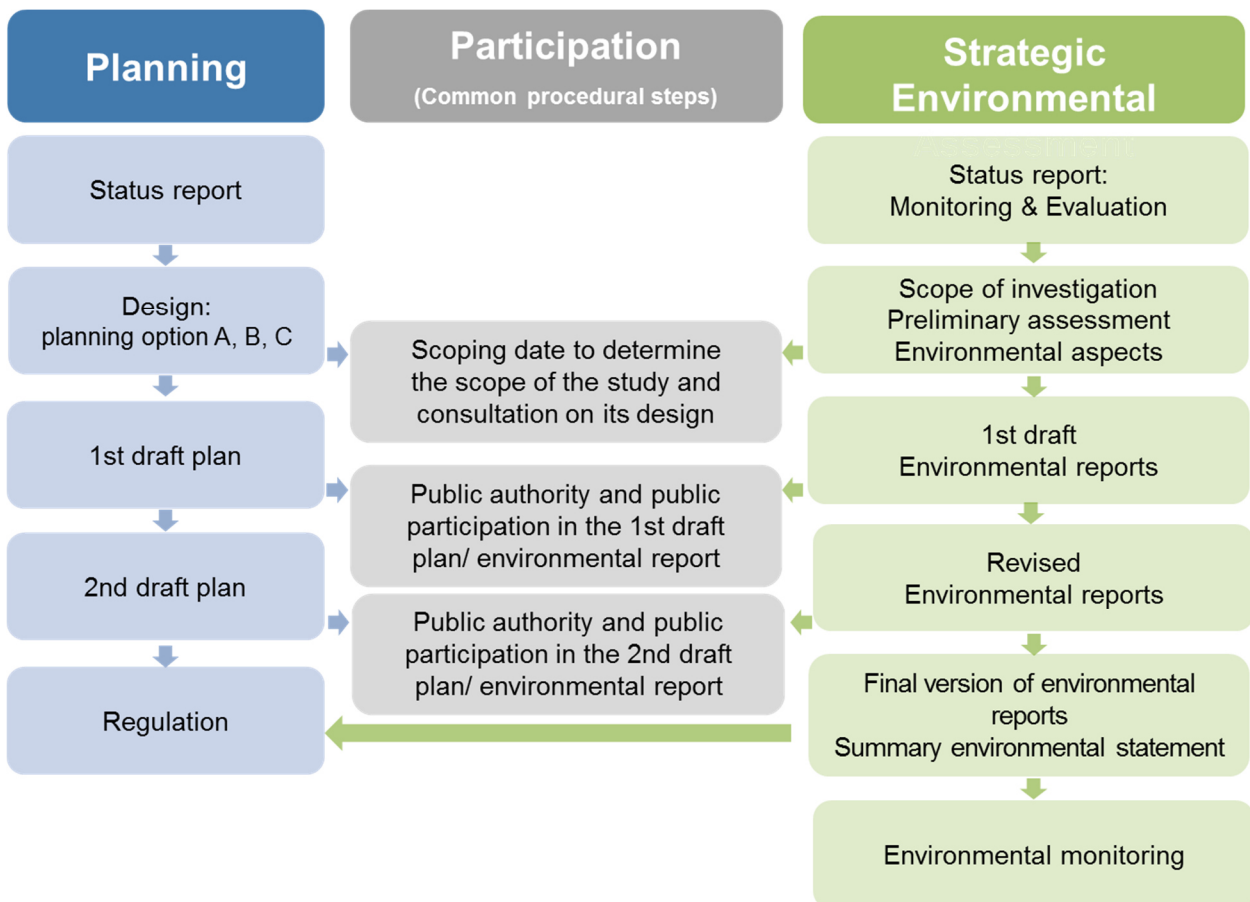


Figure 6: Overview of the planning and participation process.

4.2 Tiered assessment of alternatives

A tiered assessment of alternatives is planned for the to be updated maritime spatial plan. Depending on the increasingly more specific planning, the alternatives to be examined are reduced in the course of the planning process and become increasingly more spatially specific.

In general, environmental reports within the framework of strategic environmental assessments pursuant to Article 5 subsection 1 sentence 1 of the SEA Directive in conjunction with the criteria in Annex I of the SEA Directive frequently contain a brief description of the reasons for the choice of the assessed reasonable alternatives. When describing and assessing the environmental impacts identified pursuant to Section 8 subsection 1 ROG in accordance with number 2c Annex 1 to Section 8 subsection 1 ROG, it shall contain information on the other planning options under consideration, taking into account the objectives and the spatial scope of the maritime spatial plan. The prerequisite is always that they take the objectives and the spatial scope of the maritime spatial plan into account.

At the same time, the identification and assessment of the planning options or planning alternatives under consideration must also be based on what can reasonably be required in terms of the content and level of detail of the maritime spatial plan. The following applies here: the greater the expected environmental impacts and thus the need for planning conflict resolution, the more extensive or detailed studies are required.

Annex 4 number 2 UVPG gives examples of the assessment of alternatives with regard to the design, technology, location, size and scope of the project, but explicitly refers only to projects. At the planning level, therefore, the conceptual/strategic design and spatial alternatives play a major role.

It should be noted as a matter of course that a preliminary study of possible and conceivable planning options is already inherent in all specifications in the form of objectives and principles. As can be seen from the justification of the individual principles, in particular those relating to the environment, the respective principle is already based on a weighing of possible affected public interests and legal positions, so that a "preliminary study" of planning options or alternatives has already been carried out. In the EEZs, there is already a multitude of different uses and legally protected interests.

In addition to the zero alternative, the environmental report examines in particular maritime spatial planning options and alternatives, where relevant for the individual uses.

For the individual steps of the tiered assessment of alternatives (see Figure 7:

In the early stages of the process of updating the maritime spatial plans in the German North Sea and Baltic Sea EEZ, the concept for updating the maritime spatial plans includes three planning options (A-C) as overall spatial plan variants. The early and comprehensive consideration of several planning options represents an important planning and review step in the updating of the maritime spatial plans. This concept for updating is based on a preliminary assessment of selected environmental aspects before the actual environmental report is prepared. The preliminary assessment of selected environmental aspects in the sense of an early assessment of variants and alternatives is intended to support the comparison of the three planning options from an environmental perspective.

In a next step, the draft environmental report will be prepared in parallel with the first draft plan and subsequently consulted. Within the framework of the assessment of alternatives, the draft

environmental report will examine selected sectoral and small maritime spatial planning options in accordance with the planning that is becoming increasingly specific.

In the revised or final environmental report, the focus of the assessment of alternatives is particularly on justifying the carefully considered planning option.

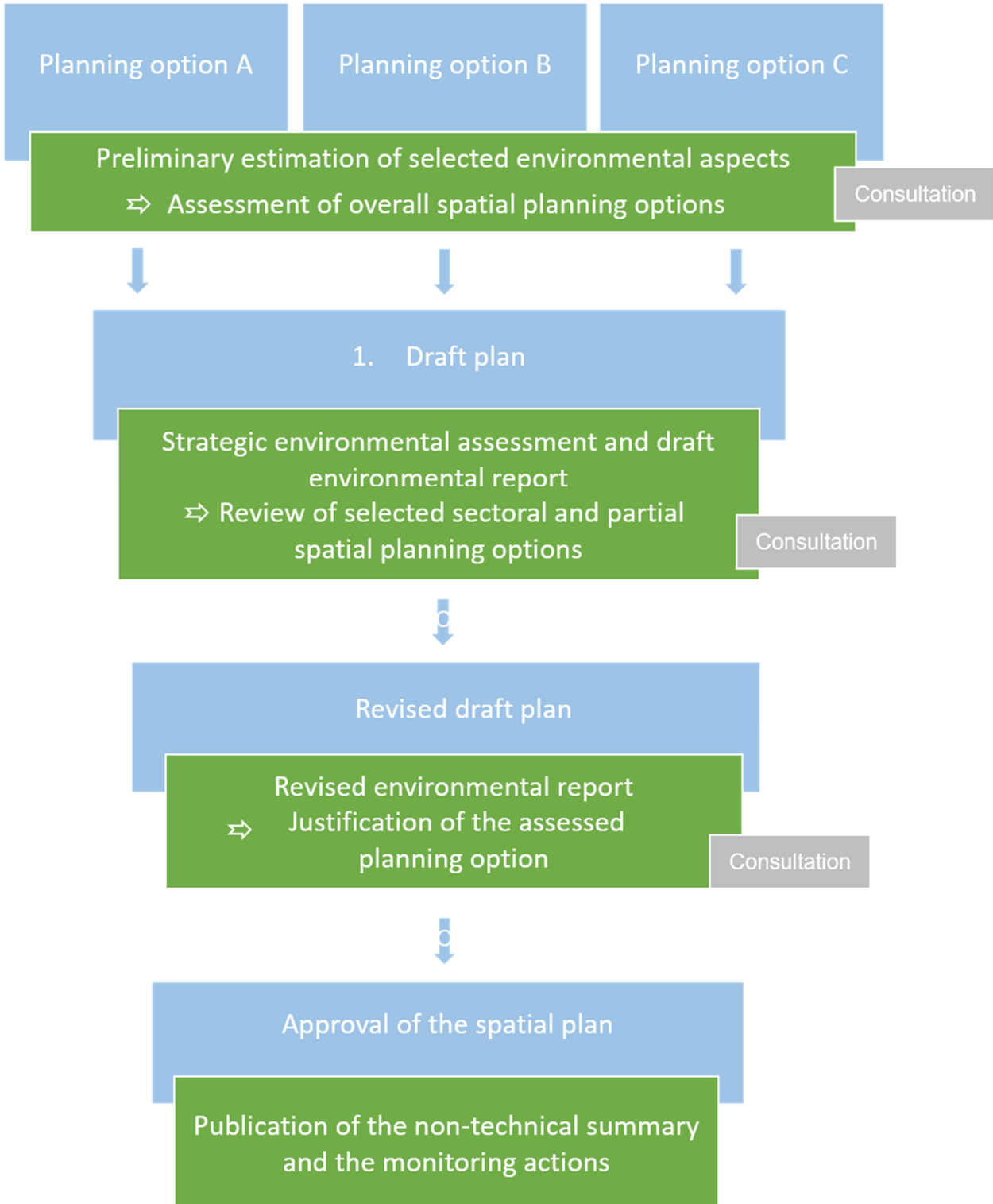


Figure 7: Tiered procedure for assessment of alternatives.

4.3 Application of the ecosystem approach

The application of the ecosystem approach is a requirement under Section 2 subsection 3 number 6 sentence 9 of the ROG with the aim of guiding human activities, sustainable development and supporting sustainable growth (see Article 5 subsection 1 of the MSPD in conjunction with Article 1 subsection 3 of the Marine Strategy Framework Directive).

Recital 14 of the MSPD specifies that maritime spatial planning should be based on an ecosystem approach in accordance with the MSFD. It is also clear here - as in Preamble 8 of the MSFD - that sustainable development and use of the seas should be compatible with good environmental status.

According to Article 5 subsection 1 of the Maritime Spatial Planning Directive, Member States "shall take into account economic, social and environmental aspects in the preparation and implementation of maritime spatial planning in order to support sustainable development and growth in the maritime domain, applying an ecosystem approach, and to promote the coexistence of relevant activities and uses".

Article 1 subsection 3 of the MSFD specifies that "Marine Strategies shall apply an ecosystem approach to the governance of human activities, which ensures that the overall pressures arising from these activities are kept to levels consistent with the achievement of a good environmental status and that the capacity of marine ecosystems to respond to human-induced changes is not impaired, while permitting the sustainable use of marine assets and services today and by future generations".

The following figure summarises the relationship between the two main directives, but also links to other relevant directives.

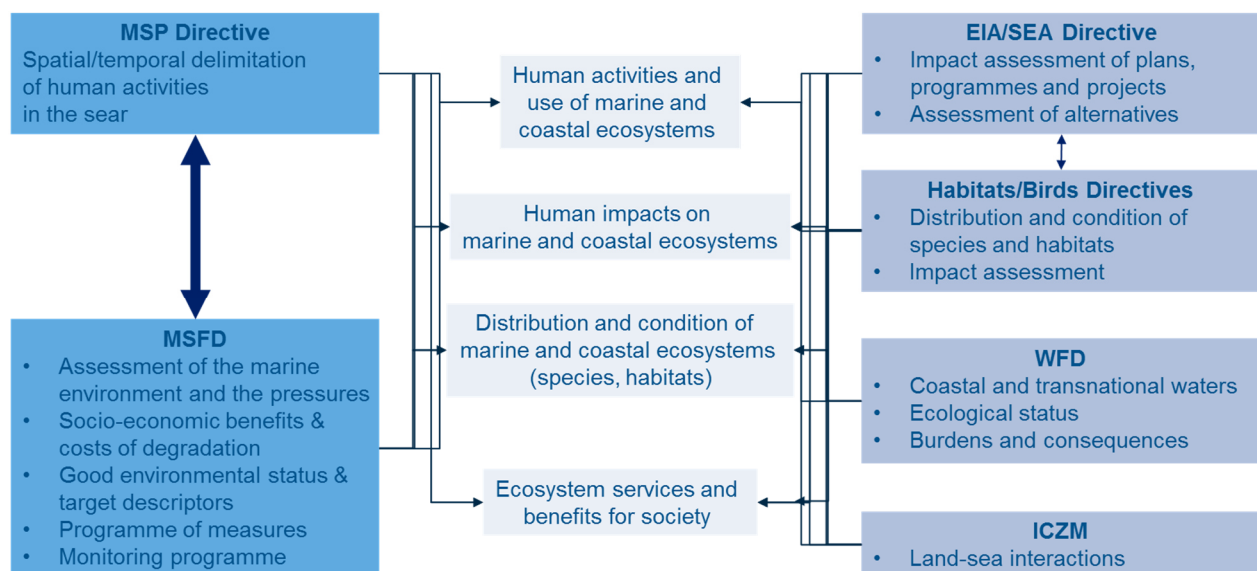


Figure 8: The Maritime Spatial Planning Directive in relation to the MSFD and other relevant directives amended after Altvater, S.; Lukic, I.; Eilers, S., 2019.

Consequently, the ecosystem approach has become increasingly important in recent years. It permits an overall view of the marine environment, recognising that humans are an integral part of the natural system. Natural ecosystems and their services are considered together with the interactions resulting from their use. The approach taken is to manage ecosystems within the

"limits of their functional capacity" in order to safeguard them for use by future generations. In addition, understanding ecosystems enables effective and sustainable use of resources.

The application of the ecosystem approach requires an integral perspective, the continuous development of knowledge about the oceans and their use, the application of the precautionary principle and flexible, adaptive management or planning. The assessment of alternatives (see Chapter 4.2) helps to avoid or reduce negative impacts on the environment and conflicts between uses.

One of the greatest challenges in this context is understanding the cumulative effects that the combination of different activities can have on species and habitats (see Chapter 5.5.1). Another important aspect of the ecosystem approach is the promotion of communication and participation processes to make use of the broadest possible knowledge base of all stakeholders and to achieve broad acceptance of the plan.

Based on the so-called twelve Malawi principles of the Biodiversity Convention, the ecosystem approach has also been embodied and specified for marine spatial planning by the HELCOM-VASAB working group on maritime spatial planning (HELCOM, 2016). The key elements formulated there represent a suitable approach for applying the ecosystem approach in the maritime spatial plans of the German EEZ:

- Best available knowledge and practice;
- Precautions;
- Alternative development;
- Identification of ecosystem services;
- Prevention and mitigation;
- Relational understanding;
- Participation and communication;
- Subsidiarity and coherence;
- Adaptation.

These key elements can be assigned to one or more phases of the maritime spatial plan and SEA. In some cases they are interdependent or build on each other. Some of the key elements have a substantive focus, others relate more to the planning process.

Some of these aspects are principle parts or have been part of the German planning system for many years. The bundling of these aspects into an overall ecosystem approach for updating the maritime spatial plans for the German EEZ, including the strategic environmental assessments, is a new approach. As shown in the following figure, the ecosystem approach is already applied in the conception of the update of the maritime spatial plans and the assessment of the different planning options.

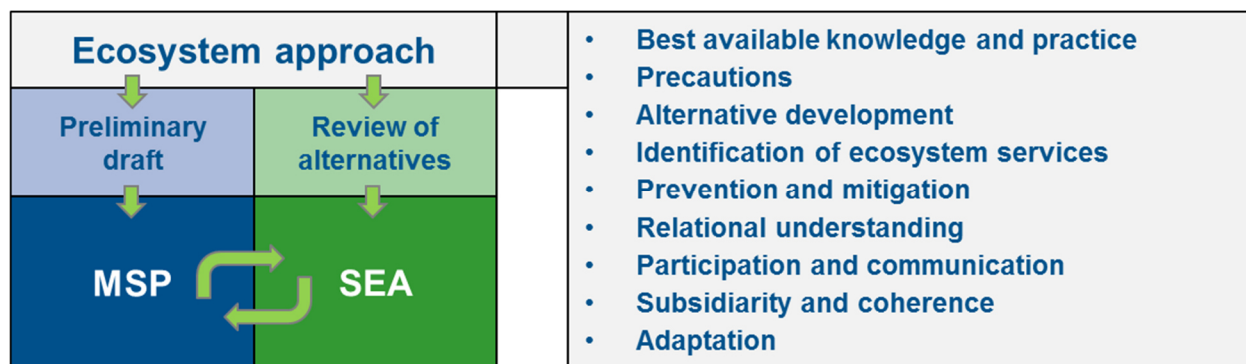


Figure 9: The ecosystem approach as a structuring concept.

5 Strategic environmental assessment methodology

In principle, different methodological approaches can be considered when conducting the strategic environmental assessment. The present environmental report builds on the methodology already applied in the strategic environmental assessment of the federal sectoral plans and the site development plan with regard to the use of offshore wind energy and electricity grid connections.

For all other uses for which designations are made in the maritime spatial plan, such as shipping, extraction of raw materials and marine research, sector-specific criteria are used to assess possible impacts.

The methodology is based primarily on the provisions of the plan to be examined. Within the framework of this SEA, it is determined, described and evaluated for each of the designations whether the designations are likely to have significant impacts on the protected assets concerned. According to Section 1 subsection 4 UVPG in conjunction with Section 40 subsection 3 UVPG, the competent authority shall provisionally assess the environmental impacts of the designations in the environmental report with a view to implementing effective environmental precautions in accordance with the applicable laws. Criteria for the assessment are to be found, inter alia, in Annex 2 of the Spatial Planning Act.

The object of study of the environmental report is the description and assessment of the likely significant impacts of the implementation of the maritime spatial plan on the marine environment for designations for the use and protection of the EEZ. In each case, the assessment is carried out on the basis of the assets to be protected.

According to Section 7 subsection 1 ROG, maritime spatial plans must contain designations as **objectives and principles** of spatial planning for the development, organisation and safeguarding of space, in particular on the uses and functions of space. Under Section 7 subsection 3 ROG, these provisions may also designate areas.

Specifications on the following uses are the subject of the environmental report, in particular

- Shipping
- Offshore wind energy
- Submarine cables
- Raw material extraction

- Fisheries and marine aquaculture
- Marine Research

Under Section 17 subsection 1 number 4 ROG, provisions for the protection and improvement of the marine environment (nature conservation/marine landscape/open space) also play a role.

5.1 Study area

Two separate environmental reports are produced for the North Sea and Baltic Sea EEZs. The description and assessment of the environmental status relates to the EEZs of the North Sea and the Baltic Sea, respectively, for which the maritime spatial plan gives designations. The SEA study area covers the German EEZs of the North Sea and Baltic Sea (Figure 7). It should be noted that the data situation within the North Sea EEZ is significantly better for the area up to shipping route 10 than for the area northwest of shipping route 10, due to the project-related monitoring data available for this area.

The maritime spatial plan also gives designations for the area north-west of shipping route 10. Based on the available sediment data and findings from monitoring for the "Doggerbank" protected area, it is also possible to describe and assess the environmental status of this area and evaluate potential environmental impacts.

The adjoining territorial sea and the adjacent areas of the coastal federal states are not covered by this plan, but they are included in the cumulative and transboundary consideration in this SEA.

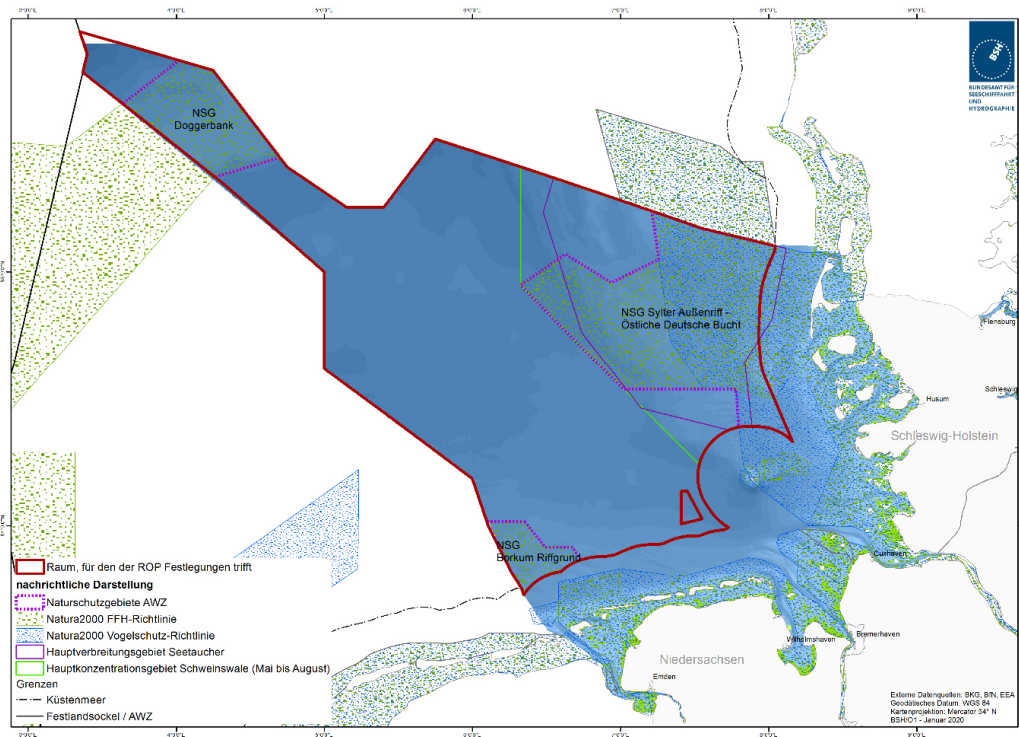


Figure 10: Boundary of the SEA study area (Environmental Report for the North Sea EEZ maritime spatial plan).

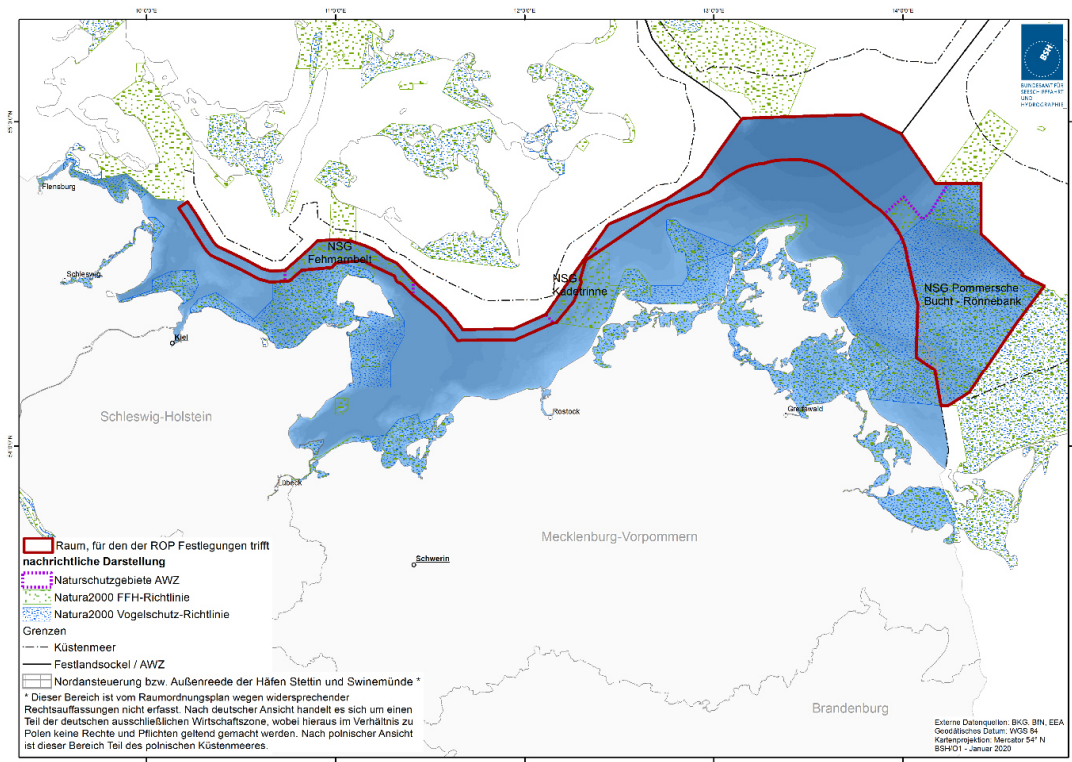


Figure 11: Boundary of the SEA study area (Environmental Report for the Baltic Sea EEZ maritime spatial plan).

5.2 Carrying out the environmental assessment

The assessment of the likely significant environmental impacts of the implementation of the maritime spatial plan shall include secondary, cumulative, synergistic, short-, medium- and long-term, permanent and temporary, positive and negative impacts in terms of the assets to be protected. Secondary or indirect impacts are those which are not immediate and therefore may take effect after some time and/or in other places. Occasionally we also speak of consequential effects or interactions.

Possible impacts of the plan implementation are described and evaluated in relation to the protected areas. A uniform definition of the term "relevance" does not exist, since it is an "individually determined relevance" which cannot be considered independently of the "specific characteristics of plans or programmes" (SOMMER, 2005, 25 et seq.). In general, relevant impacts can be understood to be effects that are serious and significant in the context under consideration.

According to the criteria of Annex 2 of the ROG, which are decisive for the assessment of the relevant probable environmental impacts, relevance is determined by

- "The probability, duration, frequency and irreversibility of the effects;
- The cumulative nature of the effects;
- The transboundary nature of the effects;
- The risks to human health or the environment (e.g. in the event of accidents);
- The scale and spatial extent of the impact;

- The importance and sensitivity of the area likely to be affected, due to its specific natural characteristics or cultural heritage, the exceeding of environmental quality standards or limit values and intensive land use;
- The impact on sites or landscapes whose status is recognised as protected at national, community or international level".

Also relevant are the characteristics of the plan, in particular

- The extent to which the plan sets a framework for projects and other activities in terms of location, type, size and operating conditions or through the use of resources;
- The extent to which the plan influences other plans and programmes, including those in a planning hierarchy;
- The importance of the plan for the integration of environmental considerations, in particular with a view to promoting sustainable development;
- The environmental issues relevant for the plan;
- The importance of the plan for the implementation of community environmental legislation (e.g. plans and programmes relating to waste management or water protection) (Annex II SEA Directive).

In some cases, further details on when an impact reaches the critical threshold can be derived from sectoral legislation. Threshold values have been based on non-legislative standards in order to be able to make a distinction.

The description and assessment of potential environmental impacts is carried out for the individual spatial and textual specifications on the use and protection of the EEZ in relation to the protected assets, taking into consideration the status assessment.

Furthermore, where necessary, a differentiation is made according to different technical designs. The description and assessment of the likely significant impacts of the implementation of the plan on the marine environment also relate to the presented protected assets. All contents of the plan that could potentially have significant environmental impacts are examined.

Both permanent and temporary, e.g. construction-related, effects are considered. This is followed by a presentation of possible interactions, a consideration of possible cumulative effects and potential transboundary impacts.

The following protected assets are considered with regard to the assessment of the environmental status:

- Marine space
- Seabed
- Water
- Plankton
- Biotope types
- Benthos
- Fish
- Marine mammals
- Avifauna
- Bats
- Biodiversity
- Air
- Climate
- Landscape
- Cultural and other material assets (underwater cultural heritage)
- Humans, in particular human health
- Interactions between protected assets

In general, the following methodological approaches are used in the environmental assessment:

- Qualitative descriptions and assessments
- Quantitative descriptions and assessments
- Evaluation of studies and technical literature, expert opinions
- Visualisations
- Worst-case assumptions
- Trend assessments (e.g. on the state of the art of installations and the possible development of shipping traffic)
- Assessments by experts/the technical community

An assessment of the impacts resulting from the designations of the plan is made on the basis of the status description and status assessment and the function and significance of the individual areas for the individual protected assets on the one hand, and the impacts emanating from these provisions and the resulting potential impacts on the other. A forecast of the project-related impacts when the maritime spatial plan is implemented is based on the criteria of intensity, range and duration or frequency of the effects (see Figure 12). Further assessment criteria are the probability and reversibility of the impacts, as specified in Annex 2 to Section 8 subsection 2 ROG.

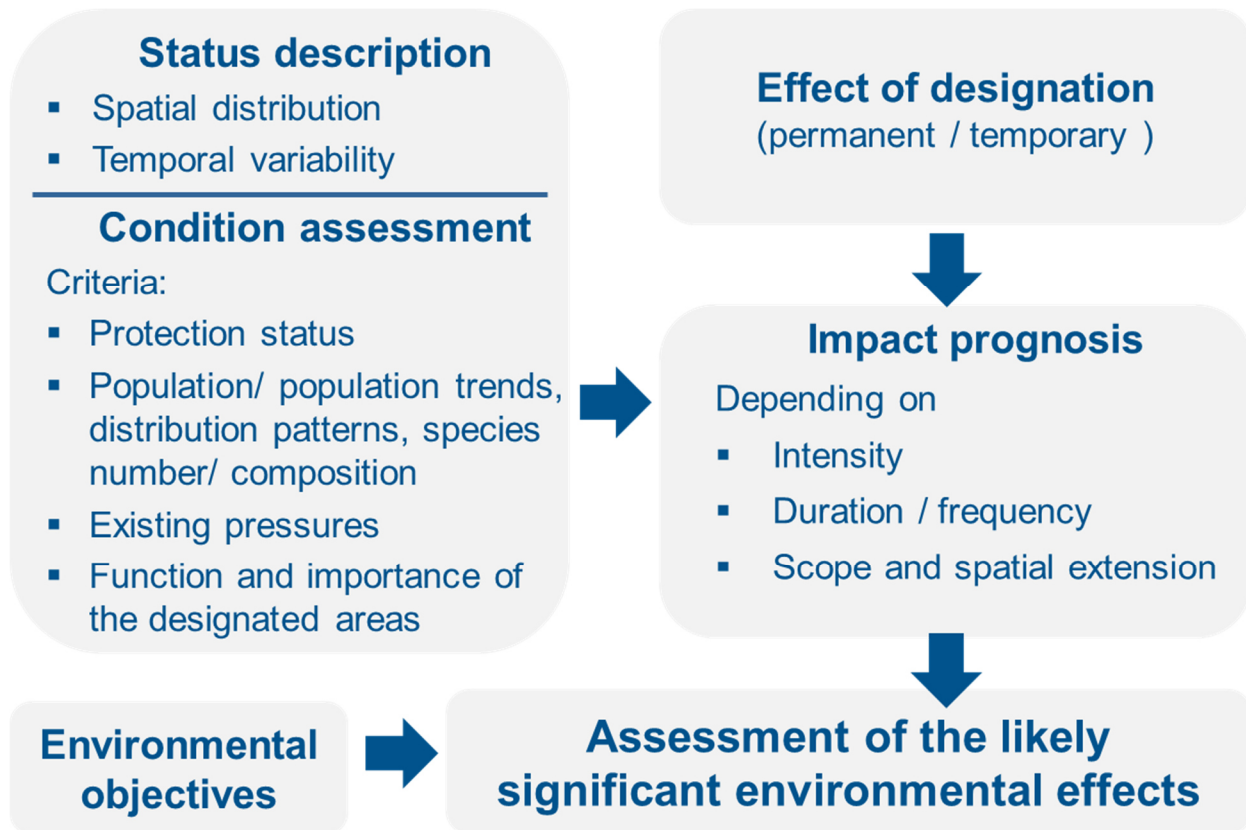


Figure 1213: General methodology for assessing likely significant environmental impacts.

5.3 Criteria for the condition description and condition assessment

The condition of the individual protected assets is assessed on the basis of various criteria. For the protected assets of marine space/seabed, benthos and fish, the assessment is based on the aspects of rarity and threat, diversity and uniqueness, and existing pressures. The description and assessment of marine mammals and sea- and stopover birds is based on the aspects listed in the figure. Since these are highly mobile species, an approach analogous to that for the protected assets marine space/seabed, benthos and fish is not appropriate. For seabirds, stopover birds and marine mammals, the criteria used are protection status, assessment of occurrence, assessment of spatial units and existing pressures. For the protected asset migratory birds, the aspects of rarity, threat and existing pressures are taken into account, as are the aspects of assessment of the occurrence and the area's significance for bird migration over a large area. There is currently no reliable data set for a criteria-based assessment of bats as a protected asset. The biodiversity asset is evaluated in text form.

The following is a summary of the criteria that were used for the status assessment of the respective protected asset. This overview deals with the protected assets which can be meaningfully delimited on the basis of criteria and which then form the focus.

Marine space/Seabed

Aspect: rarity and threat
Criterion: surface-area based proportion of sediments on the seabed and distribution of the morphological inventory of forms.
Aspect: diversity and uniqueness
Criterion: heterogeneity of the sediments on the sea floor and formation of the morphological inventory of forms.
Aspect: existing pressure
Criterion: extent of the anthropogenic existing pressure on the sediments on the seabed and the morphological inventory of forms.

Benthos

Aspect: rarity and threat
Criterion: number of rare or endangered species based on the identified Red List species (Red List by RACHOR et al. 2013).
Aspect: diversity and uniqueness
Criterion: number of species and composition of the species communities. The extent to which species or communities characteristic of the habitat occur and how regularly they occur is assessed.
Aspect: existing pressure
For this criterion, the intensity of fishing exploitation, which is the most effective disturbance variable, will be used as a benchmark. Eutrophication can also affect benthic communities. For other disturbance variables, such as shipping traffic, pollutants, etc., there is currently a lack of suitable measurement and detection methods to be able to include them in the assessment.

Biotope types

Aspect: rarity and threat
Criterion: national conservation status and threat of biotope types according to the Red List of Endangered Biotope Types in Germany (FINCK et al., 2017)
Aspect: existing pressure
Criterion: threat due to anthropogenic influences.

Fish

Aspect: rarity and threat
Criterion: proportion of species considered endangered according to the current Sea Fish Red List (THIEL et al. 2013) and, for diadromous species, the Freshwater Fish Red List (FREYHOF 2009) and

which are assigned to Red List categories.
Aspect: diversity and uniqueness
Criterion: the diversity of a fish community can be described by the number of species (α -diversity, 'species richness'). The species composition can be used to assess the specific nature of a fish community, i.e. how regularly habitat-typical species occur. Diversity and uniqueness are compared and assessed between the North Sea or Baltic Sea as a whole and the German EEZ, as well as between the EEZ and individual areas.
Aspect: existing pressure
Criterion: through the removal of target species and by-catch, and the impact on the seabed in the case of bottom-contacting fishing methods, fisheries are considered to be the most effective disturbance to the fish community and therefore serve as a measure of the pressure on fish communities in the North Sea and Baltic Sea. There is no assessment of stocks at a smaller spatial scale such than the German Bight for example. The input of nutrients into natural waters is another path through which human activities can affect fish communities. For this reason, eutrophication is used to assess the existing pressure.

Marine mammals

Aspect: protection status
Criterion: status under Annex II and Annex IV of the Habitats Directive and the following international protection agreements: Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention, CMS), ASCOBANS (Agreement on the Conservation of Small Cetaceans of the Baltic and North Seas), Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention)
Aspect: assessment of occurrence
Criteria: stock, stock changes/trends based on large-scale surveys, distribution patterns and density distributions
Aspect: assessment of spatial units
<ul style="list-style-type: none"> Criteria: function and importance of the German EEZ and the areas designated in the FEP for marine mammals as migration areas, feeding grounds or breeding grounds
Aspect: existing pressure
Criterion: threat due to anthropogenic influences and climate change.

Seabirds and resting birds

Aspect: protection status
Criterion: status according to Annex I Species of the Birds Directive, European Red List from BirdLife International

Aspect: assessment of occurrence
Criteria: stocks in the German North Sea and Baltic Sea and stocks in the German EEZ, large-scale distribution patterns, abundances, variability
Aspect: evaluation of spatial units
Criteria: function of the areas defined in the FEP for relevant breeding birds, migrants, as stopover areas, location of protected areas
Aspect: existing pressure
Criterion: threat due to anthropogenic influences and climate change.

Migratory birds

Aspect: the importance of bird migration over a wide area
<ul style="list-style-type: none"> • Criterion: guidelines and areas of concentration
<ul style="list-style-type: none"> • Aspect: assessment of the occurrence
Criterion: migration and its intensity
Aspect: rarity and threat
<ul style="list-style-type: none"> • Criterion: number of species and endangered status of the species involved according to Annex I of the Birds Directive, Bern Convention of 1979 on the Conservation of European Wildlife and Natural Habitats, Bonn Convention of 1979 on the Conservation of Migratory Species of Wild Animals, AEWA (African-Eurasian Waterbird Agreement) and SPEC (Species of European Conservation Concern).
Aspect: existing pressure
Criterion: existing pressure/threat due to anthropogenic influences and climate change.

5.4 Taking climate change into account

As one of the greatest challenges facing society Anthropogenic climate change is of particular importance for changes in the oceans and their use. The Figure 14 illustrates the links between climate change, the marine ecosystem, uses and maritime spatial planning (MSP), also as a tool for achieving sustainable development goals.

In changing seas, the consideration and integration of climate impacts in MSP is of great importance in order to do justice to the precautionary and forward-looking nature of MSP and to develop long-term sustainable plans.

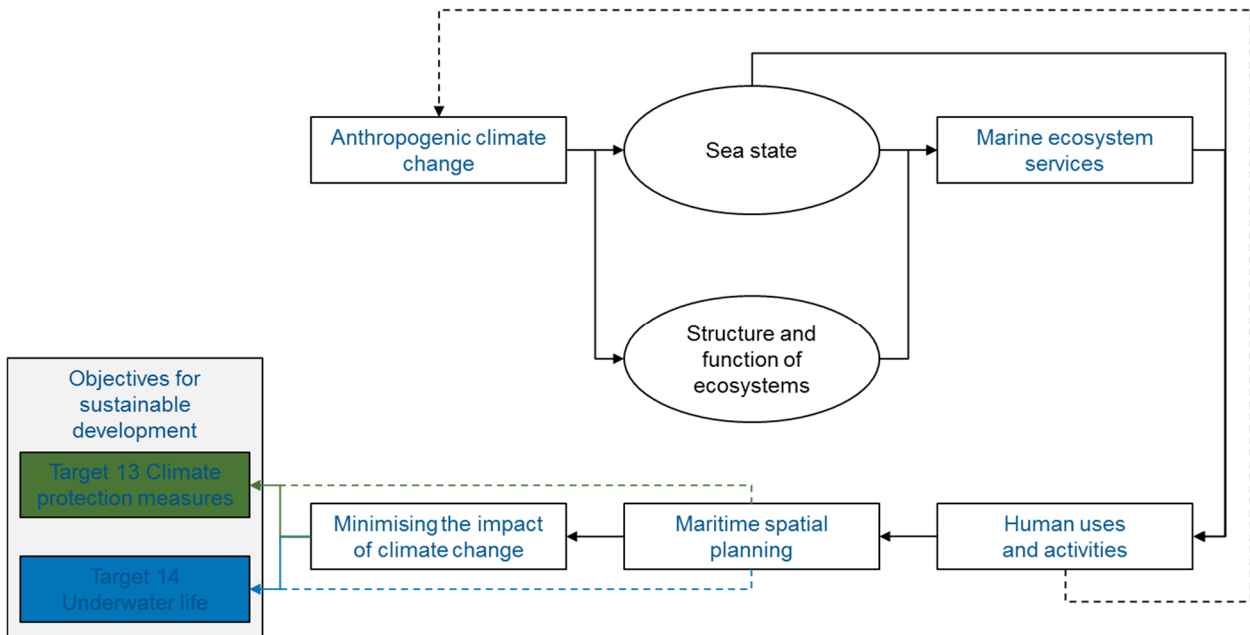


Figure 1415: Illustration of the links between climate change, marine ecosystems and maritime spatial planning (after Frazão Santos et al. 2020)

Climate change will alter the physical, chemical and biological conditions in the North and Baltic Seas. This will inevitably have an impact on marine ecosystems, their structure and functions, which may also change ecosystem services. The changes may also have a direct impact on the uses to which they are put, e.g. shipping, renewable energy or extraction of raw materials (Frazão Santos, 2020).

As a contribution to climate protection, on the one hand the designations for renewable energy and thus the CO₂ reduction potential and, on the other hand, maintaining the nature conservation priority areas clear and thus their potential as natural sinks, should be mentioned. The mission statement shows that the use of climate-friendly technologies at sea supports energy security and the achievement of national and international climate targets.

The designation of priority and reservation areas for nature conservation can also serve to strengthen the resilience of ecosystems and thus support the precautionary principle.

5.5 Assumptions used to describe and assess the likely significant impacts

The description and assessment of the probable significant impacts of the implementation of the maritime spatial plan on the marine environment is carried out for the individual provisions on the use and protection of the EEZs in relation to the protected asset, taking into account the status assessment described above. The following table lists, on the basis of the main impact factors, those potential environmental impacts that arise from the respective use and which are to be examined both as an existing pressure, in the event of non-implementation of the plan, or as an anticipated significant environmental impact resulting from the designations in the maritime spatial plan. The effects are differentiated according to whether they are permanent or temporary.

Use	Effect	Potential effect	Schutzgüter																
			Benthos	Fish	Sea birds and resting birds	Migratory birds	Marine mammals	Bats	Plankton	Biotope types	Biodiversity	Soil	Surface	Water	Air	Climate	Humans/ health	Cultural and material goods	Landscape
Maritime uses with designations in the maritime spatial plan																			
Raw materials Sand and gravel mining / Seismic investigations	Removal of substrates	Veränderung von Habitaten	x	x						x	x	x						x	
		Lebensraum- und Flächenverlust	x	x						x	x	x	x						x
	Turbidity plumes	Impairment	x t																
		Physiological effects and scaring effects		x t															
	Physical disturbance	Impact on the seabed	x							x		x	x						
Underwater sound during seismic surveys	Impairment / scaring effect		x t			x t													
Marine Research	Sampling of selected species	Reduction of stocks		x															
		Deterioration of the food base																	
	Physical disturbance by trawls	Impairment/ damage	x							x		x							
Maritime uses without designations in the maritime spatial plan																			
National defense	Underwater sound	Impairment / scaring effect		x t			x t												
	Introduction of hazardous substances	Impairment	x	x	x		x			x	x	x		x			x		
	Risk of collision	Collision					x												
	Surface sound	Impairment / scaring effect			x	x		x										x	
Recreation (-traffic)	Taking of species (fishing)	Reduction of stocks		x															
	Underwater Sound	Impairment / scaring effect		x			x												
	Emission of air pollutants	Impairment of air quality			x	x		x						x	x	x			
	Bringing in waste	Impairment	x	x	x		x						x				x		
	Visual agitation	Impairment / scaring effect			x														
Aquakultur	Introduction of nutrients	Impairment	x	x					x				x						
	Installation of fixed installations	Habitat change	x	x						x								x	
		Loss of habitat and land	x	x									x						x
Fischerei	Sampling of selected species	Reduction of stocks		x															
		Deterioration of the food base			x		x												
	Bycatch	Reduction of stocks		x			x												
	Physical disturbance by trawls	Impairment / damage	x							x		x							

x Potential impact on the protected asset

x t Potential temporary effect on the protected asset

In addition to the impacts on the individual protected assets, cumulative effects and interactions between protected assets are also examined.

5.5.1 Cumulative consideration

According to Article 5 (1) SEA Directive, the environmental report also includes an assessment of cumulative impacts. Cumulative impacts arise from the interaction of various independent individual effects which either add up as a result of their interaction (cumulative effects) or reinforce each other and thus generate more than the sum of their individual effects (synergistic effects) (e.g. SCHOMERUS et al., 2006). Both cumulative and synergetic impacts can be caused by the coincidence of impacts in time and space. The effect can be reinforced by similar uses or different uses with the same effect, thereby increasing the impact on one or more protected assets.

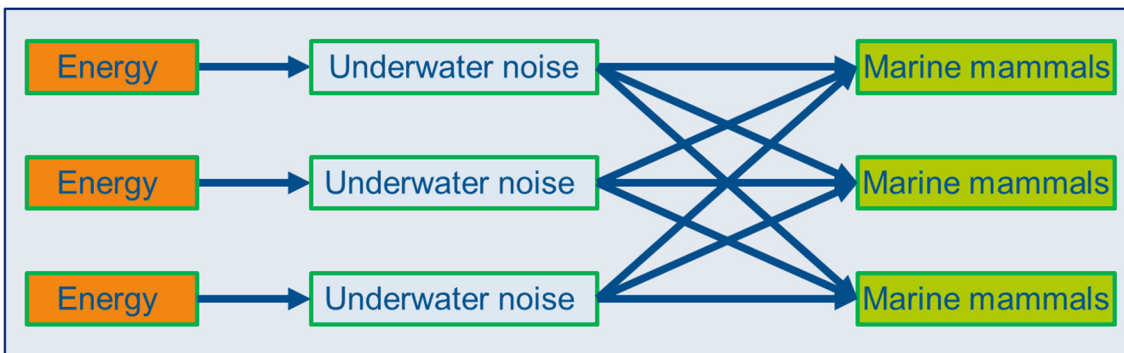


Figure 16: Typical cumulative effect of similar uses.

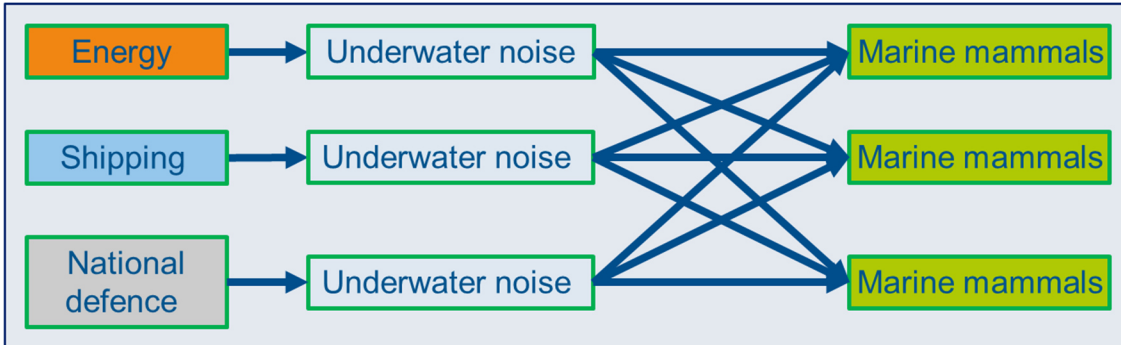


Figure 17: Typical cumulative effect of different uses.

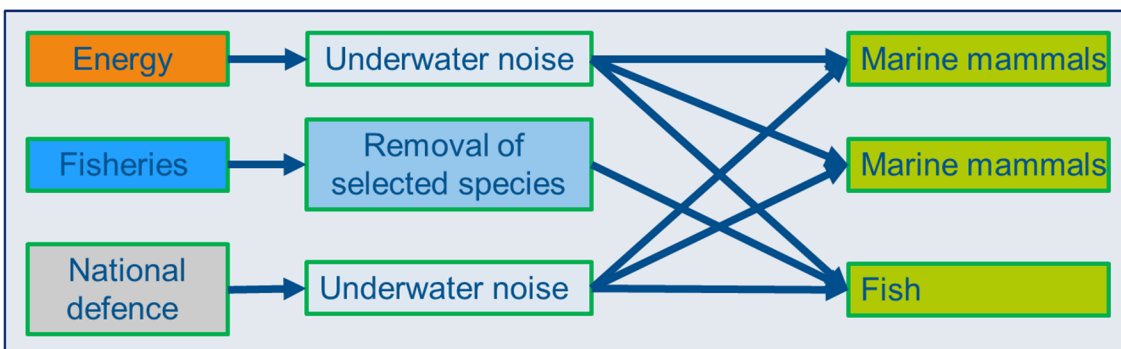


Figure 18: Typical cumulative effect of different uses with different impacts.

In order to examine the cumulative impacts, it is necessary to assess the extent to which the provisions of the plan, when taken together, can be expected to have a significant adverse impact. An assessment of the designations is performed on the basis of the current state of knowledge within the meaning of Article 5 subsection 2 of the SEA Directive. The position paper on the cumulative assessment of diver habitat loss in the German North Sea (BMU, 2009) and the BMUB's noise abatement concept (2013) form an important basis for assessing the impacts of habitat loss and underwater noise.

5.5.2 Interactions

In general, impacts on a protected asset lead to various consequences and interactions between the protected assets. The essential interdependence of the biotic protected assets exists via the food chains. Due to the variability of the habitat, interactions can only be described in very imprecise terms overall.

5.5.3 Specific assumptions for the assessment of the likely significant environmental impacts

The detailed approach for the analysis and assessment of the respective designations is as follows:

Offshore wind energy

With regard to the priority and reservation areas for offshore wind energy, a worst-case consideration is generally assumed. Certain parameters are assumed in this SEA in the form of ranges spatially separated into zones 1 and 2 and zones 3 to 5. In detail, these are, for example, the power output per turbine [MW], hub height [m], rotor diameter [m] and total height [m] of the turbines.

As input parameters, the SEA takes particular account of

- Turbines already in operation or undergoing the licensing procedure (as reference and existing pressure)
- Transfer of the average parameters of the turbines commissioned in the last 5 years to the sites defined in FEP 2019
- Forecast of certain technical developments for the additional priority and reservation areas for offshore wind energy defined in the maritime spatial plan on the basis of the parameters shown in Table 2. It should be noted that these are only partly estimation-based assumptions, as project-specific parameters are not or cannot be checked at the SEA level.

Table 23: Parameters for the consideration of areas for offshore wind energy

Wind turbine parameter	Range zones 1 and 2		Range Zone 3-5	
	from	to	from	to
Output per plant [MW]	5	12	12	20
Hub height [m]	100	160	160	200
Rotor diameter [m]	140	220	220	300
Total height [m]	170	270	270	350

For the grid connection systems in the North Sea EEZ, one platform per 2 GW of installed capacity is assumed for commissioning from 2029. A certain surface area requirement [m²] is

assumed for the platforms. For the connection lines in the priority areas for offshore wind energy, the route length (EEZ) varies between about 10 km and 160 km. For the priority areas in zones 4 and 5, an average route length of about 250 km is assumed. For the assessment of the construction and operational environmental impacts, certain widths of the cable trench [m] and a certain area of the intersection structures [m^2] are assumed for route corridors for submarine cable systems. Above all, the environmental impacts due to construction, operation and repair are considered.

For grid connection systems in the Baltic Sea EEZ, the capacity is between 250 and 300 MW. The route length varies between 14 and 24 km. The width of the cable trenches of 1 m is assumed as a parameter for the consideration of grid connection systems.

For the route corridors for pipelines, transboundary submarine cable systems or data cables, the cable lengths result from the designations. For pipelines, a width of 1.5 m is assumed for the assessment of environmental impacts for the overlying pipeline plus 10 m each for adverse effects due to "reef effect" and sediment dynamics.

For other uses, evaluation criteria or parameters for the environmental assessment are to be developed or specified in the further procedure.

Shipping

To assess the environmental impact of shipping, it is necessary to examine what additional effects can be attributed to the provisions of the maritime spatial plan.

The identified priority areas must not be used for construction purposes. This control in the maritime spatial plan should prevent or at least reduce collisions and accidents. Based on the provisions of the maritime spatial plan, the frequency of traffic in the priority areas is expected to increase, in particular due to the increase in offshore wind farms along the shipping routes. Vessel movements along the shipping routes SN1 to SN17 and SO1 to SO5 vary considerably, with the most heavily used route SN1 sometimes carrying more than 15 vessels per km^2 per day, while on the other, narrower routes there are usually about 1-2 vessels per km^2 per day (BfN, 2017).

The BSH has commissioned a shipping traffic analysis expert report, which is expected to include current evaluations.

Compared to maritime spatial plan 2009, the reservation areas along priority shipping routes are now also defined as priority areas. This is not an expression of increased use, but serves as a precautionary measure to minimise risk. In addition, it must be taken into account that the freedom of navigation must be ensured in accordance with UNCLOS and that the possibility of control by the IMO is much stronger according to international conventions than in the maritime spatial plan.

The presentation of the general effects of shipping is presented in Chapter 2 as an existing pressure, especially for birds and marine mammals. The effects of service traffic to the wind farms are dealt with in the wind energy chapter.

Raw material extraction

When assessing the potential environmental impact of raw material extraction, a distinction must be made between sand and gravel extraction and hydrocarbon extraction.

Sand and gravel extraction:

Sand and gravel is extracted by means of floating suction dredgers. The extraction field is passed over in strips of about 2 m width and the subsoil is extracted to a depth of about 2 m. The seabed remains unstressed between the excavation strips. During mining, a sediment-water mixture is pumped on board the suction dredger. The sediment in the desired grain size is screened out and the unused fraction is returned to the sea on site. Turbidity plumes result from the mining and discharge. Potential temporary effects result from the turbidity plumes, which can lead to adverse effect on and deterrence effects on the marine fauna. Potential permanent effects arise from the removal of substrates and physical disturbance cause habitat and marine space loss, habitat alteration and seabed degradation.

Sand and gravel extraction is carried out on the basis of operational plans on sub-areas of the approved concession fields.

Gas production:

Exploratory and production wells are drilled for the exploration and development of gas deposits. Drilling through the rock lying above the deposit results in drill cuttings. This is brought to the surface using drilling fluids. The drilling fluids are either water or oil-based. If a water-based drilling fluid is used, it is discharged into the sea together with the cuttings. If oil-based drilling fluids are used, they are disposed of on land together with the cuttings.

Seismic methods are used in the exploration of hydrocarbon reservoirs, which lead to marine mammal deterrence effects.

Operationally induced material discharges into the sea result from the discharge of production and spray water, sewage from the sewage treatment plant and from the shipping traffic caused. Production water is essentially reservoir water that may contain components from the subsurface, such as salts, hydrocarbons and metals. As the deposit ages, the amount of gas in production water increases. Production water can also contain chemicals that are used in mining to improve extraction or to prevent corrosion of production equipment. The production water is discharged into the sea after treatment in accordance with the state of the art and compliance with national and international standards.

Fisheries and marine aquaculture

In the area of the southern oozy seabed, the sediment there defines a particularly suitable habitat for these species, which can be easily delimited. The nephrops (scampi) stock in the North Sea is considered stable and is classified as "least concern" in the IUCN Red List (Bell, 2015). For the German fishing fleet, the nephrops fishery represents a valuable and reliable source of income. Negative impacts of fishing in this area mainly affect the seabed, sediment and the habitats affected by it, and are impaired by the trawls used.

Table 4: Parameters for the consideration of fisheries.

Fishing effort (German fleet)	Approximately 8000 hrs/year (2013) to 14,000 hrs/year (2018) 12 (2014) - 18 (2015) vessels
Fishing gear used	Bottom trawls
Catches	200 - 350 t / year (plus non-German fisheries)

Marine research

The designated areas for marine scientific research (3 in the North Sea, 4 in the Baltic Sea) correspond to standard study areas ("boxes") of the Thuenen Institute in the North Sea and the Baltic Sea. In the North Sea, the German Small-scale Bottom Trawl Survey (GSBTS), which has been carried out since 1987, has been collecting data on the development of fish stocks over many years. In the Baltic Sea, scientific fishing has been carried out several times a year for over thirty years, with research being carried out outside the reservation areas under the BALTBOS, BITS and COBALT programmes. The data sets provide an important basis for assessing long-term changes in the bottom fish fauna (commercial and non-commercial species) of the North Sea and the Baltic Sea resulting from natural (e.g. climatic) influences or anthropogenic factors (e.g. fisheries).

The GSBTS uses a standardised bottom trawl net or a high-density GOV-type otter trawl net to sample small-scale bottom fish communities to determine abundances and distribution patterns. In parallel, epibenthos (using a 2 m beam trawl), infauna (using a van Veen grab) and sediments will be studied, and hydrographic and marine chemical parameters in habitats typical of the region will be recorded. Bottom trawls and beam trawls are also used in the Baltic Sea. Details on the gear used, the effort and the catch quantities can be found in the respective voyage reports for the research voyages of the Thuenen Institute.

Impacts are to be expected based on the equipment used, in particular on the seabed/sediment and the habitats affected by it. To this end, fish of various ages and sizes are taken (see also Chapter 5.5.3).

Table 5: Parameters for the consideration of marine research

Frequency of surveys per year / number of hauls / duration per haul (approximate values, vary from voyage to voyage)	2 / in the range of approx. 40 - 50 (only GSBTS) / 30 min.
Fishing gear used (target species)	Standardised bottom trawl catches, using high-density otter trawls (bottom fish communities) 2-metre beam trawl (epibenthos) Van-Veen grab (Infauna)
Catches	Total quantities for all (sampled) boxes (partly with other research activities) in double-digit tonne range

Nature conservation / marine landscape / open space

The nature conservation designations in the maritime spatial plan are not expected to have any significant negative environmental impacts.

The designations contribute to the long-term preservation and development of the marine environment in the EEZ as an ecologically intact large-area open space. The size of the designations is of particular importance in this context, with the designations in the EEZ accounting for 37.92% of the area of the EEZ in the North Sea. The exclusion of offshore wind energy from Natura 2000 areas in the maritime spatial plans helps to avoid possible disturbances and ensure the protection of the marine environment. Maintaining the protected areas free from construction works also contributes to the large-scale protection of open spaces and the marine landscape scale.

The designation of the main distribution area of harbour porpoises and the main concentration area of divers as reservation areas is of outstanding conservation importance for the protection of the disturbance-sensitive group of diver and harbour porpoise species.

The intention of the guiding principle of the careful and economical use of natural resources in the EEZ, as well as the application of the precautionary principle and the ecosystem approach, is to avoid or reduce adverse effects to the balance of nature.

The maritime spatial plan thus contributes to achieving the objectives of the MSFD. Nevertheless, the influence of maritime spatial planning in this respect is limited, and it cannot influence all objectives.

National and NATO defence

The draft maritime spatial plan contains textual designations in respect of national and NATO defence.

6 Data sets

The data set for the SEA is a description and assessment of the environmental status in the study area. All protected assets must be included. The data set is the basis for the assessment of the expected significant environmental impacts, the assessment under site and species protection law and the assessment of alternatives.

According to Section 8 subsection 1 sentence 3 ROG, the environmental assessment refers to what can reasonably be required based on the current state of knowledge and generally accepted assessment methods and the content and level of detail of the maritime spatial plan.

Under Section 40 subsection 4 UVPG, information available to the competent authority from other procedures or activities may be included in the environmental report if it is suitable for the intended purpose and sufficiently up-to-date.

The draft environmental report will, on the one hand, describe and assess the current environmental status and present the likely development in the event of non-implementation of the plan. It will also forecast and assess the likely significant environmental effects of implementing the plan.

The basis for assessing potential impacts is a detailed description and assessment of the environmental status. The description and assessment of the current environmental status and the likely development in the event of non-implementation of the plan will be carried out with regard to the following protected assets

- Sea surface/seabed
- Water
- Plankton
- Biotope types
- Benthos
- Fish
- Marine mammals
- Bats
- Biodiversity
- Air
- Climate
- Landscape
- Cultural and other material assets
- Humans, in particular human health

- Avifauna
- Interactions between protected assets.

6.1 Data set overview

The data and knowledge situation has improved significantly in recent years, in particular as a result of the extensive collection of data in the context of environmental impact studies and the construction and operational monitoring for the offshore wind farm projects and the accompanying ecological research.

This information also forms an essential basis for the monitoring of the 2009 maritime spatial plans under Section 45 subsection 4 UVPG. Accordingly, the results of the monitoring are to be made available to the public and taken into account when the plan is redrafted. The results of the plan-accompanying monitoring of the current plans are summarised in the status report on the updating of maritime spatial planning in the German EEZ in the North and Baltic Seas, which is published in parallel (Chapter 2.5).

In general terms, the following data sets are used for the environmental report:

- Data and findings from the operation of offshore wind farms
- Data and findings from approval procedures for offshore wind farms, submarine cable systems and pipelines
- Results from the preliminary site survey
- Results of the monitoring of Natura 2000 sites
- Mapping guides for Section 30 biotope types
- MSFD initial and progress assessment
- Findings and results from R&D projects commissioned by BfN and/or BSH and from accompanying ecological research
- Results from EU cooperation projects, such as Pan Baltic Scope and SEANSE
- Studies/technical literature
- Current red lists
- Statements of the technical authorities
- Statements from the technical community

A detailed overview of the individual data sets and knowledge bases will be included in the Appendix (Chapter 9) of the framework of the study.

6.2 Indications of difficulties in compiling the documents

According to number 3a Annex 1 to Section 8 subsection 1 ROG, indications of difficulties encountered in compiling the information, such as technical knowledge gaps or lack of knowledge, must be presented. There are still knowledge gaps in in some areas, particularly with regard to the following points:

- Long-term effects from the operation of offshore wind farms
- Effects of shipping on individual protected assets
- Effects of research activities
- Data for assessing the environmental status of the various protected assets in the outer EEZ area.

In principle, forecasts on the development of the living marine environment after the maritime spatial plan has been carried out remain subject to a certain level of uncertainty. There is often a lack of long-term data series or analytical methods, e.g. for combining extensive information on biotic and abiotic factors, in order to better understand complex interrelationships of the marine ecosystem.

In particular, there is a lack of detailed area-wide sediment and biotope mapping outside the nature reserves of the EEZ. As a result, there is a lack of a scientific basis on which to assess the effects of the possible use of strictly protected biotope structures. At present, sediment and biotope mapping is being carried out on behalf of the BfN and in cooperation with the BSH, research and higher education institutions and an environmental office, with a spatial focus on the nature reserves.

In addition, for some protected assets there is a lack of scientific assessment criteria, both in respect of the assessment of their status and with regard to the impacts of anthropogenic activities on the development of the living marine environment, in order to fundamentally consider cumulative effects over time and space.

Various R&D studies are currently being carried out on behalf of the BSH on assessment approaches, including those for underwater noise. The projects are contributing towards the continuous further development of a uniform, quality-assured data set of marine environmental information for assessing the potential impacts of offshore turbines.

The environmental report will also list specific information gaps or difficulties in compiling the documents for individual protected assets.

7 Description of the individual assessment steps in the environmental report

The description and assessment of the environmental status, the presentation of the likely development in the event of non-implementation of the plan and the assessment of the likely significant environmental effects are based on the designations of the maritime spatial plan.

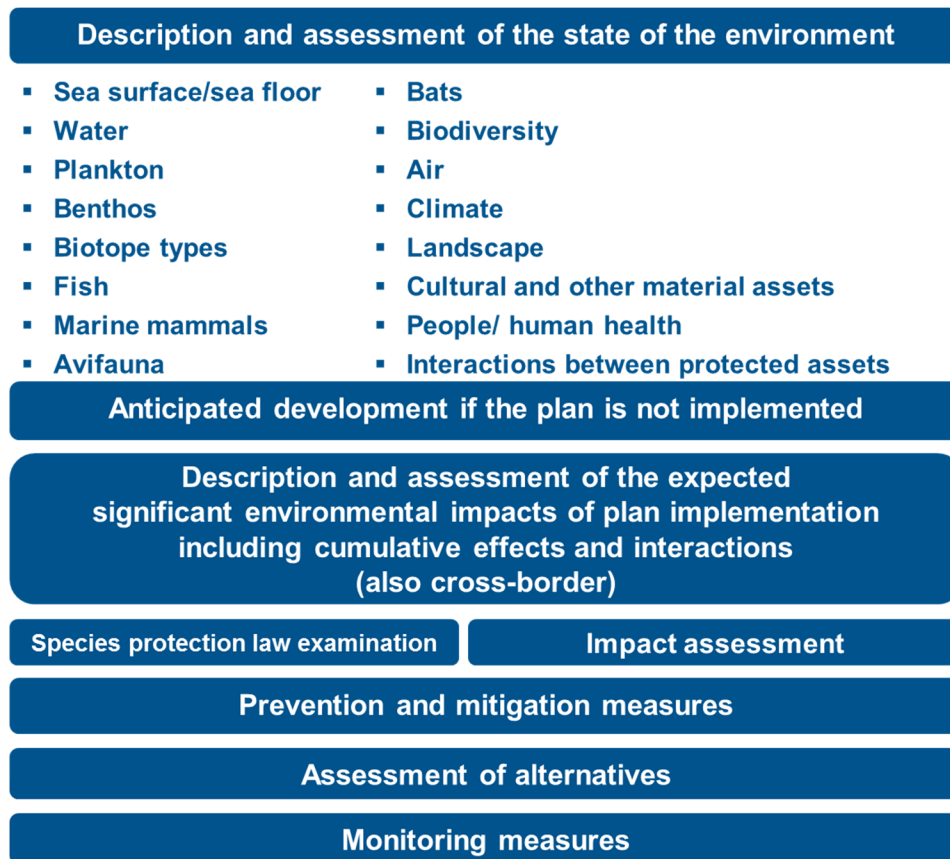


Figure 19: Components of the environmental report.

7.1 Description and assessment of the environmental status

Pursuant to Number 2a Annex 1 to Section 8 subsection 1 ROG, the environmental report contains an inventory of the relevant aspects of the current environmental status, including the environmental characteristics of the areas likely to be significantly affected, including sites of community importance and European bird sanctuaries within the meaning of the Federal Nature Conservation Act.

A description of the relevant aspects of the current environmental status is necessary in order to be able to forecast changes in it as the plan is implemented. The object of the inventory is the protected assets listed in Section 8 subsection 1 ROG and interactions between them. The presentation is problem-oriented. The focus is thus on possible existing impacts, environmental elements requiring special protection and on those protected assets on which the implementation of the plan will have a greater impact. In spatial terms, the description of the environment is based on the respective environmental impacts of the plan. Depending on the type of impact and the protected asset concerned, these impacts vary in extent and may extend beyond the boundaries of the plan.

7.2 Anticipated development if the plan is not implemented

For a comprehensive forecast of the environmental impacts associated with the maritime spatial plan, it must also be known how the environment would probably develop if the plan were not implemented (see Number 2b Annex 1 to Section 8 subsection 1 ROG). In the context of this consideration, it is particularly relevant that even without the plan being updated, the uses within

the EEZ would continue to exist, such as the expansion of offshore wind energy. This requires the fulfilment of the German government's climate protection and energy policy objectives, in respect of which the expansion of offshore wind energy plays a major role. The expected development in the event of non-implementation of the plan thus includes a comparison with the environmental impacts with an identical time horizon without an updated maritime spatial plan, but not a comparison of the environmental impacts of the plan with the current environmental status.

7.3 Description and assessment of the likely significant effects of the implementation of the plan on the marine environment

The description and assessment of the environmental impacts is focussed on the protected assets for which significant impacts cannot be excluded from the outset by the implementation of the maritime spatial plan. Not considered are those protected assets for which significant impacts can already be excluded at the time of the description and assessment of the status. In addition to significant adverse impacts, possible positive effects on the marine environment are also examined. Considered as a whole, the protected assets listed under Section 8 subsection 1 ROG are examined before the species protection and area protection assessments are carried out.

7.4 Species protection law review

The environmental report also presents a review of the legal requirements for species protection.

Special rules with prohibitions apply to animals of specially or strictly protected species. Wild animals of the specially protected species may not be injured or killed under Section 44 subsection 1 number 1 of the Federal Nature Conservation Act. Under Section 44 subsection 1 number 2 of the Federal Nature Conservation Act, wild animals of strictly protected species and European bird species may not be significantly disturbed during the reproduction, rearing, moulting, over-wintering and migration periods. A significant disturbance is deemed to exist if the conservation status of the local population of a species deteriorates as a result of the disturbance.

In this respect, it does not matter whether relevant harm or disturbance is based on reasonable grounds, nor does it matter what the reasons, motives or subjective trends are for complying with the prohibitions (Landmann/Rohmer Umweltrecht Band I - Kommentar zum BNatSchG, 2018, S. § 44 Rn. 6).

7.5 Impact assessment

The strategic environmental assessment will also include a separate assessment of the compatibility of the areas identified in the maritime spatial plan with the protection aims of the nature reserves.

Where a site of community importance or a European bird sanctuary may be significantly impaired in respect of its constituent parts that are relevant to the conservation objectives or the protection purpose, the provisions of the Federal Nature Conservation Act on the admissibility and implementation of such interventions, including the obtaining of the opinion of the European Commission, are to be applied when drawing up regional development plans (see)

The German North Sea EEZ contains the nature reserves "Sylter Außenriff - Eastern German Bight", "Borkum Riffgrund" and "Dogger Bank", which were established by decree on 22 September 2017.

The German Baltic Sea EEZ includes the nature reserves "Pomeranian Bay - Rönnebank", "Fehmarn Belt" and "Kadet Trench", which were established by decree on 22 September 2017.

In principle, the construction of man-made installations and structures in nature reserves is prohibited. However, according to the protected area ordinances, this does not apply to projects and plans for wind power generation and laying or the operation of submarine cables, subject to an admissibility review. These projects and plans must be examined for their compatibility with the protective purpose set out in the relevant regulation. In doing so, they are admissible if, pursuant to Section 34 subsection 2 of the Federal Nature Conservation Act, they cannot lead to significant adverse effects on the constituent parts of the nature conservation area relevant to the protection purpose or if they meet the requirements under Section 34 subsection 3 to subsection 5 of the Federal Nature Conservation Act. Compatibility under the BNatSchG must be examined in accordance with the assessment previously carried out for the Fauna-Flora-Habitat areas (FFH areas). With the designation of the nature conservation areas, this assessment now relates to the protective purpose of these nature conservation areas.

The habitat types to be protected are, in general, "reefs" and "sandbanks" under Annex I of the Habitats Directive, and certain fish species and marine mammals under Annex II of the Directive (river lamprey, feint, harbour porpoise, grey seal and common seal) and several bird species listed in Annex I of the Birds Directive (red-throated diver, black-throated diver, little gull, sandwich tern, common tern, arctic tern, fulmar, northern gannet, common scoter, skua, pomarine skua, common gull, lesser black-backed gull, kittiwake, guillemot, razorbill). Species listed in Annex IV of the Habitats Directive, such as the harbour porpoise, must be strictly protected everywhere, including outside the designated conservation areas.

The impact assessment also takes into account the remote effects of the provisions adopted within the EEZ on the protected areas in the adjacent territorial sea and in the adjacent waters of neighbouring countries. This also applies to the assessment and consideration of functional relationships between the individual protected areas and the coherence of the network of protected areas pursuant to Section 56 subsection 2 of the Federal Nature Conservation Act, since the habitat of some target species (e.g. avifauna, marine mammals) may extend across several protected areas due to their large radius of action.

7.6 Measures to prevent, reduce and offset significant negative impacts of the plan on the marine environment

Pursuant to Number 2c) Annex 1 to Section 8 subsection 1 ROG, the environmental report contains a description of the measures planned to prevent, reduce and compensate for significant adverse environmental impacts resulting from the implementation of the plan.

In addition, the provisions of the maritime spatial plan are subject to a continuous optimisation process, as the findings gained on an ongoing basis within the framework of the SEA and the consultation process are taken into account when updating the plan.

While individual prevention, mitigation and compensation measures can be initiated at the planning level, others only come into effect during the concrete implementation phase and are regulated there in the individual approval procedure on a project- and site-specific basis. By means of objectives and principles, the maritime spatial plan gives spatial and textual

designations relating to prevention and mitigation measures which, in accordance with the presented environmental protection objectives, serve to prevent or reduce any significant negative impacts of the implementation of the maritime spatial plan on the marine environment.

7.7 Measures planned to monitor the environmental impact of implementing the site development plan

Pursuant to Number 3b) Annex 1 to Section 8 subsection 1 ROG, the environmental report also contains a description of the planned monitoring measures. Monitoring is necessary, in particular, to identify unforeseen significant impacts at an early stage and to be able to take appropriate remedial action. The monitoring measures must be designated on the basis of the information in the environmental report.

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9 Annex

Data and knowledge bases

In addition to the overview of the data basis in Chapter 6.1, the following is a compilation of relevant documents that are to be used as a basis for the description and assessment of the environmental status in the study area and for the evaluation of the likely significant environmental impacts, the assessment under site and species protection law and the assessment of alternatives. This overview is a draft, it is explicitly not complete and not exhaustive.

- Data, expertise and reports from the operation of offshore wind farms
- Data, expert opinions and reports from approval procedures for offshore wind farms, submarine cable systems and pipelines
- Results of the preliminary area survey, e.g. study on bird migration in the Baltic Sea
- Results of the monitoring of Natura 2000 sites
- Mapping instructions for Section 30 biotope types
- Findings and results from R&D projects commissioned by BfN and/or BSH and from accompanying ecological research
- Results from EU cooperation projects, such as Pan Baltic Scope and SEANSE
- Project results FABENA, MSP-Trans, MSP-Int
- Studies/ Technical literature
- Current red lists
- Comments of the technical authorities
- Comments from the (specialist) public

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