BUNDESAMT FÜR SEESCHIFFFAHRT UND HYDROGRAPHIE

Maritime spatial-relevant developments in the German Exclusive Economic Zone in the North Sea and the Baltic Sea

Annual Report 2021








Hamburg, March 2023

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AIS	Automatic identification system in the shipping industry
EEZ	Exclusive Economic Zone
BBergG	Federal Mining Act
BDI	Federation of German Industries
BfN	Federal Agency for Nature Conservation
BGR	Federal Institute for Geology and Resource Extraction
BMDV	Federal Ministry of Digital Affairs and Transport
BMEL	Federal Ministry for Food and Agriculture
BMVBS	Federal Ministry of Transport and Digital Infrastructure (designation until December 2021 - Federal Ministry of Transport, Building and Urban Development)
BMWK	Federal Ministry of Economics and Climate Protection
BNatSchG	Federal Nature Conservation Act
FNA	Federal Network Agency for Electricity, Gas, Telecommunications, Post and Railway (Federal Network Agency)
BVEG	Federal Association of Natural Gas, Petroleum and Geoenergy e.V.
CBD	Convention on Biological Diversity
EEG	Renewable Energy Sources Act
EMODnet	European Marine Observation and Data Network
EMSA	European Maritime Safety Agency
EU	European Union
SDP	Site Development Plan
FFH	Fauna-Flora-Habitat
FFH-RL	Fauna-Flora-Habitat-Directive of the EU
FINO	Research platforms in the North Sea and Baltic Sea
GIS	Geographical Information Systems
GPDN	Joint Project Geopotential German North Sea
GW	Gigawatt
HELCOM	Convention on the Protection of the Marine Environment of the Baltic Sea Area
HoheSeeEinbrG	Act on the Prohibition of the Dumping of Wastes and Other Substances and Objects into the High Seas (High Seas Dumping Act)
HPA	Hamburg Port Authority
i. c. w.	in conjunction with
No information	No information
Coalition Agreement	Coalition agreement of the Federal Government of 07.12.2021 for the 20th legislative period.
km^2	Square kilometre
LBEG	State Office for Mining, Energy and Geology - Lower Saxony
m	Metre
m^3	Cubic metre
MARNET	Measuring network of automatically registering stations in the German Bight and the western Baltic Sea

Mil.	Million
mm	Millimetre
Bill.	Billion
MSP	Maritime spatial planning
NCA	Nature conservation area
GCP	Grid connection point
NIBIS	Lower Saxony Soil Information System
SDGs	Sustainable Development Goals (of United Nations)
ROG	Maritime Spatial Planning Act
t	Ton
Thünen-Institute	Thünen-Institute for Sea Fishing and Baltic Sea Fisheries
TWh	Terrawatt hour
UN	United Nations
V_n	Standard volume
WindSeeG	Act on the development and promotion of offshore wind energy (Wind Energy at Sea Act)
WSV	Federal Waterways and Shipping Administration
WWF	World Wide Fund For Nature

Foreword

With this report, the Federal Maritime and Hydrographic Agency (BSH) presents a synopsis and description of developments and changes in 2021 in the German Exclusive Economic Zone (EEZ).

This 2021 report is planned as the prelude to annual reporting, which is to be seen as part of spatial monitoring within the framework of federal spatial planning for the EEZ.

The content focuses on political and legal framework conditions, developments in the sectors operating at sea and the marine environment. The period under consideration for the report is primarily the year 2021. Developments at the beginning of 2022 have been included if they are of particular importance for the marine areas.

Spatially, the report primarily covers the German EEZ in the North Sea and Baltic Sea. Where spatially significant developments have taken place in the German territorial seas and neighbouring marine areas, these have been included in the consideration.

The content of the report is based on publicly available sources and third-party publications as well as on the BSH's own findings. The BSH would be pleased to receive any comments or corrections to the contents[1].

[1] Contact us via email at EingangOdM@bsh.de

1 Political and legal framework conditions

Developments at international, European and national level affect the marine space through political and legal framework conditions and thus influence the maritime sectors and the marine environment. The most important developments are presented below.

1.1 Political framework conditions

After the entry into force of the maritime spatial plan on 1 September 2021, the political framework conditions were initially shaped by the federal election in autumn 2021 and the coalition agreement of the new Federal Government[2]. This contains a significant increase in the expansion targets for offshore wind energy as well as a strengthened significance of wind energy. The planned development of offshore wind energy should now be considered of overriding public interest and serve public safety.

In the winter of 2021/22, the aforementioned objectives of the coalition were implemented in the corresponding draft laws as part of the amendment procedure for the WindSeeG, which were published on 6 April 2022 as part of the so-called Easter Package of the Federal Government.

Multilateral agreements

Baltic Sea Action Plan (BSAP) update (October 2021)

The Baltic Sea Action Plan (BSAP) is a HELCOM strategic programme of measures to achieve a Good Environmental Status in the Baltic Sea.

It was originally adopted by the HELCOM Contracting Parties (Baltic Sea States) and the European Union (EU) in 2007 with the aim of achieving Good Environmental Status of the sea by 2021. As it was already apparent in 2018 that this target would not be fully achieved, it was decided to update the BSAP. On 20 October 2021, the Parties and the EU adopted the new Baltic Sea Action Plan 2021 - 2030.

For the Baltic Sea EEZ, the two objectives:

- Biodiversity issue: The ecosystem is healthy and resilient.
- Maritime activities issue: Ecologically sustainable sea-related activities.

must be mentioned in particular.

The BSAP formulates action targets, each aimed at specific United Nations Sustainable Development Goals (UN SDGs).

[2] Coalition Agreement 2021 – 2025 between the Sozialdemokratischen Partei Deutschlands (Social Democratic Party of Germany) (SPD), BÜNDNIS 90 / DIE GRÜNEN (The Green Party) and the Freien Demokraten (Free Democrats) (FDP).

A plan review should also take place with the update and (i) the effectiveness of existing actions, (ii) new issues (e.g. underwater noise, marine litter), (iii) economic and social benefits of the BSAP, (iv) ecosystem approach, and (v) relevant SDGs, Aichi goals (UNEP, 2010) and MSFD descriptors (EU, 2008) must be considered.

European Union

"Fit for 55": towards climate neutrality - implementing the EU climate target for 2030 (COM/2021/550 final)[3]

On 14 July 2021, a package of measures was adopted to reduce greenhouse gas emissions in the EU by at least 55 % by 2030 compared to 1990 emissions and to make Europe climate neutral by 2050 (target from the European Green Deal). Among other things, the Commission proposes to raise the binding target for renewable energies in the EU's energy mix to 40%.

Biodiversity strategy for 2030 (May 2020)

In May 2020, the commission presented the Biodiversity Strategy 2030 (COM (2020) 380 final)[4]. It aims to set the recovery of Europe's biodiversity on track by 2030. Overall, the strategy aims to strengthen the resilience of societies to future threats.

In order to achieve the targets set, the strategy includes commitments such as:

- Legal protection of at least 30% of Europe's terrestrial and marine areas; at least one third of these (terrestrial areas and marine areas) must be strictly protected;
- the effective management of all protected areas, the determination of clear conservation objectives and measures, and adequate monitoring of protected areas;
- reduction of damage to the seabed and by fisheries by-catch.

Furthermore, the EU Biodiversity Strategy for the protection of nature and the restoration of habitats and species announces in particular the following measures:

- Restore damaged and degraded ecosystems across the EU and reduce pressures on biodiversity.
- Strengthen protection of marine ecosystems and restore them to 'a good environmental state ', including through the expansion of protected areas and the establishment of strictly protected areas, so that habitats and fish stocks can recover.

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[3] COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS "Fit for 55": towards climate neutrality - implementing the EUclimate target for 2030 (COM/2021/550 final), available at: https://eur-lex.europa.eu/legal-content/DE/TXT/?uri=CELEX%3A52021DC0550

[4] COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS. EU Biodiversity Strategy for 2030. More space for nature in our lives. Available at:

Guidelines of the EU Commission on the EU Biodiversity Strategy (January 2022)

The EU Commission's guidelines on the EU Biodiversity Strategy of 28 January 2022[5] are - like those of the EU Biodiversity Strategy 2030 itself - not binding. They contain criteria and explanations on how the legal protection of the areas that count towards the 30% target and the 10% target of the EU Biodiversity Strategy 2030 should be designed.

According to this document, protected areas that can count towards the 30% target[6] include Natura 2000 areas (i.e. protection under the Habitats Directive or the Bird Conservation Directive). Other national protected areas can also count towards the 30% target if they meet certain criteria. These include, in particular, legally established protection that is intended to last for a certain period of time, as well as effective management and monitoring.

Criteria for protected areas that can be counted towards the 10% target[7] are, in particular, that the statutory protection here is aimed at ensuring that the areas are essentially not disturbed by human impacts.

National sectoral strategies

The National Hydrogen Strategy (2021)

In 2021, the Federal Ministry for Economic Affairs and Energy (BMWi), which was responsible for energy at the time, published "The National Hydrogen Strategy" (BMWi, 2021). It created a framework for action for the future production, transport, use and further use of hydrogen. It defines necessary steps to contribute to the achievement of climate goals, the creation of new value chains and the further development of international energy policy cooperation (BMWi, 2021).

Concrete goals envisage the construction of generation plants with a total capacity of up to 5 GW in Germany by 2030, including the necessary offshore and onshore energy generation. This should cover part of the then expected hydrogen demand of about 90 to 110 TWh.

The strategy contains an action plan that formulates necessary steps for the success of the National Hydrogen Strategy.

Measure 4 of the action plan relates to offshore wind energy: Due to its high full load hours, offshore wind energy is identified as an attractive technology for the generation of renewable electricity, which can be used for the production of green hydrogen.

Further topics are the increased designation of areas that can be used for the offshore production of hydrogen or storage of electricity surpluses and the infrastructure required for this.

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[5] EU Commission, Commission Staff Working Document - Criteria and guidance for protected areas designations, SWD (2022) 23 final dated 28.01.2022.

[6] Ibid., page 5 ff.

[7] Ibid., page 19 ff.

Cross-sector strategies

German Sustainability Strategy (further development 2021)

On 10 March 2021, the Federal Government decided on the further development of the German Sustainability Strategy (Die Bundesregierung, 2021). Thus, the programme of measures for sustainable administrative action, which has existed since 2010 and was amended in 2015, was adapted.

With the further development of the sustainability strategy, the 17 Sustainable Development Goals (SDGs) of the United Nations from 2016 were adopted.

Sustainable action takes into account the interrelationships between the three dimensions of sustainability - ecological, economic and social. The strategy thus aims at an economically efficient, socially balanced and ecologically compatible development (Die Bundesregierung, 2021).

The strategy defines priorities, measures, indicators and goals for the implementation of the 2030 Agenda with its 17 SDGs. A selection of content that is relevant to the maritime space is given below.

Under the measure "Combating climate change and its impacts", the following targets are set, among others:

- To reduce greenhouse gas emissions in Germany by at least 40% by 2020 and by at least 55% by 2030 compared to 1990.
- Greenhouse gas neutrality should be achieved by 2050.

Measure "Conserve and sustainably use oceans, seas and marine resources for sustainable development":

- Need for an ecologically representative and effectively managed protected area system.
- Protect and sustainably use oceans and marine resources.

Coalition Agreement

The coalition agreement of the Federal Government for the legislative period 2021 - 2025 contains the following statements or agreements with reference to marine space:

- The construction of facilities for the generation or transport of electricity from renewable energies is in the public interest and serves public safety.
- Create an exemption requirement of the Federal Nature Conservation Act under certain conditions.
- Stronger focus on population protection, clarification of the relationship between species protection and climate protection, and more standardisation and legal certainty.
- Implement the Convention on Biological Diversity (CBD) and the European Biodiversity Strategy and thus establish and effectively protect 30 % protected areas.
- Push the energy transition without dismantling ecological protection standards.

- Action programme for synergies between nature and climate protection, renaturation measures, etc. for marine ecosystems.
- Marine offensive for the protection of marine nature.
- Develop a coherent and binding marine strategy.
- Strictly protect 10 % of the EEZ in accordance with the EU Biodiversity Strategy and designate zones there free of harmful use.
- Do not grant any new permits for oil and gas drilling beyond the issued framework operating permits for the German North Sea and Baltic Sea.
- Significantly increase offshore wind energy capacities to at least 30 GW in 2030, 40 GW in 2035 and 70 GW in 2045. For this purpose, corresponding areas in the offshore zone will be secured. Offshore installations should enjoy priority over other forms of use. Co-use as a possibility for a better balance of interests. Further promotion of European offshore cooperation and strengthening of cross-border projects in the North and Baltic Seas.
- Bundled grid connection of offshore wind power; meshed offshore grids.

Other political developments

In addition to the policy programmes at EU and national level described above, the following policy developments were particularly relevant for the German North Sea EEZ in 2021:

Netherlands: Additional Draft North Sea Programme 2022 - 2027

From 9 November to 20 December 2021, the consultation of the draft Dutch North Sea Programme 2022 - 2027 took place. The draft designates wind farm zones in the North Sea, including in the extension of the shipping designation SN6 of the German maritime spatial plan for the EEZ. As a consequence, the closure of the shipping route SN6 (partial) and SN12 (complete) is likely in Germany in order to create space for further areas and sites for offshore wind energy or for the expansion of another energy generation area.

1.2 Legal framework conditions

International level and EU level

At the international level, no legal framework relevant to the EEZ of the German North Sea and Baltic Sea has been adopted in 2021. The political developments at EU level described above had not yet been translated into binding legal requirements by the end of the report preparation.

National level

At national level, too, no legal bases of relevance to this report were adopted or amended in 2021. The political developments described have not yet been implemented with legal effect in the reporting period.

1.3 Nature conservation sector planning

Management plans for the Baltic Sea EEZ nature conservation areas

On 16 June 2020, the BfN initiated the participation procedure according to Section 7, paragraph 3 NSGFmbV, Section 7, paragraph 3 NSGKdrV, and Section 11, paragraph 3 NSGPBRV on the management plans for the nature conservation areas in the German EEZ of the Baltic Sea. As part of the participation process, a hearing on the drafts took place on 17 August 2020.
On 8 February 2022, the management plans "Fehmarnbelt"[8], "Kadetrinne"[9] and "Pommersche Bucht - Rönnebank"[10] were published in the Federal Gazette.

MSRL programme

On 24 June 2022, the Federal/State Working Group on the North Sea and the Baltic Sea (BLANO) adopted the update of the MSFD Programme of Measures for the Protection of German Marine Waters in the North Sea and the Baltic Sea for 2022-2027 (BMUV, 2022). The Maritime Spatial Planning of the Federal Government and the countries contribute as measures to the environmental objectives 3 (no impact on the seas due to the adverse effect of human activities on marine species and habitats) and 4 (seas with sustainably and sparingly used resources).

[8] BfN 2022: https://www.bundesanzeiger.de/pub/publication/elAf7wHnJolRFqwf4sY/content/211211000704M001/BAnzAT08022022B600.pdf

[9] Bfn 2022: https://www.bundesanzeiger.de/pub/publication/G5qzLAhuWIG48leQ6n4/content/211211000705M001/BAnzAT08022022B700.pdf

[10] BfN 2022: https://www.bundesanzeiger.de/pub/publication/cFxb0FG1MYgcFPHeYXg/content/211211000778M001/BAnzAT08022022B800.pdf

2 Key developments in the sectors

In a summary presentation, section 2 describes the developments in selected sectors, with a focus on the German EEZ. Due to cross-boundary impacts, the most important developments in the marine areas of neighbouring countries and the territorial seas are also considered.

The description is limited to the sectors that are taken into account in the EEZ spatial plan, as well as others that may have significance for maritime spatial planning.

2.1 Maritime shipping

The explanations in the Maritime shipping section are based on the following sources:

- Website of the Federal Ministry of Digital Affairs and Transport (BMDV)[11]
- Map and Data Service of HELCOM[12]
- (ABL, 2021): Shipping analysis of the North Sea
- (WSV, 2022): Traffic report 2020

The following section describes the situation of maritime shipping and its relation to maritime spatial planning in the following points:

- Shipping routes in the North Sea and the Baltic Sea: Traffic figures and importance.
- Maritime shipping and the designations in the EEZ 2021 MARITIME SPATIAL PLAN.
- The individual developments in the North Sea and Baltic Sea which have an impact on maritime shipping.

Background

Maritime shipping is of outstanding importance for the Federal Republic of Germany, especially for foreign and world trade. This takes place to a large extent via maritime shipping and is operated with various types of ships: different types of bulk carriers, tankers or container ships. In addition to the transport of goods, passenger transport is also part of maritime shipping. Due to the applicable legal framework conditions, the designations in maritime spatial planning secure the areas as the basic framework of the shipping routes used with priority. These include traffic to the German seaports in the North Sea and Baltic Sea as well as transit traffic.

[11] https://www.bmvi.de/DE/Themen/Mobilitaet/Wasser/Seeverkehr/seeverkehr.html

[12] https://maps.helcom.fi/website/mapservice/index.html

Shipping traffic data in the North Sea

The Figure 1 shows the traffic density map in area of the German EEZ in the North Sea, based on AIS data from 2020. The areas with a high traffic density are shown in red, in areas with a lower traffic density this is shown in yellow. In this figure, the basic traffic patterns in the German Bight become clear: on the one hand, the traffic along the coasts to the respective seaports can be clearly seen. On the other hand, various transit transports are also shown, for example from the English Channel through the Belgian, Dutch, German and Danish EEZs to the Baltic Sea. It is also clearly recognisable that the quality of the AIS data decreases in areas far from the coast and that not all passages are recorded comprehensively. This poses a particular challenge for the monitoring of shipping traffic.

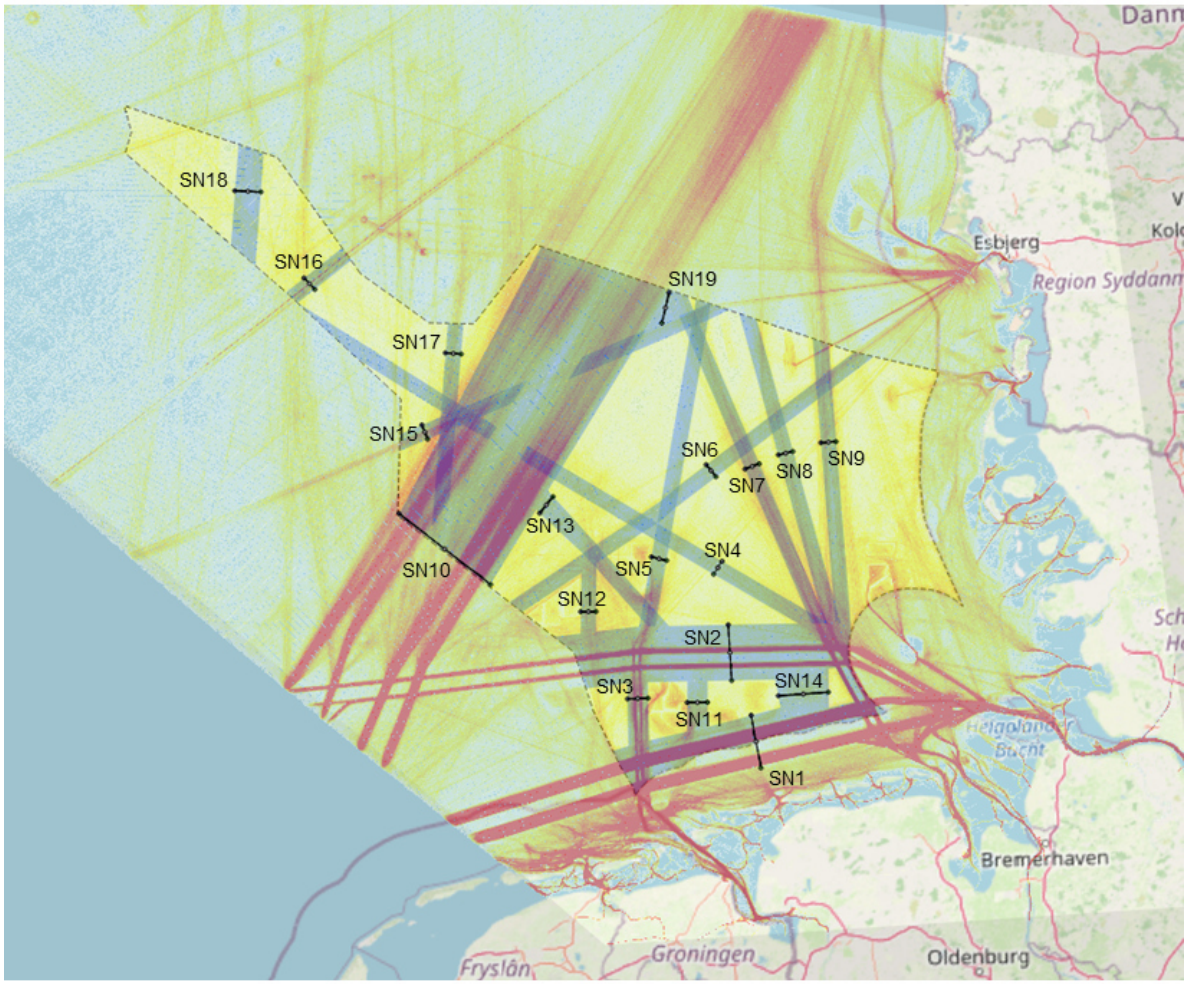

Figure 1: Traffic density map in the German EEZ of the North Sea for the year 2020 with counting gates (data: EMSA)

Table 1: Traffic figures on shipping routes from the EEZ 2021 maritime spatial plan in the North Sea for the year 2020

Shipping routes	Traffic figures in 2020
SN1	22,558
SN2	6,067
SN3	3,814
SN4	459
SN5	764
SN6	380
SN7	1,552
SN8	705
SN9	1,034
SN10	18,334
SN11	1,052
SN12	1,071
SN13	373
SN14	1,106
SN15	1,012
SN16	748
SN17	710
SN18	409
SN19	215

In Figure 1, the results of an own analysis of the BSH with the help of the "IWRAP" programme are presented. This analysis is based on the AIS data of EMSA for this area. The so-called "passage lines", i.e. counting lines, were laid across the shipping routes defined in the EEZ 2021 maritime spatial plan in order to obtain the traffic figures on each shipping route. These figures are listed in

Table 1. These results only give a rough overview of the shipping movements and do not provide a conclusive assessment. The same applies to the traffic figures listed in Table 2 and Annexes 1 to 4.

In the North Sea, the traffic figures per route vary quite strongly. Shipping route SN1 in the area of the Terschelling German Bight traffic separation zone is the busiest route with around 22,500 ship movements. North of this, shipping route SN2 comprises the German Bight Western Approach traffic separation zone. A good 6,000 ship movements were recorded here in 2020.

The shipping route SN10 is also very busy with over 18,000 ship movements, which is mainly used as a transit route from the English Channel to the Baltic Sea and vice versa.

A detailed overview of the ship movements on these three most frequented routes can be found in the Annexe. There, the ship movements are shown in tabular form, divided according to ship type and ship length, for each route.

The traffic figures for the other designations in the EEZ 2021 maritime spatial plan are largely in the range between 500 and 1,000 ship movements per year.

In some areas, such as SN18, a higher frequency is to be expected in the future. With a possible ice-free North Pole in the future, an increase in traffic is to be expected on the northbound routes.

The traffic figures in Table 2 are of the same order of magnitude as those published in the WSV's Traffic Report 2020. In this annually published traffic report, the traffic flows for the North Sea and the Baltic Sea, among others, are listed as well as count lines in some significant places. In some areas, the count lines roughly coincide with the shipping specifications from the EEZ 2021 maritime spatial plan, but in some other areas they deviate from each other in terms of location and width. In particular, in the two traffic separation zones in the North Sea (Terschelling German Bight and German Bight Western Approach), the location of the count lines and thus the results of the traffic figures are almost identical (WSV, 2022).

This is also illustrated in Figure 2, which shows the traffic flows in the North Sea with traffic figures in some important areas.

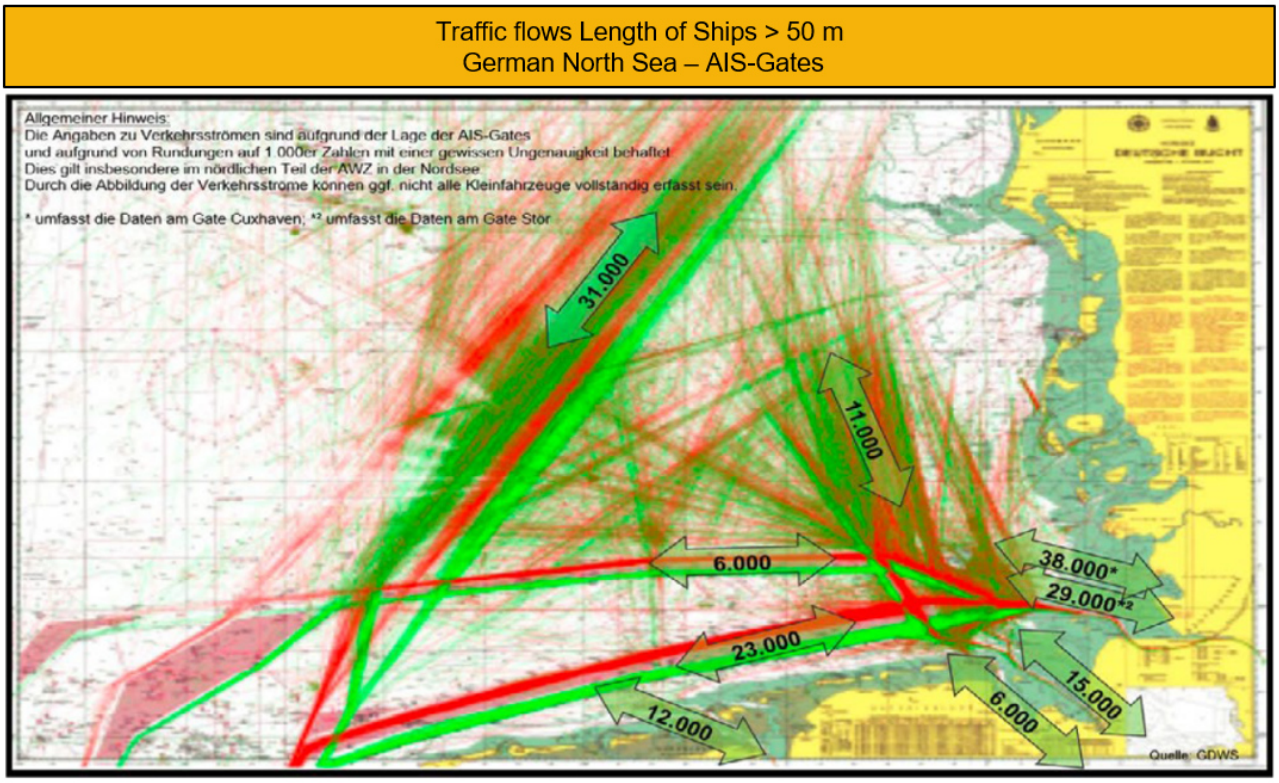

Figure 2: Traffic flows in the North Sea (source: WSV traffic report 2020)

Shipping traffic data in the Baltic Sea

Figure 3 shows the traffic density in the southern Baltic Sea. The areas with a high traffic density are highlighted with a strong red colour. Again, basic traffic patterns can be seen: on the one hand, traffic especially to and from the larger German ports in the Baltic Sea (Kiel, Lübeck and Rostock) is clearly visible. On the other hand, some transit traffic can also be seen in the German EEZ of the Baltic Sea: in particular from the North Sea via Denmark and Germany to the central Baltic Sea or to the Polish port in Świnoujście.

Figure 3 was also created with the "IWRAP" programme on the basis of HELCOM AIS data for the year 2020. Here, count lines were also defined on each route, on which the traffic figures were determined.

These figures are listed in the following Table 2.

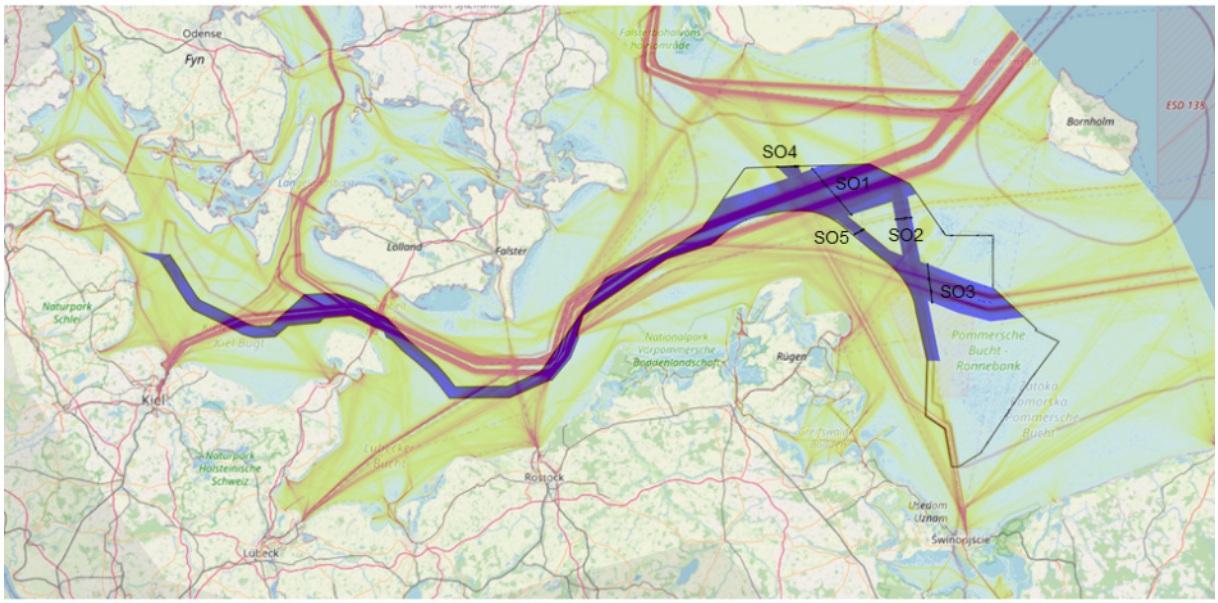

Figure 3: Traffic density map in the southern Baltic Sea for the year 2020 with counting gates (data: HELCOM)

Table 2: Traffic figures on shipping routes from the EEZ 2021 maritime spatial plan in the Baltic Sea for the year 2020

Shipping routes	Traffic figures in 2020
SO1	24,766
SO2	2,992
SO3	7,356
SO4	3,457
SO5	817

The traffic figures on the shipping routes SO1 to SO5 for the year 2020 are presented in Table 2. Most ship movements, with just under 25,000 ship crossings per year, take place on route SO1 and include most traffic from the western Baltic Sea to the eastern Baltic Sea and vice versa. The "North of Rügen" traffic separation zone is also located in this area. A detailed overview of this most heavily trafficked route can be found in the Annexe. It shows the ship movements in tabular form, divided according to the ship type and ship length.

On the two north-south routes SO2 and SO4, both routes with traffic mainly to and from Poland, approximately 3,000 and 3,500 ship movements were recorded respectively. In the area of route SO3, over 7,000 ship movements per year were recorded; these mainly comprise traffic along the Polish coast through the “Adlergrund” traffic separation zone. On the shipping route SO5, a corridor between EO2 and Arcadis Ost 1 in the territorial sea, 800 ship movements were recorded in 2020.

Designations in the EEZ 2021 maritime spatial plan

As part of the revision of the maritime spatial plan for the German EEZ of the North Sea and the Baltic Sea, AIS data from 2018 was used for the designation of priority areas for shipping. Based on the traffic density maps, it was thus possible to identify the areas that are particularly used by shipping. Due to the designations in international maritime law that guarantee freedom of navigation, shipping can take place wherever it is not explicitly prohibited (e.g. in the area of offshore wind farms). Thus, the priority areas for shipping in maritime spatial planning primarily serve to keep particularly relevant areas free of conflicting uses. They thus trace the "basic framework" of main traffic routes for shipping.

In a few areas, the traffic situation could not yet be conclusively assessed. For this reason, three areas have been designated as temporary areas for shipping: SN19 and SO5, as well as parts of the area in SN10. In principle, these areas would also be suitable for the use of offshore wind energy. In order to be able to take a closer look at the conditions in these sea areas, an expert's report for shipping was commissioned in summer 2021. Within the scope of this report, traffic analyses and, based on these, risk analyses will be carried out for the respective sea areas. The results should also be verified with the help of a ship handling simulator. At the respective deadlines specified in the EEZ 2021 maritime spatial plan, the ministry responsible for shipping may, if necessary, provide evidence based on the results of the expert opinion that the areas are required for shipping for compelling reasons of safety and efficiency of shipping.

Developments affecting shipping

Towards the end of 2021, the draft "Additional North Sea Programme" was published in the Netherlands and presented in an international consultation meeting in December 2021. The findings of a shipping study commissioned in the Netherlands were also presented. As a result of the study, it was proposed not to designate the previously used route to Esbjerg due to diverging and converging traffic. Instead, the study shows that wind farm development is possible in this area. This has impact for planning in the German EEZ of the North Sea, as this would mean that the shipping designation SN6 would end in a Dutch wind farm in the future. Adjustments will therefore probably be necessary in this area in order to continue to ensure the coherence and safety of shipping traffic.

2.2 Offshore energy generation

The explanations in the Offshore energy generation section are predominantly based on the following sources:

- Planning approval procedure of BSH
- Preliminary draft of the Site Development Plan 2021
- BMWK online: Latest information: Renewable energies in year 2021[13].
- Deutsche WindGuard 2021: Status of offshore wind energy expansion in Germany. Year 2021[14].

The situation of offshore energy production and its direct relevance for the maritime spatial planning is described in the following points in this section:

- Offshore wind energy: Expansion status in the North Sea and the Baltic Sea
- Wind energy and designations in the maritime spatial plan EEZ 2021
- Current developments, projects and discussions

Background

A large number of offshore projects are being planned and implemented in the German EEZ or on the continental shelf. Offshore energy generation has so far only taken place in the form of wind energy.

The developer needs a permit for the construction of an offshore wind farm. The Federal Maritime and Hydrographic Agency (BSH) is the competent authority. The construction of the wind turbines and the transformer platform are usually applied for and approved as one project. Due to the high complexity of these projects, the legislator has given the BSH the option of approving individual measures for construction or commissioning subject to approval. This shifts part of the official examination to the enforcement procedure.

Since 1 January 2017, the legal basis for approval has been the Offshore Wind Energy Act (WindSeeG). It stipulates that a planning approval procedure with an environmental impact assessment must be carried out before official approval is granted. This means that the public must be involved and careful consideration must be given to whether the impacts on the environment associated with the project are acceptable. The planning approval decision is issued with a large number of ancillary provisions to ensure that the construction and operation do not have any negative impacts on the safety of shipping and air traffic or on the marine environment.

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[13] https://www.erneuerbare-energien.de/EE/Navigation/DE/Service/Erneuerbare_Energien_in_Zahlen/Aktuelle-Informationen/aktuelle-informationen.html

[14] https://www.wind-energie.de/fileadmin/redaktion/dokumente/pressemitteilungen/2021/Status_des_Offshore-Windenergieausbaus_Jahr_2021.pdf

Figure 4: Arkona Basin South-East wind farm (© BSH/Dominic Plug)

Figure 5: Wind energy platform in the Wikinger wind farm (© BSH/Dominic Plug)

Future approvals for offshore wind farms are granted after a comprehensive preliminary site investigation designated in the Site Development Plan for tendering by the Federal Network Agency (BNetzA) and development with wind turbines. In the process, the marine environment, subsoil, wind and oceanographic conditions as well as the suitability of the areas for traffic are examined and

reports are prepared. The BSH examines the suitability of the area on the basis of the information from these investigations, among other things. If the BSH comes to the conclusion that the area is suitable, it establishes the suitability by means of an ordinance and the results of the investigation are forwarded to the BNetzA for the tendering procedure.

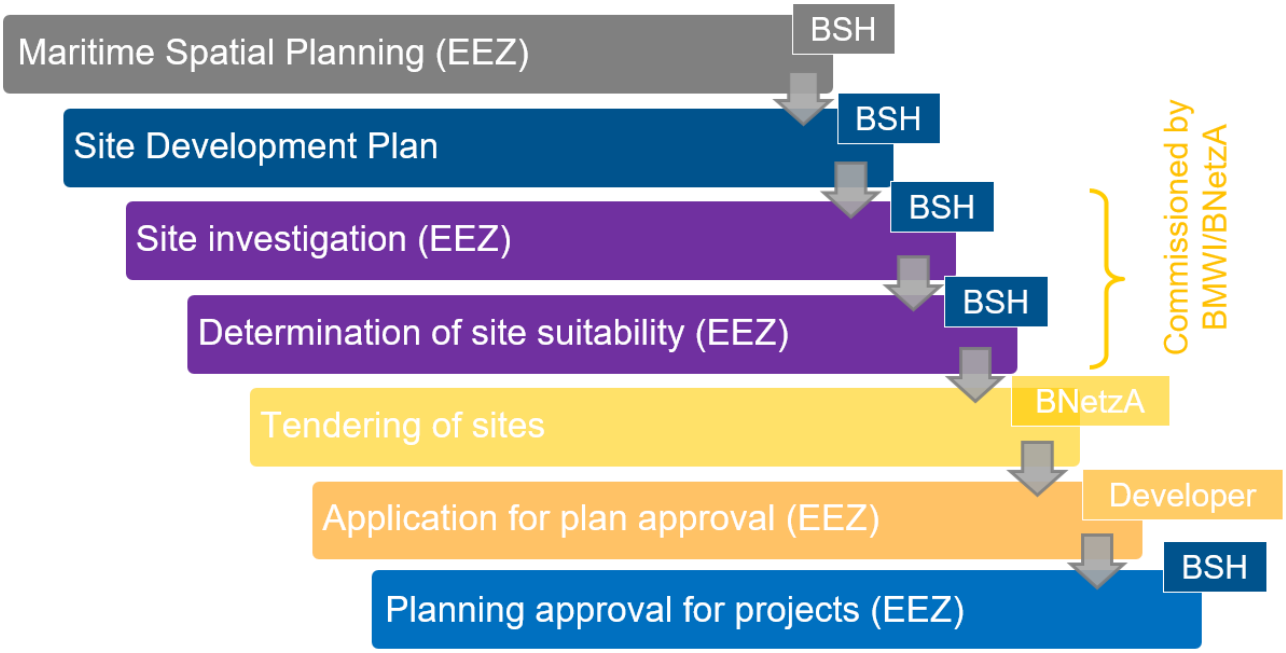

Figure 6: Central model of the offshore wind energy planning

Offshore wind energy: Expansion status

The number of offshore wind turbines in Germany has been steadily increasing since 2013, although no new wind farms were commissioned in 2021 (also see Figure 7). As of December 2021, the installed capacity is 7.7 GW. With a comparatively small EEZ area, Germany thus ranks third in an international comparison behind the UK and China (also see Figure 10).

The awards following the first tender for offshore wind energy areas in the central model for the bid deadline of 1 September 2021 were announced by the Federal Network Agency on 9 September 2021. The subject of the tenders were the three areas N-3.7, N-3.8 and O-1.3 with a total tender volume of 958 MW. On the sites N-3.8 and O-1.3, the right of subrogation was exercised by the project developers who had already submitted applications for planning approval procedure. Prior to this, the BSH had carried out a comprehensive preliminary investigation of the three areas on behalf of the Federal Network Agency and determined the suitability of the areas for the construction of offshore wind farms with the tendered capacity.

For three areas in the North Sea (areas N-7.2, N-3.5 and N-3.6), the drafts of the suitability assessment, the suitability assessment and the environmental reports were made public on 12 March 2021.

The wind farm projects Gode Wind 3 and Borkum Riffgrund 3 were approved in 2021. At present, several approved wind farms that were awarded a contract in the transitional system are under construction or in preparation for construction (KASKASI II, ARCADIS OST 1 (MV), Baltic Eagle, Borkum Riffgrund 3, EnBW He dreiht, Gode Wind 3).

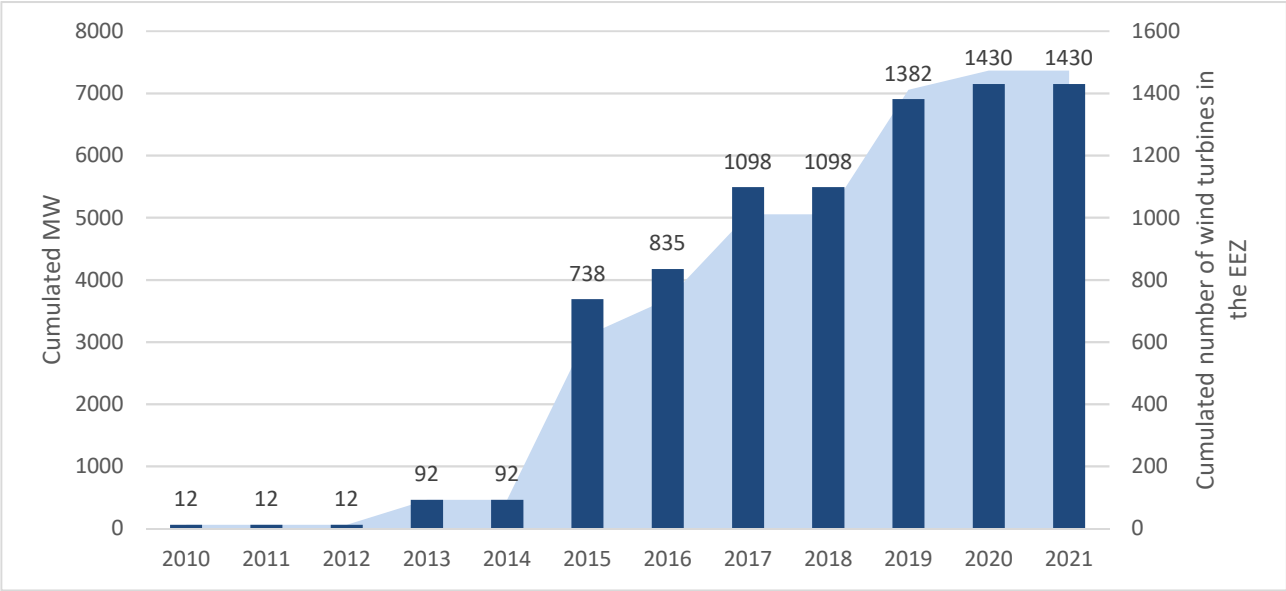

Figure 7: Number of wind turbines in the EEZ and cumulative MW 2010-2021 (own presentation; data: BSH)

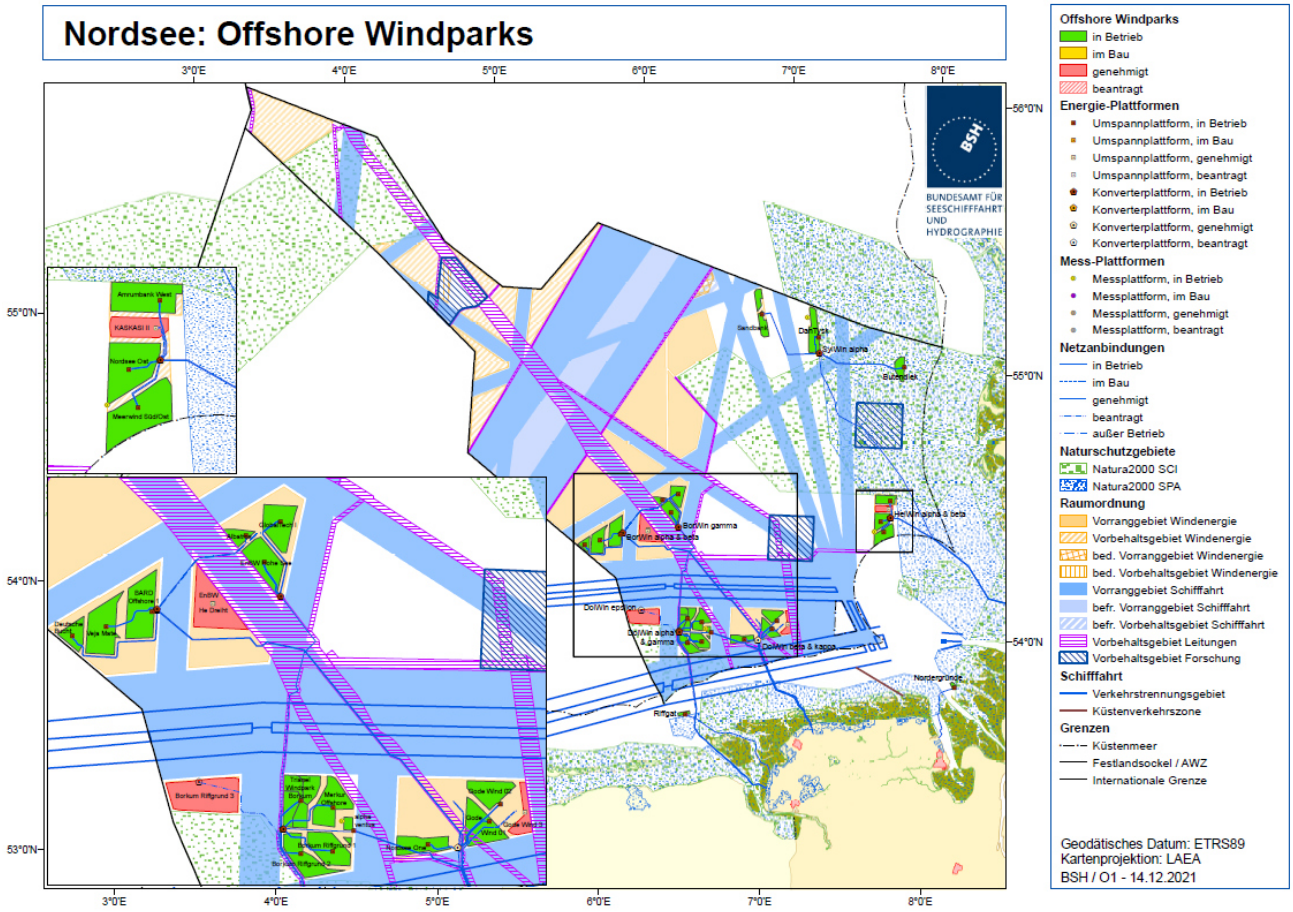

Figure 8: Overview of offshore wind farms in the North Sea as of 12/2021 (BSH 2021)

Explanation of German map legend (figure 8 and figure 9)			
German	English	German	English
im Betrieb	in use	Vorbehaltsgebiet	reservation area
im Bau	under construction	bed. Vorranggebiet	conditional priority area
genehmigt	approved	bed. Vorbehaltsgebiet	conditional reservation area
beantragt	application submitted	Windenergie	offshore wind energy
Energie-Plattform	energy-platfomorm	Schifffahrt	shipping
Umspannplattform	converter-platform	Verkehrstrennungsgebiet	traffic seperation zone
Konverterplattform	transformer-platform	Küstenverkehrszone	inshore traffic zone
Meßplattform	measurement platform	Grenzen	boundaries
Netzanbindungen	cables	Küstenmeer	territorial waters
Naturschutzgebiete	nature conservation	Festlandsockel	continental shelf
Raumordnung	maritime spatial planning	AWZ	EEZ
Vorranggebiet	priority areas	Internationale Grenze	international boundary

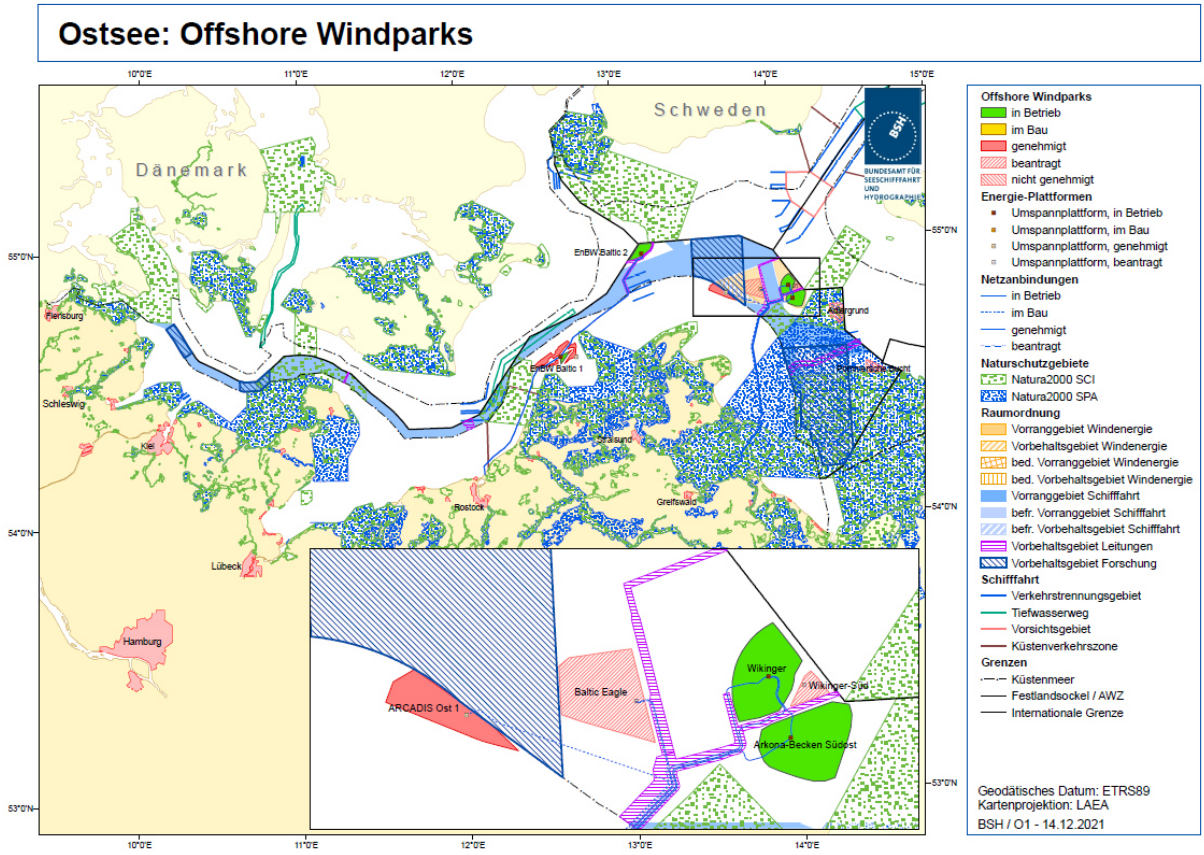

Figure 9: Overview of offshore wind farms in the Baltic Sea as of 12/2021 (BSH 2021)

Table 3: Overview of wind farms in the EEZ as of 12/2021

No.	Offshore wind farm	Location in the priority area	WTGS (built)	Capacity [MW]	Approval	In test run since
In operation (12/2021)						
1	alpha ventus (Borkum West)	Yes	12	60	2001	04/ 2010
2	BARD Offshore 1	No	80	400	2007	08/ 2013
3	Trianel wind farm Borkum	Yes	40	200	2008	06/ 2015
4	Meerwind South/East	Yes	80	288	2007	02/ 2015
5	North Sea East	Yes	48	295	2004	05/ 2015
6	Global Tech I	Yes	80	400	2006	07/ 2015
7	Dan Tysk	No	80	288	2005	03/ 2015

8	EnBW wind farm Baltic 2 (Kriegers Flak)	Yes	80	288	2005	07/ 2015
9	Borkum Riffgrund 1	Yes	78	312	2004	07/ 2015
10	Amrumbank West	Yes	80	288	2004	10/ 2015
11	Butendiek	No	80	288	2002	08/ 2015
12	Gode Wind 01	No	55	330	2006	08/ 2016
13	Gode Wind 02	No	42	252	2009	08/ 2016
14	Sandbank	No	72	288	2004	01/ 2017
15	Veja Mate	No	67	402	2009	05/ 2017
16	North Sea One (Innogy North Sea 1)	Yes	54	324	2012	10/ 2017
17	Wikinger	Yes	70	350	2007	12/ 2017
18	Arkona Basin South-East	Yes	60	385	2006	04/ 2019
19	Borkum Riffgrund II	Yes	56	465	2011	06/ 2019
20	Merkur Offshore	Yes	66	396	2009	06/ 2019
21	German Bight	No (yes as per the maritime spatial plan EEZ 2021)	31	260	2010	07/ 2019
22	EnBW High See	Yes	71	497	2006	10/ 2019
23	Albatros	Yes	16	112	2011	01/ 2020
24	Trianel wind farm Borkum construction phase 2	Yes	32	200	2008	07/ 2020
Under construction (12/2021)						
25	KASKASI II	Yes	38	342	2020	2022
In preparation for construction						
26	Gode Wind 3	Yes	23	242	2021	2024
27	Borkum Riffgrund 3	Yes	83	913	2021	2025

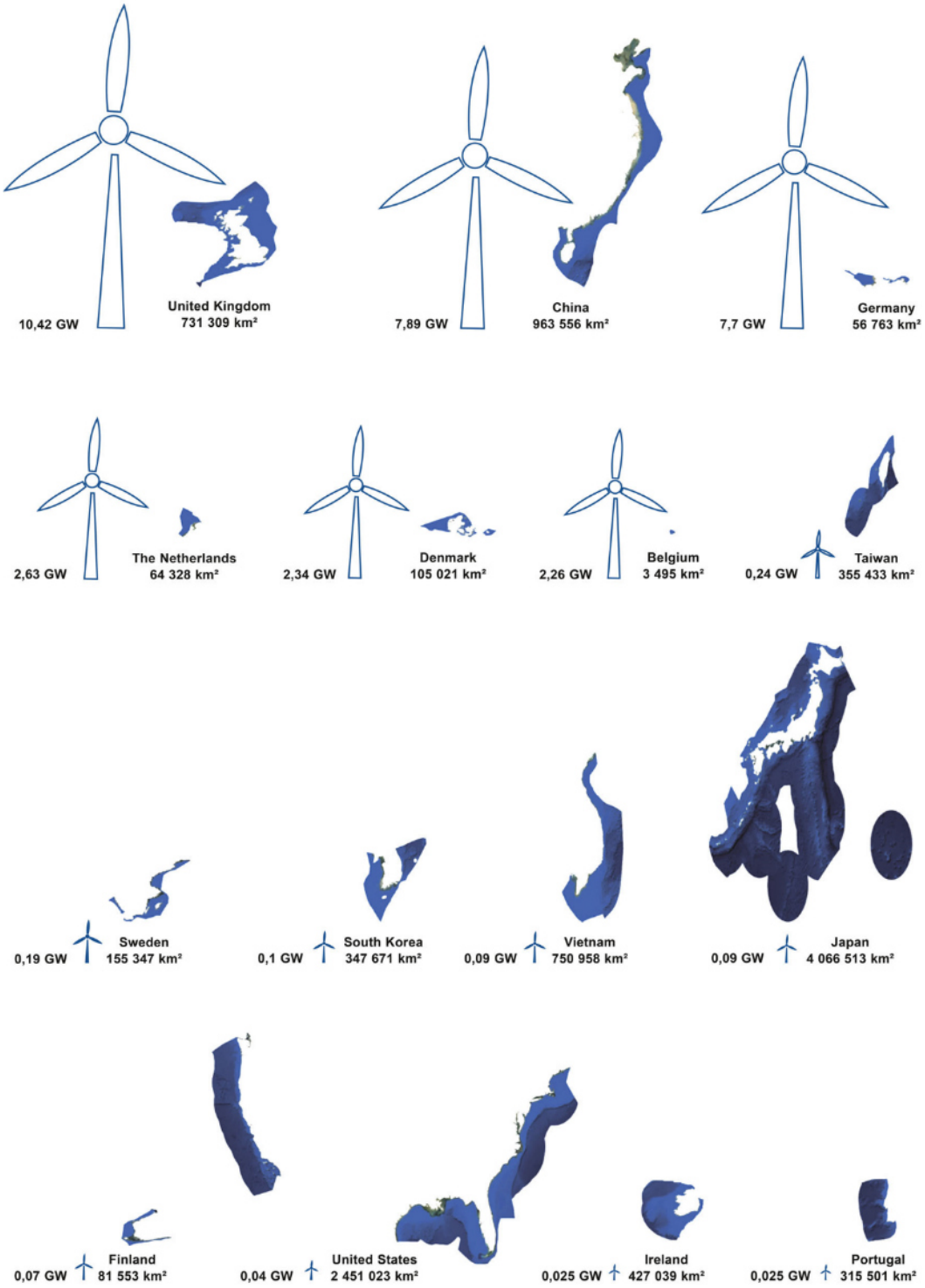

Figure 10: Offshore wind energy and sites in the EEZ & territorial sea. The 15 countries with the largest installed capacity worldwide, as of mid-2021 (sources: EEZ site (Lonneville, Britt. et al., 2022)[15]*, offshore capacity according to* (World Forum Offshore Wind e.V., 2021)[16]

[15] https://www.vliz.be/en/imis?refid=347874

[16] https://wfo-global.org/reports/

The expected development of offshore wind energy (see Figure 11) in 2021 is set by the industry at 12 GW by 2026, which is lower than politically demanded. The expansion target in the WindSeeG (20 GW by 2030) thus still seems achievable, but the increased expansion target in the coalition agreement (30 GW by 2030) hardly seems achievable. However, the largest increase in capacity will only be possible in the years 2027-2030.

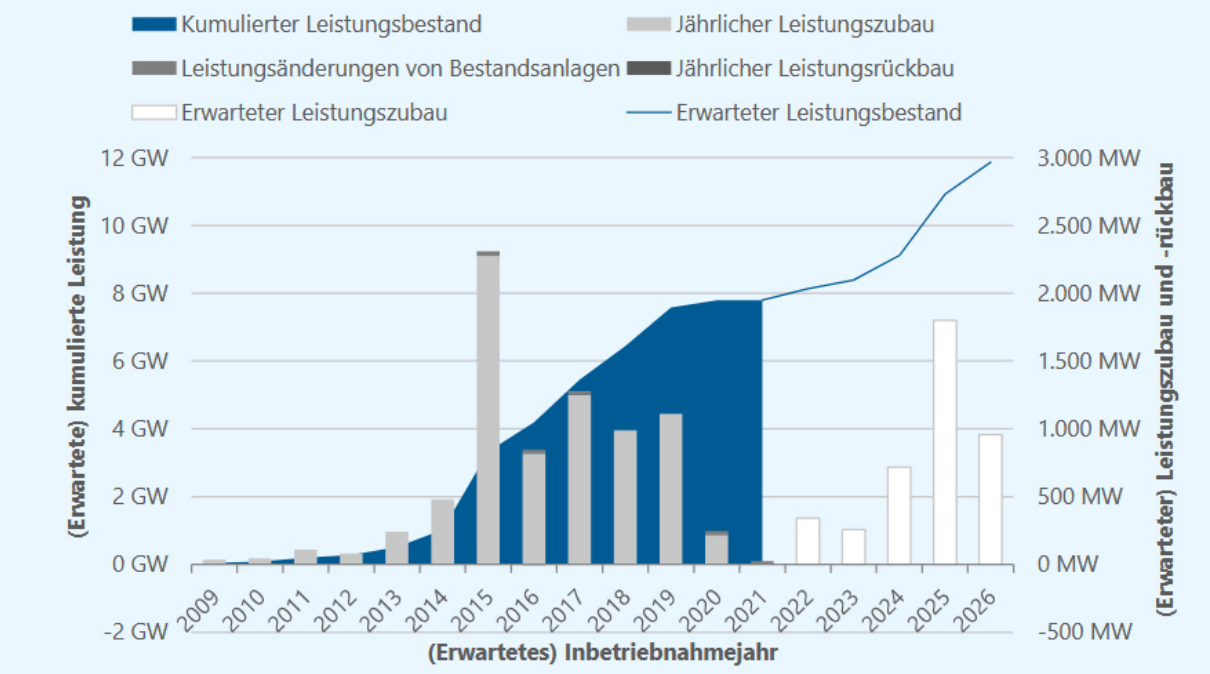

Figure 11: (Expected) development of offshore wind energy in Germany (Deutsche WindGuard 2021 with own data, as well as from MaStR, BNetzA)

German	English
Kumulierter Leistungsbestand	cumulative number of wind turbines
Leistungsänderung von Bestandanlagen	changes in number of wind turbines
Erwarteter Leistungszubau	expected increase in output
Jährlicher Leistungszubau	annual increase in output
Jährlicher Leistungsrückbau	annual decrease in output
Erwarteter Leistungsbestand	expected number of wind turbines
Inbetriebnahmejahr	year of commissioning

Wind energy and designations in the maritime spatial plan EEZ 2021

The approved wind farms and areas identified in the preliminary draft of the Site Development Plan are all spatially located in priority/reservation areas for wind energy in the EEZ 2021 maritime spatial plan.

Textual designations are taken into account in the approvals of offshore wind farms, for example in the planning approval procedure notification for Borkum Riffgrund 3 (dated 13 October 2021).

The plan for the project to construct and operate the offshore wind farm "Borkum Riffgrund 3" in the EEZ of the North Sea is established in accordance with various orders. It lays down general spatial planning principles on wind energy and economic uses.

Spatial planning principles on wind energy and economic uses in general in the plan for the project to construct and operate the offshore wind farm "Borkum Riffgrund 3" in the EEZ of the North Sea

Order 6 on shipping and air traffic: Until their removal from the sea area, the offshore structures must be equipped with facilities that ensure the safety of shipping and air traffic in accordance with the - respectively applicable - latest technological advancements and in compliance with the legal requirements, official regulations and standards.

Order 11.10 on the marine environment: All reports and data including meta-information from construction and operational monitoring must be made available to the BSH by specified dates and in agreed formats.

Order 14 on the construction and operation: For the foundations and installation of the offshore structures, the working method according to the state of the art shall be used which is as low-noise as possible under the circumstances found. In this context, a suitable noise mitigation concept must ensure that the sound emission (sound pressure SEL05) at a distance of 750 m does not exceed the value of 160 decibels (dB re1 µPa² s) and the peak sound pressure level does not exceed the value of 190 decibels (dB re 1 µPa). Blasting is to be avoided.

Order 15 on the construction and operation: To avoid and reduce disturbance-triggering sound inputs and cumulative impacts in habitats in the German EEZ of the North Sea, the legal requirements of the noise mitigation concept of the Federal Ministry for the Environment, Nature Conservation, Nuclear Safety and Consumer Protection (BMUV) from 2013, Concept for the protection of harbour porpoises from noise pollution during the construction of offshore wind farms in the German North Sea (noise mitigation concept 2013) must be observed. Sound events from different sound sources in a temporal and spatial context are to be considered cumulatively.

Order 15.2: During the sensitive period of the **harbour porpoise** from 1 May to 31 August, it shall be ensured with the necessary certainty that no more than 1% of sub-area I of the nature conservation area “Sylt Outer Reef - Eastern German Bight” with its special function as a breeding area is affected by sound-intensive pile driving work for the foundations of the piles from disturbance-triggering sound inputs.

Order 20: In order to avoid damage to foreign **marine cables and pipelines**, the first-time or repeated erection of offshore structures as well as the performance of structural maintenance work in each case at a distance of less than 500 m from foreign submarine cables or pipelines shall be notified in advance to the owners concerned of these named installations.

Order 21: If **bird migration** with very high migration intensity foreseeably passes the area of the project, the migration event, in particular any bird collision, must be recorded. The locations of the recording devices must be justified in advance and agreed with the BSH. The findings obtained must be submitted to the BSH without delay. The right is expressly reserved to issue further orders, including temporary shutdowns. An explicit reference is made to the further possibilities pursuant to § 57 para. 3 of the WindSeeG.

Current developments, projects and discussions

Site Development Plan (SDP) preliminary draft dated 17.12.2021

Based on the designations of the maritime spatial plan, further areas for the development of offshore wind energy were identified in the context of the revision of the Site Development Plan.

However, the coalition agreement provides for an increase in the targets for the development of offshore wind energy to 30 GW by 2030, 40 GW by 2035 and 70 GW by 2045. To achieve these targets, the additional commissioning of offshore wind farms by 2030 is necessary. The Site Development Plan preliminary draft does not yet contain any information on calendar years for tendering and commissioning of the areas and grid connection systems, because an acceleration of the currently planned commissioning is to be expected.

The preliminary draft of the Site Development Plan initially maps the areas and sites that have been defined as priority and reservation areas for offshore wind energy in the EEZ 2021 maritime spatial plan. A total of 43 GW of offshore wind turbines can probably be erected in these areas. In addition, a further 14.5 GW are expected to be in operation in Zones 1 and 2 in 2030 according to the designations of the Site Development Plan 2020. This means that enough areas are available to achieve the targets set in the coalition agreement of 30 GW by 2030 and 40 GW by 2035. In order to achieve the expansion target of 70 GW by 2045 set out in the coalition agreement, a considerable amount of additional areas will have to be developed for the development of offshore wind energy.

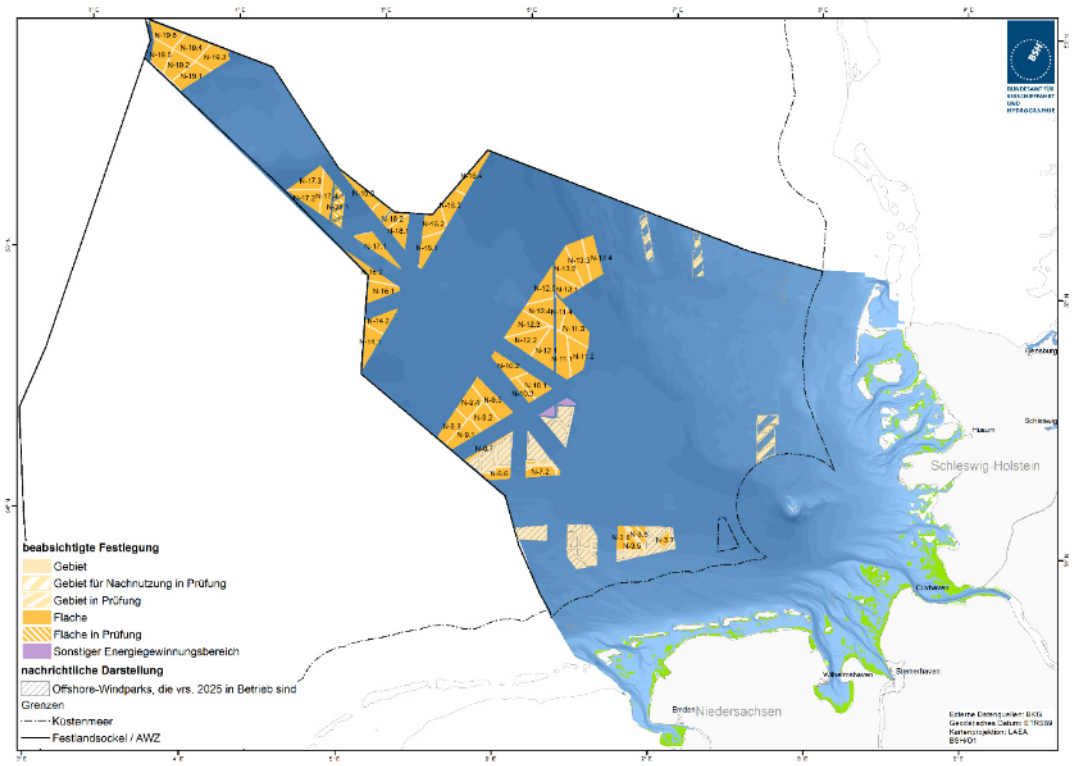

Figure 12: *Preliminary draft of the Site Development Plan, intended specifications for the North Sea (BSH 2021)*

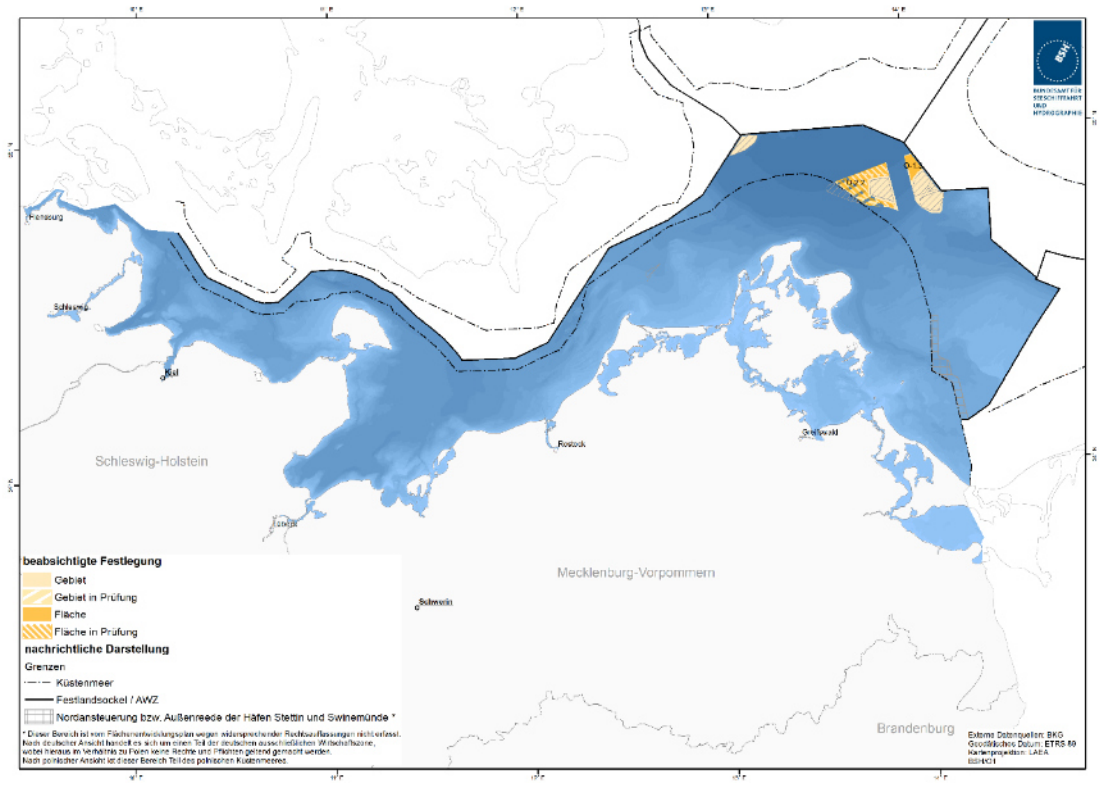

Figure 13: Preliminary draft of the Site Development Plan, intended designations for the Baltic Sea (BSH 2021)

Explanation of German map legend (figure 12 and figure 13)			
German	English	German	English
Beabsichtigte Festlegung	intented designation	Grenzen	boundaries
Gebiet	area	Küstenmeer	territorial waters
In Prüfung	under review	Festlandsockel	continental shelf
Fläche	site	AWZ	EEZ
Nachrichtliche Darstellung	informational representation	Nordansteuerung bzw. Außenreede der Häfen Stettin und Swinemünde	Approach from north or outer roads for the ports of Stettin and Świnoujście

Topic - deconstruction and subsequent use/re-powering

The first offshore wind farms in the German EEZ were commissioned from 2009 onwards. By 2040, a significant number of wind turbines are expected to have reached the end of their service life and to have been deconstructed. In order to reliably achieve the statutory expansion targets, suitable assumptions must be made about the extent of the expected deconstruction.

The permits or planning approval procedure decisions for the offshore wind farms currently in operation were generally granted for a limited period of 25 years, with an extension of a further five years possible on application in accordance with § 48, Paragraph 7, Sentence 2 of the WindSeeG if the Site Development Plan does not provide for direct subsequent use of the site. Offshore wind farms commissioned by 2021 generally receive feed-in tariffs under the EEG for a period of 20 years. After that, direct marketing of the electricity generated is possible.

According to the current state of knowledge, it can be assumed that no electricity can be produced on the sites between decommissioning and subsequent use for a certain period of time, so that the decommissioned capacity must be compensated for by the determination of additional sites in order to achieve the statutory targets. The amount of site required for this depends largely on how orderly and coordinated deconstruction and subsequent use of site can be.

A recently completed project on the topic of dismantling is the joint project SeeOff - Strategy Development for the efficient deconstruction of offshore wind farms, which was led by Bremen University of Applied Sciences. The aim of the project, which was funded by the BMWK, was to enable the companies involved in the deconstruction to identify efficient deconstruction strategies. As a result of the project, a handbook on the deconstruction of offshore wind farms has been published[17].

Figure 14: Commissioning years of wind farms for area N2

Topic - Wake effects

When defining areas for wind energy in the Site Development Plan, it is of fundamental importance to realistically determine the potential of all areas in order to be able to guarantee the achievement of the offshore expansion targets.

[17] https://media.suub.uni-bremen.de/handle/elib/5846.

To determine the expected annual electricity production in various expansion scenarios, taking into consideration long-range shading effects, the BSH commissioned a scientific report (Dörenkämper et al., Fraunhofer IWES, 2022)[18] to accompany the Site Development Plan revision procedure. Initial modelling calculations show that the efficiency of power generation depends on a large number of factors. The power density of the wind farm, the size of the contiguous area and the inflow situation have turned out to be the most important factors.

In the preliminary draft of the Site Development Plan, the power density was corrected for some areas as a target value for the power calculation. With an increase in power density, the installed capacity on the areas can be increased overall, but the utilisation of the wind farms will be significantly reduced due to the losses to be expected from wake effects.

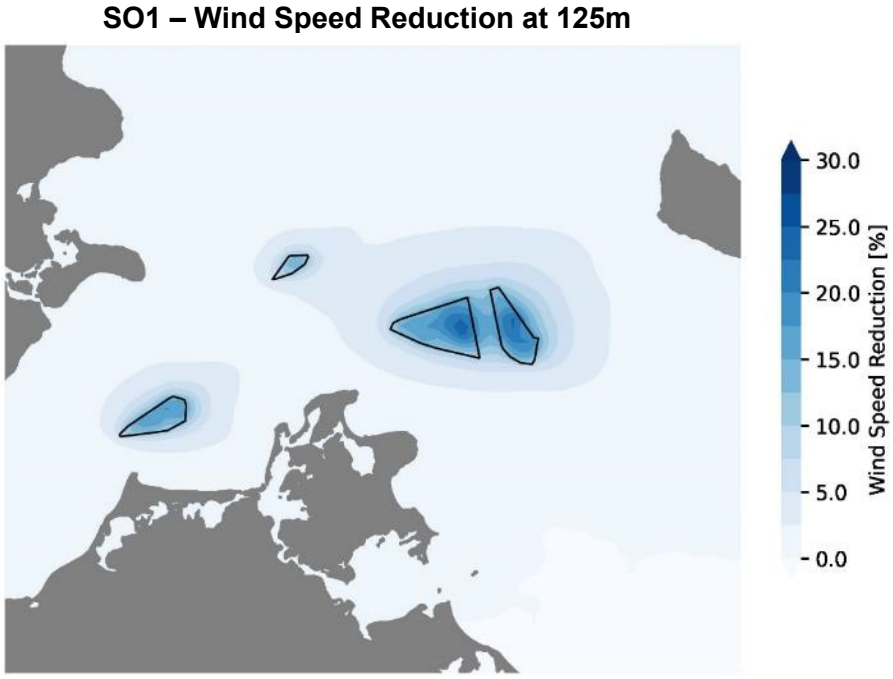

Figure 15: Baltic Sea, scenario 1: Wind speed decrease at 125-m height (Dörenkämper et al. 2022)

[18] https://www.bsh.de/DE/THEMEN/Offshore/Meeresfachplanung/Flaechenentwicklungsplan/_Anlagen/Downloads/FEP_2022_2/Zweiter_Zwischenbericht_FEP-Beratung.pdf?__blob=publicationFile&v=2

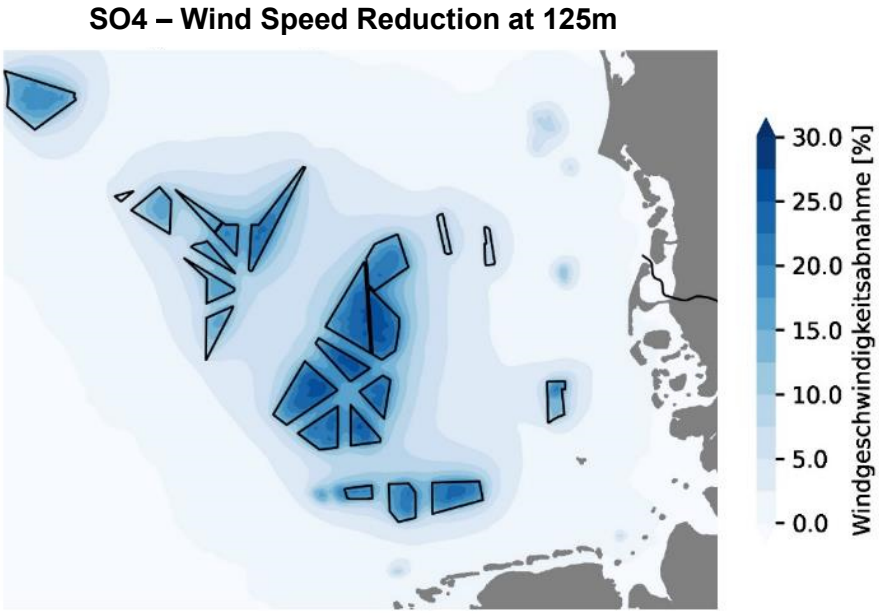

Figure 16: North Sea, scenario 4: Wind speed decrease at 125-m height (Dörenkämper et al. 2022)

2.3 Subsea cables and pipelines

The explanations in the subsea cables and pipelines section are mainly based on the following sources:

- Planning approval procedure of BSH
- Site Development Plan 2020
- Preliminary draft of the Site Development Plan 2021
- TSO data on offshore grid development[19]

The following section describes the situation of the subsea cables and pipelines and their connection with maritime spatial planning using the points given below:

- Subsea cables and pipelines and the designations in the EEZ 2021 maritime spatial plan
- Subsea cables and pipelines: Expansion status in the North Sea and the Baltic Sea
- Current developments

Background

The line corridors defined in the EEZ 2021 maritime spatial plan help in spatially safeguarding the routes for power cables, data cables and pipelines. As a rule, line corridors are designated where

[19] https://www.netzentwicklungsplan.de/de/netzentwicklung/offshore-netzentwicklung

two or more subsea cables and pipelines have already been built or concrete plans have been confirmed.

In addition to spatial designations of areas for the construction of wind turbines, the Site Development Plan also defines areas for power cables (offshore grid connection cables and interconnectors). The sectoral planning specifications are made on the basis of planning and standardised technology principles.

In particular, the temporal and spatial specifications of the **grid connection cables** by the Site Development Plan is highly relevant for the rapid development of offshore wind energy in order to ensure their orderly and efficient use and to plan, construct, commission and use them in parallel with the expansion of electricity generation from wind turbines at sea.

Interconnectors connect power networks across national borders. The national transmission grids and the connecting interconnectors between countries together form the European interconnected grid. On the one hand, they enable cross-border electricity trading and, on the other hand, increase the security of supply. For example, power surpluses, such as from wind energy, can be diverted to storage capacities abroad. Conversely, electricity can be imported from abroad when, for example, there is a wind lull in Germany.

Transnational **data cables** - usually fibre optic cables for telecommunications - cross the German North Sea and Baltic Sea in large numbers. In addition, there are also quite a number of decommissioned cables in the seabed that have not been removed after they ceased to be used.

A number of **pipelines** run through the EEZ of the North Sea and Baltic Sea, which merely cross the German continental shelf (so-called transit pipelines) and those which also land on the German coast.

Subsea cables and pipelines are subject to different approval regimes:

- Grid connection cables: WindSeeG
- Interconnectors: BBergG
- Data cables: BBergG
- Pipelines: BBergG

The construction of a **grid connection system** requires official approval. The BSH is responsible for this. As a rule, the converter platform, the AC grid connection system and the DC grid connection system are approved as one project. Due to the high complexity of these projects, the legislator has given the BSH the option of approving individual measures for construction or commissioning subject to approval. Since 1 January 2017, the legal basis for the approval regime has been the Offshore

Wind Energy Act (WindSeeG). Before the Offshore Wind Energy Act came into force, approval was based on the Offshore Installations Ordinance.

The authorisation procedure under mining law for the laying of submarine cables (**interconnectors and data cables**) and pipes (**pipelines**) is divided into two parts. On the one hand, mining permission is required (§ 133, Paragraph 4 or Paragraph 2 in conjunction with § 133 Paragraph 1, No. 1 of the Federal Mining Act). This is granted by the respective competent regional authority. The State Office for Mining, Energy and Geology in Clausthal-Zellerfeld is responsible for this in the North Sea area, whereas Stralsund Mining Authority is responsible in the Baltic Sea area. The mining authorities check whether the project conflicts with mining law concerns.

On the other hand, it requires the approval of the BSH. The BSH examines whether the project is compatible with the orderly use and enjoyment of the waters above the continental shelf and the airspace above these waters (§ 133 Paragraph 4 or Paragraph 2 in conjunction with § 133 Paragraph 1, No. 2 of the Federal Mining Act). In particular, permission may only be refused if public interests, such as the use of shipping lanes, flora and fauna, are impaired or if there is a risk of pollution of the sea. In practice, questions of routing the cable in accordance with spatial planning regulations, proper laying techniques and depth, and species and nature conservation are of particular relevance. Once approval has been granted, the project is subject to supervision by the BSH. If necessary, the BSH can issue orders to ensure the proper implementation of the project.

Subsea cables and pipelines: Expansion status

Along with the increasing number of offshore wind farms in the German EEZ, the number of grid connection cables is also steadily increasing. In 2021, two grid connection cables were laid in the Baltic Sea: OST-2-1 for grid connection of ARCADIS Ost I and OST-2-2 as one of two cable systems for grid connection of Baltic Eagle.

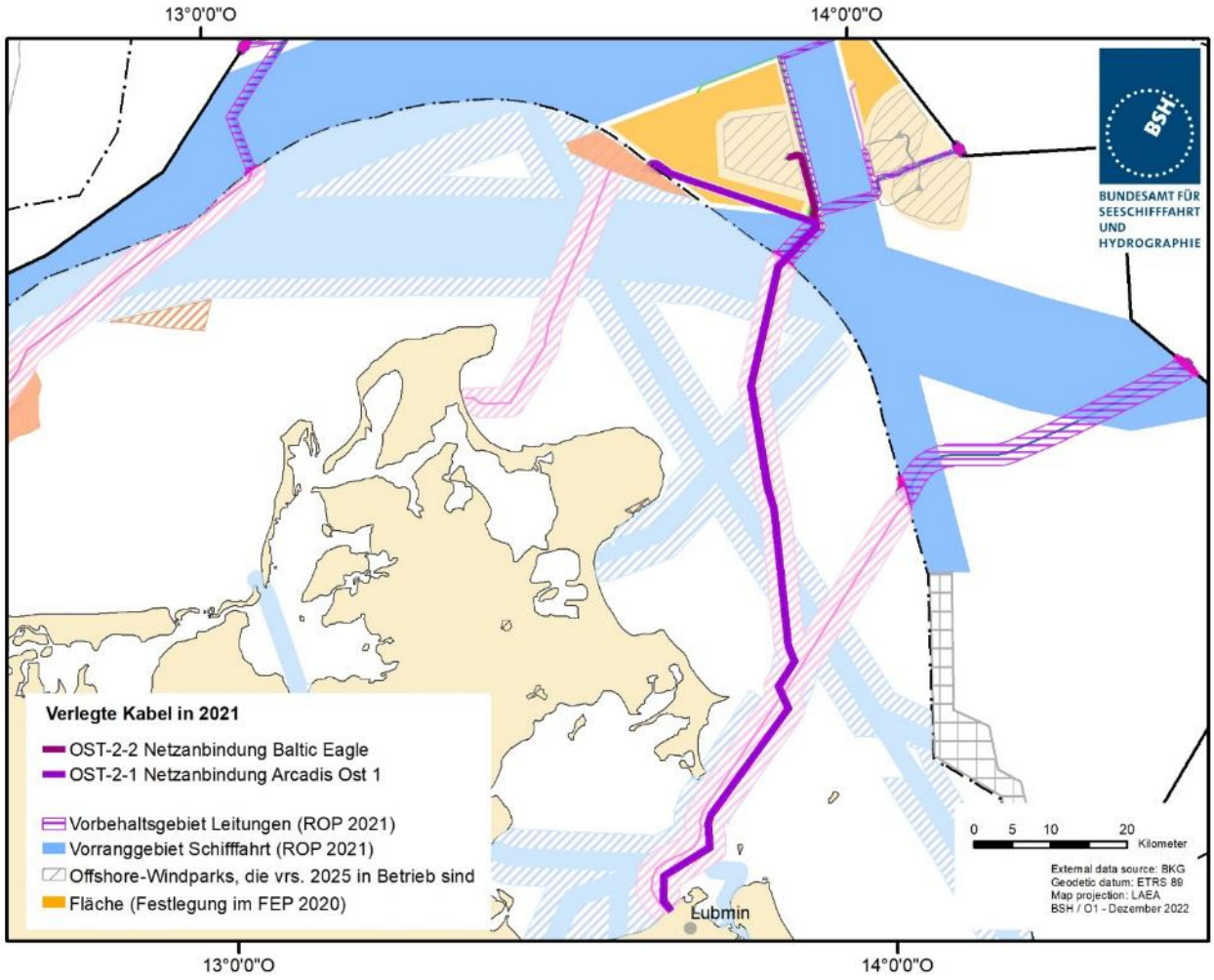

Figure 17: Grid connections laid in the EEZ in 2021 (BSH, 2022)

Explanation of German map legend (figure 17)			
German	English	German	English
Verlegte Kabel	installed cables	Schifffahrt	Shipping
Netzanbindung	grid connection	Offshore-Windparks	offshore wind farms
Vorbehaltsgebiet	Reservation area	Fläche	site
Leitungen	Cables	Festlegung	designation
Vorranggebiet	priority area	Internationale Grenze	international boundary

Table 4: Grid connection systems (as of April 2022)

Cable system	Name ONEP/NEP	Capacity [MW]	Connected Wind farms	Status	(Planned) commissioning
alpha ventus	NOR-2-1	62	alpha ventus	Commissioning	2009
BorWin1/ BorWin alpha	NOR-6-1	400	BARD Offshore 1	Commissioning	2010
BorWin2/ BorWin beta	NOR-6-2	800	Veja Mate German Bight Albatros	Commissioning	2015
SylWin1/ SylWin alpha	NOR-5-1	864	DanTysk Butendiek Sandbank	Commissioning	2015
HelWin1/ HelWin alpha	NOR-4-1	576	North Sea East Meerwind South/East	Commissioning	2015
DolWin1/ DolWin alpha	NOR-2-2	800	Trianel wind farm Borkum Borkum Riffgrund I	Commissioning	2015
HelWin2/ HelWin beta	NOR-4-2	690	Amrumbank West	Commissioning	2015
Baltic 2	OST-3-2	288	EnBW Baltic 2	Commissioning	2015
DolWin2/ DolWin beta	NOR-3-1	916	North Sea One Gode Wind 1 Gode Wind 2	Commissioning	2015
Ostwind 1	OST-1-1	250	Wikinger	Commissioning	2018
DolWin3/ DolWin gamma	NOR-2-3	900	Merkur Offshore Borkum Riffgrund II	Commissioning	2018
Ostwind 1	OST-1-3	250	Arkona Basin South-East Wikinger	Commissioning	2019
Ostwind 1	OST-1-2	250	Arkona Basin South-East Wikinger-South	Commissioning	2019
BorWin3/ BorWin gamma	NOR-8-1	900	EnBW High See Global Tech I	Commissioning	2019
Ostwind 2	OST-2-1	250	ARCADIS Ost I	under construction	2023
Ostwind 2	OST-2-2	250	Baltic Eagle	under construction	2023
Ostwind 2	OST-2-3	250	Baltic Eagle	Approved	2024
DolWin6	NOR-3-3	320	Gode Wind 3	Approved	2023

Due to the desire for greater international interconnection, the number of interconnectors applied for and approved is also steadily increasing. However, no new interconnector was commissioned in 2021. This is only expected for the following years.

Table 5: Interconnectors (as of April 2022)

Cable system	Capacity [MW]	Landing points	Status	Commis-sioning*
Baltic Cable	600	Lübeck (D) Kruseberg (SE)	Commis-sioning	1995
Kontek	600	Bentwisch (D) Bjæverskov Sogn (DK)	Commis-sioning	1996
NorNed	700	Feda (NO) Eemshaven (NL)	Commis-sioning	2008
COBRAcable	700	Endrup (DK) Eemshaven (NL)	Commis-sioning	2019
NordLink	1,400	Büsum (DE) Feda (NO)	Commis-sioning	2020
Kriegers Flak Combined Grid Solution	400	Bentwisch (DE) Bjæverskov Sogn (DK)	Commis-sioning	2020
Viking Link	1,400	Revsing (DK) Bliner Fen (UK)	Under con-struction	2024
NeuConnect	1,400	Greystone (GB) Conneforde (D)	Approved	2028

In 2021, neither data cables nor pipelines were commissioned in the German EEZ.

Grid Development Plan 2035

The Grid Development Plan (NEP) is prepared on the basis of the scenario framework approved by the BNetzA (§12a EnWG). For the NEP 2035 (2021), the investment costs for the required expansion of the offshore grid connection systems were determined for this scenario framework and on the basis of the areas identified in the Site Development Plan 2020. For scenario B 2035 with an expansion target for offshore wind of 30 GW, the transmission system operators (TSOs) assume about 3,510 km of additional cable length with required investments of about € 35.5 billion[20]. For the now decided accelerated expansion, the construction of some grid connection cables will also be adjusted in time.

The following map (Figure 18) shows the proposed grid connection points at which the grid connection systems of the offshore wind farms will be connected to the 220/380 kV transmission grid on land (BNetzA, 2022).[21]

[20] https://www.netzentwicklungsplan.de/de/netzentwicklung/offshore-netzentwicklung

[21] https://www.netzentwicklungsplan.de/sites/default/files/paragraphs-files/NEP2035_Bestaetigung.pdf

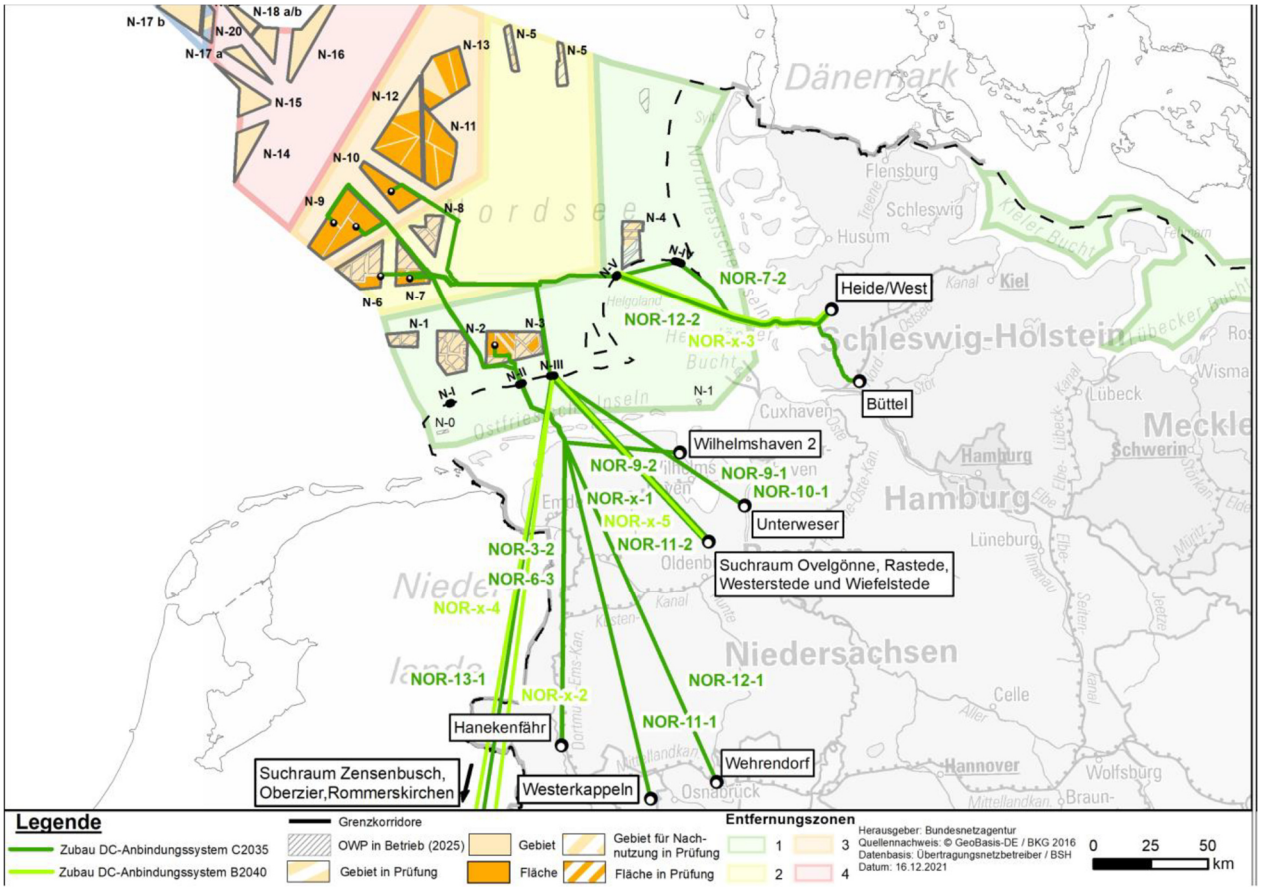

Figure 18: Offshore grid connections with grid connection points (BNetzA 2022, page 344)

Explanation of German map legend (figure 18)			
German	English	German	English
Zubau	increase	Nachnutzung	subsequent use
Anbindungsleitung	grid connection	Suchraum	search area
OWP in Betrieb	offshore wind farm in use	Grenzkorridore	gates
Gebiet in Prüfung	area under review	Entfernungszonen	distance zones
Fläche	site		

Current discussions

Acceleration potential of grid connections

Since the grid development plan 2019-2030, it also contains all effective measures for the demand-oriented optimisation, reinforcement and expansion of the offshore grid connection cables in the EEZ and in the territorial sea including grid connection points on land, which are required until the end of the period under consideration according to § 12a Paragraph 1, Sentence 2 of the EnWG. The designations in the grid development plan and in the Site Development Plan must be coordinated with each other. The uncertainty regarding the acceleration potential of grid connections with regard to the expansion targets outlined in the coalition agreement leads to the fact that the preliminary draft of the Site Development Plan dated 17.12.21 refrains from naming calendar years for the commissioning of grid connection systems. Likewise, no statements are made on the spatial course of the grid connection cables, the associated gate corridors to the territorial sea or possible GCPs.

In order to achieve the expansion target of 70 GW by 2045 stated in the coalition agreement, additional offshore grid connection cables must be planned to a considerable extent beyond the existing grid planning. In particular, the planning of suitable route corridors in the territorial sea poses a special challenge.

Coordination with the coastal states

For coordination with the coastal states, the Site Development Plan identifies gates as locations where the grid connection cables cross the border between the EEZ and the territorial sea. In this way, the cable systems should be concentrated at these points as far as possible and bundled for further routing towards the GCP. The routing in the territorial sea is not determined by the Site Development Plan; this is the responsibility of other bodies in the procedures provided for this purpose.

Networking and meshing

The topic of networking/meshing will be pursued even more strongly in the future. Various concepts, such as the North Sea Wind Power Hub programme, the Baltic InteGrid project or the planned Danish energy islands, have already been presented in the context of the IWES report[18] and should be analysed and evaluated in a next step with regard to the criteria of redundancy, degree of meshing, investment costs (qualitative), feasibility, space requirements and system efficiency.

The grid connection of energy islands in neighbouring countries (probably Denmark in the first place) as well as the international networking of hydrogen pipelines is already being discussed by the sectoral planning and should be included in the revision of the maritime spatial planning and Site Development Plan if the project is ready.

2.4 Raw material extraction

The explanations in the Raw material extraction section are mainly based on the following sources:

- Website of the State Office for Mining, Energy and Geology (LBEG)[22]
- NIBIS® maps server of the LBEG[23]
- Website of the Federal Institute for Geosciences and Resource Extraction[24]
- LBEG (2022): Crude oil and natural gas in the Federal Republic of Germany 2021. Annual Report Hanover
- Bundesverband Erdgas, Erdöl und Geoenergie e.V. (BVEG) (2021): Statistical Report 2020, Hanover.

[22] https://www.lbeg.niedersachsen.de/startseite/

[23] https://www.lbeg.niedersachsen.de/kartenserver/nibis-kartenserver-72321.html

[24] https://www.bgr.bund.de/DE/Home/homepage_node.html

- North Sea maps server. Geopotential German North Sea (GPDN) Joint project of BGR, LBEG and BSH[25]

The following section describes the situation of the raw material extraction and their connection with maritime spatial planning using the points given below:

- The most important resource extractions of raw materials in the North Sea and Baltic Sea: Occurrence and removal.
- Raw material extraction and the designations in the EEZ 2021 maritime spatial plan.
- The individual developments in the raw materials sector in the North Sea and Baltic Sea.

Background

Raw materials (resource extraction) are generally understood to be natural materials that are extracted from nature. The consideration of the raw materials situation (deposits and extraction) in this report is limited to local, non-regenerable mineral raw materials (resource extraction) for the North Sea and Baltic Sea. In the category of stones and earths, these are sands and gravels; in the fossil energy raw materials, hydrocarbons (crude oil, natural gas).

Figure 19 shows the spatial distribution of hydrocarbons as well as the situation of the North Sea permit fields as of the end of 2021 (LBEG, 2022).

Total oil production in Germany in 2021 was 1.8 million tonnes. Of this, 1.05 million tonnes were in the territorial sea in Schleswig-Holstein (Mittelplate Drilling and Production Island). Total German crude gas production in 2021 was 5.7 billion $m^3(V_n)$[26].

No hydrocarbons have been produced in the German Baltic Sea since 2000. The exploration licence areas under mining law are listed in Table 6.

Raw material extraction: Approvals

In the German EEZ in the North Sea and the Baltic Sea, mining permits exist which entitle the licence holders to explore (exploration permit according to § 7 of the Federal Mining Act) or to extract (mining permit according to § 8 of the Federal Mining Act) raw materials (resource extraction). In the North Sea and the Baltic Sea, the permits concern the raw materials, sand and gravel (resource extraction) as well as hydrocarbons (oil, natural gas).

In the EEZ 2021 maritime spatial plan, areas for the extraction of sand and gravel and hydrocarbons were defined within the permit areas existing at the time the plan was drawn up in accordance with the Federal Mining Act. According to § 2, Paragraph 2, No. 4 of the ROG, it is a principle of maritime spatial planning to create the spatial conditions for the precautionary safeguarding and for the orderly

[25] https://www.gpdn.de/?pgId=1

[26] Standard volume in cubic metre

exploration and extraction of site-bound raw materials (resource extraction) (e.g. sand, gravel, hydrocarbons). Maritime spatial planning is of particular importance in this context because, in contrast to other sectoral planning, there are no separate sectoral planning instruments for safeguarding the potential areas containing raw materials. Access by companies to the deposits is only possible with mining permits (BMVI, 2017).

Within the NE3-0002-01, NE3-0001-01 and NE3-0005-01 exploration licence areas, partial areas have been designated as the KWN2 to KWN 5 hydrocarbons reservation areas following spatial planning consideration. The German North Sea production licence area A6/B4 was incorporated into the maritime spatial plan as the KWN1 reservation area. The term of exploration permit NE3-0002-01 ended on 31 December 2021.

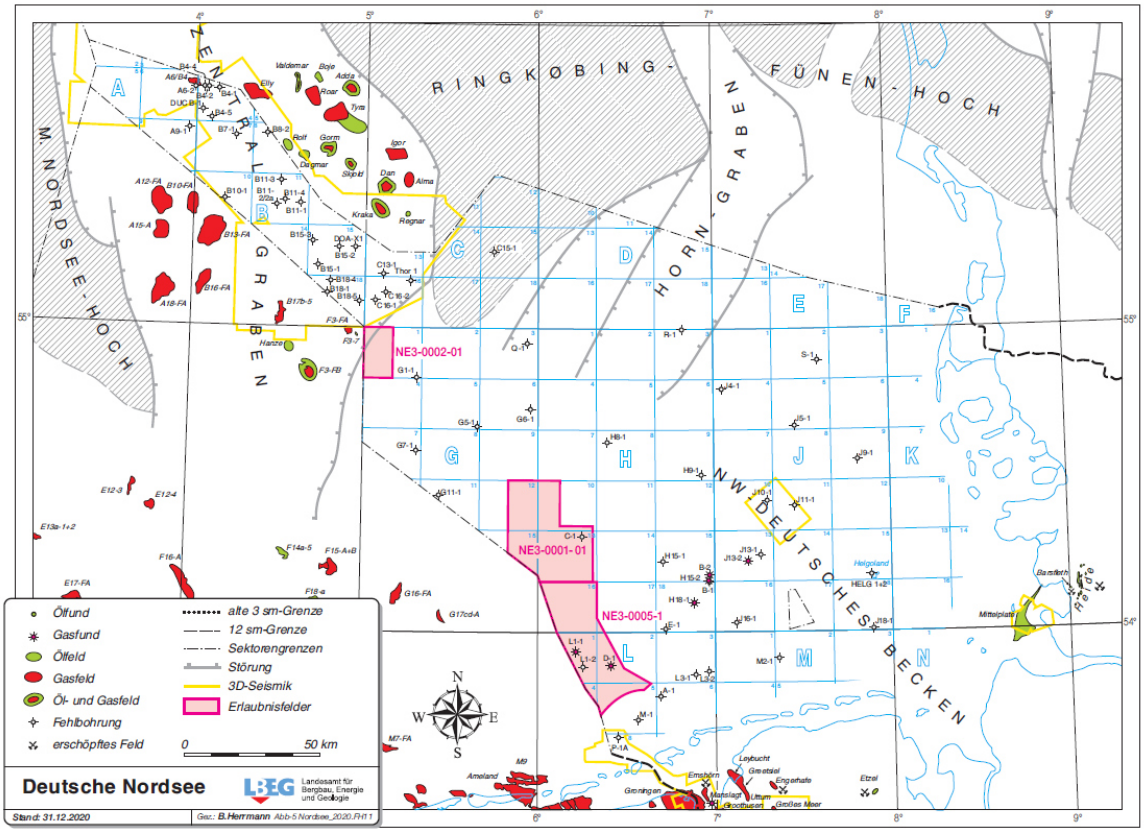

Figure 19: Deposits and exploration licence areas for hydrocarbons in the North Sea (source: LBEG)

Explanation of German map legend (figure 19)			
German	English	German	English
Ölfund	oil discovery	Alte 3sm-Grenze	former 3 nm boundary
Gasfund	gas discovery	12 sm-Grenze	12 nm boundary
Ölfeld	oil field	Sektorengrenzen	sector boundaries
Gasfeld	gas field	Störung	fault line
Fehlbohrung	failed well drilling	3D-Seismik	3D-seismics
Erschöpftes Feld	exhausted field	Erlaubnisfelder	license areas

Table 6 shows an overview of the permits for hydrocarbons in the North Sea and the Baltic Sea. The exploration licence areas in the Baltic Sea are only partially located in the EEZ and were not included

in the maritime spatial plan as an area designation. The exploration permits for these areas expired in 2021.

Table 6: Hydrocarbon permit fields in the German EEZ, as of May 2022, (source: LBEG, Stralsund Mining Authority)

Type	Designation	Duration	Legal owner	Field size [m²]
Production licence	German North Sea A6/B4	31.05.2028	Wintershall DEA Deutschland GmbH	14,932,200
Exploration licence	NE3-0001-01	30.11.2022	ONE-Dyas B.V., Hansa Hydrocarbons Limited	884,000,000
Exploration licence	NE3-0002-01	31.12.2021	Petrogas E&P UK Ltd., Danoil Exploration A/S	No information
Exploration licence	NE3-0005-01	31.05.2025	ONE-Dyas B. V., Neptune Energy Germany B. V., Hansa Hydrocarbons Ltd.	826,000,000
Exploration licence	Plantagenetgrund	31.08.2021	Central European Petroleum GmbH	1,098,000,000
Exploration licence	Oderbank	31.05.2021	Central European Petroleum GmbH	2,644,000,000
Exploration licence	Ribnitz	31.05.2021	Central European Petroleum GmbH	151,000,000

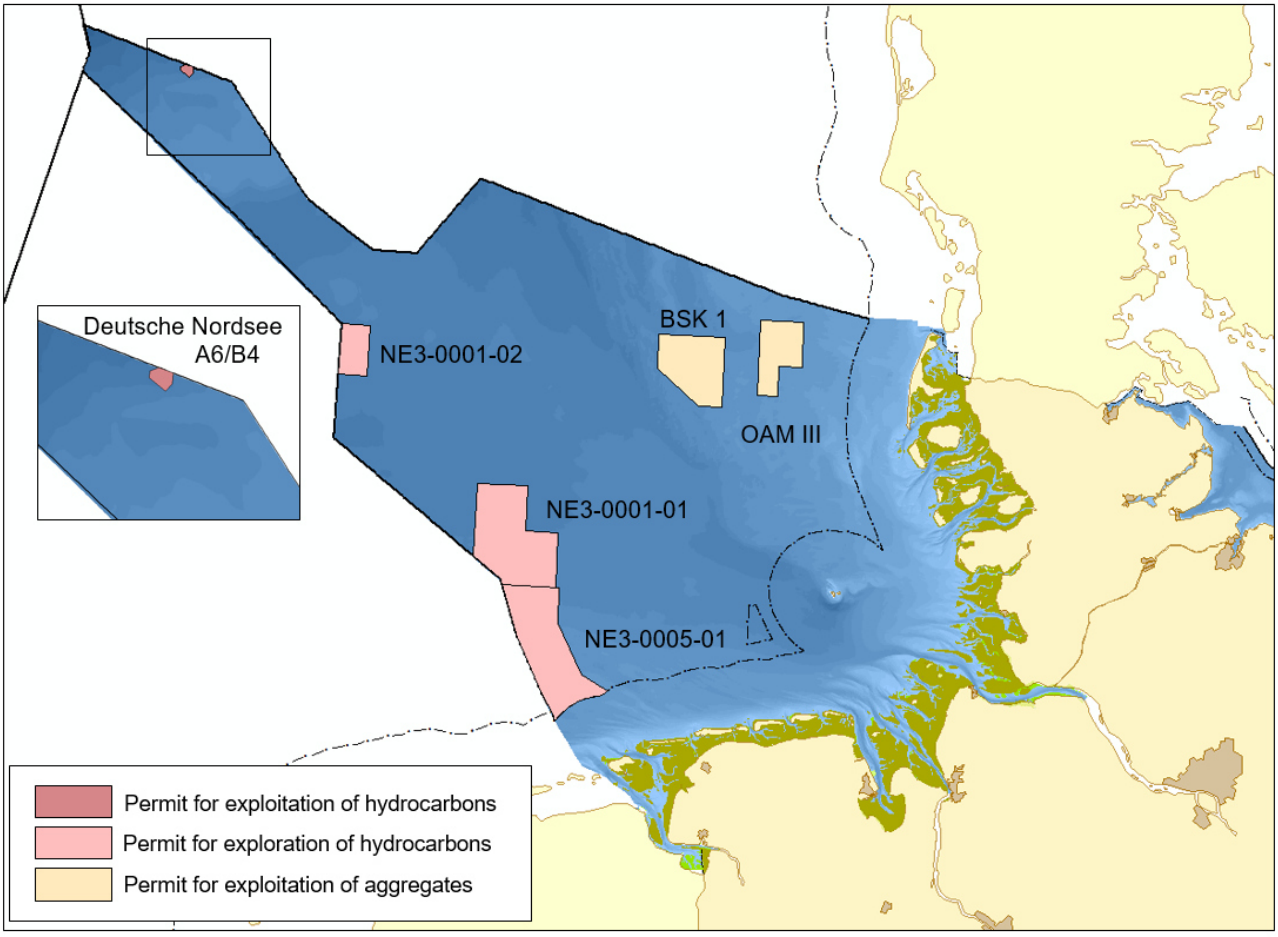

Figure 20: EEZ shares of the exploration permit and production licence areas for hydrocarbons, sands and gravels in the North Sea (Map basis: BSH; coordinates of the fields under mining law: LBEG)

In the North Sea, the SKN1 and SKN2 reservation areas for sand and gravel extraction spatially safeguard the entire areas of the BSK 1 and OAM III production licence areas; in the Baltic Sea, the SKO1 reservation area spatially safeguards the Adlergrund North-East production licence area.

Table 7 shows an overview of the permits for sand and gravel in the EEZ in the North Sea and the Baltic Sea.

Table 7: Sand and gravel permit fields in the German EEZ, as of May 2022, (source: LBEG, Stralsund Mining Authority)

Type	Designation	Duration	Legal owner	Field size [m²]
Production licence	BSK1	14.07.2033	BSK Baustoffe und Seekies GmbH	532,125,400
Production licence	OAM III	14.05.2051	OAM-DEME Mineralien GmbH	350,530,400
Production licence	Adlergrund North-East	31.12.2040	OAM-DEME Mineralien GmbH	116,000,000
Production licence	Fixed Fehmarn Belt crossing	31.07.2024	Femern A/S	13,122,000

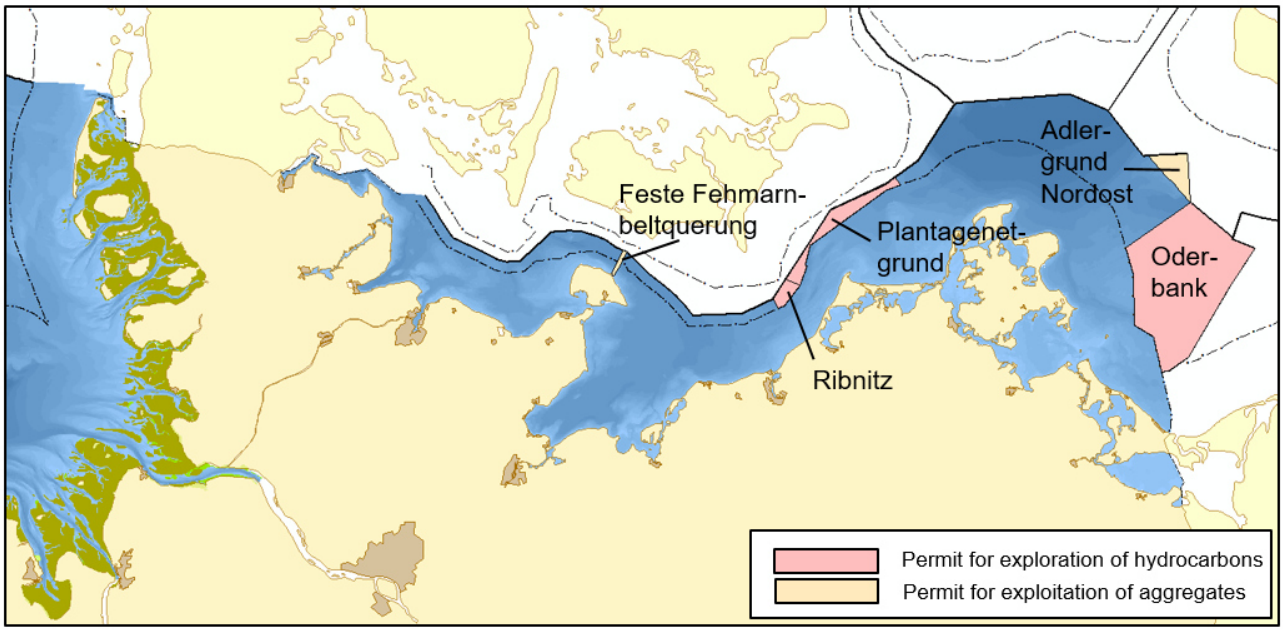

Figure 21: EEZ shares of the production licence areas for hydrocarbons, sands and gravels in the Baltic Sea (Map basis: BSH; coordinates of the fields under mining law: Stralsund Mining Authority)

Situation and development: Hydrocarbons

Exploration licence areas for hydrocarbons

During the preparation process of the EEZ 2021 maritime spatial plan, the companies ONE-Dyas B. V., Neptune Energy Germany B. V. and Hansa Hydrocarbons Limited partially returned production licence B20 008/71 (hydrocarbons) to the responsible State Office for Mining, Energy and Geology (LBEG).

The original exploration permit, covering approximately 2,572 square kilometres, was granted on 8 May 2006. After the partial return, the field size is still a good 825 square kilometres.

The companies do not see sufficient development opportunities for raw material extraction in the eastern area of the exploration permit. The partial revocation of the exploration permit area was applied for on 30 November 2020 in accordance with § Section 19, Paragraph 1 of the Federal Mining Act (BBergG). With the announcement in the Lower Saxony Ministerial Gazette on 23 December 2020, the field reduction of the exploration permit, which was still allocated until 31 May 2021, became effective. The remaining exploration permit area is designated NE3-0005-01 (see Figure 22).

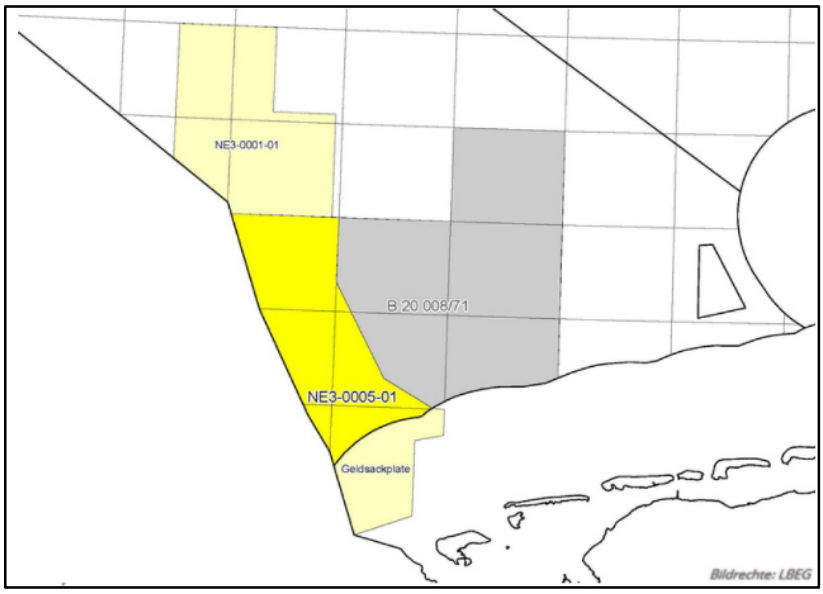

Figure 22: Reduction of the mining exploration permit area for hydrocarbons B20 008/71 (© LBEG)

Production licence area for hydrocarbons A6/B4

Since the discovery of hydrocarbons in 1974, approximately 9.5 billion m^3 (V_n) of high-calorific natural gas had been produced by the end of 2021. In 2020, production was 7.9 million m^3 (V_n), a drop of about 71 % from the previous year. No natural gas production took place in 2021. In addition, 819 t of natural gas condensate were produced here in the course of natural gas extraction. A6/B4 is considered to be depleted. No further reserves were reported for the coming year (BVEG, 2021).

Production licence area for hydrocarbons NB3-0004-00

On 13 December 2021, ONE-Dyas B. V., Hansa Hydrocarbons Ltd. and Neptune Energy Germany submitted an application for the production licence for the exploration and exploitation of hydrocarbons NB3-0004-00 for a period of 25 years. The production licence applied for has an extension of approximately 12 km^2 and is located in the area of exploration permit field NE3-0005-01. Following the start of planning in 2023 and the construction of a production platform on the Dutch continental shelf, production of natural gas is planned for the end of 2024. In 2025, further drilling should be

planned to develop the field. Based on the projected production volume, the LEBG considers a duration of 25 years to be appropriate for the entitlement. On 12 April 2022, the LBEG initiated the involvement of the public authorities in the application.

Deconstruction of platform A6-A

Wintershall DEA operated the A6-A natural gas production platform in the German North Sea A6/B4 production licence area. The platform is located in the extreme north of the EEZ of the German North Sea and lies on the edge of the Doggerbank areas under the Habitats Directive. The production licence area is considered to be depleted (BVEG, 2021). The operation of the platform is no longer economically viable for the operating company and gas production has been discontinued. The production wells should be backfilled and the production platform completely dismantled at a later date. To carry out these activities, a special operating plan was applied for at the LBEG in February 2022.

Figure 23: Platform A6-A
(© Wintershall DEA/Hermann Gründer)

Riparian states

The Dutch company ONE Dyas B.V. plans to produce natural gas from the N05-A field in the North Sea off Borkum as part of the GEMS project[27]. For this purpose, a natural gas production and processing platform should be built and operated, a pipeline is to be newly constructed on Dutch territory to the existing Nordgas transport pipeline, and a cable is to be laid to supply electricity to the Riffgat offshore wind farm in the German sector of the North Sea.
The proposed location of platform N05-A is in the Dutch territorial sea about 500 metres from German territorial waters and about 20 kilometres off the coast of Borkum. Parts of the N05-A natural gas field are located on German territory.
The surrounding natural gas fields, for which it is not yet certain whether they contain recoverable quantities of natural gas, are also partly or completely on German territory. To reach the natural gas fields, the wells are drilled vertically under the platform and then deflected towards German territory. Since 2021, the procedure for assessing the environmental impact of the project, which will also have an impact on Germany, has been underway under the auspices of the Dutch Ministry of Economic Affairs and Climate. For this reason, the Federal Republic of Germany was included in the

[27] Gateway to the Ems; https://www.gemsnordsee.de/

environmental impact assessment procedure. The State Office for Mining, Energy and Geology (LBEG) coordinates the involvement of the authorities and the public in Germany.

Development 2021

The coalition agreement stipulates that no permits for oil and gas wells should be issued beyond the framework operating permits already granted.

Situation and development: Sand and gravel extraction

Sand and gravel are mineral raw materials that are mainly used in the construction industry. Among other things, they are used as aggregates for the production of concrete, mortar and other products (BGR - Bundesanstalt für Geowissenschaften und Rohstoffe, 2021). In addition to sand and gravel extraction for commercial purposes, the sands and gravels extracted from the territorial sea are also used in coastal protection and beach restoration.

According to the LBEG[28], a total of 3,852,505 t of gravel/sand was extracted in the Schleswig-Holstein territorial sea and in the German EEZ of the North Sea in 2021.[29] A total of 2,183,922 t of gravel/sand was extracted in the German Baltic Sea EEZ and the Baltic Sea territorial sea in 2021.

Figure 24: Trailing suction hopper dredger (© DEME Building Materials NV)

[28] https://www.bergamt-mv.de/service/statistiken/2021/

[29] No information is available for the territorial sea of Lower Saxony (12 nm zone).

Production licence areas for sand and gravel

In the EEZ of the North Sea, the two permits BSK1 and OAM III are approved according to the Federal Mining Act. The OAM III production licence area is completely within, the "BSK 1" exploitation licence area, for the most part inside the “Sylt Outer Reef” areas under the Habitats Directive. The "OAM III" exploitation licence area is also located entirely within the "Eastern German Bight" Special Protection Area.

In the BSK 1 exploitation licence, there is no operational plan for the extraction of sand and gravel. For the OAM III exploitation licence, the LBEG approved a main operating plan with a term from July 2019 to June 2023. This means that, according to the application for an operating plan, a total of 2 million t. Sand and gravel can be extracted from an area of approximately 17.5 km^2. The raw material will be extracted from a depth of 20 to 25 m using loader suction dredgers. The extraction concentrates on material with a grain size smaller than 10 mm.

In the Baltic Sea, there is the Adlergrund North-East exploitation licence area in the German EEZ. It lies entirely within the "Pomeranian Bay" Special Protection Area, which is designated as a nature conservation area, and entirely within the "Adlergrund" areas under the Habitats Directive. There is currently no operational plan for the extraction of sand and gravel.

The Fixed Fehmarn Belt crossing exploitation licence in the Baltic Sea was granted by the LEBG in order to be able to continue using the material extracted during the excavation work for the 18 km long Fehmarnbelt tunnel. According to project manager Femern A/S, up to 19 million m^3 of sand and gravel should be excavated during the construction work. By the end of May 2022, 8 million m^3 had already been excavated.

2.5 Fishery and aquaculture

The contents in this section are mainly based on information and data from the following sources:

- Federal Maritime and Hydrographic Agency
- Thünen-Institute
- Federal Ministry for Food and Agriculture
- European Marine Observation and Data Network (EMODnet)

Background

Fishery is one of the traditional uses of marine areas and takes place - with varying emphases - throughout coastal waters and in the EEZ.

Deep-sea and coastal fishing is divided into large-scale deep-sea fishing and small-scale deep-sea and coastal fishing. A distinction must be made between cutter and coastal fishing, coastal fishing with vessels of up to 16 m, and small-scale deep-sea fishing, mostly with cutters of approximately 18 to 32 m.

Set net fishing is mainly carried out in the Baltic Sea, with set nets, fish traps and rods and the target species cod and herring. In addition, eel, pike-perch, perch and other freshwater fish and migratory fish species are also caught in coastal waters.

About 850 companies operate about 1,330 vessels (in 2000 still 2,315 vessels), in the majority (2020: 998) are small sideline gillnet boats and cutters, which deliver only about 4% of the German catch. In addition to German fishing vessels, vessels from other countries also use German sea waters, especially from the Netherlands and Denmark.

At the end of 2020, 11 registered vessels under the German flag are to be counted as part of the large-scale deep-sea fishery, with trawlers and factory ships being used. The 7 deep-sea trawlers under German flag with a length of 67 m to 133 m are owned by Dutch or Icelandic companies, have their fishing grounds mostly outside German maritime waters and they alone land about half of the German catches.

Approximately 180 beam trawlers are mainly used for North Sea crab fishing, mainly in the territorial sea and the adjacent EEZ, and almost 60 vessels of 10 to 40 m length use trawls or passive gear to catch cod, flatfish and Saithe, among other species, in the North Sea and Baltic Sea, also in the German EEZ. In the so-called plaice box along the Danish, German and Dutch North Sea coasts, the engine power of the cutters is restricted to keep the heavy beam trawl fishery for flatfish out of the juvenile plaice nursery area. A focal area for Norway lobster fishery in the North Sea EEZ is located on the northern edge of the EEZ bordering the Danish EEZ.

In 2020, landings from the German fleet for the large-scale deep-sea fishery took place exclusively abroad, mainly in the Netherlands, while 40% of the catches from the small-scale deep-sea and coastal fisheries were landed in Germany. The most important fishery in economic terms is the North Sea crab fishery, which accounts for about 17% of total revenues, with only a 4.7% share of catches.

Situation and development

Fisheries in the North Sea and the Baltic Sea are facing increasing challenges. In addition to the restrictive effects of the quota system for important target species, especially in the Baltic Sea, the expansion of offshore wind energy is taking large areas out of fishing use.

In the maritime spatial plan for the EEZ 2021, a core area for Norway lobster fishing in the North Sea was defined as a reservation area for fisheries on the basis of an evaluation by the Thünen Institute. The plan includes provisions for passive fishery in safety zones around offshore wind farms and the possibility of passage for smaller vessels. Detailed legal requirements for implementation are made within the framework of approval procedures for individual projects.

In addition, assessments are formulated as a basis for decisions on the design of co-use by active and passive fisheries.

In the management plans for the NSGs in the EEZ of the North Sea of 13 May 2020[30], concrete restrictions on fishing are also provided for in the context of the EU Common Fisheries Policy (CFP) with regard to the conservation objectives, in addition to measures to improve the compatibility of fishing with the conservation purpose in the areas. In April 2021, the North Sea Advisory Council (NSAC) responded to the so-called Scheveningen Group of EU member states on their negotiated joint proposal ("Joint Recommendation")[31] that this should be further improved in terms of effective conservation of the protected areas. For example, fishing in contact with the bottom in the Sylt Outer Reef Protected Area should be excluded completely and not only for a limited period of time during the seasons, whereby crab fishing should not be excluded either.

The spatial distribution of the fishery can be shown by collecting the VMS data (vessels over 12 m in length)[32].

[30] Management Plan for the “Sylt Outer Reef - Eastern German Bight”

Management plan for the nature conservation area “Borkum Riffgrund”

Management plan for the nature conservation area “Doggerbank”

[31] NSAC Advice Ref. 11-2021

[32] Fishing effort is given as the sum of all fisheries/gears (metiérs) of German and international vessels per c-squre. Data is only for vessels of 12 m length and over. Effort in hours for setting and hauling gear. Interpretation of VMS data in relation to fishing activity depending on fishing gear used.

North Sea

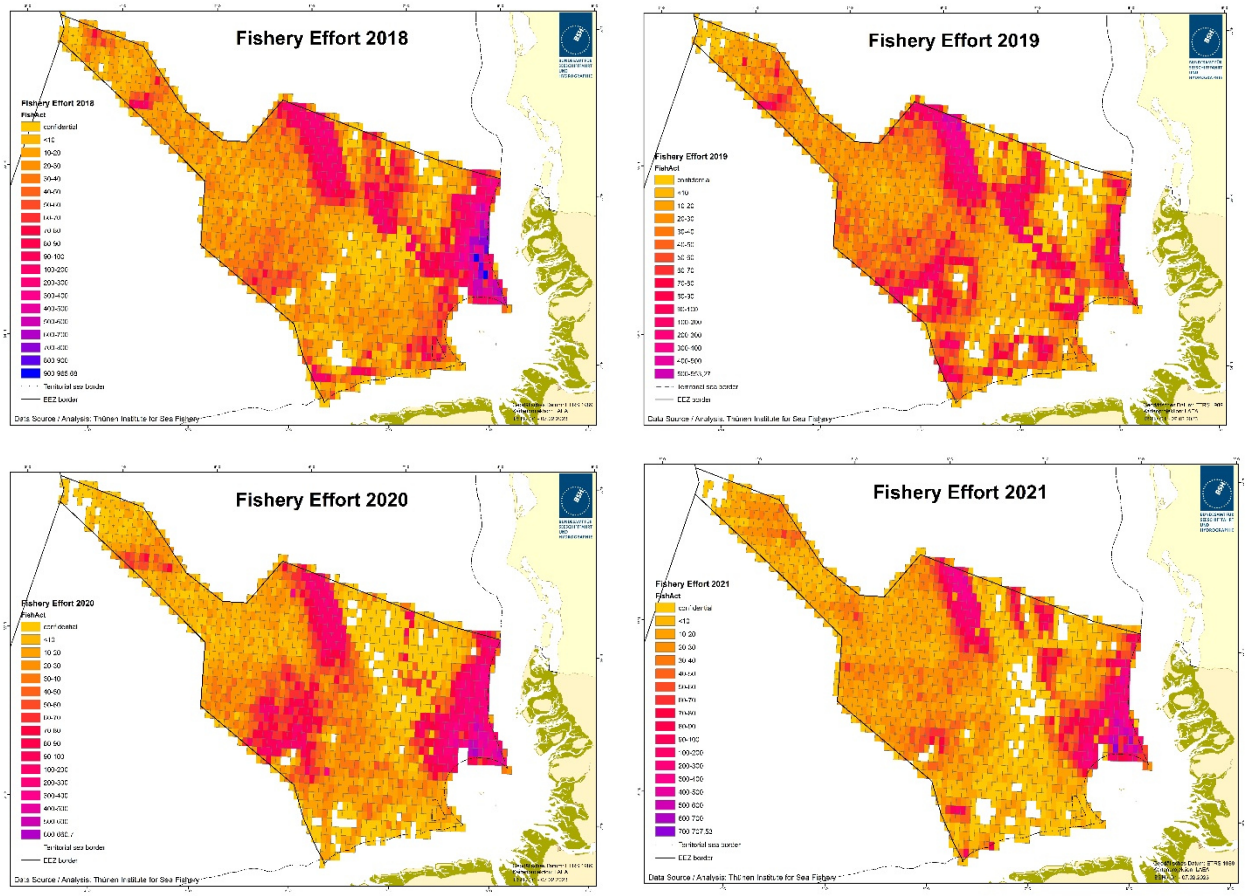

Figure 25: Fishery cost (hours) 2018-2021, North Sea (data: Thünen-Institute, maps: BSH)

Baltic Sea

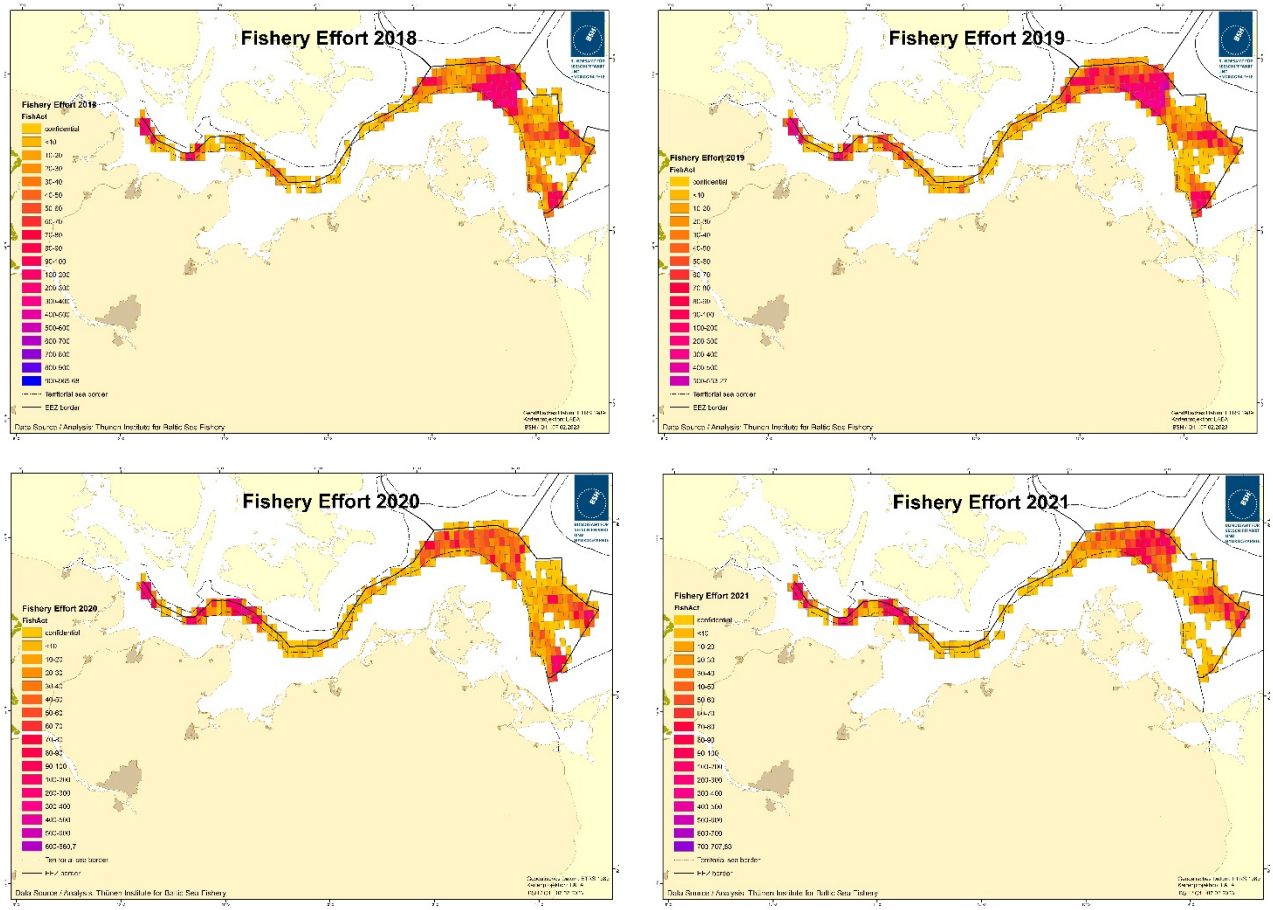

Figure 26: Fishery cost (hours) 2018-2021, Baltic Sea (data: Thünen-Institute, maps: BSH)

In the North Sea, the main areas of impact are mainly in the territorial sea and in the western part of the EEZ, including the core area of the Norway lobster fishery and a larger area where flatfish are caught in particular. In the Baltic Sea, the picture shows less clear focal points and the impact on deeper bottom layers is less pronounced.

Swept surface area ratio (up to 2 cm depth) is measured as the area taken up by fishing gear touching the seabed (swept surface area ratio) or affecting it more deeply (swept subsurface area ratio) in relation to the unit area concerned.

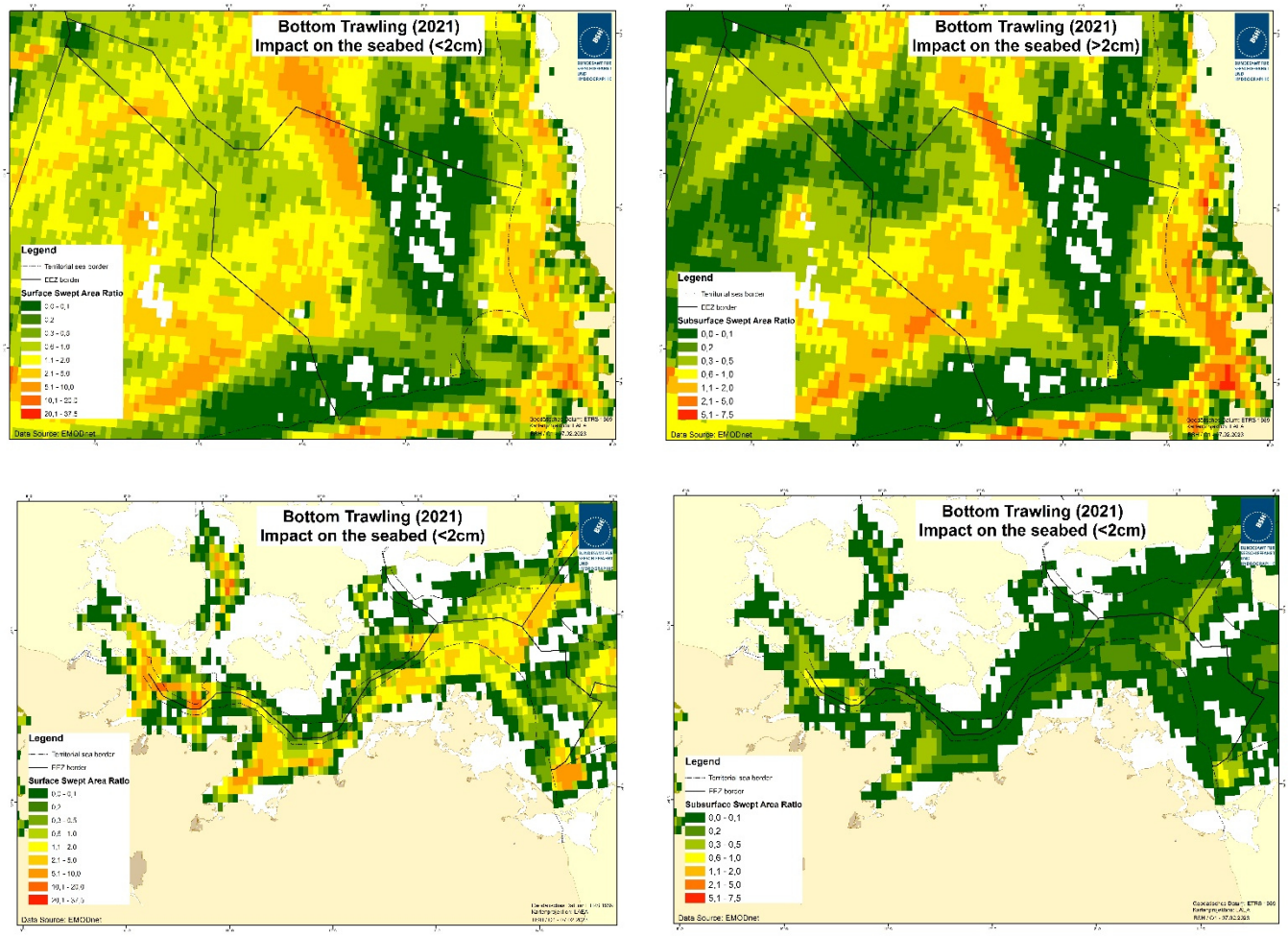

Figure 27: Swept Surface Area and Swept Surface Area Ratio (SAR) for the North Sea: (Data basis: 2017-2020), Baltic Sea (data basis 2019-2020) (International Council for the Exploration of the Sea, ICES, 2021)(maps: BSH)

2.6 Scientific uses

The contents in this section are mainly based on information and data from the following sources:

- Federal Maritime and Hydrographic Agency
- Thünen-Institute
- European Marine Observation and Data Network (EMODnet)

Background

Scientific use takes place in the entire EEZ of the North Sea and the Baltic Sea. A distinction must be made between the type and objective of use:

- General marine monitoring and scientific research.
- Investigations of the seabed and the marine environment in connection with infrastructure projects and other economic uses.

Research activities are carried out

- at fixed measuring stations with corresponding permanently installed infrastructure;
- at temporarily installed measuring stations;
- by sampling in the course of regular marine scientific research cruises or fishery research trips, wide-area investigations for infrastructure projects or other uses such as sand and gravel extraction, etc.

Temporary measurements are carried out at temporary measuring stations[33], at measuring buoys or pods, mostly in the context of investigations in connection with infrastructure projects by the project developers, or by the BSH in the context of "preliminary site investigations" of areas for offshore wind energy (esp. on the marine environment, etc.) or other scientific research projects.

The BSH maintains the MARNET monitoring network with fixed monitoring stations in the EEZ and in the territorial sea of the North Sea and the western Baltic Sea. These are 9 automatically measuring stations and 7 additional buoys that only measure the sea state. Marine environmental monitoring helps to predict the impact of natural and man-made (anthropogenic) changes on marine resources, on coasts and on coastal populations.

[33] Measuring stations are fixed or floating structures or technical devices on the seabed that are used for marine investigations of the environment or its components.

Figure 28: MARNET Station Großboje Fehmarn Belt in the Baltic Sea (© BSH)

In the course of the plans for the expansion of renewable energies at sea, three research platforms have been erected in the North Sea and Baltic Sea (FINO1 (2003), 2 (2007), 3 (2009)), in the immediate vicinity of planned and applied for larger offshore wind farms. These serve to collect meteorological and oceanographic data as well as ecological research accompanying the technical installations.

Figure 29: MARNET Station North Sea Buoy III (© BSH)

Large-scale surveys and investigations are carried out with ship support (for counts of marine mammals and seabirds also by flight) for ecological studies, with technical equipment for the investigation of the subsurface in the course of subsoil investigations, seismic, etc.

But extensive sampling is also carried out within the framework of research campaigns such as the overall survey of the German North Sea by the BSH.[34]

[34] See the BSH website

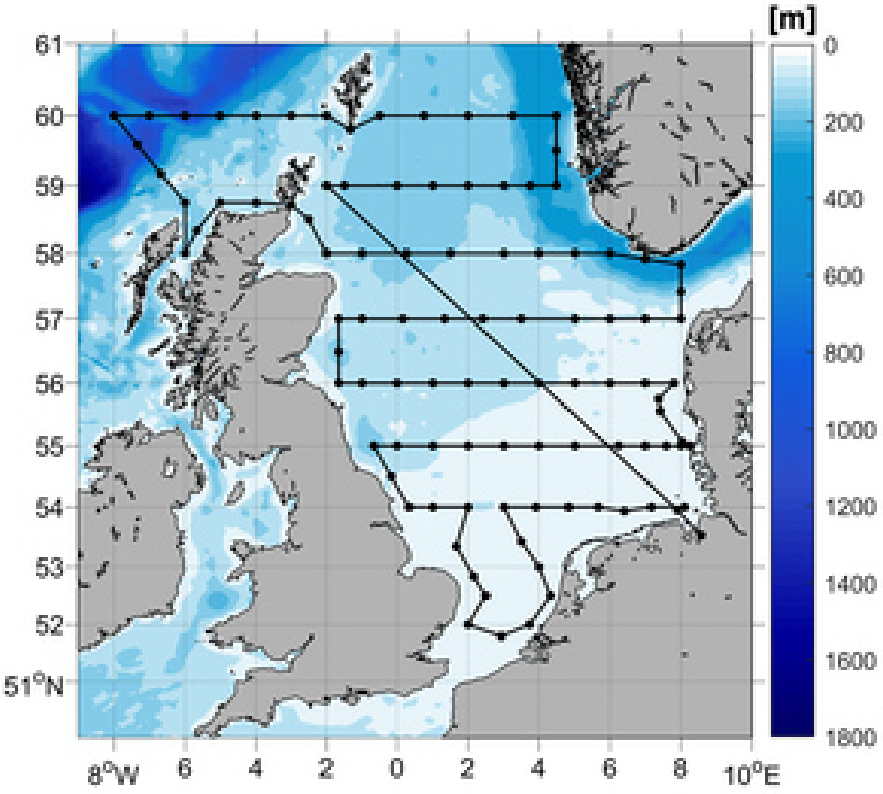

Figure 30: Route and stations of the overall survey of the North Sea in July 2021, Source: Manuela Köllner (BSH).

Figure 31: FINO1 research platform
(© FuE-Zentrum FH Kiel GmbH)

Regular ship-based surveys are carried out within the framework of fishery research, especially at the Thünen Institutes, with sampling on the one hand within fixed scientific research areas by trawl tracks/hauls and on the other hand by sampling at other defined measuring points.

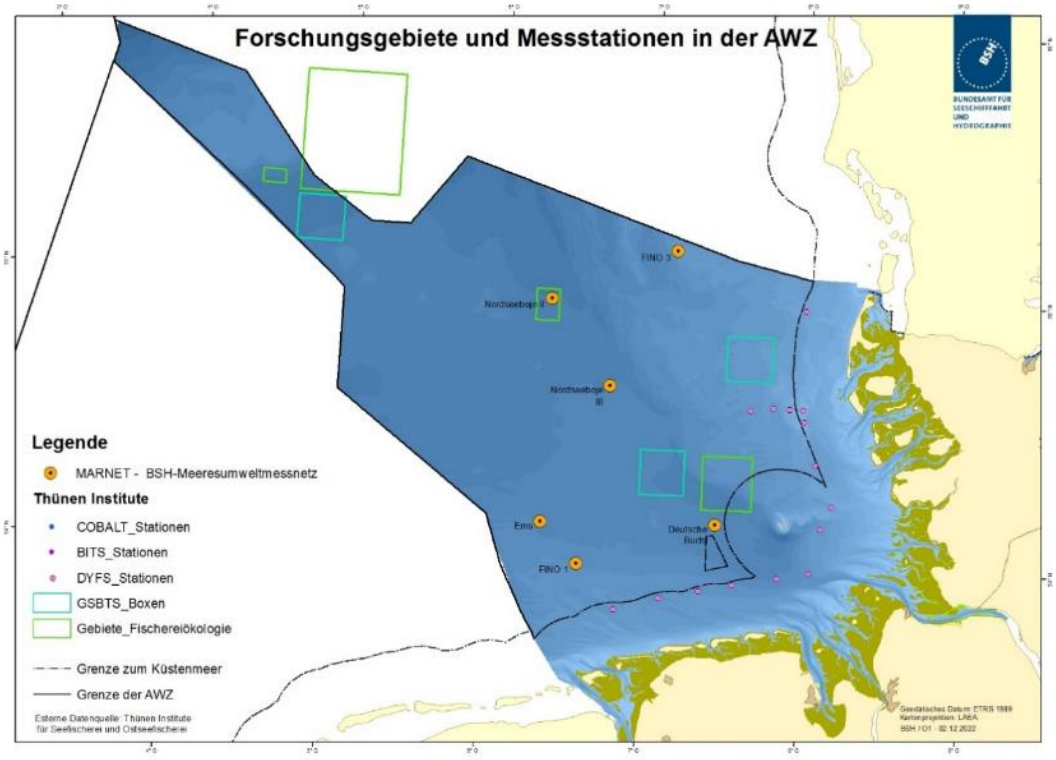

Figure 32: Scientific research areas and fixed or regularly sampled monitoring stations in the EEZ (North Sea)

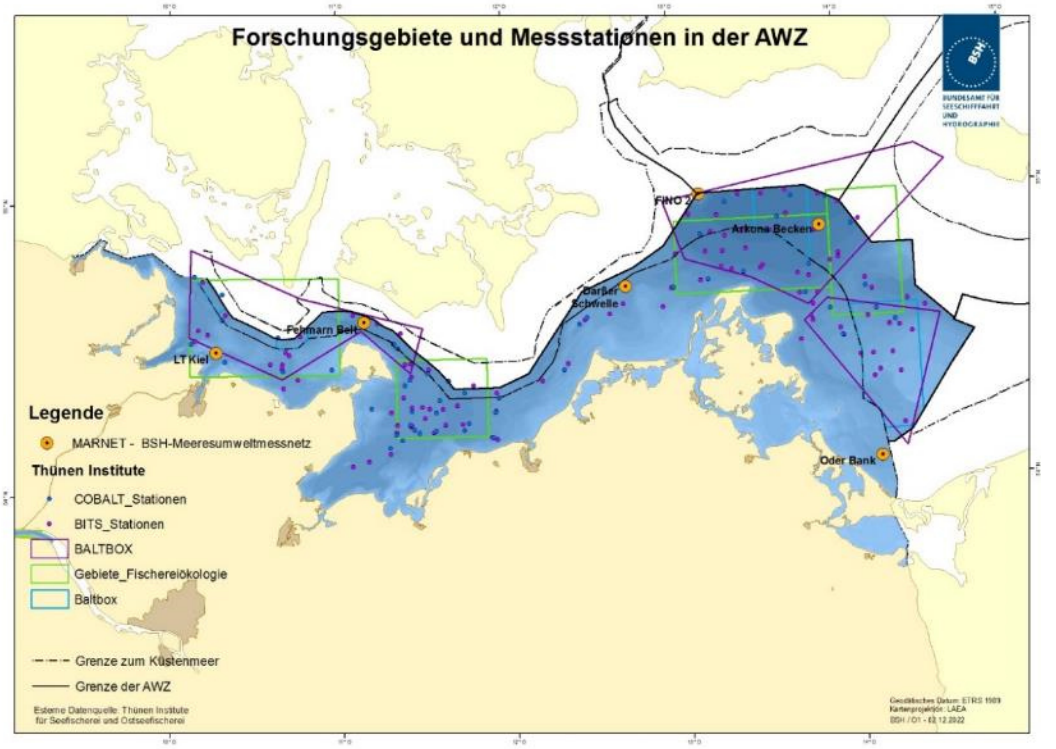

Figure 33: Scientific research areas and fixed or regularly sampled monitoring stations in the EEZ (Baltic Sea)

Situation and development

In the EEZ 2021 maritime spatial plan, the scientific research reservation areas for fishery research were spatially adjusted compared to the 2009 maritime spatial plans: Due to changes in the layout of the "Baltic boxes" of the TI in the Baltic Sea and as a result of the final departmental consultations, the areas have been redefined in some places; in some places there are now also overlaps with priority areas or reservation areas for OWE. Where, for example, a reservation area for OWE overlaps with the scientific research area in the sense of "multiple use", fishery research should continue to be possible to the same extent as before.

A general principle for taking into consideration the requirements of scientific research in relation to other economic uses has been included in the maritime spatial plan. However, it is also foreseeable that the plans for the expansion of offshore wind energy will necessitate the relocation of the MARNET stations North Sea Buoy 2 and Arkona Basin Buoy. The concrete time will depend on the respective start of construction in the affected area; before that, very cost-intensive investigations to determine suitable alternative locations must be carried out, as well as parallel measurements over several years at the new and old locations in order to be able to guarantee the continuity of the long-term measurement series. For the study on the Arkona Basin Buoy, the awarding of the contract to the IOW as operator of the station was prepared for the BSH.

The topic of multiple use, especially of offshore wind energy and other uses, is also addressed in research projects that have already been completed or are ongoing, e.g.:

- In the Horizon2020-funded scientific research project UNITED[35] (2020 - 2023), the operation of mussel and algae cultures together with wind energy production plants is being tested in the German case study.
- As part of the project "Offshore wind farms in the context of ecosystem-based spatial planning and use"[36] (2018-2020), the Thünen Institute of Sea Fisheries investigated, among other things, in and at the Meerwind OWP, how suitable the immediate environment of the wind farm is for sustainable aquaculture.
- In the SeaUseTip project[37] (2019 - 2023), the impacts of changes in the socio-economic system of the North Sea region, among others, are being investigated, including the consequences of the expansion of offshore wind energy for fisheries.

[35] https://www.h2020united.eu/

[36] https://www.thuenen.de/de/fachinstitute/seefischerei/projekte/offshore-windparks-im-kontext-oekosystembasierter-raumplanung-und-nutzung

[37] https://www.seausetip.de/

- Within the framework of extensive collaborative projects[38] on nature conservation areas in the North Sea and Baltic Sea (2020 - 2023), the exclusion of bottom-dwelling fisheries will be examined, among other things.

2.7 Security aspects

The explanations in the safety aspects section are based on the following sources:

- Federal Ministry of Defence (BMVg) (2016): White Paper 2016 on Security Policy and the Future of the Federal Armed Forces.
- Naval Command (2018): Standing Fleet Order No. 012. Exercise areas for naval and air forces. Rostock

The following section describes the security aspects and their relation to maritime spatial planning in the following points:

- The military exercise areas for national and alliance defence in the North Sea and Baltic Sea.
- The exercise areas and the designations in the EEZ 2021 maritime spatial plan.
- Situation and development.

Background

With the changes in the security policy framework since 2014, there has been a growing return to the importance of the Baltic Sea region.

This also goes hand in hand with an increase in its own activities, especially in the Baltic Sea region: In the meantime, however, no longer only as an exercise area for training, in-exercise holding and operational preparation for missions outside German home waters, but rather also again as a potential operational area.

The exercise requirements of the German naval and maritime air forces as well as the German air and land forces in and over the sea have increased in recent years. In addition to training and exercises for basic operations, the military activities include continuous operations and foreign deployments to test new procedures and systems.

Military exercise areas

The realisation of national defence and alliance obligations includes training, exercise and testing activities. In the EEZ, military exercise areas are established on the basis of the United Nations Convention on the Law of the Sea. In the German territorial seas and the German EEZ in the North Sea and Baltic Sea, special exercise areas in and over the sea have been established for the armed

[38] https://www.mgf-nordsee.de/; https://www.io-warnemuende.de/dam-mgf-ostsee-start.html

forces in the past. These are shown in Figure 34 [39] and Figure 35 [40].

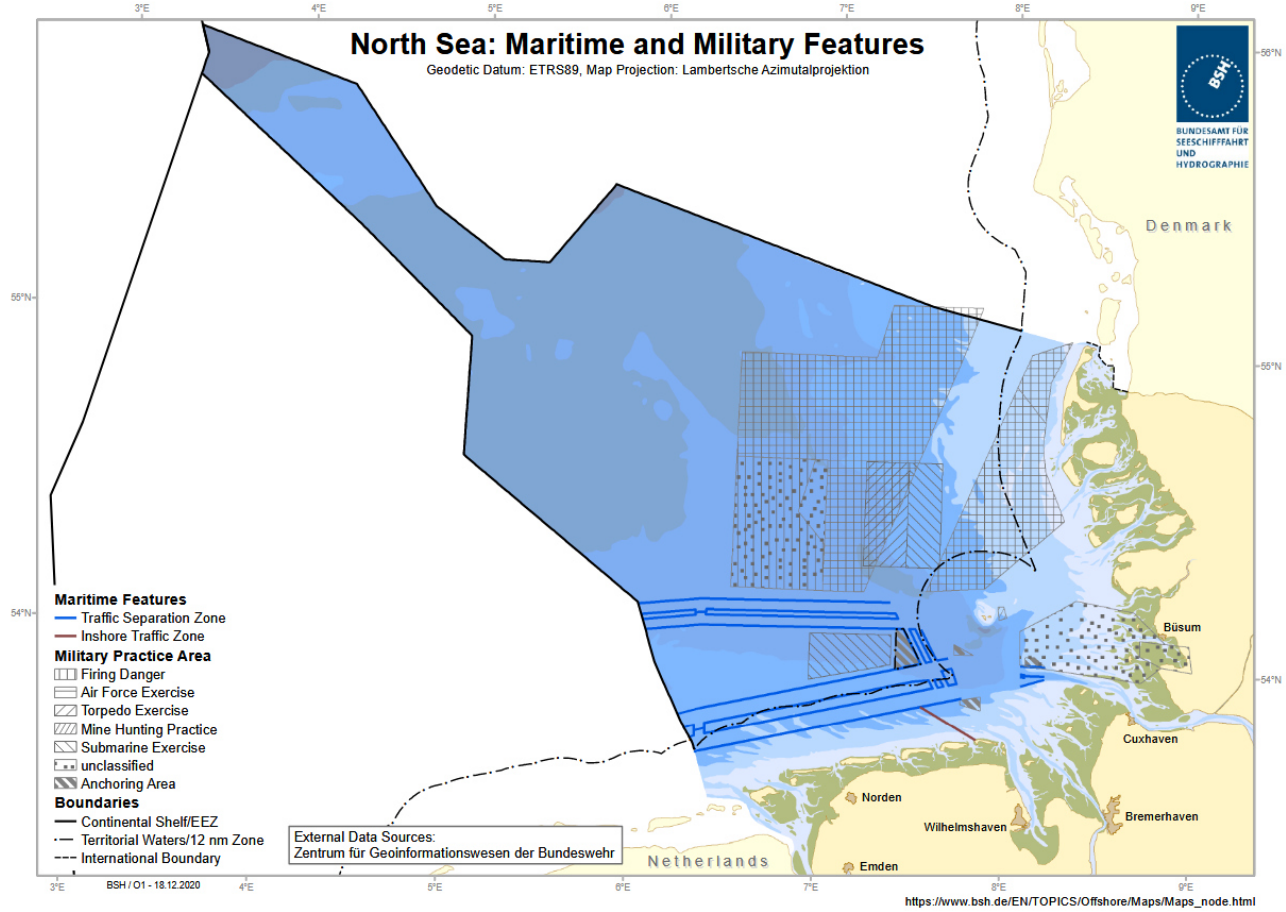

Figure 34: Shipping and national defence in the North Sea (source: BSH)

[39] Source: https://www.bsh.de/DE/THEMEN/Offshore/Nutzungskarten/_Anlagen/Downloads/Nordsee-Seeverkehr_Landesverteidigung.pdf?__blob=publicationFile&v=6 (17.06.2022)

[40] Source: https://www.bsh.de/DE/THEMEN/Offshore/Nutzungskarten/_Anlagen/Downloads/Ostsee-Seeverkehr_Landesverteidigung.pdf?__blob=publicationFile&v=13 (17.06.2022)

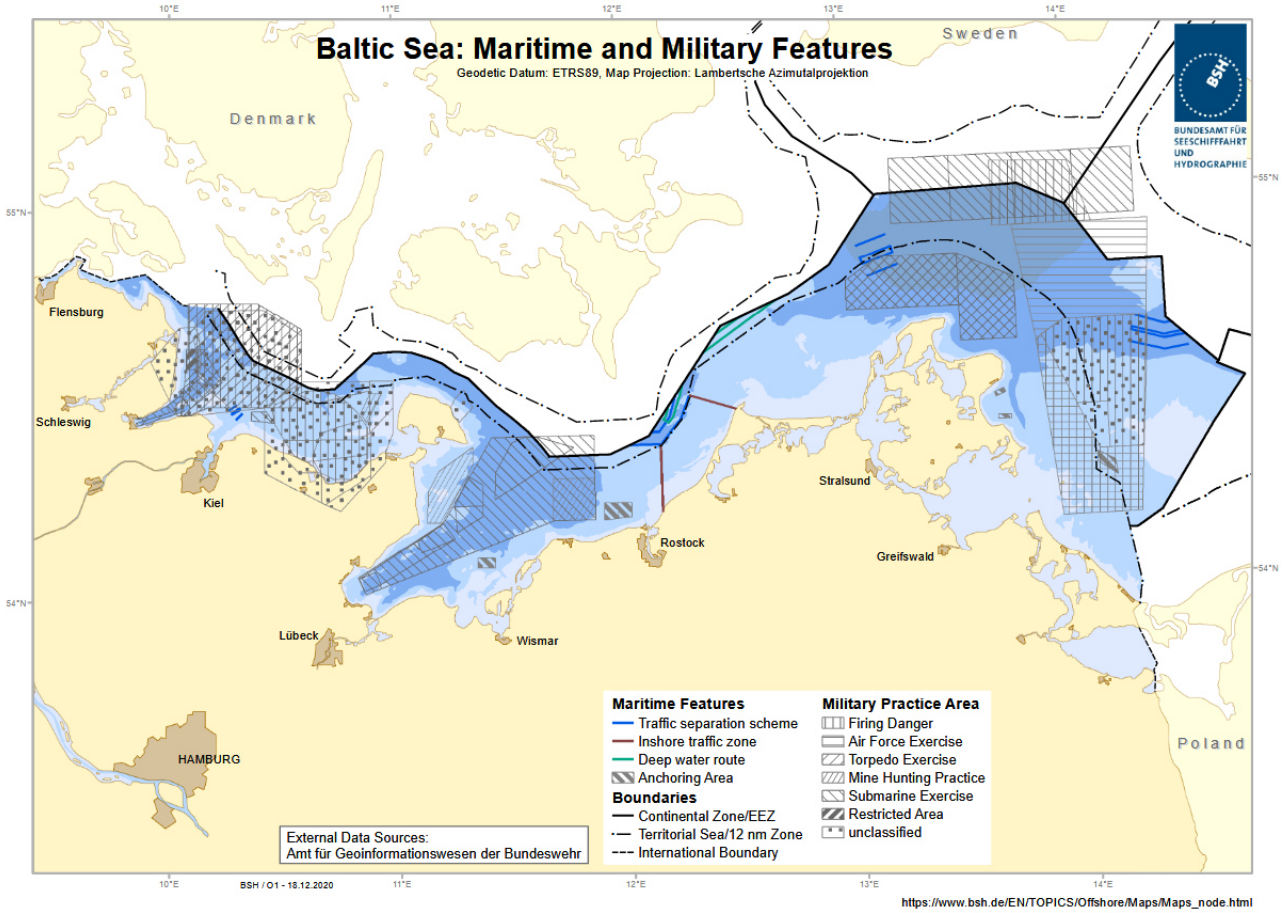

Figure 35: Shipping and national defence in the Baltic Sea (source: BSH)

The areas can be categorised into the following types according to the exercises taking place there (Hackstein, 2012):

- Artillery firing areas;
- Submarine diving areas;
- Barrage exercise areas;
- Mine-hunting exercise areas;
- Torpedo firing ranges;
- Water bombing areas;
- Amphibious exercise areas;
- Air exercise areas;
- Aerial firing ranges.

The exercise areas may concern the air space, the water surface or areas under water.

Artillery firing areas, torpedo firing areas, submarine diving areas, (air) danger areas above sea level are available to the armed forces in the German EEZ of the North Sea and Baltic Sea.

Figure 36: A mine-hunting boat of the German Navy in manoeuvre (© 2020 German Armed Forces/Friedrich Weishaupt)

In the areas, the navy and the air force practice firing with barrel weapons (machine gun, on-board gun) against air and sea targets, with missiles and with light and heavyweight torpedoes. Furthermore, the use of electronic countermeasures or decoys, mine laying and mine hunting (sonar use) are practiced.

The navy conducts firing exercises with different types of ammunition throughout the year. A detailed list is subject to military secrecy. In principle, firing and blasting can be carried out anywhere at sea, provided the necessary conditions are met (water depths, weather conditions, sea area checked and free of vehicles). Firing exercises are predominantly conducted within the boundaries of the artillery firing ranges. Exercises outside these areas are limited to exceptions with single shots. The German navy does not conduct regionally related analysis for consumption of different ammunition types and calibres. In general, practice ammunition consisting of metal and concrete as well as ammunition that self-destructs in the air is used in the artillery firing ranges. Apart from a few exceptions, the airborne combat units of the German Air Force use only practice ammunition in the exercise areas.

Military exercise areas in the EEZ 2021 maritime spatial plan

Pursuant to § 2 Paragraph 2, Number 7 of the ROG, the spatial requirements of defence and civil protection must be taken into account. According to § 17 Paragraph 1 of the ROG, security aspects and thus defence concerns must be taken into account in spatial planning designations in the German EEZ. This should ensure that the German Armed Forces have sufficient spatial and legal opportunities for military purposes (e.g. for training, exercise or mission preparation) that are required in the context of military as well as other mandated missions.

Figure 37: A German Navy corvette fires an aerial target missile (© 2019 German Armed Forces/Marcus Mohr).

In the EEZ 2021 maritime spatial plan, the reservation areas for military are defined in the North Sea EEZ: North Sea artillery range, NW Heligoland torpedo firing area, submarine firing areas (Alfa, Bravo, Charlie, Delta), Weser submarine firing area and the (air) danger areas above sea level (ED-D 44, ED-D 46, ED-D 41 A). In the Baltic Sea, these are: Western Baltic Sea artillery range, Pomeranian Bay artillery range, Trolls submarine range, Valkyria submarine range, NATO submarine ranges (Bravo 2, Bravo 3, Bravo 4), Western Bornholm artillery range, Military (air) danger areas over sea from sea level (ED-D 47 A, ED-D 47 B, ES-D 140, ED-D 19 A, ED-D 19 B).

Development 2021

The air danger area ES-D 140 (Swedish air space) and the congruent artillery firing area Bornholm-West under Danish control were dissolved. Both areas are partly located in the German EEZ of the Baltic Sea. Figure 38 shows the location of the two exercise areas northeast of the island of Rügen and west of the island of Bornholm.

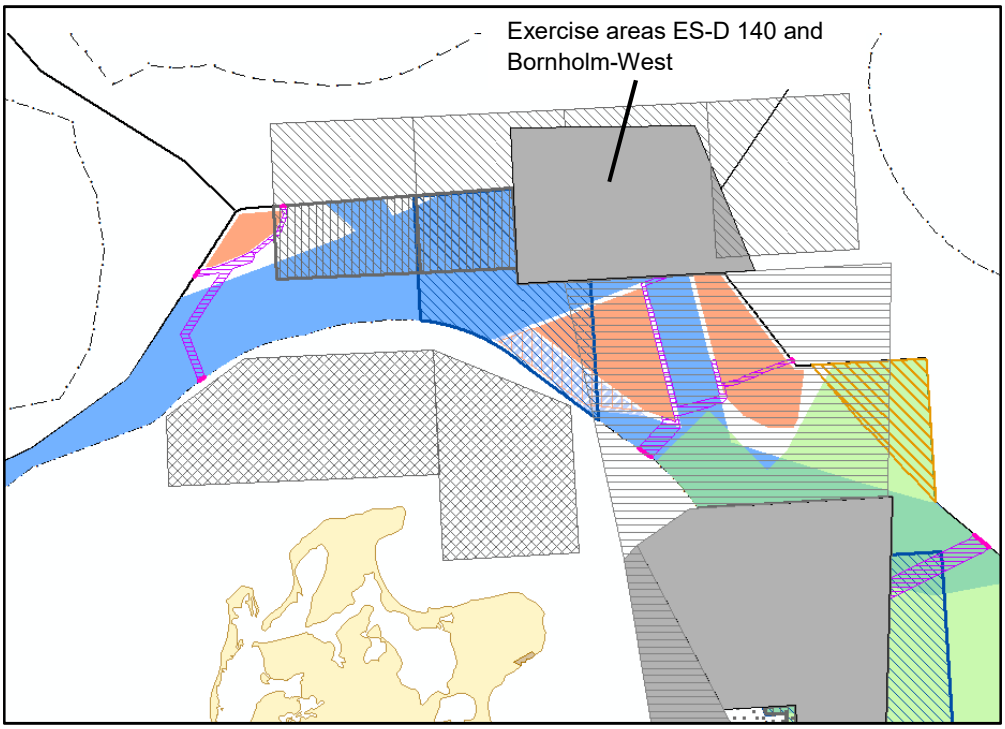

Figure 38: Location of the exercise areas ES-D 140 and Bornholm-West (map basis: EEZ 2021 maritime spatial plan, BSH, coordinates of the military exercise areas: Naval Command)

2.8 Other concerns

3.8.1 Air traffic

Air transport was included as a concern for the first time in the EEZ 2021 maritime spatial plan. In particular, the extensive expansion of the fixed infrastructure in the German EEZ leads to increasing traffic by helicopter, for example to and from converter stations, for which corresponding landing decks are built or facilities are provided for access to the installations by winch. Requirements for structural installations serving general aviation safety are also increasingly important subjects of regulation. A new standard for offshore aviation (SOLF) is being developed under the auspices of the BSH.

3.8.2 Recreation

For the EEZ, the keyword "recreational use" refers in particular to recreation and tourist shipping. Diving tourism, on the other hand, does not play a major role due to the distance to the coast. In the EEZ 2021 maritime spatial plan, a principle was included to allow small watercraft up to 24 m in length, including sailing and motor boats that should pass through offshore wind farms. However, this requires a general decree by the Waterways and Shipping Administration that defines the exact regulations. Such a general order was issued in 2021, for example, for the offshore wind farms

Meerwind South/East and North Sea East as well as the converter platforms HelWIn alpha and HelWin beta.[41]

3.8.3 Fixed link across the Fehmarn Belt crossing

In the EEZ 2021 maritime spatial plan, the Fixed Fehmarn Belt crossing[42], a tunnel construction between Fehmarn and the Danish island of Lolland, which is scheduled for completion in 2029, was included for information purposes. In autumn 2021, the groundbreaking ceremony for this took place on the German side, after enforceable construction law had been created in Germany in 2020. One point of contention after the start of construction was the biogenic reefs present in German waters, the destruction of which was approved in the course of a plan amendment by the Schleswig-Holstein Transport Planning Approval Procedure Authority (APV). According to environmental organisations, the required compensation measures by the Danish company Femern A/S are not sufficient and would contradict German nature conservation law. They also fear that the construction will have further adverse effects on the Fehmarnbelt nature conservation area and protected species such as the harbour porpoise.

2.9 Other concerns

2.9.1 Missile launch site

The explanations in the Safety aspects section are based on the following sources:

- International maritime law assessment (Proelß, A., 2021)
- Documents on project presentation (Federation of German Industries and the German Offshore Spaceport Alliance)

Situation and development

At the end of 2019, the Federation of German Industries (BDI) and the German Offshore Spaceport Alliance presented the concept for an offshore rocket launch site in the German EEZ in the North Sea. The most North-western region of the German EEZ was identified as a suitable area. So-called micro-launchers, small rockets that launch small satellites into Earth orbit, were to be launched on ship-based floating launch pads, i.e. not from fixed installations and infrastructure. Bremerhaven was planned as the supply port. Five ships would be used to carry out a launch, and 20 to 25 launches per year were planned. The project was supported by the BDI; the Federal Ministry of Economics held out the prospect of state funding.

From the point of view of maritime spatial planning for the German EEZ, the BSH issued a comment on the project in September 2021, citing both spatial restrictions for a potential launch site in the extreme northwest of the so-called North-western region of the German EEZ and risks for other

[41] https://www.elwis.de/DE/Seeschifffahrt/Offshore-Windparks/Nordsee-05.pdf?__blob=publicationFile&v=2

[42] https://www.deges.de/projekte/projekt/neubau-fehmarnbeltquerung/

marine uses in the German EEZ as well as in the adjacent marine areas of neighbouring countries. For example, due to the space required for a sufficient safety area during the preparation and execution of missile launches, the area beyond the Dogger Bank nature conservation area designated for offshore wind energy would no longer be usable as such, either partially or completely (depending on the position of the launch site), thus jeopardising the expansion targets. In addition, there are risks for the marine environment as well as for other uses such as aviation and shipping due to the regular transport of hazardous goods between the port and the launch site, but also due to possible accidents during the launch. In neighbouring marine areas, installations for oil and gas extraction could be endangered.

3.9.2 Dredged material transport

The explanations in the safety aspects section are primarily based on:

- Hamburg Port Authority (HPA) application documents (June 2022).

Situation and development

The Hamburg port area must be dredged regularly to maintain the required water depths. On the one hand, sediments from less polluted marine material that comes into the port with the tide from the North Sea are taken up and relocated or transferred to the North Sea. Heavily polluted sediments, on the other hand, are treated and deposited on land. Currently, several transfer points are used, each of which is subject to restrictions in terms of time, space, quality and quantity: three redistribution points at different locations on the Tidal Elbe and one transfer point at buoy E3 near Helgoland. At the former, a larger amount of the material is transported back upstream and sedimented. In the future, the HPA plans to move dredged material from the Port of Hamburg to a site in the North Sea EEZ that is secured for the longer term. At the same time, a further transfer site in the Hamburg Outer Elbe near Scharhörn is being examined.

Preliminary investigations for a transfer site in the EEZ west of Helgoland were already carried out by the HPA in 2017/2018, and initial coordination discussions with the BSH as the licensing authority under the HoheSeeEinbrG took place from 2018. In the consultation procedure for the 2021 maritime spatial plan, the HPA had requested that the project be taken into consideration. However, since no application had yet been submitted and no conflicting use was to be defined in the planned sea area in the EEZ 2021 maritime spatial plan (priority area for shipping), this was not done. However, the matter will be pursued further. A formal application for approval has been submitted to the BSH since 24 June 2022.

The project executing agency does not expect any adverse effects from the location of the transfer area in the priority area for shipping, as the respective - albeit possibly daily - dumping operations would only take a few minutes each.

3 Marine environment

As part of the preparation of the maritime spatial plan, a strategic environmental assessment was carried out and environmental reports were published to assess the impacts of the designations of the spatial development plan, in each case for the North Sea[43] and the Baltic Sea[44].

The environmental reports of the maritime spatial plans for 2021 are available on the BSH website[45].

No current findings and assessment bases are available for the protected interests considered in the environmental reports for the 2021 assessment period with reference to the uses examined.

Third-party reports

In 2021, the Federal Agency for Nature Conservation (BfN) published a guideline for the large-scale delineation and mapping of the habitat type "reefs" in the German Baltic Sea (BfN, 2021).

The guideline serves as a new standardised basis for mapping within the framework of the reporting obligations according to Art. 17 Habitats Directive and the assessment of descriptor 6 "seabed" of the MSFD and for the biotope register according to § 30 para. 7 BNatSchG and is addressed to the competent technical authorities (BfN, 2021).

After surveying the seabed, a method for recording rock fields was developed. The guide specifies how geogenic reefs must be delineated using geographical information systems (GIS) (BfN, 2021).

The guideline thus supplements the BfN's mapping instructions for reefs (BfN, 2018), which project developers must use for the preparation of application documents.

Data collection

BSH overall survey of the North Sea 2021

In the summer of 2021, the BSH carried out the 24th Overall survey of the North Sea. The new BSH survey, wreck search and scientific research vessel ATAIR was used for the first time during the three-week research cruise covering 3,500 nautical miles.

During this year's voyage, the scientific research team recorded depth profiles from the seabed to the water surface at almost 100 stations to measure temperature, salinity, density, turbidity, chlorophyll and oxygen content of the water.

With the help of the collected data, the BSH observes and evaluates the current state of the North Sea. Some data is already publicly available on the BSH's GeoSeaPortal[46].

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[43] https://www.bsh.de/DE/THEMEN/Offshore/Meeresraumplanung/Raumordnungsplan_2021/_Anlagen/Downloads/Umweltbericht_Nordsee_Endfassung.pdf?__blob=publicationFile&v=6

[44] https://www.bsh.de/DE/THEMEN/Offshore/Meeresraumplanung/Raumordnungsplan_2021/_Anlagen/Downloads/Umweltbericht_Ostsee_Endfassung.pdf?__blob=publicationFile&v=7

[45] https://www.bsh.de/DE/THEMEN/Offshore/Meeresfachplanung/meeresfachplanung_node.html

[46] https://www.bsh.de/DE/DATEN/GeoSeaPortal/geoseaportal_node.html

4 Overarching topics

Expert report by the Federal Environment Agency on the development of offshore wind energy

An expert report by the Federal Environment Agency (UBA, 2021 - 2024, in progress) deals with technical, specialist and, in part, legal issues relating to the development of offshore wind energy. In particular, an overview of possible developments in turbine technology with regard to potential areas should be given, but also on the state of scientific research with regard to shadowing and wake effects, taking into consideration the EEZ 2021 maritime spatial plan and its influence on the revision of sectoral planning, as well as an analysis with regard to spatial potentials but also risks due to multiple use of areas.

Assessing the balance between nature and people in European seas: Maritime Spatial Planning in the Baltic; World Wide Fund For Nature (WWF)

In March 2022, WWF published the report "Assessing the balance between nature and people in European seas: Maritime Spatial Planning in the Baltic" an evaluation of nine marine spatial plans in the Baltic Sea (WWF, 2022).

The application of the ecosystem-based approach in the maritime spatial plans of the Baltic Sea countries was examined by WWF and the results published in March 2022[47]. The approach divides various sub-items into four main categories:

- Inclusion of nature;
- Socio-economic considerations;
- Good ocean governance;
- Comprehensiveness of the complete MSP process.

The EEZ 2021 maritime spatial plan for the German EEZ received an above-average rating here. However, the indicators presented in the technical annexe[48] show that misjudgements may have been made and relevant provisions of the EEZ 2021 maritime spatial plan were not included in the assessment.

[47] WWF 2022: https://www.wwf.eu/?6106591/Baltic-countries-lead-EU-for-sustainable-sea-space-management-but-still-put-nature-at-risk

[48] WWF 2022: https://wwwwwfbalticorg.cdn.triggerfish.cloud/uploads/2022/03/wwf_msp-assessment_final-annex_01mar.pdf

Report from the Commission to the European Parliament and the Council on progress in the implementation of Directive 2014/89/EU establishing a Framework for Maritime Spatial Planning[49]

The report, published on 3 May 2022, shows the state of implementation of the Maritime Spatial Planning Directive and the status of plan-making in EU member states. The requirements of the Directive for maritime spatial plans are fulfilled by Germany. Furthermore, the role of maritime spatial planning in supporting the European Green Deal is highlighted and further potentials and challenges for the future of maritime spatial planning are identified.

BirdLife International: Are EU Member State's Maritime Spatial Plans fit for Nature and Climate? Technical Report – Approach and Main Findings (June 2022)

In June 2022, Birdlife International published[50] the investigation "Are EU Member State's Maritime Spatial Plans Fit for Nature and Climate?"; the maritime spatial plans of Germany, Belgium, Latvia and Sweden were part of the report.
However, the indicators presented in the German country report[51] show that misjudgements may have been made and relevant provisions of the EEZ 201 maritime spatial plan were not included in the considerations. Specific features of the national planning frameworks do not seem to have been fully taken into account and details have not been addressed.

[49] EU COM 2022: COM(2022) 185 final; https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52022DC0185

[50] https://www.birdlife.org/wp-content/uploads/2022/06/Birdlife-Maritime-Spatial-Plan-Technical-report_web.pdf

[51] Birdlife International 2022: https://www.birdlife.org/wp-content/uploads/2022/06/Birdlife-Maritime-Spatial-Plan-Germany_web.pdf

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Annexe

Annexe 1: Shipping traffic in SN1 broken down by ship length and ship type

Annexe 2: Shipping traffic in SN2 broken down by ship length and ship type

Annexe 3: Shipping traffic in SN10 broken down by ship length and ship type

Annexe 4: Shipping traffic in SO1 broken down by ship length and ship type

Annexe 1: Shipping traffic in SN1 broken down by ship length and ship type

Length / ship type	Bulk carrier	Chemical tanker	Container ship	Crude oil tanker	Fast ferry	Fishing ship	Gas tanker	General cargo ship	Oil products tanker	Other ship	Passenger ship	Pleasure boat	Ro-Ro cargo ship	Support ship	**Total**
0-24					6	281			6	69		17		59	**438**
25-49	2				33	28		11		155	4	5		519	**757**
50-74	7	18	2			12		97	47	384	1	12		76	**656**
75-99	103	105	6			8	152	6199	531	48		8	3	100	**7263**
100-124	137	138	47			1	261	2106	1376	22	1	5	174	23	**4291**
125-149	36	7	714	1			11	638	143	11	11		135	6	**1713**
150-174	56	3	1014					148	25	6		4	169	1	**1426**
175-199	346	3	157					164	40		9		781	4	**1504**
200-224	89		402					89			7		617		**1204**
225-249	89		231	3				24	2		4		239		**592**
250-274	1		384	2							7		20		**414**
275-299	7		643					60			8		54		**772**
300-324	6		385							1	4				**396**
325-349			357								1				**358**
350-374			291												**291**
375-399			287												**287**
400-425			196												**196**
> 425															
Total	**879**	**274**	**5116**	**6**	**39**	**330**	**424**	**9536**	**2170**	**696**	**57**	**51**	**2192**	**788**	**22558**

Annexe 2: Shipping traffic in SN2 broken down by ship length and ship type

Length / ship type	Bulk carrier	Chemical tanker	Container ship	Crude oil tanker	Fast ferry	Fishing ship	Gas tanker	General cargo ship	Oil products tanker	Other ship	Passenger ship	Pleasure boat	Ro-Ro cargo ship	Support ship	**Total**
0-24						122				3				2	**127**
25-49						255		6		35		2		125	**423**
50-74	2					15	8	10	11	159		1		37	**243**
75-99	1	7	3			7	6	510	152	21				24	**731**
100-124	3	29	1				155	83	583	3			14	19	**890**
125-149	1	17	82	1			30	78	782	23	2		2	1	**1019**
150-174	6	16	91				38	9	104	7				1	**272**
175-199	90	12	68	3			3	12	205				157		**550**
200-224	34		43						1				153		**231**
225-249	138		42	69			4	3	4				8		**268**
250-274	12		50	92					1				2		**157**
275-299	19		319	19				4			33		2		**396**
300-324	9		221								1				**231**
325-349			108	7				2			1				**118**
350-374			218					6							**224**
375-399			115												**115**
400-425			72												**72**
> 425															
Total	**315**	**81**	**1433**	**191**		**399**	**244**	**723**	**1843**	**251**	**37**	**3**	**338**	**209**	**6067**

Annexe 3: Shipping traffic in SN10 broken down by ship length and ship type

Length / ship type	Bulk carrier	Chemical tanker	Container ship	Crude oil tanker	Fast ferry	Fishing ship	Gas tanker	General cargo ship	Oil products tanker	Other ship	Passenger ship	Pleasure boat	Ro-Ro cargo ship	Support ship	**Total**
0-24						50			8	5				1	**64**
25-49					1	449				6		1	1	75	**533**
50-74	16	8	4			17	5	39		215		6		27	**337**
75-99	69	29	60			9	196	1846	213	10	2	4	12	54	**2504**
100-124	49	15	82			1	320	1381	600	9	1	1	116	24	**2599**
125-149	76	26	841	3			56	736	662	6	3		214	38	**2661**
150-174	191	14	463				113	279	221	3	2		198	36	**1520**
175-199	1436	67	443	21			62	207	1529	1	5	1	276	1	**4049**
200-224	369		422	4			3	33	15		1		492		**1339**
225-249	836		174	432			19	16	43	2	10		368		**1900**
250-274	87	3	26	441				1	11	2	2		1		**574**
275-299	33		27	35			37	1		6	5				**144**
300-324	4						19				3				**26**
325-349			2	29							4				**35**
350-374			1												**1**
375-399			4												**4**
400-425			43												**43**
> 425						1									**1**
Total	**3166**	**162**	**2592**	**965**	**1**	**527**	**830**	**4539**	**3302**	**265**	**38**	**13**	**1678**	**256**	**18334**

Annexe 4: Shipping traffic in SO1 broken down by ship length and ship type

Length / ship type	Bulk Carrier	Container Ship	Dredging Vessel	Fishery Research Vessel	Fishing Vessel	Gas Tanker	General Cargo Ship	Military	Offshore Support Vessel	Other Ship	Other Work Vessels	Passenger	Research Survey Vessel	Ro-Ro Cargo	Ro-Ro/Pax	Sailing	SAR Vessel	Tanker	Tug	**Total**
0-24					48											1			18	**67**
25-50			3	4	67			51	1		3		2			1	11		68	**211**
50-75					11		125	6	13		51					6				**212**
75-100	17	3			1	33	4524	5	7		7							209		**4806**
100-125	30	131				61	2338				15			292		2		760		**3629**
125-150	29	471				7	652		6		9	1		113	23			1181		**2492**
150-175	114	1690				162	411		4		2			586	536			265		**3770**
175-200	1110	569				26	274		3					1043	88			1651		**4764**
200-225	312	509				4	45							693	709			17		**2289**
225-250	626	222				7	3					5						522		**1385**
250-275	49	38					4					2		13				699		**805**
275-300	6	13				38						2						26		**85**
300-325						2						33								**35**
325-350		1																		**1**
375-400		45																		**45**
400-425		1																		**1**
N/A					1			3		164						1				**169**
Total	**2293**	**3693**	**3**	**4**	**128**	**340**	**8376**	**65**	**34**	**164**	**87**	**43**	**2**	**2740**	**1356**	**11**	**11**	**5330**	**86**	**24766**