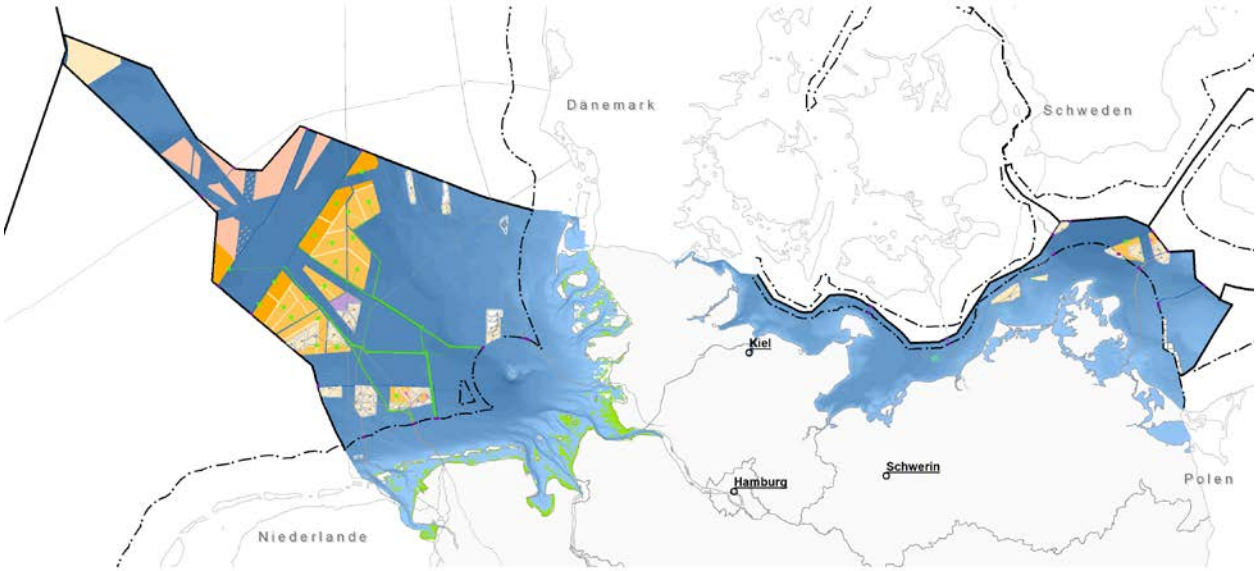
BUNDESAMT FÜR
SEESCHIFFFAHRT
UND
HYDROGRAPHIE

Preliminary Draft
Site Development Plan



Hamburg, 1st September 2023

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AISAutomatic	Identification System
EEZ	Exclusive Economic Zone
BAW	Federal Waterways Engineering and Research Institute
BfN	Federal Agency for Nature Conservation
BGBl	Federal Law Gazette
BMDV	Federal Ministry of Digital Affairs and Transport
BMUV	Federal Ministry for the Environment, Nature Conservation, Nuclear Safety and Consumer Protection
BNetzA	Federal Network Agency
BSH	Federal Maritime and Hydrographic Agency
cm	Centimetre
DC	Direct current
EU	European Union
FEP	Land Development Plan
GDWS	Directorate-General for Waterways and Shipping
GIS	Gas-insulated switchgear
GW	Gigawatt
HVDC	High-voltage direct current transmission
K	Kelvin
km	Kilometre
km²	Square kilometre
kV	Kilovolt
m	Metre
MARPOL	International Convention for the Prevention of Marine Pollution from Ships (en. International Convention for the Prevention of Marine Pollution from Ships, also MARPOL (from marine pollution)).
MHz	Megahertz
MW	Megawatt
NVP	Network interconnection point
ONAS	Offshore grid connection system
OWP	Offshore wind farm
PFAS	per- and polyfluorinated chemicals
QI, QII, QIII, QIV	Quarters of a calendar year
ROP	Spatial Development Plan
SF6	Sulphur hexafluoride
sm nautical	mile
SMV	System Maritime Traffic Engineering
SOLF	Standard Offshore Aviation for the German Exclusive Economic Zone
UNCLOS United	Nations Convention on the Law of the Sea
SEA	Strategic Environmental Assessment
t	tonne
TBT	Tributyltin
TCM	Transmission Capacity Management
TSO	Transmission system operator
vgbe	vgbe energy e.V. (international association of companies from the electricity and heat supply industry)
WTG	Wind turbine

WindSeeGWind Energy at Sea Act

Preliminary remark: *The present preliminary draft serves as a prelude to the update of the Site Development Plan (FEP) 2023. The upcoming procedure is intended to identify further sites for the expansion of offshore wind energy in accordance with the objectives of the Wind Energy at Sea Act (WindSeeG) and in line with the Grid Development Plan 2037-2045, presumably for commissioning until at least 2037.*

The main basis for updating the plan is the ongoing trilateral talks with Denmark and the Netherlands on the partial use of the shipping route SN10 for offshore wind energy, which is defined as a priority area or temporary priority area for shipping in the spatial development plan (ROP) for the exclusive economic zone (EEZ) of the North Sea and the Baltic Sea. With the preliminary draft, additional areas and sites are planned for the area sufficiently specified in the consultation, especially in the eastern area of the shipping route SN10.

Other areas on the western edge of the SN10 shipping route could also be used as sites for offshore wind energy. The concrete layout of the areas currently requires further coordination. The Federal Maritime and Hydrographic Agency (BSH) aims to complete these consultations as soon as possible and to publish a draft plan for these areas as part of this update, probably at the beginning of 2024.

In the further procedure, the amended Directive EU 2018/2001 (cf. informal trilateral agreement reached) could already be taken into account, insofar as this is possible in terms of time.

I. Destination

The WindSeeG stipulates that at least 70 GW of installed capacity should be reached in the EEZ of the Federal Republic of Germany by 2045. In order to achieve this overall target, the FEP must be continuously updated. The aim of this update is, among other things, to define areas and sites in the shipping route SN10 defined in the ROP 2021 and to the west of it and to increase the installed capacity to a total of at least 70 GW by 2045. The plan is to exceed the statutory expansion target of at least 40 GW by 2035. By 2035, 50 GW should already be installed.

As an instrument of federal sectoral planning, the specifications of the FEP form the basis for the preliminary site investigation according to §§ 9 ff. WindSeeG as well as the planning approval and planning permit pursuant to § 66 ff. WindSeeG and are thus necessary for the orderly planning and construction of offshore wind turbines (WTG) and offshore connection lines.

The construction of wind turbines and offshore connection lines is in the overriding public interest and serves public safety according to § 1 para. 3 WindSeeG[1] .

II. Specifications

§ Section 5 para. 1 sentence 1 of the WindSeeG stipulates that the FEP shall make determinations for the EEZ and the territorial sea for the period from 2026. Pursuant to § 5 para. 1 WindSeeG, the FEP may make the specifications listed in the catalogue under numbers 1 to 11.

1 Areas and sites

The FEP sets out the criteria set out in Table 1 shown in Table 1. In some areas, no sites are defined because these areas are expected to be fully developed with offshore wind farms (OWPs) by 2026.

It is planned to identify areas and sites in the German EEZ of the North Sea in the area of the shipping route SN10 and to the west of it in the context of this update. In accordance with the mandate of the ROP 2021 on temporary priority

[1] WindSeeG of 13 October 2016 (BGBl. I p. 2258, 2310), as last amended by Article 10 of the Act of 20 December 2022 (BGBl. I p. 2512).

areas within the shipping route SN10, the designation of areas and sites or possible traffic management measures are currently being examined together with Denmark and the Netherlands. As a result of the examinations to date, a peripheral development of the SN10 will be defined. In this preliminary draft, only areas and sites in the eastern section of the SN10 are initially defined. It is planned to include further areas and sites in the draft in the western area of the SN10 and beyond, once the trilateral consultations have been completed. Within the framework of the preliminary draft, only the areas in the area to the west of the SN10 are initially presented. Part of this presentation is also the closure of the shipping route SN17 discussed in the trilateral coordination with the Netherlands and Denmark. If a closure were to occur, the areas in question could be used for offshore wind energy. The area of SN17 in the German EEZ is therefore presented as an area under consideration.

Table 1 shows the areas and sites from both the specifications of the FEP 2023 and the specifications of this preliminary draft, including the respective base area and the specified power that is expected to be installed. A cartographic representation can be found in Figure 1.

In total, with the additional sites planned in the preliminary draft, a capacity of probably approx. 12 GW[2] can be established. Together with the OWPs that are expected to be in operation in 2025 and the sites already identified in the 2023 FEP, this results in an expected total capacity of approx. 49.5 GW. With the other sites mentioned and shown in Figure 1 sites and planned designations, sites with a total potential of approx. 70 GW could presumably be defined. This means that the set of sites required to achieve the 70 GW target can be defined. The identification of further sites is necessary to be able to compensate for the dismantling that is expected to start around the year 2040.

North Sea

Areas N-6, N-9, N-12 and N-13 are extended by the defined sites N-6.8, N-9.4, N-9.5, N-12.4, N-12.5, N-13.4 and N-13.5. Area N-14 will be divided into a northern and a southern area, whereby the southern area can already be clearly outlined. The southern sub-area of N-14 and site N-14.1 are defined. As these sites coincide with the priority area for shipping SN10 from the ROP 2021, a target deviation procedure will be carried out as part of the update procedure. For details of the target deviation procedure, please refer to the further details in the draft. Small-scale changes to the layout of area N-14 in the further update process can therefore not be ruled out. Sites N-12.5, N-13.4 and N-13.5 partially overlap with the Nephrops reserve of the ROP 2021.

In addition, sites N-13.4 and N-13.5 partially overlap with the reserved area for harbour porpoises of the ROP 2021.

Areas N-4 and N-5 remain under consideration for reuse.

Baltic Sea

No new areas and sites are currently planned in the Baltic Sea. The EEZ in the Baltic Sea is comparatively small and all areas and sites designated for offshore wind energy have already been identified. The possibility of further designations is not foreseeable at present.

[2] Sites N-13.3, N-13.4 and N-13.5 with a combined capacity of 4,000 MW are included in the total as they are determined.

Table 1: Designations of areas and sites. Areas and sites identified in the 2023 FEP are shown in grey for information purposes only, as they are not identified again in this update.

Designation Area	Floor space Area [km²]	Designation Area	Floor space Area [km²]	vrs. power to be installed [MW]
N-1*	79			
N-2*	223			
N-3	308	N-3.5	29	420
		N-3.6	33	480
		N-3.7	17	225
		N-3.8	23	433
N-4**	148			
N-5**	124			
N-6	543	N-6.6	44	630
		N-6.7	16	270
		N-6.8***	242	2.000
N-7	163	N-7.2	58	980
N-8*	124			
N-9	782	N-9.1	158	2.000
		N-9.2	157	2.000
		N-9.3	106	1.500
		N-9.4	141	2.000
		N-9.5	146	2.000
N-10	195	N-10.1	151	2.000
		N-10.2	31	500
N-11	378	N-11.1	205	2.000
		N-11.2	156	1.500
N-12	964	N-12.1	193	2.000
		N-12.2	187	2.000
		N-12.3	80	1.000
		N-12.4	208	2.000
		N-12.5	214	2.000
N-13	574	N-13.1	50	500
		N-13.2	91	1.000
		N-13.3	195	2.000
		N-13.4	38	500
		N-13.5	156	1.500
N-14	-	N-14.1	183	2.000
O-1	129	O-1.3	25	300
O-2	177	O-2.2	102	1.000
O-3*	28			

* The sites in these areas are already in operation or under construction.
** Area for after-use under review.
*** Site N-6.8 was designated as N-21.1 in the FEP 2023.

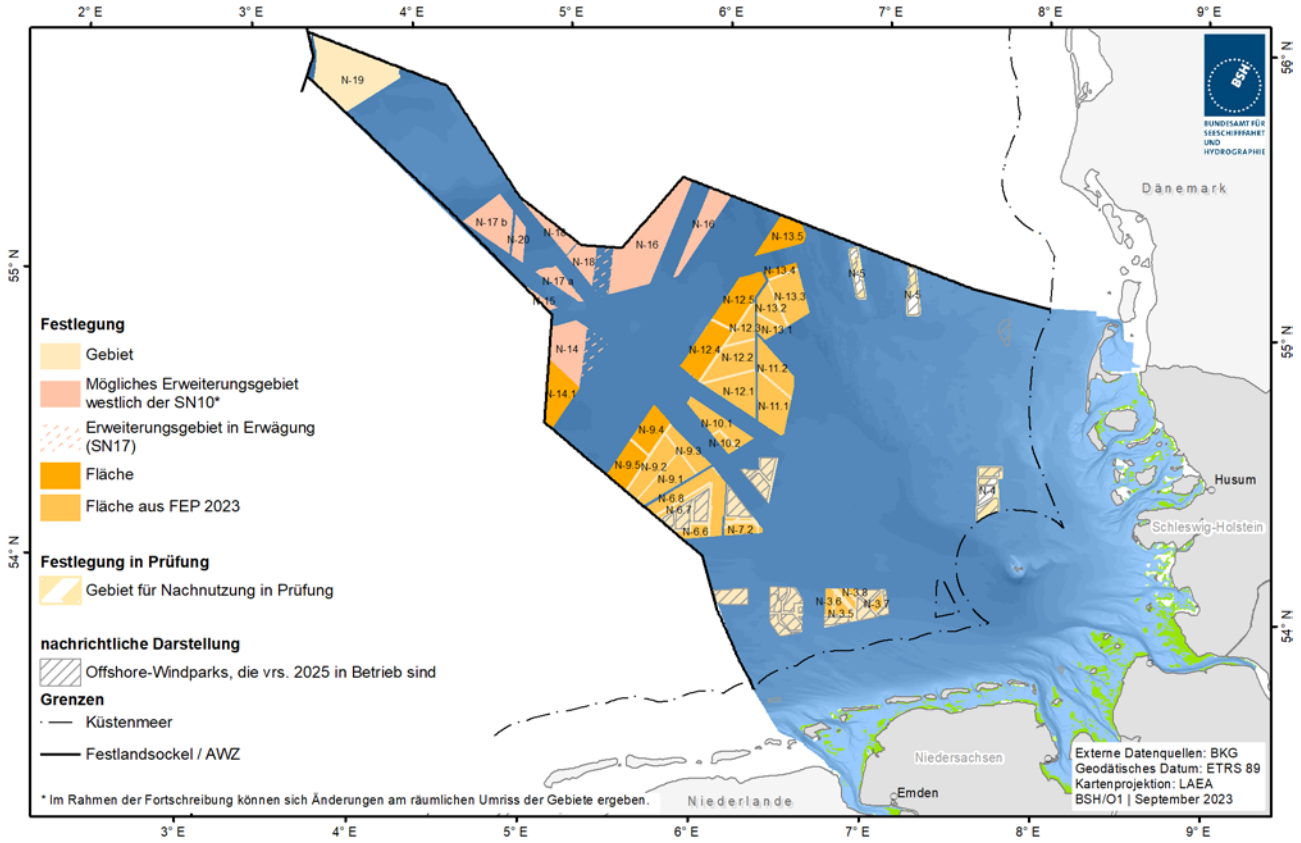

Illustration 1: Designations of areas and sites in the North Sea EEZ.

Vrs. power to be installed on areas N-9.4 and N-9.5

Due to the new sites N-9.4 and N-9.5 defined in this FEP, additional shading losses are to be expected, especially for the further sites in area N-9 (cf. (Vollmer & Dörenkämper, 2023).Note: Sites N-9.4 and N-9.5 are differently designated together as area N-23). The size of site N-9.4 and N-9.5 is limited by neighbouring areas and other land use claims. If a capacity of 2,000 MW to be installed is specified for each area, sites N-9.4 and N-9.5 have a comparatively high power density. As an alternative option, halving the expected capacity to be installed and thus also the power density for site N-9.4 and N-9.5 was considered. With this option, a connection system could consequently be dispensed with. However, the power reduction of 2,000 MW would have to be compensated for by defining a site elsewhere. This variant was also examined in an additional scenario by Fraunhofer IWES with regard to the expected energy yields (Scenario S17, not yet published). The following table shows a relative comparison of scenarios **S16** (a total of **4,000 MW** on site N-9.4 and N-9.5) and **S17** (a total of **2,000 MW** on site N-9.4 and N-9.5). This shows that in the case of a halving of capacity on site N-9.4 and N-9.5, a significantly lower overall yield must be assumed in area N-9. On the other hand, the lower power density results in higher full load hours. An increase in full load hours can be observed in particular in site N-9.4 and N-9.5; in site N-9.1, N-9.2 and N-9.3 this is less pronounced at around 5 percent overall. Only minor effects are expected for areas N-6 and N-10.

Table 2Comparison of results of scenarios S16 and S17

Relative deviation in scenario S17 (2,000 MW) compared to scenario S16 (4,000 MW)			
	Assumption: power to be installed	Result: expected energy yield	Result: expected full load hours
N-9.1, N-9.2 and N-9.3	0%	+5%	+5%
N-9.4 and N-9.5	-50%	-40%	+19%
N-9 total	-21%	-16%	+6%

The following figure shows the absolute deviations in scenario S17 from scenario S16 for the individual plants assumed in the calculation on sites N-9.1, N-9.2 and N-9.3. It can be seen from this that in particular the plants adjacent to sites N-9.4 and N-9.5 could benefit from a power reduction. For more distant plants, the effect decreases.

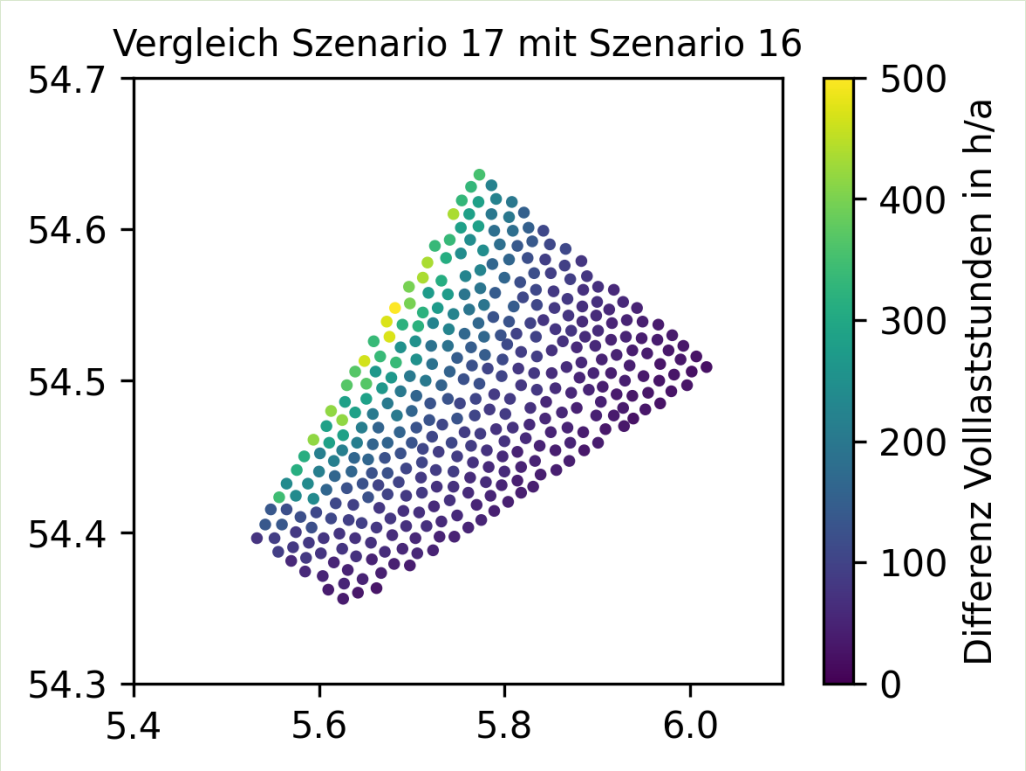

Figure 2Comparison of scenario S17 with scenario S16 (Source: Fraunhofer IWES)

Questions for the consultation

Area sizes

In accordance with the increased standard capacity of the offshore grid connection systems (ONAS), sites with an expected capacity of 2,000 MW to be installed were predominantly defined in the FEP 2023. It is also conceivable to define sites of a smaller size, e.g. 1,000 MW. This would connect two areas to a common ONAS.

F.1 In your view, are there arguments in favour of defining, for example, two sites with 1,000 MW each instead of one area with 2,000 MW?

2 Lines

2.1 Border corridors to the territorial sea

Pursuant to § 5 para. 1 no. 8 WindSeeG, the FEP specifies locations where the offshore connection lines cross the boundary between the EEZ and the territorial sea (so-called boundary corridors).

In Table 3 lists the border corridors from the EEZ to the territorial sea for the North Sea and Baltic Sea. Each border corridor is also assigned existing submarine cable systems that are planned or identified in this FEP.

Table 3Allocation of submarine cable systems to the border corridors to the territorial sea

Border-corridor	Submarine cable systems
N-I	(1) NOR-1-1 (2) NOR-8-1 (3) NOR-2-3 (4) COBRAcable
N-II	(1) NOR-7-1 (2) NOR-3-1 (3) NOR-2-2 (4) NOR-2-1 (5) NOR-6-1 (6) NOR-6-2 (7) NOR-3-3 (8) NOR-3-2 (9) NOR-6-3 (10) NOR-9-1 (11) NOR-10-1 (12) NOR-6-4
N-III	(1) NOR-9-2 (2) NOR-9-3 (3) NOR-12-1 (4) NOR-13-1 (5) NOR-11-2 (6) NOR-9-4 (7) NOR-14-1
	(8) NOR-9-5 (-) NeuConnect
N-V	(1) NOR-7-2 (2) NOR-11-1 (3) NOR-12-2 (4) NOR-12-3 (5) NOR-12-4 (6) NOR-13-3 (7) NOR-13-2
N-IV	(1) NOR-4-2 (2) NOR-4-1 (3) NOR-5-1 (4) NordLink
O-I	(1) OST-1-1 (2) OST-1-2 (3) OST-1-3 (4) OST-2-1 (5) OST-2-2 (6) OST-2-3 (7) OST-1-4 (8) OST-2-4 (9) Submarine cable system to Denmark (10) Submarine cable system to Denmark
O-II	(1) OST-2-1
O-III	(1) OST-3-1 (2) OST-3-2 (3) Submarine cable system to Sweden (4) Submarine cable system to Sweden
O-IV	(1) Contek (2) Submarine cable system to Denmark
O-V	(1) Submarine cable system to Denmark
O-XIII	(1) Submarine cable system to Denmark

Questions for the consultation

Availability of border corridors to achieve the statutory expansion targets

The border corridors N-I to N-V in the German North Sea shown are either already fully occupied or their capacity is limited according to current knowledge and already reserved for systems. The following table summarises the currently known capacities of the border corridors concerned.

Table 4: Capacities of the border corridors

Border corridor	Current capacity
N-I	Four systems, including one cross-border submarine cable system; fully utilised.
N-II	Twelve systems, fully utilised.
N-III	Expected capacity for a total of 13 systems (five via Baltrum, eight via Langeoog); plus a cross-border submarine cable system.
N-IV	Four systems, including one cross-border submarine cable system; fully utilised.
N-V	Expected capacity for a total of eight systems.

Assuming an annual commissioning of 4 GW and thus two connection systems each with the standard connection concept, the known marginal corridor capacities shown here could be sufficient until commissioning including 2038 with a then installed capacity of wind turbines of approx. 64 GW. This point in time can probably not be delayed by dismantling and re-using the first connection systems. An increase in the transmission capacity of the individual ONAS can influence the required number of connection systems, but is not realistically foreseeable at the present time. It is therefore necessary to determine further marginal corridor capacities in order to permanently achieve the statutory expansion target of at least 70 GW by 2045. In this context, corridors that are not available due to the decommissioning/post-utilisation of ONAS would have to be taken into account. Based on the plans of the second draft of the NEP 2023-2037 of the transmission system operators (TSOs), the need for further border corridor capacities is due to the proposed grid interconnection point (NVP) in the coastal sea of Lower Saxony.

F.2 Which additional border corridors or which extension of existing border corridors to the territorial sea do you consider suitable?

2.2 Offshore grid connection systems

The data shown in Table 5 are defined and are used to connect the ONAS described in chapter 1 defined in chapter 1.

The ONAS shown in the FEP 2023 up to and including the year of commissioning 2031 with the onshore NVPs are included here for information purposes. For the ONAS with commissioning from 2032 onwards, the NTP and year of commissioning are named on the basis of the second draft of the network development plan 2037-2045. Deviating from this, an ONAS via border corridor N-III is listed for the year of commissioning 2035.

With the data shown in Table 5 the sites defined in this preliminary draft can be connected. The definition of further ONAS is planned for the draft.

Table 5 Definitions for ONAS. Specifications for ONAS from the FEP 2023 are shown in grey for information purposes only, as they are not specified again in this update.

ONAS	Transmission capacity [MW]	Border corridor	For information on the basis of the second draft of the NDP 2037-2045 of the TSOs	
			Grid connection point	Commissioning[3]
OST-1-4	300	O-I	Lubmin	2026
NOR-7-2	980	N-V	Beadle	2027
NOR-3-2	900	N-II	Hanekenfähr	2028
NOR-6-3	900	N-II	Hanekenfähr	2028
NOR-9-1	2.000	N-II	Weir village	2029
NOR-9-2	2.000	N-III	Wilhelmshaven 2	2029
NOR-9-3	2.000	N-III	Lower Weser	2029
OST-2-4*	2.000	O-I	Brünzow	2030
NOR-10-1	2.000	N-II	Westerkappeln	2030
NOR-11-1	2.000	N-V	Heath/West	2030
NOR-12-1	2.000	N-III	Lower Weser	2030
NOR-12-2	2.000	N-V	Heath/West	2030
NOR-11-2	2.000	N-III	Wilhelmshaven 2	2031
NOR-13-1	2.000	N-III	Rastede	2031
NOR-6-4**	2.000	N-II	Lower Rhine	2032
NOR-9-4	2.000	N-III	Blockland/new	2032
NOR-14-1	2.000	N-III	Kusenhorst	2033
NOR-12-3	2.000	N-V	Pöschendorf	2033
NOR-12-4	2.000	N-V	Pöschendorf	2034
NOR-9-5	2.000	N-III	Kusenhorst***	2035
NOR-13-2	2.000	N-V	n/a	n/a
NOR-13-3	2.000	N-V	n/a	n/a

* The route of the ONAS is currently being examined depending on the final platform location.
** NOR-6-4 was designated as NOR-21-1 in the 2023 FEP.
*** The Federal Network Agency (BNetzA) is currently examining the Kusenhorst NVP as an alternative for the ONAS in 2035.

For all ONAS in Table 5 the standard concept is defined based on DC technology with a transmission capacity of 2,000 MW.

For the connection concepts of the ONAS that will be in operation up to and including 2031, reference is made to the specifications of the FEP 2023.

Pursuant to § 5 para. 1 no. 6 WindSeeG, the FEP shall determine the locations of converter

[3] At this point, the FEP presents the years of commissioning and the NVP presented in the second draft of the NEP 2037-2045 for information purposes. The FEP makes its own quarterly specifications for the commissioning of the WTs surcharged on the defined areas as well as the corresponding ONAS (see Chap.4.2).

platforms, collection platforms and, where necessary, transformer stations.

Converter and transformer platforms are only defined in those areas where sites are also designated. No transformer platforms are designated on the basis of the direct connection concept. Pursuant to § 5 para. 1 no. 7 WindSeeG, the FEP specifies routes or route corridors for offshore connection lines. Attention is drawn to the planning scale of 1:400,000 and the associated inaccuracies of the graphic specifications. For this reason, possible bending radii of the submarine cable systems and the associated towing radii of the laying vehicles are not shown exactly when defining the routes. This is done in the respective approval procedures.

The converter sites are generally to be located within the site to be connected. In deviation from this, a converter site is specified for each of the converter sites NOR-9-4, NOR-9-5 and NOR-14-1 at the edge of the site to be connected. Figure 3 shows the spatial representations.

The converter site OST-2-4 and an alternative site were determined within the framework of the FEP 2023. If the result of the TSO's subsoil investigations shows that the specified site cannot be realised, the alternative site must be selected. On the basis of the subsoil investigations, the TSO shall announce the decision on the converter site OST-2-4 as soon as possible. The converter site OST-2-4 is deemed to have been announced when the responsible TSO has notified the BSH of the result and also published it on the TSO's website. This has not yet been done. The result will be taken into account in this update.

Questions for the consultation

Positioning of converter sites

The designated converter sites NOR-14-1, NOR-9-4 and NOR-9-5 are to be positioned at the edge of the respective area to be connected. It is pointed out that the question of the positioning of the converter platforms was consulted in detail as part of the update to the FEP 2023 with the result that converter platforms should always be positioned in the middle of the site to be connected. The main reason for the departure from the previous definition in the centre of the site to be connected is the approach of lines for cross-border submarine cable systems for the converter sites mentioned, which are to be defined for connection to these converter platforms. This results in the necessity to bring another direct current route corridor up to the respective platform in addition to the direct current connection line, taking into account the distance requirements. This reduces the area available to the successful bidder for the positioning of WTGs. Sites N-9.4 and N-9.5 already have a comparatively high power density, so restrictions on the available site should be avoided wherever possible. In addition, however, aspects such as the length and arrangement of the cabling within the park (now at 132 kV) and possible helicopter approach and departure corridors to the converter platform must be taken into account when positioning.

F.3 Do you agree that under the circumstances described, positioning the converter platforms at the edge of the areas to be connected is advantageous compared to a central positioning?

F.4 In your opinion, are there any new reasons - such as the changeover from 66 kV to 132 kV for the cabling within the park - that speak in favour of the general positioning of converter platforms at the edge of the areas to be connected compared to the definition in the FEP 2023?

F.5 How do you assess the restrictions on the use of the site due to the sites to be kept free of development for the flight corridors of the helicopter landing deck with regard to the location of the converter platform in the middle or at the edge of an area?

2.3 Interconnectors

For the purposes of this plan, inerconnectors are to be understood as submarine cable systems which run through at least two countries bordering the North Sea or the Baltic Sea.

Several interconnectors run through the German EEZ of the North Sea. On the one hand, there is an operational interconnectors called "NorNed", which connects Norway and the Netherlands. Furthermore, the "COBRAcable" project is in operation to connect the Netherlands and Denmark. In addition, the NordLink project, a connection between Norway and Germany, is in operation and runs through the German EEZ. The "Viking Link" project to connect Denmark with Great Britain and the "NeuConnect" project between Germany and Great Britain from border corridor N-III to N-VI were approved. In addition, one link each to the neighbouring countries of the Netherlands and Denmark is defined: One connection leads from platform NOR-9-4 in a south-westerly direction via border corridor N-XIV to the Netherlands. The other connection leads from platform NOR-14-1 in an easterly direction via the border corridor N-VII to Denmark. In addition, another route corridor for cross-border submarine cable systems will be defined along the SN10 in parallel to each of the two projects mentioned.

Interconnectors are also in operation in the German Baltic Sea EEZ: "Kontek" (connecting Denmark and Germany) and "Baltic Cable" (between Sweden and Germany). Furthermore, the interconnector called "Kriegers Flak Combined Grid Solution" is in operation. This project connects Denmark and Germany by linking a Danish OWP project with a German one. For the route from the border corridor O-XI to O-I, it is planned to implement the cross-border submarine cable system to connect "Bornholm Energy Island".

The route for a interconnector identified in the FEP 2023, which ran between "NordStream 1" and "NordStream 2" from the border corridor O-XII to O-XIII, will be replaced by two routes in parallel north of "NordStream 2".

Table 6 shows the border corridors and routes for interconnectors defined in the FEP. It is to be expected that the implementation of the European and respective national expansion targets will lead to further inteconnectors. In the further update of the FEP, the definition of further interconnectors is possible on the basis of findings on meshing in the offshore area.

Table 6 Border corridors and routes for interconnectors

Point A	Point B	Country A	Country B
North Sea			
Bundling point	N-VI	Germany	Denmark/ Norway
N-III	N-XV	Germany	Great Britain
N-VI*	N-XIV*	Denmark / Norway	Netherlands
NOR-9-4*	N-XIV*	Germany	Netherlands
N-VII*	N-XIII*	Denmark / Norway	Netherlands
N-VII*	NOR-14-1*	Denmark	Germany
N-VIII	N-XII	Denmark	Great Britain
Baltic Sea			

O-V	O-VI	Germany	Denmark
O-IV	O-VII	Germany	Denmark
O-III	O-IX	Germany	Sweden
O-III	O-IX	Germany	Sweden
O-I	O-X	Germany	Denmark
O-I	O-XI	Germany	Denmark
O-XIII	O-XII	Germany	n.n.
O-XIII	O-XII	Germany	n.n.

* The route and location of the border corridors may change depending on future designations in the western area of the SN10 shipping route of the ROP 2021.

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2.4 Connections between installations

Pursuant to § 5 para. 1 no. 10 WindSeeG, the FEP contains routes or route corridors for possible connections between offshore installations, connection lines and cross-border submarine cable systems as well as locations of converter platforms. The so-called interconnections of installations are submarine cable systems that can connect the individual connection systems (according to the direct current (DC) or three-phase current (AC) connection concept) and thus the OWPs with each other. They thus contribute to ensuring system security and increase feed-in security through (partial) redundancy, thus reducing outage damage. The FEP ensures the spatial requirements for any interconnections between plants. The decision on "whether" and "when" an interconnection of installations within the German EEZ is implemented is taken by the BNetzA on a case-by-case basis. The implementation of the connections planned within the German EEZ is ensured by the provisions contained in this preliminary draft. Table 7 shows the routes defined in the FEP for interconnections between installations within the German EEZ. The FEP thus creates the preconditions for future meshing. The planning principle 6.10.3 (j) is referred to.

Table 7: Paths for interconnections between installations

Platform A	Platform B
North Sea	
NOR-9-4	NOR-9-5
Baltic Sea	

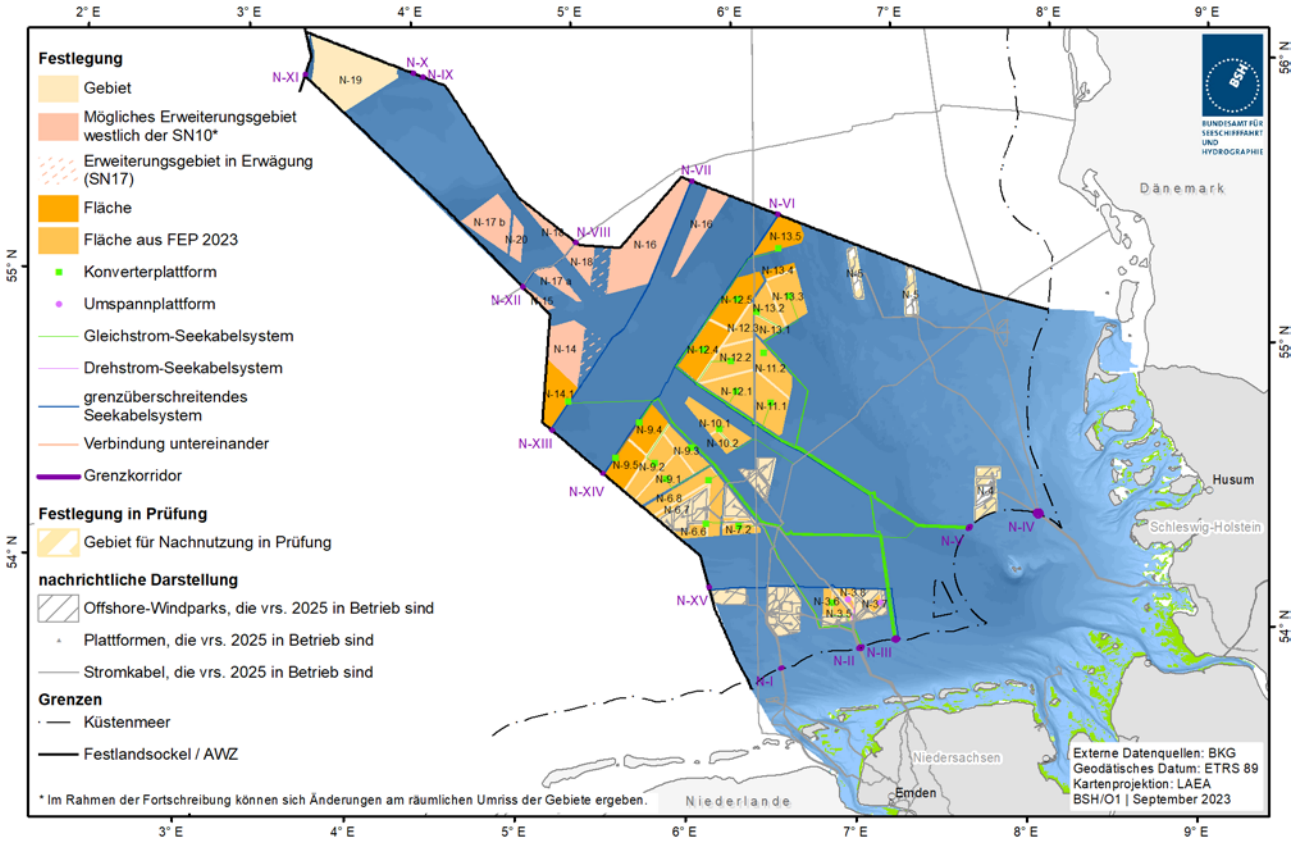

Figure 3 Determinations on pipelines in the North Sea EEZ.

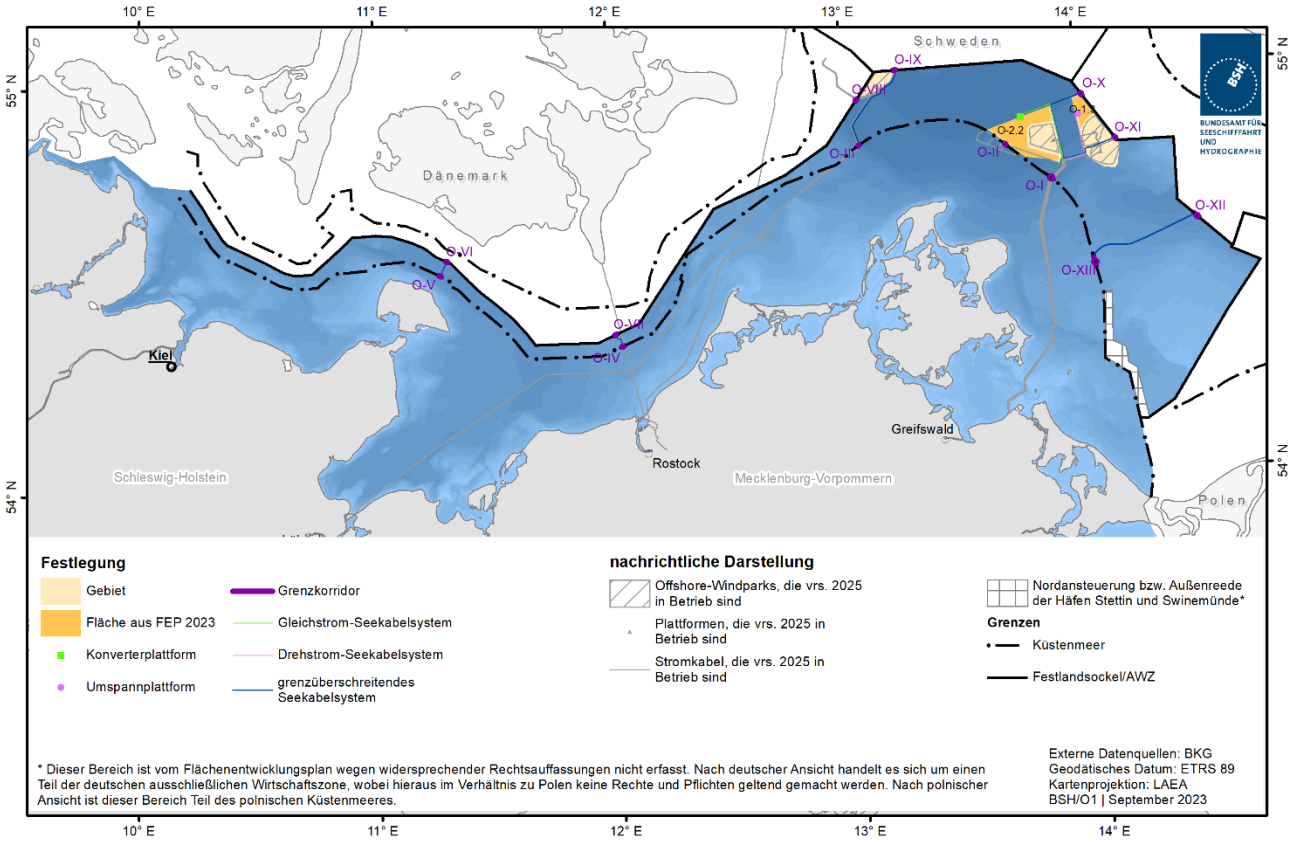

Figure 4: Determinations on pipelines in the Baltic Sea EEZ.

3 Specifications for the territorial sea

The present preliminary draft does not make any new specifications in the area of the territorial sea compared to the FEP 2023.

The test site connection line conditionally defined in the FEP 2023 is not included in the present preliminary draft, as the need for this was not announced by the state of Mecklenburg-Western Pomerania by 30.06.2023 as defined in the FEP 2023. A connection line for the test site must therefore be planned and implemented by the project executing agency itself.

No designations are made in the coastal sea of the federal states of Lower Saxony and Schleswig-Holstein, as neither state has submitted any priority or reserved areas and there is no corresponding administrative agreement.

4 Central preliminary investigation and calendar years of tendering and commissioning

Pursuant to Article 5(1)(3) of the WindSeeG, the FEP shall determine the chronological order in which the designated sites are to be put out to tender, including the designation of the respective calendar years, as well as whether the site is to be centrally pre-surveyed and, pursuant to No. 4, in which quarter of the respective calendar year the awarded WTs and the associated ONAS are to be put into operation.

In order to ensure synchronisation between the OWP and ONAS, the FEP also determines the quarter of the respective calendar year in which the in-park cabling of the OWP to be connected must be moved into the converter platform of the TSO.

4.1 Central preliminary examination

In addition to determining the calendar years for the tendering and commissioning of areas and ONAS, the FEP also makes determinations as to whether the tendering of the respective area is to take place within the framework of the central model with preliminary investigation or as an area that is not centrally pre-investigated (see also Figure 5). The different timeframes are taken into account in the determination.

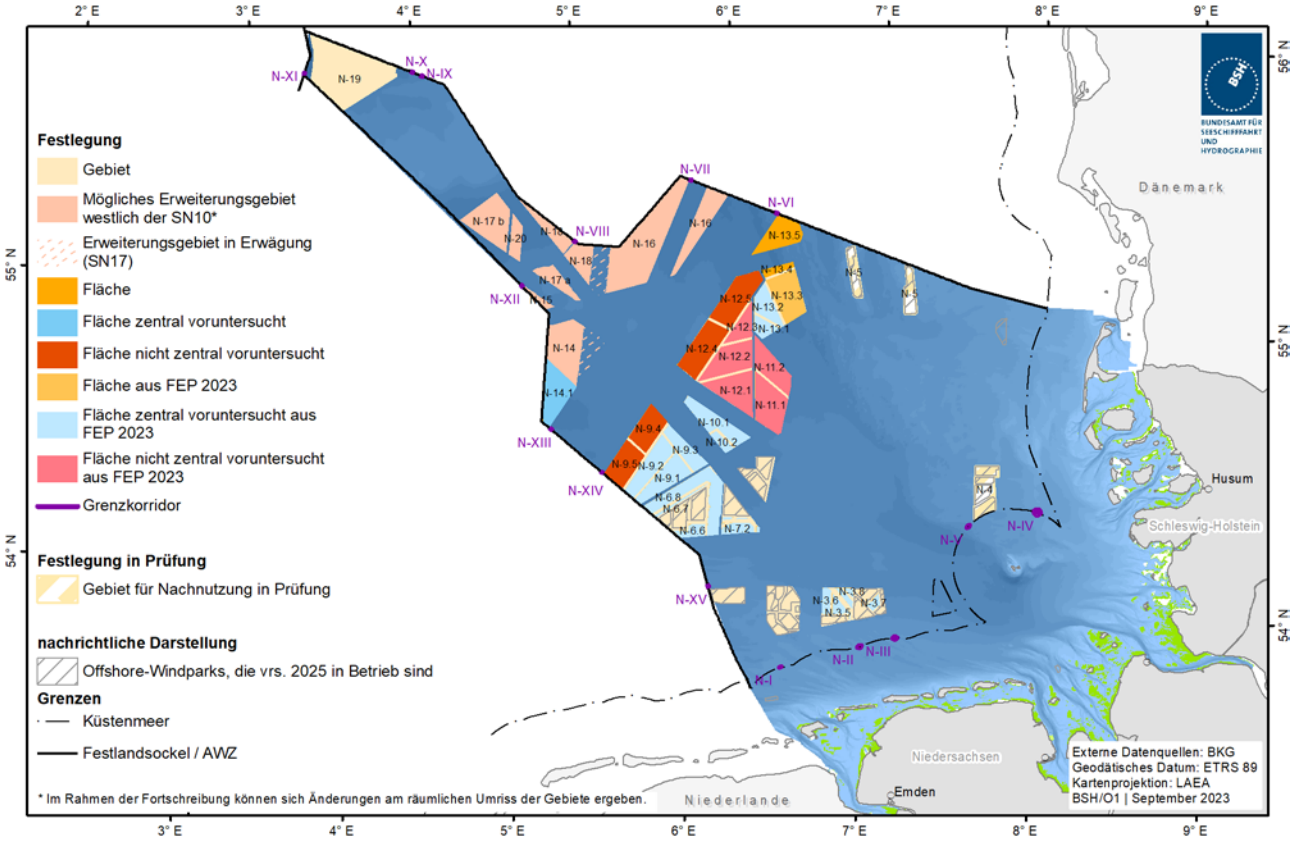

Figure 5 : Distinction of the designated areas with regard to the type of their preliminary investigation in the EEZ of the North Sea (for the distinction of the designated areas in the Baltic Sea, see. Figure 14 in the Annex).

4.2 Calendar years of tendering and commissioning

Table 8 and Table 9 present the specifications for the chronological order of tendering and commissioning of the defined areas and ONAS. Areas that are centrally pre-investigated are listed in Table 8 areas without central preliminary investigation are shown in Table 9. For a general overview, please refer to Table 12 in the appendix of this document.

Table 8: Overview of the calendar years of tendering and commissioning for WTs and the associated ONAS including the respective quarters (QI - QIV) in the calendar year - areas with central preliminary investigation.

Designation Site	Vrs. capacity to be installed [MW]	Year of tender	Commissioning of the WTGs surcharged on the respective areas	Move-in of in-park cabling of the surcharged WTs in platform	Designation ONAS	Commissioning ONAS
N-3.7	225	2021	2026 (QIII)	n/a	NOR-3-3	n/a
N-3.8	433	2021	2026 (QIII)	n/a		
O-1.3	300	2021	2026 (QIII)	2026 (QII)	OST-1-4	2026 (QIII)
N-7.2	980	2022	2027 (QIV)	2027 (QIII)	NOR-7-2	2027 (QIV)
N-3.5	420	2023	2028 (QIII)	2028 (QI)	NOR-3-2	2028 (QIII)
N-3.6	480	2023	2028 (QIII)	2028 (QII)		
N-6.6	630	2023	2028 (QIV)	2028 (QI)	NOR-6-3	2028 (QIV)
N-6.7	270	2023	2028 (QIV)	2028 (QII)		
N-9.1	2.000	2024	2029 (QIII)	2029 (QI-II)	NOR-9-1	2029 (QIII)
N-9.2	2.000	2024	2029 (QIII)	2029 (QI-II)	NOR-9-2	2029 (QIII)
N-9.3	1.500	2024	2029 (QIV)	2029 (QI)	NOR-9-3	2029 (QIV)
N-10.2	500	2025	2030 (QIII)	2030 (QI)		
N-10.1	2.000	2025	2030 (QIII)	2030 (QI-II)	NOR-10-1	2030 (QIII)
N-13.1	500	2026	2031 (QIII)	2031 (QII)	NOR-11-2	2031 (QIII)
N-13.2	1.000	2026	2031 (QIII)	2031 (QII)	NOR-13-1	2031 (QIII)
N-6.8*	2.000	2027	2032 (QIII)	2032 (QI-II)	NOR-6-4*	2032 (QIII)
N-14.1	2.000	2028	2033 (QIII)	2033 (QI-II)	NOR-14-1	2033 (QIII)

* In the 2023 FEP, site N-6.8 has been designated as N-21.1 and ONAS NOR-6-4 as NOR-21-1.

Table 9: Overview of the calendar years of tendering and commissioning for WTs and the associated ONAS including the respective quarters (QI - QIV) in the calendar year - areas without central preliminary investigation.

Designation Site	Vrs. capacity to be installed [MW]	Year of tender	Commissioning of the WTGs surcharged on the respective areas	Move-in of in-park cabling of the surcharged WTs in platform	Designation ONAS	Commissioning ONAS
N-11.1	2.000	2023	2030 (QIII)	2030 (QI-II)	NOR-11-1	2030 (QIII)
N-12.1	2.000	2023	2030 (QIII)	2030 (QI-II)	NOR-12-1	2030 (QIII)
N-12.2	2.000	2023	2030 (QIV)	2030 (QI-II)	NOR-12-2	2030 (QIV)
O-2.2	1.000	2023	2030 (QIII)	2030 (QI-II)	OST-2-4	2030 (QIII)
N-11.2	1.500	2024	2031 (QIII)	2031 (QI)	NOR-11-2	2031 (QIII)
N-12.3	1.000	2024	2031 (QIII)	2031 (QI)	NOR-13-1	2031 (QIII)
N-9.4	2.000	2025	2032 (QIII)	2032 (QI-II)	NOR-9-4	2032 (QIII)
N-12.4	2.000	2026	2033 (QIII)	2033 (QI-II)	NOR-12-3	2033 (QIII)
N-12.5	2.000	2027	2034 (QIII)	2034 (QI-II)	NOR-12-4	2034 (QIII)
N-9.5	2.000	2028	2035 (QIII)	2035 (QI-II)	NOR-9-5	2035 (QIII)

5 Standardised technology principles

According to § 5 para. 1 no. 11 WindSeeG, standardised technical principles are to be defined in the FEP for the purpose of planning. With regard to the technical connection concepts, a distinction was made between the North Sea and the Baltic Sea until the FEP 2020. Since the FEP 2023, this distinction is no longer made and only one standard concept is defined for the North Sea and the Baltic Sea.

Nevertheless, in individual cases there is still a need to deviate from the standard concept, in particular in cases where the generation capacity to be connected does not permanently reach the transmission capacity of the standard concept. If such a deviation is necessary, this will be indicated for the ONAS concerned in the determination.

Deviation from the standardised technical principles is generally not possible in order to achieve the objectives associated with the specification. This is only possible if a deviation is necessary in a justified individual case or makes sense due to new findings. In particular, due to the possible effects of a deviation on interfaces between TSOs and OWPs, but also due to the different planning and implementation progress, deviations must be introduced at a very early stage.

5.1 Standard concept DC system

The standard concept is a DC system.

5.2 Interface between TSO and OWP promoter

The primary interface[4] between TSO and OWP promoter is the input of the 132 kV submarine

[4] In the context of the standardised technical principles of the FEP, the interface is generally understood to be the property boundary between the TSO and the OWP project developer.

cable systems on the converter platform (cable termination of the 132 kV submarine cables).

(a) The responsibility for connecting the WTGs to the converter platform lies with the OWP developer.
(b) The 132 kV submarine cable systems on the platform will be pulled in according to the direct pull-in concept[5] , according to which the submarine cable systems will be routed by the OWP developer to the gas-insulated switchgear (GIS).
(c) For the connection of the 132 kV submarine cable, the OWP developer shall ensure a free usable length (from cable hang-off) of the submarine cable after direct pull-in on the platform of a maximum of 15 m. The free usable length of the submarine cable required in individual cases shall be calculated according to the TSO's requirements.
(d) Optionally, the TSO may specify the interface at a connector as a result of the platform design. In this case, the 132 kV submarine cable systems are routed to a plug-in connection pre-installed on the platform, which also represents the ownership boundary. The connector then forms the transition point between the in-park submarine cable system and a pre-installed platform cable connection leading up to the GIS. The OWP developer carries out the submarine cable pull-in and termination with a suitable plug for the pre-installed plug connection on the platform. Here, too, the maximum usable length (from cable hang-off) is 15 m to the plug connection. The concept is announced by the TSO before the respective areas are put out to tender.
(e) The start of the quarter specified for the respective areas or ONAS for the installation of the in-park cabling represents the time by which the TSO must have completed all the necessary prerequisites required for the installation of the in-park cabling.
(f) The installation of all cables of the in-park cabling that have to be installed in the platform of the TSO shall be carried out by the WTG developer within the quarter specified in the FEP, taking into account the platform-specific framework conditions. The installation of the in-park cabling for all awarded WTs shall be completed by the end of the quarter specified in the FEP.
(g) The TSO shall, at the latest by the end of the quarter specified for the site, take the necessary steps on the platform side for all AC cables of the cabling within the park that have been pulled onto the platform to such an extent that a complete commissioning of all WTs to be connected to an area is possible.
(h) In all phases, both sides shall inform each other about project-relevant developments and coordinate deadlines.

5.3 Self-guided converters

The existing ONAS and those planned within the framework of the FEP will be designed as voltage-sourced converters (VSC). converters.

[5] Direct feed is defined as direct feed of the cable onto the platform up to the GIS or pre-installed connector.

5.4 Transmission voltage +/- 525 kV

A transmission voltage of +/- 525 kV is specified for the ONAS planned under the FEP.

5.5 Standard output 2,000 MW

A standard transmission capacity of 2,000 MW is set for the high-voltage direct current (HVDC) transmission systems.

5.6 Version with metallic return conductor

HVDC systems are to be designed as bipoles with a metallic return conductor for the purpose of increasing reliability and better controllability.

5.7 Connection on the converter platform / switch panels to be provided

(a) For a connected load of 1,000 MW, 8 switchgear panels and J-Tubes shall be provided for each transmission voltage of 132 kV and shall be made available by the TSO.
(b) If the connected load deviates from 1,000 MW, the number of switchgear panels and J-Tubes to be provided changes accordingly depending on the connected load.

5.8 Requirements for interconnections between installations / cubicles to be provided

To ensure connections between platforms, two connection options for DC connections, consisting of positive and negative pole, metallic return conductor as well as fibre optic cable and the necessary J-tubes, must always be provided on each converter platform. This creates the basis for a meshing of ONAS.

5.9 Direct connection concept

For the connection of WTGs to the converter platform, the 132 kV direct connection concept is defined as the standard connection concept. Here, the connections are made in three-phase technology with a grid frequency of 50 Hz and a transmission voltage of 132 kV.

5.10 Cross-border submarine cable systems: Bundled submarine cable system

Cross-border submarine cable systems shall be implemented in direct current technology and designed with the highest possible transmission capacity. The connections are to be designed with outgoing and return conductors, which are to be laid in bundles.

5.11 Cross-border submarine cable systems: Consideration of the overall system

The planning and construction of cross-border submarine cable systems shall take into account the provisions of this plan.

5.12 Cross-border submarine cable systems: Version with metallic return conductor

Cross-border submarine cable systems where a connection with an ONAS is possible according to the standard concept shall be designed as a bipole with metallic return conductor.

Questions for the consultation

Basic technology 5.8 Requirements for interconnections between installations / cubicles to be provided

F.6 Are there other facilities beyond the requirements mentioned here that must be kept on platforms for connections with other platforms?

Technical principle 5.9 Direct connection concept

When spatially planning areas and converter platforms, the maximum cable length of the cabling within the park is taken into account.

F.7 In existing OWPs, the maximum cable length between the converter platform and the WTG is often around 20 km. The voltage level of the in-park cabling of these OWPs is below 132 kV. What maximum distance do you consider realistic for future plans with 132 kV?

Technical principle 5.12 Transboundary submarine cable systems: Design with metallic return conductor

F.8 Are there further requirements beyond those mentioned here that cross-border submarine cable systems for connection on platforms must fulfil?

Model assumptions are made for the assessments in the Strategic Environmental Assessment. Reference is made to the consultation question in the draft assessment framework.

6 Planning principles

Pursuant to Section 5 para. 1 no. 11 WindSeeG, the FEP contains specifications on planning principles.

The planning principles apply to the German EEZ and are based on the objectives and principles of the ROP for the German EEZ. In all planning principles, the overriding public interest in the construction of WTs and ONAS and their significance for public safety pursuant to section 1(3) of the WindSeeG shall be taken into account in the context of weighing decisions. In the concrete application of the planning principles in the planning approval or planning permission procedure, the overriding public interest shall be taken into account when weighing up the concerns.

6.1 No risk to the marine environment

The following principles have a concrete environmental and nature conservation reference. They are not to be understood as conclusive in this sense. Planning principles listed under other sub-headings may also have an impact on environmental protection and nature conservation concerns.

6.1.1 Observance of environmental and nature conservation framework conditions

Environmental and nature conservation framework conditions must be observed in the selection of sites and routes as well as in the context of the construction, operation and dismantling or any subsequent se of wind turbines, platforms, submarine cable systems and other energy generation facilities.

According to principle 2.2.1 (1) of the ROP 2021, economic uses should be sustainable and as land-saving as possible.

Principle 2.4 (6) of the ROP 2021 on the requirement of avoidance and mitigation measures within the designated bird migration corridors applies accordingly to this sectoral plan.

6.1.2 Overall time coordination of the erection and installation work as well as maintenance and repair work

In order to avoid or reduce cumulative impacts on the marine environment, an overall temporal coordination of the construction and installation work should be provided, taking into account the project-specific framework conditions.

For the erection of wind turbines, platforms and other energy generation facilities and the laying of submarine cable systems in close proximity to each other, the aim should be to achieve overall coordination in terms of time (cf. also planning principle 6.1.4 on noise protection).

This also includes reducing shipping traffic for construction and operation and the associated acoustic and visual impairments to a minimum through optimal construction and time planning.

6.1.3 Emissions reduction

General

(a) Emissions are to be avoided or, insofar as they are unavoidable, reduced.

(b) An emission study must be prepared to record the emissions caused by the respective design and equipment variant or their avoidance. In the approval procedure, an emission concept must be submitted as part of the application documents, as the requirements for an emission study cannot usually be fully met yet due to the early design phase.

(c) Structural installations shall be planned and implemented in such a way that neither their construction nor their operation cause emissions which are avoidable according to the state of the art or, insofar as the causing of emissions is unavoidable due to the actions which are absolutely necessary in order to fulfil the safety requirements, e.g. of shipping and air traffic, cause the least possible impairment of the marine environment and do not generate electromagnetic waves which

are capable of interfering with the functioning of customary navigation and communication systems as well as frequency ranges of the correction signals.

(d) Lighting during operation of the wind turbines and converter platforms that is as compatible with nature as possible shall be provided to reduce attraction effects as far as possible, taking into account the requirements of safe shipping and air traffic and occupational safety, such as switching obstruction lighting on and off as needed, selecting suitable light intensities and spectra or lighting intervals.

(e) For the operation of the plant, environmentally compatible operating materials shall be used as far as possible and biodegradable operating materials shall be preferred, if available.

(f) In switchgear, cooling and air-conditioning systems as well as fire protection systems, operating materials should be used that have no or the lowest possible greenhouse gas potential. In particular, switchgear without SF_6 shall be used as far as technically feasible and available.

(g) All technical installations used on the site shall be secured by structural safety systems and safety measures in accordance with the state of the art and monitored in such a way that pollutant accidents and environmental discharges are avoided and that in the event of damage it is ensured that the project sponsor can intervene immediately at any time.

(h) Organisational and technical precautions must be taken for fuel changes and refuelling measures in order to avoid pollutant accidents and environmental discharges.

Waste

(i) The dumping and discharge of waste into the marine environment shall be prohibited unless otherwise provided for in this planning policy.

Corrosion protection

(j) The corrosion protection used for the system must be as pollutant-free and low-emission as possible.

(k) Wherever possible, external current systems shall be used as cathodic corrosion protection on foundation structures.

(l) If the use of galvanic anodes is unavoidable, it is only permissible in combination with coatings on the foundation structures. The content of minor components of the anode alloys, in particular zinc, cadmium, lead, copper and mercury, shall be reduced as far as possible.

(m) The use of zinc anodes is prohibited.

(n) The use of biocides to protect the technical surfaces from the undesired settlement of organisms is prohibited.

(o) The project executing agency shall provide the installation with an oil-repellent coating in the area of the splash water zone.

Plant cooling

(p) A closed cooling system should be used for plant cooling, which does not lead to cooling water discharges or other material discharges (anti-fouling agents or biocides) into the marine environment.

Waste water

(q) The project-executing agency shall, as a matter of principle, collect waste water from sanitary facilities, sanitation facilities, kitchens and laundries in a professional manner, transport it ashore and dispose of it there in accordance with the applicable waste management regulations.

Oil content of the drainage water

(r) Drainage water must not exceed an oil content of 5 milligrams per litre when discharged.

(s) The oil content of the drainage water must be continuously monitored in the drain by means of sensors. The current values measured with the sensors must be able to be read out remotely.

(t) If the limit value of 5 milligrams per litre is exceeded, the use of appropriate automatic valves must ensure that the drainage water is not discharged into the marine environment. Instead, the drainage water can be discharged into collection tanks or recirculated.

Extinguishing foam on helicopter landing decks

(u) Drainage systems connected to helicopter landing decks shall have bypass systems to ensure that the resulting firefighting foam is automatically discharged to a collection tank bypassing the oil separators. The extinguishing foam shall not be discharged into the marine environment via the drainage system.

(v) Fire extinguishing exercises are to be carried out with water only.

Diesel generators

(w) Diesel generators used on platforms shall be certified to the emission limits defined in MARPOL Annex VI, Regulation 13, paragraph 5.1.1 or to emission standards equivalent to those defined in MARPOL Annex VI, Regulation 13, paragraph 5.1.1. This shall be demonstrated.

(x) On wind turbines, the use of diesel generators for emergency power supply should be avoided.

(y) If diesel generators are to be operated, fuel that is as low in sulphur as possible must be used.

Grouting method and grouting material

(z) Where grouting methods are to be used, the grout material must be as free of pollutants as possible. Appropriate techniques and devices for the grouting process (installation phase) shall be used to prevent the input of grout material into the marine environment as far as possible.

6.1.4 Sound insulation during the foundation and operation of plants

(a) When founding and installing a plant, the state of the art working method shall be used which is as quiet as possible under the circumstances found.

(b) If wind turbines or platforms and other energy generation plants are installed by means of impulse pile driving, the use of effective technical noise reduction measures in accordance with the state of the art in science and technology shall be provided for during the pile driving of the foundations. The requirements of the noise abatement concept of the Federal Ministry for the Environment, Nature Conservation, Nuclear Safety and Consumer Protection (BMU, 2013) are to be observed.

(c) Before pile-driving work is carried out, animals are to be scared away from the endangered area by means of a configurable state-of-the-art system.

(d) In the case of pile-driving, the duration of the pile-driving operation, including the entanglement, shall be kept to a minimum.

The draft noise abatement concept of a specific project shall be submitted to the BSH prior to the conclusion of contracts if pile driving or similarly sound-intensive foundation methods are planned for the installation of a plant. The selection of the planned foundation structure, the planned installation process, the planned working method, and the planned noise abatement measures as presented in the draft noise abatement concept as well as the noise prognosis shall be justified. The sound prognosis shall take into account the planned foundation structure and the planned construction process.

(e) In good time before the start of construction, the measures to reduce noise and prevent damage to the marine environment shall be tested under comparable offshore conditions in accordance with the state of the art in science and technology, insofar as they are not yet state of the art and have not yet been tested in a comparable manner.

(f) To avoid or reduce significant cumulative impacts and to comply with the specifications of the BMU noise protection concept (BMU, 2013) a temporal and spatial overall coordination of the pile driving work should be ordered within the framework of the subordinate approval procedure, taking into account the project-specific framework conditions.

(g) Blasting is generally not permitted. If blasting is unavoidable in order to remove ammunition that cannot be transported, a noise protection concept must be submitted to the BSH in good time beforehand.

(h) The project-executing agency shall select the plant design that is as low in operating noise as possible according to the state of the art.

6.1.5 Minimisation of scour and cable protection measures

(a) Scour and cable protection measures shall be reduced to a minimum. In the case of scour and cable protection measures, the project sponsor shall limit the introduction of hard substrate to the minimum necessary to establish the protection of the respective installation.

(b) Only fill made of natural stones or inert and natural materials are to be used as scour protection. The use of alternatives based on plastic or plastic-like materials (e.g. geotextile sand containers, (recycled) plastic nets filled with natural stones, concrete mats covered with plastic) is not permitted.

(c) Preferably, fillings made of natural stones or inert and natural materials are to be used as cable protection. The use of cable protection systems containing plastic is only permitted in exceptional cases and must be kept to a minimum.

6.1.6 Bird collision monitoring

In order to monitor bird collisions with wind turbines, state-of-the-art collision detection systems must be installed in OWPs within all areas and other energy production areas defined in the FEP. With reference to Article 77(1) sentence 1 no. 1 and Article 77(3) no. 1 WindSeeG, this requirement also applies outside bird migration corridors. The exact configuration of the collision monitoring, such as the locations, number and technical specifications of the recording devices, shall be coordinated with the BSH on a procedure- and site-specific basis. The monitoring methods must be suitable for interpreting the site-specific collision risk in relation to the site-specific migration intensity and for correlating or

evaluating it with regard to the effects of weather conditions and the operating status of the wind turbines. The following requirements shall be fulfilled for the respective configuration of the collision monitoring, as far as they correspond to the state of the art:

(a) Combined data collection of the site-related total migration, the number of birds flying through the rotor area (or collisions) as well as accompanying data on weather and operating status of the wind turbines with different systems (e.g. by means of radar camera systems, weather sensors).

(b) Appropriate methods with regard to continuous and automated recording (day and night), at least during the main migration periods.

(c) The number and location of the sampling points shall be chosen in such a way that the species spectrum and the quantity of birds can be recorded in a representative manner.

(d) The recording systems must be calibrated and the calibration must be documented.

(e) Specialised bird radars shall be used, as far as they are state of the art, to record migration intensity and migration phenology.

6.1.7 Sediment heating

When laying submarine cable systems, potential adverse effects on the marine environment due to cable-induced sediment heating should be reduced as far as possible. The so-called "2 K criterion", which sets a maximum tolerable temperature increase of the sediment by 2 degrees (Kelvin) at a sediment depth of 20 cm in the German EEZ, is to be observed as a precautionary value for nature conservation. Pursuant to Article 17d para. 1b sentence 2 EnWG, a warming greater than 2 K is permissible, inter alia, if it does not last more than ten days in total. In this context, stronger heating in individual hours is to be added until the limit value of ten days or 240 hours per year is reached. Furthermore, stronger warming is permissible if it affects less than 1 km of ONAS. Applicability is also given for in-park submarine cables and transboundary submarine cable systems. In all cases, the maximum length of 1 km refers to the total length of the project. More heating at different sections is therefore permissible as long as they do not exceed the total length of 1 km.

(a) For this purpose, the cable system should be laid at a depth that ensures compliance with the 2 K criterion. Planning principle 6.13.6 is referred to.

(b) Proof of the expected maximum sediment heating or compliance with the 2 K criterion is to be provided as part of the individual approval procedure, taking into account the expected operating mode of the submarine cable.

(c) Compliance with the 2 C criterion in ongoing operation is to be verified by the TSOs using model-based procedures, such as Transmission Capacity Management (TCM) II.

6.1.8 Further nature conservation planning principles (avoidance and mitigation measures)

Within the framework of forward-looking planning, the amended EU Directive 2018/2001 (cf. informal trilateral agreement reached) is to be taken into account on the basis of the most recent information available. This creates the obligation and possibility to designate so-called "acceleration areas".

These planning processes start with this preliminary draft in order to designate corresponding "acceleration areas" when this FEP process is completed.

For these "acceleration areas", Art. 15c para. 1 b of the above-mentioned proposal for a Directive provides for specific avoidance and mitigation measures to be defined. Already in the framework of the preliminary draft, there shall be

the possibility to introduce justified proposals for measures.

6.2 No impairment of the safety and ease of shipping traffic

The construction and operation of wind turbines, platforms, submarine cables and other energy generation facilities must not impair the safety and ease of shipping traffic.

(a) In order to ensure the safety of shipping, but also the integrity of the turbines, safety zones are established around the turbines in accordance with § 74 WindSeeG - especially in the case of adjacent priority or reserved areas for shipping - usually 500 m around the WT, platform or other energy generation facility. Within the defined areas and outside the defined areas, the safety zone shall be defined in such a way that it is contiguous and gaps are avoided. The safety zone shall be established outside the priority and reserved areas for shipping (ROP 2021).

(b) The structure shall be designed and constructed in such a way that in the event of a ship collision, the hull of the ship is damaged as little as possible; this includes the work vehicles used during construction and operation. Compliance with the state of the art is presumed if the requirements of the "Standard Construction - Minimum Requirements for the Construction of Offshore Structures in the EEZ"[6] are met.

(c) The construction of platforms at the edge of a site and the development of the site should be integrated into the overall ensemble of the development of the site in which the platform or site is located and should be carried out in a coherent manner.

(d) In addition, in the course of conflict minimisation, shipping concerns are taken into account when choosing the routing of submarine cable systems (especially with regard to priority and reserved areas). Wherever possible, the cable routes will run away from the main shipping routes. However, if the installation depth is sufficient, planning on the edge of those reserved areas adjacent to the OWP projects to be connected will also be considered, provided that the laying of the submarine cable systems is not expected to have a negative impact on the routes.

(e) Wind turbines, other energy generation facilities, platforms and other relevant obstacles shall be equipped with state-of-the-art marking devices to ensure the safety of shipping and air traffic until they are removed from the maritime area. In the case of the construction of further areas or other energy generation sites directly adjacent to the respective site, the project sponsor shall adapt the marking for the safety of shipping traffic in consultation with the sponsors of the adjacent projects in accordance with the overall development situation in the traffic area.

(f) For sites, other energy production sites and platforms, a state of the art maritime surveillance shall be carried out and the necessary measures to avoid collisions shall be taken.

(g) In order to secure the vicinity of the construction site and to avoid collisions with ships, a traffic safety vehicle shall be deployed in the vicinity of the construction site from the start of installation and throughout the installation phase of wind turbines, other energy generation plants and platforms. The traffic safety vehicle shall be deployed from the start of preparatory construction measures, insofar

[6] Available on the BSH website at: https://www.bsh.de/DE/PUBLIKATIONEN/_Anlagen/Downloads/Offshore/Standards/Standard-Konstruktive-Ausfuehrung-von-Offshore-Windenergieanlagen-Aktualisierung-01-06-21.html

as this is necessary for traffic safety. The traffic safety vehicle shall be used exclusively for the purpose of traffic safety. The traffic safety vehicle and its use shall correspond to the state of the art. Until the regular marking system is put into operation, the wind turbines, other energy generation plants and platforms shall be temporarily marked visually and by radio technology in accordance with the state of the art. The construction site shall be marked as a general danger area by the use of fired cardinal buoys in accordance with the state of the art.

(h) All working equipment and vehicles used, including the traffic control vehicle, must comply with the Ordinance on the International Regulations for Preventing Collisions at Sea of 1972 of 13 June 1977 (Federal Law Gazette I p. 813), as last amended by Article 1 of the Ordinance of 7 December 2021 (Federal Law Gazette I p. 5188), with regard to their marking and traffic behaviour, and must meet the safety standard required for the federal flag or a demonstrably equivalent standard with regard to equipment and crew.

(i) The BSH may order measures, in particular the provision of additional towing capacity by the project-executing agency, as part of the approval decision in order to reduce the risk to the safety and ease of shipping traffic.

(j) The developers of OWPs located in the traffic area of the shipping route SN10 of the ROP 2021 are obliged to ensure that sufficiently dimensioned additional towing capacities are permanently maintained on site in the catchment area of the SN10 for the prevailing shipping traffic and the hazard situation, for which the competent authorities have the authority to issue instructions and the right of access if necessary. The owners of the projects of the sites in the catchment area of the SN10 are obliged to provide the towing capacities in such a way that each of them is obliged to provide the entire capacity, but this is only required once in the catchment area of the shipping route SN10 (joint obligation). The obligation is expected to come into effect at the time of the first development of land in sites N-11 or N-12. Any requirements for the necessary provision of further additional towing capacities, in particular in other traffic areas, remain unaffected by this regulation.

6.3 No impairment of the safety and ease of air traffic

The construction, operation and dismantling of wind turbines, platforms, submarine cables and other energy generation facilities must not impair the safety and ease of air traffic.

(a) The regulations of the "Standard Offshore Aviation for the German Exclusive Economic Zone"[7] (SOLF) of the Federal Ministry of Digital Affairs and Transport (BMDV), as amended from time to time, shall be complied with in the planning, construction and operation of wind turbines, platforms, submarine cable systems and other energy generation facilities as well as the establishment and operation of air traffic areas in this context.

(b) It must be prevented that existing and planned offshore helipads (helidecks) become unusable due to the increase of obstacles in their vicinity. Therefore, obstacle-free conditions must be ensured for these approach and departure areas. The approach should be as holistic as possible, i.e. area-

[7] Available at https://www.verwaltungsvorschriften-im-internet.de/bsvwvbund_12082022_LF156116525.htm

wide and, if necessary, cross-area. The parties involved must coordinate with each other with regard to the alignment and dimensioning of the flight corridors.

(c) Approach and departure areas of helicopter landing decks shall be planned in such a way that sites or other energy production sites of third parties are affected as little as possible. They shall not be located beyond the boundaries of the German EEZ

(d) Obstructions along the approach and departure surfaces of helicopter landing decks shall be equipped with tower radiation if they are also to be operated at night and tower radiation is required as specified by the SOLF. To the extent that third party flight corridors are located in or immediately adjacent to an site or other energy generation site, the third party shall be permitted to install and operate such tower radiations.

6.4 No impairment of the security of national and alliance defence

The construction and operation of wind turbines, platforms, submarine cable systems and other energy generation facilities must not impair the security of national and alliance defence.

(a) In the course of conflict minimisation, the selection of sites for wind turbines as well as platforms and other energy generation facilities or the routing of submarine cable systems should take into account the concerns of national defence and alliance obligations.

(b) If the installation or operation work touches military exercise or restricted areas or if the use of acoustic, optical, optronic, magnetic sensor, electrical, electronic, electromagnetic or seismic measuring devices as well as unmanned underwater vehicles is planned, this shall be notified to the Navy Command as a rule at least 20 working days in advance in accordance with § 77 para. 3 no. 3 WindSeeG, stating the coordinates of the respective area of operation as well as the period of operation. The use of measuring instruments shall also be limited to the necessary extent.

(c) OWPs and their safety zones may be navigated by vehicles of the Federal Armed Forces in accordance with the principles of good seamanship, provided that the operation and maintenance of the OWP are not or only insignificantly impaired.

(d) Sonar transponders shall be installed at suitable corner positions of the OWPs, platforms and other energy production facilities in accordance with § 77 para. 3 no. 2 WindSeeG. The arrangement and specification of the sonar transponders shall be adapted to the requirements of the Bundeswehr with regard to functionality.

(e) It shall be possible for the Bundeswehr to install and operate fixed facilities such as transmitters and receivers on energy generation facilities, in particular on platforms. This is subject to the provison that the operation of military installations on energy generation facilities is necessary from a military point of view for national and alliance defence, and that the operation of energy generation facilities is thereby impaired as little as possible.

6.5 Removal of facilities

If the plan approval decision or the plan approval becomes invalid, the facilities shall be removed in accordance with section 80 (1) sentence 1 WindSeeG.

(a) The facilities shall be removed with the aim of ensuring the complete re-use of the site and the restoration of the site's performance and functionality. The BSH shall decide on the extent of the removal, taking into account the concerns specified in section 69(3) sentence 1 nos. 1 to 4 of the WindSeeG, the state of the art in science and technology at

the time of the decision on the removal and the generally recognised international standards as well as the requirements of a statutory instrument pursuant to section 96 no. 7 of the WindSeeG.

(b) After dismantling, the aim should be to reuse the removed components before recycling them, and to recycle them before any other form of recovery, in particular energy recovery, or otherwise to dispose of them - demonstrably and properly - on land.

6.6 Identification and consideration of objects

Prior to the start of planning and realisation of the installations, existing cables, lines, wrecks, cultural assets and material assets as well as other objects on the site, route, platform location or other energy extraction area shall be identified.

(a) The choice of location or route should take into account any sites where objects have been found.
(b) If found munitions are located on the site, route, platform location or other energy generation site, protective measures must be taken.

6.7 Consideration of cultural assets

Known sites of cultural heritage should be taken into account when selecting sites and routes. If previously unknown historical shipwrecks are found in the seabed during the planning or construction of wind turbines, platforms or submarine cable systems and other energy generation facilities, an exclusion zone with a radius of 50 m around the site shall be provided. In the exclusion zone, no impact of any kind may be made on the seabed or the shipwreck found. While safeguarding the overriding public interest in the development of offshore wind energy, measures may be taken to protect the cultural property. The authorities responsible for the preservation of historical monuments and archaeology shall be involved at an early stage in the case of finds.

6.8 Official standards, specifications or concepts

In the planning, construction and operation of wind turbines, platforms, submarine cable systems and other energy generation facilities, official standards, specifications and concepts in their currently applicable version shall be observed, taking into account the overriding public interest in the construction of wind turbines and ONAS. The overriding public interest in the construction of wind turbines and ONAS must always be taken into account in the context of weighing up the protected interests.

6.9 Communication and monitoring

In order to ensure the safety of installations and the safety and ease of traffic, sufficient communication infrastructure and monitoring shall be ensured in the vicinity of the WTGs and platforms.

(a) At suitable wind turbines or turbines in other energy generation sites at the edge of a site or other energy production site, state-of-the-art equipment approved for bidirectional communication with shipping shall be installed and operated for coastal radio stations in the mobile maritime radio service. This includes the acquisition of Automatic Identification System (AIS) data. For the range requirement of the equipment, a radius of at least 15 nm around the installation site of the marine radio antenna is specified, with a ship antenna height of 5 m to be taken into account. Furthermore, meteorological environmental data (wind direction, wind force, temperature and visibility) shall be recorded and submitted with the above-mentioned data. The data are to be sent or handed over to the WSV according to their specifications.

(b) The developer of an OWP shall ensure that a state of the art mobile radio network is operated within and in the immediate vicinity of the site.

Principles (a) and (b) do not apply insofar as coverage of the OWP as well as the surrounding traffic area from land is provided.

6.10 Consideration of all existing, approved[8] and established uses

Due consideration shall be given to existing and approved uses, as well as determinations made under this Plan and other matters worthy of protection. Unless the ground conditions require greater distances, the following principles shall apply:

6.10.1 General

(a) In the specific selection of locations for wind turbines, platforms, other energy generation facilities and the routing of submarine cable systems, consideration must be given to other specifications as well as existing and approved uses, rights of use and other interests worthy of protection.

(b) The planning, construction and operation of the WTGs, platforms and submarine cable systems shall be carried out in close coordination between the TSO and the OWP developer.

(c) For fishing use, it is specified that fishing vessels should be able to pass through OWPs on their way to their fishing grounds. Passive fishing with fish traps and baskets shall be possible in the safety zones of the OWP in accordance with §74 of the WindSeeG; however, this shall not apply to the area enclosed by the outer installations of the OWP and not to the immediate vicinity of the outer installations. Sentences 1 and 2 shall apply insofar as the construction, operation and maintenance of the OWP are impaired as little as possible, and subject to any conflicting regulations under technical law.

(d) For the use of sites for wind energy that overlap completely or partially with other reserved areas for research, fisheries and raw material extraction of the ROP 2021 in the EEZ of the North Sea, multiple use must be permitted in the overlapping area of the affected sites. In addition to the stipulations of this planning principle, further, possibly more detailed and site-specific stipulations are contained in Chapter II.1 can be found.

(e) In overlapping sites for wind energy with reserved research areas in the North Sea EEZ, multiple use must be implemented. Fisheries research must be made possible in the same way and to the same extent as before. For the overlap areas concerned, the FEP stipulates that when planning the park layouts, two corridors each, at 90 degrees to each other, must be kept free of WTs. The dimensions of the corridors must at least ensure that research vessels can carry out a half-hour haul with fishing gear (trawls) that touches the bottom and is towed freely in the water column. On the planning principle 6.13.6 is referred to. There shall be a responsible exchange between the parties concerned.

(f) In overlapping areas with marine research areas of the Thünen Institute that have not been designated as reserved research areas in the ROP (2021), the Thünen Institute shall be given the opportunity to continue research activities and, in particular, the surveys for long-term series in these areas, provided this is compatible with the interests of offshore wind energy.

[8] It is clarified that "approved" means all approval procedures.

6.10.2 Pipelines

(g) Within a protection zone of 500 m on both sides of pipelines, impacts on the seabed shall be avoided wherever possible. If an impact within the 500 m is unavoidable, this may only occur as a justified exceptional case and in agreement with the operator of the pipeline. Compliance with the current standard for technical and organisational safety measures shall be assumed.

6.10.3 Submarine cable

(h) A distance of 500 m shall be maintained on both sides of third party submarine cable systems by WTGs, in-park cabling, platforms of the OWP operator or other energy generation facilities. In-park cabling of OWPs or other energy generation sites shall be designed in such a way that existing, approved or planned pipelines, as well as existing, approved pipelines identified in this plan, are not crossed wherever possible. Where crossing is unavoidable, the requirements of the planning principle shall apply. 6.13.4 To Crossings.

(i) When laying submarine cable systems in parallel, a distance of 100 m must be maintained between the individual systems in alternation and a distance of 200 m after every second cable system. In the Baltic Sea in particular, the specific subsoil conditions must be taken into account.

(j) If the paths for interconnections between installations cross defined areas and do not run parallel to the TSO's connection systems, so-called handover areas are defined between two adjacent areas. The FEP shall define a width of 500 m for these transfer areas. It must be ensured that connections between turbines can be routed through the transfer areas at the boundaries of the sites. When selecting the locations of the wind turbines, it shall be taken into account that the route for interconnecting turbines may not be longer than the direct route from the converter platform to the site boundary by more than 20 percent. The route of the interconnection of turbines shall also be as straight as possible. The required distances between wind turbines and submarine cables shall be taken into account.

As the interconnection of installations would only be realised after tendering of a site, the OWP developer can propose a deviating crossing-free route within a corridor with a maximum width of 1,000 m as part of its own approval procedure.

6.10.4 Platforms

(k) In principle, no wind turbines may be erected in a protection zone of 1000 m around the location of the converter platform defined in the FEP. Exceptions to this are possible in agreement with the TSO in an area of 500 to 1000 m around the site. Work within the entire 1000 m protection zone may only be carried out in agreement with the TSO.

6.10.5 Wind turbines and other energy generation plants

Wind turbines and other energy generation facilities shall maintain a sufficient distance from wind turbines in neighbouring sites or other energy generation sites.

(l) As a general rule, a distance of at least five times the diameter of the larger rotor diameter must be maintained between wind turbines in neighbouring sites or other energy generation sites. This includes WTs that are in planning, under construction or in operation. Reference is made to the associated consultation question.

(m) In the case of neighbouring OWPs that are in the planning stage during the same period, proof of coordination with the respective project developer must be submitted as part of the individual approval procedure.

(n) The construction of wind turbines and other energy generation facilities is only permitted within the defined areas or in other energy generation areas.

6.10.6 Sites and other energy generation sites

(o) As a rule, a distance of at least 750 m must be maintained between the sites defined in the FEP and each other and/or the other energy generation sites. For sites whose commissioning is planned from 2030 onwards, the distance shall generally be at least 1,000 m.

6.11 Specific planning principles for sites and wind energy plants and other energy generation sites and plants

The following are planning principles for sites, primarily for the construction and operation of wind turbines, as well as other energy generation sites and facilities. Reference is made to Chapter 6.12which sets out planning principles for platforms and also for transformer and residential platforms, is referred to. Planning principle 6.11.1 is not applicable to other energy production areas.

6.11.1 Deviation of the actually installed capacity from the allocated grid connection capacity

The number of wind turbines to be installed on the site and, if applicable, any generation capacity in excess of the allocated grid connection capacity shall be determined as part of the approval procedure.

(a) If the amount of the increase in installed capacity does not exceed a share of ten percent of the allocated grid connection capacity, the OWP developer does not have to provide any additional evidence. If, on the other hand, the bidder intends to increase the installed capacity by more than ten percent of the allocated grid connection capacity, the TSO's approval is required with regard to compliance with the maximum temperatures of the TSO's operating equipment.

(b) The additional wind turbines are to be erected within the allocated site.

6.12 Specific planning principles for platforms

The following are planning principles for platforms. Platforms usually include converter platforms, collection platforms, substation platforms, residential platforms and other platforms located in sites or other energy generation sites.

6.12.1 Platform planning and design

During the planning, construction, operation and dismantling of the platform, particular attention shall be paid to structural safety, supply and disposal, including the provision of drinking water, waste water treatment and occupational health and safety concerns, including escape routes and means of rescue.

(a) Compliance with this planning principle shall be set out in a concept in the individual approval procedure.

(b) The accommodation of personnel on platforms shall take place in accommodation units already provided for this purpose in the planning of the platform. The subsequent installation of accommodation units which were not provided for in the concept with regard to the accommodation units already considered in the planning of the platform is to be avoided.

(c) At least two and independent means of access and egress suitable for the purpose of escape and rescue shall be provided for a platform, which shall use different transport systems.

(d) A winch operation area may be set up on platforms as a rescue area for emergencies. Its use is generally restricted to the prevention of danger to life and limb of persons (emergency) or to necessary sovereign measures; regular access of persons to the platform by means of helicopter winch operation is not permitted.

(e) When dimensioning the rescue and emergency response resources, the higher arrival times and maximum ranges (outward and return journeys) due to the higher coastal distances of the emergency resources and forces must be taken into account.

6.13 Specific planning principles for submarine cable systems

The following are planning principles for submarine cable systems, which for the purposes of this Plan means power cable systems such as ONAS, cross-border submarine cable systems, interconnections between installations and submarine cable systems for other power generation installations. The following planning principles apply to submarine cable systems of in-park cabling also of other energy production areas, with the exception of 6.13.2 and 6.13.3.

6.13.1 Bundling

(a) When laying submarine cable systems, the greatest possible bundling in the sense of parallel routing should be aimed for.

(b) The route should be chosen parallel to existing structures and buildings as far as possible.

6.13.2 Guided tour through border corridors

(a) Submarine cable systems landing in Germany shall in principle be routed through the border corridors N-I to N-V or O-I to O-V established at the border to the EEZ and the 12 nm zone.

(b) Transboundary submarine cable systems are also to be routed through the boundary corridors N-VI to N-XV and O-I to O-XIII defined at the border with the EEZ and the 12 nm zone.

(c) Cross-border submarine cable systems that do not land in Germany should not be routed through the border corridors N-I to N-V.

6.13.3 Crossing of shipping lanes

Submarine cables should be routed through traffic separation areas, their continuations and the Kiel-Baltic Sea Route by the shortest possible route if parallel routing to existing structures is not possible.

6.13.4 Crossings

Crossings are to be limited to the minimum necessary from a planning and technical point of view.

(a) Crossings of submarine cable systems should be avoided as far as possible, both with each other and with pipelines.

(b) If crossings cannot be avoided, they are to be carried out according to the respective state of the art and as perpendicularly as possible as well as in agreement with the owners of the affected, laid or approved submarine cables as well as pipelines.

(c) If both cables are newly laid, a crossing without structures should be aimed for in their planning, e.g. by laying the first system to be crossed sufficiently deep in the expected crossing area.

(d) Crossings between pipelines defined in the FEP are to be carried out without structures.

(e) The design of the crossing structure must be as environmentally friendly as possible, depending on the soil conditions (see also regulations under 6.1.5).

(f) When planning a crossing structure, the subsoil conditions and the respective laying radii of the cables must be taken into account.

(g) In the case of crossings, the conditions of planned crossings shall be contractually agreed with the owners of affected, laid or approved underwater cables and pipelines.

(h) In the event of the cutting of disused cables (so-called out-of-service cables), these cables shall be laid down and their ends fixed in the seabed in such a way that any impairment of shipping and fishing is permanently ruled out. Sealing of the seabed by fixing must be limited to the absolutely necessary extent. The planning principle 6.5 is referred to.

6.13.5 Gentle laying method

According to Section 17d (1a) EnWG, all technically suitable methods can be used for the construction of ONAS. In order to protect the marine environment, the least intrusive of the available installation methods should be selected, as long as this allows parallel installation and timely installation.

(a) Any anchor positions should be placed in such a way that significant impairment of legally protected biotopes is avoided as far as possible.

(b) When clearing stones, large-scale clearing should be avoided. The removal of individual stones must be carried out within a 20 m wide impact zone (10 m to the right and left of the route) or 30 m in curved areas. The stones are to be deposited as close as possible to their place of removal, at most 20 m outside the working strip within the biotopes, while avoiding lifting from the water body. Area clearance and clearance outside the impact zone must be applied for separately and approved by the BSH.

(c) In the case of reef occurrences, a minimum distance of 50 m shall be maintained where technically possible. The planning principle 6.1 is referred to.

6.13.6 Cover

When determining the coverage of submarine cable systems to be permanently ensured, the interests of marine environmental protection, shipping, defence, fisheries, fisheries research and system safety in particular shall be taken into account in weighing decisions, taking into

account the overriding public interest of offshore wind energy.

(a) In the North Sea EEZ, an overlap of at least 1.5 m is specified for all submarine cable systems outside areas identified in the FEP and other energy production areas.

(b) In the North Sea EEZ, an overlap of at least 1.5 m shall be specified for all submarine cable systems for research vessel corridors in the overlap areas of areas for wind energy with reserved areas for research.

(c) The coverage for submarine cable systems in the Baltic Sea is determined in individual procedures on the basis of the comprehensive study in consultation with the Directorate-General for Waterways and Shipping (GDWS) and with the involvement of the Federal Agency for Nature Conservation (BfN). The study and the proposed coverage of the various route sections based on it are to be submitted to the BSH with the application documents.

6.14 Possibilities of deviation

The possibility of deviating from planning principles depends, among other things, on whether the planning principles are based on binding regulations from sectoral law. Insofar as specific requirements can be derived from sectoral law, any deviations must be measured against these.

Thus, a deviation from the objectives according to § 4 para. 1 ROG and thus the obligation to observe them in spatially significant planning via the ROP is only possible under the conditions specified there.

With regard to existing official standards, specifications and concepts, the FEP does not make any new stipulations, but only refers to existing rules. Accordingly, it does not make any statements on the possibilities for deviation regulated within this framework.

Furthermore, in justified cases it is possible to deviate from planning principles that are not based on mandatory sectoral law or represent spatial planning objectives. This concerns cases in which compliance cannot or can no longer be guaranteed due to special framework conditions. Furthermore, some situations are conceivable in which not all principles can be implemented at the same time, as they partly serve conflicting interests and must therefore be balanced.

Insofar as no binding requirements arise from the sectoral legislation, possibilities for deviation are provided for in the respective planning principles themselves for (individual) cases that can already be anticipated.

Project developers submitting an application to the BSH for the construction and operation of wind turbines including corresponding ancillary facilities, other energy generation facilities, ONAS, interconnections between facilities or transboundary submarine cable systems may, in justified cases, deviate from planning principles not subject to deviation, provided that simultaneous compliance with all planning principles not subject to deviation is not possible.

When considered as a whole, it is necessary that the deviation fulfils the objectives and purposes of the respective principle and of the plan pursued by the rule in an equivalent manner or does not impair them in a significant manner. The basic principles of planning must not be affected. Following the principles developed within the framework of the ROG, atypical individual cases in particular can be an indication of such possible deviations.

Section 1 (3) of the WindSeeG shall be taken into account in the formulation of the deviation decision.

Questions for the consultation

Planning principle 6.10 Consideration of all existing, approved and established uses

F.9 The planning principle 6.10.3 stipulates that a distance of 500 m must be maintained between installations and submarine cable systems. Should the requirement be amended to allow deviation from this rule in individual cases, or is the 500 m stipulated mandatory?

Planning principle 6.10.5 Distance between WTGs of neighbouring areas or other energy generation areas

The requirement 6.10.5 (l) to maintain a distance of five times the rotor diameter (5D) between WTs of neighbouring OWPs results from the assumption that such distances can be considered unproblematic with regard to their impact on the stability of the neighbouring installations even without further analysis. Due to the technical development of WTs with increasing rotor diameters, five times the rotor diameter often exceeds the blanket distance requirements. 6.10.6 (o) of 750 m and 1,000 m, respectively, so that without an increase in the standard distances, the relative distance requirement of 6.10.5 (l) will come into effect.

An adjustment of the blanket distance requirement to ensure compliance with a sufficient distance for stability does not appear expedient against the background of the difficult-to-predict plant development by the plant manufacturers and the plant selection by the project developers.

Instead, the relative distance requirement should also continue to be applied in order to ensure stability and reasonable shading losses. In the current version of the planning principle, however, different boundary conditions may arise for the utilisation of space in the event of sequential commissioning of neighbouring OWPs. On the other hand, in the case of parallel planning of neighbouring OWPs, coordination between the project promoters is necessary to ensure the distance of 5D in relation to all turbine locations.

An exemplary situation is shown schematically in the following diagram. The problem will become more acute as rotor diameters are expected to continue to increase.

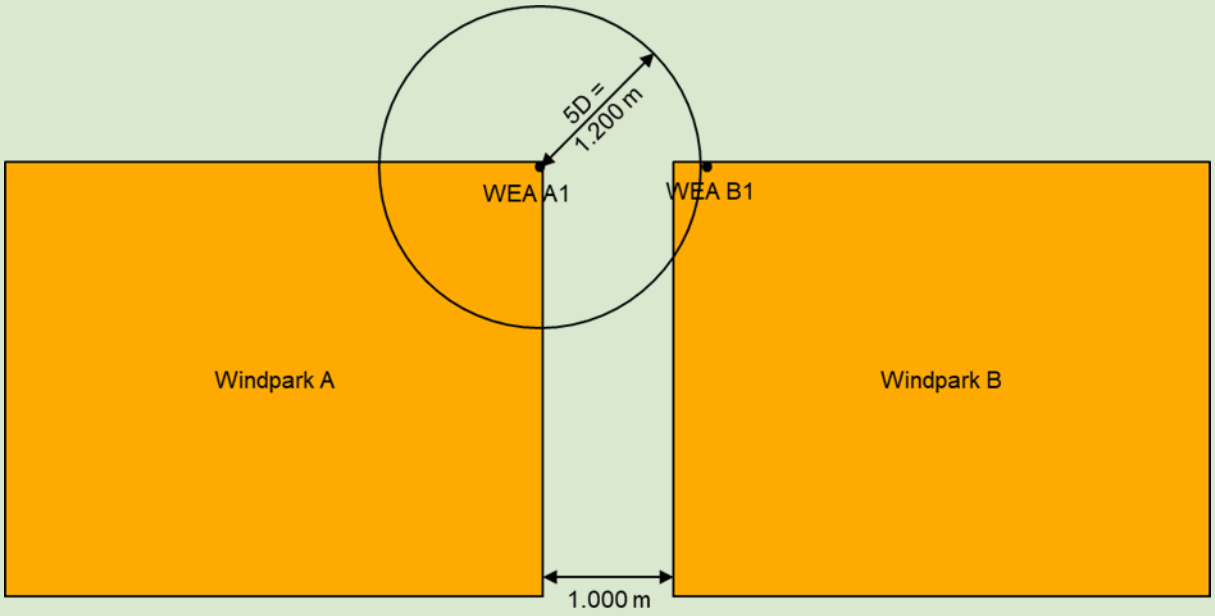

Illustration 6Example schematic representation of a sequential commissioning of neighbouring OWPs according to the current regulation. Assumption: OWP A goes into operation before OWP B, both OWPs use a turbine type with a rotor diameter of 240 m

In order to arrive at more comparable boundary conditions and possibly reduce the need for coordination, a supplement to **the** 5D regulation would be conceivable with reference to **the** distances of WT sites **to the centre line between the outer boundaries of** the areas or according to the other energy generation areas. The distance between defined areas of at least 1,000 m as well as the basic distance requirement of at least 5D in relation to the specific WT locations and WT types of neighbouring OWPs would remain in place.

Different variants would be conceivable, each with different advantages or disadvantages depending on the sequential or parallel planning/construction of the OWPs on the neighbouring areas, for example:

- Supplement Variant 1: The first OWP in time must maintain at least 2.5 times the rotor diameter of its own turbines to the centre line between the respective areas. The subsequent OWP must continue to maintain a distance of 5D of the larger rotor diameter in its site planning.
- Supplement Variant 2: All OWPs with neighbouring areas must maintain a distance to the centre line equal to 2.75 times the respective rotor diameter, see schematic diagram in Figure 2. If the neighbouring OWPs use WTs with identical rotor diameters, a distance of 2.5D each to the centre line would ensure that the distance between WTs of neighbouring OWPs is at least 5D. However, in order to ensure a distance of 5D even with unequal rotor diameters, the distance to the centre line should be chosen somewhat higher. Thus, for example, a specification of 2.75D ensures that a distance of 5D is maintained as long as the larger rotor diameter is at most 1.2 times the smaller rotor diameter.

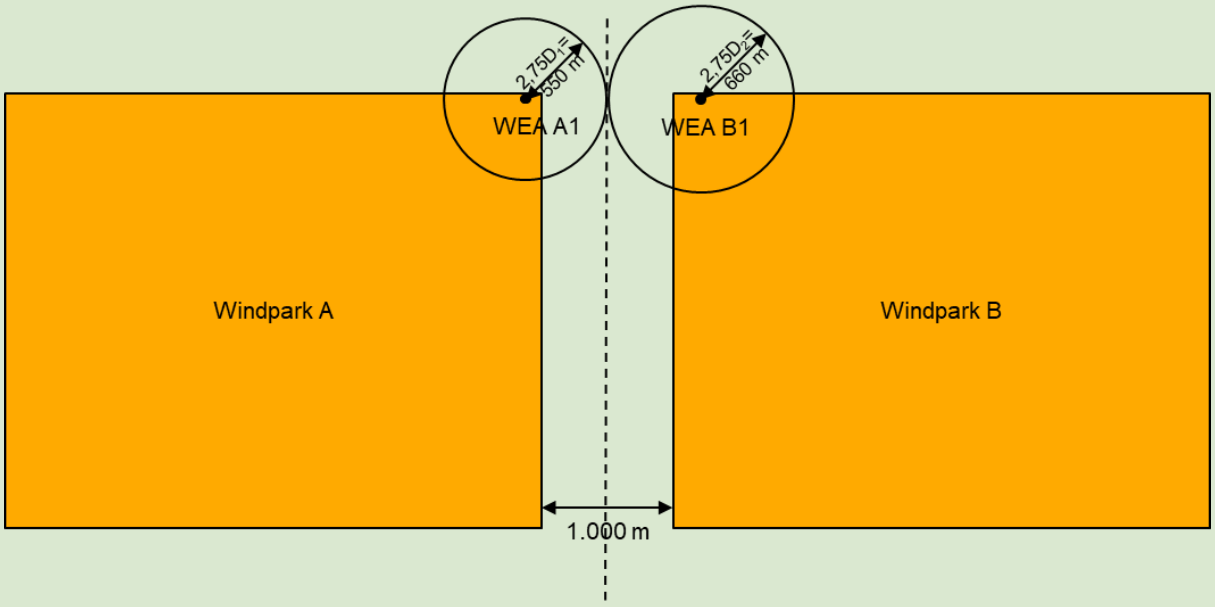

Figure 7Supplement to the distance between wind turbines in neighbouring areas Variant 2: Assumption: D_1 =200m, D_2 =240m, resulting distance between the turbines is 1,210m. This corresponds to 6.1*D_1 and 5.0*D_2 .

F.10 Do you think it would be helpful to supplement the planning principle by specifying distances to the centreline between OWPs, for example to reduce the risks of delays associated with coordination between the promoters of neighbouring projects?

F.11 In your opinion, do the advantages with regard to the procedure or the possibly better equal treatment in the case of a sequential expansion outweigh the disadvantages that may result from possible larger distances between plant locations?

F.12 Do you have any suggestions for adapting or concretising the outlined variants or alternative proposals for operationalising the 5D distance from turbine locations of neighbouring OWPs?

Planning principle 6.13.6 Cover

F.13 Should the requirement of an overlap of at least 1.5 m in the EEZ of the North Sea, analogous to the park-internal submarine cable systems, also apply to ONAS only outside areas? In this case, the overlap to be complied with within specified areas would be determined by compliance with the planning principle 6.1.7 Sediment heating.

7 Pilot wind turbines

This preliminary draft does not make any new stipulations for pilot wind turbines compared to the FEP 2023. Therefore, the chapter is not further elaborated in this preliminary draft.

8 Other energy production areas

In the North Sea EEZ, the other energy extraction area SEN-1 was defined in the FEP 2023. This preliminary draft does not make any new specifications for other energy production areas compared to the FEP 2023.

The Ordinance on the Award of Other Energy Extraction Areas in the Exclusive Economic Zone (SoEnergieV) is currently being revised. The tendering of other energy production areas can take place in several sub-sites. Please refer to the consultation of the Federal Ministry of Economics and Technology (BMWK) "Zuschnitt Teilbereich sonstigen Energiegewinnungsbereich SEN-1"[9] .

The planning principles of the FEP and the objectives and principles of the ROP 2021 must be complied with.

The possibility of non-discriminatory connection of further other energy production areas by third parties must be guaranteed by the pipeline operator if the final energy carrier is transported away through such.

A connection of the SEN-1 area to existing and planned pipelines that exclusively transport the final energy carrier is mandatory. In the case of a connection to an existing pipeline, the required line is to be planned on the shortest possible route within the other energy extraction area and crossings with own cables as well as third-party cables are to be avoided as far as possible.

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9 https://www.bmwk.de/Redaktion/DE/Artikel/Energie/marktkonsultation-Zuschnitt-Teilbereiche-SEN-1.html

III. Justification

The BSH is responsible for amending and updating the site development plan in agreement with the BNetzA, § 8 para. 1, para. 4 sentence 2 in conjunction with § 6 WindSeeG. § 6 WindSeeG. With the FEP 2023, specifications have already been made for an installed capacity of wind turbines connected to the grid of at least 30 GW by 2030. Further updates are therefore required to achieve the long-term target of 70 GW by 2045, § 1 para. 2 sentence 1 WindSeeG. Changes, such as in the legal framework conditions or in findings or planning, may make it necessary to make changes even beyond these stipulations. Accordingly, the FEP is to be updated and amended within the framework of this procedure with a view to the future.

1 Areas and sites

[The chapter is executed on the draft].

2 Lines

2.1 Border corridors to the territorial sea

The routes planned in the FEP must be able to be reasonably routed through the coastal sea to the grid connection point (NVP) (cf. planning principle 6.13.2). For coordination with the coastal states, the border corridors serve as locations where the grid connection lines cross the border between the EEZ and the territorial sea. This is intended to concentrate the cable systems at these points as far as possible and to bundle them for further routing towards the NVP. The routing in the territorial sea is not determined; this is the responsibility of other bodies in the procedures provided for this purpose. When the corridors were defined, no assessment of the continuation of the route, for example with regard to nature conservation issues in the coastal sea, was carried out. This is also the responsibility of other agencies in the procedures provided for this purpose.

The dimensioning of the border corridors at the transition to the territorial sea results from the distances between the cable systems and the number of required or possible systems as well as the respective space situation at the transition to the territorial sea.

With regard to the planned location of the border corridors, there are already strong restrictions within the EEZ due to the already approved and existing OWPs, so that the existing lack of space cannot be easily solved by specifications in this plan. In addition, existing structures, i.e. in particular cable systems and pipelines already in operation, must be taken into account, whereby the submarine cable systems planned for the future must fit into the existing system. At the same time, planning in the territorial sea has not yet progressed to the point where a sufficient number of routes have been identified to achieve the expansion targets. Therefore, the border corridors in this plan are to be defined in close consultation with the coastal countries.

North Sea

No further systems can be envisaged through the N-I border corridor (Ems route) within the framework of the FEP, as this will already be fully occupied after 2025.

The border corridor N-II (Norderney route) will be fully occupied with the commissioning of NOR- 6-4 (defined as NOR-21-1 in the FEP 2023).

ONAS via the N-III border corridor are to be routed in the territorial sea via the two islands of Baltrum and Langeoog in future - subject to further checks. The total capacity of the N-III border corridor has not been conclusively determined. However, according to findings from the "Seetrassen 2030" project, a potential total of 13 ONAS could be derived via this corridor from a technical point of view using the methods currently available. Five of these ONAS would then be routed via the island of Baltrum and a further eight ONAS via the island of Langeoog. So far,

only two ONAS have been identified for the island of Baltrum.

The route corridor via the island of Baltrum is available earlier than the route corridor via the island of Langeoog. The ONAS with border corridor N-III NOR-9-2, NOR-9-3, NOR-12-1, NOR-11-2 and NOR-13-1 defined in the FEP 2023 up to and including 2031 are therefore planned spatially via the island of Baltrum.

After commissioning of these five ONAS, the line corridor via Baltrum will be exhausted and all further ONAS via the N-III border corridor will be routed via Langeoog.

The N-V border corridor to the south-west of area N-4 is defined for the North Sea coastal sea of Schleswig-Holstein. Following an examination of the capacity via the so-called Büsum corridor in the Schleswig-Holstein territorial sea as part of the update procedure for the FEP 2023, it was possible to determine that 12 systems can probably be routed via the corridor without a relocation within the fairway being necessary. This corresponds to a capacity of eight ONAS for the N-V border corridor, while the remaining four systems are routed via the already fully utilised N-IV border corridor.

Baltic Sea

In the area of the O-I border corridor, two additional ONAS and two cross-border submarine cable systems are envisaged under this plan in addition to the existing systems (see chapter 2.3).

Boundary Corridor O-II is not a corridor for connecting OWPs through the territorial sea to the NVP in the sense of this plan. This corridor serves exclusively to connect the OWP "ARCADIS East I" (area O-4) approved in the territorial sea.

Border corridor O-III is defined by the existing systems to the OWP "EnBW Windpark Baltic 2". For this corridor, two cross-border submarine cable systems are planned within the framework of the FEP (see chapter 2.3).

The border corridors O-IV, O-V and O-XIII also serve exclusively for the routing of cross-border submarine cable systems within the scope of this plan (see Chapter 2.3).

2.2 Offshore grid connection systems

[The chapter is executed on the draft].

2.3 Interconnectors

The purpose of the FEP is to spatially secure routes or route corridors for possible interconnectors in order to ensure in the future that the existing and planned interconnectors are spatially integrated into a coordinated overall system, i.e. in particular with regard to the ONAS for OWPs.

North Sea

Within the framework of the FEP, seven additional interconnectors are identified in the North Sea EEZ. Of these, two connections each are planned with a direct and indirect (via a platform) landfall in Germany. One connection is only defined up to a bundling point, so that the question of landfall can be clarified at a later date. In this way, another route on the limited border corridors to the territorial sea can be kept open for ONAS for the time being. Starting from the bundling point, the grid connection runs parallel to "Europipe 2", to shipping route SN4 to shipping route SN10 and from there along the border of areas N-12 and N-13 to border corridor N-VI.

The other interconnector landing in Germany is the approved NeuConnect system routed to the UK. It starts at border corridor N-III and runs parallel to "Europipe 2" in a northerly direction to the southern edge of shipping route SN2. From there, it continues north of areas N-1, N-2 and N-3 westwards to border corridor N-XV. NeuConnect is routed across the N-III border corridor,

but not across an island. For this reason, NeuConnect is not relevant for the limited capacity of 13 ONAS via border corridor N-III.

Another connection leads from platform NOR-9-4 in a south-westerly direction, parallel to area N-9.5 via border corridor N-XIV to the Netherlands.

The fourth connection to Germany leads from platform NOR-14-1 in a north-easterly direction via border corridor N-VII to Denmark and runs between the planned expansion areas in area N-16, which are still unclear.

In addition, three further interconnectors are planned, which can only cross the German EEZ and connect the Netherlands with Denmark or Norway. Two routes run on both sides of the shipping route SN10 and connect the border corridors N-VI and N-XIV as well as N-VII and N-XIII. Depending on future determinations in the area of the shipping route SN10 of the ROP 2021, the route and location of the border corridors may change. A system is planned in parallel to "Viking Link".

Baltic Sea

In the Baltic Sea EEZ, eight routes are identified for interconnectors connecting the German territorial sea with the Danish and Swedish EEZs. One system each is planned in the area of the Fehmarnbelt crossing (O-V to O-VI) and parallel to "Kontek" (O-IV to O-VII). In the border corridor O-III, two systems begin in the direction of Sweden and lead parallel to the OWP "EnBW Windpark Baltic 2" to the border corridor O-IX. These are planned in the area of the OWP "EnBW Windpark Baltic 2" with a reduced distance of 350 m and 450 m respectively to the OWP in order to have as little impact as possible on the overlapping submarine diving area. Two interconnectors are also planned from the O-I border corridor in the direction of Bornholm, running parallel to the existing ONAS to border corridor O-X and O-XI. It is planned to implement the interconnectors to connect Bornholm Energy Island via the route from border corridor O-XI to O-I. This runs after entering the German border corridor. After entering the German EEZ, this runs via the border corridor O-XI between the OWP Wikinger and Arkona Basin Southeast and crosses the shipping route SO2 parallel to OST-1-4. From the area O-2, it runs parallel to OST-1-4 and the route for the interconnectors, which comes from the northeast direction from the border corridor O-X and connects Germany and Denmark, to the border corridor O-I in the direction of the territorial sea. With regard to the border corridor O-X, it is pointed out that this is located at the edge of a submarine diving area and that, for reasons of national and alliance defence security, a route should also be taken in the Danish area outside this NATO exercise area.

Another system was planned in the FEP 2023 parallel to "NordStream 1" or between "NordStream 1" and "NordStream 2" and connected the border corridors O-XII and O-XIII. However, after consultation with the TSOs, this route will be replaced by a parallel route north of "NordStream 2" due to technical difficulties. In addition, another parallel route for a interconnectors will be defined there. The relevant border corridors O-XII and O-XIII will be extended by 600 m to the north.

A route from Poland to Denmark does not seem possible at the moment due to the existing restrictions within the German EEZ.

2.4 Connections between installations

[The chapter is executed on the draft].

3 Specifications for the territorial sea

Pursuant to § 4 para. 1 sentence 2 of the WindSeeG, the FEP may also make sectoral planning specifications for areas, sites, the chronological order of the tendering of sites, the calendar years of commissioning and the expected capacity to be installed, as well as for test sites and other energy generation areas for the territorial sea. In

accordance with an administrative agreement[10] between the Federal Government, represented by the BSH, and the competent Land, the individual specifications for the territorial sea shall be determined in more detail.

Pursuant to § 4 para. 1 sentence 4 WindSeeG, the Land shall provide the BSH with the information and documents required in each case, including those required for the Strategic Environmental Assessment (SEA).

Under the terms of the Administrative Arrangement, determinations for the territorial sea shall not include

- the locations for converter platforms, collection platforms and transformer stations,
- Routes or route corridors for offshore connection lines, for cross-border submarine cable systems or for possible interconnections between installations, routes and route corridors; and
- Determination of locations where the offshore connection lines cross the boundary between the EEZ and the territorial sea, and
- standardised engineering principles and planning principles pursuant to § 5 para. 1 nos. 6 to 11 WindSeeG.

The corresponding technical and spatial requirements are the subject of the planning and individual approval procedures within the jurisdiction of the Land.

An administrative agreement was already concluded between the federal government, represented by the BSH, and the state of Mecklenburg-Western Pomerania as part of the process of drawing up the FEP 2019.

For the federal states of Lower Saxony and Schleswig-Holstein, an administrative agreement is currently out of the question. Therefore, no designations are made in the territorial sea of these federal states.

Areas and sites for the construction and operation of offshore wind turbines

The justification for "Areas and sites for the construction and operation of offshore wind turbines" corresponds to the content of the FEP 2023. No additions are to be listed.

Testing ground and testing ground connection line

The content of the justification "Testing ground and testing ground connection line" in the FEP 2023 is basically still valid. However, an adjustment is made with regard to the definition of a test field connection line to be implemented by the TSOs with a capacity of 300 MW and commissioning in the calendar year 2032. The above-mentioned test field connection line is not specified. This is due to the fact that the state of Mecklenburg-Western Pomerania has not announced the need for such a test field connection line by 30 June 2023.

4 Central preliminary investigation and calendar years of tendering and commissioning

Section 5 (4) of the WindSeeG specifies criteria for determining the sites in the FEP and the chronological order in which they are put out to tender. The overriding aim of the specifications is to ensure that the expansion of offshore wind energy and the associated ONAS on these areas takes place in parallel and that the existing ONAS are also used efficiently and at full capacity. This ensures that all offshore wind turbines are connected in time and that vacancies on the

[10] Available on the BSH website at: https://www.bsh.de/DE/THEMEN/Offshore/Meeresfachplanung/Flaechenentwicklungsplan/_Anlagen/Downloads/FEP/Flaechenentwicklungsplan_Verwaltungsvereinbarung_BSH_Mecklenburg_Vorpommern.html?nn=1653366

ONAS are avoided. In this way, the expansion of the use of wind energy shall be as cost-efficient as possible. When applying the criteria listed in § 5 par. 4 sentence 2 WindSeeG, this objective as well as the general objective of the Act to ensure a steady and cost-efficient expansion of the use of offshore wind energy shall always be taken into account. The list in § 5 para. 4 sentence 2 WindSeeG is not exhaustive.

For a detailed description of the criteria and their application, please refer to section 4.8 of the FEP 2020.

Between the calendar year of the invitation to tender for a site and the calendar year of commissioning of the awarded WTG on this site, there must be at least so many months that the realisation deadlines pursuant to § 81 WindSeeG can be met.

The basis for determining the chronological order of the sites and ONAS is firstly the achievement of the expansion targets in accordance with § 1 para. 2 sentence 1 WindSeeG. In addition, § 2a para. 1 WindSeeG specifies how high the tender volume should be in the individual calendar years.

In accordance with § 5 para. 1 no. 3 WindSeeG, the FEP must also determine whether the respective site is to be centrally pre-surveyed and tendered according to Part 3 section 4 WindSeeG or whether a tender for sites not centrally pre-surveyed is to be carried out according to Part 3 section 5 WindSeeG. In this context, § 5 para. 4 sentence 2 WindSeeG defines criteria for the determination of sites and the chronological order in which they are to be put out to tender.

4.1 Central preliminary examination

Pursuant to § 2a para. 2 WindSeeG, the tender volume is to be divided equally between centrally pre-screened and non-centrally pre-screened sites starting in 2027.

As the first site beyond the shipping route SN 10, area N-14.1 is to be subject to central preliminary investigation. Further sites in Zones 4 and 5 are to be identified for central preliminary investigation in the further procedure for updating the FEP in coordination with the implementation of the amended Directive EU 2018/2001 (cf. informal trilateral agreement reached).

Sites N-13.3, N-13.4 and N-13.5 are not intended to be commissioned before site N-14.1. They are therefore not currently ranked, so that no statement is made as to whether the areas should be centrally pre-screened.

4.2 Calendar years of tendering and commissioning

Pursuant to section 5(1) no. 4 of the WindSeeG, the FEP shall determine the calendar years, including the quarter in the respective calendar year, in which the WTs and the corresponding ONAS sited on the specified sites are to be commissioned, as well as the quarters in the respective calendar year in which the cables of the in-park cabling of the sited WTs are to be connected to the converters or the transformer platform. In addition, the FEP may specify essential intermediate steps for the joint implementation schedule pursuant to section 17d (2) EnWG.

The interaction of the commissioning of the ONAS and the commissioning of the WTs was consulted on during the FEP 2020 consultation. Against this background, if two sites are connected to an ONAS, the first or second quarter is generally determined in each case. If only one area is connected to the converter platform, the period for cable entry is generally set to the first and second quarter of the respective calendar year.

Pursuant to § 5 para. 1 no. 4 WindSeeG, the FEP for sites and ONAS determines the respective quarter in the calendar year in addition to the calendar year of commissioning. The question of which quarter of the respective calendar year the ONAS can be commissioned as early as possi-

ble was discussed extensively during the consultation on the draft FEP 2020. Against this background, the third quarter of the respective calendar year is generally determined for the commissioning of the ONAS. Pursuant to Section 17 d (2) sentence 1 EnWG, the TSO with connection obligations commissions the ONAS in good time so that the completion dates fall within the calendar years specified in the FEP for this purpose, including the quarter in the respective calendar year.

The data shown in Table 8 and Table 9 are based, among other things, on the NDPs available for connecting the sites to the grid. The availability of the NDPs in terms of time is proposed by the TSOs as part of the NDP process and reviewed by the BNetzA. For the years of commissioning 2032 to 2035, for which specifications are made in this preliminary draft, there is regularly a distribution between NPTs in north-west Germany on the one hand and NPTs in north or north-east Germany on the other. In order to avoid crossings both in the EEZ and in the coastal sea, areas must therefore be identified that can be sensibly routed via the N-III border corridors to Lower Saxony or N-V to Schleswig-Holstein in the year specified for the NVP in the NEP. As a result, neighbouring sites may not be tendered or put into operation in the same or consecutive year, but there may be a time lag due to the availability of the NVP.

5 Standardised technology principles

Compared to the specifications of the FEP 2023, the increase of the voltage level in the direct connection concept according to 5.9 from 66 kV to 132 kV represents the only substantive adjustment. Therefore, for further justification of the standardised technical principles already established, please refer to Chapter III. 5 of the FEP 2023.

6 Planning principles

The planning principles are based on the objectives and principles of the ROP for the North Sea and Baltic Sea EEZs. The ROP has already weighed up the various uses against each other. The specifications made within this framework are observed and taken into account in the update of the FEP. The relevant objectives and principles at the level of spatial planning are predominantly adopted as planning principles in the RDP and reviewed, specified and weighted in terms of their importance with regard to their applicability to the regulatory issues addressed in the RDP on the basis of the concerns and rights presented.

The definition of standardised technology principles and planning principles is already based on a consideration of potentially affected public concerns and legal positions, so that the definition of standardised technology principles and planning principles also already includes a "preliminary examination" of possible alternatives.

The following are the justifications for the planning principles for areas, wind turbines, platforms, submarine cable systems, other energy generation areas and other energy generation facilities. These concretise the planning principles and serve to provide a clear interpretation in the individual procedures.

Planning principles from the FEP sufficiently bind the subsequent approval decision in accordance with section 6 para. 9 sentence 2 of the WindSeeG, insofar as they lay down specific requirements in terms of content, if necessary including concrete formulations in the respective justification of the planning principles. For such topics, there is therefore no reason to be concerned about impairments of the criteria and concerns pursuant to § 10 para. 2 in conjunction with § 12 para. 5 sentence 3 WindSeeG.

At the level of the Ordinance on the Implementation of the Wind Energy at Sea Act (WindSeeV), corresponding regulations are therefore omitted.

6.1 No risk to the marine environment

The environmental and nature conservation planning principles ensure that the marine environment is not endangered, § 5 para. 3 sentence 2 no. 2 WindSeeG, and that environmental and nature conservation concerns are concretised and safeguarded. They therefore fundamentally represent avoidance and mitigation measures within the meaning of Article 40 para. 2 sentence 1 no. 6 UVPG.

6.1.1 Observance of environmental and nature conservation framework conditions

This planning principle serves as a clarifying reference to the applicable environmental and nature conservation requirements. These include the following aspects in particular. The list is not exhaustive.

Significant impairment of legally protected biotopes within the meaning of Article 30 (2) sentence 1 BNatSchG should be avoided as far as possible when erecting wind turbines and other energy generation plants.

Areas, sites and other energy production areas must be compatible with the conservation purpose of a protected area ordinance issued under section 57 of the Federal Nature Conservation Act; designations are permissible if, under section 34(2) of the Federal Nature Conservation Act, they cannot lead to significant impairments of the components of the area relevant to the conservation purpose of the respective protected area ordinance, or if they meet the requirements under section 34(3) to (5) of the Federal Nature Conservation Act.

Reference is made to Article 45a of the Water Resources Act[11] (WHG). The best environmental practice according to the Helsinki and OSPAR Conventions as well as the respective state of the art shall be taken into account and specified in the individual procedure.

Pursuant to Article 2(2)(6) of the ROG, the area is to be developed, safeguarded or, where necessary, possible and appropriate, restored in terms of its importance for the functional capacity of soils, the water balance, fauna and flora and the climate, including the respective interactions. The significance of the area for the functioning of soils, the water balance, fauna and flora and the climate, including the respective interactions with the requirements of the biotope network system, shall be preserved. This shall ensure that the dispersal processes and long-range ecological interactions of species and their habitats are taken into account.

When laying offshore connection lines, possible adverse effects on the marine environment should be minimised. To this end, submarine cable systems should be laid outside nature conservation areas wherever possible.

Known occurrences of legally protected biotopes according to § 30 BNatSchG are to be avoided as far as possible when laying submarine cable systems.

Project-specific avoidance and mitigation measures may be required during the planning and construction of wind turbines and other energy generation plants at sea in the vicinity of nature conservation areas in order to ensure compliance with site protection requirements. These measures, e.g. noise abatement measures to protect noise-sensitive marine mammals, are determined on a project-specific basis at project level, taking into account the special features of the project area and the circumstances of the individual case.

Depending on the location and foundation design of the wind turbines and other energy generation facilities, as well as the protective purpose of the nature conservation area, additional or specific protective measures may be required in individual cases.

Should occurrences of structures listed in § 30 BNatSchG be found during closer investigations in the specific approval procedure, these are to be analysed and taken into account in the decision-making process. However, no concrete spatial allocation of the structures mentioned is possible at the present time.

These regulations refer to the justification of principle 2.2.1 (4.1) of the ROP 2021, according to which the impairment of occurrences of legally protected biotopes according to § 30 BNatSchG should be avoided during the planning, construction and operation of energy generation plants and power lines. To avoid negative impacts on sensitive habitats, power lines should be planned and laid outside nature conservation areas wherever possible. Further-reaching technical and nature conservation regulations remain unaffected.

The laying of offshore grid connection lines, as well as their operation, maintenance and eventual retention after abandonment or dismantling, can lead to impacts on sensitive habitats. In order to limit potential negative impacts on sensitive habitats and to safeguard the conservation purposes of nature conservation areas, offshore grid connection lines within the EEZ should primarily be routed outside nature conservation ar-

[11] Federal Water Act of 31 July 2009 (Federal Law Gazette I p. 2585), last amended by Article 2 of the Act on the Implementation of Requirements of Directive (EU) 2018/2001 for Approval Procedures under the Federal Immission Control Act, the Federal Water Act and the Federal Waterways Act of 18 August 2021 (Federal Law Gazette I p. 3901).

eas. If this is not possible, impacts on the protection and conservation objectives of the nature conservation areas must be assessed in the individual approval procedure.

In the ROP for the EEZ 2021, main bird migration routes were identified as bird migration corridors on the basis of extensive data. During migration events, a significantly increased collision risk for birds is to be expected within these areas compared to other areas of the EEZ. Within reasonable limits, the operation of wind turbines should be as compatible with nature as possible. Insofar as birds within the bird migration corridors of the ROP 2021 cannot be protected against a significantly increased risk of collision with wind turbines by other measures, the requirement for avoidance and mitigation measures - such as the shutdown of turbines during mass migration events - ensures targeted protection of migratory birds. This is required to protect the marine environment in the form of avoiding a proven significantly increased collision risk of birds with wind turbines that cannot be mitigated by protective measures. The planning principle 6.1.6 is referred to.

6.1.2 Overall time coordination of the erection and installation work as well as maintenance and repair work

The determination corresponds to the requirements for overall temporal coordination in Principle 2.2.3 (8) of the ROP 2021.

In this way, the number of interventions can be reduced and possible cumulative impacts can be avoided or mitigated.

6.1.3 Emissions reduction

The avoidance and reduction requirement ensures that the construction and operation of offshore installations does not lead to "pollution of the marine environment" within the meaning of Art. 1 para. 1 No. 4 of the Convention on the Law of the Sea and endangerment of the marine environment pursuant to Sections 5 para. 3 sentence 2 No. 2, 69 para. 3 sentence 1 No. 1 WindSeeG. In addition, the requirements of the Ordinance on the Environmentally Sound Conduct of Maritime Navigation must be complied with.

Emissions" are substances or energy added directly or indirectly to the marine environment, such as heat, sound, vibration, light, electrical or electromagnetic radiation.

In order to prevent pollution and hazards to the marine environment, no substances may be discharged into the sea during the construction, operation, maintenance and dismantling of the installations. Should the discharge of such installation-specific emissions into the marine environment be unavoidable for technical reasons, e.g. due to safety-relevant requirements of shipping or air traffic, this shall be presented and justified to the planning approval authority within the framework of the planning approval procedure, together with an environmental assessment. Alternative assessments specific to the installation shall be carried out and documented.

The minimisation requirement for material discharges applies. This also applies to the vehicles used during construction, operation and dismantling. The requirements of the Ordinance on Environmentally Sound Practices in Maritime Shipping shall be complied with.

Light emissions

The attraction effect of artificial light on birds migrating at night has long been known and documented (summarised in (Ballasus, Hill, & Hüppop, 2009); (Dierschke, et al., 2021); (Brayley, How, & Wakefield, 2022). Especially in poor weather conditions and low visibility, songbirds are attracted by lights on lighthouses, ships, research platforms and oil rigs. On the one hand, this increases the risk of collision (with illuminated and non-illuminated parts of the structures), and on the other hand, artificial light can lead to disorientation of the birds, which can be

associated with energy losses. (Ballasus, Hill, & Hüppop, 2009); (Dierschke, et al., 2021).

Research has shown that light intensity, the colour of the light and the flashing frequency can affect the attraction of migratory birds (Burt, et al., 2023). Current research shows that, when complete switching off is not possible, red flashing lights, as opposed to other colours and continuous illumination, have the least attracting effect on night migrating birds (Evans, Akashi, Altman, & Manville, 2007); (Rebke, et al., 2019); (Zhao, Zhang, Che, & Zou, 2020). Long dark phases with short light phases as well as synchronisation of the flashing regime of all WTs of an OWP are recommended. (Ballasus, Hill, & Hüppop, 2009); (Dierschke, et al., 2021).

Measures to reduce light emissions are only possible in consideration of the requirements of safe shipping and air traffic.

Emissions study

The preparation of an emission study to record the emissions caused by the respective design and equipment variant or their avoidance is mandatory. Due to the early design phase, the requirements for an emission study cannot usually be fully met in the approval procedure. Therefore, an emission concept must already be submitted as part of the application documents. In the concept, the project sponsor must address emissions that are as concrete and project-related as possible, the possible and applied avoidance and reduction measures, and the cumulative effects of the installation(s). The emission study concretised in the enforcement procedure forms the basis for the waste and process material concept to be drawn up within the framework of the protection and safety concept. For the preparation of the waste and operating materials concept, the minimum requirements of the "Waste and Operating Materials Framework Concept for OWPs and their Grid Connection Systems in the German EEZ" published by the BSH in its currently valid version shall be taken into account. Contingency plans shall be drawn up, inter alia, for accidents involving substances hazardous to water during the construction and operation phases and other unexpected events giving rise to concerns about pollution of the marine environment.

The minimisation requirement also includes that environmentally compatible operating materials (such as oils, greases) are to be used as far as possible for the operation of the plant and that biodegradable operating materials are to be preferred, if available. The environmental compatibility of the operating materials used in the plants must be ensured by comprehensive alternative tests.

Fluorinated greenhouse gases in switchgear, cooling and air-conditioning systems and fire protection systems

The requirements of Regulation (EU) 517/2014 of the European Parliament and of the Council of 16 April 2014 on fluorinated greenhouse gases shall be complied with. According to Art. 3 of Regulation (EU) 517/2014, these measures are basically the avoidance and limitation of emissions of fluorinated greenhouse gases. In addition, the requirements regarding leakage checks of technical installations, if necessary by means of leakage detection systems, must be observed, carried out or documented by the operator (Art. 4-6 Regulation (EU) 517/2014).

The operating materials used must be assessed for their climate impact. SF_6 in particular is a highly climate-impacting gas. Its use should therefore be avoided for reasons of climate protection. It must be examined whether SF_6 can be replaced by a less or non-climate-impacting alternative. The substitution test and its result shall be presented and justified in the planning approval documents.

Structural and operational precautions and safety measures

Possible structural safety systems and measures for the prevention and monitoring of

pollutant accidents and environmental discharges include, among others, enclosures, double-walled enclosures, room/door enclosures, catch basins, drainage systems, collection tanks or leakage and remote monitoring. This applies in particular to systems that contain or carry larger quantities of operating materials and/or substances hazardous to water (e.g. diesel tanks, pipelines, transformers). False activations of the fire protection systems on helicopter landing decks must be avoided at all costs.

As there is an increased hazard potential in the offshore area from changes of operating materials and refuelling measures, special organisational and technical precautionary measures must be taken for these activities (e.g. preparation of method statements, precautionary measures during crane work, self-sealing breakaway couplings (emergency breakaway couplings), dry couplings, catch basins, overfill protection, spill kits) in order to avoid pollutant accidents and environmental discharges.

Waste

Waste must be brought ashore and disposed of there in accordance with the applicable waste management regulations. Exceptions may be the discharge of properly treated waste water or drainage water with a maximum oil content of 5 milligrams per litre (see below).

Corrosion protection

If the use of galvanic anodes (sacrificial anodes), typically consisting of alloys of aluminium-zinc-indium, is unavoidable, this is only permissible in combination with a suitable coating of the foundation structures (cf. BSH standard construction). The content of minor components of the anode alloys, in particular zinc, cadmium, lead, copper and mercury, shall be reduced as far as possible. The zinc content required for the functionality of the anodes shall also be limited to a technically necessary minimum.

The cathodic corrosion protection system must be dimensioned in such a way that the use of galvanic anodes is limited to a necessary minimum. The use of zinc anodes (in the sense of zinc as the main component of the anodes) is prohibited. If necessary, external current systems should be used as a cathodic corrosion protection system in the inner areas of the foundation structures.

The minimum requirements for corrosion protection in the standard construction shall be complied with. The vgbe/BAW Standard Corrosion Protection has been introduced in relation to Parts 1-3 as a technical supplement to the BSH Standard Construction and shall be taken into account in enforcement. The use of biocides such as tributyltin (TBT) or other anti-fouling agents to protect the technical surfaces from the undesired settlement of organisms is prohibited. The (underwater) construction shall be provided with an oil-repellent coating in the splash water zone; regular removal of marine fouling is not required in this context. The aim is to ensure that coating materials are solvent-free.

The exterior coating shall be as glare-free as possible, without prejudice to the regulation on air and navigation marking.

Plant cooling

Seawater cooling systems with discharges during regular operation are only permissible in justified exceptional cases, for example if the required cooling capacity cannot be demonstrably achieved with closed systems or system variants and no suitable alternative systems are available. The use of anti-fouling agents or biocides in seawater cooling systems to ensure continuous operation must be kept to a minimum, e.g. by seasonal use or reduction of the active concentration, and requires a comprehensive environmental assessment in advance.

Waste water

The waste water mentioned in the planning principle must not be discharged untreated into the marine environment. Since the discharge of

treated wastewater is still associated with material discharges to a certain extent, the wastewater must always be collected professionally, transported ashore and disposed of there in accordance with the applicable waste management regulations.

Waste water treatment plants on platforms are generally not permitted. On unmanned platforms or platforms that are manned only during maintenance work, waste water is generated only for a limited period of time. However, wastewater treatment plants are only effective to a limited extent in intermittent operation, so that inadequately treated wastewater can lead to emissions into the marine environment that go beyond what is avoidable. On unmanned platforms or platforms manned only during maintenance work, solutions should therefore be used that do not lead to discharges or that permanently maintain the functionality of the wastewater treatment plants, for example by adding nutrient solutions. For example, sufficiently dimensioned collection tanks must be provided for the professional collection of wastewater and the limited quantities of wastewater must be transported ashore, or other solutions must be used (such as "incineration toilets").

Exceptions may apply in individual cases for permanently manned platforms. On a permanently manned platform, a waste water treatment facility is permissible on a case-by-case basis, in particular if the negative impacts on the marine environment associated with bringing the waste water ashore - for example due to the required number of ship transports - exceed the impacts associated with discharging the treated waste water. Proof that such an individual case exists must be provided by the project sponsor within the framework of the planning approval procedure.

The waste water treatment plant must comply with the state of the art. This includes, inter alia, that only a waste water treatment plant is permitted which at least complies with the requirements of MARPOL Resolution MEPC.227(64) "2012 GUIDELINES ON IMPLEMENTATION OF EFFLUENT STANDARDS AND PERFORMANCE TESTS FOR SEWAGE TREATMENT PLANTS" Annex 22 para. no. 2.7. (MARPOL, 2012) nitrogen and phosphorus compounds, provided that such a waste water treatment plant is available for the quantity of waste water expected to be generated in each case.

If waste water treatment plants are permissible in individual cases, they shall treat all waste water arising on the platform.

Chlorination of wastewater is not permitted, as chlorination processes produce halogenated secondary compounds that are harmful to the environment. Other techniques must be used that are demonstrably more environmentally friendly, such as UV systems or ultrafiltration.

To ensure proper operation and to check the purification performance and the discharge values in the operating phase, the waste water shall be sampled and analysed regularly. At waste water treatment plants, suitable sampling points shall be provided at the inlet and outlet for this purpose. This shall enable sampling and subsequent analysis of the waste water.

Oil content of the drainage water

Insofar as an oil separator is used instead of a closed system for the collection of drainage water and subsequent disposal on land, the oil content shall not exceed 5 milligrams per litre at discharge in order to mitigate the discharge of oil contained in the drainage water into the marine environment. The setting of the maximum oil content at 5 milligrams per litre is based on the current state of implementation in existing OWPs and the technical availability of these systems (DIN EN 858-1).

In order to monitor compliance with the maximum oil content when discharging into the marine environment, the oil content in the drainage water shall be continuously monitored by means

of sensors after passing the oil separator in the discharge.

Chemical use, especially in extinguishing foams on helicopter landing decks

Due to the close proximity of the installed facilities to the marine environment, the use of chemicals potentially hazardous to humans and the environment shall be minimised as far as possible. The requirements of Regulations (EC) 1907/2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) and (EU) 2019/1021 on Persistent Organic Pollutants, including the amendments to the annexes of the aforementioned regulations, must therefore be complied with.Perfluorinated and polyfluorinated chemicals (PFAS) in particular, e.g. in fire-fighting foams, are substances of particular ecotoxicological concern, have proven negative effects on the marine environment and accumulate everywhere as extremely persistent substances. Against the background of ongoing European and international procedures to restrict further PFAS in fire-fighting foams, the use of fire-fighting foams containing PFAS should be avoided with foresight.

Reference is made to the principle that emissions are to be avoided or, if unavoidable, reduced. Fire extinguishing exercises are therefore to be carried out exclusively with water.

Diesel generators

This specification ensures that the level of protection is consistent, while a choice can be made from various suitable certifications.

The use of diesel generators for emergency power supply on wind turbines is to be avoided. The use of diesel generators leads to air emissions. In addition, the operation of diesel generators requires extensive refuelling measures and fuel storage, which may result in risks of environmental hazards due to oil spills. Therefore, alternative systems are to be used for the temporary supply of the wind turbines within the framework of ensuring general operational safety, if possible.

In order to reduce sulphur dioxide emissions to a minimum, the lowest possible sulphur fuel must be used, taking into account the storage capability of the respective product (such as low-sulphur fuel oil according to DIN 51603-1 or diesel according to DIN EN 590 (so-called "land diesel")). This applies to temporary generators during installation work on wind turbines and platforms as well as to permanent diesel generators (grid backup systems) on platforms. When selecting the appropriate diesel generators, suitability for the respective fuel type must be ensured in good time.

Grouting method and grouting material

The purpose of establishing grout procedures is to reduce the input of grout material during the construction phase and the release of pollutants from the grout material into the marine environment.

6.1.4 Noise protection during the foundation and operation of plants

The requirement serves to avoid hazards to the marine environment from sound emissions. In particular, to ensure compliance with the prohibition of killing and injury under Article 44(1)(1) and the prohibition of disturbance under Article 44(1)(2) of the Federal Nature Conservation Act with regard to the protected species of harbour porpoise, appropriate measures shall be taken to avoid sound emissions as far as possible and to prevent damage.

The planning principle also corresponds to the assessment of requirement 2.2.2 (6) of the ROP 2021.

Most environmentally friendly working method

Based on the environmental conditions, the project-executing agency shall choose the least noisy or otherwise most environmentally sound

construction process according to the circumstances found. The same applies to the working method. This requirement shall be further specified in the authorisation procedure.

During pile-driving work for the foundations of wind turbines or platforms and other energy generation plants, the use of effective technical noise abatement systems is to be provided for in order to safeguard species protection and site protection concerns. In the individual approval procedures, it is regularly stipulated that a suitable noise abatement concept must ensure that the noise emissions at a distance of 750 m do not exceed the value of 160 decibels for the broadband single event level SEL05[12] and the value of 190 decibels for the peak sound pressure level[13] . Noise abatement measures, which include technical noise reduction, optimised pile-driving methods, deterrence and monitoring of effectiveness, shall be specified on a site-specific basis and in relation to the foundation construction used in each individual case. This is not intended to restrict the bid within the framework of the tender for the respective area with regard to the type of foundation. The established working method according to the state of the art shall be used, which is as low-noise as possible according to the circumstances found.

The further development of low-noise installation methods should be encouraged. Noise protection measures are specified for specific projects within the framework of the approval procedure.

The best available method or a combination of the best available methods according to the state of the art in science and technology for reducing the input of underwater noise to comply with applicable noise protection values during the installation of foundation piles, such as large bubble curtain, cladding tube, hydro silencer, restriction of pile driving energy or optimised pile driving method with real-time monitoring, shall be used. The respective subsoil conditions must be taken into account when designing suitable sound reduction systems.

In addition to the actual sound mitigation system, the use of further extensive sound mitigation and monitoring measures, in particular by recording underwater sound input as well as harbour porpoise activity during the installation of foundations, is required.

Reference is made to the statements under 7.2 of the BMU concept for the protection of harbour porpoises from noise pollution during the construction of OWPs in the German North Sea from 2013.

The SEA comes to the conclusion that only by complying with applicable noise protection values and implementing the requirements of the BMU noise protection concept (BMU, 2013) it can be ensured with the necessary certainty that the requirements for species protection are met and that nature conservation areas are not significantly impaired in their components relevant to the conservation objectives or the conservation purpose.

Creep

In order to avoid the presence of animals in the vicinity of planned pile-driving activities that could be harmed by pile-driving noise, pile-driving activities must be preceded by a deterrence procedure. According to the current status, the danger zone is at least a radius of 750 m around the pile driving site (cf. BMU concept for the protection of harbour porpoises from noise pollution during the construction of OWPs in the German North Sea of 2013).

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[12] Single event level in dB re 1 µPa² s; dB = decibel; re = in reference to; 1 µPa = 1 microPascal; 1 µPa² s = 1 microPascal squared * second; the reference level for water is 1 µPa.

[13] Peak sound pressure level in dB re 1 µPa; dB = decibel; re = in reference to; 1 µPa = 1 microPascal 1 µPa² s = 1 microPascal squared * second; the reference level for water is 1 µPa.

The requirement under (c) serves to avoid a violation of the ban on killing and injuring species under species protection law in accordance with Article 44(1)(1) of the Federal Nature Conservation Act. The species to be primarily protected is the harbour porpoise. In addition, representatives of other species may also be protected.

At the time of publication of the FEP preliminary draft, configurable state-of-the-art deterrent systems include FaunaGuard or APD (Acoustic Porpoise Deterrent).

The noise abatement concept shall describe the planned measures to prevent damage to the marine environment. As part of the approval procedure, it is also regularly ordered that a concept be submitted to verify the efficiency of the deterrent and sound-reducing measures.

Duration of the pile driving process

Limiting the duration of individual pile driving operations is intended to minimise the impact and serves to avoid a violation of the species protection prohibition of disturbance, § 44 paragraph 1 number 2 BNatSchG.

According to current knowledge, in addition to the absolute volume, the duration of sound emissions also determines the disturbance effect on marine mammals. Both the spatial extent of the disturbance of animals and the duration of the disturbance until presence rates comparable to the situation prior to the impulsive sound input are restored depend on the duration of the pile driving works, including the displacement: The longer the duration of the sound-intensive work, the longer it takes to restore presence rates in the vicinity of the construction site. Habitat loss due to avoidance behaviour can have a significant impact due to prolonged sound emission, even at reduced sound levels. This is to be prevented by limiting the duration, and the effectiveness can be monitored via monitoring.

For the different foundation types (monopile, jacket, etc.) and dimensions, there are maximum pile-driving periods that have to be specified specifically for each project based on the ground found and the foundation used. At the time of publication of the FEP preliminary draft, the guideline values for a maximum pile driving period are 180 minutes for monopiles and 140 minutes for jacket piles. In order to effectively avert a hazard to the marine environment, the BSH specifies the duration on the basis of these guidelines.

The purpose of this provision is to allow animals that are still in the vicinity of pile-driving activities to move away from the sound source before they are exposed to the full intensity of the sound. At present, a common procedure to ensure this is the so-called soft-start procedure.

Draft sound insulation concept

In order to ensure that the noise protection limits are complied with during pile driving work, a noise protection concept must be drafted and submitted to the BSH.

The draft noise abatement concept shall show:

- the site conditions,
- the planned foundation structure,
- the planned deployment process,
- the planned working method,
- the planned measures to reduce noise and prevent damage to the marine environment; and
- the sound prognosis
- the expected frequency spectrum of the hammer during pile driving work
- the estimation of the compatibility of the expected frequency spectrum of the hammer with the sound reduction potential of the planned sound reduction measures.

The design must be submitted to the BSH in sufficient time to allow a review and, if necessary,

adjustment of the plans before the sound-intensive works and the sound reduction system are commissioned. It shall also be ensured that the sound insulation is included in the design and that the planned sound insulation measure is coordinated with the planned supporting structure. In particular, lifting vessels and crane capacities must also be designed to accommodate additional sound minimisation measures if necessary.

The selection of the planned procedures as well as the sound prognosis shall be justified.

Within the scope of the presentation of the planned working method, the characteristics of the hammer and the possibilities of controlling the pile driving process shall be described, among other things.

Measures to reduce sound are sound-reducing measures that already affect the sound input (e.g. HiLo method) and sound-reducing accompanying measures individually or in combination, in each case according to the state of the art in science and technology. Sound-reducing accompanying measures include measures away from the pile (bubble curtain systems) and, if necessary, sound-reducing systems close to the pile. Measures to prevent damage include, in particular, deterrence. A concept for this is to be submitted as part of the draft noise protection concept.

When designing the prevention and mitigation measures, the current state of knowledge from other procedures as well as results from investigations within the framework of the accompanying state ecological research and the monitoring of the nature conservation areas shall be taken into account. The noise prognosis shall take into account all relevant parameters.

In the final sound insulation concept, the concrete site- and plant-specific properties (basic design) must also be taken into account.

As part of the approval procedure, it is regularly ordered that an implementation plan be drawn up no later than 6 months before the start of construction, which concretises the final noise protection concept and sets out the final processes and components in detail.

Testing

The requirement to test the sound insulation measures and damage prevention measures under offshore conditions is intended to ensure that the sound reduction predicted in the sound insulation concept can be achieved. In particular, if a system is used which has not yet been used under comparable conditions, an offshore test shall be carried out. If the test shows that the selected system cannot achieve the required noise reduction, it may also be necessary to change the noise abatement system - if no milder, equally suitable means are available - in order to ensure that species protection prohibitions do not come into effect. As part of the approval procedure, it is regularly ordered that a concept for reviewing the efficiency of the sound-reducing measures be submitted.

Timing coordination of the pile driving work

The order of an overall temporal and spatial coordination of the pile driving works within the framework of the subordinate approval procedure can be applied due to both species protection law and site protection law requirements.

The 2013 BMU concept for the protection of harbour porpoises from noise pollution during the construction of OWPs in the German North Sea states that, according to current knowledge, harbour porpoises may be disturbed by noise in the form of flight and avoidance behaviour even if noise protection values are complied with.

Chapter 7.3.1 of the BMU's concept for the protection of harbour porpoises from noise pollution states: "In order to exclude population-relevant significant disturbances in the German North Sea now and in the future, sufficient areas not affected by pile driving noise must be available for harbour porpoises. The protection concept assumes that this is always the case if, firstly, no

more than 10 percent of the area of the EEZ of the German North Sea lies within the disturbance radii of the OWPs under construction and, secondly, the limit value for impulsive noise from the ban on killing and injuring is complied with (ibid.).

In order to avoid disturbance of the harbour porpoise as a protected species within the meaning of Article 44(1)(2) BNatSchG in conjunction with the noise protection concept of the BMU (BMU, 2013) appropriate overall coordination may be required so that no more than 10 per cent of the area of the EEZ is exposed to disturbance-triggering impulse noise at any time. In order to comply with the species protection requirements under Article 44 of the Federal Nature Conservation Act, it is necessary to ensure that there are permanently sufficient escape routes for harbour porpoises in the German EEZ of the North Sea and that significant disturbance of the local population can be ruled out with the necessary degree of certainty. Appropriate spatial and temporal coordination of parallel construction sites can prevent significant disturbance even in the years with the highest construction rates, 2028 to 2030 (cf. explanations in Chapter 4.12.3 Environmental Report North Sea FEP 2023).

To comply with the requirements of site protection law as defined in Section 34 of the Federal Nature Conservation Act in conjunction with the noise protection concept of the BMU (BMU, 2013) appropriate overall coordination may be required so that no more than 10 per cent of the area of one of the nature conservation areas is exposed to disturbance-triggering impulse noise at any time. When implementing projects in areas adjacent to Area I of the nature conservation area "Sylt Outer Reef - Eastern German Bight" or in or near the main concentration area of harbour porpoises, stricter requirements apply in the period from 1 May to 31 August according to the noise protection concept. For the particularly sensitive period of the harbour porpoise (May to August), the noise protection concept additionally requires that the Natura2000 area "Sylt Outer Reef" (corresponding to Area I of the nature reserve "Sylt Outer Reef - Eastern German Bight") as well as the main concentration area of the harbour porpoise be kept free of sound-intensive construction measures for which cumulatively more than 1 percent of the area is within the disturbance radius of 8 km. This is intended to meet the requirements of site protection law under Article 34 of the Federal Nature Conservation Act by ensuring that there are sufficient permanent escape routes for harbour porpoises and that any impairment of the conservation objectives and the conservation purpose of the nature conservation area can be ruled out with the necessary degree of certainty.

If compliance with the above-mentioned 1 percent criterion (protection in the sensitive phase in the Natura2000 site "Sylt Outer Reef" and in the main concentration area of the harbour porpoise) or the 10 percent criterion (species protection) cannot be technically ensured in the individual procedures, spatial and temporal coordination of parallel construction sites could be considered - as already implemented in the years 2013 to 2018. This means that at the downstream approval level, if necessary, orders can be issued regarding the permitted period for pile driving for individual OWP projects whose pile driving overlaps with that of other projects. For individual projects, noise-intensive work may not take place at certain times.

Blasting

Blasting is generally not permitted due to harmful effects on the marine environment, in particular harmful sound pressures. If blasting is unavoidable in order to remove ammunition that cannot be transported, a noise abatement concept must be submitted to the licensing authority in good time beforehand. The specification of a noise abatement concept is necessary in order to avoid endangering the marine environment even

in the exceptional case of blasting non-transportable ammunition regulated here through the use of suitable protective measures, such as deterrence and the use of bubble curtains.

Operating sound

In order to protect the marine environment from significant noise emissions during the operation of the turbines, it is necessary to always ensure that the turbines are as quiet as possible in accordance with the state of the art. According to current knowledge, the wind turbines that have been used so far are very quiet, so that even at a very short distance from the turbine, the sound emission does not differ from the usual ambient sound (final report FuE OWF-Noise, 2023). This applies to all types of turbines since 2009 (alpha ventus) until today in the German EEZ of the North Sea and Baltic Sea, regardless of manufacturer, power, size, foundation type and location.

6.1.5 Minimisation of scour and cable protection measures

In certain areas, measures to prevent scour are necessary to ensure the long-term stability and positional safety of structures on the seabed.

In any scour and cable protection measures, the placement of hard substrate shall be limited to the minimum necessary to establish protection in order to minimise the impact on the marine environment.

There are no fundamental technical reasons for exclusion against the use of other inert materials (e.g. plastic-free and pollutant-free concrete mats), provided that material emissions and abrasion of plastic particles can be excluded. However, the use of appropriate cable protection systems must be examined on a case-by-case basis.

6.1.6 Bird collision monitoring

§ Section 77 (1) sentence 1 no. 1 WindSeeG obliges the persons responsible pursuant to Section 78 WindSeeG to ensure that the facility does not pose a risk to the marine environment during construction, during operation and after cessation of operation. This also includes that

there is no proven significantly increased risk of collision of birds with wind turbines that cannot be mitigated by protective measures, section 69(3) sentence 1 no. 1 b WindSeeG. This requirement also applies outside bird migration corridors. In addition, Section 77 (3) no. 1 WindSeeG stipulates that the responsible persons must carry out monitoring of the construction- and operation-related impacts of the installations on the marine environment during the construction phase and during the first ten years of operation of the installations and must immediately transmit the data obtained to the BSH and the BfN. As part of the precautionary principle under environmental law for the protection of migratory birds, bird collision monitoring shall be carried out with regard to possible collisions of birds with wind turbines. Reference is made to the possibility under section 79(3) in conjunction with section 69(3) sentence 1 no. 1. § Section 69 (3) sentence 1 no. 1 b WindSeeG is referred to.

In order to ensure that professionally coordinated bird collision monitoring is carried out, it is necessary to submit a monitoring concept at an early stage. The concept must be drawn up by experts in the field and agreed with the BSH prior to the conclusion of contracts for the purchase of recording equipment.

The aim of the survey is to interpret the site-specific collision risk in relation to the site-specific migration intensity and to correlate or evaluate it with regard to the effects of weather conditions and the operating condition of the wind turbines. High migration rates do not necessarily go hand in hand with high collision risk (relative share of collisions in the total number of migrating birds in the area of the surveyed site). Some birds can avoid the rotors on a small scale (micro-avoidance). Similarly, low migration rates do not automatically mean a low collision risk if, for example, a higher proportion of migrating birds collide in bad weather conditions.

In order to record the number of colliding birds with the wind turbines operated on the sites, collision monitoring with measuring systems suitable for the marine area that can record the entire range of species to be expected (including small songbirds) is required. According to the current state of the art, this requires a combination of radar systems for recording migration phenology and intensity, camera systems (including infrared cameras) for recording individuals in the rotor area and weather sensors. With regard to the recording of weather conditions, the parameters precipitation, fog/visibility, wind speed and wind direction are to be recorded. As further accompanying data, the operating state of the WT (standstill, spin, revolutions per minute and orientation of the rotor blades to the direction of migration) shall be recorded. If technical systems are available that can quantitatively and reliably record direct bird collisions with wind turbines (e.g. vibration sensors), these should be used in consultation with the BSH in order to reliably measure actual collisions in real time. Direct collision detection, in addition to camera detection, is expected to provide a more precise measurement of collision mortality than camera-based detection of birds in the vicinity of the rotor blades alone. The latter is a conservative method that potentially overestimates the number of collisions and is dependent on visibility conditions.

During the migration periods in autumn and spring, a large proportion of migratory birds cross the German EEZ of the North Sea and Baltic Sea. For this reason, continuous surveys are required during the main migration periods from 1 March to 31 May and from 15 July to 30 November. To ensure this, in the event of a failure of one or more systems, replacement equipment shall be kept ready to resume recording immediately. The BSH shall be informed immediately of any failures in recording and of any measures taken to resume recording.

The number and locations of wind turbines equipped with detection systems must be suitable to collect representative data for the respective area or other energy production area. Data are representative if they allow reliable extrapolations of collision events for the entire study area. A clear assignment of individuals affected by collisions is required at least down to the species group. Therefore, it must be ensured that no collisions are missed ("false negatives") and detected collisions ("true positives") can be correctly classified and quantified. The detection systems used must be technically capable and positioned in such a way that the generally expected species spectrum of bird migration (for example, also very small and light songbirds) is detected at all times (also during bad weather conditions as well as operation and non-operation of the WT) and in the entire rotor area (i.e. coverage of the danger zone to 100 percent). The expected species spectrum can be taken from annual reports on the standard surveys for migratory birds, or from specialist literature on bird migration over the German EEZ. If several measuring systems (of the same or different type) are used to cover the entire rotor area, it must be ensured that there are no multiple counts or that these can be clearly identified and taken into account in the evaluation.

The calibration of the systems used is a prerequisite for the interpretation of the measurement data and must be described in methodological detail in the investigation concept of the bird collision monitoring. It must be completed and approved by the BSH before the start of operation. The documentation of the calibration is part of the reporting to the BSH.

In order to put the collision risk in relation to the site-specific migration intensity, the total migration occurrence must be recorded with bird radars. In addition to the continuous recording of bird migration, specialised bird radar systems allow insects to be reliably distinguished from bird signals and species groups to be separated from each other. This is necessary for the evaluation of collision risk and is not possible with conventional marine radars that were not developed for bird detection.

6.1.7 Sediment heating

The determination on sediment heating is based on the justification of principle 2.2.3 (6) of the ROP 2021 as well as on §17d para. 1b EnWG.

During operation of the submarine cable systems, there is significant heating of the surrounding sediment radially around the cable systems. The heat emission results from the thermal losses of the cable during energy transmission. The conductor temperature can be a maximum of 70 °C for DC conductors and 90 °C for three-phase conductors.

The so-called "2 K criterion", i.e. a maximum temperature increase of 2 degrees (Kelvin) 20 cm below the seabed surface, has become established as a precautionary value for nature conservation in current official approval practice for all submarine cable systems laid in the EEZ. The 2 K criterion represents a precautionary value which, according to BfN's assessment based on the current state of knowledge, ensures with sufficient probability that significant negative impacts of cable warming on the marine environment or the benthic community will be avoided. Increased warming of the uppermost sediment layer of the seabed may lead to changes in the benthic communities in the area of the submarine cable route. Particularly in deeper areas, coldest thermic species, which are bound to a low temperature range and are sensitive to temperature fluctuations, can be displaced from the area of the cable routes. In addition, there is the possibility that new, non-native species could become established as a result of sediment warming. An increase in soil temperature could also change the physico-chemical properties of the sediment, which in turn could result in a change in oxygen or nutrient profiles.

In addition to the ambient temperature in the area of the submarine cable systems and the thermal resistance of the sediment, the cable type and the transmission power have a significant influence on the extent of sediment heating. Accordingly, compliance with the 2 K criterion should be ensured when dimensioning the cable systems, taking into account §17d para. 1b EnWG.

It must be taken into account that in the area of crossing structures, the overlap required for compliance with the 2 K criterion may not be met.

For the temperature development in the near-surface sediment layer, the depth position or overburden of the cable systems is also decisive.

For the further justification and the discussions on this planning principle during the update procedure for the FEP 2020, please refer to the explanations in Chapter 4.4.4.8 of the FEP 2020.

6.1.8 Further planning principles relating to nature conservation (avoidance and mitigation measures)

[Will be included and justified in the further proceedings, if necessary].

6.2 No impairment of the safety and ease of shipping traffic

This determination is derived from principle 2.2.1 (3) of the ROP 2021, according to which economic uses should impair the safety and ease of traffic as little as possible.

A common safety zone is regularly established around wind turbines and platforms. The effect of this safety zone is, on the one hand, that commercial shipping does not take place in these areas and, on the other hand, that proper shipping operated in accordance with the rules of good seamanship continues to be generally possible without danger. Reference is made to the responsibility of the GDWS in this regard for the establishment of safety zones and for the establishment of any navigation rules.

In the case of cable systems, the specified depth position (cf. 6.13.6) and the crossing angles (cf. 6.13.3), no impairment of navigation is to be expected.

On the planning principles 6.8 and 6.10 are referred to.

According to the current state of knowledge, the provision of additional tugboat capacity of presumably at least one additional tugboat in the traffic area of the shipping route SN10 of the ROP 2021 is a necessary prerequisite to minimise the risks to the safety and ease of shipping traffic caused by the further development of areas in Zone 3 as well as in the area of the shipping route SN10. This is the conclusion of the risk analysis developed on the occasion of the update of the FEP in the expert report "Verkehrlich-schifffahrtspolizeiliche Risikoanalyse der im Rahmen der Fortschreibung des FEP der deutschen AWZ der Nordsee festzulegenden Gebiete" (Traffic and Shipping Police Risk Analysis of the Areas to be Defined in the Framework of the Update of the FEP of the German EEZ of the North Sea). (DNV GL, 2021) of April 2021, taking into account the parameters, criteria and acceptance limits specified by the BMDV's "Approval-relevant reference values" working group in connection with the risk analysis and assessment of OWPs. Current findings of a shipping survey currently underway for the future design of the SN10 also support the assumption of the need for additional towing capacity in the above-mentioned traffic area using a different methodology. The obligation to provide additional towing capacity initially falls on the OWP developers east of SN10 in areas N-9, N-10, N-11, N-12 and N-13, individually and jointly. It is left to the OWP promoters to develop a joint model for operation. Based on the available shipping reports, esp. (DNV GL, 2021)it can be expected that the need for additional towing capacity will arise from the time of the first development of the sites in areas N-11 or N-12.

The positioning of the additional towing capacity will have to be finally determined in the course of further proceedings.

The requirements for towing capacity must correspond to the conditions of the traffic area concerned. The WSV traffic centres should have the authority to issue instructions regarding the towing capacities. In addition, the emergency command must have the right to access the towage capacity if necessary. Other solutions for the provision and operation of towing capacities, which are developed in agreement with all authorities involved, are not excluded by the above planning principle.

A vessel is suitable for emergency towing operations if it is capable of performing the emergency towing tasks. This is presumed if it complies with the standards and guidelines for the type, dimensioning and number of towing equipment components to be carried on board from the concept for towing equipment of the multipurpose vessels of the General Average Command for the respective sea area to be covered. Emergency towing essentially involves making a tow connection and then holding at sea or towing ("controlled drifting") the drifting casualty. These measures will be carried out until the average is restored to manoeuvrability, commercial salvage tugs can safely take over the average or the danger has otherwise been removed. This determination of additional towing capacity in the catchment area of the shipping route SN 10 does not affect the requirements for the provision of additional towing capacity in other traffic areas, in particular on the Baltic Sea or in the areas N-1 to N-8. The need for any additional towing capacity will have to be assessed depending on further development and the development of traffic in the traffic area concerned or other relevant framework conditions and cannot be ruled out at present.

6.3 No impairment of the safety and ease of air traffic

Offshore structures, parts thereof or associated activities may pose a risk to air traffic (collision risk). In order to minimise the potential danger, such structures and temporary obstacles due to construction, maintenance or dismantling must therefore be marked as aviation obstacles. Since the regulations applicable to the marking of aviation obstacles on the territory do not extend to the German EEZ, a corresponding regulation for the EEZ has already been created by the BMDV with the SOLF, among others, for this purpose. Section 9 (8) EEG specifies the areas in the German EEZ whose night marking must be demand-controlled.

In the German EEZ, there is an airspace structure which includes, in particular, danger areas or helicopter route networks. The flight operation requirements for aviation to be observed in this context are specified in the relevant Aeronautical Information Publication. For example, for the Dutch helicopter route network in the German North Sea EEZ, the lowest IFR flight level is currently 600 m (2000 ft) AMSL, with a minimum vertical separation of an aircraft from obstacles of 300 m (1000 ft). This does not imply a restriction on the height of WTs. Discussions are currently taking place with the responsible authorities in the Netherlands regarding the use of IFR flight heights.

Specifications for the establishment and operation of air traffic areas (helicopter landing decks, winch operation areas) are made in the SOLF.

Sufficient permanent obstacle clearance is an essential criterion for safe flight operations on a helicopter landing deck. The dimensions and orientation of the approach and departure areas (especially flight corridors) to be provided and kept clear for this purpose are also derived from the SOLF in its currently valid version.

A holistic view, i.e. a view of the obstacle landscape covering the entire area in each case, is

intended to ensure that, in addition to the operator's own air traffic concerns, the air traffic concerns of third parties in the area in question or regularly in adjacent areas are also sufficiently taken into account, e.g. if a helicopter landing deck of a third party is to be set up and operated in an area, as is regularly the case with platforms of the TSO. In this case, it must be made possible for the third party to comply with or implement all necessary regulations on the required freedom from obstacles (flight corridors) in accordance with Part 3 of the SOLF. Only in this way can it be ensured that the obstacle protection concerns of all helicopter landing decks to be established are sufficiently taken into account. The primary objective is that the erection of obstacles, such as wind turbines, should not render any of the helidecks in the relevant vicinity unusable or prevent the erection of a planned helideck.

The spatial proximity of the OWPs in an area to each other on the one hand and the manoeuvring requirements of a helicopter on the other hand regularly require a cross-area consideration in addition to a cross-area consideration. It cannot be ruled out that corridor areas may extend into other areas or be located entirely within them. Insofar as third party helicopter landing decks on converter or transformer platforms already defined by the FEP or shown therein for information purposes are concerned, or the landing deck is already defined in the planning documents of a licensing procedure at the time of the local announcement of the plan interpretation, the establishment of these helicopter landing decks including the associated flight corridors must be made possible. The parties involved shall coordinate with each other. If helidecks with flight corridors already exist or have been approved, the absence of obstacles in the flight corridors shall be ensured.

This may impose restrictions on layout planning within areas or other energy harvesting areas. Therefore, at the same time, the flight corridors must be planned in such a way that areas or other energy production areas of third parties are impaired as little as possible within the framework of the requirements of the SOLF. For example, by planning the corridors as far as possible away from land and other energy production areas, or by using areas that are to be kept free of development anyway, such as cable corridors, for the establishment of the air traffic areas. Approach and departure areas of helicopter landing decks may not be established beyond the boundaries of the German EEZ in order to prevent spaces outside the German EEZ from becoming restricted in their use or unusable. Outside the German EEZ boundaries, there is no or only very little influence on any uses planned there, so that reliable planning and the required freedom from obstructions pursuant to planning principle b cannot in principle be ensured for these areas.

Tower illumination along the approach and departure areas concerned is intended to ensure the safe use of helicopter landing decks at night by increasing the detectability of these obstacles as well as facilitating the orientation of helicopter crews and providing a spatial impression of the surroundings. In this way, the approach to obstacles can be better assessed as the lateral boundary of the approach and departure paths is marked. Where third party flight corridors extend into surface or other energy harvesting areas and tower radiation is required along these corridors in accordance with the SOLF, tower radiation shall be permitted to avoid hazards to air traffic. In these cases, in order to ensure proper operation of the tower radiation, the third party operator of the tower radiation shall have access to the facilities of the project sponsor in order to carry out necessary maintenance or repairs.

6.4 No impairment of the security of national and alliance defence

The specifications comply with Article 5(3)(2)(4) of the WindSeeG and Objective 2.2.2 (5.1) and Principle 2.2.2 (5.2) of the ROP 2021.

Designation of areas, surfaces, platforms and other energy generation facilities within military training areas for floating units or flight training areas that begin at sea level shall be avoided. To the extent that specific exercise procedures are not restricted by the designation, designation in these areas is not precluded in individual cases. Routing of submarine cable systems shall be sought outside military exercise areas for floating units.

The provisions c) and d) correspond to Objective 2.2.2 (5.1) and Principle 2.2.2 (5.2) of ROP 2021 and serve to ensure effective national and alliance defence. For further justification, please refer to ROP 2021.

During exercises for the purpose of national and allied defence, the installation of sonar transponders is intended to avoid sources of danger through collisions of submarines with structural installations by means of acoustic signals.

6.5 Removal of facilities

Pursuant to section 80 (1) sentence 1 WindSeeG, the facilities are to be removed if the planning approval decision or the planning approval becomes ineffective, with the aim of ensuring full subsequent use and restoration of the area's performance and functionality. Objective 2.2.1 (2) of the ROP 2021 stipulates that fixed installations must be dismantled at the end of their use.

The extent to which the facilities, in particular the foundations, are to be removed shall be decided by the BSH at the time of the dismantling procedure. In doing so, the then applicable state of the art in science and technology shall be taken into account and, in particular, the extent to which removal is necessary or advisable for reasons of a complete subsequent use as well as the restoration of the performance and functional capability of the area. As a rule, the removal must be carried out at least to such an extent that the upper edge of the remaining foundation is permanently below the mobile lower edge of the sediment and below the area of interference by fishing gear, so that it is ensured that no obstacle is created for shipping and fishing.

The developer shall complete the removal at the latest within twelve months of the occurrence of the removal obligation, section 80 para. 2 WindSeeG. In order to ensure the fulfilment of the removal obligation, the BSH may order the provision of a suitable security in the plan approval decision or in the plan approval pursuant to section 80 para. 3 WindSeeG.

In the case of dismantling, the aim should be to reuse the components before recycling them and to recycle them before any other form of recovery, in particular energy recovery, or otherwise to dispose of them - demonstrably - properly on land.

6.6 Identification and consideration of objects

Project sponsors are obliged to identify existing objects on sites, routes, platforms or other energy generation areas before starting the planning and realisation of facilities. Locations of the objects mentioned shall be taken into account in the planning of sites and routes.

In 2011, a federal-state working group published a basic report on the munitions contamination of German marine waters, which is updated annually. According to current knowledge, the munitions load in the German Baltic Sea is estimated at up to 0.3 million tonnes and in the German North Sea at up to 1.3 million tonnes. The overall data situation is insufficient, so that it can be assumed that explosive ordnance deposits are also to be expected in the area of the German EEZ (e.g. remnants of mine barriers and combat

operations). The location of known munitions dumping areas can be found on the official nautical charts and in the above-mentioned report from 2011 (which also includes suspected areas for munitions-contaminated areas). (Böttcher, et al., 2011). The reports of the Federal-Länder Working Group are available at www.munition-im-meer.de.

It is recommended that project sponsors carry out detailed historical research on the possible presence of explosive ordnance as part of the concrete planning of a project.

According to DIN 4020, the building owner is responsible for ensuring that the site is free of explosive ordnance. This task remains with the project owner as a duty to avert danger within the framework of the general duty of care. The owner must take measures to protect his employees.

The respective project sponsor is responsible for the identification and investigation of explosive ordnance as well as for all resulting protective measures. Within this framework, the project sponsor is also responsible for any necessary salvage or removal. The responsibility of the project executing agency also includes its duty to bear the costs for the identification, investigation and resulting protective measures as well as for the salvage or removal of unexploded ordnance.

If ammunition is found, this must be documented immediately and reported to the planning approval authority. Findings of ammunition and the further handling thereof must also be reported to the Maritime Safety Centre Cuxhaven (Joint Control Centre of the Water Police of the Coastal States, Central Reporting Centre for Ammunition in the Sea) and the responsible traffic control centre.

If there are no instructions of one's own, the quality guidelines for offshore ordnance disposal of the University of Leipzig can be used.

Blasting of found munitions is generally not permitted, see also planning principle. 6.1.4.

Transportable found ammunition must not be dumped again after recovery, but must be disposed of properly on land in consultation with the responsible explosive ordnance disposal services of the Länder.

The corresponding details of any protective measures that may become necessary are regulated in the individual procedure.

6.7 Consideration of cultural assets

This determination corresponds to the values of principle 2.2.1 (3) of the ROP 2021, according to which impairments of the cultural heritage by economic uses are to be minimised.

The seabed may contain cultural objects of archaeological value, such as landmarks, settlement remains or historic shipwrecks. According to Art. 149 of the United Nations Convention on the Law of the Sea (UNCLOS), found objects of an archaeological or historical nature are to be preserved or used for the benefit of all mankind.

A large number of shipwrecks are known and listed in the BSH underwater database. The information available at the competent authorities should be taken into account when selecting sites for the construction of wind turbines and platforms or the specific routing of submarine cable systems. For consideration within the framework of spatial planning, all known wrecks located within these reserved areas were communicated to the monument offices with the request for examination and assessment of the required distances when defining the reserved areas for cables in the ROP 2021. These assessments of the case-by-case examination are used for the spatial planning in the FEP. No wrecks are known to exist in the immediate vicinity of the defined converter sites that are relevant for monument protection. However, it cannot be ruled out that previously unknown cultural assets will be found during the closer investigation of planned sites or a suitable route or during construction. The authorities responsible for the preservation

of monuments and archaeology should be involved at an early stage in the case of finds. In order not to damage them, exclusion zones are to be defined around the sites in the case of historical shipwrecks. The requirement is based on § 5 para. 3 p. 2 no. 2 in conjunction with § 69 para. 3 p. 1. § 69 para. 3 p. 1 nos. 1 and 8 of the WindSeeG and Article 303 of UNCLOS. The size of the exclusion zone may vary depending on the size of the shipwreck. The restriction to shipwrecks is based on the assessment that such cultural assets can be well detected and delimited. In addition, appropriate safeguarding measures can be implemented in consultation with the competent authority (with the involvement of monument protection and monument specialist authorities in the federal states of Lower Saxony, Schleswig-Holstein and Mecklenburg-Western Pomerania) and while safeguarding the overriding public interest in the expansion of offshore wind energy as part of weighing decisions.

6.8 Official standards, specifications or concepts

This planning principle stipulates that in the planning, construction and operation of wind turbines, platforms, submarine cable systems and other energy generation facilities, official standards, specifications and concepts in their currently applicable version must be observed in the context of weighing decisions, taking into account the overriding public interest in the construction of wind turbines and ONAS. This serves to ensure a speedy approval procedure and the safe and proper erection and operation of the installations. In particular, the following must be taken into account

- the BSH's "Standard - Investigation of the Impact of Offshore Wind Turbines on the Marine Environment (StUK)",
- the "Standard Baugrunderkundung - Mindestanforderungen an die Baugrunderkundung und -untersuchung für Offshore-Windenergieanlagen, Offshore-Stationen und Stromkabel" of the BSH,
- the BSH's "Standard Design - Minimum Requirements for the Structural Design of Offshore Structures in the EEZ",
- the "SOLF - Standard Offshore Aviation for the German EEZ" of the BMDV,
- the "WSV Framework Specifications Marking Offshore Installations" of the GDWS,
- the implementation guideline "Maritime Observation of Offshore Wind Farms" of the BMDV,
- the "Guideline Offshore Installations to Ensure the Safety and Ease of Shipping Traffic" of the GDWS,
- Recommendations R0139 (Marking of man-made Offshore-Structures) and R0126 (Use of the AIS in Marine AtoN Services) as well as Guideline G1162 (Marking of Offshore man-made Structures) of the International Association of Marine Aids to Navigation and Lighthouse Authorities,
- the "Offshore Wind Energy - Safety Framework Concept" of the BMDV,
- the BSH's "Framework concept for waste and operating materials for OWPs and their grid connection systems in the German EEZ",
- the German regulations on safety and health at work,
- the "Concept for the protection of harbour porpoises from noise pollution during the construction of OWPs in the German North Sea (noise protection concept)" of the BMU (BMU, 2013)
- the BfN mapping instructions for the German EEZ "Species-rich gravel, coarse sand and shingle beds in the marine and coastal zone

- Definition and mapping instructions for gravel, coarse sand and shingle beds".

It is pointed out that the planning, construction, operation and dismantling of the WTGs, platforms, submarine cable systems and other energy generation facilities must take into account the occupational health and safety, rescue and medical care concerns of persons working in the area of the offshore facilities in the vicinity of these facilities.

6.9 Communication and monitoring

Due to the bundling of traffic in the EEZ because of the existing and emerging offshore installations, it is necessary to collect data and voice radio capabilities for the WSV and to transfer them ashore. The interface required for this should fulfil all technical requirements for communication with the Maritime Traffic Engineering (SMV) system. A connection of the data to the SMV is made via the safety zone of the transfer service.

The construction of all facilities (offshore to onshore interface) and their operation are the responsibility of the OWP developer. The application for and obtaining of frequency allocation certificates is the responsibility of the OWP project sponsor. The current state of the art is as follows: For the mobile maritime radio service, equipment shall be provided for three radio channels of the VHF maritime radio service with the frequencies of channel 16 (156.800 MHz), channel 70 (156.525 MHz, Digital Selective Calling (DSC)) and a radio channel to be determined by the WSV to cover the requirements of the WSV traffic centres in the frequency range of the mobile maritime radio service. To ensure the AIS service, the frequencies of the channels (161.975 MHz, AIS 1) and (162.025 MHz, AIS 2) shall be received.

The transfer of data to the SMV takes place via IP addresses. The transmission path is the responsibility of the OWP project sponsor. The data must be encrypted in accordance with WSV specifications and provided or collected via a virtual private network tunnel.

To ensure the availability requirements of 99.9 percent at the transfer point, a suitable system design and transmission path must be considered.

The mobile radio network serves the safety of installations and traffic. It forms a second communication channel alongside digital radio systems. The establishment of this principle is intended to achieve universal mobile radio coverage. A specific mobile radio standard should not be specified, but the mobile radio network should correspond to the state of the art.

A mobile phone network also enables communication in areas far from the coast, which is of considerable security-relevant importance there. For example, telemedical care could also be ensured in case of need if other communication channels are not available. In addition, occasional traffic of smaller ships can also be assumed in more distant parks, especially from recreational sailors. Here, experience shows that accessibility via mobile radio can lead to a considerable increase in safety. Furthermore, access to a mobile radio network opens up the otherwise non-existent or limited possibility of transmitting more comprehensive sensor data for environmental monitoring ashore. Due to the existing connection of the facilities via high-performance fibre optic cables, it does not appear necessary to lay additional cables, which reduces the effort required to set up a mobile radio network.

6.10 Consideration of all existing, approved and established uses

This planning principle also corresponds to the evaluations in the ROP 2021, including in requirements 2.2.1 (3), 2.2.2 (3), 2.2.2 (4), 2.2.2 (5.1) and 2.2.2 (5.2).

6.10.1 General

In the course of minimising conflicts, shipping concerns should be taken into account as early as possible when selecting sites for wind turbines, platforms, other energy generation facilities and the routing of submarine cable systems (cf. planning principle 6.2) national defence and alliance obligation concerns (cf. planning principle 6.4) as well as existing and approved uses, rights of use (including OWPs) and other interests worthy of protection. Routing outside these areas should be sought if the laying of the submarine cable systems is expected to have a negative impact on the aforementioned uses and concerns.

Due to the spatial proximity between the OWP projects and the ONAS including the platforms of the TSO, there is a high need for coordination between the OWP project developer and the TSO. Accordingly, it is imperative that close coordination between the TSO and the OWP project developer takes place at a very early stage of the project. There is an absolute necessity for both the WTG project developer and the TSO to cooperate with each other. This applies in particular to the exchange of information on project deadlines, the mutual transfer of necessary information and details on planning, construction and commissioning of the platform and the submarine cable systems, but also during operation, any repair and maintenance work and during dismantling. The construction in particular is to be coordinated and optimised at an early stage in good neighbourly cooperation.

In the reserved research areas identified in the ROP 2021, sovereign research activities regularly take place within the framework of the Common EU Fisheries Policy and according to standardised methods, which contribute to the annual international assessment of the status of fish stocks. Scientific marine research must continue to be made possible in the areas of multiple use in the manner and to the extent that it has been carried out to date. An autonomous exchange between the users concerned is imperative. To this end, the concerns of the research institutions should be taken into account as early as possible during the conceptual design of the OWP project or grid connection, as well as at the downstream planning and decision-making levels. For the overlap area of affected utilisation areas in the North Sea EEZ, accessibility by research vehicles is therefore defined in two corridors to be kept free of WTs (e.g. one in a north-south direction and another in an east-west direction). The type of fishing gear used (mobile, bottom-touching, pelagic) is determined on an area-specific basis. Reference is made to Chapter II.1 is referred to. Measures to implement and ensure navigability are to be developed and implemented by the users concerned on their own responsibility. Research activities outside the reserved areas for research designated in the ROP 2021 should be made possible for the Thünen Institute - insofar as this is compatible with the interests of offshore wind energy.

The concerns of fisheries should also be taken into account at an early stage. The construction of aquaculture facilities should take place in close proximity to or in combination with other facilities already in existence or under construction. Maintenance and operation of the facilities should be affected as little as possible by the construction and operation of aquaculture facilities. Reference is made to Principle 2.2.5 (2) in the ROP 2021. Fishing over submarine cable systems outside the safety zones is generally made possible by ensuring that the cables are at a sufficient depth and by imposing appropriate conditions in the individual procedures. 6.13.6 Cover are referred to. Regulations within OWP

areas in accordance with principles 2.2.2 (4) and 2.2.5 (2) of ROP 2021 must be clarified in individual cases.

6.10.2 Pipelines

In order to reduce the risk of damage to existing pipelines and not to impair the possibilities of repair, impacts on the seabed in a protection zone of 500 m on either side of pipelines shall be avoided wherever possible. In individual cases, the respective subsoil conditions may also require larger distances. The centre line of the pipeline is decisive for determining the protection zone.

Exceptions are permitted, for example, if compliance with this principle demonstrably endangers or significantly impedes the commissioning or grid connection of an OWP. In addition, planning that leads to an impact within the 500 m protection zone of pipelines requires close coordination with the respective operator.

6.10.3 Submarine cable

In accordance with the planning scale of 1:400,000, the FEP does not define the actual submarine cable routes, but only corridors. The exact planning of the submarine cable route ("fine routing") is left to the respective approval or enforcement procedure. The routing and associated arrangement of the cable systems must take into account the implementation of the planning principles as early as possible. This principle can reduce the amount of land required and the environmental impact during laying and dismantling.

The distance of 500 m between the submarine cable systems and the WTG is required so that work can be carried out on the submarine cable systems while the OWP is in operation. Even in the event that work is carried out on cable systems and the OWP at the same time, sufficient space must be available for the construction vessel of the WTG and the laying vessel. The centreline of the submarine cable system is decisive for determining the required distance.

Existing submarine cables must also be taken into account during planning and installation. In accordance with the requirements of the principle, a distance of 100 m or 200 m alternately is to be provided between submarine cables. This also applies to distances from data cables and existing interconnectors. With this distance, a smaller distance is specified for the shallower water depths of up to 45 m in the planned area compared to corresponding internationally agreed industry guidelines, which apply for water depths of up to 75 m, for example.

For the justification of the specified distances to submarine cables, please refer to the justification of planning principle 6.4.2 in the FEP 2023.

The planning principle also applies to submarine cables of the park-internal cabling of areas and other energy production areas, provided that they are located outside areas, areas or other energy production areas.

If connections between installations cross areas and do not run parallel to connection systems, this is likely to have an adverse effect on the planning of the area. In order to minimise this, the FEP can firstly define so-called transfer areas between areas. These serve to take into account possible routes at an early stage of site planning, even if no route has yet been selected. Secondly, an OWP project developer must enable the routing of a route for the interconnections between plants on the affected site, starting from the converter platform through the site to the transfer area. However, the bidder is granted flexibility in the WTG layout planning in that the possible connection may be at most 20 percent longer than the direct route from the converter platform to the area boundary. After consultation between the responsible TSO and the OWP developer, deviations from the specified distances between the WT and the interconnector may be

made. Crossings between several interconnectors as well as between interconnector and in-park cabling shall be avoided wherever possible.

6.10.4 Platforms

In order to reduce the risk of damage during the construction and operation phases of the platforms and in order not to impair the possibilities of the necessary maintenance and servicing work, due consideration must be given to existing and approved structures in the case of platforms planned for the future. The distance to be observed depends, among other things, on the position of the platform in space, in relation to building structures on site, the subsoil conditions and the water depth.

In the area of the transformer/converter platform, it must be ensured that sufficient space is available for routing the DC and three-phase submarine cable systems of the TSO, due to the large number of cable systems that will be fed in. Therefore, in the area where the submarine cable systems are routed to the transformer or converter platform, a distance of at least 1,000 m must be maintained between the platform and the nearest wind turbines. The centre of the platform is decisive for the distance.

In addition, interference-free operation of existing installations (e.g. radio or radar installations) must be ensured.

6.10.5 Wind turbines and other energy generation plants

The minimum distance of five times the rotor diameter of the new turbines to be erected from the WTGs of the neighbouring OWP project is measured between the centres of the turbines. The larger rotor diameter shall be taken as a basis. The requirements for minimum distances only apply to turbines of neighbouring OWPs. This planning principle does not apply to the distances between WTs within an area. The same also applies in the case of the same project sponsor for two adjacent sites.

In order to ensure the coordinated planning of neighbouring OWPs that are in the planning stage during the same period, proof of coordination with the respective project developer must be submitted as part of the individual approval procedure. Existing installations or installations already specified in the planning documents of an approval procedure at the time of the local announcement of the interpretation of the plan shall be taken into account.

6.10.6 Sites and other energy production areas

The determination serves to limit shading effects and to ensure the stability of the wind turbines. Against the background of the technical development of wind turbines, the minimum distance for specifications will be increased from 750 m to 1,000 m from 2030.

With regard to two adjacent sites that are put out to tender by the BNetzA in the same year and therefore the planning by the respective project developers takes place in the same period, close coordination between the project developers is required at an early stage in good neighbourly cooperation with regard to the turbine locations and distances, taking into account the rotor diameters. Therefore, the submission of proof of coordination is stipulated as a prerequisite for the respective individual approval procedure.

In the event that a site is located next to a site that has already been put out to tender but has not yet been approved, it is not possible for the project that is already in the approval procedure to take into account the planning of the site that was put out to tender at a later date due to the different progress in planning. The basic prerequisite for the preparation of the planning approval documents for the later site is therefore the transmission of the plans for the site that was put out to tender earlier, especially with regard to turbine locations and distances, taking into account the rotor diameters, as well as immediate information in the event of changes.

6.11 Specific planning principles for sites and wind turbines at sea and other energy generation areas and installations

The following are planning principles for sites, primarily for the construction and operation of wind turbines and other energy generation areas and facilities. Reference is made to Chapter 6.12which sets out planning principles for platforms as well as for transformer and residential platforms. Planning principle 6.11.1 is not applicable to other energy production areas.

6.11.1 Deviation of the actually installed capacity from the allocated grid connection capacity

According to the explanatory memorandum to § 24 para. 1 no. 2 WindSeeG, the OWP project developer has the option of installing additional WTs above the bid quantity, provided that the planning approval decision permits this. Furthermore, a supplementary capacity allocation can be made in accordance with § 14a WindSeeG. However, excess feed-in over and above the allocated grid connection capacity is not permitted at any time.

When submitting the application, the OWP project developer must state whether and to what extent additional turbines are to be installed beyond the allocated grid connection capacity.

The increase in installed capacity above the allocated grid connection capacity serves to compensate for electrical losses and the unavailability of individual WTs. When the responsible TSO verifies compliance with the 2 K criterion, the non-availability of individual WTs, ONAS or measures through feed-in management as well as the electrical losses of the park-internal cabling are generally not taken into account. Due to the conservative approach of the verification procedure, measures to increase the installed capacity beyond the allocated grid connection capacity are thus covered within a certain framework.

The verification of compliance with the 2 K criterion for the in-park cabling by the OWP developer is carried out in a similar way to the verification for the ONAS without taking into account the aforementioned power-reducing restrictions. Due to the conservative approach of the verification procedure, subsequent measures to increase the installed power beyond the originally permitted nominal power are covered within a certain framework.

Should the increase in installed capacity exceed a share of 10 percent of the allocated grid connection capacity, approval from the responsible TSO is required with regard to compliance with the maximum temperatures of the operating equipment.

Compliance with the 2 C criterion in the ongoing operation of the connection system is to be verified by the TSO using model-based procedures (e.g. TCM II), in particular in the event of an increase in the actually installed capacity beyond the allocated grid connection capacity.

6.12 Specific planning principles for platforms

6.12.1 Platform planning and design

During the planning, construction, operation and dismantling of the platform, particular attention shall be paid to structural safety, supply and disposal, including the provision of drinking water, waste water treatment and occupational health and safety concerns, including escape routes and means of rescue. The requirements of planning principle 6.8 on official standards, specifications or concepts and the planning principle 6.1.3 (emission reduction) with regard to supply and disposal as well as waste water treatment.

The implementation of the planning principle is to be set out in a concept for the various areas mentioned in the individual approval procedure.

Major challenges are regularly associated with the subsequent installation of accommodation

units to house personnel. Therefore, these should be avoided and accommodation, where necessary, should already be provided for in the planning of the platform.

Depending on the escape and rescue concept, at least two regular access points should be provided. Each installation should be equipped with a device (e.g. boat landing) which, in the event of an emergency, enables rescue workers who moor at the installation with a ship without wave-compensated access systems and persons who have gone overboard to ascend. On platforms, another access system (e.g. helicopter landing deck, landing point for wave compensated access systems) is regularly established in addition to access by boat landing. It should be possible to use two different transport systems so that, for example, the helicopter landing deck or the landing point for wave-compensated access systems is available as an alternative access option if access by crew transfer vessel is restricted due to weather conditions. On a platform, the installation of a winch operating area can only be considered as a rescue area for emergencies. Use of the winch operating area on a platform beyond emergencies is permissible by way of exception if, in the event of a technical incident, the hazard potential must be reduced within a short period of time in order to prevent the occurrence of an emergency, it is not possible to exert an influence from shore or countermeasures initiated have remained unsuccessful and no more suitable access options to the platform are temporarily available.

The dimensions of the rescue and emergency response equipment must be calculated in such a way that bridging of the arrival times (e.g. rescue operation) as well as complete defence against conceivable dangers (e.g. fire-fighting operation) is ensured. If necessary, especially at greater distances from the coast, suitable landing and refuelling facilities for airborne rescue vehicles must be provided. In this context, the case of a complex damage situation or complex rescue situation must not be disregarded. Corresponding measures are to be adapted to the rescue means provided by the authorities.

6.13 Specific planning principles for interconnectors

The following are the rationales for planning principles for submarine cable systems, which for the purposes of this Plan means power cable systems such as ONAS, interconnectors, inter-facility connections and grid connection systems for other power generation facilities. The following planning principles apply to offshore grid connection systems of in-park cabling also of other energy production areas, with the exception of 6.13.2 and 6.13.3.

6.13.1 Bundling

This designation implements principle 2.2.3 (5) of the ROP 2021.

The bundling principle is intended to minimise impacts on other uses and the need for coordination among and with other uses. In addition, it should create as few constraints as possible for future uses. Bundling in the sense of parallel routing also reduces undesirable fragmentation effects, which can also be reduced by the above-mentioned definition.

The planning principle also applies to submarine cables of the park-internal cabling of areas and other energy production areas, provided that they are located outside areas, areas or other energy production areas.

6.13.2 Guided tour through border corridors

This definition ensures that the submarine cable systems are routed through predefined border corridors. This concentrates the cables at these points as far as possible and bundles them for further discharge towards land. This definition implements Objective 2.2.3 (3) and Principle 2.2.3 (4) of ROP 2021 with modifications. The

definition was made in close consultation with the coastal federal states.

Border corridors have been defined at the external borders of the EEZ with neighbouring countries, from which a route within the German EEZ appears possible. In some cases, these use existing infrastructure such as submarine cable systems or pipelines that have already been laid. The definition was made in consultation with the neighbouring countries.

Due to the limited number of available routes in the territorial sea, cross-border submarine cable systems that do not land in Germany should not be routed through the N-I to N-V border corridors.

6.13.3 Crossing of shipping lanes

This designation meets the requirements of Principle 2.2.3 (5) of the ROP 2021.

In order to minimise mutual interference with shipping and grid infrastructure, it is necessary for the cable routes to cross the traffic separation areas, their continuations and the Kiel-Baltic Sea Route by the shortest possible route, insofar as parallel routing to existing structures and built facilities is not possible. Due to the large number of cable systems to be expected, this applies in particular to the submarine cable systems for connecting OWPs, but also to all other submarine cable systems. By routing them parallel to existing structures, the land use and - in favour of shipping - the devaluation of the manoeuvring space as anchorage ground can be reduced. In addition, conflicts can be minimised by laying the submarine cable systems sufficiently deep. The planning principle 6.13.6 is referred to.

6.13.4 Crossings

This determination also corresponds to the evaluations of principle 2.2.3 (5) of the ROP 2021.

The purpose of the requirement is to avoid damage to third party submarine cables and pipelines and other third party facilities that have already been laid, established or approved by the FEP. In addition, crossings of submarine cables are to be avoided as far as possible in order to prevent interference with the marine environment through the introduction of hard substrate. Recommendations for the construction of crossing structures are set out, for example, in the recommendations of the European Subsea Cables Association (ESCA) and the International Cable Protection Committee (ICPC).

The two crossing cable systems usually have to be mechanically separated from each other. This is usually done by constructing a crossing structure. When building crossings, an engineered structure is usually erected on the ground using hard substrate.

By laying the cable without crossing structures, it is not necessary to cover the upper cable system with a cover or stone fill. This minimises the intervention, especially in the case of expected large crossing structures.

If crossing structures cannot be avoided, the crossing should be designed as perpendicular as possible according to the respective state of the art. This specification is intended to minimise the size of the crossing structure and thus the surface sealing. In justified cases, the crossing angle can be reduced to up to 45 degrees if this leads to a lower overall land use and is technically feasible. This applies in particular to the crossing of several cables in parallel with existing cables, which can lead to significantly longer cables. In principle, the crossing angle must not be less than 45°. Within the crossing structure, the two crossing submarine cable systems are usually separated from each other by concrete mats. These extend approx. 30 m on each side beyond the submarine cable to be crossed. The narrower the crossing angle, the longer the required crossing structure. Within the crossing

structure, it is not possible to repair the lower cable system due to these structural measures. In the event of faults in the lower cable system, a new crossing structure may therefore be required.

When planning a crossing structure, the subsoil conditions must be taken into account. It is to be expected that the upper cable system will have to be additionally covered over a length of at least 100 metres. The possibly necessary covering of the crossing structure should remain fishable.

In addition, the bending radii of the submarine cable must be taken into account, especially in the case of crossings. When crossing existing cables, it must be ensured that the laying radii of the newly crossing submarine cable systems do not lie in the area of the crossing structure so as not to enlarge it.

The routes for the TSO's submarine cable systems shall be provided without any crossings within the areas, and the cabling within the park of the OWP shall be designed accordingly.

If it is necessary to cut decommissioned cables (so-called out-of-service cables), these cables shall be laid down and their ends fixed in the seabed in such a way that any adverse effect on shipping and fishing is permanently ruled out. Sealing of the seabed shall be limited to what is strictly necessary. The fixed cable ends shall be precisely measured for the aforementioned purpose and the coordinates shall be documented for the BSH. The cables removed from the seabed shall be disposed of properly on land.

6.13.5 Gentle laying method

The determination corresponds to the evaluations of principle 2.2.3 (6) of the ROP 2021.

In order to minimise possible negative impacts on the marine environment caused by the laying of submarine cable systems, a laying method should be selected in the individual procedure, in particular depending on the geological conditions, which can be expected to cause the least interference and impact on the marine environment, but at the same time safely achieve the specified overburden. The use of the installation methods should cause as little impairment as possible to the safety and ease of shipping traffic.

6.13.6 Cover

This planning principle is also found in Principle 2.2.3 (5) of the ROP 2021 and specifies it more precisely. According to the Bundesfachplan Offshore Nordsee (BFO-N) 16/17, a depth of at least 1.5 m was required for the cable system to be laid in the North Sea. Please refer to the justification in planning principle 5.3.2.7 of the BFO-N 16/17.

In areas where designated areas overlap with reserved areas for other uses in the ROP 2021 and multiple uses are envisaged, different regulations may apply. These are weighed up and specified in the respective individual approval procedures. For the corridors for research vessels in the overlap areas of areas for wind energy with reserved areas for research, an overlap of at least 1.5 m is required for all submarine cable systems in order to be able to implement multiple use.

The overburden to be created in the Baltic Sea was determined on the basis of planning principle 5.4.2.7 of the Federal Sectoral Plan for the Baltic Sea (BFO-O) 16/17 in the individual approval procedure or in the enforcement procedure on the basis of a comprehensive study.

6.14 Possibilities of deviation

The concrete justification of the possibility of a deviation is to be justified within the framework of a case-by-case decision in an overall weighing of the conflicting interests on the basis of the relevant planning principle in each case as well as the associated specialist legal regulations.

7 Pilot wind turbines

The explanatory memorandum on "pilot wind turbines" corresponds to the content of the FEP 2023. No additions need to be made, as the preliminary draft of the FEP 2023 does not contain any new specifications for pilot wind turbines.

8 Other energy production areas

[The chapter is executed on the draft].

IV. Consistency of the specifications with private and public interests

The assessment of the compliance of the determinations with private and public concerns will be carried out after the consultation.

Since designations that do not comply with the spatial planning requirements pursuant to section 17(3) ROG are inadmissible, section 5(3) sentence 2 no. 1 WindSeeG, a deviation procedure pursuant to section 19 sentence 1 in conjunction with section 19 sentence 2 no. 1 of the ROP is to be initiated for the planning of designations in the priority area for shipping of SN10 of the ROP and, if necessary, for other designations where this is required. 1 in conjunction with. § Section 6 (2) of the ROG. In addition to a deviation from objectives in the shipping route SN10, a deviation from objectives procedure may be required in other cases, such as for border corridors, since the planning of the spatial development plan for the EEZ still assumed, among other things, a significantly lower total amount of energy from renewable sources for the EEZ as well as other circumstances with regard to the requirements of the uses.

V. Summary environmental statement and monitoring measures

[This chapter will be executed after the consultation].

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Appendix

1 Map part

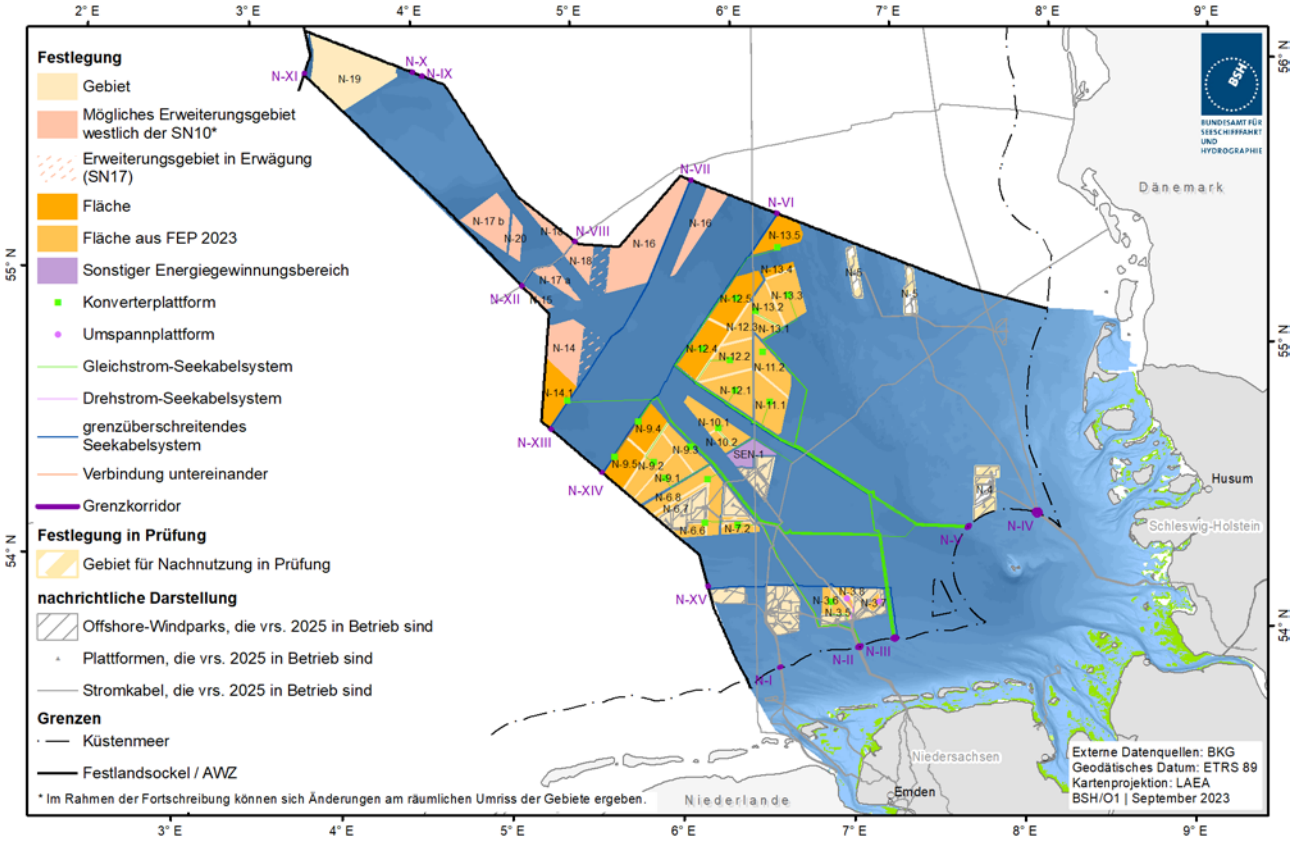


Illustration 8 Specifications preliminary draft FEP North Sea

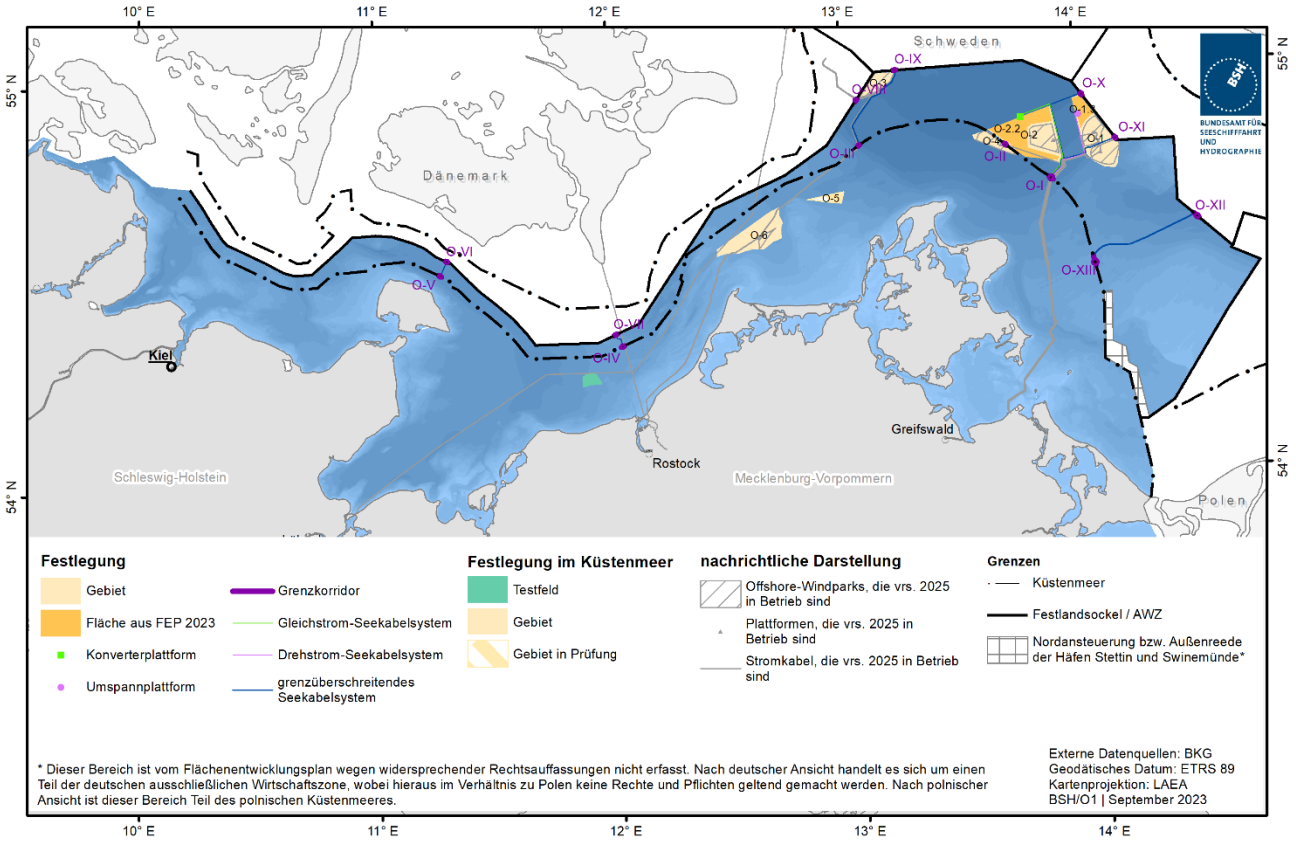


Illustration 9 Specifications in the preliminary draft of the Baltic Sea FEP

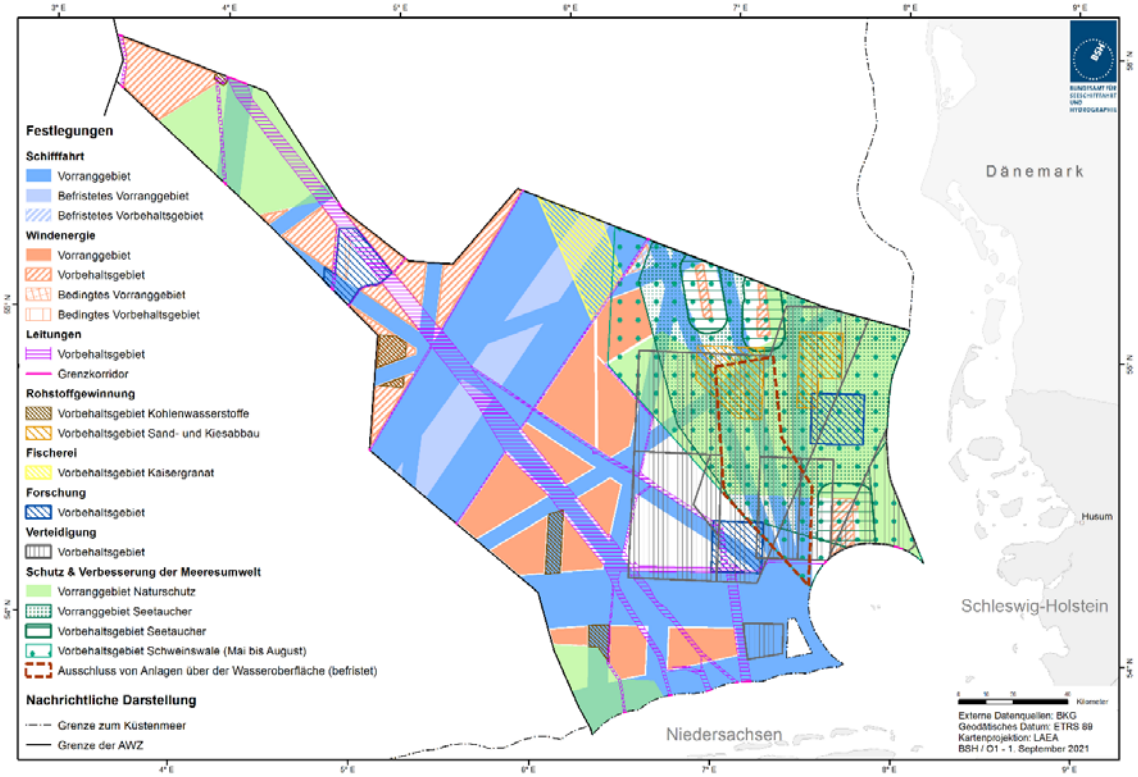


Figure 10 Marine spatial Plan for the German Exclusive Economic Zone in the North Sea and the Baltic Sea - Map Section North Sea

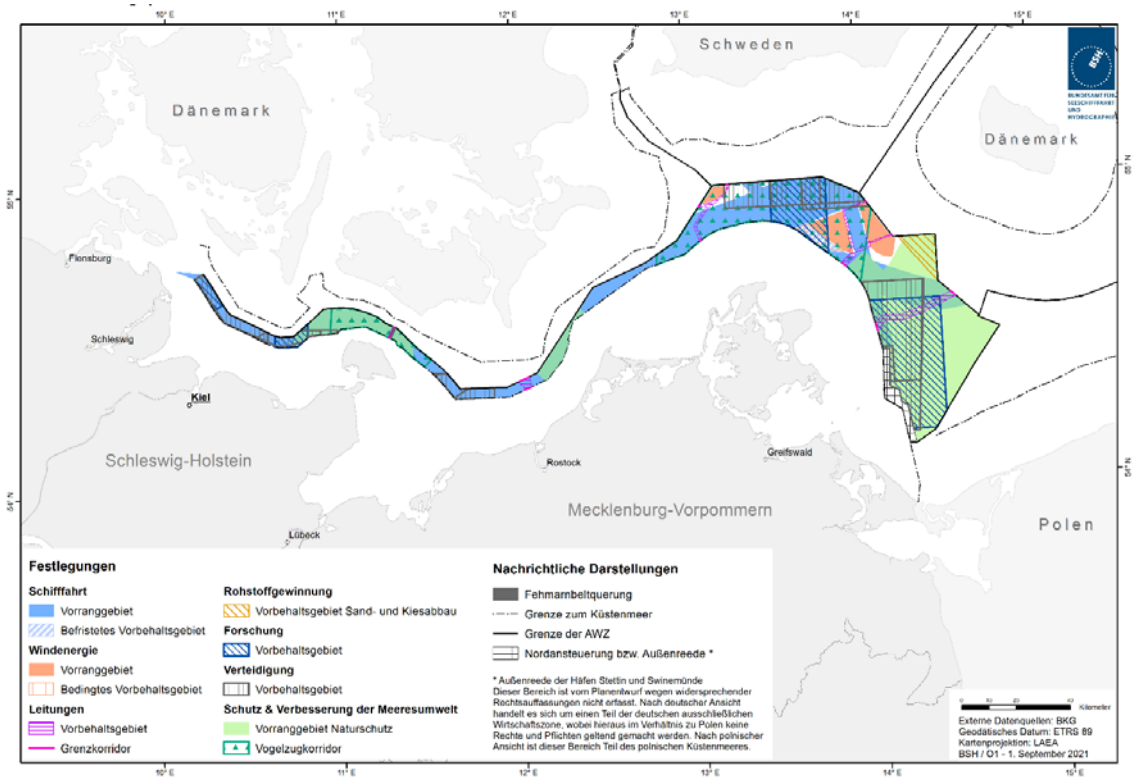


Figure 11: Marine spatial plan for the German exclusive economic zone in the North Sea and the Baltic Sea - Baltic Sea map section e

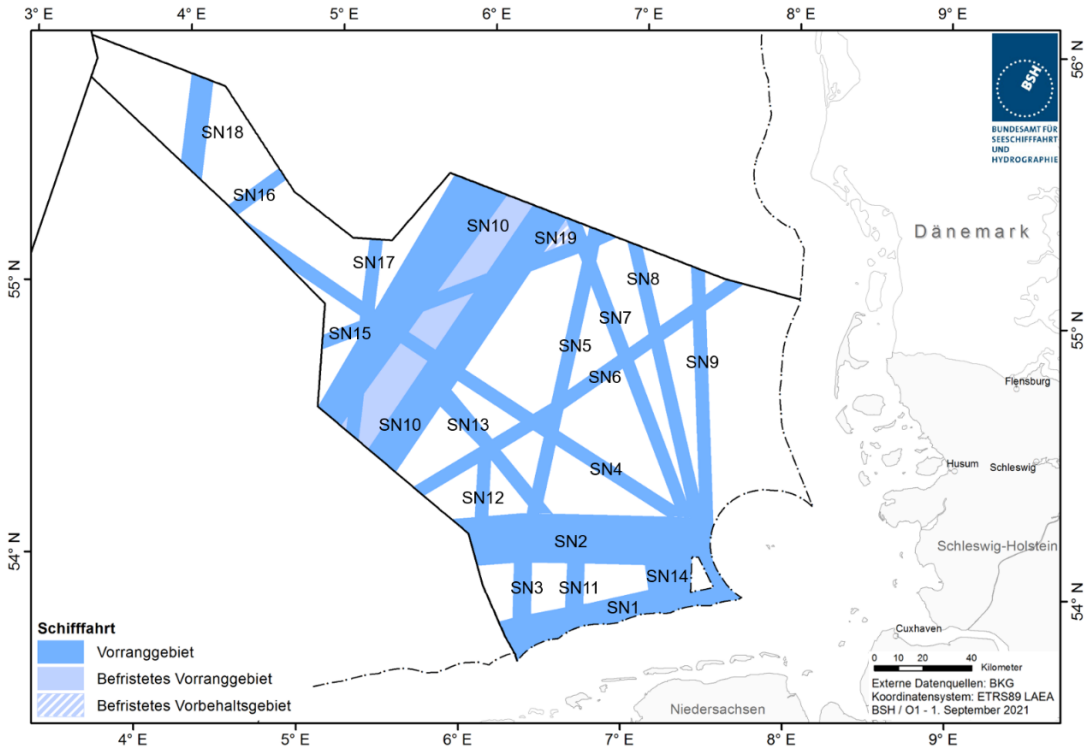


Illustration 12 Marine Spatial Plan for the German Exclusive Economic Zone in the North Sea and the Baltic Sea - Priority and Reserved Areas for Shipping in the North Sea

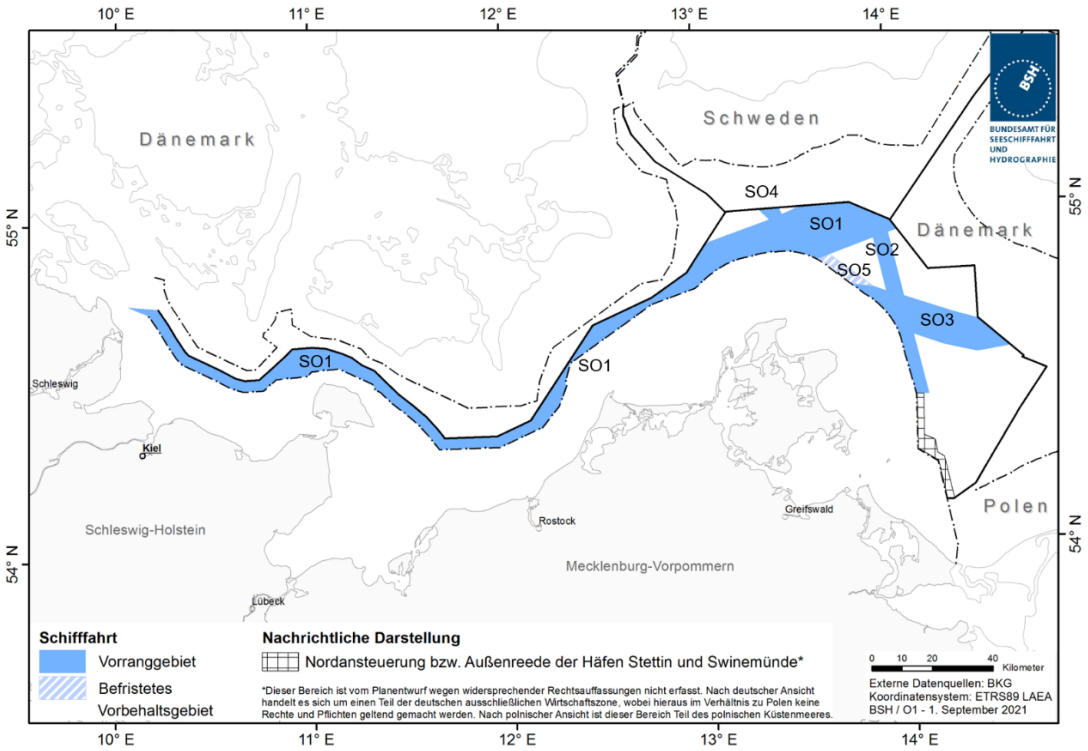


Figure 13 Marine Spatial Plan for the German exclusive economic zone in the North Sea and the Baltic Sea - Priority and reserved areas for shipping in the Baltic Sea

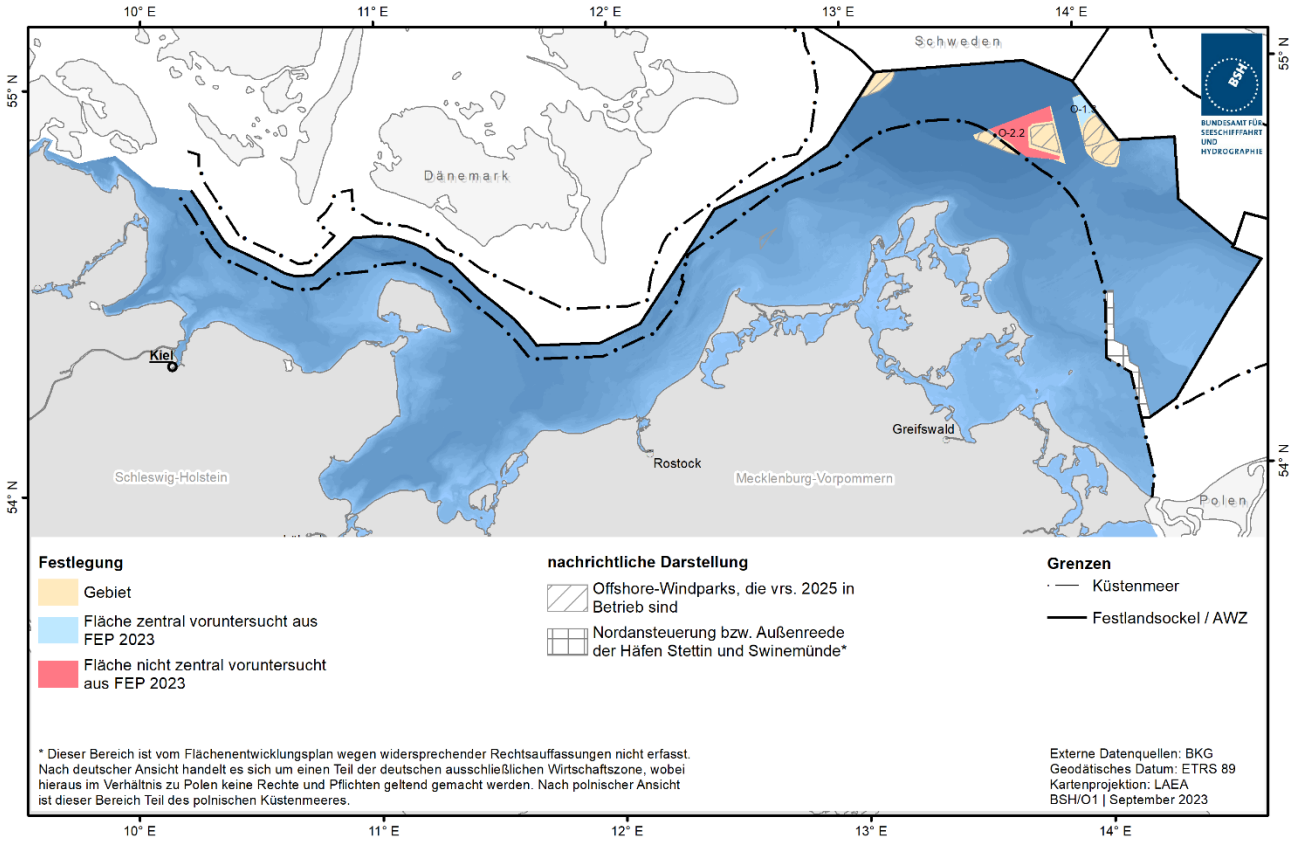


Figure 14 : Differentiation of the defined areas with regard to the type of their preliminary investigation in the EEZ of the Baltic Sea (A corresponding figure for the North Sea is provided in chapter 4 included).

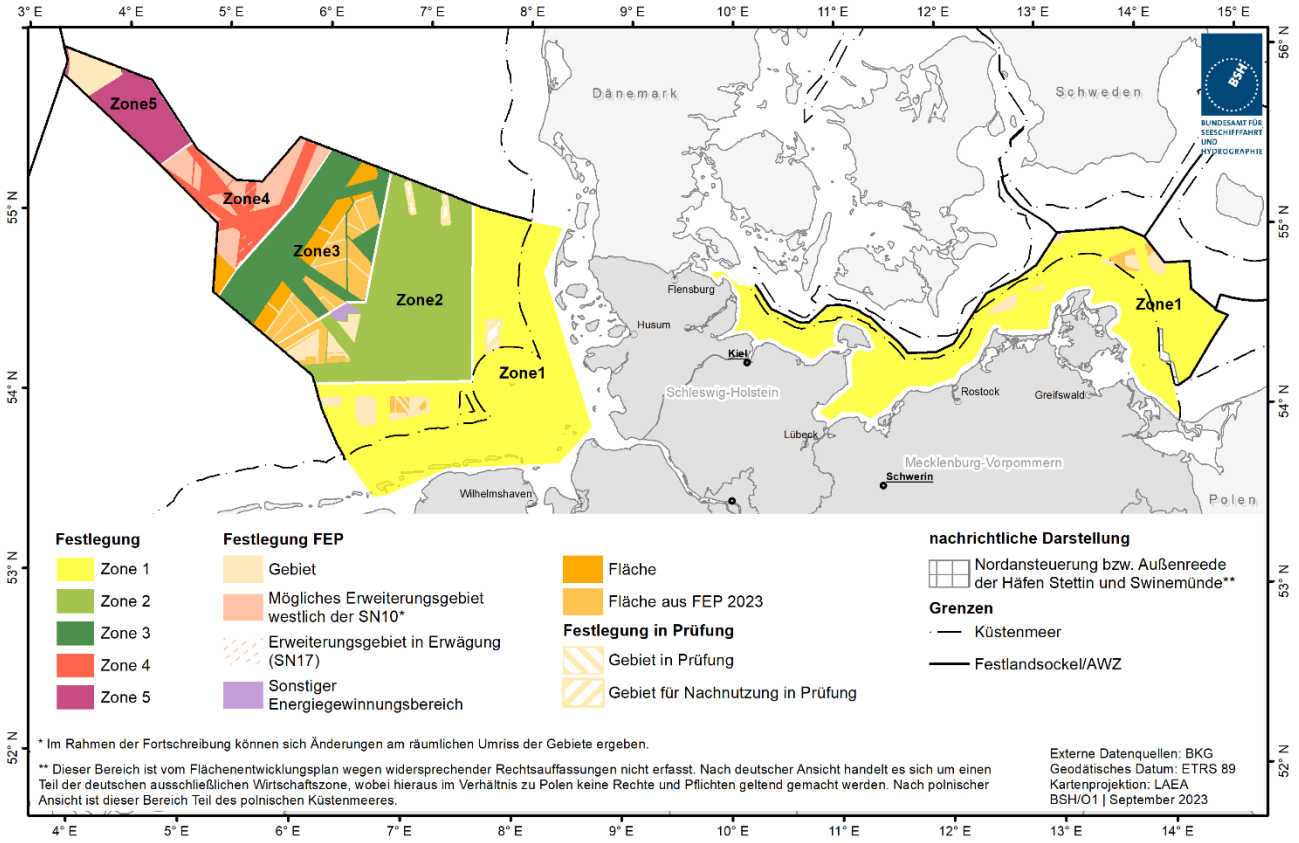


Figure 15FEP zones (new cut)

2 Overview table on the planning principle 6.10 Consideration of all existing, approved and established uses

Table 10: Overview table on the planning principle 6.10 Consideration of all existing, approved and established uses

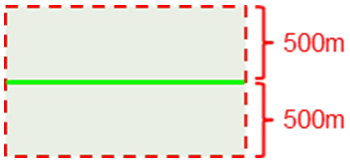
Use / Installation	Distance to be kept (m)	Explanation distance	Requirement / Reference	Planning principle
Pipeline	500	both sides	Centre line of the pipeline	6.10.2
Submarine cable system, third	500	both sides	Centre line of the route	6.10.3
Submarine cable system, parallel	100-200-100	in alternation	Centre line of the route	6.10.3
Platform, converter	1000	Radius	Centre of the location	6.10.4
Wind turbines and other energy generation plants	At least 5 x Ø rotor	Radius	the larger rotor (centre point)	6.10.5
Areas and/or other energy production areas in relation to each other [IBN by 2029].	750	outside	Edge of the surface/area	6.10.6
Areas and/or other energy production areas in relation to each other [IBN from 2030].	1000	outside	Edge of the surface/area	6.10.6

Table 11: Illustrations explaining the distances to be observed. On the planning principle 6.10 Consideration of all existing, approved and established uses. is referred to.

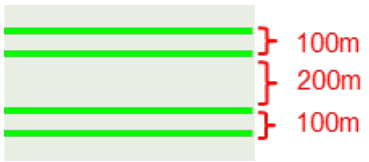
All figures in metres (m)

6.10.2 Pipelines

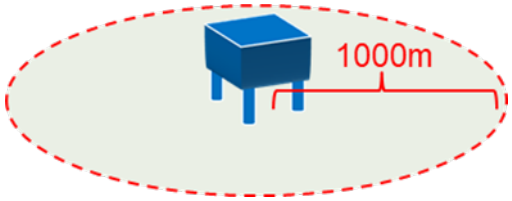
6.10.3 (h) Submarine cable



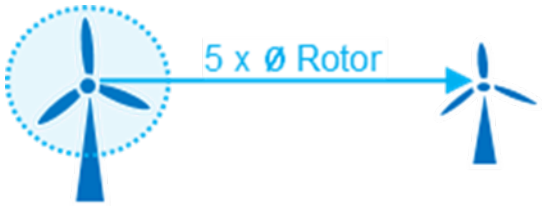
6.10.3 (i) Submarine cable



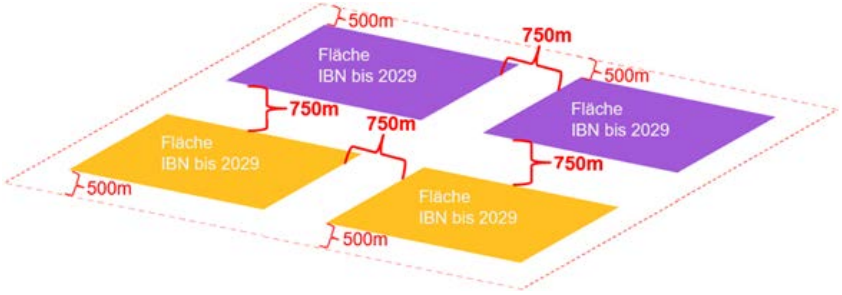
6.10.4 (k) Platforms



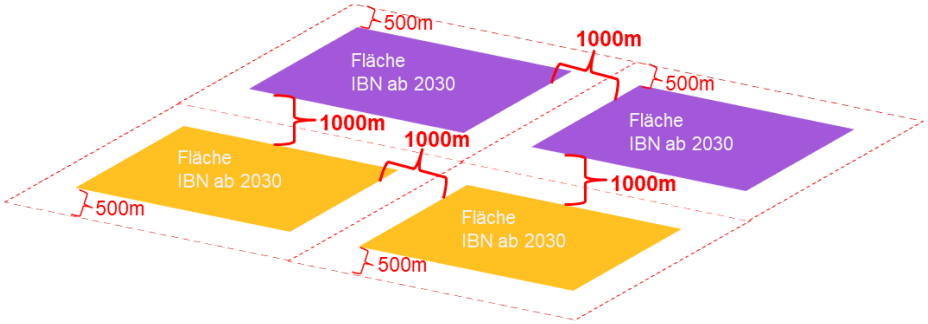
6.10.5 (l) Wind turbines and other energy production facilities



6.10.6 Areas and other energy production areas [IBN by 2029]



6.10.6 Areas and other energy production areas [IBN as of 2030]



3 Overview table

Table 12 Overview table of specifications for areas and ONAS. In grey, specifications for areas and ONAS from the FEP 2023 are only shown for information purposes, as they are not specified again in this update.

Calendar year Commission-ing	Area designa-tion	Calendar year Call for tenders	Calendar year / quarter Com-missioning	Vrs. to be in-stalled Power [MW]	Commission-ing per calen-dar year [MW]	Designation Mains connec-tion system	Calendar year / quarter Commission-ing	Transmission capacity [MW]	Border corridor to the territorial sea
2026	N-3.7	2021	2026 (QIII)	225	958	NOR-3-3	n/a	900	N-II
	N-3.8	2021	2026 (QIII)	433					
	O-1.3	2021	2026 (QIII)	300		OST-1-4	2026 (QIII)	300	O-I
2027	N-7.2	2022	2027 (QIV)	980	980	NOR-7-2	2027 (QIV)	980	N-V
2028	N-3.5	2023	2028 (QIII)	420	1.800	NOR-3-2	2028 (QIII)	900	N-II
	N-3.6	2023	2028 (QIII)	480					
	N-6.6	2023	2028 (QIV)	630		NOR-6-3	2028 (QIV)	900	N-II
	N-6.7	2023	2028 (QIV)	270					
2029	N-9.1	2024	2029 (QIII)	2.000	5.500	NOR-9-1	2029 (QIII)	2.000	N-II
	N-9.2	2024	2029 (QIII)	2.000		NOR-9-2	2029 (QIII)	2.000	N-III
	N-9.3	2024	2029 (QIV)	1.500		NOR-9-3	2029 (QIV)	2.000	N-III
2030	N-10.2	2025	2030 (QIII)	500	9.500				
	N-12.1	2023*	2030 (QIII)	2.000		NOR-12-1	2030 (QIII)	2.000	N-III
	N-12.2	2023*	2030 (QIV)	2.000		NOR-12-2	2030 (QIV)	2.000	N-V
	O-2.2	2023*	2030 (QIII)	1.000		OST-2-4	2030 (QIII)	2.000	O-I
	N-10.1	2025	2030 (QIII)	2.000		NOR-10-1	2030 (QIII)	2.000	N-II
	N-11.1	2023*	2030 (QIII)	2.000		NOR-11-1	2030 (QIII)	2.000	N-V
2031	N-11.2	2024*	2031 (QIII)	1.500	4.000	NOR-11-2	2031 (QIII)	2.000	N-III
	N-13.1	2026	2031 (QIII)	500					
	N-12.3	2024*	2031 (QIII)	1.000		NOR-13-1	2031 (QIII)	2.000	N-III
	N-13.2	2026	2031 (QIII)	1.000					
2032	N-6.8	2027	2032 (QIII)	2.000	4.000	NOR-6-4	2032 (QIII)	2.000	N-II
	N-9.4	2025*	2032 (QIII)	2.000		NOR-9-4	2032 (QIII)	2.000	N-III
2033	N-14.1	2028	2033 (QIII)	2.000	4.000	NOR-14-1	2033 (QIII)	2.000	N-III
	N-12.4	2026*	2033 (QIII)	2.000		NOR-12-3	2033 (QIII)	2.000	N-V
2034**	N-12.5	2027*	2034 (QIII)	2.000	2.000**	NOR-12-4	2034 (QIII)	2.000	N-V
2035**	N-9.5	2028*	2035 (QIII)	2.000	2.000**	NOR-9-5	2035 (QIII)	2.000	N-III
Total specifications preliminary draft***					34.738				
Projected stock 2025					10.800				
OWP Gennaker (coastal sea Mecklenburg-Vorpommern)					900				
Total					46.438				

* These tenders are issued as tenders for areas that have not been centrally pre-surveyed. The period between tendering and commissioning is extended accordingly.
** For commissioning in 2034 and 2035, further centrally pre-surveyed areas amounting to 2,000 MW per year are to be defined, so that an expected installed capacity of around 50 GW is reached in 2035.
*** Areas N-13.3, N-13.4 and N-13.5 with a combined capacity of 4,000 MW are not included in the total, as no calendar year of commissioning and grid connection system are specified for these.