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IMPLEMENTATION
OF EU-JAPAN
STRATEGIC
PARTNERSHIP
AGREEMENT (SPA)

Study on Best Practices in Maritime Spatial Planning for Offshore Wind Power



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ABBREVIATIONS

BEMIP - Baltic Energy Market Interconnection Plan
BSH - Federal Maritime and Hydrographic Agency of Germany
BPNS - Belgian Part of the North Sea
BSR - Baltic Sea Region
CBSS - Council of the Baltic Sea States
COLREG - Convention on the International Regulations for Preventing Collisions at Sea
DEA - Danish Energy Authority
EBA - Ecosystem-based Approach
EC - European Commission
EEZ - Economic Exclusive Zone
EIA - Environmental Impact Assessment
EU - European Union
FOW - Floating Offshore Wind
GES - Good Environmental Status
GPSR - General Provisions on Ship's Routeing Systems of the IMO (GPSR)
GW - Gigawatt
HELCOM - Helsinki Commission
IMO - International Maritime Organisation
MSFD - Marine Strategy Framework Directive
MSP - Maritime Spatial Planning
MSPD - Maritime Spatial Planning Directive
MU - Multi-uses
MW - Megawatt
NIS - Natura Impact Statement
NSEC - North Seas Energy Cooperation
NSP - North Sea Programme
ORE - Offshore Renewable Energy
OWE - Offshore wind energy
OWF - Offshore Wind Farms
OWP - Offshore Wind Power
PEZ - Princess Elisabeth Zone
SEA - Strategic Environmental Assessment
SOLAS - International Convention for the Safety of Life at Sea
UNCLOS - United Nations Convention on the Law of the Sea



1. INTRODUCTION

1.1. Background and rationale

Offshore wind power (OWP) is a high political priority for the EU as highlighted in high-level speeches and summits such as (1) the State of the Union speech by Ursula von der Leyen, President of the European Commission (13 September 2023), (2) the EU-Japan Summit (13 July 2023), and (3) the Green Alliance (May 2021).

The development of offshore wind farms (OWF) has shown rapid capacity increases and declines in product costs globally. The potential for OWP is increasingly recognised in the Asia-Pacific region, with authorities not only in Japan but also in the People's Republic of China, South Korea, Taiwan, the Philippines, Australia, and Vietnam establishing legal frameworks enabling the development of OWF projects. The EU companies operating in this sector, from turbine and parts manufacturers and service providers to developers, are among the leading companies globally, and the emergence of new markets may provide them with considerable opportunities to increase their output and market share.

In the case of Japan, the country has made commitments regarding carbon neutrality and increasing the share of renewables in its energy mix. One of the key new sectors in reaching these targets is offshore wind power. Japan has issued a list of around 20 new projects and continuously seeks new areas for OWF development. The first two rounds of procurement processes have already been completed; a third round is ongoing, and Japan is expected to roll out 4-6 new tenders per year during the next 10 years. Japan's objectives aim at increasing the OWF capacity but also in terms of lowering the price of energy and creating a local supply chain. Reaching these objectives requires enhancing the regulatory system to create incentives that encourage innovation and competition.

The EU-Japan Economic Partnership Agreement (EPA) includes ambitious provisions and cooperation structures for regulatory cooperation with Japan. The EPA presents opportunities to enhance bilateral cooperation, with a view to sharing European best practices and tools with Japan to meet its targets.

To that end, the Delegation of the EU to Japan already commissioned several studies looking at various aspects relevant in offshore wind in Japan, including a study on "Standards, technical regulation and conformity assessment in the Japanese and European offshore wind power market: current implementation and best practices" that was published in July 2022. The report provided a useful overview of the respective regulatory systems of the EU and Japan

and provided practical recommendations on how the EU experience and best practices could be utilised as benchmarks in Japan.

1.2. Objectives

The objective of the "Study on Best Practices in Maritime Spatial Planning (MSP) for Offshore Wind Power" (hereinafter referred to as the "Study") is to utilise the outcomes of the previous studies commissioned by the EU Delegation in offshore wind, in informing our interlocutors of the possible ways to develop the Japanese regulatory system. Furthermore, the "Study" aims to ensure that the findings and the recommendations could be used in relevant bilateral fora with the Japanese authorities as benchmarks for developing the regulatory framework related to these topics.

1.3. Expected Outcomes

The main expected outcome of the Study is the report on best practices in Maritime Spatial Planning (MSP) presented herein, including four country fiches in its annex. The findings presented in this report are expected to give a comprehensive understanding of the EU planning context, focusing on how the Maritime Spatial Planning Directive is implemented in each country, the level of integration presented within the OWF sector, and its corresponding planning and development policy. The case studies showcase best practices and tailor recommendations for the Japanese context.

1.4. Activities

This report addresses the following analysis as proposed: Study of European Union (EU) Maritime Spatial Planning (MSP) and Maritime Spatial Plans to support strategic advice for the development of MSP in Japan – with particular focus on the role which MSP has played and does play in the development of Offshore Wind in Europe.

The report covers, among others, the following aspects:

- The main characteristics of the MSP Directive and different practices on how EU Member States have adopted and implemented the MSP Directive within their specific national and regional context (governance as well as sectoral differences)
- The role of offshore renewable energy in some of these countries and how it has been considered in their MSPs (also in relation to other sectors and spatial interests)



- Processes for stakeholder consultations, especially best practices for approaches that consider the interests of local communities, including fisheries organizations.
- Matters that relate to cross-border cooperation and consultations among the various EU Member States.

1.5. Methodology

This study's approach is desk-based. Four case studies were selected in detail, complemented by interviews to fill knowledge gaps. This followed an iterative approach to develop recommendations for the Japanese case study.

1. Desk Research: Review of key literature and Maritime Spatial Plans of relevant EU countries took place in the period between February – May 2024.
 - EU MSP Platform - Conflict Fiches
 - Maritime Spatial Plans of Relevant EU Countries
 - Study of EU Context for Offshore Renewable Energy Planning in Ireland and Germany
 - Cross-border Consultation on MSP - Clare Waldmann et al., 2018
 - BalticLINES and NorthSEE Crossborder Planning Guidelines 2018
 - How to develop Visions in MSP - Lukic et al. 2018
 - Report on Implementation, Monitoring and Evaluation Mechanisms for MSPs in the Baltic Sea Region - Schultz-Zehden, 2021
2. **Interviews:** Engaged with planners in the EU to fill knowledge gaps, where relevant.
3. **Development of Case Study fiche:** Analysis of countries excelling in offshore renewable energy and renewables development offshore.

The selection of case studies focused on EU Member States with a high level of maturity in maritime spatial planning, the offshore wind farms sector development, existing experience with mitigation and conflict resolution, and a mature permitting/approval system that has supported implementation. Four Member States, Belgium, Denmark, Germany, and the Netherlands, were shortlisted to provide valuable best practices on MSP processes that have supported the deployment of OWF.

It is no surprise that the selected case studies are located in the Baltic and North Seas. Namely, in the EU,

the OWF deployment began in the North Sea due to the abundance of sites and higher wind resources compared to onshore alternatives. The first operational OWFs in the EU were constructed in the Baltic Sea Region and North Sea (e.g., 1991—Vindeby, Denmark, 1994—Lely, 2008—Thorntonbank, Belgium, and 2009—Borkum West Offshore Wind Park, Germany). Thus far, these two sea basins have been at the forefront of the OWF deployment critical to the EU's long-term strategy to reach its climate objectives and carbon neutrality by 2050, as stated by the EU Green Deal.

The analysis presented will provide insight into how MSP has enabled the development of OWF and influenced the consenting systems in these case study sites. Best practices on stakeholder engagement, cross-border consultation, mitigation, and conflict resolution with other sectors will also be presented, focusing on fisheries, aquaculture, and nature protection since these are also key sectors in Japan.

1. **Belgium:** Pioneering MSP and offshore wind turbine planning with numerous multi-use pilot projects such as EDULIS (mussel farming and offshore wind turbines), UNITED (algae and oyster farming and offshore wind turbines), and ULTFARMS (algae, mussels, and offshore wind turbines). Belgium has also pioneered supportive policies and planning frameworks for offshore wind planning and multi-use.
2. **Denmark:** Experiences from the Danish adaptive MSP approach can inspire strategies for conflict resolution and co-location that enhance ecological and socio-economic benefits.
3. **Germany:** Germany has long-standing experience with both integrated MSP and sectoral planning, which has facilitated the expansion of offshore wind farms. Germany is currently in the process of reviewing its current MSP to enable an even better integration of future offshore wind with uses such as new forms of fisheries (passive), mariculture, and nature protection, as well as planning for emerging uses such as carbon storage.
4. **Netherlands:** Innovative approaches to offshore wind co-location with aquaculture and nature restoration. Technological advancement, adaptable policies, and cooperative decision-making. Tenders that include non-financial criteria favour multi-use concepts (e.g., integration between uses).



2. MARITIME SPATIAL PLANNING

2.1. Introduction to MSP

Over the past two decades, Maritime Spatial Planning (MSP) has become a significant political initiative in Europe. Maritime or Marine Spatial Planning are almost synonymous terms that describe a management approach to marine space and its associated uses. As defined by UNESCO, Marine Spatial Planning is the “public process of analysing and allocating the spatial and temporal distribution of human activities to achieve ecological, economic, and social objectives that are usually specified through a political process” (Ehler and Douvere, 2007).

Similarly, the European Commission¹ defines maritime spatial planning as “a process by which the relevant Member State’s authorities analyse and organise human activities in marine areas to achieve ecological, economic and social objectives.”

Traditionally, the management of marine resources and regulation of maritime activities followed a **single-sector planning** and permitting approach. MSP offers a **comprehensive approach** through which an **integrated multi-sector planning** and permitting framework is applied. It encompasses all human activities in oceans and seas, such as fishing, aquaculture, mining, transportation, tourism, and leisure. It advocates for applying an ecosystem-based approach (EBA), ensuring long-term co-existence, conservation, and sustainable use of marine resources. Conflicts between activities can be identified and managed by mapping and identifying the different spatial uses. What is more, MSP also considers possible future uses and the best spots for them to be placed, considering all other existing or equally future uses. Hence MSP very much aims to avoid conflicts from happening in the first place. It also does so in view of considering land-sea interactions. It distinguishes between those uses which ‘move’ (i.e. shipping, fishery) and those which require permanent infrastructures/installations (i.e. offshore wind parks, aquaculture, cables/pipelines).

MSP also encourages – to the extent possible - multi-uses in marine areas, i.e. in accordance with national policies and legislation. Ocean multi-use is not the same as MSP but is rather a sub-category. It refers to the intentional shared use of marine resources in close geographic proximity by two or more maritime activities. It is an umbrella term that covers many combinations of maritime activities and represents a radical change from the concept of exclusive re-

source rights - to the inclusive sharing of marine resources and space by one or more activities. The main rationale behind the application of multi-use solutions is a) to lower conflicts between different maritime users who seek the same maritime space; b) to create synergies between users, especially in very offshore harsh environments and hence lower costs; and c) to apply the concept of spatial efficiency; aiming towards leaving as much marine space ‘un-used’ as possible for the environment as well as future generations.

2.2. MSP in Japan

In Japan, the use of marine space is managed by sectoral laws established for specific purposes of use, and there has been no spatial plan or planning process to manage and coordinate marine areas in a comprehensive manner. The concept of MSP and its importance have been long discussed, even at a governmental expert committee, and was finally included in the Fourth Basic Plan on Ocean Policy in 2023, stressing data collection and sharing in the context of digitalization as well as its uniqueness in terms of methodology.

Meanwhile, there are several local governments which have conducted zoning of marine areas for OWP development as demonstrative projects.

2.2.1. Status and government policy

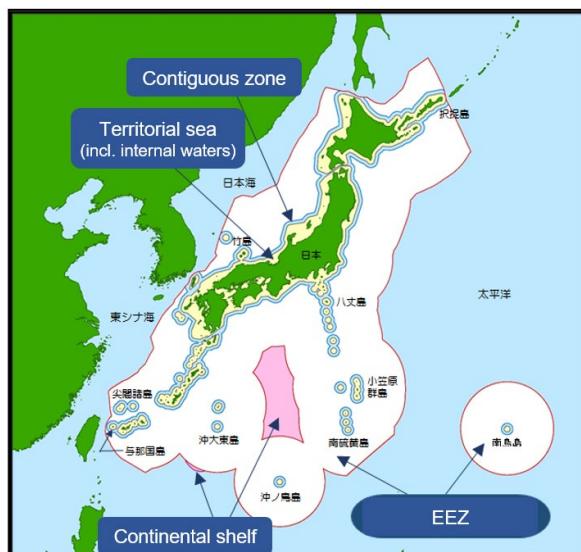
Japan's territorial waters, inland waters, and exclusive economic zones total 4.47 million km², ranking sixth in the world.

The territorial sea and internal waters are governed by each sectoral law. Both national and sub-national (prefecture/municipality) governments may have an authority to manage the utilization of waters up to 12 nautical miles (nm) offshore depending on each sectoral legislation. Other than individual sea area management laws and regulations, there are no general laws and regulations governing the use and management of sea areas. In practice, management is carried out using the provisions of the National Property Act. Some local governments have their own ordinances to manage sea area use.

There is no legislation for comprehensive management of the area use of EEZs, though some sectoral laws cover EEZs (e.g., related to fishery, mining, or nature conservation).

¹ European Commission. "Directive 2014/89/EU of the European Parliament and of the Council of 23 July 2014 establishing a framework for 'maritime spatial planning'" (2014).

Figure 1 Conceptual Diagram of Japan's Territorial Waters and beyond



Note: This conceptual diagram is shown for convenience, including geographical intermediacy in the sea area where the boundary with a foreign country has not yet been determined.

Source: Japan Coast Guard, "Conceptual Diagram of Japan's Territorial Waters, etc."
(https://www1.kaiho.mlit.go.jp/ryokai/ryokai_setsuzoku.html)

Around 2000, there raised a strong social awareness of the need to address various issues such as the deterioration of the marine environment, resource depletion, competition for sea surface use, and the need to ensure maritime security, and in 2007 the Basic Act on Ocean Policy was enacted, which states comprehensive ocean management as one of its principles. Under this Act, the government established the Headquarters for Ocean Policy, headed by the Prime Minister and comprising relevant cabinet ministers, and the Secretariat for the Promotion of Ocean Policy in the Cabinet Secretariat (later transferred to the Cabinet Office). The government is also required to formulate a "Basic Plan on Ocean Policy", which is to be reviewed approximately once every five years.

Headquarters for Ocean Policy takes charge of establishing the Basic Plan on Ocean Policy and promoting and executing measures based on the Plan. The personnel of the Secretariat for the Promotion of Ocean

Policy in the Cabinet Office are from multiple related ministries including the Ministry of Land, Infrastructure, Transport and Tourism (MLIT), the Ministry of Economy, Trade and Industry (METI), and the Ministry of Foreign Affairs. Their important function is mainly synthesis coordination, as stipulated by the Act. In general, the policies in the Plan are assumed to be executed by each ministry concerned.

The importance of MSP has been discussed for more than a decade and the word "MSP" was referred to in the Third Basic Plan on Ocean Policy published in 2018². However, no further activities for comprehensive marine use planning at the national level have been engaged, apart from the Marine Domain Awareness (MDA), of which the government has stressed the importance. MDA in Japan is defined as "the effective collection, aggregation, and sharing of a variety of ocean-related information that contributes to maritime security, marine environmental conservation, marine industry promotion, and the development of science and technology, while paying attention to handling, etc., and efficiently understanding ocean-related situations"³. It covers information that can be used not only for maritime security, but also for the promotion of maritime policies such as marine environmental conservation, marine industry promotion, and the development of science and technology. An information service operated by Japan Coast Guard, "MDA Situational Indication Linkages," so-called "MSIL (海しる)" provides an environment that enables access to a variety of marine use information in both Japanese and English⁴. More than 200 types of information are available from a wide range of fields, including topography/geology, marine weather, meteorology, safety, disaster prevention, fisheries, and marine use and conservation.

² The Plan stated that "we will strive to understand the facts of MSP and we will study needs, issues, and feasibility in light of the reality of the use of Japan's ocean areas and the relationship with existing domestic laws and regulations." The Third Basic Plan on Ocean Policy (Cabinet decision, May 15, 2018). https://www8.cao.go.jp/ocean/english/plan/pdf/plan03_e.pdf

³ Headquarters for Ocean Policy, "Japan's Marine Domain Awareness (MDA) Concept" (December 22, 2023) https://www8.cao.go.jp/ocean/policies/mda/pdf/r05_mda_main.pdf

⁴ <https://www.msil.go.jp/msil/htm/topwindow.html>

⁵ In April 2024, the Headquarters for Ocean Policy announced the "Priority Strategies for Ocean Development," in which promoting MDA and information utilization is selected as one of the six prioritized policies. ("Draft) Priority Strategies for Ocean Development" (April 26, 2024) <https://www.kantei.go.jp/jp/singi/kaiyou/dai22/02shiryou1-2.pdf>

Figure 2 Example of information display view on MSIL

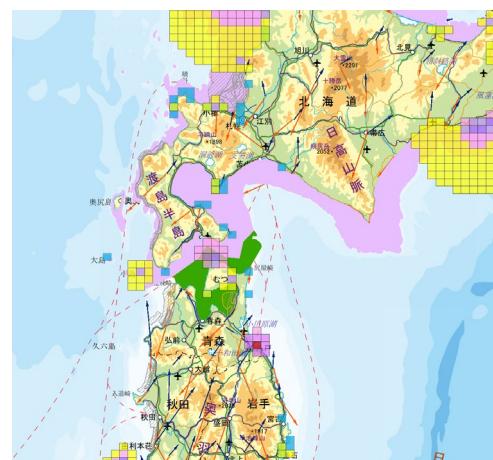


Note: displayed data from Geospatial Information Authority of Japan, the Ministry of the Environment, the Japan Coast Guard

Source: Created by the author based on the MDA Situational Indication Linkages (<https://www.msil.go.jp/>)

In addition to MSIL, a GIS-type information service operated by the Ministry of the Environment (MOE). The "Environmental Impact Assessment Database System," so-called EADAS, aggregates more than 250 types of information concerning multiple fields, such as natural and social environments, renewable energy potential, power lines, birds' sensitivity map, including both onshore and offshore.

Figure 3 Example of information display view on EADAS



Note: displayed data from GIA, MOE

Source: Created by the author based on EADAS
<https://www2.env.go.jp/eiadb/webgis/index.html>

The Fourth Basic Plan on Ocean Policy⁶, released in 2023, refers to MSP in its section on the promotion of digitalization. It states that "Japan will establish its own unique Marine Spatial Planning methodology," in the section on the promotion of digitalization, indicating that the focus is on data sharing, and less on the approach toward coordinating the use of marine areas. Still, the plan also states that "efforts will be made to promote more appropriate and effective use of complex maritime areas." It can be said that the foundation has been laid for the discussion to create a mechanism for the coordination across government ministries and agencies.

Another aspect worth noting is the Plan's attitude towards MSP and offshore wind development process. It states that efforts in promotion zones designated under the Renewable Energy Sea Area Utilization Act should be appropriately positioned as a form of MSP, based on the situation where "the sharing and visualization of the actual status of regulations and sea area use under jurisdiction of each act" has already been undertaken under the Act. The plan also points out that "expanding to other individual issues in the exclusive economic zone, etc., and applying it to multiple sea area uses will be considered," which implicates the starting point towards MSP aiming at not only installing OWF but also achieving variety of goals and uses.

⁶ The fourth Basic Plan on Ocean Policy (Cabinet Decision, April 28, 2023) https://www8.cao.go.jp/ocean/policies/plan/plan04/pdf/keikaku_honbun.pdf



2.2.2. Overview of legal framework for marine area use

As noted above, the use of marine space is managed by laws and regulations established for specific purposes of use. Those include marine traffic, fishery, mining, environmental conservation, as well as use of military, infrastructures such as port and coast, among others. Air space use above sea water is also regulated for the use of radar. The following shows several major marine uses and related rules.

2.2.2.1. Maritime traffic

The Act on Preventing Collisions at Sea "establishes the necessary matters concerning the navigation to be observed by ships, the lights and figures to be displayed and the signals to be made, in conformity with the provisions of the International Regulations for Prevention of Collisions at Sea of 1972"⁷.

The Maritime Traffic Safety Act is applied to ensure the safety of vessel traffic in Tokyo Bay, Ise Bay, and the Seto Inland Sea, which are the most congested sea areas for vessel traffic. It stipulates traffic methods, including the designation of shipping routes⁸ and requires permission and notification for construction work, among others, in the sea area to prevent danger.

Ports that meet certain requirements are subject to the Port Regulations Act, which "aims to ensure the safety of marine traffic and the orderly conduct of business in the port," and regulations concerning entry and exit, anchoring, use of navigation channels, navigation, and preservation of waterways are enforced. The captain of the port is appointed from among the Japan Coast Guard officers at the subject port (Article 21 of the Japan Coast Guard Act), and various authorities are exercised to prevent hazards in the port.

As for shipping routes, there are two "recommended routes" designated by the International Maritime Organization (IMO) based on the SOLAS Convention (off the west coast of Izu Oshima, Tokyo, and off the coast of Cape Shionomisaki, Wakayama Prefecture)⁹.

In addition, the Maritime Transportation Act regulates the licensing and notification system for the business of transporting people and goods by ship on the sea, while the Port and Harbor Transportation Business Act regulates the licensing system for transportation at ports. MLIT issues these licenses and permits.

2.2.2.2. Fisheries and fisheries resource development

The Fishery Act provides the basic framework for fisheries. The Act provides for fisheries based on fishing rights established in coastal waters, permitted fisheries for fisheries operated offshore, and fisheries that do not fall under these categories (free fisheries).

Fishery rights are "the exclusive right to operate a specific fishery on a certain water surface for a certain period of time"¹⁰ and are established by a license from the prefectural governor. There are three types of fisheries covered by fishery rights: a fixed fishery (定置漁業) where fishing gear is fixed in place, a demarcated fishery (区画漁業) for aquaculture, and a common fishery (共同漁業), which is community fishing. Fishery rights are regarded as property rights under the Civil Code, and holders of fishery rights are granted the right to demand the elimination or prevention of interference with the right to fish in the fishing grounds. In principle, the duration of fishing rights is 5 or 10 years. Fishery rights may be granted to individuals or corporations individually or to local Fishery Cooperative Associations or Federations of Fisheries Cooperative Associations (group fishery rights), with the latter being applicable to common fishery rights and some demarcated fishery rights. Those who belong to a Fisheries Cooperative Association conduct fisheries in accordance with the rules established by the cooperative (Fishery Right Exercise Rule). The prefectural governor approves the Exercise Rule. In addition, there is a Piscary system in which fishermen operate part of the contents of fishing rights in fishing areas belonging to others' demarcated fishery rights or common fishery rights. The Piscary is licensed only to Fisheries Cooperative Associations or Federation of

⁷ Article 10 of the Act provides for a separate passage system under the CORLEG Convention, but it is reportedly not set up in waters around Japan (information as of July 2017. (Outline "Maritime Laws and Regulations," 2nd ed. p216). As a reason for this, it is pointed out that it is difficult to coordinate interests among users of the sea area by setting legal conditions for navigation because of the diverse socioeconomic activities flourishing along the coast of Japan. Rina Miyake et al. "PS-15 Application Example of Safety Assessment Methodology for Designing Recommended Navigation Routes," <https://www.nmri.go.jp/event/presentation/h29/pnm2b170015-00.pdf>

⁸ Designated by government ordinance in the sea areas listed in the attached table (Article 2, Paragraph 1 of the same law), there are currently 11 designated shipping routes. Japan Coast Guard website, "Laws and regulations of maritime traffic," <https://www.kaiho.mlit.go.jp/safety/cat/2hourei.html>

⁹ The 3rd Regional Coast Guard Headquarters, "Establishing Japan's first recommended route off the west coast of Izu Oshima" (December 22, 2017), <https://www.kaiho.mlit.go.jp/03kanku/kouhou/29-12/12-1.pdf>, Japan Coast Guard, "Establishing a recommended route off the coast of Shionomisaki, Wakayama Prefecture" (November 16, 2022), https://www.kaiho.mlit.go.jp/info/kouhou/r4/k221116_2/k221116_2.pdf

¹⁰ The Fishery Agency website, "Fishery Rights," https://www.jfa.maff.go.jp/j/enoki/gyogyouken_jouhou3.html

Fisheries Cooperative Associations and is exercised by the members under the Piscary Exercise Rule approved by the prefectural governor.

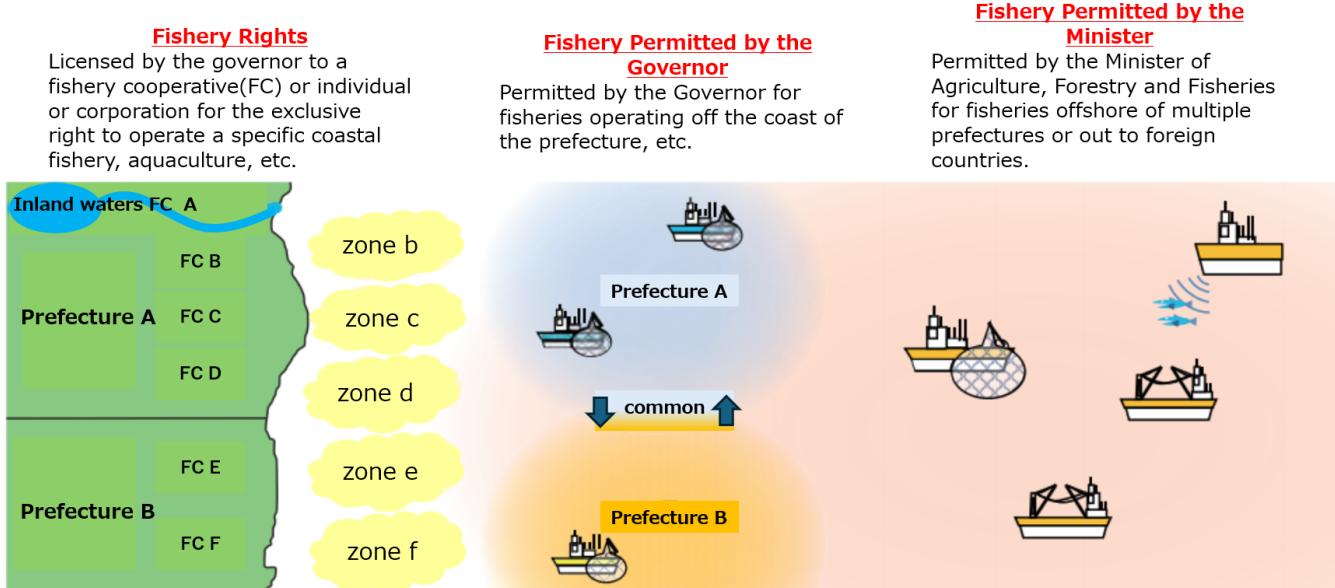
Matters related to the establishment of fishery rights, such as the location and zone of fishing grounds, type and timing of fishing, etc., are set forth in the Sea-Area Fishing Ground Plan to be established every five years by the prefectural governor for the sea area under his jurisdiction.

Permitted fisheries may be licensed by the Minister of Agriculture, Forestry and Fisheries (MAFF) or by the prefectural governor, depending on the authority granting the permit. Fisheries subject to permission by the minister are those conducted by vessels that require restrictive measures for fisheries adjustment and for which it is appropriate to take measures in a unified manner (e.g., agreements between national governments, large fishing areas, etc.). This applies to fisheries that go offshore of multiple prefectures or to foreign countries. Target fisheries are defined by Ordinance of MAFF¹¹. Permits are granted on a vessel-by-vessel basis. Permit periods are set at 5 years or less.

Fisheries subject to permission by the governor are those that should be regulated in accordance with local conditions for fisheries operated in the offshore areas of the prefectural boundaries and are stipulated in the Ordinance of MAFF or the regulations established by the prefecture. The fisheries permitted by the governor as stipulated by the Ordinance of MAFF include medium-size purse seine fisheries, small motor vessel trawl fisheries, and small salmon and trout drift net fisheries. The Fisheries permitted by the governor provided for in the prefectural regulations include a variety of fisheries depending on the actual conditions in each prefecture. The stipulation of the validity period of the permit is delegated to the regulations¹².

Fishery rights are established in coastal waters and in almost all coastal areas in Japan. Permitted fisheries, on the other hand, operate offshore. Fishery permitted by the governor operate mainly in territorial waters, while fishery permitted by the minister operate in EEZs as well¹³.

Figure 4 Fishery Rights and Permissions under the Fishery Act



Source: Fisheries Agency, "Fishery Permission System under the Fishery Act," with English translation by the author
<https://www.jfa.maff.go.jp/jikaku/sitei/attach/pdf/index-81.pdf>

¹¹ Article 2 of the Ministerial Ordinance on Permission and Control of Fishing. Currently 17 types are defined. <https://elaws.e-gov.go.jp/document?lawid=338M50010000005>

¹² Study Group of the Fishery Act, "Commentary of the Fishery Act," Taisei Shuppansha, 2021, p.144.

¹³ Fishing by foreigners in the territorial water is basically prohibited according to the Act on the Regulation of Fishing Operations by Foreign Nationals. Fishing by foreigners in EEZs shall be subject to the permission of MAFF under Act on the Exercise of Sovereign Rights on Fishing Operations in the Exclusive Economic Zone.



There are approximately 15,600 fishers in Japan (2018). The number of fishery operators and vessels engaged in coastal fisheries accounts for 80% of the

total number of fishery operators and vessels, which means a large number of businesses are small in scale.

Table 1 Production and size of business by type of fishery

	Category of fishing / Main fish species/	Production [t]	Number of business units	Number of fishers	Number of fishing boat
Pelagic	Overseas seine [M] Catching bonito and tuna by seine in the Pacific Ocean south of 20 degrees north latitude / bonito, tuna/	205,783	14	682	55
	Pelagic tuna longline [M] Catching Tuna mainly on the high seas by longlines / tuna/	74,247	60	3,214	186
	Pelagic trawl [M] Operating with bottom trawl nets outside of surrounding waters (15t or more) / Alaska pollack, golden threadfin bream, greenland halibut/	8,078	3	105	8
Offshore	Offshore trawl [M] Operating with bottom trawl in surrounding waters (15t or more) / Alaska pollack, Atka mackerel, flounder, snow crab/	214,566	248	2,359	320
	large and medium-size seine [M] Using seine nets in surrounding waters, etc. (40t or more) / mackerel, sardines, horse mackerel, common squid, bonito, tuna/	751,362	56	2,948	387
	Pacific saury pole-catching net [M] Catching pacific saury using a pole-catching net in the surrounding waters, etc. (10t or more) / Pacific saury/	126,947	107	1,334	152
	Squid fishing [M] Catching squid in the surrounding waters, etc. (30t or more) / squid/	14,657	37	521	59
Coastal/ Offshore coastal	Medium size purse seine, etc. [G] Using seine nets in coastal waters (5t or more, less than 40t) / mackerel, sardines, horse mackerel/	426,726	309	3,605	1,324
	Small trawl net [G] Using trawling net in coastal waters (less than 15t)	382,728	6,165	9,891	6,652
	Gillnet [G] Using a gillnet (other than a drift net to catch swordfish, etc.)	124,472	10,242	14,515	8,438
	Large-size Set nets [R] Using set nets in coastal waters (water depth 27m or more) / sardines, mackerel, horse mackerel, yellowtail, tuna/	235,124	409	5,116	1,176

Note: [M]permitted by the minister, [G]permitted by the governor, [R]fishery right

Source: Created by the author based on Fisheries Agency, "The Circumstances Surrounding Fisheries" (April 2024) p.8,
https://www.jfa.maff.go.jp/policy/kihon_keikaku/attach/pdf/index-26.pdf



Aquaculture in Japan

The aquaculture industry produces about 1 million tons of fish, shellfish, and algae in 28 categories (2016), with algae and shellfish accounting for 70% of the total. Fish aquaculture production at sea is dominated by yellowtail, sea bream, bluefin tuna, and coho salmon, and accounts for 54% of total sea surface aquaculture in production value (2018). In addition to yellowtail and sea bream, Japan is also unique in that it farms a wide variety of marketable fish species in addition to marine surface fish. While these fish have been farmed on a small scale in coastal areas, large-scale offshore aquaculture of yellowtail, salmon, trout, tuna, and other species has recently progressed from the demonstration stage to the stage of commercialization. The Japanese government is encouraging various efforts to increase production with a view to export. The Fisheries Agency has formulated the "Comprehensive Strategy for the Growth Industrialization of Aquaculture" in 2020 (revised in 2021¹⁴), which outlines policy measures for aquaculture.

2.2.2.3. Marine environmental conservation

There are several laws related to marine environmental conservation. Those include the Natural Parks Act, the Nature Conservation Act, the Wildlife Protection, Control, and Hunting Management Act, and the Act on Conservation of Endangered Species of Wild Fauna and Flora. Depending on the criteria stipulated by each act, MOE or competent local governments designate certain areas for environmental conservation and require permission for certain activities such as establishing structures.

Marine Protection Areas (MPA) in Japan

Japan defines a "Marine Protected Area" as "a clearly identified area managed by law or other effective means, taking into account patterns of use, for the purpose of conserving biodiversity and sustainable use of ecosystem services that support the healthy structure and functioning of marine ecosystems"¹⁵. Although there is no specific area (water surface) managed under the name of MPA, various regulated areas are treated as MPA on the basis of existing legislation related to nature conservation and fisheries¹⁶.

Table 2 Application of Zones and Regulations in relation to Marine Protection Areas

Zones and Laws and Regulations	Competent authorities
For the purpose of protecting natural scenery, etc.	
Natural Parks (Natural Parks Act) Natural Seashore Preservation Areas (Act on Special Measures concerning Conservation of the Environment of the Seto Inland Sea)	MOE
For the purpose of protecting natural environment or habitats	
Nature Conservation Areas (Nature Conservation Act) Offshore Seabed Nature Conservation Areas (Nature Conservation Act) Wildlife Protection Areas (Wildlife Protection, Control, and Hunting Management Act) Habitat Protection Zones (Act on Conservation of Endangered Species of Wild Fauna and Flora) Natural Monuments (Act on Protection of Cultural Properties)	Ministry of the Environment Agency for Cultural Affairs

¹⁴ Fisheries Agency, "Comprehensive Strategy for the Growth and Industrialization of Aquaculture" (revised in July 2021), https://www.jfa.maff.go.jp/j/saibai/yousyoku/seityou_senryaku.html

¹⁵ MOE, "Strategy for Marine Biodiversity Conservation" (March 2011), <https://www.env.go.jp/nature/biodic/kaiyo-hozon/other/pdf.html>

¹⁶ In Japan, each MPA was not established after a system for the purpose of "conservation of biodiversity and sustainable use of ecosystem services" was created, but rather the marine areas established in the past under laws and systems passed for individual issues such as landscape protection, conservation of monuments with high academic value, and development of fisheries. It is pointed out that in individual marine protected areas, management and conservation are carried out only in accordance with the objectives of the applicable laws. It is expected that discussions on qualitative improvement of management and conservation will be advanced, and the collection of scientific evidence (data) and objective evaluation of management and conservation effects based on such evidence are essential for the improvement. "Study Group Report on Further Expansion and Management of Marine Protected Areas" (March 2020) https://www.kantei.go.jp/jp/singi/kaiyou/sanyo/dai49/shiryou2_9.pdf



For the purpose of protection and cultivation of aquatic organisms, etc.

Protected Water Surface (Act on the Protection of Marine Resources) Coastal Fisheries Resources Development Area, Designated Sea Area (Marine Resources Development Promotion Act) Common Fishery Right Area (Fishery Act) Other areas designated by prefectures or fishery organizations (e.g., Fishery Act, Act on the Protection of Marine Resources, Fishery Cooperatives Act, Prefectural Fisheries Adjustment Regulations, etc.)	Fisheries Agency
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Source: Created by the author based on Ministry of the Environment's "How Marine Protected Areas Should be Established in Japan" (May 2011), etc. <https://www.kantei.go.jp/jp/singi/kaiyou/dai8/siryou3.pdf>

2.2.2.4. Other uses

Sea areas are also used for training and research by the Self-Defense Forces. When it is necessary to use the water surface for training, etc., the Minister of Defense may set a certain area and period of time to restrict or prohibit fishing operations. In making this decision, MAFF and the relevant prefectural governor's opinion shall be heard. Those who are engaged in the fishing industry will receive compensation for losses caused by the restriction or prohibition.

In cases where air space is used in conjunction with the use of the sea, the laws governing the use of such space are also relevant. The following are particularly relevant to offshore wind installations.

According to the Civil Aeronautics Act, certain spaces around airports must be kept free of obstructions in order for aircraft to take off and land safely. It is prohibited to install, plant, or detain any structure, plant, or other object of any height that comes above certain area indicated in the public notice (restricted surface). In addition, if a wind power generation facility is to be constructed near VHF Omnidirectional Radio Range (VOR) or Distance Measuring Equipment (DME) facilities that simultaneously provide azimuth and distance information to aircraft operating within the effective communication distance, notification and consultation with the Civil Aviation Bureau is required.

The Meteorological Service Act prohibits without justifiable grounds conducting any acts detrimental to the effects of meteorological instruments installed by the Japan Meteorological Agency and requires operators to notify and consult with the Agency when wind turbines are installed in the vicinity of weather radar. The distance from the radar to the wind turbine is based on the World Meteorological Organization's guidance statement on weather radar/wind turbine siting (The CIMO Guide, 2021).

The Ministry of Defense also requires that operators be consulted early in the project planning process to reduce the impact on radar.

2.2.3. Status of offshore wind power

This part shows the status of OWP in Japan, including policies and legal framework for the development.

2.2.3.1. Current project capacity and policy target

Japan, as of June 2024, has deployed offshore wind with capacity of approximately 300 MW, including 5MW of floating, and 34MW of nearshore ones¹⁷. At the same time, the potential for offshore wind power in Japan is large, more than 1100 GW¹⁸.

Policies which promote offshore wind deployment have been promoted in recent 10 years. The Headquarters for Ocean Policy in the Cabinet Office, in its policy from 2012, has defined a series of issues related to the practical viability and commercialization of offshore wind power, including coordination with other stakeholders in sea area utilization, clarification of related utilization rules, appropriate environmental impact assessments, and cost reductions, and in its Basic Plan on Ocean Policy, specific government initiatives have been formulated. Deficiencies in sea area utilization rules, and long-term occupancy rights in particular, were addressed through legislation, and for ports areas, the Port and Harbor Act was amended in 2016; and, for territorial sea areas other than port areas, a new framework, the Act on Promoting the Utilization of Sea Areas for the Development of Marine Renewable Energy Power Generation Facilities (hereinafter referred to as the Renewable Energy Sea Area Utilization Act), was created that links long-term occupancy and the financial support scheme (FiT or FiP).

¹⁷ Based on the statistics from Japan Wind Power Association as of December 2023, <https://jwpa.jp/information/8034/> with the addition of the 112MW capacity of Ishikari Bay New Port offshore wind farm, fully commissioned in January 2024.

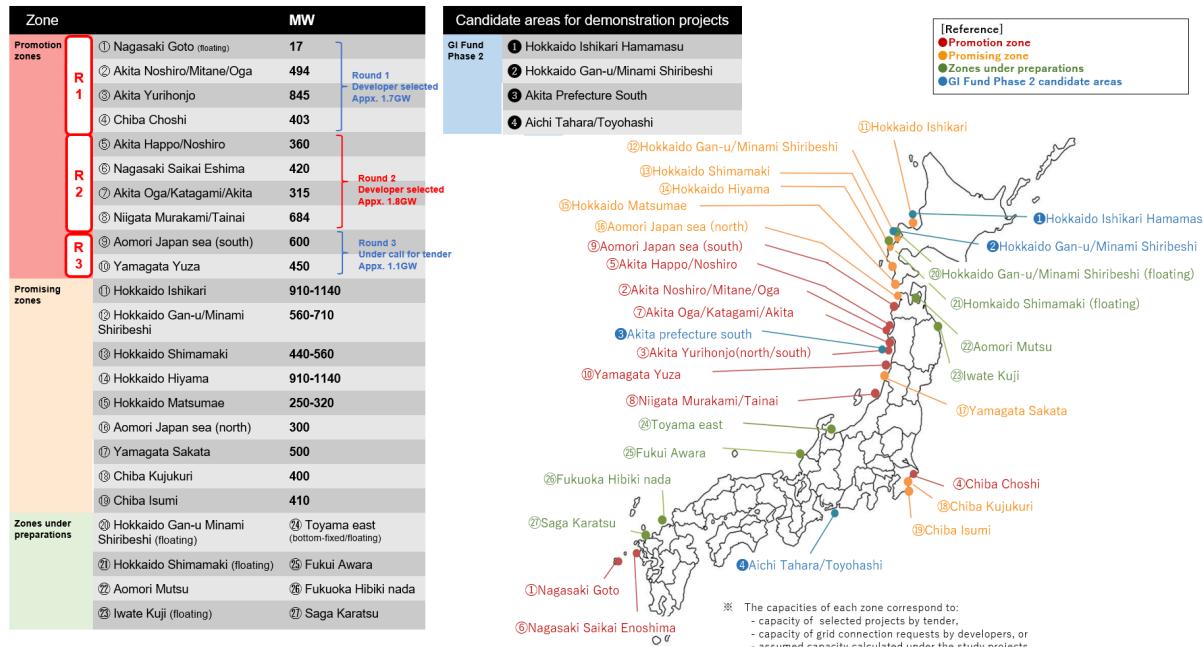
¹⁸ Renewable Energy Institute, "Japan's Offshore Wind Power Potential -Territorial Sea and Exclusive Economic Zone-" (December 2023). <https://www.renewable-ei.org/en/activities/reports/20231219.php>

In 2020, the government established the “Public-Private Council on Enhancement of Industrial Competitiveness for Offshore Wind Power Generation” with industry and the Council released “Offshore Wind Power Industry Vision (Ver. 1)”, which set the offshore wind targets of pipeline (not installation) at 10 GW by 2030 and 30-45 GW by 2040. Based on the vision and others, the government set the offshore

wind target of installation in 2030 at 5.7GW in the 6th Basic Energy Plan established in 2021.

As of June 2024, the government designated 10 areas as Promotion zones for 4.5GW of development in total. Among those, developers have been selected for eight areas. The government opened the tender for two area in January 2024 and closes the window in July of the year.

Figure 5 Status of designation and identification of offshore wind promotion zones, promising zones, etc. (as of May 2024)



Source: Created and updated by the author based on Agency for Natural Resources and Energy, METI, “Next Generation Technologies for Renewable Energy” (December 5, 2023) https://www.meti.go.jp/shingikai/enecho/denryoku_gas/saisei_kano/pdf/057_01_00.pdf

The government established a new bill for OWP development permission framework in EEZ, as well as an environmental impact assessment reform¹⁹, which is under discussion at the Diet as of June 2024.

2.2.3.2. Overview of permitting process

Currently, there are mainly three legal frameworks of OWP planning: the Renewable Energy Sea Area Utilization Act, the Port and Harbor Act, and prefectural ordinances. The procedures of the Port and Harbor Act is applied to port areas, while the Renewable Energy Sea Area Utilization Act is applied to sea areas in territorial waters not subject to other sectoral laws for area use management. The process under the prefectural ordinances is only applied to a small scale OWP development. For the OWP development in EEZs, the Diet is discussing a bill to introduce a new procedure, which will be the fourth one.

Other than a permit for occupancy of sea area issued by MLIT or prefectures, developers are responsible for obtaining various permits from relevant authorities and local government(s) under related legislation including those referred to the section above.

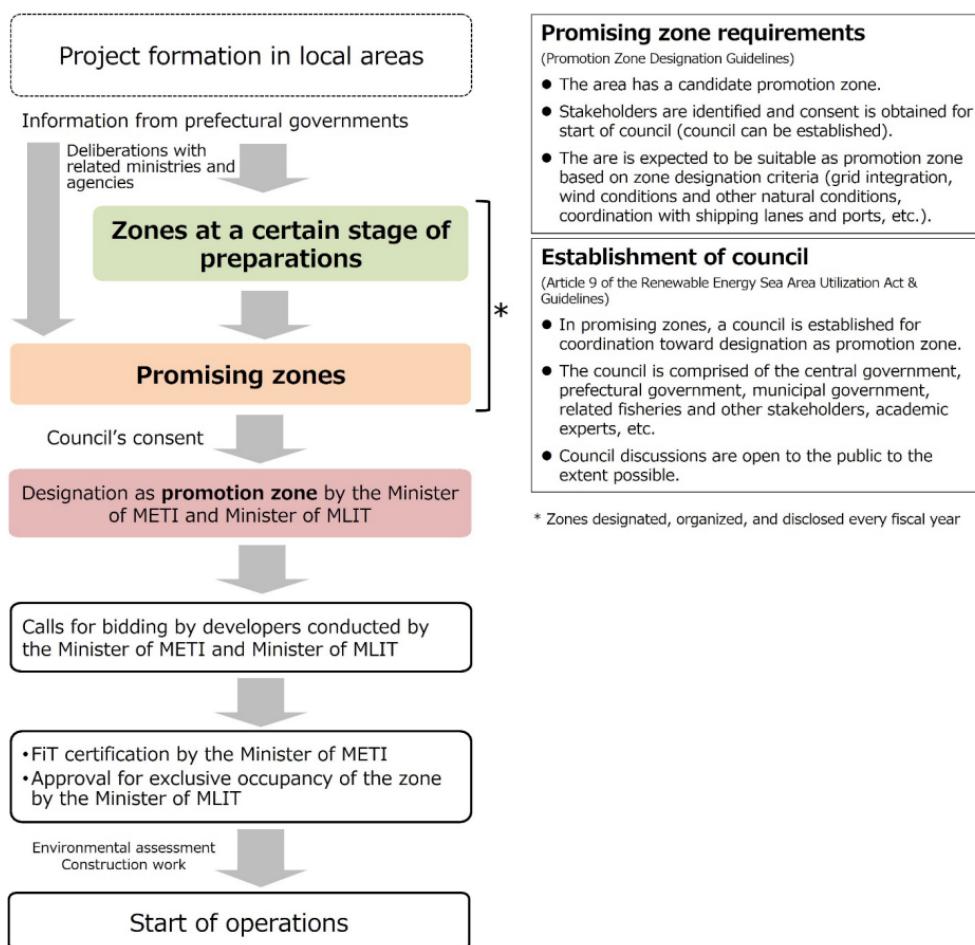
The Environmental impact assessment process has been conducted by developers. As the new bill incorporates a reform of EIA for the OWP development under the Renewable Energy Sea Area Utilization Act, the EIA process will differ to each planning type after the bill passed.

▪ The Renewable Energy Sea Area Utilization Act in territorial waters

The Act establishes procedures for government designation of ‘promotion zones’ and selection of developers by public tender. Developers that are selected receive financial support (FiT or FiP) authorization.

¹⁹ Joint Press Release of the Cabinet Office, METI, MLIT and MOE, “Cabinet Decision on the Bill for the Act for Partially Amending the Act on Promoting the Utilization of Sea Areas for the Development of Marine Renewable Energy Power Generation Facilities” (issued on March 12, 2024), https://www.meti.go.jp/english/press/2024/0312_003.html

Figure 6 Process of zone designation and calls for bidding by developers under the Renewable Energy Sea Area Utilization Act



Note: "Zones at a certain stage of preparations" is now called "Preparation zones."

Source: Renewable Energy Institute, "Recommendations on Accelerating the Offshore Wind Power in Japan -To Create a Fair and Transparent Competitive Environment-" (August 2022) p.6, The chart was based on METI and MLIT, "Offshore wind policies" (February 2022), <https://www.kantei.go.jp/jp/singi/kaiyou/sanyo/dai62/shiryou4-1.pdf>

The national government identifies "candidate" sea areas, based on the information provided by prefectures, and publishes a list of areas in three categories: "Preparation zones" (準備区域), "Promising zones" (有望区域), and "Promotion zones" (促進区域).²⁰ Before publishing the list, related ministries and agencies are consulted to provide information relevant to the qualification of areas as candidates. The criteria for designating a Promotion zone according to the Act include;

- meteorological, oceanic and other natural conditions are suitable to operate offshore wind and it is expected that their power output will reach a considerable level;

- the proper placement of offshore wind facilities is possible without hindering the use, preservation and management of waterways and ports within the relevant zones and its neighboring areas;
- the integrated use of the ports within and outside of the relevant zones is possible in connection with the transportation of personnel and materials necessary for installment, maintenance and management of offshore wind facilities;
- it is expected that grid connection between the offshore wind facilities and the power lines maintained and operated by electricity utilities will be properly secured;
- it is expected that the operation of the offshore wind will not hinder fisheries;

²⁰ These three "zones" do not mean those designated by a zoning method, but the stage of maturity of each specific candidate sea area for OWP development.



- the promotion zones will not overlap the zones that public authorities designate for other purposes under other legislation.

"Promising zones" are sea areas which are expected to be suitable as a "promotion zone" with conditions as above. According to the "Guidelines for Designation of Areas for Promoting the Development of Offshore Renewable Energy Power Generation Facilities," revised in April 2024²¹, it is necessary that the stakeholders being identified agree to start a Council, a statutory organization for the stakeholder coordination. METI and MLIT will inquire in advance to MAFF (the Fisheries Agency), MOE, Ministry of Defense, and other relevant administrative agencies to ensure harmonizing with measures for marine environment conservation, marine safety, and other ocean-related issues. If there is an opinion that the arrangement into promising zones should be reserved because of the hinderances it would cause, the areas concerned will not be listed as "promising zones".

The following are representative examples of the items checked through the ministerial exchanges:

- (i) Fisheries and navigation (identification and coordination of interested parties)
- (ii) Environment (national parks, national monument areas, etc.)
- (iii) Defense (operation of defense facilities and Self-Defense Forces, etc.)
- (iv) Weather (weather radar)
- (v) Aviation (radar and other radio facilities, flight paths, training airspace, height restrictions, etc.)

Preparation zones are those where the prefectural government has begun coordinating with interested parties with a view to establishing a Council and holding specific discussions for OWP development in the future. In some preparation zones, the national government takes, under certain conditions, initiative to conduct site surveys and prepare for grid connection under the "Operation Policy for the Centralized System for Offshore Wind Power Generation," published in April 2024²².

A 'Council' is established in each area for coordinating with stakeholders. It is organized by METI, MLIT and the relevant prefectural governor, and its members include MAFF (the Fisheries Agency), the mayors of related municipalities, local stakeholders, and academic experts. The sea area designated as a "promotion zone" is determined based on its discussion.

The council also creates a report of the discussion, including the future vision of the area with offshore wind project and requests for the selected developer.

"Promotion zones" are designated after public consultation process. For the next step, a developer is selected through public tender. Conditions for selection are stated in the Guidelines for Public Tender of Exclusive Occupancy and Use, established for each area. The Council report consists of a part of the Guidelines for Public Tender and potential bidders need to consider its content to win.

Developers apply by submitting their Exclusive Occupancy and Use Plans over Public Tender. Assessments of plans are comprehensively evaluated based on the electricity supply price, technical capabilities related to project execution, and coexistence in harmony with local communities (building connections with the community and local economic benefits). METI and MLIT hear the prefectural governor's opinion related to benefits of the community, make references to the evaluation of the third-party committee, and select the developer based on these opinions. The tendered occupancy plan of the developer selected is effective for 30 years from its certification. METI certifies the selected project as a qualified project supported under the FiT/FiP scheme, and MLIT provides the developer a 30-year occupancy permit for the promotion zone.

After being selected, the developer proceeds with the design and construction of OWP, including obtaining necessary permits and consents.

Until now, EIA process is conducted separately from the development process of offshore wind under the Renewable Energy Sea Area Utilization Act. According to the new bill for the procedural reform of OWP development, MOE shall collect environmental information and conduct on-site survey before zone designation in territorial waters, as described in detail below.

²¹ Agency for Natural Resources and Energy, METI, and Port and Harbour Bureau, MLIT, the "Guidelines for Designation of Areas for Promoting the Development of Offshore Renewable Energy Power Generation Facilities," (revised in April 2024), https://www.enecho.meti.go.jp/category/saving_and_new/saiene/yojo_furyoku/dl/legal/guideline.pdf

²² Agency for Natural Resources and Energy, METI and Port and Harbour Bureau, MLIT, "Operation Policy for the Centralized System for Offshore Wind Power Generation," (April 24, 2024) https://www.enecho.meti.go.jp/category/saving_and_new/saiene/yojo_furyoku/dl/legal/central_youyou.pdf



Challenges of zone designation based on a bottom-up approach

Offshorewind projects have been formed by developers, who had to conduct, in the early stages of development, negotiations with local communities and fishermen, surveys of wind and seabed, and environmental impact, among others. As a result, multiple developers conducted similar surveys at the same time, which increased the burden on the developers and the local communities. In terms of coordination with local stakeholders, developers tried to explore initiatives that would meet local characteristics, but ad hoc responses increased the burden on local communities including fishers, and the lack of objective data to rely on led to opacity and prolongation of discussions.

Under the Renewable Energy Sea Area Utilization Act, the national government is to take certain initiatives in terms of site designation, through coordination of stakeholders to be conducted by Councils presided over by the national and prefectural governments. However, it can be said that involvement of the national government is not sufficient in practice. As the designation of development zones begins with the information provided by prefectures to the national government, the reality is that the local governments are approached by developers at the stage when projects begin to be formed by them in each area, leading to the provision of information from municipalities to prefectures, and then from prefectures to the national government.

Recognizing the issues, the national government has formulated a policy to strengthen its role in a series of procedures, which is called the "Japanese version of centralized system". The government has worked to sort out its roles in project development such as regional symbiosis, site investigation, grid securing, and environmental impact assessment, and has examined how the government should get involved. In April 2024, after the discussion for more than a year, the "Operation Policy for the Centralized System for Offshore Wind Power Generation" was published to summarize the new policy. The Operation Policy, however, keeps a bottom-up approach in terms of area designation. Specifically, (1) local governments (prefectures and municipalities) should take the lead to identify an OWP development area through coordination, and (2) the national government should

provide necessary support to local governments in their efforts to foster local understanding and to grasp and sort out the actual fishery situation, while also taking the needs of local governments into consideration. Under the policy, if large-scale development is envisioned far offshore in territorial sea, it will be difficult for each local government alone to coordinate projects since the range of interested parties could extend beyond the boundaries of each municipality and prefectures, and even beyond their jurisdiction.

▪ **The Port and Harbor Act**

A Port administrator establishes auction guidelines and calls for tender to select a development plan submitted by developer(s). The procedure is similar to that under the Marine Renewable Energy Sea Area Utilization Act, although there is no clause regarding the establishment of a Statutory Council.

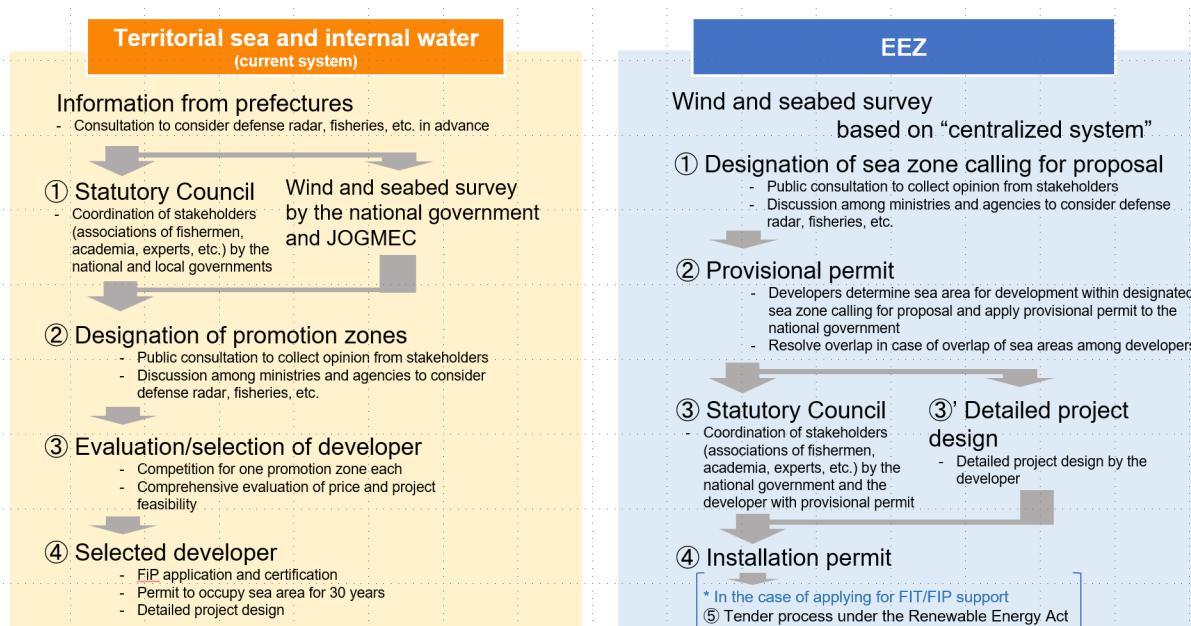
▪ **Prefectural ordinances**

A developer who are planning to develop an OWP project solicits a permit for occupancy of sea area to a relevant prefecture. Since June 2019, it is highly recommended by the national government that prefectures would not issue a permit for occupancy when the project size is 30 MW or more, or when the sea area concerned will possibly be designated as a promotion zone.

▪ **Development permission procedure in EEZs**

According to the new bill, METI designates certain potential sea area for offshore wind development. Before designation, METI consults related ministries and agencies (MLIT, MOE, Fisheries Agency, Ministry of Defense, etc.) to collect information of sea areas. Within the potential sea area, a developer chooses a specific sea zone for their project and submits a development plan to METI. METI issues a provisional permit to the developer if the plan meets the conditions set by the government. After the issue of provisional permit, a statutory Council consisting of stakeholders is established to discuss issues related to the coordination of sea area use. It is a responsibility of the developer to obtain all the permits and consents for OWF development. METI issues an installation permit solicited by the developer when the project is mature to be built.

Figure 7 Comparison of OWF development processes in territorial waters and in EEZ



Source: created by Renewable Energy Institute based on ANRE, METI and MLIT, "Discussions to date on the implementation of offshore wind power in the EEZ," February 2024.

https://www.meti.go.jp/shingikai/enecho/denryoku_gas/saisei_kano/yojo_furyoku/pdf/023_s01_00.pdf

▪ EIA procedure and its reform

The Environmental Impact Assessment Act stipulates a process to conduct EIA on a specific project by a developer. The environmental impact assessment procedure is divided into four major stages. First, the project proponent examines environmental considerations at the planning stage (i Document on Primary Environmental Impact Consideration). Then, the method of environmental impact assessment is examined (ii Scoping Documents), and a draft assessment conducted in accordance with the method is prepared (iii Draft Environmental Impact Statement). Finally, the project proponent prepares an environmental impact assessment report about the results of the project implementation (iv Environmental Impact Statement). The documents prepared by the project proponent are made publicly available at each stage (public notice and consultation), and, depending on the stage and the project, MOE, the ministries, and agencies involved in licensing the project, and the relevant local governments provide their opinions.

The strategic environmental assessment is not conducted in Japan. In addition, there is no legal obligation stipulated in the Act for project developers to

publicize documents prepared for EIA after the period of public notice and public consultation. Therefore, basically, there is a difficulty to access EIA documents outside of the public notice and public consultation period. The documents are made available on the Internet or in the library of MOE if the project proponent agrees, but this is not the case in many cases.

Under the current framework, EIA procedures are not associated with the public tender process, and developers considering the development of offshore wind are required to go through the EIA procedures individually. As a result, multiple developers conduct duplicate surveys in the same offshore area, which is inefficient and increases the burden on developers, local communities, and other interested parties, as well as government agencies. In addition, the procedures are said to take four to six years, and the timing of their initiation and streamlining are also issues.

In response to these issues, MOE has proposed a new procedure for projects developed under the Renewable Energy Sea Area Utilization Act²³.

According to the proposal, MOE collects information and conducts on-site surveys from an early stage in the sea area where the project is expected to be implemented, analyzes the environmental impact, and

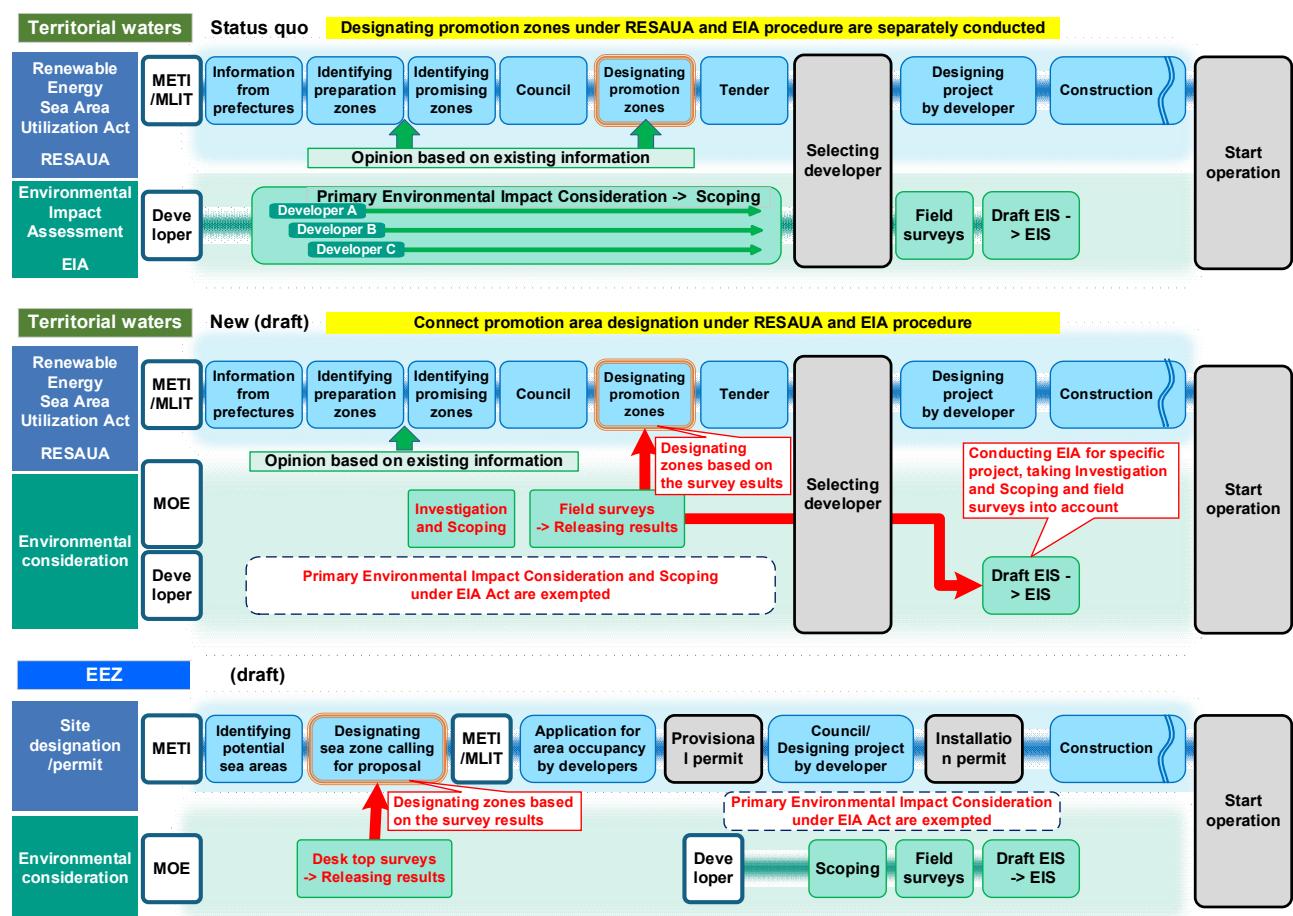
²³ MOE press release, "The Central Environment Council's "The Way of Environmental Impact Assessment for Wind Power Generation Project (First Report)" "(issued on March 7, 2024) https://www.env.go.jp/press/press_02852.html. This report is based on the "New Environmental Assessment System for Offshore Wind Power Generation," a report of the Study Group on the Optimal Environmental Impact Assessment System for Offshore Wind Power Generation" (August 2023), http://assec.env.go.jp/files/0_db/seika/1055_03/report.pdf

indicates how appropriate environmental considerations should be ensured. MOE's findings would be made available, and items to be considered would be fed back to METI and MLIT in their procedures for designating promotion zones. After the developer selection, the developer would conduct an EIA of the specific project plan based on the results of the study by MOE, which would enable exemption of the first and second stages of EIA process. For EEZs, MOE would collect environmental information (literature research) and provide to METI as a reference for area designation. The data set would also be provided to

developers which are planning their project. In this case, the Document on Primary Environmental Impact Consideration procedure would be exempted.

Monitoring during construction and operation and collecting and managing environmental information would be also considered. The report of the national council, based on which the new bill was established, points out that it would be effective to establish a system in which MOE and selected developers of offshore wind work together to collect monitoring data, and MOE centrally manages said data.

Figure 8 Draft new environmental consideration procedure



The EIA process for the projects in port areas remains as it currently is, while the environmental assessment for projects under prefectural ordinances is conducted under the local regulation of the prefecture concerned due to the fact that the Environmental Impact Assessment Act does not apply to a small size project such as less than 30MW.

2.2.4. Coordination of multiple sea area use

Laws and regulations related to the use of Japan's marine areas are designed for individual purposes. Even though most of such laws have provisions to coordinate with other uses of the sea area, the achievement of the objectives of the law concerned is essentially of paramount importance when considering individual permits and consents, and it may not be easy to reconcile this with other interests. In addition, in many cases, there are no specific statutory



provisions for the participation of interested parties with other interests in the proceedings. Even under such circumstances, some recent legislation allows for the consideration of other interests, especially environmental considerations, or the participation and coordination of interested parties in the use and occupation of the ocean.

The following shows some examples of legal framework for coordination of two or more interests.

2.2.4.1. Maritime Traffic

Laws governing maritime traffic include provisions that take into account vessels engaged in fishing. For example, vessels navigating should avoid vessels engaged in fishing, navigation rules are partially inapplicable to fishing vessels, and the Maritime Traffic Safety Act excludes areas along the shoreline where vessels other than fishing vessels do not normally navigate (Article 1, specified by a Cabinet Order).

2.2.4.2. Fisheries and "necessity of public interests"

The prefectural governor concerned may change or rescind a fishery right or may order the suspension of the exercise of a fishery right, when the prefectural governor finds it to be necessary for fisheries adjustment, the navigation, anchoring or mooring of ships, installation of underwater cables and other public interest. There are similar frameworks for the fishery permitted by the minister and by the governor. It is said that even in a case that falls under the category of "public interest," whether it falls under the category of "when it is deemed necessary" should be considered in a limited manner, and the necessity of its application should be determined after concrete and careful consideration of the importance of the public interest, its urgency, its relationship to the fishery, and the difficulty of resolving the issue through negotiations between the parties concerned.

The Act also stipulates compensation clauses for these measures. In practice, almost all the cases of coordination between fishery and other activities were done by agreements between parties and it is reported that there were very few cases in which the compensation clauses in the Act were applied when it comes to the fishery right²⁴.

2.2.4.3. Installation of submarine cables

Other than the Fishery Act, which incorporates the provisions of coordination for submarine cable installation, the Telecommunication Business Act stipulates provisions to protect submarine cables for telecommunication. Specifically, when telecommunications carriers lay underwater cable in public waters,

they notify the Minister of Internal Affairs and Communications and the related prefectural governors of the location of the underwater cable and the construction plan. This is to ensure coordination between the underwater cable and fishery rights. Upon application by a telecommunications carrier, the Minister of Internal Affairs and Communications may designate an area within 1,000 meters of the underwater track as a protected area when necessary. No anchoring of vessels or fishing with bottom trawl nets shall be allowed in this protected area. Fishery rights may also be revoked when necessary.

There are not similar clauses in the Electricity Business Act for power cables.

2.2.4.4. Mining and other resource-related

The Mining Act states that METI shall take into consideration the following circumstances when establishing mining rights for specified minerals: The mining of minerals shall not be harmful to health, destroy facilities used for public purposes or facilities equivalent thereto, disrupt the protection of cultural properties, parks, or hot spring resources, or impair the profit of agriculture, forestry, or other industries, and be contrary to public welfare. The Gravel Gathering Act also requires coordination with permitting authorities and right holders under the Coast Act, the Act on Development of Fishing Ports and Grounds, the Fishery Act, and the Port and Harbor Act, which vary depending on prefectures.

2.2.5. Stakeholder coordination and participation

In Japan, some of the statutory procedures for coordinating the use of sea areas with the participation of interested parties include hearing the opinions of interested parties, such as the Sea-area fishing ground plan under the Fishery Act, while others involve the establishment of a statutory council for discussion, such as the Renewable Energy Sea Area Utilization Act.

The councils under the Renewable Energy Sea Area Utilization Act are hosted by the national government (METI, MLIT) and prefectures concerned, and attended by local fishery cooperatives, users of the sea area such as passenger ship operators, related municipalities, experts, and related ministries and agencies (MOE and Fisheries Agency). The Council will (1) identify (including modifying) the promotion zones for offshore wind power development in the sea area (2) identify points to be considered in the project evaluation of tender (3) conduct necessary discussions and information sharing on construction

²⁴ Yoshiyuki Kaneda, "New Edition: What to know about the Fishery Act" (2nd revised and enlarged edition, Seizando, 2016) p.112.



work related to the project, among others. Specifically, the following issues will be discussed: whether or not the installation of offshore wind turbines will have an impact on fisheries and other industries, the identification of sea areas that may be affected, requests for noise prevention during construction, provision of information from experts on the environment and fisheries nature conservation, and measures for coexistence with local communities. The results of the discussions (summary) will be reflected in the scope of the promotion zone to be designated. They also become the content of the "Guidelines for Public Occupancy" to be followed by developers when bidding for the project. In addition, members of the council must respect results of deliberations with regard to the particulars on which they have reached a consensus at the council.

The "Guidelines for Designation of Areas for Promoting the Development of Offshore Renewable Energy Power Generation Facilities"²⁵ released in April 2024 indicate that the discussion summary include: (1) Co-existence between power generation projects and local communities and fisheries that should be addressed in cooperation between selected operators and local communities ("vision of the future of the area"); (2) Community coexistence fund (fund to be donated for coexistence with communities and

fisheries); (3) Fishery impact study; (4) Discussion on the scope of restrictions on the installation of power generation facilities, among others. In addition, from the perspective of ensuring transparency and promoting cooperation with the community, discussions at the Council meetings will be open to the public to the extent possible.

In the initial stage prior to the establishment of the council, prefectures and municipalities will take the lead in coordination, and the national government will provide necessary support to the local governments in fostering local understanding and organizing the actual status of the fishing industry, taking into consideration the needs of the local governments²⁶.

Information related to the fishery

It is essential to identify the stakeholders using the sea area, in particular, fishers who may operate in a large area of the sea. However, it is reported that in many cases it is not easy to identify them. Information on fishers is not always available in data format, and the data that has not yet been digitized is said to be an obstacle to analysis. According to Mitsubishi Research Institute, the data availability is as follows:

Table 3 Status of data on actual fishery conditions by fishery category

Fishery category		Data on Fishery Status		Main data	Notes on the Data
		○: Available	△: Partially available ✗: Difficult to obtain		
Location of operation	Navigation data				
Permitted fishery	Fishery permitted by the minister	△	○	- Designated operation area under the Fishery Act - Navigation data of Vessel Monitoring System (VMS) - Fishery Performance Report	- The main operation area within the operation area is unknown - Installation and constant operation of VMS is mandatory for licensed fishing vessels, and navigation data can be obtained
	Fishery permitted by the governor	△	△	- Designated operation area based on the Fisheries Adjustment Regulations, etc.	- There is no data that organizes operating areas centrally across the country. - Some fisheries do not have designated operating zones, depending on the characteristics of the fishery

²⁵ https://www.enecho.meti.go.jp/category/saving_and_new/saiene/yojo_furyoku/dl/legal/guideline.pdf

²⁶ Agency for Natural Resources and Energy, METI and Port and Harbour Bureau, MLIT, "Operation Policy of the Centralized System for Offshore Wind Power" (April 2024) p.2
https://www.enecho.meti.go.jp/category/saving_and_new/saiene/yojo_furyoku/dl/legal/central_unyou.pdf



				- Navigation data of Automatic Identification System (AIS) - Fishery Performance Report	- If the fishing vessel is not equipped with AIS, navigation data cannot be obtained
Fishery rights	Common fishery right	△	△	- Fishing rights area map - AIS navigation data - Fishery Performance Report	- In the case of common fishery rights where the area of operation is large, it may be difficult to identify the location of the operation. - If the fishing vessel is not equipped with AIS, navigation data cannot be obtained
	Fixed gear fishery right Demarcated fishery right	○	△		
Free fishing		×	×	Fishery Performance Report	No data indicating location of operation or navigation data Interviews with fishery associations, etc. are necessary to understand the actual situation.

Source: Created and translated in English by the author based on Mitsubishi Research Institute, "The Future of Offshore Wind Energy Series - Part 3: Marine Spatial Planning and Implications for Japan (Part 2)" figure 3

<https://www.mri.co.jp/knowledge/column/20230905.html>

2.2.6. Zoning at local level: examples of offshore wind demonstrative project

There are some demonstrative projects to plan marine area use (zoning) at a local government level. According to MOE, "it is effective to use a zoning method that overlaps environmental information and establishes areas where the introduction of wind power generation can be promoted and areas where environmental conservation is prioritized under the coordination of relevant parties and organizations."

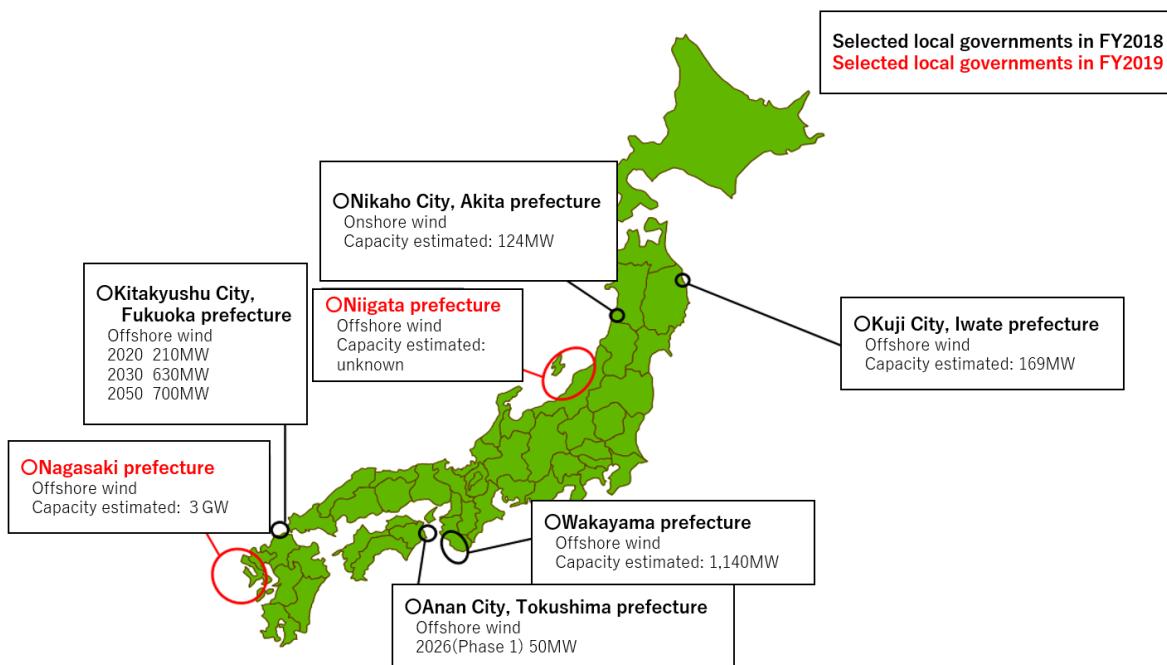
²⁷ MOE has conducted demonstrative projects on zoning since FY2016, studied zoning methods based on its experience, and compiled the "Zoning Manual for Wind Power Generation" (hereinafter referred to as "the Manual")²⁸.

The Manual mainly targets local governments. According to the manual, "This will allow local residents to be involved in the planning of wind power generation projects in the community at an early stage, while allowing developers to plan their projects with a concrete outlook and to smoothly introduce wind power generation in a way that is compatible with environmental conservation."

²⁷ MOE, "Zoning Manual for Wind Power Generation by Local Governments" (2nd ed.) (March 2020) http://as-sess.env.go.jp/files/0_db/seika/0006_02/02.pdf

²⁸ Ibid.

Figure 9 Locations of the demonstrative projects of zoning for wind power generation



Source: MOE, "Demonstrative project of zoning for wind power generation" with English translation by the author <https://www.env.go.jp/content/900513474.pdf>

2.3. MSP in the European Union

In the European Union, MSP efforts began as early as 2002 with the EU-funded BaltCoast project involving almost all countries around the Baltic Sea (BSR). Subsequently, in 2005 Belgium, Germany, and the Netherlands became the first countries in Europe to start the process of developing MSP by approving integrated management plans for their waters (Ehler et al., 2019). In all these countries, the development of MSP has responded to the need to develop Offshore wind farms and to find the suitable space for that.

2.3.1. The EU MSP Directive

The approval of the Directive 2014/89/EU (commonly known as the MSP Directive) in the EU in 2014 established MSP as a key policy instrument across Member States. This marked a milestone - as the Directive required all EU coastal member states, regardless of whether driven by OWF or not, to install a formal MSP authority and to have maritime spatial plans in place by 2021. By now, nearly all coastal states within the EU have such formal MSP authorities and have formally adopted MSPs except Italy and Greece.²⁹

The European Union (EU) adopted Directive 2014/89/EU of the European Parliament and the Council of 23 July 2014 establishing a framework for maritime spatial planning (MSPD) mandates that coastal Member States develop and implement maritime spatial plans.

As stated by Article 5 of the Directive, the **objectives** of MSP are the following:

1. When establishing and implementing maritime spatial planning, Member States shall consider economic, social and environmental aspects to support sustainable development and growth in the maritime sector, applying an ecosystem-based approach, and to promote the coexistence of relevant activities and uses.
2. Through their maritime spatial plans, Member States shall aim to contribute to the sustainable development of energy sectors at sea, of maritime transport, and of the fisheries and aquaculture sectors, and to the preservation, protection and improvement of the environment, including resilience to climate change impacts. In addition, Member States may pursue other objectives

²⁹ European Commission. "Report from the Commission to the European Parliament and the Council outlining the progress made in implementing Directive 2014/89/EU establishing a framework for maritime spatial planning." (2022).



- such as the promotion of sustainable tourism and the sustainable extraction of raw materials.
3. This Directive is without prejudice to the competence of Member States to determine how the different objectives are reflected and weighted in their maritime spatial plan or plans.

Minimum requirements as enshrined in Article 6:

1. Member States shall establish procedural steps to contribute to the objectives listed in Article 5, taking into account relevant activities and uses in marine waters.
2. In doing so, Member States shall:
 - a. take into account **land-sea interactions**;
 - b. take into account **environmental, economic and social aspects**, as well as **safety** aspects;
 - c. aim to promote coherence between maritime spatial planning and the resulting plan or plans and other processes, such as integrated coastal management or equivalent formal or informal practices;
 - d. ensure the **involvement of stakeholders** in accordance with Art 9;
 - e. organise the **use of the best available data** in accordance with Art 10;
 - f. ensure **trans-boundary cooperation between Member States** in accordance with Art 11;
 - g. promote cooperation with third countries in accordance with Article 12.
3. Maritime spatial plans shall be reviewed by Member States as decided by them but at least every ten years.

2.3.2. Sectors to be covered in Maritime Spatial Planning

Article 8 (2) requires the following **activities and uses** to be integrated into the MSPs by Member States:

- aquaculture areas,
- fishing areas,
- installations and infrastructures for the exploration, exploitation, and extraction of oil, of gas and other energy resources, of minerals and aggregates, and for the production of energy from renewable sources,
- maritime transport routes and traffic flows,
- military training areas,
- nature and species conservation sites and protected areas,
- raw material extraction areas,
- scientific research,

- submarine cable and pipeline routes,
- tourism,
- underwater cultural heritage.

The following Tables 1 and 2 detail the activities and sectors included in the MSPs of the case study countries. As can be seen, the coverage of sectors and uses varies between the MSPs adopted by each country, particularly in the designations for each sector. For example, some countries differentiate between zones for **existing uses** and zones for **possible future uses**; others only show this differentiation at a sub-level. This differentiation at a sub-level implies that the use has not been zoned, and therefore, the activity can continue in any zone unless it is forbidden (e.g., fishing and shipping). The only activities/uses that are designated in all the case study countries are nature conservation areas and OWF energy.

Table 4 Sectors as per Article 8.2 of the MSPD

Countries:	BE	DK	DE		NL
			EEZ	MV	
General Use			X		
Shipping Routes	X	X	X	X	X
Energy: OWF	X	X	X	X	X
Energy: Oil & Gas			X		X
Energy: Wave			X		
Cables	X	X	X	X	X
Pipelines	X	X	X	X	
MPAs	X	X	X	X	X
Fishing	X		X	X	X
Aquaculture	X	X	X		
Fish	X	X			
Shellfish			X		
Algae					
Defense / Military Training	X	X	X		X
Raw Material Extraction	X	X	X	X	X
Marine Culture					
Underwater Cultural Heritage	X		X		
Tourism and Recreation	X		X	X	
Scientific Research	X		X		

Sectors/uses not mentioned in Article 8.2 of the EU MSP Directive, but considered by some countries include diving, dumping, CO2 storage, land reclamation, compensation excavation, maritime industry and ports. In addition, some MSPs show areas important for other functions, i.e. coastal protection; sea rescue and even aviation (thus uses above the water column).



Table 5 Other sectors mentioned in MSPs, not mentioned in Article 8.2 of the EU MSPD

Activities / Countries	BE	DK	DE	NL
			EEZ	
Diving				
Sea Rescue, Pollution, Boarder Guard				
Dumping				
Natural resources				
CO2 storage	X			
Compensation Excavation	X			
Land Reclamation	X			
Protective Measures for Aviation	X	X		
Multi-Functional Use			X	X
Energy / Artificial Islands	X			
Specific Coordination Areas				
TEN-T Ports and Ports				X
Special Areas				
Maritime Industry				
Archipelago				
Coastal protection	X			X

2.4. Overview of the MSP Process in Case Study Countries

2.4.1. Governance of MSP

The following sections give a brief overview of the MSP process in each case study country. It specifically shows the variety of authorities that have been assigned to coordinate the MSP process. In some countries special ‘ministries’ have been created responsible for the sea; others have given the overall authority either to the Ministry of Environment, the authorities in charge of Maritime Transport or Energy Planning. Even though all EU MSP authorities must show that they closely consult and integrate the perspectives of all other sectoral ministries and authorities, it should be noted that it does influence the process of which authority is in charge.

Moreover, differences exist in the divisions of who is in charge for which maritime space. Whereas Den-

mark, Belgium and the Netherlands prepare one single plan for their entire sea space; countries like Germany have different authorities in charge; with the ‘Länder’ being responsible for their own 12sm zone and the national level only dealing with the areas of the German EEZ. Similar concepts exist in Poland, Sweden and Finland.

In all case countries studied, the resulting MSPs are legally binding; but it should be noted that this is not necessarily the case throughout the whole of the European Union. In Sweden and Finland for instance the MSPs are strategic plans, which are in the following integrated into the formally binding lower plans designed at regional level.

Annex 1—Case Study Fiches provides a more detailed description of the MSP processes, plans, and associated regulatory framework.

Table 6 provides an overview of the relevant MSP authorities and the progress of the plans:



Table 6 Status of MSP in Case Study Countries

Country	Type	Planning level	Area covered	Competent authority	Status
Belgium	Binding	National	All marine waters	Minister for the North Sea Marine Environment Service of the Federal Public Health Service	In force, update expected
Denmark	Binding	National	All marine waters	Danish Maritime Authority	In force (March, 2021), already updated (March 24)
Germany	Binding	Federal	EEZ	Responsible: Federal Ministry of the Interior, Building and Community (BMI) Preparatory steps of plan preparation Federal Maritime and Hydrographic Agency	In force, 1 st MSP (2009) revised 2 nd MSP (Sept 2021)
	Binding	State, Mecklenburg-Vorpommern	Territorial and internal waters; Part of Regional Plan	Ministry of Energy, Infrastructure, Digitalisation MV	In force (1 st : 2006 / 2 nd : June 2016)
	Binding	State, Schleswig-Holstein	Territorial and internal waters	Ministry of Interior, Rural Areas and Integration SH	In force (Oct 2010), revision of plan under elaboration
Netherlands	Binding	National	All marine waters	Interdepartmental Directors' Consultative Body North Sea led by the Ministry of Infrastructure and Water Management	3 rd plan revision 4 th cycle as part of the North Sea Programme 2022-2027 (partial revision for 2025)

Source: Schultz-Zehden, 2021

2.4.1.1. Belgium

The first MSP for the Belgian Part of the North Sea was approved in 2014, and the second MSP entered into force in March 2020 and will be in place until 2026 (European MSP Platform, 2022). The MSP sets principles, goals, objectives and a long-term vision and spatial policy choices for the management of the territorial sea and EEZ.

The Belgian minister for the North Sea is responsible for coordinating the MSP, and the Marine Environment Service of the Federal Public Health Service coordinates preparation and implementation. Public consultation on the draft of the third Belgium MSP was carried out between April and June 2023. The comments received are now being integrated into

the draft document, which will be put out for consultation in June 2024. A study on additional zones for offshore renewable energy is ongoing.

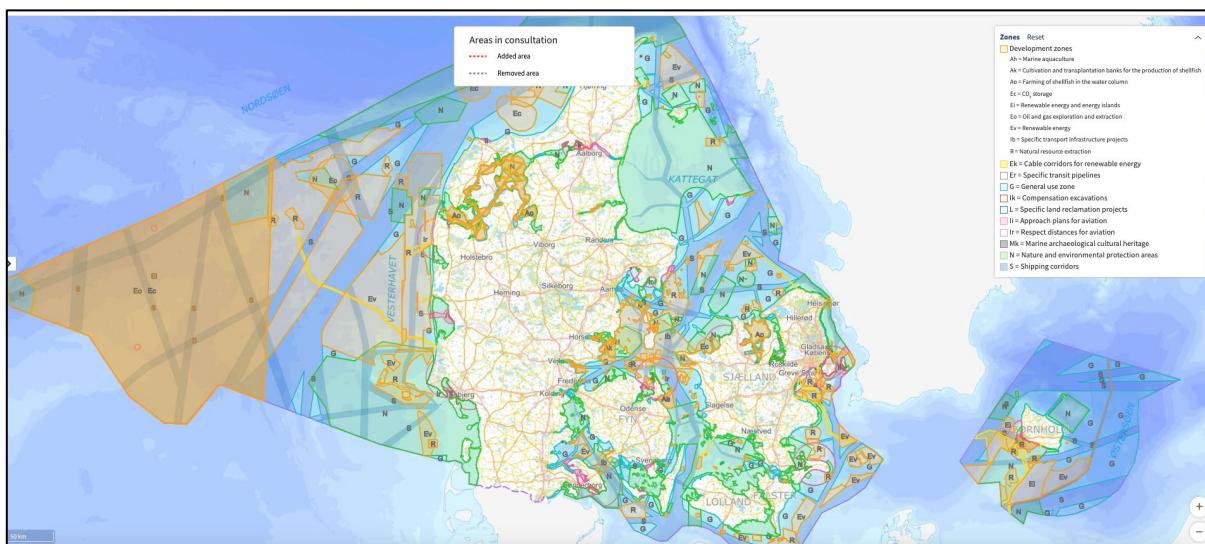
2.4.1.2. Denmark

The Danish Maritime Authority (DMA) under the Ministry of Business and Growth is the competent MSP authority in Denmark. DMA collaborates in this work with the 'working group on maritime spatial planning, which consists of representatives of 12 different maritime authorities in Denmark. Denmark adopted and launched its maritime spatial plan in March 2021. The Danish MSP was issued as an executive order and is therefore legally binding. It is the first legally binding digital map of Denmark and the Danish waters, covering internal waters, territorial sea and EEZ (see figures 1, 2 and 3).

The objective of the plan is to promote economic growth, the development of marine areas and the sustainable use of marine resources. The MSP establishes which sea areas in Danish waters can be used for, inter alia, offshore energy extraction, shipping, fishing, aquaculture, seabed mining and environmental protection towards 2030. Prior to 2021, Denmark did not have a holistic spatial plan for the sea, however, a range of sectoral plans have been in use. These plans have provided key contributions to the MSP planning process in Denmark.

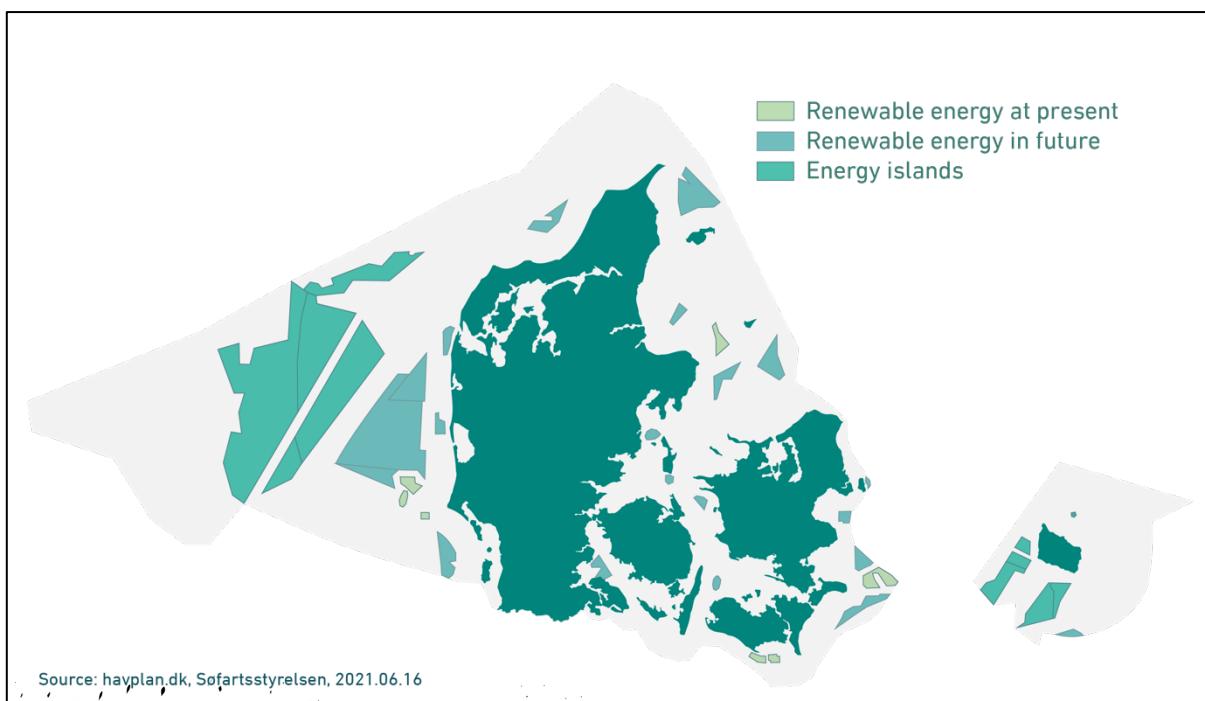
The MSP adopted in 2021 has already gone through a review based on a proposal from the Danish Maritime Authority to increase the offshore energy and biodiversity targets in the national MSP. The Danish Parliament reached an agreement on the new targets in the summer of 2023. Public consultation on the draft MSP amendments and the environmental assessment was launched in November 2023 for a period of ten weeks until February 2024. The results of this public and transboundary consultation will feed the finalisation of Denmark's revised MSP.

Figure 10 Denmark Maritime Spatial Plan (available in digital format)



Source: Denmark's maritime spatial plan <https://havplan.dk/en/page/info>

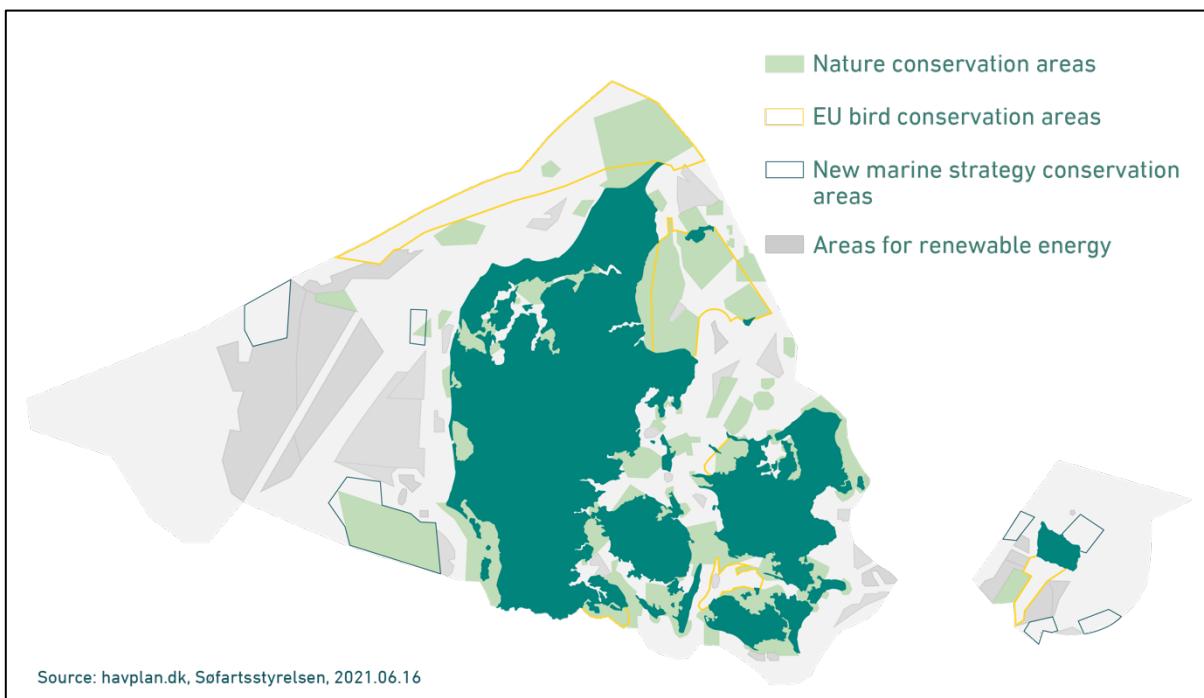
Figure 11 Danish Renewable Energy Development Zones



Source: havplan.dk, Søfartsstyrelsen, 2021.06.16

Source: Denmark's maritime spatial plan <https://havplan.dk/en/page/info>

Figure 12 Danish Nature Conservation Areas



Source: Denmark's maritime spatial plan <https://havplan.dk/en/page/info>

2.4.1.3. Germany

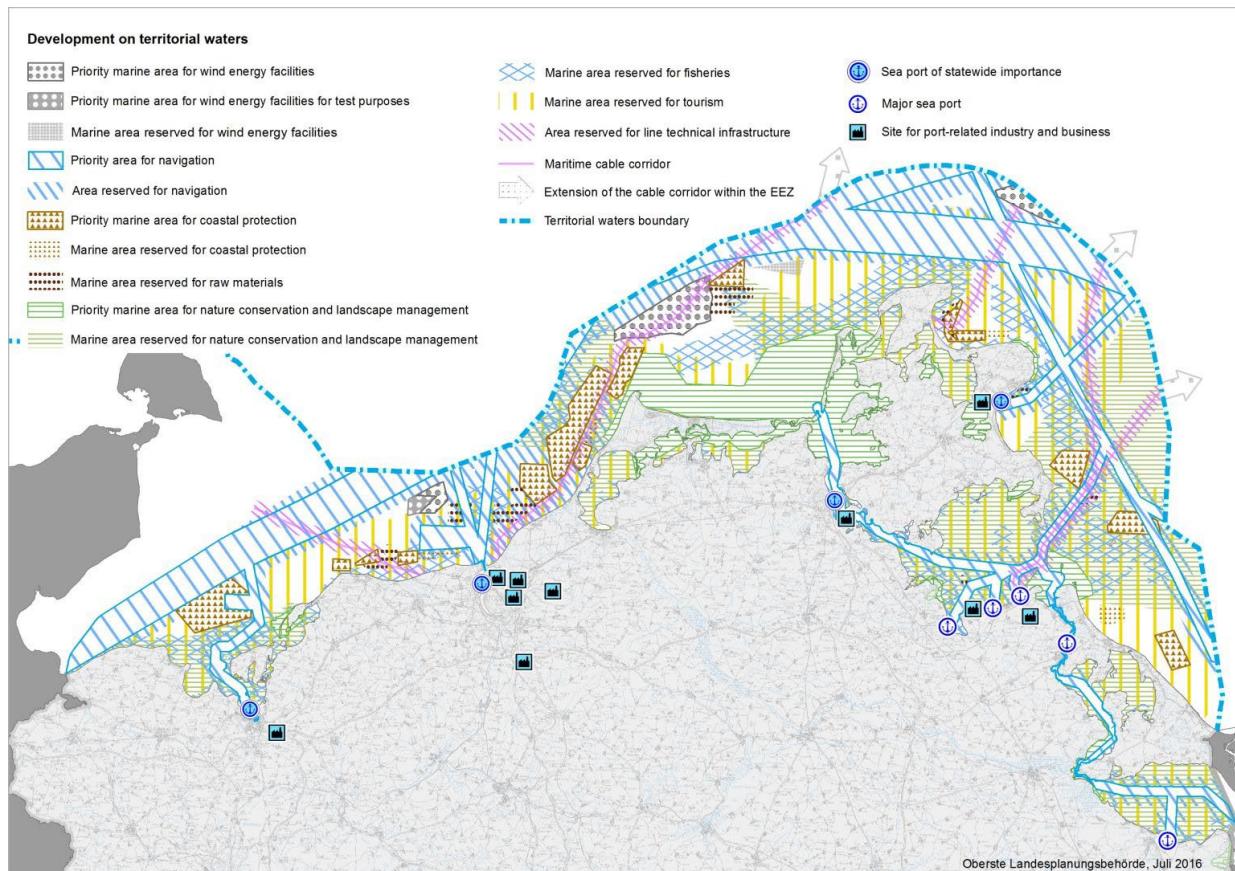
The first MSP was established in 2009 for the EEZ in the North Sea and Baltic Sea. The second round of MSP plans has been in place since September 2021 and covers the EEZ and the territorial sea areas under the jurisdiction of the three coastal federal States: Lower Saxony, Schleswig-Holstein, and Mecklenburg-Vorpommern.

Mecklenburg-Vorpommern stands out as the first German coastal state to integrate designations for various uses within its 12-nautical-mile zone into its regional development program through MSP³⁰.

Adopted in 2005, this extended program became legally binding and was overseen by the Ministry of Transport, Building, and Regional Development. In this plan, suitable areas for OWF were designated, far from the reservation area for tourism to avoid spatial conflict. The plan also carried out a risk analysis to identify priority areas and suitable areas for OWF to ease shipping in the 12-nautical mile zone. The plan was then updated and adopted in 2016 and is implemented by the Ministry of Energy, Infrastructure and Digitalization of Mecklenburg-Vorpommern.

³⁰ European MSP Platform. "Maritime Spatial Plan for the Territorial Sea of Mecklenburg – Vorpommern." (2020).

Figure 13 Germany MSP for Mecklenburg-Vorpommern

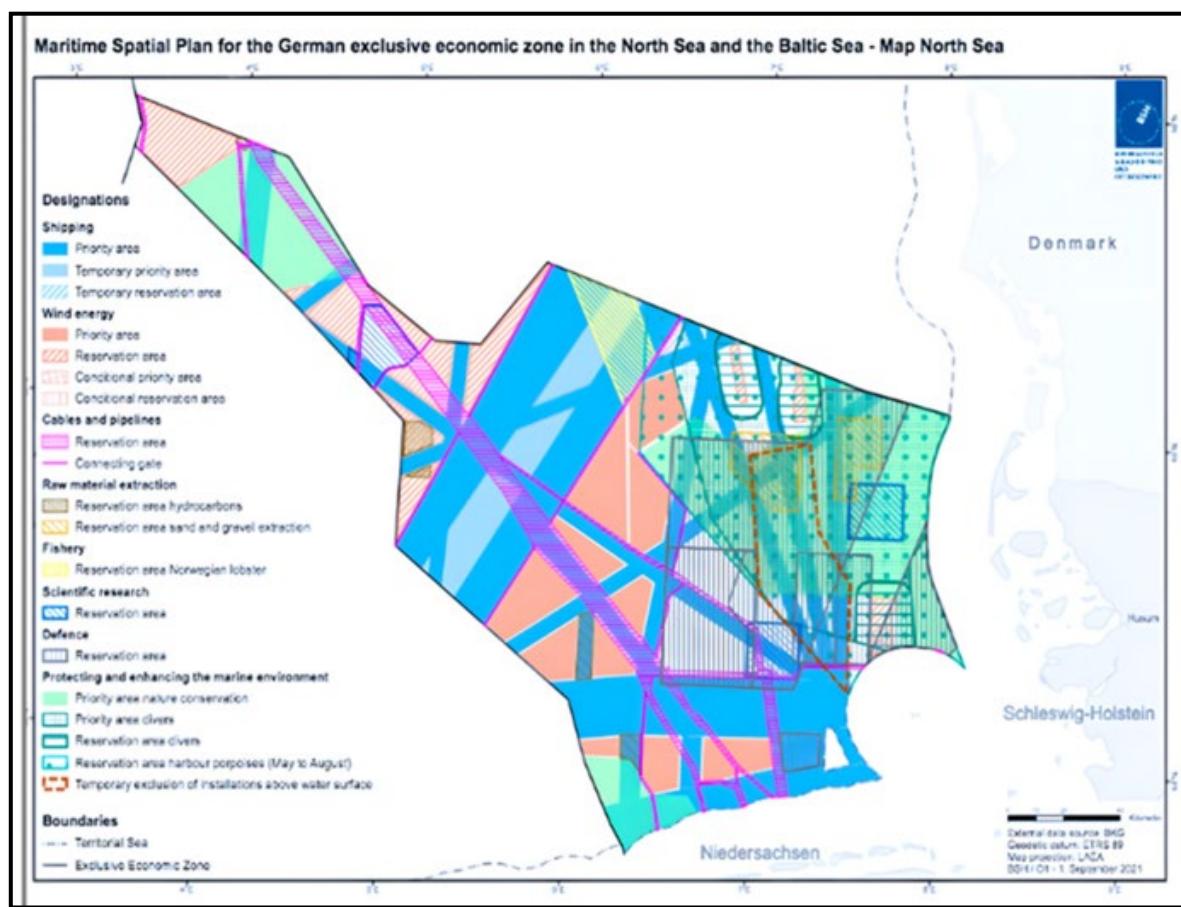


Source: BSH, 2016

The Federal Ministry of Housing, Urban Development and Building (BMWSB) is responsible for maritime spatial plans for the German Exclusive Economic Zone (EEZ) in the North and Baltic Sea. The Ministry commissioned the Federal Maritime and Hydrographic Agency (BSH) to draw up the plans.

These plans are setting objectives (legally binding) and principles (guidelines that need to be particularly considered, e.g. in a decision process on licensing, when considering relevant interests) of spatial planning about; economic and scientific use, ensuring safety and efficiency of maritime traffic, protection of the marine environment.

Figure 14 Germany MSP for North Sea



Source: BSH, 2023

The updating of the current spatial plan for the German EEZ by the commissioning authority BSH is intended to take place from 2027 onwards. Usually, the update of the EEZ plans considers, among other factors, the changing demands on sea space, the changing policy environment (e.g., EU MSP Directive and MSFD Directive), international guidelines (e.g., HELCOM/VASAB guidelines on the ecosystem approach), as well as lessons learned from international projects in which Germany participates.

In addition to the overarching MSP (covering all sectors), Germany published in 2023 a specific Area Development Plan for the German North Sea and Baltic Sea (see Figure 6 below), spatially allocating future OWF farms to reach the 30 GW goal by 2030³¹. However, as shown in Figure 7 these areas for OWF development will even further expand within the German EEZ of the North Sea considering the 70 GW goal to be reached in 2045.

³¹ BSH. "Flächenentwicklungsplan 2023 für die deutsche Nordsee und Ostsee." (2023).

Figure 15 Area Development Plan for the German North and Baltic Sea

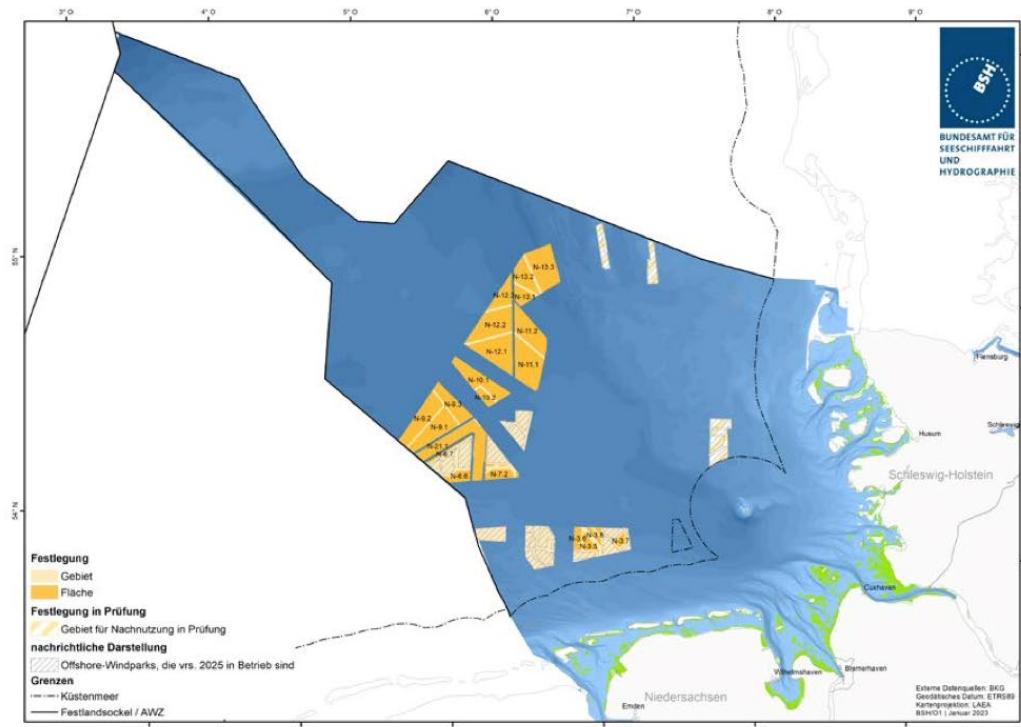


Abbildung 1: Festlegungen zu Gebieten und Flächen in der AWZ der Nordsee.

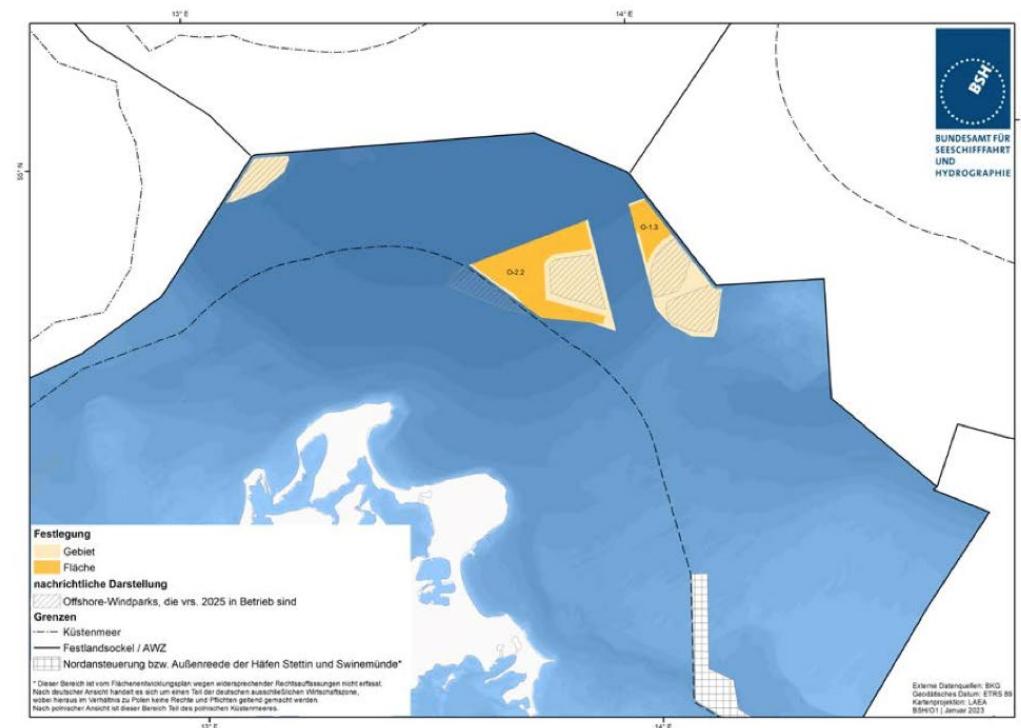
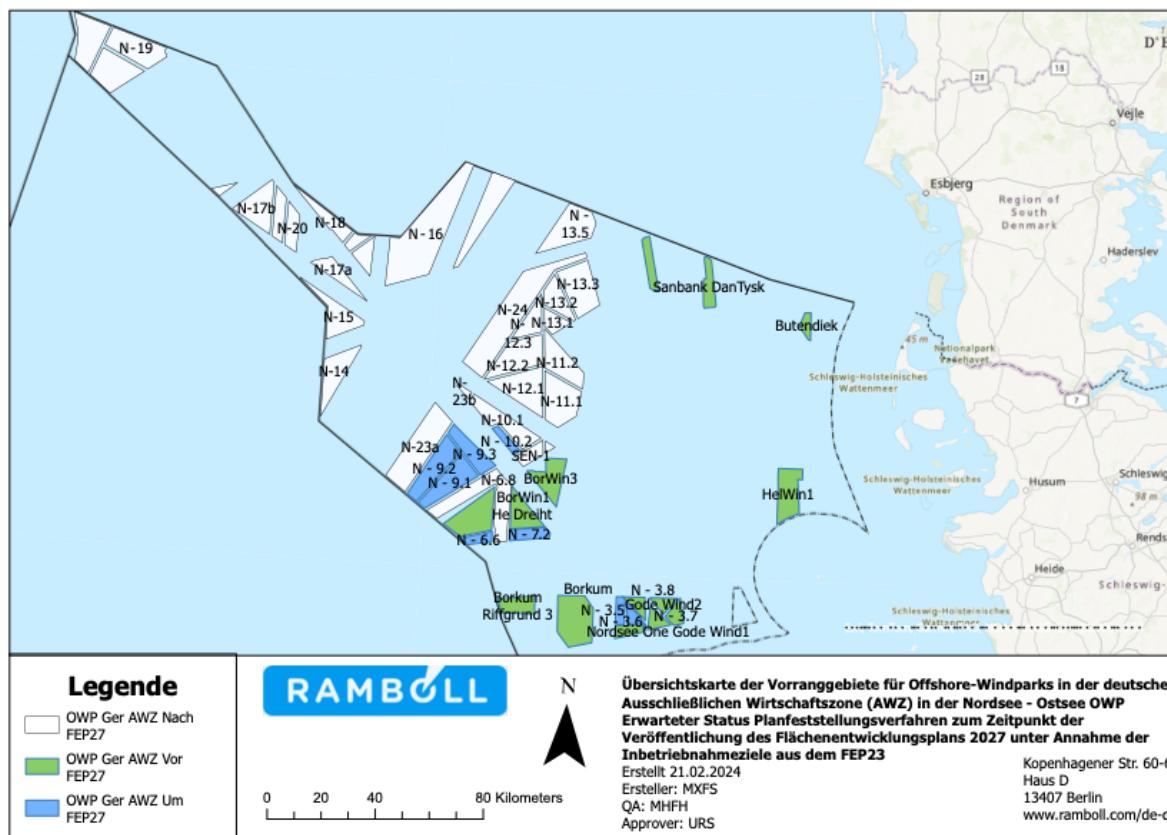


Abbildung 2: Festlegungen zu Gebieten und Flächen in der AWZ der Ostsee.

Source: BSH, 2023

Figure 16 Area Development Plan (Flächenentwicklungsplan)



Source: Ramboll, 2024

2.4.1.4. Netherlands

The Dutch EEZ of the North Sea is part of the southern North Sea. It is intensely used. Higher demand for offshore renewable energy and sand to strengthen the coast is foreseen in the future. The Netherlands adopted its first MSP, the North Sea Policy Document in 2009. The second plan, covering the period of 2016-2021 was adopted in 2015 and the most recent third plan is in place from 2022 until 2027. The National Water Plan provides a policy framework for MSP based on the Water Act and includes the Policy Document for the North Sea 2016-2021 as an appendix. The Policy Document includes the Netherlands' Maritime Spatial Plan and reflects the Dutch Government's policy choices for the North Sea. Every 6 years the plan is revised.

The Dutch Ministry of Infrastructure and Water Management is responsible for managing and coordinating the Integrated North Sea Policy, and thus MSP. The Interdepartmental Directors' Agriculture, Nature and Food Quality; Ministry of Internal Affairs; Ministry of Defence; Ministry of Education, Culture and Science; and the Ministry for Finance.

2.5. Overview of Zoning Systems

As explained earlier, a few countries take a high-level policy approach for their MSP which serves more as a strategic guiding document, with specific zoning regimes and spatial criteria being laid out in subsequent specific regional plans.

Normally throughout Europe, however, the MSP plan is displayed both as a map (plan) with specific zones for the various maritime uses (including nature protection), which is then accompanied by a detailed report explaining the overarching principles, rationale and spatial planning criteria and specifying additional regulations and restrictions for the various sectors within specific zones.

Zoning systems in MSPs are characterized by showing:

- Zones, in which given or additional uses are explicitly allowed.
- Zones, where given or additional uses are allowed under certain conditions.
- Zones, in which given or additional uses are not allowed.

- ‘White’ zones, where none of the above regulations apply.

The given priority use is then complemented with other **permitted functions**, which do not constitute an obstacle to the main function or cause conflicts in this field. The accompanying report subsequently spells out possible limitations to the acceptable functions (e.g. only certain forms of fishing may be allowed in the areas intended for renewable energy production and storage).

In **Germany** the zoning system, which is based on its spatial planning law, differentiates mainly between **priority** and **reservation areas**. In priority areas, no use is allowed, which would significantly constrain the use that is given priority in this area. In reservation areas a certain use is given special weight in the balancing of competing interests in the areas. Unlike priority areas, it is not certain that the activity receiving specific attention has absolute priority. In Germany, **priority areas have the legal character** of

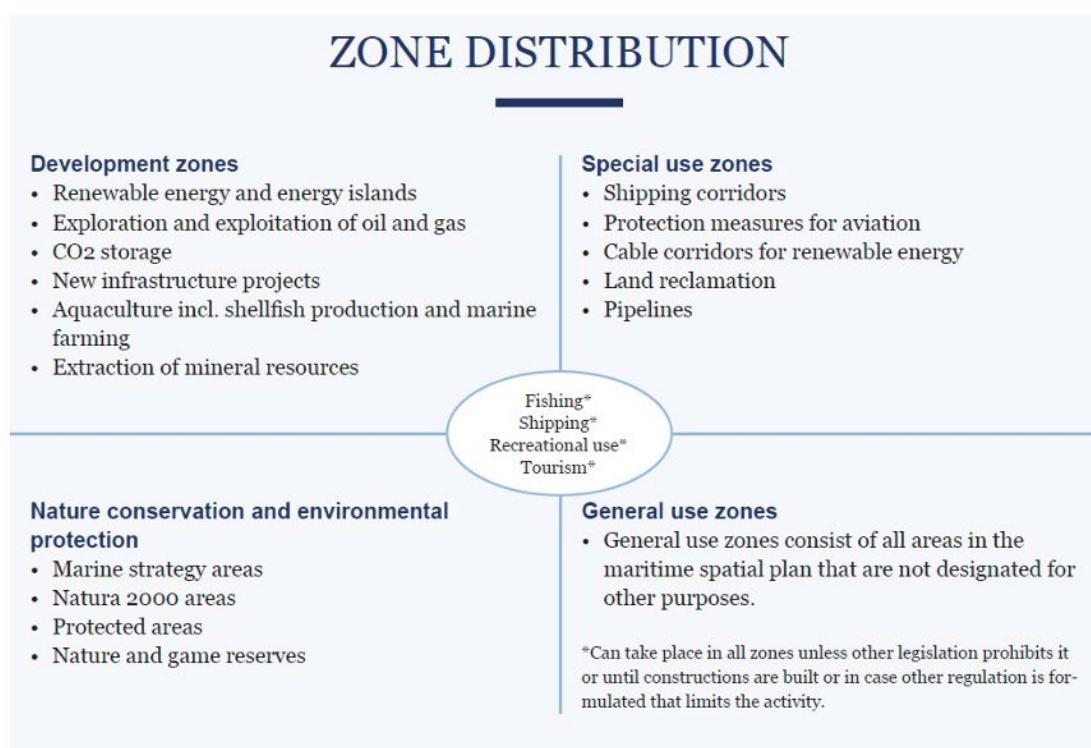
spatial planning objectives, whereas reservation areas are based on spatial planning principles.

Sectors for which priority areas have been allocated include:

- Shipping Routes (but not all routes)
- Offshore wind farms (but not all areas)
- Nature Conservation (and specifically for Divers)

In **Denmark**, on the other hand, the MSP does **not explicitly differentiate between priority or other zones**. The zones indicated in the digital plan can be searched through the sectors, which are differentiated between ‘development zones’ for a set of given new purposes and several zones for existing uses (cables, pipelines, compensation excavation, protective measures for aviation, land reclamation projects, nature and environmental protection areas and shipping corridors). Figure 8 gives an overview of how activities are divided into these zones.

Figure 17 Types of zones in the Danish MSP

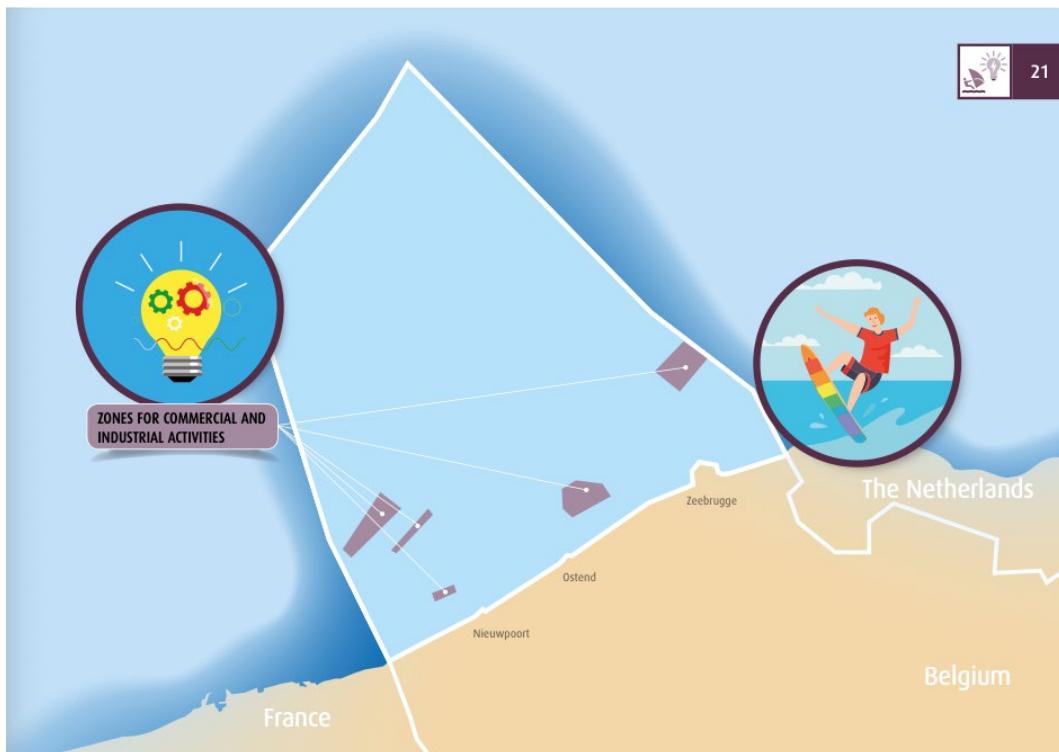


Source: Danish Maritime Authority 2021

In **Belgium** the zoning system applied establishes reservation areas for OWF, known as wind turbine areas. The most recent MSP **reserves** 285 km² for constructing, installing, and producing electricity from renewable energy resources; including OWE. What is

interesting in the case of Belgium are the so-called ‘Zones for commercial and industrial activities’ as these are essentially areas where it is not defined how the zones will be used and hence are also open for multi-use options (see figure 10).

Figure 18 Zones for Commercial and Industrial Activities



Source : FPS MSP Economie, 2023

In the **Netherlands**, zoning follows a similar structure to that of Belgium and is also similar to the German priority areas. It is described in the "North Sea Programme 2022-2027" policy document (De Rijksoverheid, 2021). What is different from other countries is the new approach adopted in the Netherlands since 2023 for co-use in wind farm zones, which is guided through so-called Area Passports (indicative zonation for non-priority uses).

2.6. Strategic Environmental Assessment

In the EU MSPs are subject to the Strategic Environmental Assessments (SEA) Directive (2001/42/EC). The SEA is instrumental in **ensuring nature and environmental protection standards are implemented at the regional level** and at the first stage of the planning process. This Directive requires Member States to assess plans, and sectoral strategies that may have a significant effect on the environment, including MSP plans.

The **SEA complements the preparation process of MSPs** by providing a mechanism for strategic consideration of environmental effects, assessment of plan alternatives, and potential development of mitigation measures, and public consultation to ensure transparency. It also contributes to the implementation of the Ecosystem-based approach, as it frames the evaluation of effects on species and habitats of

conservation importance. It also requires public consultation to ensure transparency in the different stages of the SEA.

A fundamental aspect of SEA is the environmental report (Art. 5), in which likely significant effects of implementing the plan on the environment are identified, described and evaluated, taking into account the objectives and geographical scope of the plan. Alternatives to the plan can be considered. The environmental report considers the following issues:

- current knowledge and methods of assessment,
- the content and level of detail in the MSP,
- its stage in the decision-making process,
- the extent to which certain matters are more appropriately assessed within a more detailed Environmental Impact Assessment (EIA), which is often required for the licensing of specific projects after a Maritime Spatial Plan has entered into force.

The SEA provides a systematic process to identify, report, propose mitigation measures and monitor the environmental effects of plans, programmes, and strategies. This is done to ensure that environmental considerations are considered at every stage in the preparation, implementation, monitoring and review of plans, programmes, and strategies. The SEA facilitates the development of long-term vision MSPs (20 to 30) years for the future development of sea use.

3. SPATIAL PLANNING CRITERIA

Planning criteria are the factors that are considered for the identification, assessment and ultimate spatial designation and regulation of areas for specific spatial uses and activities, such as the selection of suitable areas for offshore wind farms, cable corridors and important corridors for shipping ('site/corridor selection criteria'). The planning criteria are different factors that are considered when identifying and deciding which areas are suitable for a specific use.

Criteria are principles or standards by which something may be judged or decided. In Table 4, the following types of criteria for spatial designation are used in OWF planning.

The following sections are based on the results of the EU-funded project, BalticLINES (2016-2019), on the development of planning solutions for the designation of OWF, shipping lanes and fixed linear infrastructure (e.g., cables and pipelines). Table 5 gives an overview of the planning criteria in the case study countries with a particular emphasis on the role of MSP for spatial allocation for ship traffic, OWE, and environmental considerations.

Table 7 Types of criteria

Exclusionary criteria	Restrictive criteria	Textual regulations
Sometimes referred as "hard constraints", "no go areas" → areas that are not available Areas unsuitable for development due to natural or technical conditions	Sometimes referred as "soft constraints" Activities or interests to be considered that may preclude development Areas available for development only at a reduced density	Legislation or similar, regarding e.g. 1) safety issues (buffers around offshore installations), 2) environmental aspects (e.g. avoidance of cable routing through Natura 2000), 3) height restrictions for offshore turbines, etc.
Areas designated / licensed for other incompatible uses / priority areas for other uses		

Source Schultz-Zehden et al., 2019



Table 8 Spatial Planning Criteria in MSP

Country	Shipping MSP's role in providing space for ship traffic	Offshore Wind MSP's role in locating OWE	Grid MSP's role in locating grid connections, platforms, and inter-connector routes	Environment Considerations of MPAs and other ecologically valuable areas in the planning process
Belgium	Priority area for shipping, no incompatible activities in these areas are allowed	MSP is used to designate spatial areas for renewable energy and offshore wind	Cable corridors are identified in the MSP. Cables (energy and telecom) and pipelines are to be located within these corridors (alternative routes can be allowed).	MPAs are part of the existing plan (Special Area for Conservation, Special Protection Area)
Denmark	Priority areas for shipping shall safeguard space for ship traffic, no incompatible activities (e.g. artificial installations) are allowed.	Until now, sectoral decision making and planning by the Danish Energy Agency. MSP's role is to coordinate use of the sea areas for different uses.	MSP will plan for cable corridors to offshore wind farms, and for international transmission pipelines	Strict protection in 12 areas accounting for 30% of Denmark's sea area
Germany	Priority areas for shipping shall safeguard space for ship traffic, no incompatible activities (e.g. artificial installations) are allowed	Designation of priority areas is indicative. OWF can be built outside the designated areas.	Definition of subsea cable routes or corridors, platforms and transboundary gates for the grid connection of offshore windfarms and interconnectors within the EEZ in the Site Development Plan and not in the MSP	The needs of the marine environment are protected by provisions for marine environmental protection included in the regulations applying to the individual uses (e.g. exclusion of offshore wind farms in Natura2000 areas) and by dedicated regulations for the protection of the marine environment
Netherlands	TSS, precautionary areas, clear-ways and anchorages	MSP is used to designate wind energy areas and all the conditions required to build wind farms (location, permit and grid connection etc.)	Priority and preferred routes for cables around sand extraction reserve areas	Designated Natura 2000 are part of the current MSP plan

Source: NorthSEE, 2019

4. SPATIAL PLANNING CRITERIA FOR OFFSHORE WIND

In contrast to the shipping sector and despite common EU targets, there is so far no established inter-governmental collaboration or body within the EU and/or the North or Baltic Sea, which formally coordinates activities in the offshore energy field. Initiatives such as the North Sea Energy Cooperation are informal collaboration formats between the various countries bordering the North Sea. But there is, for instance, no international convergent and binding legal framework to regulate the allocation of offshore wind farms installations. Typically, these are based on the regulation of other sectors such as shipping, defense, and nature protection, which place restrictions on the allocation of locations for OWF projects.

Currently, the following international guidelines are relevant for energy sector considerations³²:

- UN Convention on the Law of the Sea (UNCLOS): states general principles (i.e. rights to decide and use sea areas) and mentions the possibility for coastal states to establish in EEZs 'reasonable' (max. 500m) safety zones around artificial islands, installations or structures (incl. OREIs).
- International Maritime Organization (IMO): designated sea lanes and TSSs (Traffic Separation Scheme) are excluded zones for OREIs, but rerouting for the benefit of other sea uses is possible.
- Nature conservation regulation (Convention on Biological Diversity, International Union for Conservation of Nature and HELCOM): protected areas often prevent building of OWF.

A study undertaken within the framework of the parallel ongoing NorthSEE / BalticLiNes projects (2019) showed, however, the Member States use similar criteria for the spatial planning of offshore energy. These include the following factors:

Policies / Strategic Targets:

- Climate policy trends and targets

Technical infrastructure and connections:

- Availability to connections and distances to onshore grid
- Distance to shore and to construction, operation, maintenance port

- Area and project size (space demand per turbine)
- Future planned development potential of grid (connections and extensions)
- Grid Capacity

Environmental habitats and species:

- Marine and coastal protected areas (Natura 2000 areas)
- (concentrated) bird migration routes
- Biotopes
- Mammal (seasonal) distribution
- Important bird areas

Economic Factors:

- Regional demand for electricity
- Local employment and growth stimulation
- Trends in the energy sector
- Economic profitability

Social aspects:

- Visual impact on the landscape and views from the coast
- Stakeholder involvement

Relationship with other sea uses:

- Shipping lanes
- Safety of navigation
- Pipeline and cables
- Other permanent infrastructure
- Fishing zones
- Dumped munitions
- Proximity of existing wind farms
- Cultural heritage
- Radars
- Military zones
- Mineral resources extraction

4.1.1. Offshore wind farms

Planning of energy installations is an iterative process starting from more general considerations of the suitability of areas and corridors to more detailed construction planning, which is followed by permitting procedures before the actual construction. The BalticLiNes project developed a **step-wise approach**³³ summarising the considerations taken when assessing, deciding on and designating suitable areas for offshore wind farms and grid development (see guidance below). This approach **should**

³² Schultz-Zehden, A., Clara Coornaert, C., Ooms, E. "Baltic LiNes Project findings." (2018).

³³ BalticLiNes, "A practical guide to the designation of energy infrastructure in Maritime Spatial Planning." (2018).



not be seen as the one-and-only way but as a possible process for the designation of offshore wind.

Planning guidance for offshore renewable energy installations:

STEP 1: Define the need for development and political goals for offshore renewable energy installations

- Clarify what the political goals for the development of offshore wind farms are, what the priority of the development is and be aware of the future trends and technological developments

STEP 2: Map the existing designations and installations

- Find out areas already designated for offshore wind farms and areas designated for other uses and activities
- Check your neighbouring countries' area designations for wind energy and other uses
- Consider in the plan the previously mentioned and incorporate them into the planning process.

STEP 3: Map suitable areas (general planning criteria – see also below for capacity density)

- Assess the natural and technical conditions, the demand for energy in the coastal area and the possibility for grid connection

STEP 4: Map conflicts and synergies with other uses and activities

- Detect areas/locations with conflicts, find solutions for these conflicts and discuss with other sectors and stakeholders

STEP 5: Define of the priority areas for offshore wind farms

- Consider again national targets for renewable energy production, identify the priority areas, discuss with other sectors and stakeholders, define specifications for the priority areas

Planning guidance for offshore energy cables:

STEP 1: Define political framework/targets

- Clarify what the political energy or climate protection targets are
- Consult neighbours as early as possible to identify further need for cables
- Define future need for offshore energy cables and interconnectors based on political and market-driven framework/criteria

STEP 2: Check suitability of areas

- Geology and seabed conditions
- AIS data needs to be analysed for the designation of ship corridors

STEP 3: Stocktake: Analysing/Mapping with other uses conflicts and synergies

- Consider existing and planned energy and data cables/cable corridors and include all other relevant planned and existing uses/rights of use and protected areas

STEP 4: Consider land-sea interaction

- Consider connection to onshore power grid

STEP 5: Define cable corridors based on the analysis and application of planning criteria/planning principles

- Space needed for the cable itself and its laying, as well as a safety zone around it to ensure sufficient space for potential repairs, space at cable crossing areas and/or specific distances in case of parallel routing with other uses.

4.1.2. Recommendations/Best Practices

Countries should aim to coordinate linear infrastructure (e.g., power lines, data cables, pipelines) through the MSP process, establishing the definition of strategic corridors and the possible establishment of gates.



5. SHIPPING

Usually, shipping lanes and Offshore Wind Areas are not compatible. Only recently have countries started to plan 'corridors' within their large offshore wind areas to allow passage through (see below chapter on conflict resolutions between OWE and shipping).

Maritime traffic and related navigation spatial restrictions are regulated by various international conventions such as the United Nations Convention on the Law of the Sea (UNCLOS), the International Convention for the Safety of Life at Sea (SOLAS), the Convention on the International Regulations for Preventing Collisions at Sea (COLREGS), and the General Provisions on Ship's Routeing Systems (GPSR) of the International Maritime Organization (IMO).

In the EEZ national governments can propose the following routing measures to the IMO:

- Traffic Separation Scheme: separation of opposing streams of traffic by the establishment of traffic lanes.
- Traffic Lane: a corridor with established one-way traffic; natural obstacles, including those forming separation zones, may constitute boundaries.
- Separation Zone: a zone (1) separating traffic lanes with opposite or nearly opposite directions; or (2) separating a traffic lane from the adjacent sea area; or (3) separating traffic lanes designated for particular classes of ship proceeding in the same direction
- Roundabout: a circular separation zone/ traffic lane within defined limits.
- Inshore Traffic Zone: a designated area between the landward boundary of a traffic separation scheme and the adjacent coast.
- Recommended Route: a route of undefined width, for the convenience of ships in transit, which is often marked by centre line buoys.
- Deep-water Route: a route within defined limits which has been accurately surveyed for clearance of sea bottom and submerged articles.
- Precautionary Area: an area within defined limits where ships must navigate with particular caution and within which the direction of flow of traffic may be recommended.
- Area To Be Avoided: an area within defined limits in which either navigation is particularly hazardous or it is exceptionally important to avoid casualties and which

should be avoided by all ships, or by certain classes of ships

The routing measures adopted by the IMO aim to ensure the safety of navigation in areas with vessel traffic, and a large part of the sea outside of these areas remains unregulated and freedom of navigation is applied. When MSPs are drafted in these unregulated areas there are usually no legal impacts on ship traffic. In this case MSP can be used to identify the spatial demands outside of IMO schemes areas to ensure the safety of navigation and allocation of space for shipping activity presently and in the future.

Usually, the main goal for designating shipping areas in MSP is to safeguard space for current and/or future needs of the shipping sector during the weighting process as opposed to other uses. As a maritime spatial plan shall cover the spatial needs for different activities over the entire (national) sea area two questions arise: a) how to deal with IMO regulated areas and b) how to deal with areas that are completely unregulated to this date (i.e. how to transfer existent regulations and how to designate new areas for shipping). While transferring existing IMO regulations to an MSP seems to be fairly easy, the determination of how much space is needed for shipping outside the routing schemes (now and in future) is complex. In this context it is important to underline that even priority areas for shipping designated in MSPs shall not limit maritime transport to certain corridors nor regulate ship traffic (ergo "freedom of navigation" remains). This circumstance also explains why the responsibilities for MSP and those for the regulation of ship traffic often lie at different competent authorities.

Unlike international regulations for shipping, MSP planning principles vary between countries. For example, while in many countries just one type of area is used to designate shipping areas (usually called priority area for shipping), Germany also designate so-called reservation areas for shipping, which have a different status when weighting with other uses.

In the following section, an overview of the parameters that are important for the designation of shipping areas in MSP is provided. Underlying data and information will be presented, and descriptions will be given of how planning criteria are applied in Denmark and Germany. Table 6 gives an overview of the national characteristics for shipping corridor designations.



Table 9 Shipping Corridor Designation

	Belgium	Denmark	Germany	Netherlands
MSP's role in providing space for ship traffic	Shipping is given priority and the ports of Zeebrugge and Ostend have been given a zone for possible expansion	Priority areas for shipping shall safeguard space for ship traffic, no incompatible activities (e.g. artificial installations) are allowed. Safety zones are included in these.	Priority areas for shipping shall safeguard space for ship traffic, no incompatible activities (e.g. artificial installations) are allowed. Safety zones are added as reservation areas. These have a less strong status as priority areas in the weighting process.	Achieve and maintain a single system of traffic separation, clears and anchorage areas to accommodate shipping safely and easily
Existing IMO routeing measures	Large area is regulated by IMO, which will be transferred to MSP + 2nm safety zones along TSS	Large area is regulated by IMO, which will be transferred to MSP + 2nm safety zones along TSS	Large area is regulated by IMO, which is also transferred to MSP + 2nm safety zones along TSS.	Large area is regulated by IMO, which will be transferred to MSP + 2nm safety zones along TSS
Planning criteria used for MSP shipping area designation	Based on AIS records, economic implications for ports	Width of priority areas + safety zones according to traffic density (AIS data from 2016) and ship sizes on main traffic routes, guidance taken from Nautical Institute paper. Corridor widths between 6 and up to 10 nm.	Larger corridors equal widths of TSS; 1nm width for 1000-4900 vessels/year; 10nm for >10,000 ships. Designation in MSP from 2009 based on AIS data from 2005-2009 (national stations).	In the event of designation of areas at sea for a specific purpose, the safety and accessibility of the area to shipping must be guaranteed. If safety risks arise because of new functions, these must be mitigated. The related necessary measures must be in place before the new use is initiated.

5.1.1. General process of designating Shipping Corridors

Designations of ship corridors in MSP vary greatly due to differences in national planning systems. Especially at the project level, e.g., for shipping in the vicinity of OWF, **thorough risk assessments** must be conducted on a case-by-case basis. The EU funded research project Baltic LINes project developed a se-

ries of recommendations for the designation of shipping areas under MSP. These have been drafted into a five-step approach to showcase best practices in the designation of ship corridors for MSP³⁴.

Baltic LINes: Best Practices for Ship Corridor Designation under MSP

Using the similarities and differences of designations of ship corridors in the different national systems, the following 5-step approach claims to be a good

³⁴ A Practical Guide To The Designation Of Ship Corridors In Maritime Spatial Planning



example of how to prepare the first draft of ship corridor designations in MSP for national and international consultation.

STEP 1: Data acquisition of IMO measures in the national sea area <ul style="list-style-type: none">Transfer of existent IMO routeing and fixed uses as a basis for initial plan draftingAssessment of future plans for potential spatial regulation of ship traffic
STEP 2: Data acquisition and preparation of Automatic Identification System (AIS) data <ul style="list-style-type: none">Assessment of current ship traffic patterns for a first draft of ship corridor designationsConsideration of safety issues
STEP 3: Assessment of political goals and policies that impact the shipping sector <ul style="list-style-type: none">Assessment of economic development and industrial developments in the shipping sectorAssessment of changing natural conditions impacting the shipping sectorIndication of an area with changing spatial needs for shipping in the future
STEP 4: Assessment of spatial demands across sectors <ul style="list-style-type: none">Indication of potential conflicts between different usesDevelopment of planning solutions
STEP 5: Assessment of transnational ship traffic <ul style="list-style-type: none">Analysis of designated ship corridors along bordersAlignment of ship corridors across borders
STEP 6: Categorisation of areas for shipping <ul style="list-style-type: none">Designation of shipping corridors

5.1.2. Recommendations/Best Practices

- Common positions towards the IMO in view of the possible shifting of shipping lanes
- Improve the integration and alignment of IMO terminology within national MSP

6. FISHERIES

In the EU, there is no direct national competence for regulating fisheries as they are regulated under the Common Fisheries Policy, and fisheries are in general allowed everywhere³⁵. Zoning only applies in areas where fisheries are not allowed, or where there are

spawning areas. Therefore, no designations for fisheries are made in countries' MSPs. However, countries can assess the possibility of whether a fishery can continue in areas with OWF. This is explained below in the case of the Nephrops Fishery in Germany below.

Figure 19 German Nephrops Fishery and OWF sites

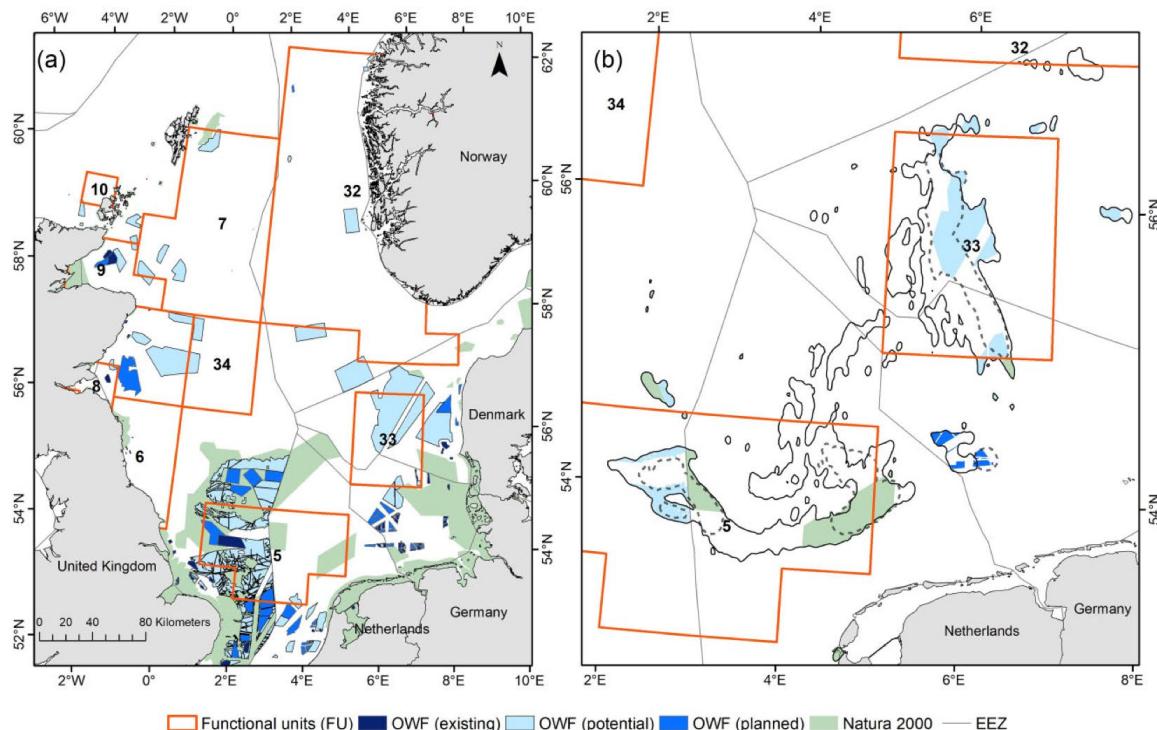


Figure 7. (a) The North Sea with Nephrops functional units (FU), designated Natura 2000 conservation sites (in green), and offshore wind farms (OWF) at different developmental stages: existing (black; before 2020), planned (dark blue; 2020–2033), and potential (light blue; without starting date); (b) The German Bight with the core fishing areas of the German fishing fishery clusters *Nephrops & plaice* (dashed line) and *plaice* (solid line) and their overlap with different stages of OWF development and Natura 2000 conservation sites.

Source: Letschert et al., 2021

In Germany, the designation of the reservation area for the Nephrops fishery does not have a regulatory effect, but in the case of spatial overlap with other activities, fishing interests shall prevail in area 13. This means that if an OWF is approved in the area,

passage regulations must be included within the ancillary provisions of the licensing decision.

³⁵ Multiannual Plans are implemented through the Common Fisheries Policy for specific stocks and fisheries management areas.



7. AQUACULTURE

MSP may support the development of the sustainable aquaculture sector by providing access to space through the allocation of zones in areas with spatial overlap with OWF. In the selected case study countries, marine fish aquaculture is not being promoted due to issues with eutrophication and characteristics of the marine environment (Kotta et al., 2023). Marine aquaculture is zoned separately from OWF sites and provisions on spatial monitoring of the allocated zones are detailed in certain policy guidelines in line with the EU's recommendations on sustainable aquaculture development.

The EU's "Strategic guidelines for a more sustainable and competitive EU aquaculture for the period 2021 to 2030" provide guidelines on coordinated spatial planning based on the designation of areas suitable for aquaculture (European Commission, 2021). Below are the recommendations of most relevance for the scope of this study:

- Anticipate the development of offshore aquaculture, where natural conditions allow.
- Special attention should be given to the development of aquaculture with a lower environmental impact (such as combining certain types of farming to further reduce the emissions of nutrients and organic matter into the environment), and the integration of suitable aquaculture activities (notably those offering ecosystem services) into protected areas such as Natura2000 areas.
- Spatial planning should always ensure the implementation of relevant EU legislation and make available special areas for organic aquaculture and the production of molluscs.
- Spatial planning should be based on the designation of areas suitable for aquaculture through a process involving coordination among different relevant authorities at different levels. This process should start

with mapping existing and potential aquaculture areas in a way consistent with existing environmental planning.

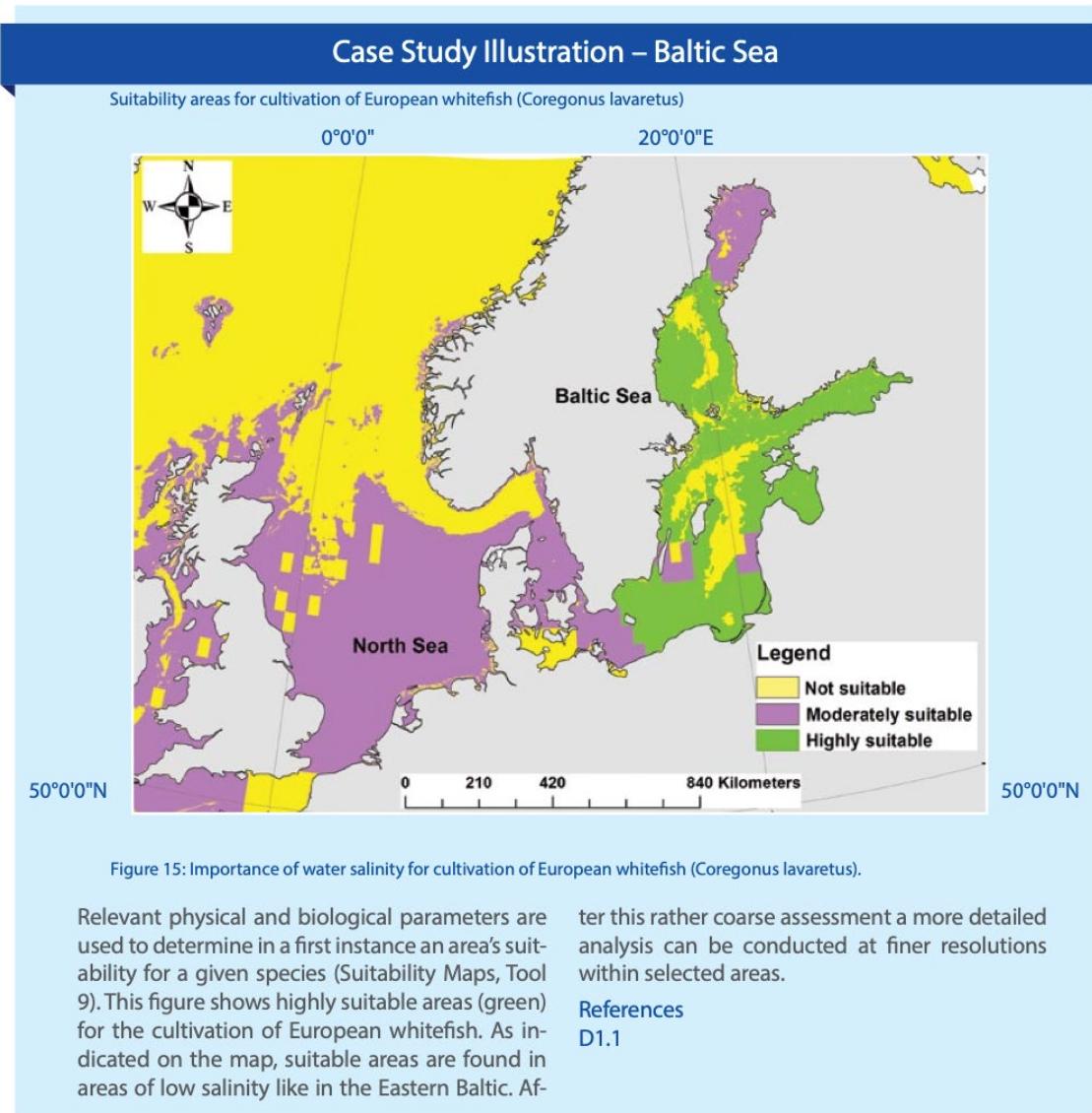
- Promote synergies between different activities & multiple uses of space, such as encouraging aquaculture development in combination with the development of offshore wind power.

Based on these recommendations and the enabling legislation, multi-use in OWF farms is being piloted in some of the case study countries. For example, in Belgium, sustainable aquaculture, particularly bivalve aquaculture, can be allowed in OWF if "the holder of the concession for the construction and exploitation of a wind farm gives consent and the aquaculture reduces the level of eutrophication." In the case of Germany, there are no projects or applications for aquaculture in the EEZ of the North and Baltic Sea presently, but the MSP has created an approach for the feasibility assessment of future projects in the context of existing or planned wind farms.

In the Netherlands, the MSP presents a policy priority on the ***transition to a sustainable food supply, in which aquaculture should be encouraged***. This will be promoted through the principle of the sustainable blue economy, in which multiple uses of space in OWFs are encouraged. The adopted approach is based on the following zoning principle: "the areas identified for aquaculture development are coastal marine areas that have been proved suitable for the development of aquaculture with favourable characteristics" (De Rijksoverheid, 2021).

In the Baltic Sea, long-term impact assessments have been conducted in the context of maritime spatial management to determine the suitability of sites for whitefish aquaculture. As shown in Figure 20, suitability is constrained in the case study countries.

Figure 20 Suitability Assessment for fish aquaculture in the Baltic Sea



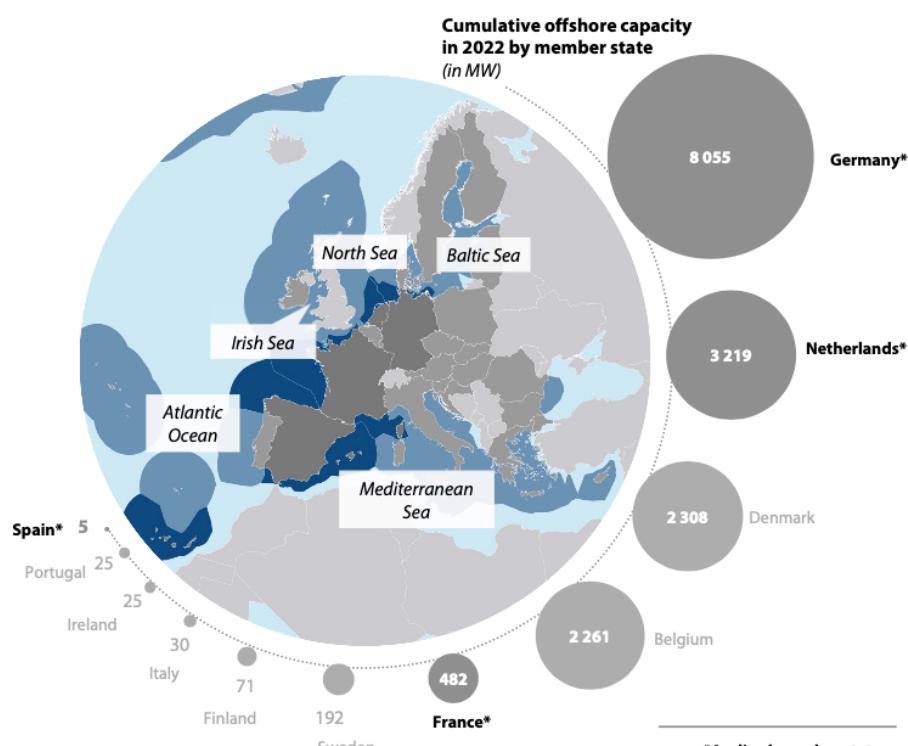
Source : Stelzenmüller et al., 2013

8. PLANNING FOR OFFSHORE WIND POWER IN THE EU

By mid-2022 there was 24 GW of installed offshore wind capacity in Europe, spread over 123 offshore wind farms with a total of 5,795 grid-connected wind turbines³⁶. Germany leads with OWF with 8.1 GW and 1501 turbines, the Netherlands with 3.2 GW and 599 turbines, Denmark with 2.3 GW and 631 turbines and Belgium with 2.2 GW and 399 turbines (see Figure 11 for a visual overview). OWF farms in operation

have both bottom fixed and floating offshore wind (FOW) foundation technologies. Most farms in operation are bottom-fixed due to technological and operational costs, but it is envisioned that more floating farms will be deployed in the future. However, 80% of the world's OW resource potential lies at depths beyond 60m for which floating offshore wind turbines are required (WindEurope, 2021).

Figure 21 OWF in the EU 2022



Note: The figure presents only those coastal member states which have installed offshore renewable energy capacity.

Source: European Court of Auditors, 2023

The deployment of offshore wind farms is central to delivering the European Green Deal's objective of achieving carbon neutrality by 2050. The EU Offshore Renewable Strategy (COM (2020)741), published in November 2020, set a target of achieving 111 GW offshore wind capacity by 2030 and 317 GW by 2050. Figure 11 gives an overview of ORE development in the EU and Table 7 gives an overview of the targets in each country.

Table 10 OWF Capacity and Goals

Country	Installed capacity	2030	2050
Belgium	2.2 GW	5.8 GW	8 GW by 2040
Denmark	2.3 GW	18 GW	35 GW
Germany	8.1 GW	40 GW by 2035	70 GW by 2045
Netherlands	3.2 GW	38 GW	70 GW
TOTAL IN EU	34 GW	111 GW	317 GW

Source Global Wind Energy Council, 2023;
WindEurope, 2021

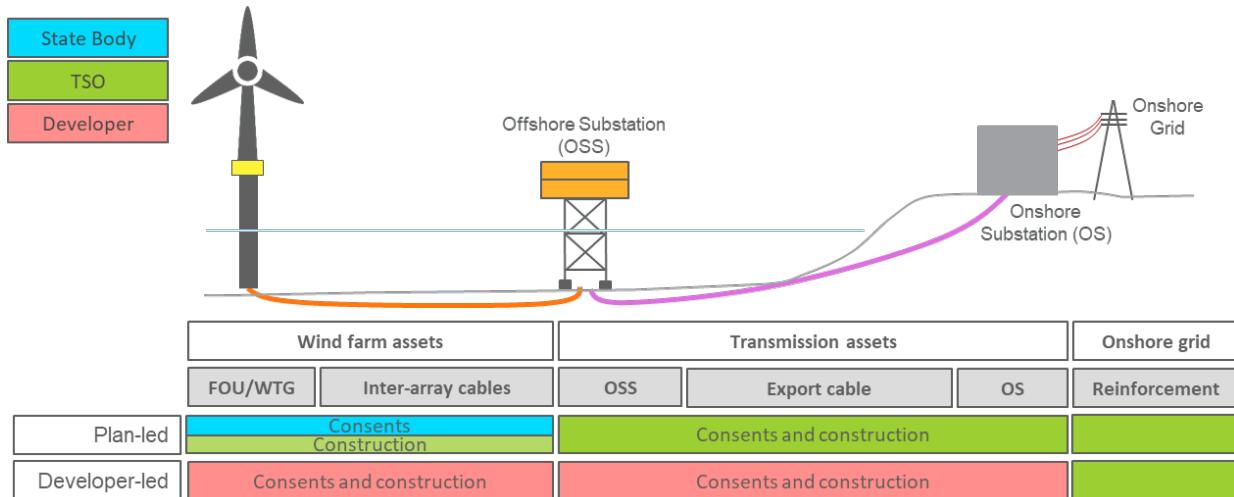
³⁶ European Marine Board. "European offshore renewable energy: Towards a sustainable future." (2023).

8.1. Types of OWF Planning

Two main classes of Offshore Wind Grid Delivery models are used for OWF development: plan-led and developer-led (Nigrant, 2020). The plan-led model

is centralised, and the developer-led model is decentralised. Initially, OWF planning and consenting were developer-led. Figure 12 details how these models are set up. By now, this is shifting through the spatial allocation of OWF sites through MSP to a plan-led model. Table 8 below gives an overview of consenting time per case study country.

Figure 12 Offshore Wind Grid Delivery Models



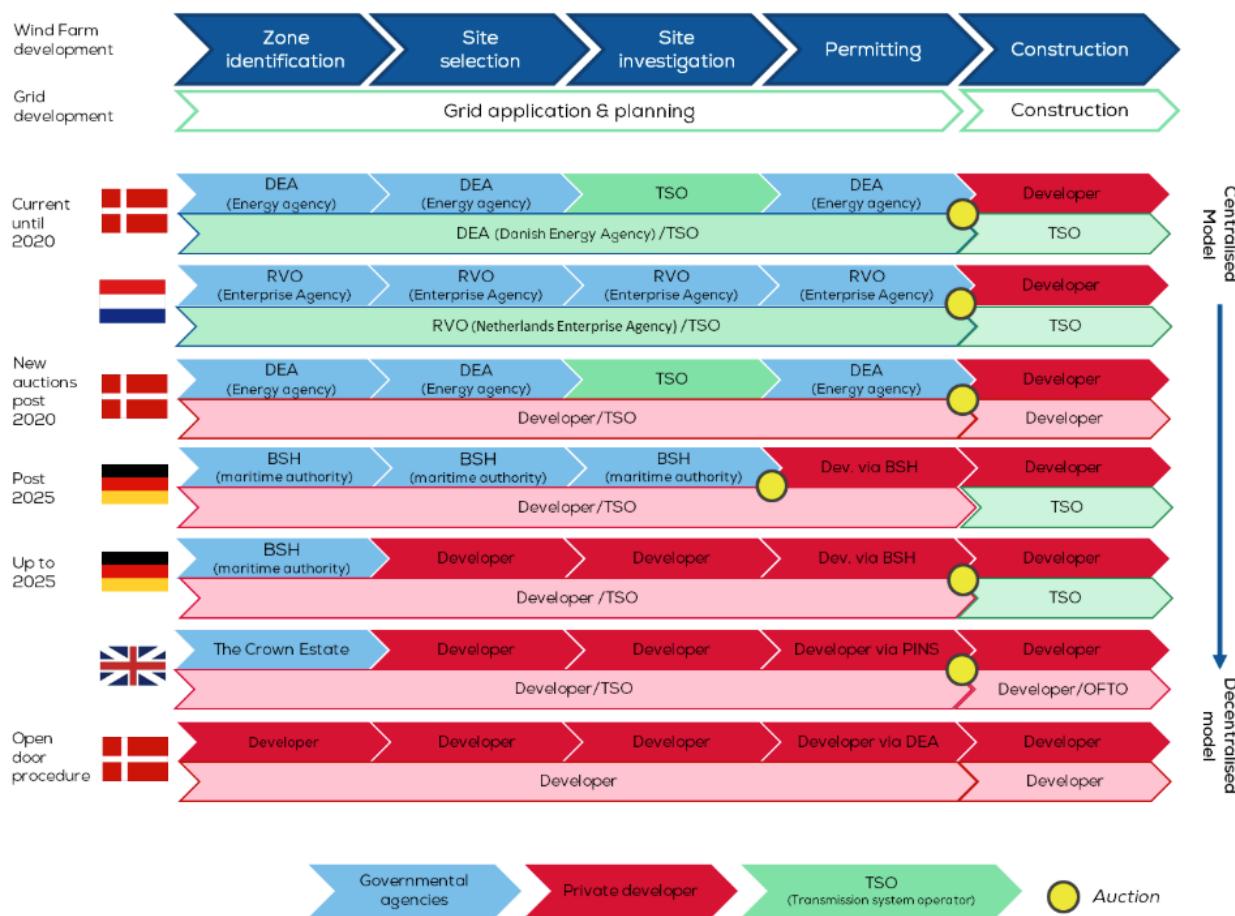
Source: Nigrant 2020

In the **Developer-led model (Open-door scheme)**, developers prepare the consent requirements, pre-develop and select wind farm sites, and develop and build both offshore wind farm and transmission assets (offshore substation, export cables, and onshore connection assets). Developers are responsible for securing the required consents, financing, construction and operation and maintenance of both wind farm and transmission assets. The grid connection point lies onshore, and onshore grid reinforcement would be undertaken by an existing Grid company. Initially, Denmark and Germany used this model.

However, as noted above – Denmark and Germany have, over the past years, also moved to the plan-led model.

For the **Plan-led model (Tender scheme)**, a State body or a Transmission system operator (TSO) is responsible for the complete process of wind farm site selection and pre-development and offshore grid connection development. Figure 13 details how roles and responsibilities are allocated within these two grid delivery models. The Netherlands, Belgium, and by now Denmark and Germany use this model.

Figure 22 Allocation of roles and responsibilities in Grid Delivery Models in Europe



Source: Navigant, 2020

Table 11 Consenting Overview

Assessment of Permitting frameworks in Case Study Countries						
Country	Number of phases	Number of authorities involved	Administrative time (months)	Total lead time (months)	Achievement rate (%)	
Belgium	4	4	13.2	14.7	0.57	
Denmark	4	1	n/a	n/a	0.46	
Germany	3	1	24	36	0.27	
Netherlands	-	-	-	36 to 48	-	

Source: WindEurope, 2020

8.2. Role of MSP in Offshore Wind Power Development

Limited land-based renewable energy sources have driven the pressure to develop OWF in Belgium, the Netherlands, Germany, and Denmark. This pressure

has been increased by the high-level policy commitments acquired from the EU Green Deal. To secure investment for such large projects, MSP has been advocated as a tool that gives certainty to the decision-making process and investment. Table 9 details the linkages between MSP plans and OWF plans in the case study countries.



Table 12 OWF and MSP Linkages

Energy	Belgium	Denmark	Germany	Netherlands
MSP's role in locating OWE	MSP is used to designate spatial areas for renewable energy and OWF the wind turbine area	Until now sectoral decision-making and planning by the Danish Energy Agency. MSP's role is to coordinate use of the sea areas for different uses.	Designation of priority areas is indicative. OWF can be built outside the designated areas.	MSP is used to designate wind energy areas and all the conditions required to build wind farms (location, permit and grid connection etc.)
OWE distance from the shore	12 NM	Smaller OWF located between 4 and 20 km Large OWF are located > 15 km distance	Not defined, but visibility and the National Park has been a reason why far from the coastline. Hub height limited to 125m if visible from coast	Current OWF 6-34 NM off the coast. All new designated OWF areas are at least 10 NM out of the coast.
MSP linked to permit procedure	MSP shows wind turbine area	Guided by the designated Development Zones	Shows suitable areas in EEZ. Indicative designation of suitable areas in EEZ. Permissions outside designated areas possible	Wind farm site decisions are based on MSP designated areas. Wind farms are not permitted to be built outside these designated areas.
Initiative from the operators or from the authorities/planning process?	The authorities define the area, the operators develop the wind-farm layout		New scheme for OWF installations from 2021: designation of OWF areas by authorities. Preliminary assessment included	The State is responsible for designating offshore wind farm areas.

Source: Lukic et al., 2020

8.2.1. Spatial designations for OWF under MSP – overview of zoning system

8.2.1.1. Belgium

OWF is one of the eight main activities in the Belgian MSP. While developing the MSP, the goals set for renewable energy are always considered and spatial areas are designated. The Minister for the North Sea took the initiative to allocate an area of 238 km² in the Belgian part of the North Sea to the production of renewable energy under the first Marine Spatial Plan of March 2014. This area is known as the wind turbine area and occupies about 7% of the Belgian North Sea.

The Federal Public Service for Economy carries out sectoral planning. The minister of Economy sets the energy targets. Elia is the electricity transmission system operator. The responsible authorities provide

the building permits and designate the area for each wind farm company. They are part of the advice commission that decides on the draft version of the MSP.

Since 2020, 2261 MW of OWP has been operational in the Belgian Part of the North Sea (BNS). In 2021, the Belgian Federal Government set an ambitious goal of upscaling capacity by 3.15-3.5GW through new installations in the Princess Elisabeth Zone. Belgium is the fourth largest producer of OWP and has nine operational offshore wind farms.

8.2.1.2. Denmark

The approach for MSP for OWF in Denmark recognises a planning approach which respects the vulnerability of the marine environment and takes all sea uses into account. In 1995 a spatial planning committee for offshore wind was established and led by the Danish Energy Agency. This committee is made up by government authorities responsible for the natural environment, safety at sea and navigation, offshore



resources extraction, visual interests, and grid transmission conditions.

As nearshore wind farms are cheaper than offshore wind farms, a planning exercise was launched to find the most suitable sites for nearshore wind farms. In addition to the large offshore areas, 15 suitable nearshore sites, each with a possible capacity of up to 200 MW, were identified in an initial mapping exercise carried out in 2011. The 15 sites were submitted to a strategic environmental assessment to prevent any future conflicts with environmental and natural interests. In 2012 the spatial planning committee for offshore wind published the results of the planning exercise with the final set of 12 areas seen as the most suitable sites for nearshore offshore wind farms. Knowledge from the environmental monitoring programme for large-scale offshore wind farms and the knowledge collected in environmental impact assessments have continually been fed into this spatial planning process.

8.2.1.3. Germany

Planning for OWE in Germany follows a multi-level system in which the federal government, states, regions, and municipalities play a role in different parts of the planning process (Weber, 2023). The planning of OWF in the German EEZ aims to achieve specific energy targets in accordance with the German Energy Industry Act and WindSeeG, while also ensuring the participation of the interested stakeholders. The MSP considers the interests of, e.g., the energy, fisheries, marine conservation, and shipping sectors, and designates areas to meet energy targets and accommodate other users of the sea. Stakeholders offer feedback on the spatial and area development plans as part of the planning process.

The EEZ's limited size meant that spatial planning alone was not sufficient to regulate wind energy, and that regulatory instruments and sectoral planning had to be used to enable energy achievement. The so-called **Area Development Plan** (see Figures 14) defines the marine sectoral planning of OWF through the definition of areas, sites, and chronological order for tenders, based on the spatial designation under MSP and clusters defined in the **Federal Offshore Plans** (BSH, 2023; BSH, 2023a).

Criteria for identifying suitable areas for offshore wind farms are provided by the statutory objectives within the WindSeeG. In Germany, OWF is spatially organised as follows:

- priority areas
- reserved areas
- suitability areas
- priority areas with the effect of suitability areas

The areas where OWF zones were / are planned were traditionally also host to other activities such as com-

mercial fisheries and shipping. Hence, conflict mitigation measures were adopted through an adequate stakeholder consultation process, which is detailed in the case study fiche.

8.2.1.4. Netherlands

Also, the Netherlands has taken a zonation approach to allocating space and planning for future OWF farms in its MSP. Following consultation with the parties involved the government presented its plans in the 'Offshore wind farms Road Map'. This road map sets out details such as where and when the new wind farms will be built. By doing so, it provides clarity to all stakeholders and ensures certainty for wind farm developers (Noordzeeloket, 2024).

In consultation with the wind energy sector, a new wind energy system has been designed. The system contributes to efficient space use, cost reduction and acceleration of wind power roll-out at sea. In this new system, the State arranged all the conditions required to build wind farms, such as their precise location, the permit and the connection to the electricity network. This was stipulated in an – at that time - new legislation and bill on offshore wind farms, the Offshore wind farms Act (Wet windenergie op Zee), which came into force in July 2015.

The system followed the following process:

1. The National Water Plan designated areas at sea where the construction of wind farms is permitted. It also states that outside the designated wind energy areas, the government does not give permission for the construction of wind farms at sea. The Government has chosen three areas where offshore wind farms were supposed to be developed up to 2023.

2. Within these designated areas, the State makes 'wind farm site decisions.' The Minister for Economic Affairs is responsible for these decisions in conjunction with the Minister for Infrastructure and the Environment (jointly competent authority). Within each designated area, multiple wind farm site decisions were possible. Each site had a capacity of approximately 350 MW, and each time, two sites will be connected to a platform that can process a maximum of 700 MW capacity.

Each wind farm site decision specifies where and under which conditions a wind farm may be built in the area. These conditions leave space for the builders to decide—within specific frameworks—which technique to use. The State draws up an environmental impact assessment (EIA) for each site. This means that no additional EIA was required by companies bidding to develop projects. In addition, the State studied the structure of the site, the soil, the wind speeds and the water data for the sites.

The project developers could use this information in their bid during the tender procedure. The Dutch Government provided all relevant site data, via the



Netherlands Enterprise Agency (RVO.nl), an agency of the Ministry of Economic Affairs. In the Water decree, part of the Water act, some general rules are listed for all wind farms in the North Sea. Before starting the building process, the developer must provide, for instance, detailed plans for the outline of the wind farm, the vessels they are going to use and the marking and lighting of the wind farm to the competent authorities.

3. The State provides subsidies to companies to construct the farms. The company that can build the best and least expensive wind farm will be simultaneously granted the subsidy and the permit to build the wind farm.

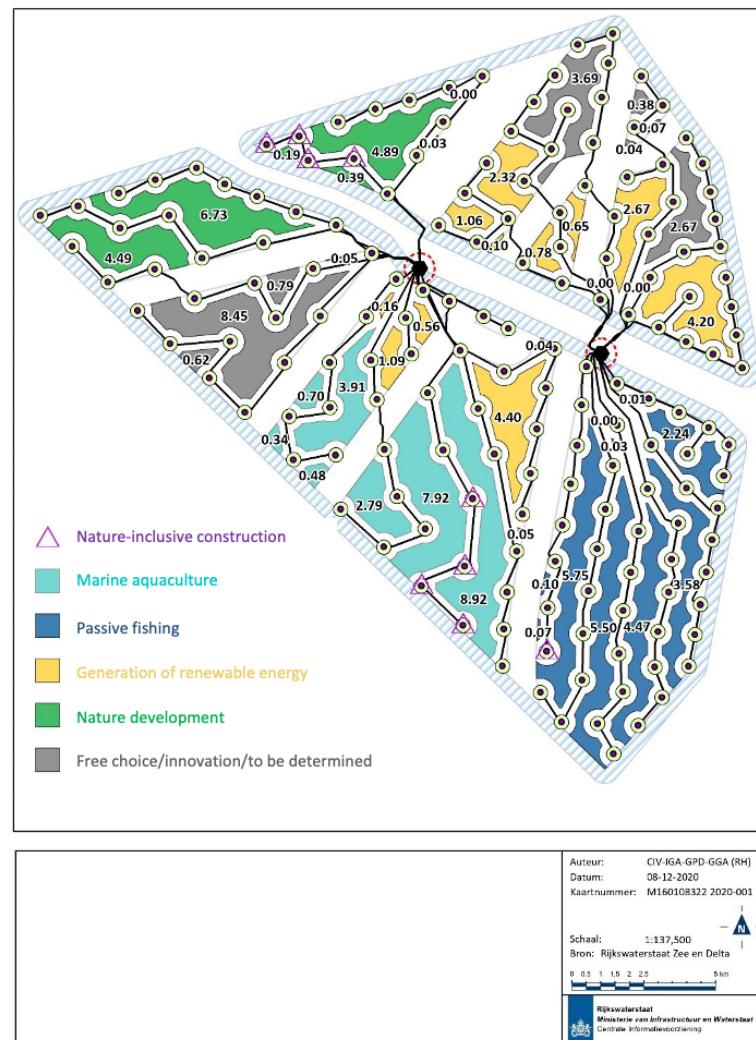
Rijkswaterstaat coordinates the monitoring of the expected impacts, to learn for future EIAs (adaptive management). Under this new legal framework, the Dutch transmission system operator TenneT is responsible for the electricity transmission infrastructure needed for the offshore wind farm. The Electricity Act 1998 was amended to formally designate TenneT as operator of the offshore grid, including the legal framework for the planning of the roll-out and the establishment of its statutory liabilities for delays and faults. TenneT will construct five platforms of 700 MW with two 220 kV cables to the high-voltage network on land. Two wind farms can be connected to each platform.

As an additional new development, the Dutch Offshore Wind Road Map identifies area passports as an approach to facilitate ORE use combinations. The

"Area Passport" Guide defines zoned areas with space in a wind farm for shared use. Other areas not available for shared use are lanes for free passage of shipping, maintenance and safety zones around platforms, wind turbines and infield cables, and logical shipping supply routes (Noordzeeloket, 2021). Area Passports are developed for areas outside the OWF turbines. It is, therefore, not part of the permits for individual OWF areas. The area passports indicate potential use combination areas, including passive fishing (crab and lobster), aquaculture, nature enhancement/ restoration, including artificial reefs, and other forms of renewables such as solar energy. There are plans to move from project-level details to setting up a policy that considers area passports at a North Sea level to identify the best locations for use combinations (Noordzeeloket, 2022).

The Ministry of Infrastructure and Water Management is currently undertaking area surveys as part of the preparation of the Wind Farm Site Decisions to develop more detailed guidance concerning area passports once OWFs are commissioned. Following the application process and receipt of the necessary permits, the co-user can subsequently use the space available within the wind farm. In terms of shipping corridors, in principle, one or more passages will be designated in each Wind Farm Zone, making it possible to pass through the area logically and under specific conditions.

Figure 23 The Borssele OWF area passport and proposed OWF use combinations



Source: Noordzeeloket, 2021

Non-financial tendering criteria: The Dutch government also integrates non-financial criteria in the tendering and auction process to support innovative combinations between users and ecology. The Dutch Government, as part of the tender process for the Hollandse Kust (west) Site VI, added 'contribution to the ecology of the North Sea' as a criterion for comparative assessment between development applications.

The licensing scheme for Hollandse Kust (north) and Hollandse Kust (west) Site VI also included a criterion to encourage innovations that benefit the integration of future wind farms into the Dutch energy system.

The introduction of these criteria has led to the consideration of innovative approaches for a combination of OWF with other ORE developments, such as solar energy and ecology within the design of OWF.



8.3. Spatial Conflict Resolution

The development of OWF places additional pressure on the existing use of sea space, which may result in conflicts with other sectors. Measures such as co-location, where possible, have been proposed in addition to mitigation measures. In cases where this is not feasible (e.g., commercial fisheries), compensation mechanisms have been developed.

The MSP Directive and other policies advocate for the co-location of marine activities. However, strict insurance and liability policies can limit implementation. The feasibility of co-location of offshore activities remains at a research level, without commercialisation in place yet. For example, in the Belgian part of the North Sea, WindEurope found that OWF can be compatible with aquaculture, other ORE devices energy storage and passive fishing (WindEurope, 2018).

Governments and developers must ensure a public consultation process is carried out throughout the planning, application, and operation of OWF to minimise conflicts and comply with legal requirements on stakeholder consultation (e.g., the Aarhus Convention). In the following, we provide examples of spatial conflicts and examples of resolution mechanisms in the case study countries. The EU MSP Platform provides further detail on all sectors and conflicts (2018a)³⁷.

8.3.1. OWF and Shipping Lanes

Safety margins around OWPs

Safety zones must be up to 500 metres as defined by Article 60, clause 5 of UNCLOS, and IMO routes cannot be changed without going through a process with the IMO, which is not common practice. Ships can use routes outside of the IMO-designated shipping lanes so long as they avoid the OWF safety zones. In this case, using radars and good marking of OWFs is crucial.

However, some countries designate safety margins along the outer edges of shipping priority corridors. Denmark and Germany, for example, have added 2 nm along traffic separation schemes and their continuations. These areas do have another status in the plan than the priority areas and usually other (compatible) uses are allowed here. This is not the case for Latvia and Lithuania where safety margins are included in the priority areas and thus hold the same priority status. Other countries, like Estonia and Finland, will designate safety margins but probably only very case specific. Still others are not designating additional safety margins along the shipping corridors at all. In Poland, safety margins for ship traffic will be added to the priority areas for offshore energy. Here, ample space will be given around offshore structures

to avoid collisions at sea. Sweden, on the other hand, has not designated safety margins at all. Swedish planners argue that the risk assessment from IMO for traffic separation schemes should guarantee sufficient space for ships. Partly, the argumentation is also based on the Swedish strategy of designing corridors and areas that are of national importance. Here, additional space for the shipping sector as well as smaller routes rely on the "freedom of navigation" and are not further indicated in the plan.

Shipping corridors within OWPs

Integrating shipping lanes within offshore wind farms is a complex issue that varies by country. While some nations, like Belgium, restrict commercial shipping within OWFs to only maintenance and government-operated vessels, others, like the Netherlands, are more permissive, allowing for both commercial and recreational passage with specific regulations to ensure safety.

The Netherlands initially prohibited shipping within OWFs but has since adapted its approach. As of 2018, smaller vessels up to 24 meters long are allowed transit passage during daylight hours, with strict equipment requirements such as an operational AIS transponder and marine VHF radio tuned to channel 16. The Dutch North Sea Agreement further aims to designate logical passages for larger vessels up to 46 meters, for 24/7 access, integrating shipping corridors into wind farm designs post-2018. Belgium takes a more restrictive approach, only allowing maintenance and government-issued vessels, like military and research boats, within OWF areas. Nevertheless, the layout of wind park areas includes corridors between different wind farms to facilitate shipping.

8.3.2. OWF and commercial fishing

OWF impact commercial fisheries in the North and Baltic Sea. Depending on national regulations, fisheries access in Offshore Wind Farms is often restricted. This can result in the loss and/or displacement of fishing grounds of fisheries.

Countries that allow fishing within OWFs have adopted diverse approaches to ensure conflict reduction and foster co-existence.

The Netherlands adopts a proactive approach by **integrating passive fishing methods** such as traps, creels, and longlines within specific OWF areas, as exemplified in the Borssele wind farm. Currently, passive fishery only occurs on a trial basis; however, the established policy extends to future wind farms, promising dedicated areas for passive fisheries based on previously determined viability. Additionally, the establishment of a **Transition Fund** aims to

³⁷ EU MSP Platform Technical Study on Addressing conflicting spatial demands in MSP



compensate fishers and support sustainability innovations, though details on its application remain pending.

Denmark generally does not prohibit fisheries within offshore wind farms. Offshore wind **developers must negotiate with fishers** and ensure fair mitigation and compensation strategies are in place. These may include compensation for documented losses, providing alternative revenue opportunities, and special arrangements that allow for fishing within wind farms or over cables, provided **proper burial and other safety measures** have taken place. Special to Denmark is the fact, that – other than in the other case study countries) bottom trawling is allowed under certain conditions (due to burial of cables).

When co-location or coexistence is not possible, financial compensation for the displaced activity is in all countries offered, which are subject to national legislation. In Belgium, Germany, and the Netherlands, the compensation is, however, not provided directly to fishermen – but is organised through transition funds, where the use is defined through the ministries in charge and/or working groups. As shown, only in Denmark do fishermen have to be directly compensated for the (proven) loss of income by the OWE developers.

8.3.2.1. Example: Offshore Wind EIA processes in Denmark account for the impact on commercial fisheries

Offshore wind EIA processes in Denmark account for the impact on commercial fisheries³⁸. During the tendering process of an offshore wind farm in Denmark, an exhaustive Environmental Impact Assessment (EIA) of the designated offshore area, export cable route, and onshore grid connection is completed by the Danish Transmission System Operator (TSO), Enginet, and fully consented before the bidding date. The Danish Kriegers Flak case study provides a typical example of the environmental impact assessment (EIA) process required ahead of an OWF implementation and illustrates how the knowledge gaps on anticipated OWFs effects on commercial fisheries are currently tackled in such EIAs. The EIA report is based on the principle of the greatest conceivable environmental impact, through a combination of a “most likely” and a “worst case” approaches, to ensure that subsequent EIAs are not necessary for the specific project. The EIA aims to evaluate the largest possible environmental impact, along with the potential cumulated effects with the other nearby offshore wind farms.

Compensation for temporal and permanent losses of fishing grounds at all stages. Denmark is the only North Sea country where, according to the Danish Fisheries Act, all fishers who normally fish in the affected area, must be compensated for the loss of income. It is the developer's responsibility to negotiate compensation with all affected fishers, and the license to produce electricity from the offshore wind farm (power plant) can be granted to the Developer only if an agreement has been made with all affected fishers.

Different mitigation measures to enhance coexistence between OWF and fisheries. The following mitigation measures are applied within the Danish planning and licensing process:

- Compensations are paid for documented losses with, for example, two- to ten-year data. compensation for disturbances to fisheries during the construction phase and for permanent losses, as well as the amount of possible compensation, should be as far as possible determined prior to commencement of offshore construction;
- Limiting the exclusion areas by dividing the construction area into different phases;
- Providing substitute revenues by including some fishing vessels or fishermen in the construction and operation of the offshore wind farm, e.g. as guard vessels;

8.3.2.2. Allowing fishing with static gear inside the wind farm, under agreed conditions.Example: Prohibition of fishing in OWF farms in Germany

Fishing is generally not allowed in offshore wind parks in German waters. However, the Spatial Development Plan for the German EEZ allows fishing vessels to pass through wind parks on their way to fishing grounds. In addition, passive methods such as pots and traps should be possible in the safety zones of the wind parks, as far as construction, operation, and maintenance of the wind parks are minimally affected, and subject to conflicting specialist legal regulations. However, this regulation generally does not apply to the area delimited by the outer structures of the wind park and not to the immediate vicinity of the outer structures. Nevertheless, two examples near Helgoland show that multiple use of the seas by fishing and OWFs is possible. In this case, fishermen must ensure a) 150m from the structures, b) fishing permits are based on current weather conditions, and c) a maximum speed must be maintained.

³⁸ In general, the EIA methodology varies across cases. Most EU jurisdictions normally consider the environmental impact of OWF or the suitability of offshore wind zones but not the displacement of fisheries. More available [here](#): click



8.3.3. OWF and aquaculture

Large-scale offshore aquaculture operations and offshore wind power projects, both fixed installations that require regular maintenance, often compete for the same spatial resources. Co-location of OWF and aquaculture is complex, and only Belgium requires and allocates multi-use in its new MSP. The Belgium MSP Royal Decree establishes that aquaculture may be authorized in OWF zones as long as the following conditions are met, consent from the concession holder; aquaculture reducing the level of eutrophication designation of control zones.

In the Netherlands, the Dutch Offshore Wind Farms Road Map 2024-2030 defines OWF areas where combination with aquaculture and passive fishing are suitable to inform future shared uses. The mapping process indicated the activity is absent, where this activity is present, and where there is potential based on predicted gradients. The potential areas were then graded into good, very good, best, suitable, and less suitable according to aquaculture type as detailed in Table 10. As shown before – the so-called area passports subsequently then show areas, which are suitable for various uses, including aquaculture – but also nature restoration or passive fishery.

8.3.3.1. Example: Scientific pilot projects to test the co-location

MSP stipulates that the establishment of aquaculture facilities should be near or in combination with existing or under-construction facilities, with the maintenance and operation of the other facilities to be minimally affected by the establishment and operation of aquaculture. Environmentally friendly types and forms of aquaculture should be chosen.

The development of combining renewable energy with sustainable biomass production (algae/mussels for various purposes) is, however, in all EU countries still in the developmental phase. Scientific pilot projects, such as UNITED/ULTFarm/OLAMUR, aim to demonstrate the feasibility of such multiple-use combinations. Also the “Dutch Rich North Sea” programme sets out various test sites for OWF and aquaculture options.

However, innovative infrastructures, even for research purposes, currently undergo lengthy administrative processes due to the lack of predefined rules. Commercial aquaculture permits typically take between 5 and 10 years and reflect a robust regulatory approach that can occasionally hinder innovation.

8.3.4. OWF and Nature Conservation / Marine Protected Areas

The potential environmental impacts of Offshore Wind Farms (OWFs) are diverse and necessitate a range of mitigation strategies. In principle spatial

segregation stands out as the most effective method for minimising negative impacts, involving careful initial site selection to avoid areas of high conservation value, which would exclude Marine Protected Areas (MPAs) as potential OWF locations. Effective ecosystem-based MSP and Strategic Environmental Assessments (SEAs) are actively used in case study countries to ensure that renewable energy deployment avoids areas containing sensitive habitats, species, and ecological processes. Sensitivity mapping is a valuable tool for renewable energy planning, aiding developers and regulators in steering wind energy development away from nature-sensitive areas, thus reducing business risk.

However, complete segregation may not always be feasible, particularly concerning cable connections to the mainland or service vessel routes, where avoiding protected areas can prove challenging. Thorough MSP is a valuable tool for selecting or ruling out OWF and MPA locations aiming to prevent or mitigate spatial conflicts over the long term. Nevertheless, in instances where MPAs cover a significant portion of a marine area, segregation becomes challenging, and interactions with OWF activities may become unavoidable, as evident from the Borselle offshore wind farm derogation case in the Netherlands. Namely, the derogations under the Habitats Directive and Birds Directive are vital in determining if OWFs can overlap with protected areas. These exceptions allow OWF development if specific conditions are met, including demonstrating overriding public interest and implementing compensatory measures. Assessing these derogations is crucial in the decision-making process for OWF development in protected areas designated by the Habitats and Birds Directives.

When planning OWFs in sensitive areas, including MPAs, and when knowledge of impact levels is insufficient, starting with small-scale projects enables environmental impact monitoring and data collection to define no-go criteria for further development. If avoidance is impossible, competent authorities must implement mitigation measures. Table 8, available in the annexes, details the mitigation hierarchy for OWF impacts on nature conservation at the project level.

In cases of significant residual impacts, ecological compensation may be necessary, typically involving habitat restoration or creation. However, these measures are considered a last resort due to their complexities and costs.

In general, OWE's impacts on nature have to be distinguished by the various phases of OWE development, i.e., the construction phase, the implementation phase, and finally, the decommissioning phase. While normally especially the construction phase is seen as environmentally harmful; recent scientific projects have also taken into account the environmental impact of the decommissioning phase to ensure the proper removal of



infrastructure and restoration of sites once projects conclude. For example, in the UNITED Belgian pilot, a method statement outlines the decommissioning process, including the removal of infrastructure like seaweed cultivation and restoration tables.

8.3.4.1. Example: Spatial overlap between OWF and MPA in Belgium

In Belgium, the Vlaamse Banken Natura 2000 site overlaps with a new offshore wind zone, which has been criticised, but it was argued that this overlap is due to the limited space availability in the Belgium Part of the North Sea (BPNS). In response, a project has been set up to fill the gaps in knowledge of the potential effects and impacts of offshore developments and investigate how nature objectives can be combined with the development of the OWF zone (EDEN project). In March 2022, it was announced that additional protection measures will be proposed for two new offshore wind parks that are currently near or in protected areas.

8.3.5. OWF and Nature Restoration

The key findings related to the successful implementation of multi-use combinations of offshore

wind and nature restoration highlight several important aspects, including the need to address legal constraints, ensure alignment with conservation objectives, and early planning for decommissioning.

Efforts to restore native flat oyster reefs within offshore wind farms have shown promise, especially in the North Sea region. Through suitability assessments, utilising tools like population dynamics models, researchers have identified potential sites for habitat restoration, considering factors like population growth, fitness, and self-recruitment. Generally, coastal and nearshore environments are more suitable for flat oyster habitat restoration due to faster population growth rates.

Countries like the Netherlands have introduced **non-financial tendering** and auction criteria to encourage innovative combinations of offshore wind farms

with ecology. These criteria consider contributions to ecology in the assessment process, promoting investments in biodiversity and stimulating innovation for future offshore wind farms.

8.3.5.1. Example: A special case of nature restoration and low trophic aquaculture

A UNITED pilot project in Belgium has been working on the flat oyster reef restoration and aquaculture and seaweed cultivation within the safety zone of an offshore wind farm, where fishing is restricted. UNITED project partners have been working for over years to find the best technical and managerial solutions in a pilot aquaculture farm and oyster restoration within the designated zone for offshore wind in the Belgian offshore space (Exclusive Economic Zone). Models to correctly position the longlines were applied, proper systems for spat collection and grow-out were developed, and several scour protection materials were tested. In addition, they combined the culture of flat oyster and sugar kelp on the same longline and compared the characteristics of sugar kelp grown nearshore and offshore.

8.3.5.2. Example: Mitigating the Seabird Habitat Displacement

The development and operation of offshore wind farms in the North Sea have various impacts on seabirds. The three main effects are: 1) collision mortality, 2) displacement and attraction, and 3) barrier effects. This is why determining the species-specific risk of collision between birds and turbines needs to be addressed in offshore wind farm planning. To develop mitigation solutions, data gathering and assessment, monitoring models need to be created first. The Dutch government ran the Wozep (Offshore Wind Ecological Programme) avian research programme from February 2019 to 2021 in and around the Luchterduinen offshore windfarm to gain insight on species-specific fluxes, avoidance, and flight behaviour of birds (Leemans et al., 2022).

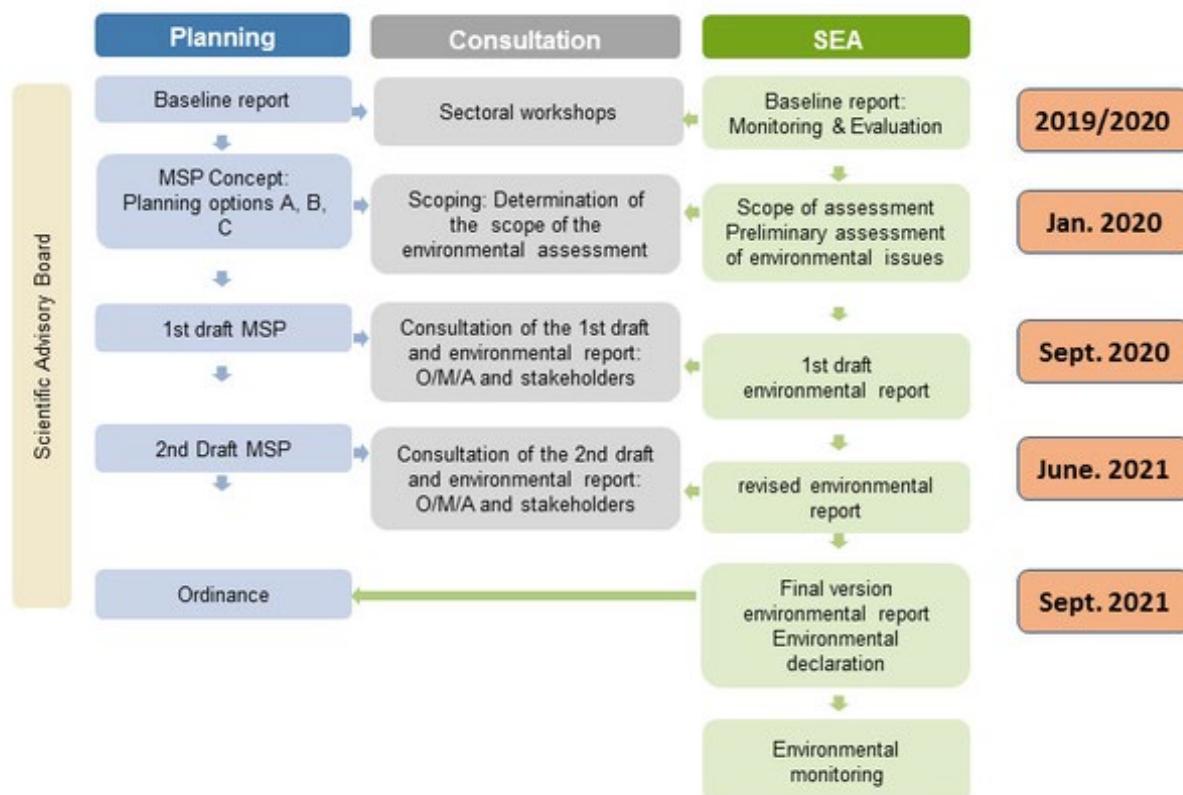
9. STAKEHOLDER CONSULTATION

Member States are required to create opportunities for public involvement by providing information to all those who are interested and consulting with the appropriate stakeholders, authorities, and the affected public in the initial phases of developing maritime spatial plans. In Article 9, the MSPD requires member states to "establish means of public participation by informing all interested parties and by consulting the relevant stakeholders and authorities, and the public concerned, at an early stage in the development of maritime spatial plans." Stakeholder consultation can provide a governance mechanism through which conflicts between OWF, and other sectors can be identified at the beginning of a plan and resolved. Throughout the case study countries, there are a variety of best practices identified.

The minimum level of stakeholder engagement of the Directive only requires a normative formal approach which can be observed in the case of Denmark and Germany. In this approach, the MSP draft plan is published for consultation and interested stakeholders submit written observations.

In Germany, the consultation process follows an extensive process initiated by the Federal Ministry of the Interior for Building and Community (BMI). BMI and BSH inform the public and relevant authorities about the draft plan and corresponding environmental reports. Public authorities are given the opportunity to provide information on any plans and measures they intend to take in the EEZ or have already taken. This is followed by thematic workshops and expert discussions on shipping, nature conservation, fisheries, underwater cultural heritage, defence and raw material extraction. Figure 16 provides an overview of the consultation process that was followed for the 2021 MSP. Furthermore, international participation in the consultation process was extended to neighbouring countries (e.g., England, the Netherlands, Sweden, Poland, Latvia, and Estonia, while Belgium, Denmark and Ireland requested to participate but did not submit comments.

Figure 24 Consultation Process for 2021 MSP



Source: 1 BSH, 2023

In the case of the Netherlands and Belgium, stakeholder engagement is taken a step further through innovative practices. In the Netherlands, this is observed through the development of a participatory tool, "Communities of Practice" (see below in detail). In Belgium, stakeholder engagement was supported through the development of a vision process resulting in the Belgian Vision for the North Sea 2050 policy document, which complements the national MSP (Lukic et al., 2018).

Dutch Community of Practice

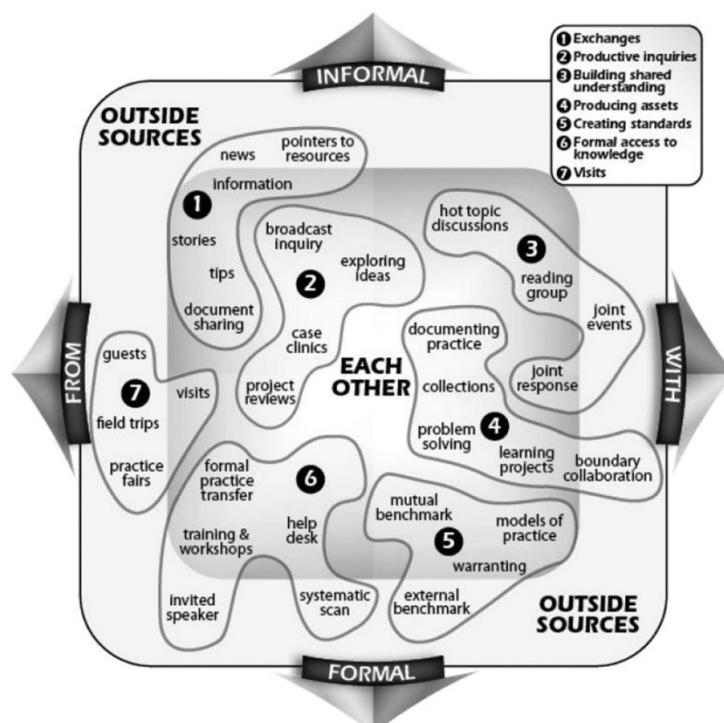
The Dutch Community of Practice North Sea (COPNS) has been set up as a hybrid of a boundary organization and voluntary groups, which provides a learning environment and makes recommendations for adaptive policies for energy, nature, and food transitions as well as use combinations. The COPNS, as a national network, includes over 600 members from government agencies, research institutes, NGOs, and private companies that work together on blue economy sectors and multiuse. The COPNS engages with start-up developers such as seaweed farms, wave, tidal, and solar to discuss how to discuss licensing, planning, and regulatory processes to support new activities and use combinations. See Figure 14 for a conceptual explanatory diagram.

The Netherlands Enterprise Agency (RVO) was tasked with its organisation and setting up a platform on which all North Sea stakeholders meet and

debate, where initiatives are forged and where people work together on solutions. The COPNS was set up to ensure that initiators are responsible for developing their business cases, risks and investment decisions. The Dutch Government is responsible for facilitating licensing, at appropriate moments, by creating frameworks and commissioning a strategic investigation into (cumulation of) environmental impact. The COPNs meetings have a steady attendance of between 50 and 70 participants including Government, offshore energy companies, research institutes, fishing industry, water sports and the financial sector. The first meeting focused on how to support entrepreneurs involved in or interested in ORE use combination pilots, so that needs could be addressed in subsequent COPNS meetings. Subsequent meetings have covered different topics including OWF and multi-use, nature conservation and development, food production, policy and regulations, funding for research and innovation, restoration of shellfish beds amongst others.

The COPNS predominantly focused on two activities: (1) 'exchanges', and (2) 'productive inquiries'. The COPNS is also involved in 'building shared understanding' (3) and 'formal access to knowledge' (4). 'Producing assets' (5), 'creating standards' (6) and 'visits' (7). Beyond these, the COPNS was used to discuss and develop the area passport concept for use combinations. Members present their ideas to the government and find partners to collaborate with on innovative OWF-use combination projects.

Figure 25 Joint Activities in Communities of Practice



Source: Steins et al., 2021



10. REGIONAL COOPERATION

The EU MSP Directive (Art. 11)³⁹ encourages Member States with bordering marine waters to cooperate in developing their MSP plans to ensure coherence and coordination across marine regions. Furthermore, Article 12 of the Directive encourages cooperation with third countries at a marine region level, ensuring compliance with international law and conventions relevant to managing the marine environment (e.g., Espoo, Aarhus Convention etc.). Various other EU Directives require transboundary cooperation, particularly in the management of the environment (e.g., MSFD, WFD, EIA, SEA, etc.).

More specific to the OWE sector, specific policies and projects have been developed at a sea basin level to ensure coherence in the development and technical efficiency of the sector. This is briefly described in section 6.1.2.

10.1. Transboundary consultation and cooperation in MSP

In general the terms ‘consultation’ and ‘co-operation’ should be distinguished and be described as follows:

- **Consultation** is arising in the elaboration of maritime spatial plans, e.g., transboundary impacts of the plan or transboundary coherence of the planning provisions. This usually occurs in bilateral or trilateral interactions (cross-border interactions) and refers to the formal process between affected countries and their authorities on specific provisions foreseen in each Maritime Spatial Plan.
- **Cooperation** on maritime spatial planning is understood as a more open and preparatory process with focus on information and knowledge exchange as well as development of common understanding. Co-operation often concerns strategic and farsighted decisions on joint directions, guidelines and principles for the development of marine areas.

10.1.1. Transboundary Consultation on MSP

Following the Espoo convention, EU Member States must consult each other to consider the plan's trans-

boundary impacts and coherence on planning provisions. The consultation usually takes place by sharing the draft MSP plan and accompanying SEA with all the bordering Member States in writing and is often followed by a meeting. The draft plan is usually translated into the English language before sharing. The report on how comments have been taken into consideration is then usually prepared.

10.1.1.1. Transboundary Cooperation on MSP

Both the North and Baltic Sea Regions are very advanced in terms of regional collaboration on MSP, which is mainly facilitated via the Regional Sea Conventions. Such collaboration initiatives go beyond single-plan consultation and have defined regional planning priorities and how countries plan as a region. Funded often through EU-funded projects – collaboration and cooperation have been fostered at the ‘working level’, i.e. among MSP planners in all given countries as well as contributing research institutes/experts – as well as providing resources for extended transboundary stakeholder engagement and data sourcing/alignment. Hence such initiatives have contributed to more coherent planning and alignment on the planning criteria, data standards used in plans, environmental parameters, more effective consultation practices, etc.

More formally, the HELCOM-VASAB MSP Working Group was established as a task force in 2019 within the Baltic Sea Region to promote coherence between MSPs and develop common criteria to evaluate cross-border coherence. Member-States send representatives of both MSP Authorities as well as Environmental Ministries to this group – which in some countries coincide in case the MSP authority is placed within the environmental ministry.

The HELCOM-VASAB “Guidelines on transboundary consultations, public participation and co-operation” adopted by the HELCOM Ministerial Meeting in 2013 and welcomed by the VASAB Ministerial Conference in 2014 clarify how consultations should be carried out (HELCOM, 2019). Even though being of non-binding character, all EU Member States adjoining the Baltic Sea have adhered ever since to these guidelines:

³⁹ Article 11: As part of the planning and management process, Member States bordering marine waters shall cooperate with the aim of ensuring that maritime spatial plans are coherent and coordinated across the marine region concerned. Such cooperation shall take into account, in particular, issues of a transnational nature.



Recommendations on transboundary consultation and cooperation for a specific MSP process include:

1. Broaden the scope of transboundary dialogue beyond the Espoo convention.
2. Establish a formal process of transboundary information exchange and consultation early in the MSP process.
3. Organise stakeholder involvement in the transboundary consultation process via the authorities in the neighbouring country.
4. Develop a transnational consultation strategy (minimum requirements)
5. Strengthen informal transboundary cooperation processes.

Recommendations for transboundary pan-Baltic cooperation

1. Continue cooperation under the auspices of the VASAB CSPD/BSR, the HELCOM HOD and the HELCOM-VASAB MSP working group.
2. Create and facilitate expert groups for pertinent MSP topics and issues and implementing their results.
3. Engage and cooperate with other pan-Baltic organisations on a continuous basis.
4. Promote informal pan-Baltic co-operation of MSP practitioners.

Beyond the Baltic, there have been numerous other EU-funded projects, which specifically aim to foster regional cooperation within sea basins (e.g., SIMNORAT, BalticSCOPE, REGINA-MSP, SIMCELT, etc.). Moreover, the EU Commission has been instrumental ever since the adoption of the EU MSP Directive in fostering EU wide knowledge exchange, transfer and generation through the so-called EU MSP Assistance Mechanism, which does not only run the EU MSP Platform, but also fosters EU wide collaboration on MSP especially by facilitating the EU MSP Authority Working Group as well as providing knowledge input by targeted studies.

10.2. Regional Cooperation for OWE

The EU's ambitious target of achieving 300 GW of OWF by 2050 necessitates regional cooperation across sea basins. Regional sea conventions such as the HELCOM-VASAB MSP Working Group under the Helsinki Commission (HELCOM) for the Baltic Sea, can help harmonise and coordinate the planning of offshore renewable energy between Member States. These conventions aim to protect the marine environment of specific marine regions and provide forums to share knowledge and make legally binding decisions. Strengthening sea basin cooperation and coordination with other regional fora dedicated to renewable energy and maritime planning is essential

for fostering sustainable development in offshore energy projects.

Formalized sea basin co-operations, such as the North Sea Energy Cooperation (NSEC) or the Baltic Energy Market Interconnection Plan (BEMIP), are important political platforms. The NSEC, for instance, supports and facilitates the development of offshore grid development at a regional level, with four support groups focusing on hybrid and joint projects, MSP, support framework and finance, and delivering 2050 renewable energy goals.

Furthermore, Belgium, Denmark, and Germany have entered a joint pact titled "The Declaration of Energy Ministers on the North Sea as a Green Power Plant of Europe." Under this pact, they commit to install 65 GW of offshore wind power by 2030. This ambitious goal shall be accomplished by interconnecting offshore energy islands between these three countries, exemplified by the connection between the Danish Energy Island and the Belgian Energy Island, as well as between the Danish Energy Island and the Dutch energy hub.

Similarly, in 2023, the Netherlands, Belgium, France, Germany, Denmark, Norway, Ireland, and Sweden have signed agreements under the Greater North Sea Basin Initiative (GNSBI). This initiative streamlines government structures to facilitate quicker and more effective collaboration between countries and sectors, enabling easier knowledge sharing. For example, insights into the cumulative impacts of wind farms and shipping on the North Sea are exchanged. The European Commission has recognized GNSBI as a model for international spatial planning optimization in Europe.

Also, in response to the 2022 energy crisis the Heads of Government and Energy Ministers from eight Baltic Sea countries (Denmark, Estonia, Finland, Germany, Latvia, Lithuania, Poland, and Sweden) signed the Marienborg Declaration on August 30, 2022 (Baltic Sea Energy Security Summit, 2022). This landmark declaration sets forth an ambitious target of achieving at least 19.6 GW of offshore wind production by 2030 in the Baltic Sea region, with a cumulative potential of 93 GW. To realise this vision, these nations commit to expediting permitting processes, ensuring the harmonious coexistence of economic and ecological interests, and fostering collaborative renewable energy projects across borders, while addressing infrastructural needs.

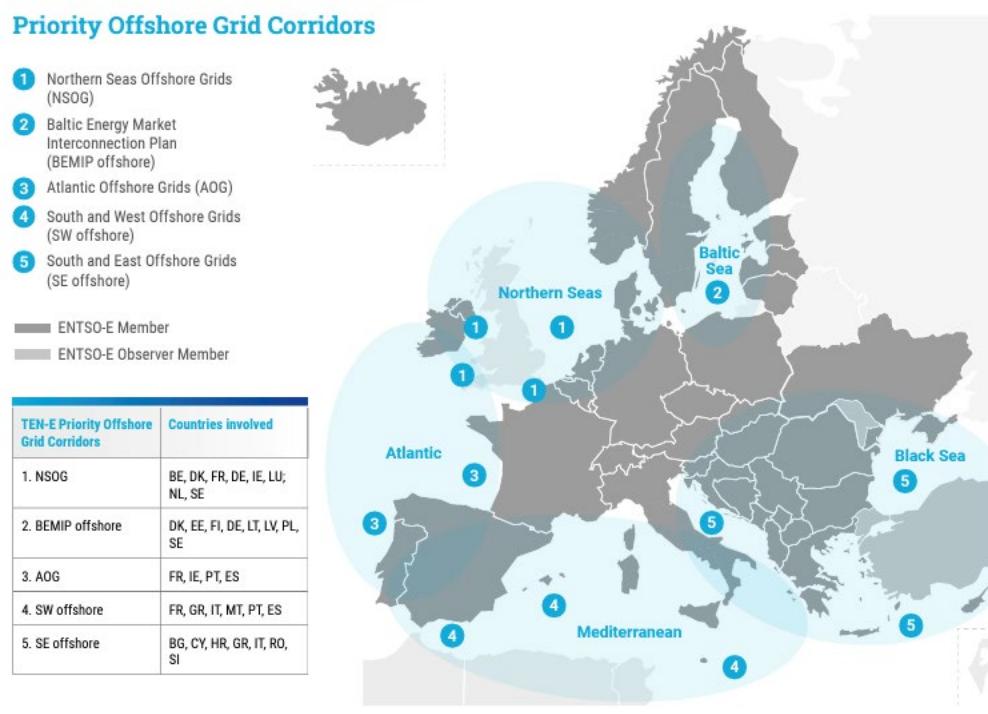
10.3. Cross-border hybrid projects

The Offshore Network Development Plan (ONDП) provides some high-level information related to this transmission infrastructure in the TEN-E offshore priority corridors, which is needed to connect the offshore renewable energy sources (RES) capacities

foreseen by EU Member States and some neighbors. The plan is based on the European Member States' non-binding agreements on offshore goals from January 2023. In line with the European Commission's Offshore RES Strategy from 19 November 2020 and Regulation (EU) 2022/869, EU Member States agreed to increase their efforts to integrate up to 354 GW of offshore RES generation capacities by 2050 in European energy systems. This plan aims to accelerate the implementation of the European offshore RES targets by providing information for multiple political and industrial discussions. "The development of

the offshore network infrastructure should happen in synergy with the protection of the maritime environments, achieving a sustainable energy system co-existing with biodiversity. Therefore, the ONDP can contribute to the coordination between offshore installations and other users of the maritime space such as environmental protection areas, fishery, shipping, military usage and sand extraction.

Figure 26 TEN-Priority Offshore Grid Corridors according to Regulation (EU) 2022/869



Source: TYNDP 2024



11. TRANSFERABILITY OF EU MSP PLANNING PRACTICES TO JAPAN FOR THE ADVANCEMENT OF OWF DEPLOYMENT

Led by the MSP Directive as a common framework and aiming to advance and reconcile the sustainable blue economy and nature protection, EU member states have adopted MSP as a suitable tool for managing ocean uses. MSP has been particularly praised for facilitating the expansion of offshore wind, which is well-advanced in many EU North Sea member states, as detailed in this report. Good practices identified in these countries, related to governance setup, zoning, and stakeholder engagement, among others, provide valuable insights for the current planning efforts in Japan. This chapter covers several relevant aspects that could have transferable value in the Japanese context, highlighting pertinent recommendations and conclusions.

11.1. Governance Structure

While the case study countries of the Netherlands, Belgium, Denmark, and Germany exhibit differences in how the MSP governance has been set up, e.g. multi-level versus single authorities, there is a clear distribution of planning responsibilities for distinct maritime territories. Whereas Denmark, Belgium and the Netherlands prepare one single plan for their entire sea space, Germany has different authorities in charge, with the Federal states' authorities being responsible for their own 12nm zone and the federal level ministry dealing with the areas of the German EEZ. In addition to the overarching MSP (covering all sectors), the federal ministry also develops a specific Offshore Wind Area Development Plan for the German North Sea and Baltic Sea, providing

more detailed sectoral planning and spatially allocating future OWF farms to reach its offshore renewables goals.

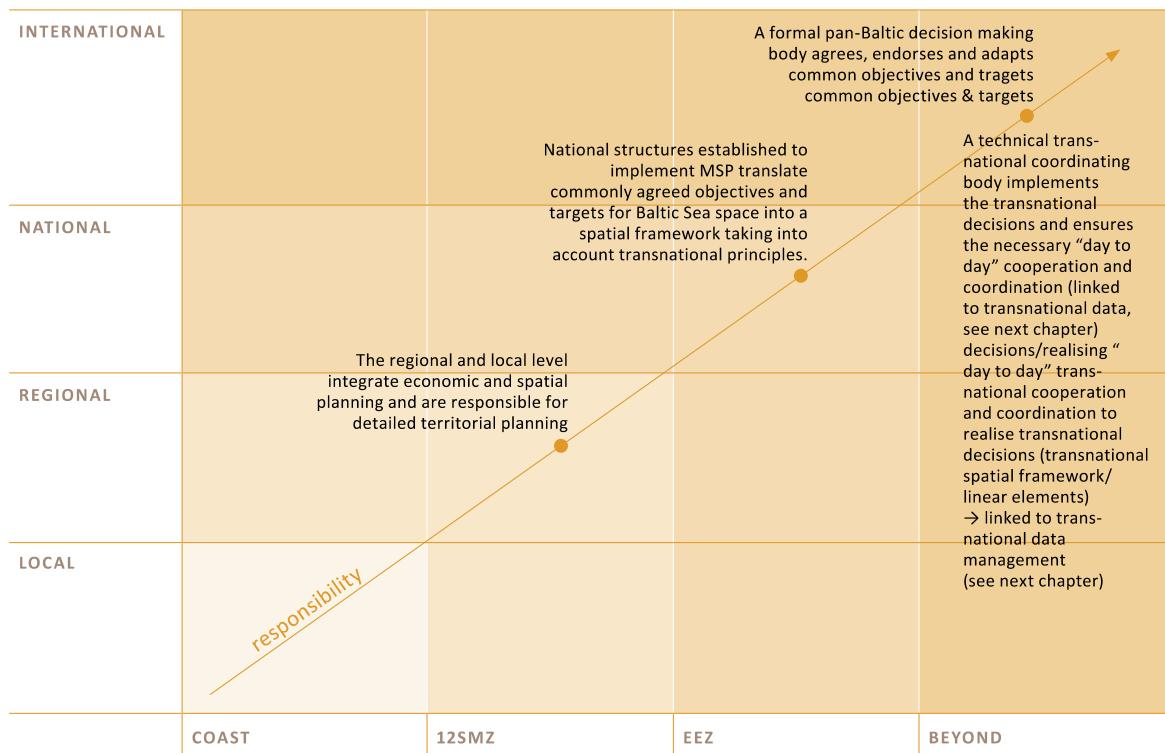
Japan has made efforts to centralise its governance approach; with the enactment of the Basic Act on Ocean Policy in 2007 and the formation of the Headquarters for Ocean Policy. This has laid the foundation for coordination across government ministries and agencies. However, the overlapping mandates and lack of coordination still stall the implementation.

The EU model, with clear mandates at different governance levels, ensures sufficient capacity to effectively address regional specificities and stakeholder concerns.

As encapsulated in the 'BaltSeaPlan Findings' (Schultz-Zehden, A, Gee, K. 2013, pg.39) MSP should be understood as a cooperative practice that involves several spatial and administrative levels. This also addresses the issue of continuity: A local plan only makes sense if its key objectives do not contradict what is said in the regional plan; and if the regional plan is in line with the national objectives. This process encapsulates the basic philosophy behind the principle of spatial subsidiarity. Facilitated by appropriate structures and processes and national and regional level, spatial challenges should be dealt with at the lowest most appropriate level, however following the overarching objectives of the next higher levels.

Figure 27 Different roles and responsibilities in MSP

DIFFERENT ROLES & RESPONSIBILITIES IN MSP (A POSSIBLE SET UP)



Given Japan's unique geographic challenges, such as frequent natural disasters and diverse coastal ecosystems, adopting a clearly mandated multi-tiered governance approach facilitates the adaptability and resilience of its MSP efforts.

As shown, several EU countries have similar regional setups, such as Sweden, which has four regional plans and many detailed county and municipal plans. However, the national government plays a strong overarching role, coordinating and uniting all these plans through a strategic overarching framework. The same applies for countries like Poland and Finland.

This stronger overarching role of the national government can be recommended for Japan, especially for the EEZ, to unify regional plans towards overarching national objectives concerning energy, sustainable food production from the sea, nature protection, and other goals.

11.2. Approach to MSP

Following the EU MSP Directive as a common framework, almost all the EU coastal member states have well-developed, legally binding MPSs. MSP takes a strategic approach to balance various maritime objectives, often followed by clear zoning. This approach is exemplified in the Netherlands, Belgium, Denmark, and Germany.

Japan has initiated steps towards a more strategic approach, as seen in the Basic Act on Ocean Policy and the subsequent Basic Plans on Ocean Policy. Japan's experience with tools like the Marine Domain Awareness (MDA) initiative and the Environmental Impact Assessment Database System (EADAS) shows a strong foundation in data sharing.

However, the practical implementation of MSP at the national level remains limited to mainly data and information collection and sharing, and sectoral zoning meant to designate specific areas for OFW.

For Japan to effectively integrate OWE into its maritime domain and accommodate various national priorities, including nature protection and sustainable food security, a shift towards a more strategic MSP is necessary. This would involve holistic assessments of maritime space, considering the dynamic nature of marine ecosystems and other uses in a holistic manner.

Therefore, as a first step, the national government of Japan should provide an overarching picture. Such basic 'stocktaking' of both current as well as future planned uses is always the very first step in each MSP process. It provides the basis for any kind of subsequent strategic plan; which often also provides the basis for taking a decision, in which areas more detailed planning is required; which may subsequently be worked out in more detail by the prefectures. This



follows EU examples from Sweden and Finland, where similar setups are present.

11.3. Planning Objectives

The Netherlands, Belgium, Denmark, and Germany's MSP objectives prioritize renewable energy targets, environmental sustainability, and economic development, aligning with the EU's broader goals of achieving carbon neutrality by 2050.

Japan shares similar goals, driven by its commitment to the Paris Agreement and its 2050 carbon neutrality pledge.

However, the implementation strategies may differ due to contextual differences. Japan's frequent seismic activity and typhoons necessitate unique technological and infrastructural solutions for offshore wind installations, which may not be directly transferable from the EU context. Additionally, Japan's maritime areas, characterised by deeper waters compared to the relatively shallow North Sea, require different technological approaches such as floating wind turbines, which are still in the developmental stage in many EU countries.

In general, following EU good practices, Japan needs to concretize its national targets and implementation periods. Shorter timeframes, such as 2035 or 2040, are preferable as 2050 is too long and vague. These targets should then be reflected in the OWF tender rollouts, etc. Additionally, based on EU examples, there is a need for a periodic review and update of the plan. This would not only consider new information and data as it becomes available but also expand the timeline and revise the plan based on new objectives for the updated timeline.

11.4. Spatial designations

Japan's initial bottom-up approach, where developers initiate the designation process, has led to coordination and data collection challenges. They often conducted redundant surveys, increasing burdens on local communities and prolonging discussions. This practice continued even after the enactment of the Renewable Energy Sea Area Utilization Act, under which the national government is responsible for site designation. Recognizing the issues, Japan is transitioning to a more centralized system, aiming to enhance national government involvement in site designation and stakeholder coordination.

Namely, under the Marine Renewable Energy Sea Area Utilization Act the national government creates a list of "candidate" sea areas for OWF development based on the information provided by prefectures. In the list, there are three categories: Preparation zones, Promising zones, and Promotion zones. A Preparation zone "steps up" to Promising zones when stakeholders are identified and agree the establishment of a statutory Council. After discussing

various interests of sea area use at the Council, a Promising zone may be designated as a Promotion zone based on the results of the discussion. The same sea area changes its classification depending on the progress of discussion between stakeholders or maturity of coordination. This approach ensures certain predictability of sites for OWF development, as well as alignment with fisheries, environmental conservation, and maritime safety measures, through discussion at a local level.

Moreover, since several years ago the national government started a new scheme where it conducts site surveys including environmental studies in some of the Preparation zones or other non-listed areas, which are selected based on the information provided by prefectures. The first tender with such site information provided by the government is expected to open in FY2025.

While this centralized approach is being adopted in Japan, the Japanese central government still does not perform the zoning itself. Instead, it coordinates the process, while suggested zones come from the prefectures and developers.

The subsequent EU experiences offer potentially transferrable practices concerning spatial designations in MSP for Japan:

Priority and Reservation Areas (Germany): Germany's MSP framework is characterized by a zoning system that differentiates between priority and reservation areas. Priority areas grant absolute priority to specific uses, such as offshore wind energy and shipping routes, prohibiting any activities that would significantly constrain these uses. Reservation areas, on the other hand, give certain uses special consideration without guaranteeing absolute priority, allowing for a more flexible approach to balancing competing interests.

Japan could benefit from adopting a similar system of priority and reservation areas to clearly define and protect critical zones for OWF development and other uses. This approach would help mitigate conflicts by clearly delineating areas where certain activities are prioritized, reducing ambiguity and streamlining decision-making. Also, Japan could consider implementing the Strategic Environmental Assessment (SEA) to release tenders for specific OWF zones, combined with the Environmental Impact Assessment (EIA) conducted by the developer at the end. This approach, based on EU experience, accelerates OWF development by saving resources for developers and providing more certainty that the tendered zones have already been vetted by the government through their SEA assessment process. It is hoped that a new EIA procedure for OWF incorporated in the bill under discussion in the Diet as of June 2024 will be in line with these directions.



In addition, Japan may consider the recently established 'good practice of applying a **Digital MSP System**' as operated especially in Denmark. Denmark employs a digital MSP system that categorizes maritime zones by sectors, including 'development zones' for new purposes and zones for existing uses like cables, pipelines, and nature protection. This system allows for a clear visual representation of maritime uses, facilitating easy access and understanding of spatial regulations for stakeholders. It has also shown to be of advantage for a more frequent adaptation/adjustment of the MSP based on stakeholder input.

Implementing a digital MSP system in Japan would enhance transparency and accessibility of zoning information, making it easier for stakeholders to understand spatial regulations and plan their activities accordingly. This system would support the efficient management of marine areas by providing up-to-date information and facilitating stakeholder engagement.

Dedicated Wind Turbine Areas (Belgium): Belgium's zoning system establishes specific areas for OWF development, known as wind turbine areas. The most recent MSP designates 285 km² for renewable energy production. Belgium also incorporates multi-use zones, enabling the co-use of maritime space for compatible activities, thus promoting the efficient use of marine areas.

Establishing dedicated zones for OWF in Japan, similar to Belgium's wind turbine areas, would provide clarity and security for developers, ensuring that designated areas are reserved for renewable energy projects. Moreover, incorporating multi-use zones within Japan's MSP could promote the co-use of marine areas, enhancing the overall utility of maritime space.

Area Passports (The Netherlands): The Netherlands employs a zoning approach similar to Germany's, incorporating priority areas for specific uses and encouraging co-use in wind farm zones. The North Sea Programme 2022-2027 outlines the spatial planning framework, emphasizing the integration of multiple uses where feasible. Area Passports provide guidelines for non-priority uses within these zones, facilitating coordinated development and reducing conflicts.

Japan could adopt Area Passports to guide the integration of non-priority uses within OWF zones, fostering a balanced approach to MSP. This would provide a structured yet flexible framework for managing multiple uses within designated zones, reducing conflicts and promoting sustainable development. It is expected that in future also in Europe other countries will start to apply similar schemes to the 'Area Passport' to better accommo-

date emerging uses such as 'low trophic aquaculture'. Given the importance of these sectors also in Japan, such an approach may also be suitable to be applied at the prefecture level.

11.5. Approval procedures

EU countries have employed both plan-led and developer-led models for OWF development, evolving toward more centralized, plan-led approaches over time. This has helped to streamline approval processes and reduce redundant efforts. Such a **plan-led model** in the EU, where a central body oversees the entire process from site selection to grid connection, could address the challenges seen in Japan's current zoning-based, bottom-up approach.

By **centralizing data collection and environmental impact assessments** (EIAs), the burden on developers can be significantly reduced. Japan's proposed centralized framework mirrors this approach, indicating a potential for successful adaptation.

A new bill under discussion as of June 2024 aims to introduce a more centralized approval process. This bill proposes that MOE (Ministry of the Environment) take a role to collect environmental information of potential sea areas for OWF development. It also includes that METI (Ministry of Economy, Trade and Industry) designate potential sea areas for OWF development in EEZs, followed by a structured process involving provisional permits, stakeholder coordination through statutory councils, and final installation permits.

The EU's approach often integrates **EIA processes within the tendering system**, ensuring that environmental considerations are addressed early. Japan's proposal in the new bill to involve the Ministry of the Environment (MOE) in early-stage environmental assessments aligns with this practice, suggesting a move towards a more efficient and coordinated EIA process.

The **inclusion of non-financial criteria in the EU's tender processes**, such as ecological contributions and innovative uses, has encouraged more sustainable and multifunctional OWF developments in some of the EU member states (e.g. the Netherlands and Belgium). Japan could benefit from incorporating similar criteria to promote innovations that align with both, environmental and economic objectives.

11.6. Conflicts & conflict resolution mechanisms

The development of OWF presents unique challenges, particularly in managing conflicts with existing marine activities and interests. Examining the approaches used in the Netherlands, Belgium, Denmark, and Germany, reveals valuable insights into



conflict resolution mechanisms that could be applicable in the Japanese context.

In the EU, **careful siting** through MSP is crucial in minimizing conflicts. By strategically selecting areas for OWF development, potential clashes with other marine activities are mitigated.

Clear zoning in maritime spatial plans delineates areas for specific uses, reducing ambiguity and potential conflicts. Countries like Belgium and Germany have established safety margins around OWF sites to ensure safe navigation for shipping vessels. On another note, Belgium's MSP Royal Decree allows for aquaculture within OWF zones under certain conditions, promoting multi-use of space.

Interministerial (horizontal) and multi-level (vertical) working groups are essential to mitigate conflicts evolving from the various sector and regional demands within the MSP process. As shown, even though all EU Member States have assigned one single MSP authority, those authorities work with interministerial working groups, including representatives of all ministries concerned. In Denmark, for instance, the working group on maritime spatial planning has representatives from 17 authorities in Denmark with activities and responsibilities at sea or along the coastline. It has been shown, that such 'standing' working groups are more effective for conflict resolution than a one off consultation process.

Effective stakeholder engagement is essential for conflict resolution and fostering consensus. Japan could benefit from enhancing stakeholder engagement practices both to ensure better collaboration between the ministries and to solicit input from various stakeholders, including local communities and industry representatives, thus fostering greater acceptance and cooperation. The formation of 'Communities of Practice' and various MSP working groups identified in the assessed countries can provide good guidance in developing a more comprehensive approach to engagement in Japan.

Promoting synergies among different marine uses encourages coexistence and minimizes conflicts. For example, Denmark's approach to OWF Environmental Impact Assessments (EIAs) considers the impact on commercial fisheries, incorporating mitigation measures such as co-use arrangements and compensations.

Compensation mechanisms serve as a last resort to address conflicts that cannot be resolved through other means. While some EU countries lack formal compensation processes, Denmark mandates compensation for fishermen affected by OWF development.

11.7. Engagement and Consultation

While the MSP Directive requires member states to ensure public consultation early in the MSP process, it does not prescribe specific methods for doing so. At a minimum, public hearings and feedback collection on the draft plan and associated strategic environmental assessment have been used. Over the years, a variety of additional mechanisms, such as sectoral workshops, have been applied. Comprehensive stakeholder engagement has been recognized as one of the key mechanisms for identifying possible conflicts between users early on and ensuring public acceptance and buy-in for the plan.

Long-lasting forms of engagement have played an especially important role in facilitating discussions about the reconciliation of different national priorities, including offshore wind development. These engagements have taken place in two primary ways. First, they occur as part of permanent committees or working groups that bring different authorities together, providing a platform to exchange information and discuss planning options.

Second, **wider forums, such as the Dutch North Sea Community of Practice or Belgium's vision development working groups**, have served to bring all relevant stakeholders and interested public together in open dialogue. **Developing the MSP vision** can be particularly useful, as it provides a strategic and forward-looking character to the plan. It serves as an exercise to unite all involved around the same goal, bringing them to the same level playing field and building support and buy-in for the plan's development and implementation.

Japan has shown progress in stakeholder engagement and consensus building, particularly at the regional level through regional councils. Nevertheless, for holistic MSP plan development, **multi-level stakeholder engagement models covering all relevant sectors**, similar to those applied in the Netherlands or Belgium, could benefit Japan. These models could pinpoint opportunities of common interest, support early conflict identification, provide a higher level of transparency, and build a shared understanding among stakeholders.

11.8. Transboundary planning

The transboundary consultation and coordination in the EU is a standard practice following several relevant directives and conventions. However, the methods for conducting transboundary consultations or cooperating with neighboring states are not prescribed and vary among countries. While consultation involves mere information sharing and the collection of comments on draft plans, cooperation



goes a step further. In the EU, regional sea conventions have played a unique role in facilitating cooperation among planning authorities. They contribute for example to the **alignment of planning criteria, planning principles, the identification of common issues of interest, and the interpretation of environmental impacts** across concerned countries.

EU co-financed **research and development projects at the sea basin level** have also been important. These projects bring relevant authorities and other actors together to **jointly address issues of regional importance, standardize commonly used data, and initiate planning exercises** that cross national borders. Specific **sectoral agreements on a cross-border or transnational level**, such as the North Sea Energy Initiative, have further facilitated the alignment of questions relevant to offshore wind planning and development.

From these examples, it is evident that the EU, particularly in the North and Baltic Seas in terms of offshore wind, provides a range of options for transnational collaboration and cooperation. Agreements on transboundary consultation can ensure mutual information sharing on plans and data, while effective transboundary cooperation, in the form of permanent forums, can identify projects of common interest, build trust, and address potential issues.



ANNEX I: RELEVANT EU POLICY TO MSP AND OWF (CHRONOLOGICAL ORDER)

EU Policy on MSP & OWF		
Name	Year	Relevance in the consenting process
Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora (Habitats Directive)	1992	<ul style="list-style-type: none">• European Court of Justice ruled that the Directive is legally binding in the maritime EEZ⁴⁰.• Natura Impact Statement is a report that must be carried out to identify and characterize the possible implications of a plan or project on a Natura 2000 site(s) conservation objectives. Based on the results of the NIS, the consenting authority would carry out an AA for the development of compensatory measures.• Appropriate Assessment must be carried out when a development is near a Natura 2000 site. Compensatory measures must be developed in case negative impacts without alternatives are identified.
Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy (Water Framework Directive)	2000	<ul style="list-style-type: none">• Sets basis to improve the ecological and chemical status of water bodies, including coastal bodies.• Mitigation measures to ensure ecological continuum with respect to migration of fauna and appropriate spawning and breeding grounds (relevant for fisheries).• Applicable to Port-based infrastructure used by OWF
Directive 2001/42/EC of the European Parliament and of the Council of 27 June 2001 on the assessment of the effects of certain plans and programmes on the environment (SEA Directive)	2001	<ul style="list-style-type: none">• Strategic Environmental Assessment• Embed conservation and improving biodiversity of the marine environment into the early stages of the planning and consenting process
European Strategic Energy Technology Plan (SET Plan)	2007	<ul style="list-style-type: none">• Establishes framework for developing synergies between national and EU level Research & Innovation priorities and funding, therefore enabling regional cooperation.
	2023	<ul style="list-style-type: none">• Update includes measures to prioritise deployment of floating OWF.
Directive 2008/56/EC of the European Parliament and of the Council of 17 June 2008 establishing a framework for community action in the field of marine environmental policy (Marine Strategy Framework Directive)	2008	<ul style="list-style-type: none">• Good Environmental Status Descriptors embedded through the EIA process⁴¹ in the construction, operation and decommissioning of a OWF farm.

⁴⁰ European Court of Justice. "Case C-6/04 Commission of the European Communities v United Kingdom of Great Britain and Northern Ireland [2005] ECR I-9017." (2005).

⁴¹ Abramic, A., Víctor Cordero-Penín, and R. Haroun. "Environmental impact assessment framework for offshore wind energy developments based on the marine Good Environmental Status." *Environmental impact assessment review* 97 (2022): 106862.



EU Policy on MSP & OWF

Name	Year	Relevance in the consenting process
Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds (Birds Directive)	2009	<ul style="list-style-type: none">• Appropriate Assessment to ensure protected habitats and species of listed wild birds are not affected or mitigation measures are developed.
Directive 2014/89/EU of the European Parliament and of the Council of 23 July 2014 establishing a framework for maritime spatial planning (MSP Directive)	2014	<ul style="list-style-type: none">• Drafting of MSP plans to coordinate use of sea space, in some countries it has served as a legally binding spatial allocation tool for OWF. For example, in Belgium developers must refer to the National MSP when applying for licensing.
Directive 2014/52/EU of the European Parliament and of the Council of 16 April 2014 amending Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment (EIA Directive)	2014	<ul style="list-style-type: none">• Environmental Impact Assessment Report: establishes the basis for a mitigation hierarchy which outlines measures to avoid, reduce, and if possible offset significant adverse effects.• Each consent application must be accompanied by an Environmental Statement
A European Green Deal	2019	<ul style="list-style-type: none">• OWF is promoted as essential to decarbonizing the EU's energy system
An EU Strategy to harness the potential of offshore renewable energy for a climate neutral future	2020	<ul style="list-style-type: none">• Strategy to make OWF a core component of the EU energy system• Emphasises the role of MSP as an enabler of the expansion of OWF• Promotes multi-use and co-existence with fishing, aquaculture, nature preservation and restoration
EU Biodiversity Strategy for 2030 Bringing nature back into our lives	2020	<ul style="list-style-type: none">• Guidance on reconciling wind energy developments and nature published
A new approach for a sustainable blue economy in the EU Transforming the EU's Blue Economy for a Sustainable Future	2021	<ul style="list-style-type: none">• Positions OWF as a cornerstone to achieving the EU's climate neutrality and zero pollution goals
REPowerEU: Joint European Action for more affordable, secure and sustainable energy	2022	<ul style="list-style-type: none">• Proposes changes to the Renewable Energy Directive: require Member States to designate "renewable go-to areas" at sea• Operationalise the presumption of OWF as being an overriding public interest
Regulation (EU) 2022/869 of the European Parliament and of the Council of 30 May 2022 on guidelines for trans-European energy infrastructure	2022	<ul style="list-style-type: none">• Provisions on development of offshore grids and non-binding goals of ORE generation by 2050 set to 354 GW
Communication on Delivering on the EU offshore renewable energy ambitions COM/2023/668 final	2023	<ul style="list-style-type: none">• 61 GW ORE target set for the EU by 2030



ANNEX II: STAKEHOLDER CONSULTATION FOR OWF IN CASE STUDY COUNTRIES

Key Features of stakeholder consultation in the Planning Systems for Offshore Wind Farms					
Country	Zoning/Pre-Project Stage	Pre-Application	Post-Application	Post Approval & Construction	Post-Commissioning
Belgium	EIS is open to public consultation during the domain concession application process	Domain concession	N/A	N/A	N/A
Denmark	• Several hearings depending on developers	Written comments on wind farm specifications	• Consultations on EIA • Public hearing	• Appeals	• Benefits (shareholding, compensation schemes)
England	• Early consultation on NPS	• Pre-application consultation that determines further consultation strategies	• Information provision • Consultation of general public on application • Written comments	• Negotiation of benefits	• Potential community funds
Germany	• Consultation, written comments on regional plan	• Written comments during the regional planning procedure • Public hearing	• Public display of documents • Written comments during licensing procedure • Non-public hearing	• Progress updates	N/A
Netherlands	Views on the Range and Detail Memorandum (NRD) and suggestions can be made	Views on the draft site decisions and underlying documentation	N/A	Once the final site decisions have been made, taking into account all views submitted and responses to the same, they will be open to appeal (by those who are entitled to do so) at the Dutch Council of State, Administrative Jurisdiction Division	N/A



ANNEX III: IUCN MITIGATION HIERARCHY

Project phase	Mitigation Hierarchy	Mitigation approaches
Site characterisation	Avoidance and minimisation	Scheduling: changing the timing of survey activities to avoid disturbing biodiversity during sensitive periods Operational controls to manage and regulate contractor activity (e.g controlling vessel movements)
Project design phase	Avoidance and minimisation	Micro-siting changing the layout of project infrastructure to avoid sensitive areas Selecting or designing project components to avoid or reduce impacts such as quiet foundations Re-routing, marking or burying onshore powerlines to avoid collision risk
Construction phase	Avoidance	Scheduling: changing the timing of construction activities to avoid disturbing biodiversity during sensitive periods
	Minimisation	Abatement controls to reduce emissions and pollutants (e.g. selecting construction methods to minimise underwater noise impacts) Operational controls to manage and regulate contractor activity (e.g controlling construction/installation vessel movements and managing lighting)
	Restoration and rehabilitation	Repair of degradation or damage to biodiversity features and ecosystem services from project-related impacts that cannot be completely avoided and/or minimised (e.g. revegetating onshore laydown areas or restoring coastal intertidal habitats disturbed during export cable installation)
Operational phase	Minimisation	Physical controls involving modification to standard infrastructure or the standard operation of infrastructure, to reduce impacts (e.g. through shutdown on demand to minimise collision risk) Abatement controls to reduce emissions and pollutants (e.g. by managing maintenance lighting) Operational controls to manage and regulate contractor activity (e.g through controlling maintenance vessel movements)
End-of-life	Avoidance	Scheduling changing the timing of decommissioning activities to avoid disturbing biodiversity during sensitive periods such as breeding seasons
	Minimisation	Abatement controls to reduce emissions and pollutants created during decommissioning, such as cutting of sub-sea infrastructure Operational controls to manage and regulate contractor activity (e.g. vessel speed regulation) and minimize risk to biodiversity such as marine mammal strike
	Restoration and rehabilitation	Consider (if legislation allows) leaving infrastructure in place if there is a biodiversity/ecosystem services benefit such as the reef effect associated with foundation/scour protection Revegetation of disturbed areas onshore as they become available, using top soil and indigenous plants from the site where possible.



SUPPORT
FACILITY FOR THE
IMPLEMENTATION
OF EU-JAPAN
STRATEGIC
PARTNERSHIP
AGREEMENT (SPA)

Study on Best Practices in Maritime Spatial Planning for Off- shore Wind Power

ANNEX IV: COUNTRY FICHES



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1. COUNTRY FICHE: BELGIUM

1.1. MSP Overview

1.1.1. Status of MSP

The foundations for MSP were laid out in 2002 through the Belgian Part of the North Sea (BPNS) management plan, with a comprehensive policy framework targeting key issues. These encompassed diverse objectives like offshore wind farm development, delineation of marine protected areas, sustainable sand and gravel extraction, oil pollution prevention, marine habitat mapping, wreck preservation for biodiversity, and regulation of land-based activities impacting the marine environment. Together, these objectives formed the cornerstone of the 'Master Plan' to be executed progressively.

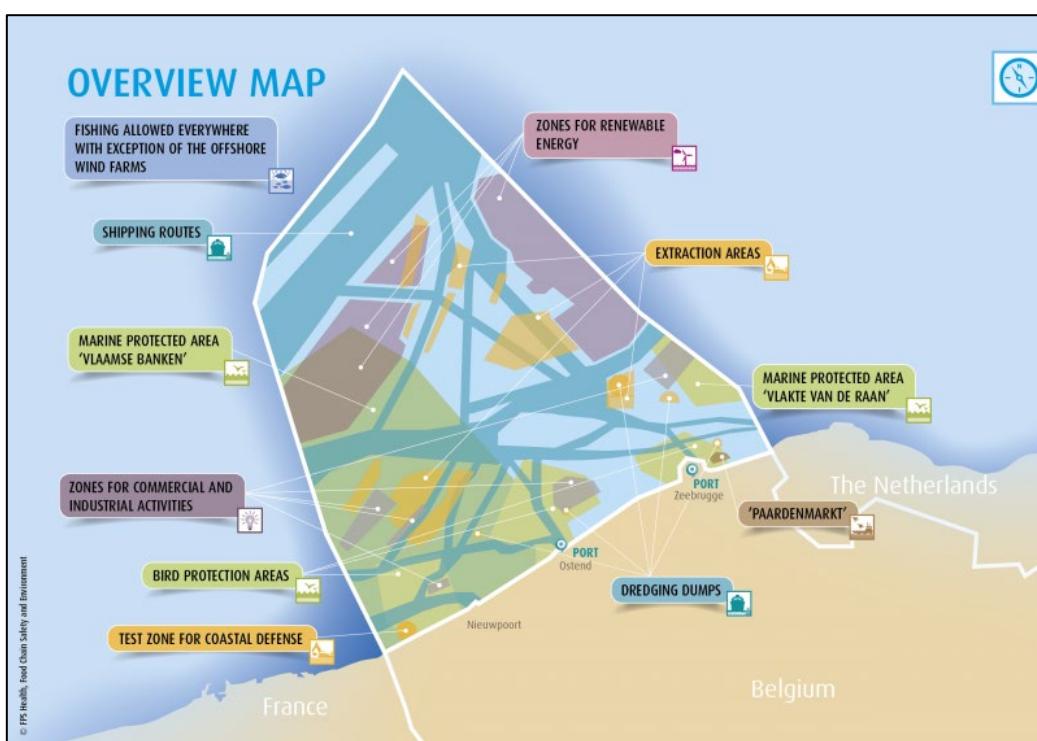
Despite the absence of a formal legal foundation for MSP, the 'Master Plan' served as a translation of current and future sectoral objectives into a coherent spatial vision. Initial phases have been successfully implemented, focusing on spatial zoning for sand and gravel extraction and earmarking zones for future offshore wind energy projects, followed by the

demarcation of marine protected areas as part of the EU Natura 2000 Network.

The first MSP for the Belgian Part of the North Sea was approved in 2014, and the second MSP entered into force in March 2020 and will be in place until 2026⁴². Based on the new Marine Protection Act, the next plan will cover an eight-year cycle from 2026 to 2034.

Offshore wind energy emerged as a viable solution to Belgium's renewable energy targets, given land constraints and regulatory hurdles. Through meticulous planning and zoning, suitable areas were earmarked for wind farm development, considering biodiversity, visual impact, and fishery importance. These initiatives not only bolster renewable energy prospects but also foster multi-use opportunities, such as aquaculture projects alongside wind farms, thereby revitalizing the fisheries sector. The subsequent phases of the Master Plan focused on establishing Special Protection Areas (SPAs) and Special Areas of Conservation (SACs) to fulfil Natura 2000 objectives, underpinning stakeholder engagement and commitments to conservation measures.

Figure 1 Belgium MSP Plan



Source: Federal Public Service Health, Food Chain Safety and Environment, March 2020

⁴² European MSP Platform, "Maritime Spatial Planning Country Information: Belgium." (2022).



1.1.2. Government set up

The Belgian minister for the North Sea coordinates the MSP, and the Marine Environment Service of the Federal Public Health Service coordinates preparation and implementation.

The planning process at national level has a legal basis in the Marine Environment Act, amended in 2012 to include the development of an MSP. Its name was also amended to "Act for the Protection of the Marine Environment and for the Organisation of Maritime Spatial Planning in the Maritime Regions under the Belgian jurisdiction." The Royal Decree of 20 November 2012 dictates the establishment of an advisory committee and the procedure for the adoption of a MSP in the Belgian maritime regions. The Royal Decree of 20 March 2014 adopted the first MSP for 2014- 2020. The Royal Decree of 22 May 2019 establishes the second MSP covering the period from 2020 until 2026.

At the Regional Level (Flanders) The division of competences between the federal State and the Flemish Region is described in the table below:

Maritime Competences of the Federal State and Flemish Region	
Federal State	Flemish Region
Environmental Protection	Fisheries
Nature Conservation	Aquaculture
Wind Energy Development	Nature conservation on land
Disposal of dredged material	Dredging
Shipping	Ship pilotage and traffic guidance
Aggregate extraction	
Military activities	

1.1.3. Spatial Planning/ Zoning mechanisms

The minister of Energy and the Minister for Marine Environment and Marine Spatial Planning determine by a decree deliberated on in the Council of Ministers what is the subject of a domain concession, among other things:

- the location,
- the size,
- the number of parcels.

They do so after receiving the CREG's advice and consulting with the system operator, Elia. This decree also integrates the results of all preliminary studies and the location of the transmission system's elements.

The identification of the parcels is one of the numerous steps for a successful tender. In view of the identification of the parcels, the following is considered:

1. the fulfilment of the social functions of the sea, including the importance of a functional space usage of the sea;
2. the consequences of an instruction for third parties;
3. the environmental importance;
4. the costs of executing the installation for the production of electricity in the parcel;
5. the importance of the most optimal and cost-efficient connection of the production installation on the Modular Offshore Grid.

1.2. Conflict Resolution Mechanisms

The selection criteria established in the tendering procedures and conditions by the Belgian Electricity Act integrate spatial conflict elements, particularly with Natura 2000 zones.

1.2.1. Offshore wind and nature protection

In Belgium, the Vlaamse Banken Natura 2000 site overlaps with a new offshore wind zone, which has been criticised, but it was argued that this overlap is due to the limited space availability in the BPNS. In response, a project has been set up to fill the gaps in knowledge of the potential effects and impacts of offshore developments and investigate how nature objectives can be combined with the development of the OWF zone (EDEN project, (FPS Env, 2022)). In March 2022, it was announced that additional protection measures will be proposed for two new offshore wind parks that are currently near or in protected areas.

A UNITED pilot project in Belgium has been working on the flat oyster reef restoration and aquaculture and seaweed cultivation within the safety zone of an offshore wind farm, where fishing is restricted. UNITED project partners have been working for over 4 years to find the best technical and managerial solutions in a pilot aquaculture farm and oyster restoration within the designated zone for offshore wind in the Belgian offshore space (Exclusive Economic Zone). Models to correctly position the long-lines were applied, proper systems for spat collection and grow-out were developed, and several scour protection materials were tested. In addition, they combined the culture of flat oyster and sugar kelp on the same longline and compared the characteristics of sugar kelp grown nearshore and offshore.



1.2.2. Stakeholder engagement

The Belgian State Secretary for the North Sea, attached to the Minister of Social Affairs and Public Health, has overseen the development of a “Long-term Vision Document for the Belgian Part of the North Sea 2050” through an integrated and participative trajectory. More than 100 stakeholders assisted in the development of the long-term vision document through the project ‘Future of the Sea / Sea of the Future’ The strategic vision document guides the development of MSP in Belgium.

In cooperation with the Flemish Institute for the Sea (VLIZ) and the Royal Belgian Institute for Natural Science (Operational Direction Natural Environment), a bottom-up trajectory was initiated including the instalment of three core working groups, around the following themes:

- Nature
- Blue Economy and Innovation
- Multi-use

Alongside these working groups, six transversal themes were appointed:

- Sustainability
- Research and development
- Governance
- Safety and security
- Land-sea interactions
- Transboundary thinking

Each working group organised at least four meetings, producing a total of three consensus-based final reports. The final vision is based on these reports as it aims to guide future developments in the Belgian part of the North Sea. The document also includes key tasks to ensure that the policy is transparent, adaptive and participative:

- Invest in research, collection and distribution of knowledge (developing a central data bank and promoting digitalisation)
- Working with nature
- Invest in national and transnational cooperation (including land-sea interactions)
- Adaptive policy requires adapted and transparent procedures
- Enforcement policy

The three groups involved different groups of stakeholders (so called ‘user committees’). A wide range of stakeholders was invited, including authorities, the research community and business representatives. The process was open, so that everyone could participate. However, each stakeholder was only allowed to become a member of one of the three working groups.

Every group made a starting note / briefing paper and distributed it to the members of the working group. The purpose of the note was to explain the vision process and its objectives, outline the planned

number of meetings, and planned outputs. Throughout the process the progress reports were sent to the group members. Each group had a slightly different approach to the organization of the meetings and the methods that were used to facilitate the meetings. Generally, PowerPoint presentations were used to introduce the meetings. The Blue Growth group, for example, invited sector experts to give presentations. Other methods used included participatory mapping, world cafés and exercises using post-its. The meetings were well documented so that those that missed a meeting, could stay up to date.

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1.3. Status of Offshore Wind Energy

1.3.1. Current capacity and targets

Since 2020, 2261 MW of OWP has been operational in the Belgian Part of the North Sea (BNS). In 2021, the Belgian Federal Government set an ambitious goal of upscaling capacity by 3.15-3.5GW through new installations in the Princess Elisabeth Zone. Belgium is the fourth largest producer of OWP and has nine operational offshore wind farms.

1.3.2. Overview of Regulatory and Permitting System

1.3.2.1. Offshore Wind Energy Consenting System

The authorisation system consists of four phases: domain concession, released by the Federal Ministry of Energy; the marine protection authorisation, managed by the Scientific Service Management Unit of the North Sea Mathematical Models (MUMM), also submitted to the Public Inquiry, and the final decision, released by the Federal Minister of Marine Environment; then the submarine cable authorisations, dealing with the Federal Minister of Energy, and finally the grid connection step. The Maritime Spatial Plan defines the zones dedicated to development and operation.

1.3.2.2. Offshore Wind Auction System

The Belgian government currently allocates the development rights for all offshore wind projects in the country through direct allocation instead of through bidding⁴³. These projects are all located within a designated area in the Maritime Spatial Plan (2014-2020). However, in 2019, the Belgian government decided to award future offshore wind development rights through a tendering process. The latest Maritime Spatial Plan (2020-2026) has designated the Princess Elisabeth Zone, which covers three areas (Noordhinder North, Noordhinder South, and Fairyb Banks), for bidding, with a total installed capacity of up to 3.5 GW. The first round of bidding will take place in a yet-to-be-determined year.

Previously, developers were responsible for preliminary surveys, and the domain concession and environmental permit were the two most critical permits needed to begin construction. The domain concession granted developers the right to construct and operate offshore wind farms in designated areas. Once the developer obtained the domain conces-

sion, they would then apply for an environmental assessment of the project area. Once the environmental permit was granted, the project could proceed. On average, Belgian offshore wind projects take 3.3 years from initiation to approval and 6.3 years from approval to commissioning, with a total average duration of 9.6 years. The longer time from approval to commissioning is mainly because the grid connection agreement was finalized after the approval, unlike in the Netherlands, and Denmark, where the grid connection is usually secured after project approval, allowing for construction to commence.

Four later projects, Rentel, Northwester 2, Seastar, and Mermaid, share the same substation, the Modular Offshore Grid (MOG), whose construction began in 2018 and was commissioned in 2019. An extension of the MOG will be built to accommodate upcoming projects within the Princess Elisabeth Zone. After adopting the bidding method, the Belgian government will be responsible for conducting the preliminary survey work of the project, and the developer who wins the bid will pay the relevant fees to the government. The subsidy mechanism for wind power in Belgium was a "feed-in premium (FiP)" system based on Green Certificate (GC). Wind power projects receive a fixed GC on top of the market electricity price. One GC is awarded for each MWh of electricity produced by a wind farm, and the Belgian transmission system operator (TSO) Elia purchases these GCs at a minimum price, which is determined in accordance with Article 14, §1 of the Royal Decree of 16 July. The duration of the GC purchase agreement is generally 20 years. The subsidy varies among different projects. Four projects that completed financing before May 1, 2014, received a FiP. Projects that completed financing after May 1, 2014, receive a one-sided CfD, also based on GC. The minimum GC purchase price is equal to the project LCOE, which is determined by the negotiation between the government and developer after the domain concession is granted, deducted by the adjusted reference market price. A negotiated LCOE encourages developers to strive for cost-effectiveness of the projects to obtain higher green certificate prices.

The Belgian government has decided on a two-sided CfD with a period of 20 years in the Princess Elisabeth zone tender. According to the tender principles, bids will be evaluated on the strike price, which carries a weight of 90 out of 100 points. This strike price will be partially indexed annually at 30% related to the operation and maintenance (O&M) portion, and the remaining 10 points will be awarded for innovation in the business model.

⁴³ Zhang, Hongyun, and Michael Pollitt. "Comparison of policy instruments in the development process of offshore wind power in North Sea countries." (2023).

2. COUNTRY FICHE: DENMARK

2.1. MSP Overview

2.1.1. Status of MSP

Denmark adopted and launched its maritime spatial plan in March 2021. The Danish MSP was issued as an executive order and is, therefore, legally binding. It is the first legally binding digital map of Denmark and its waters, covering internal waters, territorial seas, and EEZ (see figures 1, 2, and 3).

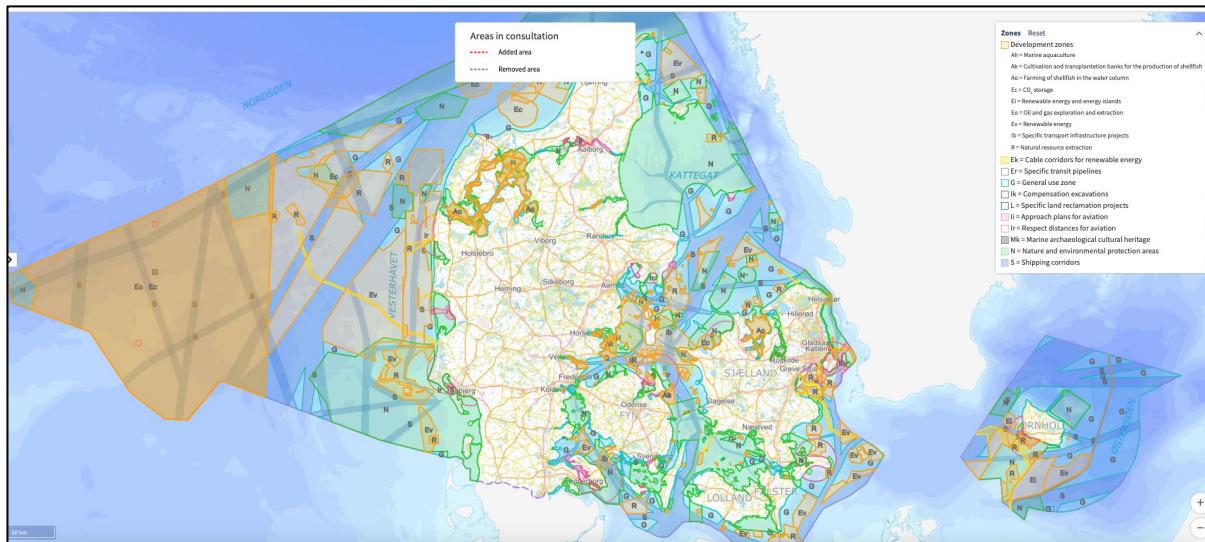
The objective of the plan is to promote economic growth, the development of marine areas and the sustainable use of marine resources. The MSP establishes which sea areas in Danish waters can be used for, *inter alia*, offshore energy extraction, shipping, fishing, aquaculture, seabed mining and environ-

mental protection towards 2030. Prior to 2021, Denmark did not have a holistic spatial plan for the sea, however, a range of sectoral plans have been in use. These plans have provided key contributions to the MSP planning process in Denmark.

The MSP adopted in 2021 has already gone through a review based on a proposal from the Danish Maritime Authority to increase the offshore energy and biodiversity targets in the national MSP. The Danish Parliament reached an agreement on the new targets in the summer of 2023.

Public consultation on the draft MSP amendments and the environmental assessment was launched in November 2023 for a period of ten weeks until February 2024. The results of this public and transboundary consultation will feed the finalisation of Denmark's revised MSP.

Figure 2 Denmark MSP Plan ⁴⁴



Source: Danish Maritime Authority, 2024

⁴⁴ <https://havplan.dk/en>

Figure 3 Denmark Renewable Energy Development Zones

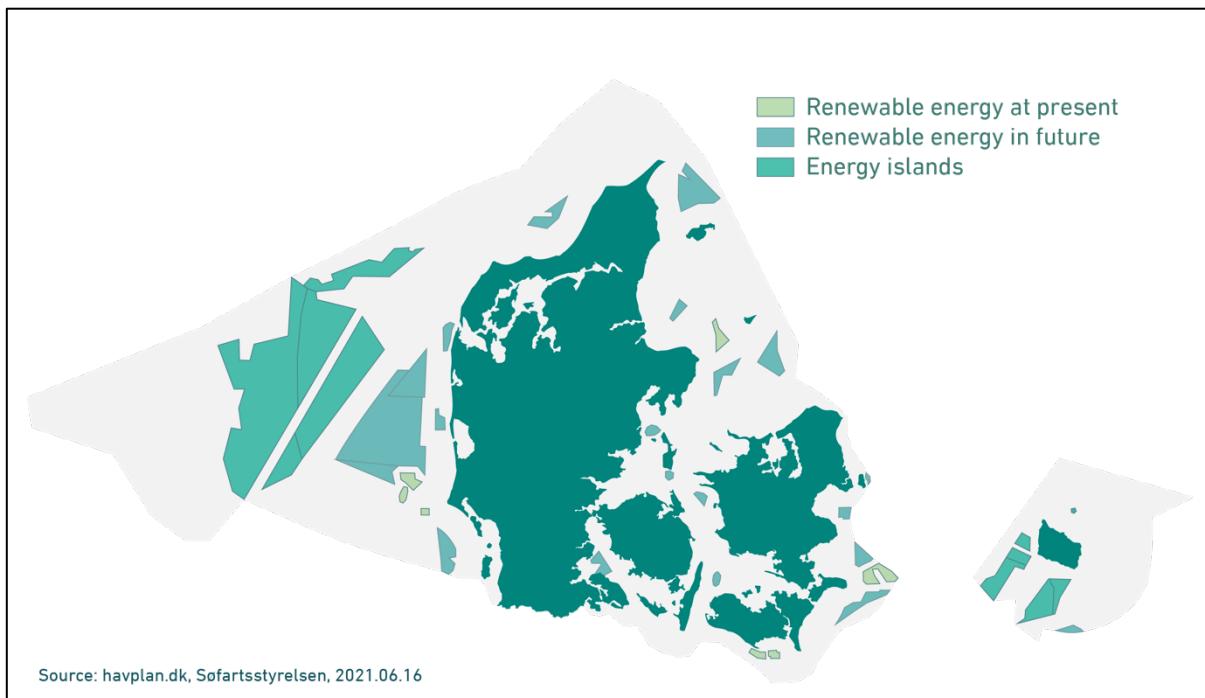
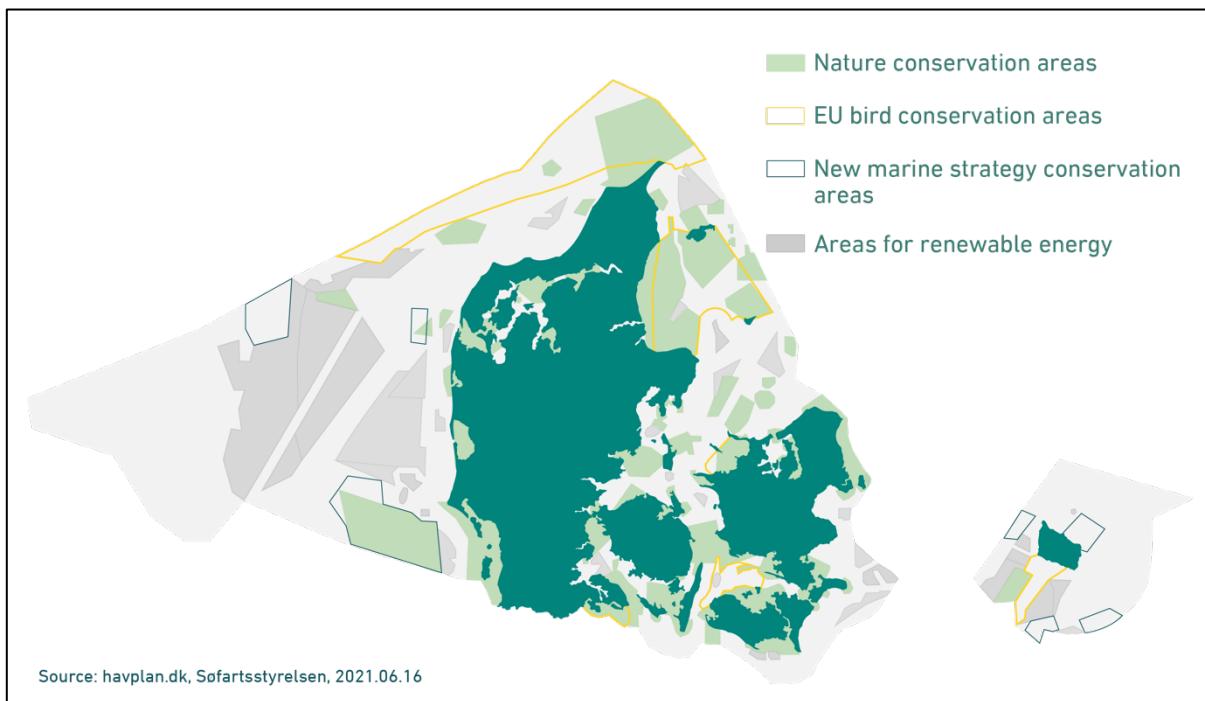


Figure 4 Denmark Nature Conservation Areas



2.1.2. Government set up

The Danish Maritime Authority (DMA) under the Ministry of Business and Growth is Denmark's marine planning authority. Key agencies relevant to OWF delivery in Denmark are the Danish Maritime Authority (Søfartsstyrelsen) and the Danish Energy Agency (DEA). The latter is responsible for the marine licensing process for OWF, including negotiations with the government in a one-stop shop approach. DMA collaborates in this work with the 'working group on

maritime spatial planning, which consists of representatives of 12 different maritime authorities in Denmark.



2.1.3. Spatial Planning/ Zoning mechanisms

Development zones:

- Renewable energy and energy islands
- Exploration and exploitation of oil and gas
- CO₂ storage
- New infrastructure projects
- Aquaculture incl. shellfish production and marine farming
- Extraction of mineral resources

Special use zones

- Shipping corridors
- Protection measures for aviation
- Cable corridors for renewable energy
- Land reclamation
- Pipelines

Nature conservation and environmental protection

- Marine strategy areas
- Natura 2000 areas
- Protected areas
- Nature and game reserves

General use zones

- General use zones consist of all areas in the MSP not designated for other purpose

OWP is zoned as a development zone in Denmark. A thorough screening of Denmark's territorial sea was conducted as part of the energy pact, identifying over 11,000 km² potentially suitable for offshore wind locations with a projected 17 to 27 GW capacity. These areas include parts of the North Sea with exceptional wind conditions that could propel it into a leading area for offshore wind globally. While no specific screenings have been carried out for wave power or other renewable energies at sea, existing offshore wind farms underscore Denmark's commitment to exploring various renewable energy options within its maritime spatial plan. The areas allocated for renewable energy also cover existing offshore wind farms and areas for offshore wind projects that are being processed by the Danish Energy Agency. No specific zones have been allocated for open-door projects. The maritime spatial plan will therefore have to be amended to allow for new open-door projects.

2.2. Conflict Resolution Mechanisms

In Denmark, coexistence has emerged as a crucial strategy amidst rising demands for sea area utilization,

especially in zones coveted for multiple purposes. This strategy is reflected in the identification of existing and prospective renewable energy areas, along with the exploration of renewable energy islands. Pilot projects and test sites for offshore renewable energy (ORE) and aquaculture combinations are actively underway, exploring the synergies between wind energy and marine resource cultivation. Furthermore, Denmark delves into innovative approaches like OWF and nature conservation integration, as seen in projects like Kriegers Flak and Anholt OWF. These initiatives involve investigating the impact of offshore structures on biodiversity and deploying artificial reefs to bolster marine ecosystems. Additionally, Denmark addresses the coexistence of OWF and fisheries by requiring developers to engage with fishery organisations and obtain the consent. The solutions that are reached are project specific and range from series of compensation and mitigation measures including compensation for documented losses, limiting exclusion areas, and allowing fishing vessels and operations in OWF, under agreed conditions. However, the Danish Maritime Spatial Plan does not set out suitable areas for OWF combinations and clear licensing procedure for overlapping uses. Beyond that, the longevity of permits is not unified and may differ per activity which can lead to issues at the end of life of one of the multi-use activities where one activity relies on the presence of another leading to uncertainty as to whether the remaining activity can continue its operations.

2.2.1. Offshore wind and fisheries

Offshore wind EIA processes account for impact on commercial fisheries⁴⁵. During the tendering process of an offshore wind farm in Denmark, an exhaustive Environmental Impact Assessment (EIA) of the designated offshore area, export cable route, and onshore grid connection is completed by the Danish Transmission System Operator (TSO), Energinet, and fully consented before the bidding date. The Danish Kriegers Flak case study provides a typical example of the environmental impact assessment (EIA) process required ahead of an OWF implementation and illustrates how the knowledge gaps on anticipated OWFs effects on commercial fisheries are currently tackled in such EIAs. The EIA report is based on the principle of the greatest conceivable environmental impact, through a combination of a "most likely" and a "worst case" approaches, to ensure that subsequent EIAs are not necessary for the specific project. The EIA aims at evaluating the largest possible environmental impact, along with the potential

⁴⁵ In general, the EIA methodology varies across cases. Most EU jurisdictions normally consider the environmental impact of OWF or the suitability of offshore wind zones but not the displacement of fisheries. More available [here](#): click



cumulated effects with the other nearby offshore wind farms.

Compensation for temporal and permanent losses of fishing grounds at all stages. Denmark is the only North Sea country where, according to the Danish Fisheries Act, all fishers who normally fish in the affected area must be compensated for the loss of income. It is the responsibility of the developer to negotiate compensation with every affected fishers, and the license to produce electricity from the offshore wind farm (power plant) can be granted to the Developer only if an agreement has been made with all affected fishers.

Different mitigation measures to enhance coexistence between OWF and fisheries. The following mitigation measures are applied within the Danish planning and licensing process:

- Compensations are paid for documented losses with, for example, two- to ten-year data. compensation for disturbances to fisheries during the construction phase and for permanent losses, as well as the amount of possible compensation, should be as far as possible determined prior to commencement of offshore construction;
- Limiting the exclusion areas by dividing the construction area into different phases;
- Providing substitute revenues by including some fishing vessels or fishermen in the construction and operation of the offshore wind farm, e.g. as guard vessels;
- Allowing fishing with static gear inside the wind farm, under agreed conditions.

The Danish MSP encourages colocation and coexistence between conservation and other marine uses. The updated Danish MSP designates 'marine strategy areas', which define which activities can take place in such conservation areas on a case-by-case basis. These areas could allow nature conservation in combination with fisheries and OWF. The Digital MSP further supports engagement on co-use. The DMA have received requests from stakeholders about places not correctly designated in the local plans. This has served as an opportunity for DMA and stakeholders to understand interest areas.

2.2.2. Offshore wind and tourism

Early engagement of the local community in a co-design process and cooperative ownership of OWF e.g. the Middelgrunden OWF. The Middelgrunden OWF is owned 50% by HOFOR (Copenhagen local energy and water supply) and 50% by the Middelgrunden Wind Turbine Cooperative with 8,553 coming from local communities and businesses. The local community were engaged in a co-design process before construction of the OWF to help design the layout of the OWF and form the cooperative. The

formation of the cooperative and the attractive layout of the wind farm have enabled the creation of additional activities of interest to the local communities such as the boat tours to the wind farm and virtual tours and info centres on land. Promoting cooperative ownership structure enables effective involvement of local communities and ensures that revenues generated from tours circulate in the local economy, further garnering support from the local communities.

2.2.3. Stakeholder Engagement

Stakeholders have been involved in the planning work in connection with the preparation of the maritime spatial plan. The steps followed have been first through the notification of the start of the consultation process through the DMA website, followed by the consultation process which includes seminars, workshops, forums and active participation through working groups and advisory committees.

2.3. Status of Offshore Wind Energy

2.3.1. Current capacity and targets

Denmark is a pioneer in the OWP sector, having built the world's first offshore wind farm (OWF) at Vindeby in southern Denmark in 1991 (it was decommissioned in 2016). Presently, it has 14 offshore wind farms in operation, with a total installed capacity of 1.7 GW, and at least 7.6 GW of additional offshore wind is planned by 2030.

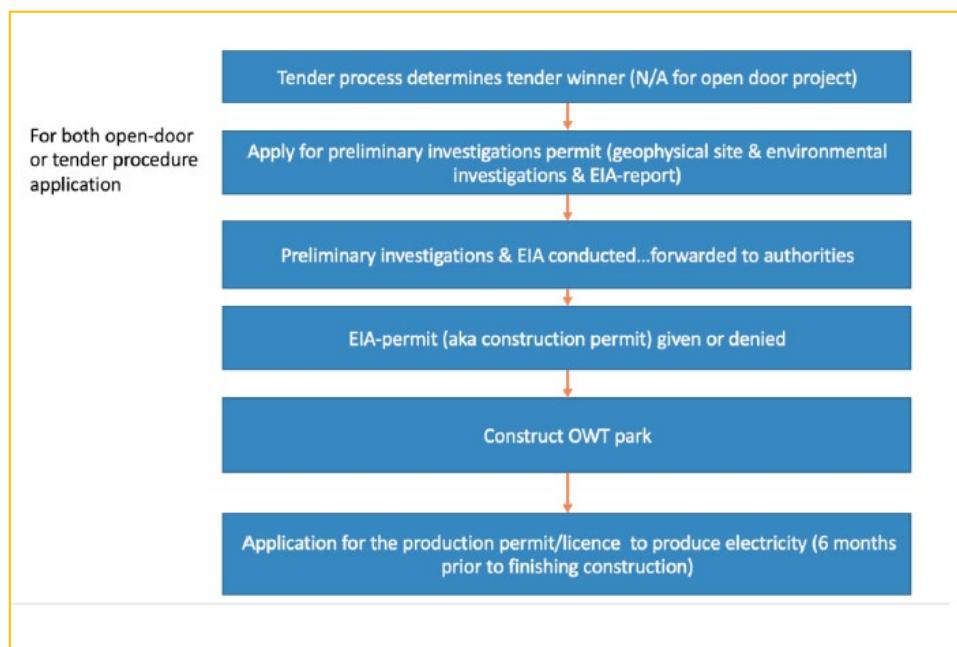
A stable and supportive policy framework paired with a long-term planning vision has been key to the success of large-scale OWP development. In Denmark, OW targets are settled through political agreements by a majority in Parliament.

2.3.2. Overview of Regulatory and Permitting System

2.3.2.1. Consenting System

The legal framework for the development of OWP in Denmark is the Danish Act on the Promotion of Renewable Energy. The licencing process for the development of OWP is streamlined and carried out by one central authority in Denmark, the Danish Energy Agency (DEA). This type of permitting and licensing system is referred to as a "one-stop-shop" mechanism (Danish Energy Agency, 2020). A central government authority manages the permits, licences and consultations required for the development of offshore wind projects. The DEA handles the process, issuing licences for preliminary investigation, construction, electricity production and electricity production authorisations. Figure 4 gives an overview of the permitting process in Denmark.

Figure 5 Overview of Danish permitting process



Source: Jack, 2022

2.3.2.2. Act on the promotion of renewable energy (No. 1392 of 2008)

The purpose of this Act is to promote the production of energy using renewable energy such as wind, hydro, biogas, biomass, solar, wave and tidal energy and geothermal heat. The Act specifically applies to wind turbines facilities by promoting development measures to harness energy from water and wind on onshore or offshore economic zones.

The Act specifies that renewable energy facilities at sea can only be established with the permission of the Minister of Climate, Energy and Utilities. Relevant licenses are issued in accordance with S22-29 of the Act on the promotion of renewable energy and the Act on electricity supply.

The DEA have served as a one-stop-shop for all licensing and permitting issues since 1996. This includes all negotiations are coordinated and engagement with other public bodies. The DEA supervises conditions in the licences all the way through to end-of-life and decommissioning of the OWF.

2.3.2.3. Auction System

Denmark held its first competitive OWP auction in 2005 for Horns Rev 2. Nine auctions have followed, yielding 3.2 GW of projects, with the most recent auction in 2021 for the Thor project. Auctions are agreed upon individually in a political process in the national parliament, and the auction design is adapted for each single auction. Usually, single-item auctions

with a predefined size of 200-1000 MW are held (e.g., one OW site).

The DEA is the auctioning body that grants licenses for preliminary studies, construction, and operation of OWF. The auction award criterion is the support level paid out as a two-sided CfD in ore/kWh of produced electricity. All auctions use static sealed-bids with pay-as-bid pricing. Bidders must prequalify, apart from two early auctions. The DEA conducts extensive stakeholder engagement during the auctioning process. Each auction consists of a two-step process with a first indicative offer and a best and final offer, through which tender design specifications are improved through individual meetings with bidders. The tendering procedure is explained in detail below (Danish Energy Agency, 2017).

Tendering procedure in Denmark

1. **Technical dialogue** with interested tenderers and investors. The Danish Energy Agency is inviting potential tenderers and investors to a bilateral technical dialogue. This will enable adjustment of preliminary surveys and tender specifications to market requirements. The dialogue will take into account the principles on equal treatment, transparency and proportionality.
2. **Publication of the contract notice** and the full tender specifications. The contract notice notifies the market that the Danish Energy Agency wants to enter into a concession contract. The Danish Energy Agency will draw up technical



and financial criteria for pre-qualification of potential tenderers suitable for meeting the concession contract. The full tender specifications will list the terms of the tendering procedure, framework conditions for establishing the offshore wind farms, draft permits for preliminary surveys, establishment and operation of the offshore wind farms, as well as a draft concession contract.

3. **Negotiation with prequalified tenderers.** Potential tenderers express their interest in participating in the tendering procedure by submitting an application for prequalification. Applicants for prequalification must submit documentation that they meet the suitability conditions. Based on the first proposed tenders by the prequalified tenderers, the Danish Energy Agency will negotiate the final design of specification requirements, contract proposal, etc. with the pre-qualified tenderers. The reason for the negotiations is that the Danish Energy Agency must be able to clarify, specify and

adjust the tender documents, if necessary. Negotiations will be carried out without the risk of distorting competition. Prior to the negotiations, the Danish Energy Agency will provide information about which items are open for negotiation. The items open for negotiation will primarily concern whether and how the tender documents can be improved with a view to lowering prices.

4. **Final call for tender.** Based on the negotiations, the tender documents will be adjusted within the framework of the published tender documents. Submission of final tenders based on the final tender documents.
5. **Selection of winner and drafting of the contract.** The final winner will be selected based on the award criteria in the tender documents. Danish Energy Agency can enter a concession contract with the winner and award permits for preliminary surveys and establishment.



3. COUNTRY FICHE: GERMANY

3.1. MSP Overview

Maritime Spatial Planning in Germany is done on two levels, the Federal level for the EEZ and the level of coastal Federal States (Länder) for the 12nm territorial waters. The Federal Republic of Germany consists of 16 Federal States (Länder). The first MSP was established in 2009 for the EEZ in the North Sea and Baltic Sea. The second round of MSP plans has been in place since September 2021 and covers the EEZ and the territorial sea areas under the jurisdiction of the three coastal federal States: Lower Saxony, Schleswig-Holstein, and Mecklenburg-Vorpommern.

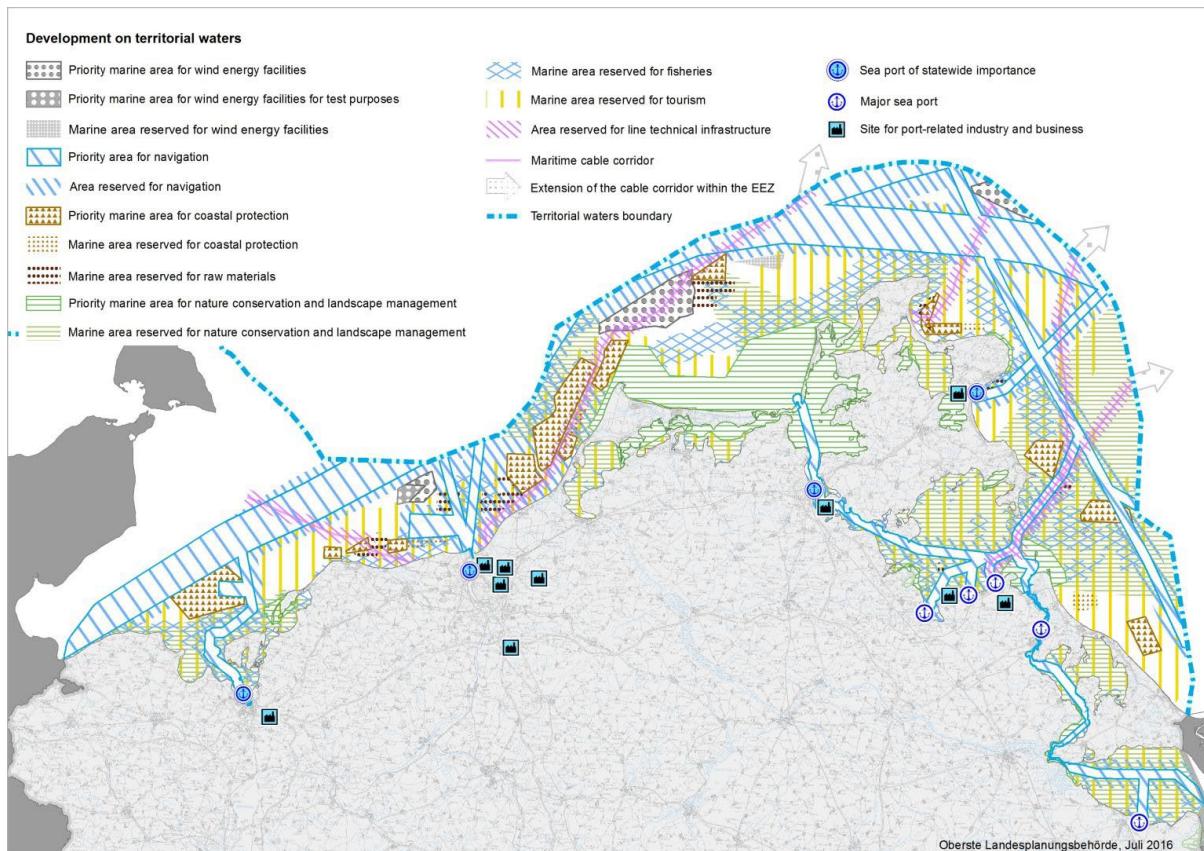
With the development of offshore wind energy, the utilization of Germany's marine space increased beyond its traditional uses, such as shipping or fishing. The Federal Maritime and Hydrographic Agency (Bundesamt für Seeschifffahrt und Hydrographie - BSH) is responsible for the maritime spatial planning in the EEZ, where most offshore wind plants are situated, and defines priority areas for competing uses. The agency reports to the Federal Ministry of Transport and Digital Infrastructure (Bundesministerium für Verkehr und digitale Infrastruktur - BMVI), while states are responsible for the coastal waters.

The German Federal Agency for Nature Conservation (Bundesamt für Naturschutz – BfN), an agency of the BMU, is the government's scientific authority with responsibility for national and international nature conservation (BfN 2020). The BfN provides the BMU with professional and scientific assistance in all nature conservation and landscape management issues and compiles environmental impact assessments.

Mecklenburg-Vorpommern stands out as the first German coastal state to integrate designations for various uses within its 12-nautical-mile zone into its regional development program through MSP⁴⁶. Adopted in 2005, this extended program became legally binding and was overseen by the Ministry of Transport, Building, and Regional Development. In this plan, suitable areas for OWP were designated, far from the reservation area for tourism to avoid spatial conflict. The plan also carried out a risk analysis to identify priority areas and suitable areas for OWP to ease shipping in the 12-nautical mile zone. The plan was then updated and adopted in 2016 and is implemented by the Ministry of Energy, Infrastructure and Digitalization of Mecklenburg-Vorpommern.

⁴⁶ European MSP Platform. "Maritime Spatial Plan for the Territorial Sea of Mecklenburg – Vorpommern." (2020).

Figure 6 Germany MSP for Mecklenburg-Vorpommern



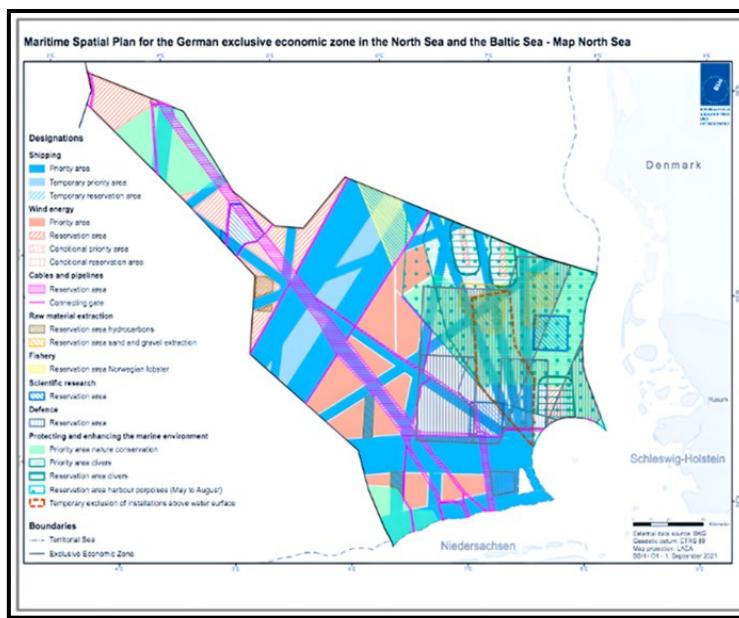
Source: BSH, 2016

3.1.1. Planning in the German EEZ

Germany has established a maritime spatial plan for the German EEZ in the North Sea and the Baltic Sea for the first time in 2009 and most recently in 2021. Unlike the territorial sea, the EEZ is not part of the sovereign territory of the Federal Republic of Germany, which is why MSP must respect, among other things, UNCLOS provisions for other states (such as

freedom of navigation, overflight, and laying of cables and pipelines). The MSP aims to coordinate conflicts of use in the EEZ, especially between the development of space-intensive OWE installations, maritime environmental protection, and traditional uses of the sea such as shipping and fishing. See Figure 2 for the MSP. MSP pursues an integrated and sustainable approach, aiming to create favourable conditions for the utilisation of the potential for OWE installations in the German EEZ.

Figure 7 Germany MSP for North and Baltic Sea



Source BSH, 2023

The Federal Ministry of Housing, Urban Development and Building (BMWSB) is responsible for MSPs in the North and Baltic Sea's German Exclusive Economic Zone (EEZ). The Ministry commissioned the Federal Maritime and Hydrographic Agency (BSH) to draw up the plans. These plans set legally binding objectives and principles (guidelines that need to be particularly considered, e.g. in a decision process on licensing, when taking into account relevant interests) of spatial planning with regard to; economic and scientific use, ensuring safety and efficiency of maritime traffic, protection of the marine environment.

The updating of the current spatial plan for the German EEZ by BSH is intended to take place in a few years. Usually, the update of the EEZ plans considers, among other factors, the changing demands on sea space, the changing policy environment (e.g., EU MSP Directive and MSFD Directive), international guidelines (e.g., HELCOM/VASAB guidelines on the ecosystem approach), as well as lessons learned from international projects in which Germany participates.

The featured sectors in the German EEZ MSP include:

1. Shipping/Navigation: This sector remains a priority and has designated areas for shipping routes, including temporary priority and reservation areas.
2. Offshore Wind Energy: The plan designates priority and reservation areas for offshore wind

energy, indicating its importance in the maritime spatial plan.

3. Cables and Pipelines: The plan includes designated areas for cables and pipelines, recognizing the need for infrastructure development in the maritime space.
4. Raw Material Extraction: The 2021 plan introduces reservation areas for raw material extraction, indicating the recognition of this sector's importance in the EEZ.
5. Fisheries and Marine Aquaculture: The plan designates reservation areas for fisheries and marine aquaculture, acknowledging the significance of these sectors in the maritime space.
6. Scientific Uses: The plan includes reservation areas for scientific research, highlighting the importance of marine research in the EEZ.
7. Protection and Improvement of the Marine Environment: The 2021 plan prioritizes the protection and improvement of the marine environment, designating areas for this purpose.
8. National and Alliance Defence: The plan designates reservation areas for national and Alliance defence, recognizing the importance of security aspects in the maritime space.
9. Underwater Cultural Heritage: The plan includes reservation areas for underwater cultural heritage, indicating the recognition of the importance of preserving and protecting cultural heritage in the EEZ.
10. Recreation: The plan features reservation areas for recreation, indicating the consideration of recreational activities in the maritime space.



3.1.2. Priority areas and reserved areas in the German MSP for the EEZ

In the priority area for a specific use or function, other uses that are incompatible with the priority use or function are not permitted – this means that this area is kept free for the priority use. Principles are statements on the development, order, and safeguarding of space that are to be considered in the context of consideration or discretionary decisions. T

In the reservation area, in the event of a conflict of interest with other uses or functions, greater weight is attached to the designated use or function. The designation of priority or reservation areas does not mean that the respective use or function in the planning area may not take place outside these areas. However, the use/function must assert itself against all other competing uses, whilst the priority area is reserved for it or whilst it is given greater weight in the reservation area when competing uses are considered.

However, the current plan does not allocate separate areas for multiple use but focuses primarily on minimizing mutual interference through temporal coordination and spatial distance determination.

Nevertheless, exceptions due to overlays of different priority areas as well as combinations of multiple uses with non-spatial marine uses are already evident in the existing MSP.

3.2. Offshore Wind Energy with Other Marine Uses

The current MSP 2021 does not explicitly allocate areas for co-use between OWPs and secondary use. However, the plan indicates that co-use areas with OWPs are planned for the future. The following table shows the overlaps in the offshore wind energy zone in the German EEZ MSP.

Combination	North Sea	Baltic Sea
Energy - Shipping	Pipeline Reserved Area + Priority Shipping Area	Pipeline Reserved Area + Priority Shipping Area
Energy - Nature protection	Nature Conservation Reserved Area + Pipeline Reserved Area Priority Area / Reserved Area / Conditional Reserved Area for Wind Energy + Reserved Area for Harbour Porpoises (May to August)	Priority Wind Energy + Bird Migration Pipeline Reserved Area + Priority Nature + Bird Migration (and only Nature / only Bird Migration)
Energy - Research	Pipeline Reserved Area + Research Reserved Area	Priority Wind Energy + Conditional Wind Energy Reserved Area + Research Reserved Area Pipeline Reserved Area + Research Reserved Area
Energy - Military	Wind Energy Reserved Area + Defense Reserved Area	Priority Wind Energy + Defense Reserved Area (very small)

3.3. Conflict Resolution Mechanisms

3.3.1. Wind Energy and Aquaculture

MSP stipulates that the establishment of aquaculture facilities should be located in close proximity to or in

combination with existing or under-construction facilities, with the maintenance and operation of the other facilities to be minimally affected by the establishment and operation of aquaculture. Environmentally friendly types and forms of aquaculture should be chosen. In fact, aquaculture is currently not permitted in offshore wind zones in Germany. However, as later shown, there are already successful examples of such combinations of multiple use in other



North Sea countries. These could serve as inspiration for how such multiple use could be possible in Germany in the future, as already formulated as a goal in the current plan. The development of combining renewable energy with sustainable biomass production (algae/mussels for various purposes) is still in the developmental phase in Germany. Scientific pilot projects, such as UNITED, demonstrate the feasibility of this multiple use combination in the German EEZ. However, innovative infrastructures, even for research purposes, currently undergo lengthy administrative processes due to the lack of predefined rules. Commercial aquaculture permits typically take between 5 and 10 years and reflect a robust regulatory approach that can occasionally hinder innovation.

3.3.2. Wind Energy and Fisheries

Fishing is generally not allowed in offshore wind parks. However, the Spatial Development Plan for the German EEZ provides for fishing vessels to be able to pass through wind parks on their way to fishing grounds. In addition, passive methods such as pots and traps should be possible in the safety zones of the wind parks, as far as construction, operation, and maintenance of the wind parks are minimally affected, and subject to conflicting specialist legal regulations. However, this regulation generally does not apply to the area delimited by the outer structures of the wind park and not to the immediate vicinity of the outer structures. Nevertheless, two examples near Helgoland show that multiple use of the seas by fishing and OWPs is possible. In this case, fishermen must ensure a) a distance of 150m from the structures, b) fishing permits are based on current weather conditions, and c) a maximum speed must be maintained (Bonsu et al., 2024).

3.3.3. Wind Energy and Research

Research in wind priority areas is still partially facilitated, for example, by the research platform FINO 3 at the DanTysk offshore wind park. Furthermore, explicit reference is made to the 'multiple use' of the wind energy areas EO2-West and EN20. Insofar as these are also designated as reservation areas for research FoN3 and FoO3, fisheries research as practiced to date should remain possible in terms of nature and scope.

3.3.4. Wind Energy and Nature Conservation

Implementation of innovative avoidance measures to protect birds at offshore wind turbines: The MSP emphasizes that consideration must be given to bird migration when placing wind turbines. Measurement and shutdown systems can be used during critical times to avoid collisions. Although Germany has not yet adopted the practice, as in the Netherlands, of temporarily shutting down

wind parks due to bird migration, this could be a possible development in the future.

The threat to migrating birds is a potential conflict with the expansion of OWE, and to date, there is no technical basis for recognising increased periods of collision risk for migratory birds and implementing mitigation measures. The Federal Agency for Nature Conservation (BfN) is developing a concept for an automated bird migration detection network to monitor bird migration in the German EEZ in real-time. This system should make it possible to predict bird migration patterns in the height range of wind turbines to implement measures such as **temporary shutdowns** during bird migration events.

Offshore wind and Natura 2000 nature protection site: Butendiek OWF in Germany (approved in 2002 and in operation since 2015) has various cable connections and service traffic crossing Natura 2000 marine site (designated in 2004). At the time of approval, a site designation had been proposed by the Federal Agency for Nature Conservation (BfN) but had not yet been implemented.

In November 2020, based on new scientific findings, the BfN concluded that operation of the wind farm (in contrast to what had previously been assumed) has significant impacts on the bird sanctuary (SPA) and therefore violates prohibitions under nature conservation law. At the operator's request, exemptions from the prohibitions concerned for the continued operation of the wind farm was in March 2021. The NABU (NGO) opposed this with an urgent application and a lawsuit. The court rejected the emergency application, stating as grounds that the BfN had rightly given priority to the public interest in electricity generation from renewable energies.

Two projects in Natura 2000 areas were denied approval in 2002, and since then no further applications within Natura 2000 areas have been put forward. Today, planning regulations do not allow OWFs in Natura 2000 areas, but cable connections can cross some MPAs (BSH, 2023). According to the German EEZ MSP and the sectoral FEP (site development plan), OWF are only planned outside MPAs. Therefore, there is no justification with an overriding public interest required in the planning/designation of OWF sites.

The German Government is currently discussing on how to adapt our planning and permitting processes to these requirements to address REDIII and acceleration areas (go-to-areas) and will only be implemented after the directive is transferred into German law.



3.3.5. Joint Use within the Energy Sector (e.g. with solar or wave)

An already practiced approach within the energy sector is to use a common substation between the transmission system operator (TSO) and the wind farm operator. This is particularly relevant in the Baltic Sea, where the grid connection at the OSS is located in the offshore wind park. To enable this joint cooperation, the BSH has stipulated the organization of a "Proximity Agreement" as a licensing condition. This agreement regulates work in the respective safety zones to ensure safe coexistence of activities.

3.4. Planning in German Federal States

Spatial planning conducted by the federal states (Länder) takes place within their respective territories. This includes planning for coastal waters, with coastal states incorporating marine areas extending seaward up to 12 nautical miles into their spatial plans. In Schleswig-Holstein the competent authority is the Ministry of the Interior, Rural Areas and Integration Schleswig-Holstein. In Mecklenburg-Vorpommern the responsibility is with the Spatial Planning Authority in the Ministry of Economics, Infrastructure, Tourism and Labour (since Nov. 2021).

3.4.1. Government set up

The Federal Ministry for Economic Affairs and Energy (Bundesministerium für Wirtschaft und Energie - BMWi) is the lead ministry in the field of energy policy. The pooling of responsibilities enables a coherent energy policy and a close consideration of the energy market in its entirety. The BMWi drives the energy transition efforts and has committed to making it a driver for energy efficiency, modernisation, innovation and digitalization in the electricity and heating sectors.

Besides the BMWi, other ministries with interests or marginal competencies in the energy field include the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (Bundesministerium für Umwelt, Naturschutz und nukleare Sicherheit - BMU), the Federal Ministry of Economic Cooperation and Development (Bundesministerium für wirtschaftliche Zusammenarbeit und Entwicklung - BMZ), the Federal Ministry of Education and Research (Bundesministerium für Bildung und Forschung - BMBF) and the Federal Foreign Office (Auswärtiges Amt - AA).

The Federal Network Agency (Bundesnetzagentur - BNetzA), an agency of the BMWi, is the competent regulatory authority to ensure the most secure, low-

priced, consumer-friendly, efficient, and environmentally sustainable supply of electricity and gas possible (Bundesnetzagentur 2020c). Its role as the authority holding the renewable energy tenders and regulating the grid network in Germany is most significant in this context.

Maritime Competences in Germany	
MSP for the North & Baltic Sea EEZs	Federal Maritime and Hydrographic Agency (BSH)
Internal Waters and the Territorial Sea	Schleswig-Holstein – Ministry of the Interior, Rural Areas and Integration of the State Schleswig-Holstein Mecklenburg Vorpommern – Ministry of Energy, Infrastructure and Digitalization Mecklenburg-Vorpommern Lower Saxony – Ministry of Food, Agriculture and Consumer Protection
Nature Conservation	Federal Agency for Nature Conservation
Wind Energy Development	Federal Ministry for Economic Affairs and Energy BSH

3.4.2. Stakeholder Engagement

The Federal Ministry of the Interior, for Building and Community (BMI) formally initiated revising the maritime spatial plans by informing the public and relevant authorities about the revision process pursuant to § 9 para. 1 ROG. Public Authorities had the opportunity to provide information on any plans and measures they intend to take in the EEZ or have already taken, as well as on the time schedule for their implementation. From September to December 2019, the BSH conducted various thematic workshops and expert discussions on shipping, nature conservation, fisheries, underwater cultural heritage, defence and raw material extraction.

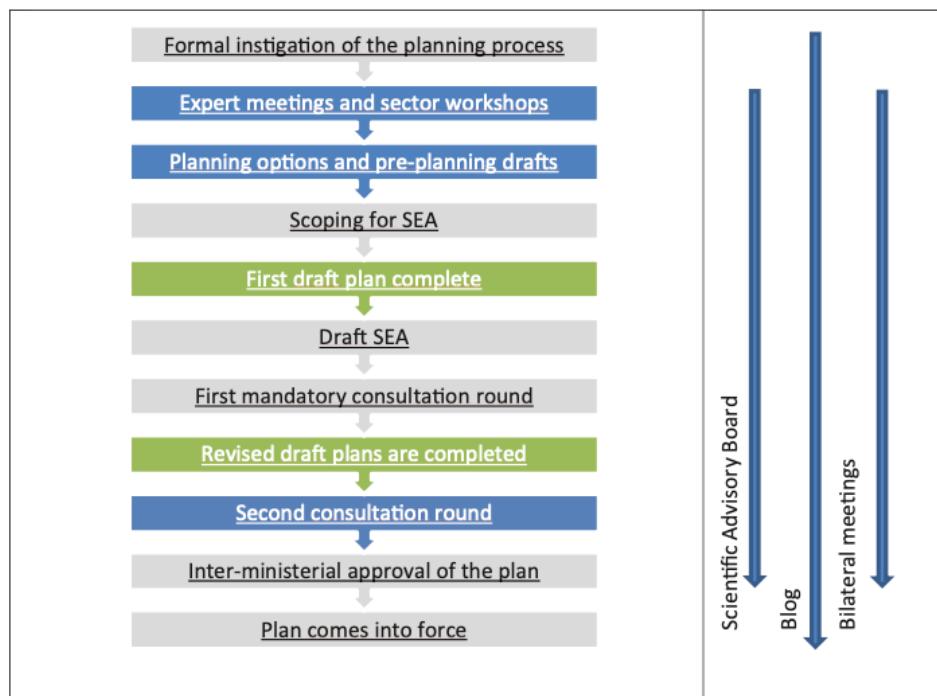
National Consultation: Considering the information received and the results of the workshops and expert discussions, the BSH drew up a concept for revising the maritime spatial plans. The concept set out three planning options with different areas of focus. At the same time, the draft scope of the SEA was prepared. A national public hearing to discuss the concept and scope of the SEA was held on 18 and 19 March 2020. On 17 September 2020, the BSH confirmed the investigation framework for the SEA for the revision of the maritime spatial plans. Based on the public hearing results, the BSH prepared the first draft maritime

spatial plan for the German EEZ in the North and Baltic Seas. The draft plan was published together with the draft environmental reports on September 25, 2020.

Authorities and the public had the opportunity to submit comments on the draft plan and environmental reports. In addition, a consultation meeting was offered as an online conference on 24 and 25 November 2020.

The BSH revised the draft plan and the environmental reports based on the comments received and consulted with national ministries and departments. In April and May 2021, BMI and BSH prepared a second draft plan based on the results of that consultation. The national consultation on the second draft plan was launched on June 3, 2021. Comments on the second draft and the revised environmental reports could be submitted until 25 June 2021.

Figure 8 Planning process of the 2021 EEZ plan



International Consultation: The international consultation for the revision of the maritime spatial plans for the German EEZ started early in the process in the first quarter of 2020. It also included the formal ESPOO procedures for participation. On 23 April 2020 an informal online meeting was held to inform international stakeholders on the progress of the revision process.

The BSH provided translations of the draft maritime spatial plan as well as the environmental reports in English, Danish and Polish. Authorities and the public concerned in neighboring countries had the opportunity to comment on the documents until 15 January 2021. In addition, an international consultation meeting took place on 27 January 2021 as an online conference in English. Based on the results of the national and international consultations in November 2020 and January 2021, respectively draft plan and the environmental reports were revised. The departments at national level, affected by the spatial plan, jointly agreed upon a draft plan during consultation rounds in April and May 2021. BMI and BSH prepared a second draft plan based on the results of

that consultation. The international consultation round on the second draft plan was launched on 4 June 2021. Comments on certain amendments of the second draft maritime spatial plan and the revised environmental reports were invited until 30 June 2021. An international information meeting was organized on 15 June 2021 as an online conference in English. Following an extensive process that included national and international consultation, the new maritime spatial plan for the North and Baltic Seas' EEZ came into force on September 1, 2021.

3.5. Status of Offshore Wind Energy

3.5.1. Current capacity and targets

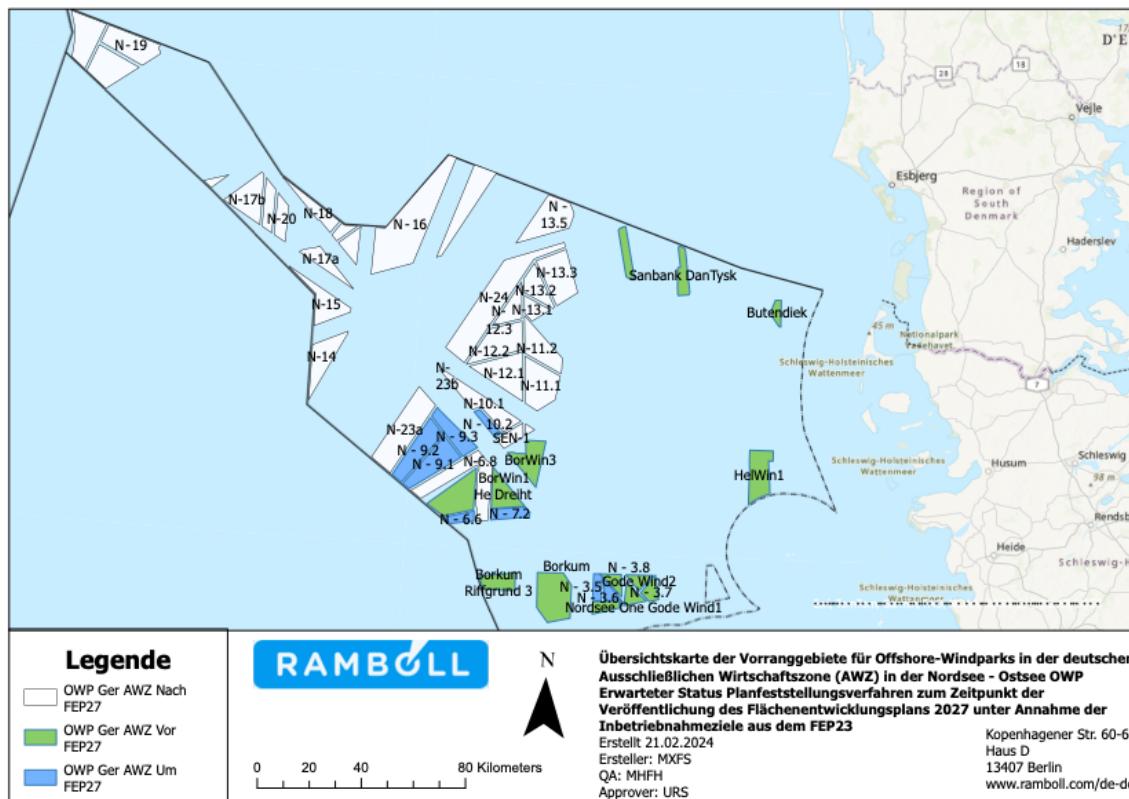
Germany plans to install 30 GW of offshore wind capacity in the North Sea and Baltic Sea by 2030, an expansion that will reduce costs through technology enhancements and improved operational strategies. Currently, approximately 27,000 individuals are employed in this sector.

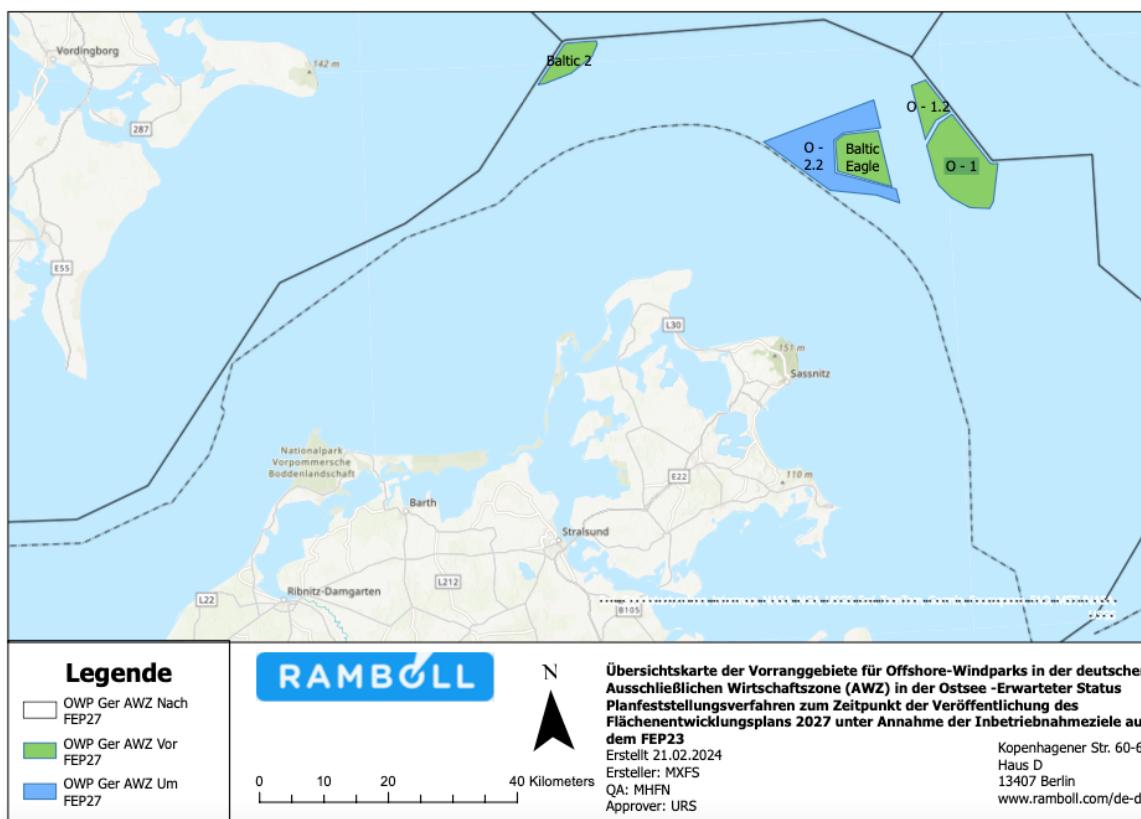
Currently there are 1,563 offshore wind turbines connected to the grid, amounting to around 8.4 GW of installed capacity and two additional offshore farms under construction with a combined output of 500 MW. For the first half of 2023 alone, these installations generated roughly 11.3 terawatt hours (million MWh) of electricity from offshore wind power

sources. Figure 6 provides a map of the OWE installations in Germany.

The **Offshore Wind Act** (WindSeeG) establishes long-term targets, a significant increase in the expansion target to 20 GW by the year 2030 and 70 GW by 2045.

Figure 9 Area Development Plan (Flächenentwicklungsplan)





Source: Ramboll, 2024

3.5.2. Overview of Regulatory and Permitting System

Consenting System

Only the consenting system relevant in the context of EEZ is described in detail given that most offshore wind farms in Germany occurs in the EEZ. The consenting process in Germany EEZ follows a one-stop-

shop mechanism through a central authority, in this case, the Federal Maritime and Hydrographic Agency (BSH). The first step is investigating the EEZ's marine spatial planning, ensuring that economic and use interest areas are balanced with environmental protection. The EEZ is divided into safety zones to minimise conflicts and accidents.

The tiered system of planning and licensing for offshore wind planning in the German EEZ and responsible authorities.		
Level of planning	Authority	Environmental assessment
Maritime spatial plan (EEZ)	BSH	SEA
Site Development Plan for offshore wind (EEZ)	BSH	SEA
Preliminary site investigation (EEZ)	BSH	N/A
Determination of site suitability (EEZ)	BSH (Commissioned by the Federal Ministry for Economic Affairs and Energy and the Federal Network Agency)	N/A
Tendering of sites	Federal Network Agency (Commissioned by the Federal Ministry for Economic Affairs and Energy and the Federal Network Agency)	N/A
Application for planning approval (EEZ)	Developer	EA
Planning approval for projects (EEZ)	BSH	

Figure 10 Central model for the development of wind energy in Germany⁴⁷



Source: BSH, 2023a

The Federal Ministry for Economic Affairs and Energy (Bundesministerium für Wirtschaft und Energie - BMWi) is the lead ministry in the field of energy policy. The pooling of responsibilities enables a coherent energy policy and a close consideration of the energy market in its entirety. The BMWi drives the energy transition efforts and has committed to making it a driver for energy efficiency, modernisation, innovation and digitalization in the electricity and heating sectors.

Besides the BMWi, other ministries with interests or marginal competencies in the energy field include the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (Bundesministerium für Umwelt, Naturschutz und nukleare Sicherheit - BMU), the Federal Ministry of Economic Cooperation and Development (Bundesministerium für wirtschaftliche Zusammenarbeit und Entwicklung - BMZ), the Federal Ministry of Education and Research (Bundesministerium für Bildung und Forschung - BMBF) and the Federal Foreign Office (Auswärtiges Amt - AA).

The Federal Network Agency (Bundesnetzagentur - BNetzA), an agency of the BMWi, is the competent regulatory authority to ensure the most secure, low-priced, consumer-friendly, efficient, and environmentally sustainable supply of electricity and gas possible. Its role as the authority holding the renewable energy tenders and regulating the grid network in Germany is most significant in this context.

Germany's legal framework governing offshore wind energy comprises several key laws and regulations, including the Renewable Energies Sources Act (EEG),

the Wind Energy at Sea Act (WindSeeG), and the German Energy Industry Act (EnWG), alongside ancillary regulations through the Maritime Facilities Ordinance, Seeanlagenverordnung (SeeAnIV). These laws provide for grid connection rights and electricity off-take for wind farm operators under the EEG.

To streamline project development and cut costs, the WindSeeG establishes a centralised planning process overseen by the Federal Maritime and Hydrographic Agency (BSH). WindSeeG aims to increase the total installed capacity of OWE systematically and cost-effectively to 15 GW by 2030 through spatial planning, expedited site approval EEG incentives and grid connection for OWP. This law also governs auctions conducted by the Federal Network Agency (BNetZA) and licensing for offshore wind farms in the German Exclusive Economic Zone (EEZ). The SeeANIV governs the approval process for installations at sea, for example OWE facilities and grid connections.

The EnWG outlines the obligations of transmission system operators (TSOs) to build grid connections and compensate for delays or interruptions. Additionally, various ordinances and regulations issued by BNetzA and BSH provide detailed guidelines for offshore wind farm planning, licensing, construction, and operation.

Under Section 2 of the EEG, new offshore wind projects undergo simplified approval procedures, considered to serve public interest and safety until Germany's power generation is carbon-neutral. The WindSeeG explicitly emphasizes this for offshore

⁴⁷ BSH, "Spatial Planning in the German EEZ: Supporting Document to the Maritime Spatial Plan for the EEZ 2021." (2023).



wind from January 1, 2023, making rejections of wind turbine installation applications exceptional.

Since 2023, Germany adopted a dual auction model to meet expansion goals, requiring increased auction volumes and accelerated project development. Successful bidders are expected to fund project development without relying on feed-in tariffs or market premiums. Auctions will include both centrally pre-investigated sites and new sites, with different criteria for each.

Successful bidders must provide bonds to secure compliance with development milestones and timely commissioning. Following the Site Development Plan, their rights and duties include exclusive project permit procedures and obtaining grid capacity and connection from operators.

3.5.3. Auction System

The auction system⁴⁸ is regulated by the Offshore Wind Energy Act (WindSeeG) and held by the Federal Network Agency (BNetzA). Launched in 2017, the WindSeeG oversees and streamlines the process for bidding, as well as the licensing, planning, construction, and initiation of offshore wind projects and their grid connections. During its "transitional period," WindSeeG facilitated two auctions in April 2017 and April 2018, specifically for projects that were significantly developed, setting their commissioning window between January 2021 and December 2025. A total of 29 projects in the North and Baltic Seas. Each auction offered 1,550 MW of capacity, ensuring at least 500 MW for the Baltic Sea, with an additional 60 MW from the first auction carried over due to unassignment.

A "pay-as-bid" mechanism was utilized in both instances. Competing projects vied for sliding market-premium payments, effectively a unilateral Contract

for Difference (CfD), for a duration of 20 years post-commissioning, despite the potential for operational lifetimes extending to 25 or even 30 years. Payments are determined by the initial bids and are not adjusted for inflation, excluding grid connection costs, which are managed by the grid operator and incorporated into network fees. The auctions were exclusively for offshore wind projects.

Nevertheless, Germany has begun to implement combined auctions for offshore wind and hydrogen electrolysis starting in 2022. By the end of 2020, an updated WindSeeG was enacted, detailing the auction methodology from 2021 onwards, introducing a "central model" for offshore wind energy projects with commissioning dates post-January 2026. In this model, government bodies will conduct preselection and site investigation, inviting bids for the development rights of these sites through annual auctions each September from 2021.

The initial auction in September 2021 saw three projects auctioned, totalling 958 MW, including two in the North Sea (N-3.7 and N-3.8) and one in the Baltic Sea (O-1.3), with non-compliance penalties set at €100/kW for existing projects (N-3.8 and O-1.3) and €200/kW for preliminary sites (N-3.7). "Existing projects" refer to those eligible for the 2017/18 auctions but not awarded, now available for auction under the new system, allowing any pre-qualified bidder to participate. The original developer retains the right of substitution for these projects, enabling them to match the winning bid terms. The German auction framework prohibits negative bids, with ties at zero resulting in a draw to choose the winner. Notably, there has not been a direct allocation of seabed leases in any German offshore wind auction.

⁴⁸ Janßen, Malte, Philipp Beiter, Iegor Riepin, Felix Müsgens, Víctor Juarez Guajardo, Fajardo, Iain Staffell, Bernard Bülder,

and Lena Kitzing. "Policy choices and outcomes for offshore wind auctions globally." *Energy Policy* 167 (2022): 113000.



4. COUNTRY FICHE: THE NETHERLANDS

4.1. MSP Overview

4.1.1. Status of MSP

The Netherlands is now in the 3rd cycle of MSP, preparing the programme for 2022-2027 which will be part of the new National Water Plan (NWP). The National Water Plan contains the North Sea Programme 2022 - 2027 (NSP) through which the MSP is implemented by the Dutch Government.

The Dutch MSP allows the government to prioritise nature over economic activities in cases where economic activities significantly impact nature conservation goals outlined in national and European law. Like many other marine areas globally, the Dutch EEZ is seeing increasing use by various sectors for different purposes, which could result in conflicts over usage. OWFs are expected to undergo major expansion by 2030, with a current capacity of 957 MW set to increase substantially to 11.5 GW. Furthermore, new OWFs may be allocated for up to 20-40 GW until 2050. The large-scale development of OWFs has raised concerns among North Sea fishers as these areas will no longer be accessible for fishing using active gear, potentially leading to socio-economic impacts on the fleet, supply chain and related services when combined with other spatial measures.

The Dutch government is also working on increasing marine food production in a sustainable manner through fisheries and mariculture development, aiming for a more resilient and circular food production system. Furthermore, Dutch environmental organisations argue that a larger portion of the Dutch EEZ should be established as marine protected areas. This would have implications for both the fishing industry and offshore wind farm development, as the latter may affect nature conservation objectives.

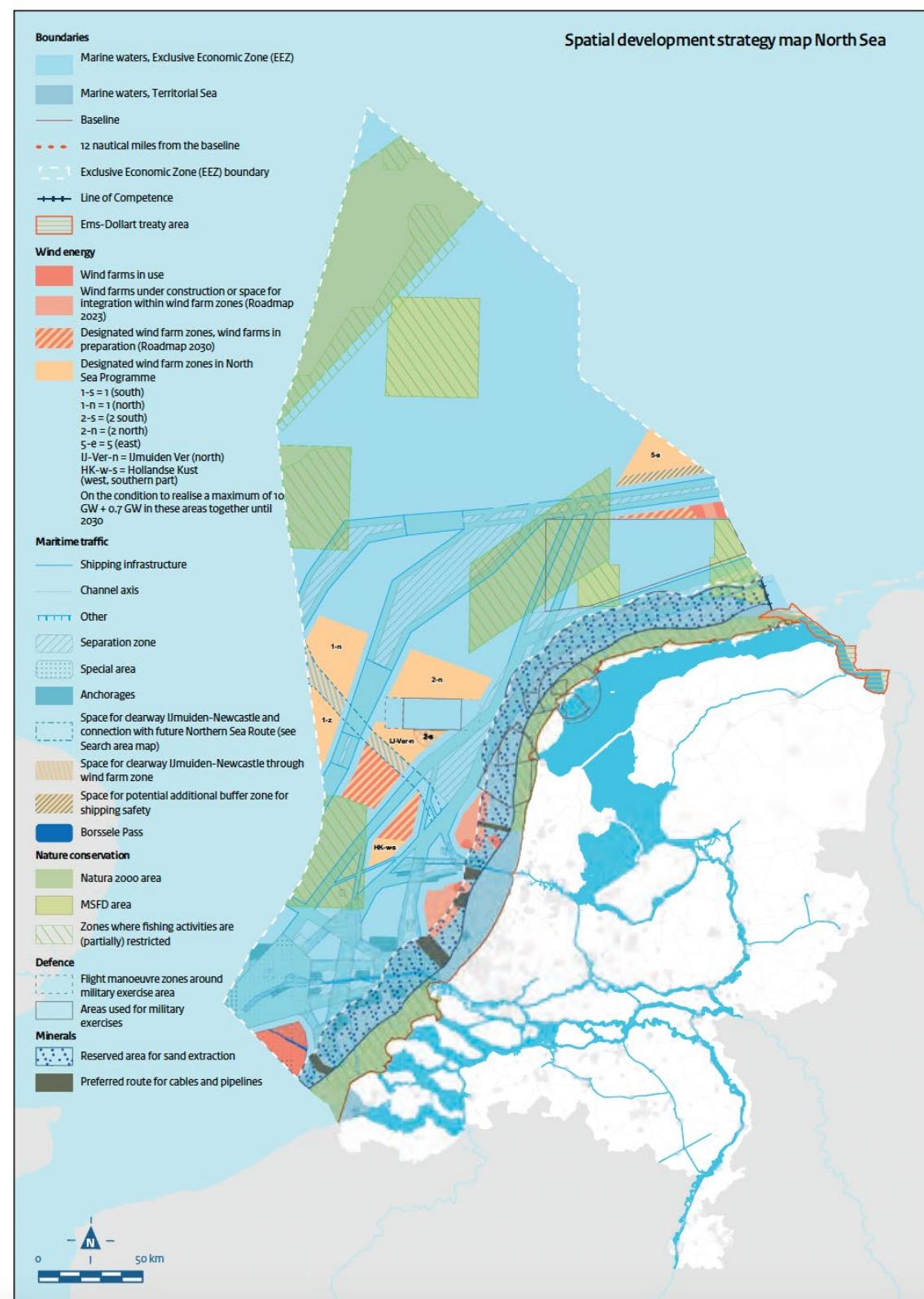
Given the complexities involved in decisions about allocating and constructing offshore wind farm areas – including technical, economic, and political factors – there is a need for an integrated approach that allows nature conservation, energy generation, and seafood harvesting to coexist effectively.

The Dutch government addressed these diverse challenges by formulating a comprehensive strategy for marine use based on the creation of the policy document "North Sea 2030 Strategy." Prior to finalizing this strategy, fishers engaged in stakeholder consultations. They actively sought media coverage to highlight their concerns about spatial claims and resulting conflicts between fisheries and OWF development, even organizing well-attended public demonstrations in major cities.

In reaction to the worries expressed by stakeholders in the media and discussions with MSP, as well as to expedite the North Sea 2030 Strategy, the Dutch government adjusted its strategy and established a forum called the North Sea Dialogue. This initiative involved government officials, major economic players, and nature conservation groups working under an impartial facilitator to develop a North Sea Agreement that would chart a path for diverse utilization of the Dutch North Sea. In June 2020, the formalized agreement outlined spatial allocations for new nature conservation areas and OWFs, along with a EUR 200 million Transition Fund. However, it was finalized without the full backing of the fishing industry. The North Sea Dialogue will be responsible for overseeing the implementation of the NSA.

The NSA represents a change in Dutch environmental strategies, moving away from government-driven policies towards collaborative efforts involving private partners and civil society organizations. This reflects a shift towards more inclusive and participatory governance models.

Figure 11 Netherlands MSP 2022 to 2027



Source: Rijkswaterstaat. "North Sea Programme 2022-2027." (2021).



4.1.2. Government set up

The Netherlands has been a pioneer in ORE use combinations as 'shared use' is defined in legislation to cover ORE combinations with nature development, food (passive fishing, marine aquaculture) and energy (other forms of renewable energy: solar panels, tidal energy).

The Ministry of Economic Affairs and Climate Policy, along with the Ministry of Infrastructure and Environment are responsible for designating areas for wind farm development. The Ministry of Agriculture, Nature, and Food Quality is in charge of managing and policy ownership for fisheries which also includes aquaculture. They also have interest in decisions about whether shellfish aquaculture is implemented within wind farms.

The Netherlands Enterprise Agency (RVO) is a government agency responsible for implementing the policies of the Ministry of Economic Affairs and Climate Policy. As a result, they are responsible for the tender process for offshore wind farms, as well as conducting site assessments and environmental impact assessments for future wind farm sites. The Rijkswaterstaat is a Dutch government agency that is part of the Ministry for Infrastructure and Water Management. Rijkswaterstaat handles applications for permits for multi-use under the Water Act. They

also conduct monitoring activities during the planning, construction, operation, and environmental impact of wind farms.

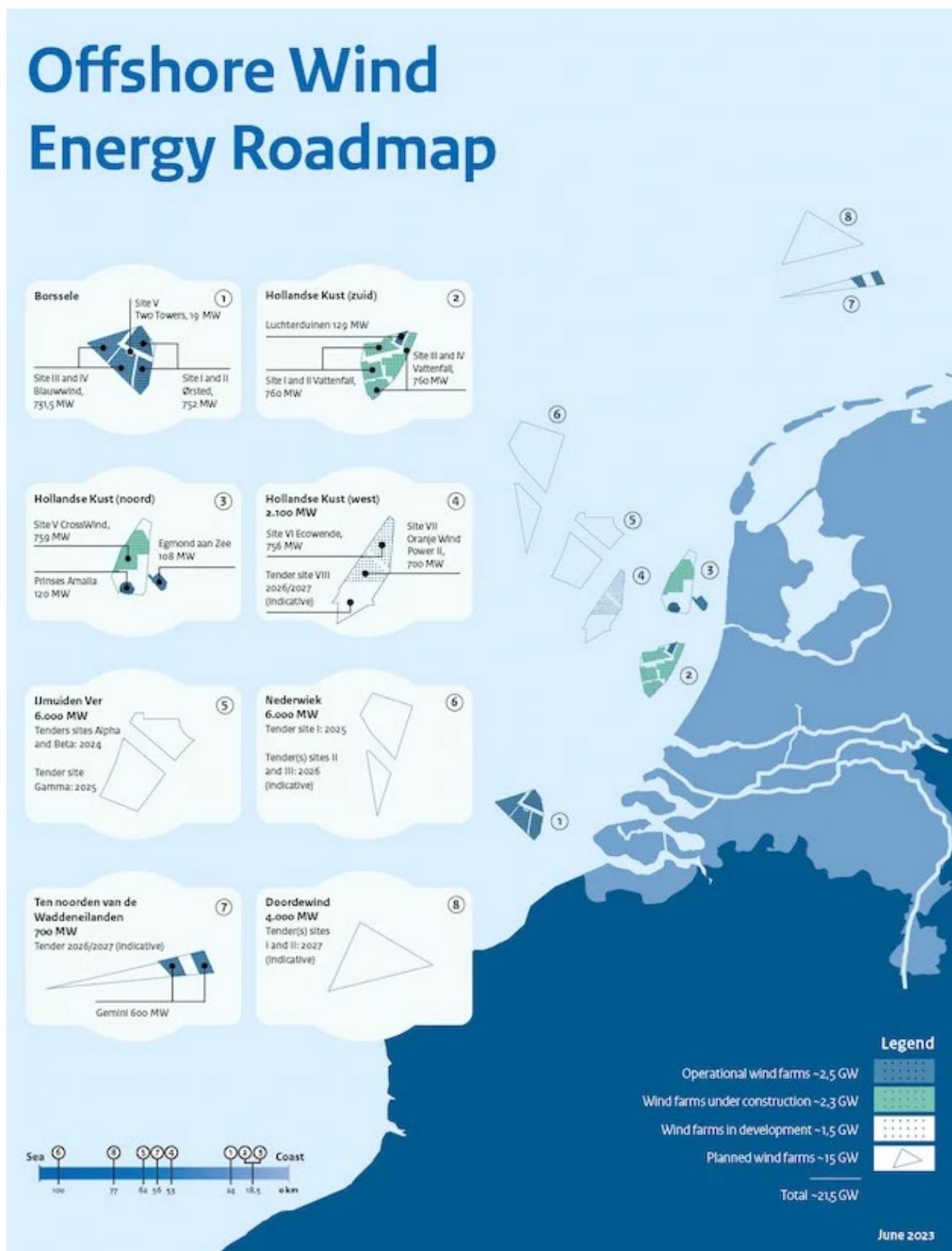
4.1.3. Spatial Planning/ Zoning mechanisms

Opportunity maps have been created as part of the MSP, identifying potential future uses of the marine space, these maps have been developed for sand mining, wind farms and areas of potential special ecological value.

An **integrated spatial assessment framework** for issuing permits was developed for location-based activities. This framework contains five elements: (1) definition of spatial allocation; (2) possibility of developing precautionary measures to prevent negative impacts on the ecosystem; (3) the usefulness and necessity of the activity; (4) choice of location and evaluation of use of space, and (5) mitigation and compensation for ecological impact.

The NSP 2022 – 2027 establishes the designation of offshore zones where OWF can be created. A **Offshore Wind Energy Roadmap** is then drafted by the Ministry of Economic Affairs and Climate Policy that shows when an OWF will begin construction, and the planning schedule will depend on other spatial developments such as oil and gas production.

Figure 12 Offshore Wind Energy Roadmap



Source: Government of Netherlands, 2023



"Area passports" are being implemented to guide multi-use within offshore wind farms. Within these wind farms, an indicative zonation designates specific zones for priority and non-priority uses. In this context, non-priority uses are permitted in the zones primarily allocated for renewable energy production. This allows various activities to apply for permits to develop within the wind farm without requiring formal authorisation from wind farm operators. It's essential to clarify that this form of MU is envisioned specifically for "new" offshore wind farms, not for existing ones. In the Dutch part of the North Sea, an offshore renewable energy installation zone has been introduced to optimise the coexistence of both traditional mobile activities and new fixed installation activities, thus reserving an area for future use by these installations.

4.1.3.1. Zonation under MSP

This activity is of national interest and space for operational capacity of 4,450 MW of offshore wind energy by 2023 has been designated. The following are designated wind energy areas: Borssele, Coast of Holland, IJmuiden Ver and North of the Wadden Islands. The Central Government does not grant permission for wind farms to be built outside designated wind energy areas. Within designated areas, permission is granted only for wind farms built according to the requirements of the Offshore Wind Energy Act (Wet windenergie op zee). In March 2018, the Minister of Economic Affairs and Climate Policy announced the 'Offshore Wind Energy Roadmap 2030'. The Roadmap 2030 outlines plans and designates locations where new wind farms may be built between 2024 and 2030. Development must be in harmony with other uses of the North Sea; the Policy Document thus provides a design criterion for maintaining the appropriate distance between shipping routes and wind farms and a design process for calculating the appropriate distance between mining sites and wind farms. The specific conditions under which, from 2017, passage and multiple uses will be allowed.

4.2. Conflict Resolution Mechanisms

4.2.1. Bird Protection

The development and operation of offshore wind farms in the North Sea have various impacts on seabirds. The three main effects are: 1) collision mortality, 2) displacement and attraction, and 3) barrier effects. This is why determining the species-specific

risk of collision between birds and turbines needs to be addressed in offshore wind farm planning. Monitoring models must be created first to develop mitigation solutions, data gathering and assessment. The Wozep serves as a best practice for data gathering and monitoring for the impact of wind farms on seabirds.

4.2.2. Wozep (Offshore Wind Ecological Programme)

The Dutch government ran the Wozep⁴⁹ (Offshore Wind Ecological Programme) avian research programme from February 2019 to 2021 in and around the Luchterduinen offshore windfarm to gain insight on species-specific fluxes, avoidance, and flight behaviour of birds.

4.2.3. Communities of Practice

In the Netherlands, a prescribed model of stakeholder engagement and coordination is used. It is facilitated through platforms like the Dutch Community of Practice North Sea (COPNS) and initiatives like Blue Cluster, which provide opportunities for dialogue, learning, and collaboration among diverse stakeholders in the blue economy sectors. These groups also cover a much wider set of sectors, going beyond offshore wind and fisheries.

4.2.4. Stakeholder engagement

During the process of developing the MSP, extensive consultations took place with a variety of representatives from different sectors to incorporate their objectives, visions, and planned developments in the maritime space. Stakeholders representing the different uses of the sea and environmental NGOs were informed of the scope of the document and consulted on specific issues. A public consultation was held on the Draft Policy Document on the North Sea and the draft of the Marine Strategy part 3 (WFD), as part of the NWP, from December 2014 to June 2015. A total of 110 responses were received, of which about half related to the Marine Strategy, with requests for further attention to be given to marine litter, lead concentrations in the sea, fishing techniques and marine nature reserves. The other responses concerned a variety of elements of the North Sea Policy and the use of sea space: policy for cables and pipelines, passage and multiple use, the visibility of wind farms and the connection with the land, the environmental impact and the framework for ecology and accumulation of impact on the marine environment, the treatment of archaeological heritage and the policy decisions regarding sand extraction and ammunition dump sites. Two formal

⁴⁹ Leemans, J.J., R.S.A. van Bemmelen, R.P. Middelveld, J. Kraal, E.L. Bravو Rebollo, D. Beuker, K. Kuiper & A. Gyimesi, "Bird fluxes, flight- and avoidance behaviour of birds in offshore wind farm Luchterduinen." (2022).

meetings with representatives from the various sectors were also held during this period. All the comments from the public were addressed by the Government in the Answer Memorandum. The Central Government amended the Policy Document on the North Sea to address points raised in the comments presented during the public consultation.

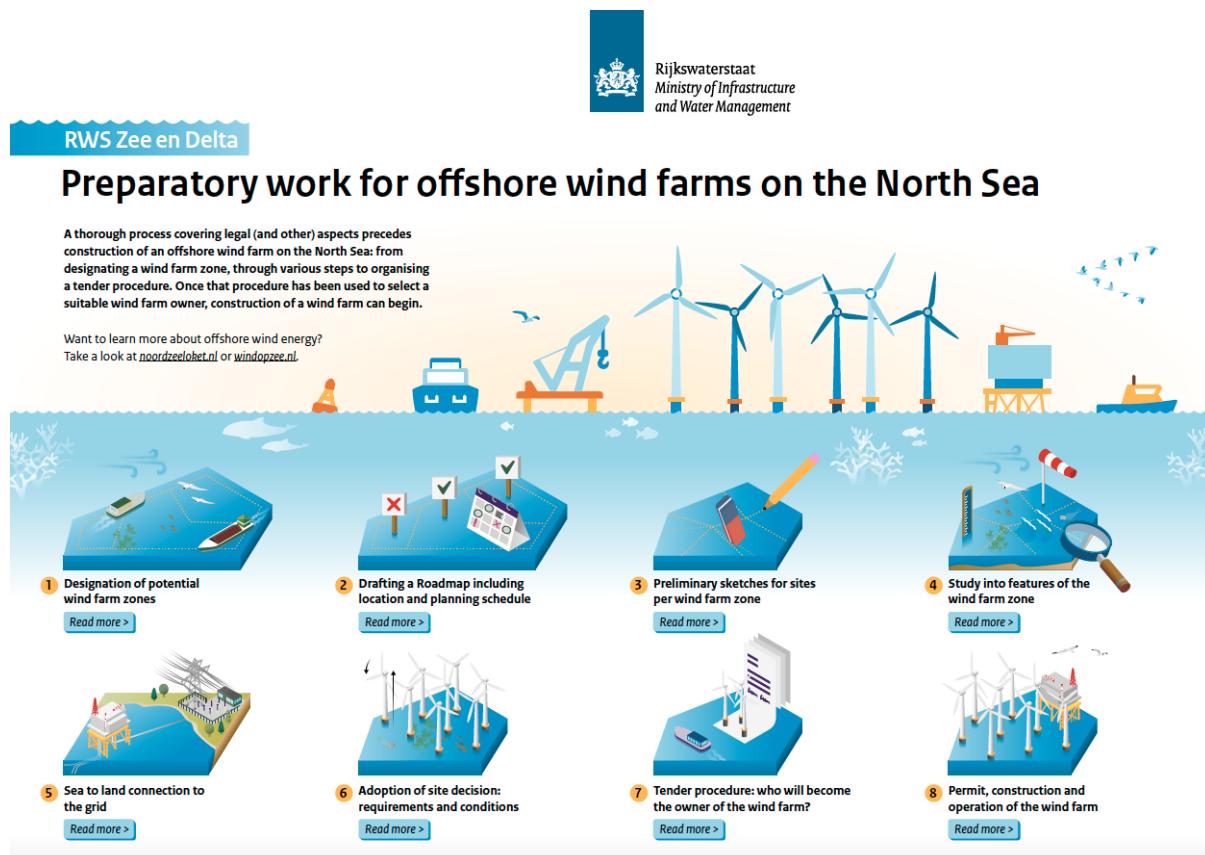
4.3. Status of Offshore Wind Energy

4.3.1. Current capacity and targets

The Netherlands has a total of 4.7 GW of installed offshore wind capacity, which represents 16% of the current national electricity demand. Furthermore, it has the world's biggest operational wind farm with a 1.5 GW capacity, "Hollandse Kust Zuid."

4.3.2. Overview of Regulatory and Permitting System

Figure 13 Overview of OWF Development in the North Sea



4.3.2.1. Consenting System

The Offshore Wind Energy Act includes four allocation methods for granting permits ('tender instruments'), including a comparative assessment. When applying the comparative assessment, a ranking criterion can be elaborated and added by ministerial regulation that are location-specific or that play a one-off role at that time due to additional social considerations with regard to innovation. The ranking criteria to be added might also be criteria in relation to nature, aquaculture, fisheries, safety or shipping. The licensing scheme and tender process for Hollandse Kust (north) and Hollandse Kust (west) Site VI,

for example, included a criterion to encourage innovations that benefit the integration of future wind farms into the Dutch energy system. The expert committee that decided on the tender for the Hollandse Kust (west) Site VI added 'contribution to the ecology of the North Sea' as a criterion as part of the comparative assessment.

Applications were assessed based on the following criteria:

1. Amount of the financial offer;
2. Certainty of the wind farm being completed
 - (knowledge and experience of the parties involved and financial guarantees issued by the parent company(s));



3. Contribution of the wind farm to energy supply;
4. Contribution to the ecology of the North Sea.

This advice meant that half of the total points available could be obtained, which was decisive for the final ranking. This 'ecology' criterion was split into two parts:

1. Stimulation of investments to benefit naturally occurring biodiversity (species, populations, and habitats) in the Dutch North Sea.
2. Stimulation of innovation and the development of solutions to benefit naturally occurring biodiversity in the Dutch North Sea from the wind farm at Site VI and future Dutch offshore wind farms.

4.3.2.2. Assessment framework for multi-use in offshore wind farms in the NL

Step 1: Initial Consultation and Activity Description

The process begins with preliminary consultations between the initiator and the competent authority, often involving other stakeholders like wind farm operators. These discussions aim to explore the proposed multiple-use activities within offshore wind farms, emphasizing integration and collaboration. The initiator provides a detailed description of the activities, including spatial requirements and potential environmental impacts. This stage also invokes the ecosystem approach and the precautionary principle to assess effects on the broader ecosystem and Natura 2000 areas. It's essential that co-use activities do not hinder wind energy generation or jeopardize safety, making early cooperation with wind farm operators highly beneficial.

Step 2: Preliminary Assessment

In this step, the competent authority evaluates the proposed activity based on policy preferences established for the specific wind farm zone. There are two potential outcomes. If the proposed activity aligns with the preferred activity for the area and location, the formal permit procedure begins immediately. However, if the proposed activity isn't the preferred one, the authority announces its intention to issue a permit for the specific location. During this period, other initiators can express interest and demonstrate their intent to develop co-use activities in the area within a specified timeframe. If no other initiators come forward, the formal permit procedure commences. If another candidate registers a preferred activity within this period, consultations are conducted to determine if both initiatives can coexist.

Step 3: Activity Assessment and Location Selection

Following the submission of the formal permit application, a comprehensive assessment process begins. The application is scrutinized based on specific criteria, encompassing spatial and operational impacts, safety, environmental compliance, and even cultural values. Permits are typically issued with specified durations, and the permit holder must initiate the approved activity within a set timeframe. Additionally, removal obligations and financial security may be required to cover potential removal costs. This step ensures sustainable co-use in offshore wind farms, taking into account environmental protection, safety, and collaboration with wind farm operators. The specific requirements may vary depending on the wind farm zone and evolving regulations.

4.3.2.3. Auction System

The Netherlands has been at the forefront of offshore wind energy tenders since 2009, with a significant shift in 2013 to the present "SDE+" competitive setup. This transformation was a result of a groundbreaking energy-climate agreement between the government, industry, and stakeholders, culminating in the energy action plan. The agreement granted offshore wind energy a substantial role, and the government established a dedicated "Wind op Zee" (Wind at Sea) team.

As per the agreement, a reduction in costs of at least 40% was expected by 2020, in comparison to the prices of the Gemini and Luchterduinen wind farms. Six auctions were held up to 2020 under the SDE+ auction setup, with three for the Borssele I-IV area (1,400 MW), two for the Hollandse Kust Zuid I-IV (1,400 MW), and one tender for Hollandse Kust Noord V (700 MW), totaling 3.5 GW. The upcoming seventh auction is in the works, and it is expected to mirror the setup of the last three auctions, which have resulted in subsidy-free projects. It is important to note that all auctions are exclusively for offshore wind.

To reduce the risks for prospective developers during the tendering phase, the government provides free site assessment campaigns, such as wind resource and met-ocean conditions, and an initial environmental impact assessment, to all bidders. TenneT, the Dutch transmission system operator, is responsible for developing and operating offshore wind energy substations and grid connections. The operator guarantees that the nominal power of 350 MW (per site) can be exported to the main grid. Furthermore, wind sites can be overplanted by 8% nominal power, and the operator is responsible for reducing power to the nominal power of 350 MW when instructed by TenneT. The cost for offshore transmission is socialized to accelerate the development of sites. Site assessment costs, including a provisional environmental impact assessment, have been socialised to encourage more relevant parties and lower bids.



From 2022 onwards, the winner of the tendering process will have to reimburse the Dutch government for the site development costs, which are estimated at €13.5m for each HKW site. Initially, the auction selection criterion was the cost of energy. However, now, each bid must show a positive business case on submission. On award, financial guarantees, such as bank guarantees, must be provided to ensure construction and commissioning within the agreed time. Without these guarantees, the government will reject the bid due to potential delivery risks, which would violate targets set in the energy agreement.

For the subsidy-free auctions, additional criteria, such as applied innovations, were implemented as the cost of energy was no longer the only decisive factor. Seabed leases are not awarded separately, but the use of the seabed will incur charges. Non-delivery of a project could trigger a ministerial order for penalty payments to cover damages to the state and the revocation of the permit. A penalty of €10m must be paid if the bidder does not take the project forward, or fails to provide the bank guarantees, and incurs a penalty of €3.5m (up to ten times) for each month of delay in the commissioning date.

The SDE+ system offers subsidies as a top-up (one-sided CfD, market premium) and the wholesale market price. A floor market price of approximately €30/MWh was determined, below which the risk falls on the developer and is not compensated by subsidy. The subsidy is paid for 15 years, starting from the "first power" from the wind farm supplied to the grid, with no indexation to inflation. Additionally, the auctioning body implements a maximum of subsidised MWh per year based on a state-of-the-art independent yield prediction report.

In conclusion, the Netherlands has established itself as a leader in offshore wind energy tenders, with a robust and transparent competitive setup. The government's efforts to minimise risks for developers, provide free site assessments, and socialise costs have made it an attractive destination for relevant parties. Furthermore, the subsidy system incentivises innovation, and the penalties for non-delivery ensure that the targets set in the energy agreement are met. The Netherlands' commitment to offshore wind energy is commendable, and we can only be optimistic about the future of offshore wind energy in the country.



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