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Country Specific Manual Denmark
Maritime Spatial Planning in Denmark

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- SEAPLANSPACE -

Country Specific Manual

Maritime Spatial Planning in Denmark

Content

Maritime Spatial Planning in Denmark

1 Introduction

Denmark is located along the southwestern shores of the Baltic Sea, where the Danish straights and Oeresund provide access to Kattegat and the North Sea. Compared to a land area of 42.933 km², Denmark has a relatively large sea territory of 105,000 square km². According to the latest survey by the Danish Geodata Agency, the Danish coastline extends approximately 8750 km (Geodatastyrelsen, 2021). Denmark consists of the peninsula of Jutland, which is connected to northern Germany all well as approximately 443 named islands, of which 78 are inhabited, and from any given location in Denmark, there is less than 52 km to the nearest seashore. (Danish Ministry of Environment, 2021)

Historically, Denmark has been a nation of seafarers closely connected to the sea, and nowadays fisheries as well as shipping continue to be very important business sectors. Due to a significant sea territory in the North Sea, exploitation of oil and gas energy has become a huge economic sector during the past half century. Also, wind energy has been an important industry in Denmark for decades, and recently this sector has expanded offshore. Denmark has a long tradition for spatial planning, including a strong focus on assessing how specific projects influence the environment. Still, maritime spatial planning as a holistic and integrative process has a very brief history in Denmark, as the first Danish maritime spatial plan was launched during spring 2021.

In the following, it is described how Maritime Spatial Planning (MSP) is being implemented in Denmark. The legal frameworks for MSP on an international as well as on the national level in Denmark will be presented including an introduction of some of the central terms and concepts within the field.

2 Legislative background of the Danish MSP process

In Denmark, the MSP covers the Danish sea territory including internal waters, the territorial sea and the exclusive economic zone (EEZ) see figure 1. The Danish Maritime territory extends 105,000 km² in total, which includes Marine internal waters: 3,500 km² Territorial sea (12 nm zone): 40,000 km². Exclusive Economic Zone (EEZ): 61,500 km².

Terminology

A definition of the central terms and concepts used in maritime spatial planning is included in the Danish Act on Maritime Spatial Planning (the Danish Ministry of Environment, 2016). The central concepts are defined by law as follows:

- Marine area: The marine territory (Søterritoriet) and the Exclusive Economic Zones, see the law on the borders of the Marine Territory (Søterritoriet) and the law on the Exclusive Economic Zones.
- Marine region: The North Sea (including Kattegat) and the Baltic Sea.
- Maritime Spatial Planning: A process during which, relevant authorities analyse and organise human activity in marine areas to achieve economic, environmental, and social aims.
- Maritime Spatial Plan: Rules with attached maps established by the Minister of Industry and Growth, determining the spatial and temporal distribution of activities and use of maritime space in Danish marine areas.

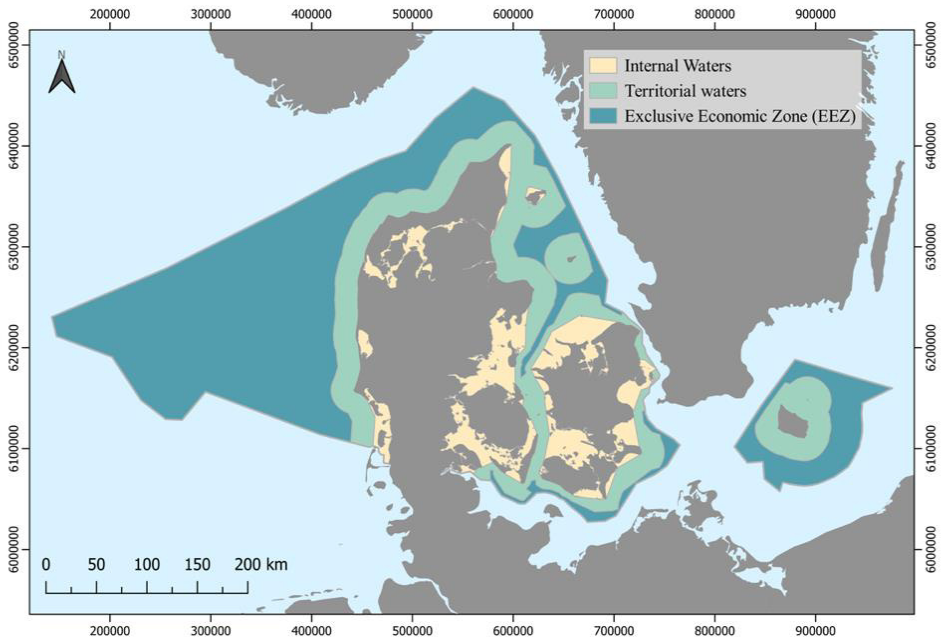

Figure 1: The Danish sea territory including internal waters, the territorial sea and the exclusive economic zone (EEZ) (Data source: Danish Ministry of Environment, 2021)

Aims and principles of Maritime Spatial Planning

Maritime spatial planning or maritime physical planning is a multifaceted term, which can be characterised as the authorities' organisation and planning of human activity at sea, based on different economic, social, and environmental concerns (see terminology). Working across borders and sectors is important in order to ensure that human activity takes place effectively and sustainably (The European Convention a). Human use of the oceans has changed during the last decades, and much emphasis has been placed on the potential for `blue growth´ and an increasingly widespread exploitation of the oceans' resources. Ocean-based activities do not take place within a bounded area, but across national territories. Maritime spatial planning of human activity affecting the marine environment and its ecosystems thus needs to be sustainable, holistic, and transnational. In 2014, the European Parliament and the Council of the European Union published EU Directive 2014/89/EU on maritime spatial planning, which functions as a shared legal framework for MSP in Europe. According to this directive, the main purpose of maritime spatial planning is "to promote sustainable development and to identify the utilisation of maritime space for different sea uses as well as to manage spatial uses and conflicts in marine areas" (The European Parliament and the Council of the European Union, 2014: 138). Maritime spatial planning is thus an area of planning which affects numerous sectors and areas of knowledge, making cooperation between regional, national, and global authorities vital.

An overall ecosystem-based approach or EBA is intended to be applied, and in extension to the Directive on Maritime Spatial Planning, other EU-directives are of significance for the marine environment, including: the European Water Framework Directive, the Marine Strategy Framework Directive, the Habitats Directive, the Common Fisheries Policy (CFP) and legal acts following these.

The Danish Act on Maritime Spatial Planning came into force in the summer of 2016, at which point Denmark, as one of the last countries of the EU, implemented the MSP Directive (Erhvervsministeriet 2016: 1). This provided the basis for the Danish maritime spatial planning process lead by the Danish Maritime Authority and the development of the first Danish MSP plan, which came into force in March 2021 (Danish Maritime Authority, 2021).

International frameworks

In this section, the legal context for marine management will be introduced including international frameworks, such as The United Nations Convention on the Law of the Sea (UNCLOS) and marine areas outside national laws and relevant conventions.

The United Nations (UN) Convention on the Law of the Sea (UNCLOS) is an international convention containing guidelines and regulations concerning shipping, environment and the nations' utilisation and administration of the seas and its resources. UNCLOS was passed in 1982 and came into force in 1994. It concerns "almost everything that has to do with the oceans, including fishing, shipping, environmental preservation and the juridical borders of the open seas" (Globalis, 2015). Although much of UNCLOS is a written account/legalisation of customary proceedings, there are also new aspects such as states' responsibilities in protecting the marine environment and in combating pollution. 168 countries have signed The United Nations Convention on the Law of the Sea, including all members of the EU. Denmark ratified it in 2004 (Udenrigsministeret, 2005).

There are areas of the sea where no state can implement its national laws. These areas include The High Seas and the seabed beneath the High Sea, called The Area. The High Seas are defined as the water column that lies beyond national jurisdiction. The High Seas are open to activities such as fishing and shipping for all states, who therefore must cooperate to protect these areas (Udenrigsministeret, 1969). The Area is the seabed outside of national jurisdiction, meaning beneath the open ocean (UNEP WCMC, 2019). This area, along with its resources, has been declared a World Heritage Site by the UN (Dahl, 1978/1982).

Other relevant frameworks accounted for in the Danish MSP, is the Convention on Biodiversity and the underlying nature objectives, the UN Sustainable Development Goals, in particular Goal 14 on life below water as well as the Danish obligations to ensure a good marine environment pursuant to the Helsinki Convention (HELCOM) and the OSPAR Convention.

The Danish legislative framework

Denmark's first law on maritime spatial planning came into force in the summer of 2016 in accordance with EU Directive 2014/89/EU on Maritime Spatial Planning (Erhvervsministeriet 2016: 1). The law with further revisions provides a framework for the implementation of planning for Danish marine areas (Erhvervsministeriet, 2016/2020: 2). According to this law, maritime spatial planning needs to contribute to a sustainable development of offshore renewable energy production, sea transportation, transport infrastructure, fisheries and aquaculture, the use and extraction of raw materials, land reclamation, as well as preservation, protection, and improvement of the environment.

State and municipal authorities have an obligation to ensure that licenses, etc. for area use at sea and adopted plans do not conflict with the maritime spatial plan, cf. §14 of the Maritime Spatial Plan Act. Whether licenses can be granted, or plans adopted for a specific activity in a given area in accordance with the maritime spatial plan, will still depend on the main sector legislation.

Administration of the coastal zones

Compared to for example our neighbouring countries, Sweden and Germany, where land-sea interaction perspectives are included in the MSP in the coastal zone – respectively at the municipal and regional level – Danish municipal planning jurisdiction ends at the coastline, where the national planning jurisdiction starts. There are some jurisdictional overlaps, however. Some of the Danish Coastal Authority's administrative areas relating to coastal protection under the Coastal Protection Act overlaps land-sea areas. Also, the municipalities' planning referring to the Danish Spatial Planning Act may also – to a minor extent -include guidelines for the use of coastal waters (see figure 2).

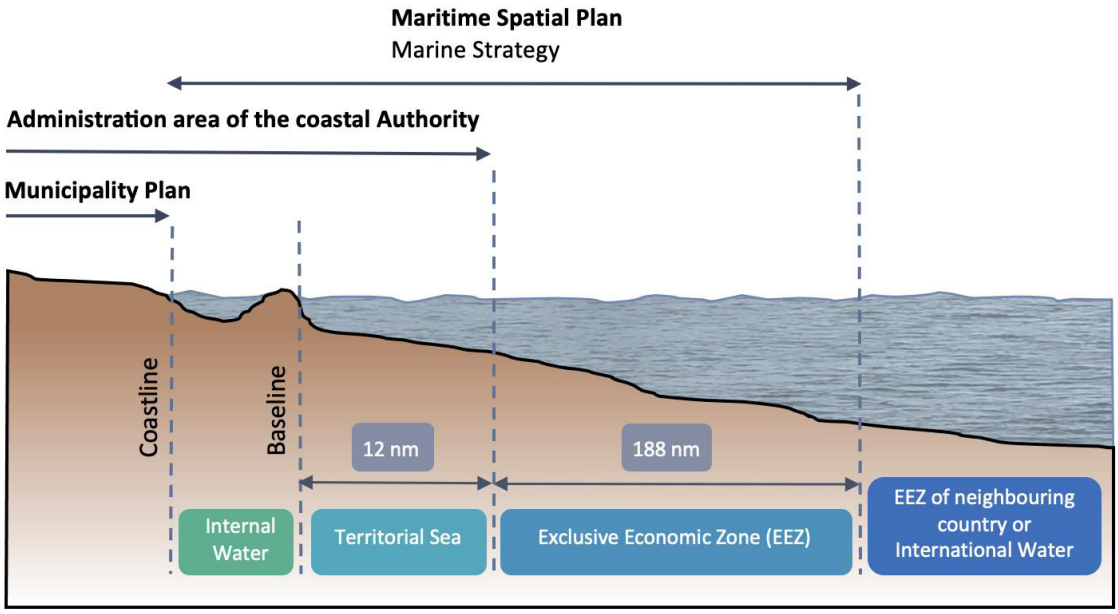

Figure 2: As a general rule, the terrestrial planning of the municipalities and the national spatial plan meet at the coastline. Though, some of the Danish Coastal Authority's administrative areas such as coastal protection, overlap land and sea. (Adapted from Danish Maritime Authority 2021)

As defined by the Danish Planning Act, Danish municipalities are responsible for the planning of the designated coastal zone, which covers a 3 km wide zone along the coast including both rural land zones (open lands as well as agricultural lands) and land zones with summer housing. The coastal zone must be kept free of buildings and facilities, unless these are dependent on a near-coastal location or appointed as a specific 'area of development' (Planloven, 2020). The term 'area of development' was introduced in Danish spatial planning legislation in 2017 due to government policies on promoting growth and job development within coastal- and nature-based tourism. If permission is granted by the state, the designation of local 'areas of development' makes it easier for municipalities to begin new development projects and promote city planning within the coastal zone (Erhvervsstyrelsen, 2019). In a second round of applications in 2019, 22 Danish municipalities applied for `areas of development´ within their municipalities – among them Holbæk, Faxe, Vordingborg, and Lolland from the South Baltic Region. (Bolig- og Planstyrelsen, 2021).

Regarding municipalities' planning jurisdiction for the sea territory, referring to §11a(1) of the Danish Planning Act, §11a(1), no. 20, municipalities can make guidelines for the use of coastal waters, including guidelines for water quality, outdoor facilities, construction of beaches for bathing, restrictions on traffic, et cetera. See more in chapter 4.

Organisation of the Danish MSP process

As pointed out by the Danish Maritime Authority, which has coordinated the MSP process in Denmark, maritime spatial planning in Denmark has many stakeholders and other parties, who will be affected by its implementation (Danish Maritime Authority, 2021). As illustrated in figure 3, the preparation of the maritime spatial plan is coordinated by the MSP secretariat, which is part of the Danish Maritime Authority belonging to the Ministry of Industry, Business and Financial Affair, and the work of preparing the maritime spatial plan has therefore taken place in close collaboration between the following ministries and their specific agencies (see also figure 3):

- The Ministry of Industry, Business and Financial Affairs,
- The Ministry of Finance,
- the Ministry of Defence,

- the Ministry of Climate and Energy,
- the Ministry of Environment, the Ministry of Food, Agriculture and Fisheries,
- the Ministry of Transport,
- the Ministry of the Interior and Housing,
- the Danish Energy Agency,
- the Danish Business Authority,
- the Danish Fisheries Agency,
- the Danish Geodata Agency,
- the Coastal Authority,
- the Danish Environmental Protection Agency,
- the Danish Housing and Planning Authority,
- the Agency for Culture and Palaces and
- the Danish Civil Aviation and Railway Authority.

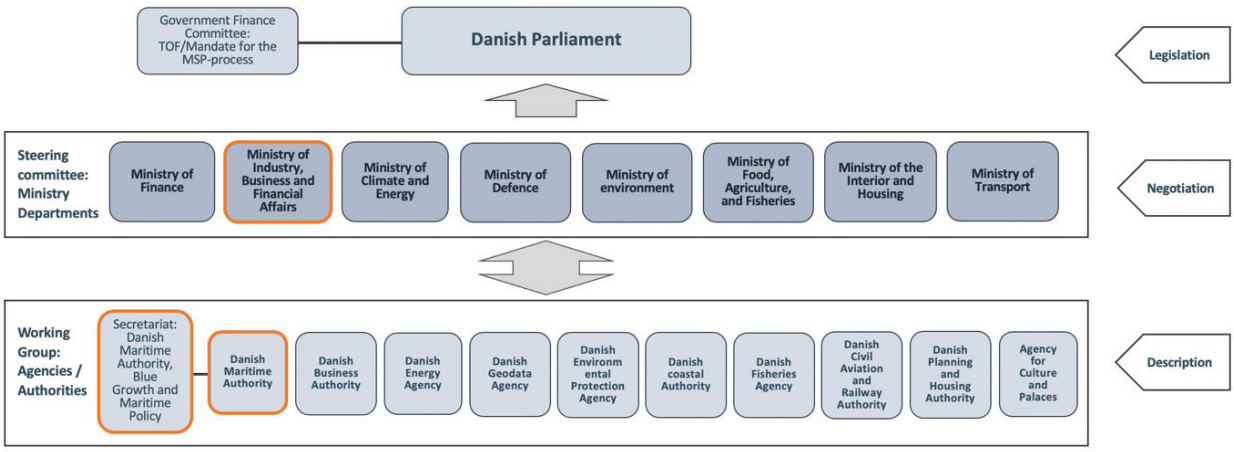

Figure 3: The organisation of the Danish MSP decision process

All national agencies and authorities with interests in the sea territory, were included in the MSP working group, which was responsible for describing the differentiated interests, while a steering committee where all relevant ministry departments were represented, carried out the negotiations, balancing the differentiated interests in the MSP. The ensuing legislation, made by the Danish Parliament, is based on this negotiation of interests.

3 The content of the Danish MSP

The first Danish maritime spatial plan was launched by the Danish Maritime Authority on March 31st, 2021, and sent into a six-month public hearing.

According to the Danish Act on Maritime Spatial Planning, planning of the Danish sea territory should:

- Support economic growth, development of marine areas, and sustainable use of resources in the marine environment.
- Contribute to achieving the goals set by the Danish MSP Act
- Take land-sea interaction into consideration
- Strengthen cross-border collaboration according to the United Nations Convention on the Law of the Sea (UNCLOS)

Areas utilised for national defence or security activities are not affected by the act.

More specifically, the Danish maritime spatial plan must include the following sectors (Danish Maritime Authority, 2021):

1. The offshore energy sector
2. Maritime transport
3. Transport infrastructure
4. Fisheries and aquaculture
5. Extraction of raw materials at sea and
6. Preserving, protecting, and improving the quality of the environment.

The maritime spatial plan may also promote sustainable tourism, recreational activities, outdoor life as well as land reclamation. In other words, the Danish MSP decerns between several activities and concerns that are mandatory and others that are optional.

Like in other countries, several new activities are expanding offshore, so despite Denmark's relatively large sea territory, demands on the sea territory are increasing. The overall maritime spatial plan illustrates national political priorities regarding the future allocation of space for the majority of the activities within the Danish sea area. In principle, these priorities apply for the next 10 years. However, the plan can be changed if the government decides upon it due to new needs or directive obligations (Danish Maritime Authority, 2021).

Zones for uses and activities

Until the Danish MSP planning process was initiated, an integrated plan for the Danish sea territory did not exist. The distribution of areas in the Danish maritime spatial plan is based on a zoning principle dividing the sea area into four different types of zones. Those zones can overlapif co-location and multiple uses are possible (Danish Maritime Authority, 2021).

The four distinct types of zones are termed:

1. Development zones, which include activities pertaining to:
   - Renewable energy and energy islands,
   - The exploration and exploitation of oil and gas,
   - CO_2 storage,
   - New infrastructure projects,
   - Aquaculture incl. shellfish production and marine farming,
   - The extraction of mineral resources
2. Special use zones, which include activities pertaining to:
   - Shipping corridors
   - Protective spatial measures for aviation
   - Cable corridors for renewable energy
   - Land reclamation
   - Pipelines
3. Nature conservation and environmental protection zones, including:
   - Marine strategy areas
   - Natura 2000 areas
   - Protected areas
   - Nature and game reserves
4. General use zones

- General use zones consist of all areas in the maritime spatial plan that are not designated for other purposes.

Besides the uses and activities included in the above-mentioned four zones, fishing, shipping, recreational use and tourism can take place in all zones unless other existing legislation prohibits it, or if future regulation is formulated that limits such activities, or until constructions are built which spatially obstructs such activities (Danish Maritime Authority, 2021).

In the following section, the specific sectors covered by the Danish MSP are described briefly, based on the Explanatory Notes to the Danish Maritime Spatial Plan, where further details are provided (Danish Maritime Authority, 2021).

Renewable energy

Denmark is a pioneering country in renewable energy as highlighted in the European Commission's strategy for renewable energy at sea. In order to meet government goals for green transition and the further development of green technologies at sea, the maritime spatial plan allocates a significant part of the sea area for renewable energy. The maritime spatial plan sets the overall framework for a long-term development of renewable energy at sea, which includes establishing space for the new offshore wind farms and energy islands as well as the ensuing increased demands on the transport sector, industry and society in general – see figure 4 (Danish Maritime Authority, 2021).

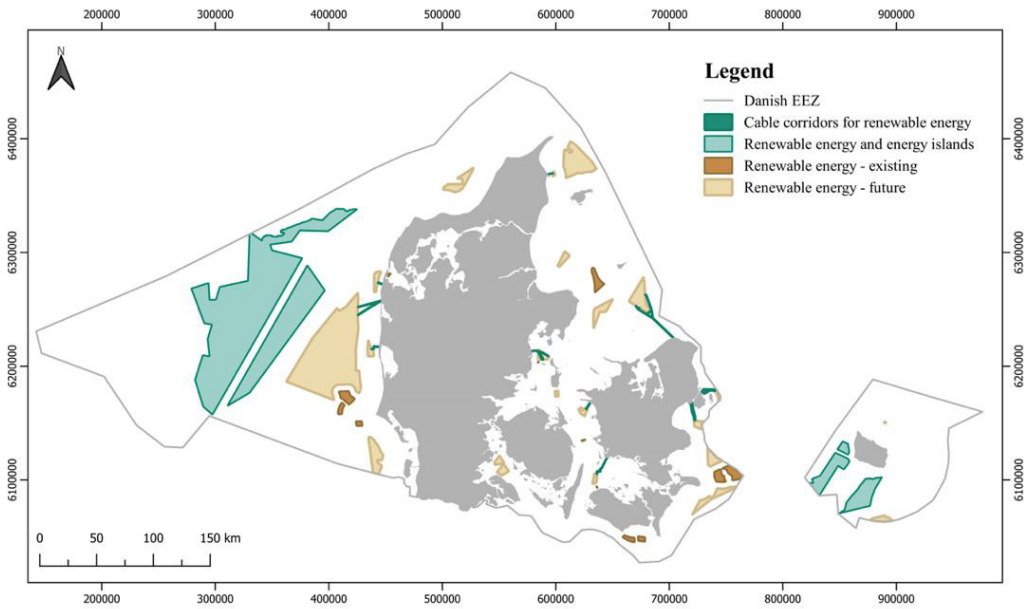

Figure 4: Danish MSP (www.havplan.dk) – renewable Energy (Data source: Danish Ministry of Environment, 2021)

Nature conservation and environmental protection areas

Regarding conservation and environmental protection, the MSP includes areas designated as Natura 2000 sites, marine strategy areas, nature and wildlife reserves, and conservation areas – see figure 5. In parallel with the consultations on the maritime spatial plan, and referring to the obligations in the Marine Strategy Directive, which aims to help in the preservation of habitats for marine flora and fauna and restore biodiversity in Denmark's marine areas, the government has submitted 13 new maritime conservation areas for consultation. These include 12 areas with strict protection. In order to meet directive obligations, an executive order on the designation of new bird protection areas has also

been sent for consultation, with the purpose of securing habitats and to increase the proportion of Danish protected sea areas from approximately 19% to approximately 30% of the Danish sea area (Danish Maritime Authority, 2021).

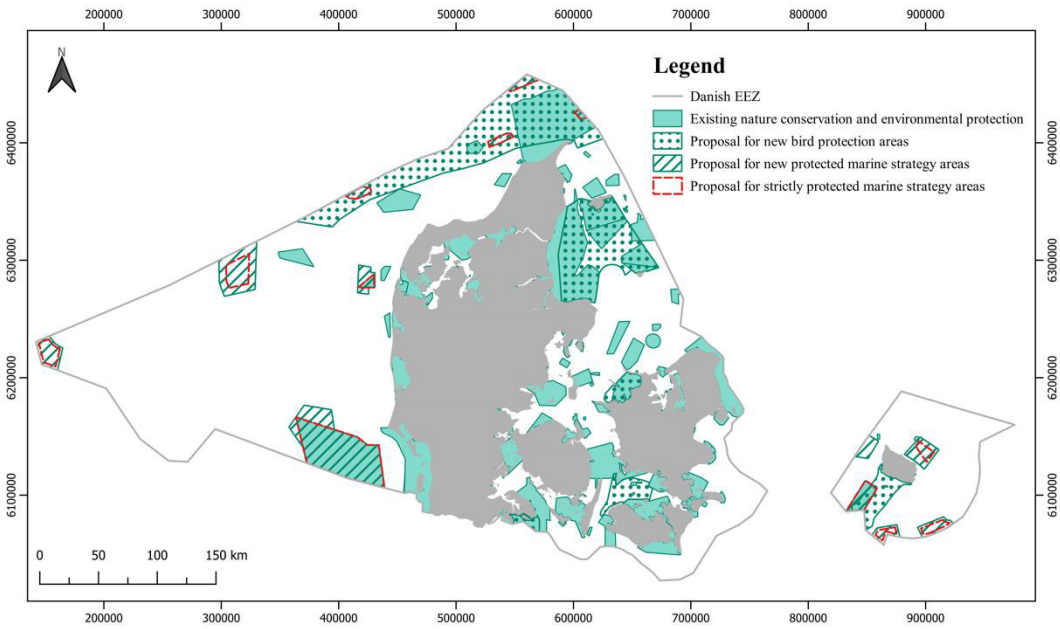

Figure 5: Danish MSP (www.havplan.dk) – Environmental protection (Data source: Danish Ministry of Environment, 2021)

Oil and gas activities and CO_2 storage

As decided in the broad political agreement on the future of oil and gas extraction in the North Sea in December 2020, oil and gas extraction in Denmark will cease in 2050, at the latest. Still, Oil and gas extraction in the North Sea continues to have significant value for society by contributing to job generation, investments, tax revenue and energy supply. Thus, the maritime spatial plan has designated space to existing oil and gas area in the North Sea west of 6°15'' east longitude – see figure 6. To comply with the Paris Agreement and the goals for removing CO_2 from the atmosphere, a broad majority of parties in the Danish parliament have decided to designate areas for the capturing, transportation, and storage of CO_2 in Denmark if appropriate safety and environmental conditions can be fulfilled. Storing CO_2 in the former oil and gas reservoirs can support Denmark's green transition and the path toward meeting the 70% reduction target. Thus, the majority of the existing oil and gas areas, as well as a newly designated area has been allocated for this purpose. Space has also been allocated for the two future transit pipelines, Nord Stream 2 and Baltic Pipe (Danish Maritime Authority, 2021).

Fisheries and aquaculture

The Danish fishery sector play a key role in job and food provision in coastal areas, and throughout history, fisheries have played a central role in Danish society and culture. The maritime spatial plan allows fishing to continue `freely´, in accordance with existing rules and regulations. However, due to other legislation, area-specific restrictions for fishing activities apply, e.g. in protected areas. As pointed out in the MSP, the Danish government wants to promote careful fishing methods and will therefore provide more knowledge about the effects on the marine environment of the use of bottom trawling (beam trawl, demersal trawl and anchored seine net). To ensure sustainable development of

the Danish aquaculture sector, fish farming will to a great extent have to take place in environmentally friendly salt and freshwater fish farms on land. The maritime spatial plan, thus, only allocates areas to existing sea farming and current/pending applications for establishing sea farms, which are already under official consideration. Areas for mussel production include mussel and oyster cultivation banks, transplantation banks, and the farming of mussels and oysters in the water column – see figure 7. Seaweed production is not yet common in Denmark and can, in principle, take place throughout the sea area (except in the shipping corridors) as no areas have been designated yet. However, permission has to be sought and restrictions may follow from other legislation or if the zone is already allocated for other purposes (Danish Maritime Authority, 2021).

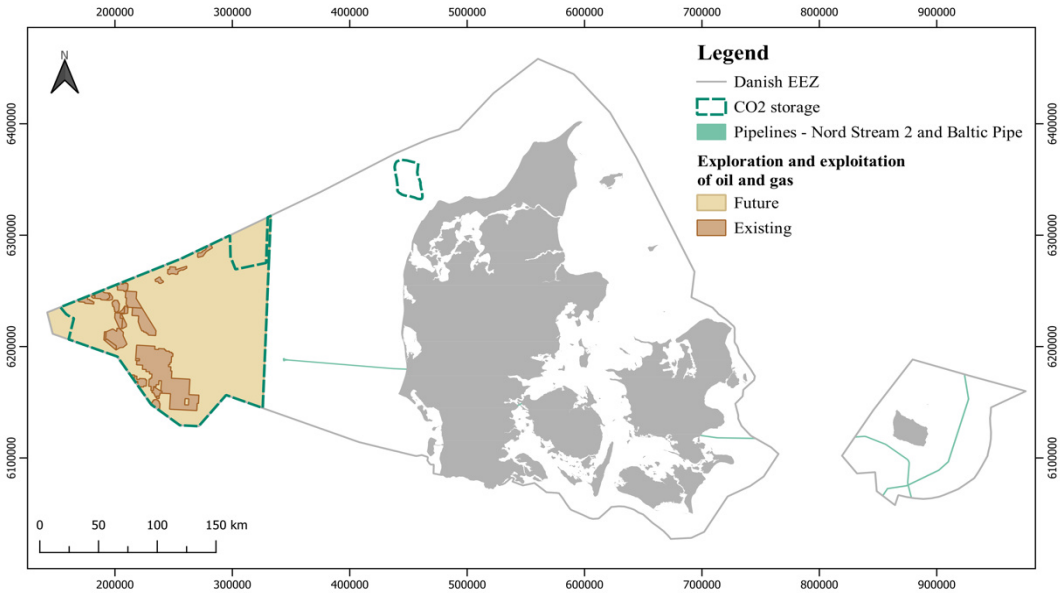

Figure 6: Danish MSP (www.havplan.dk) – Oil and gas (Data source: Danish Ministry of Environment, 2021)

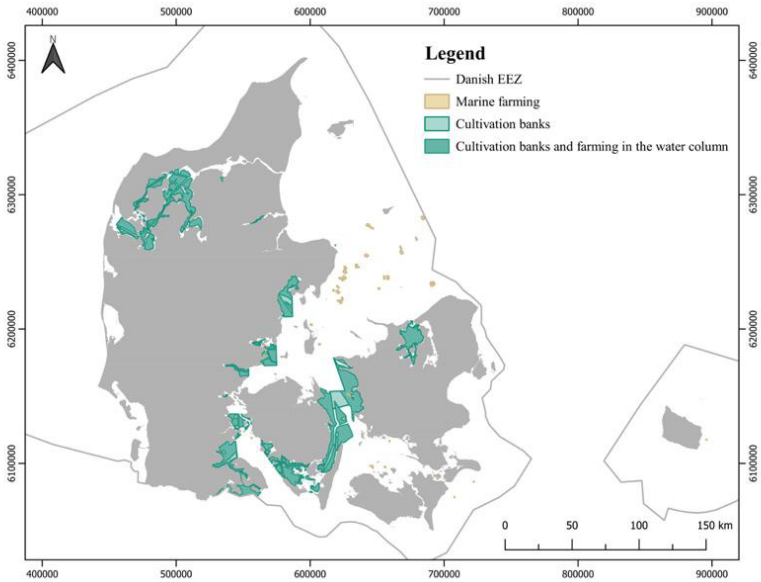

Figure 7: The Danish MSP at www.havplan.dk: Fisheries and aquaculture (Data source: Danish Ministry of Environment, 2021)

Mineral resource extraction

Mineral resource extraction at sea complements land-based extraction, and Denmark is largely self-sufficient as regards sand, gravel, and stone. In order to ensure that Denmark continues to have access to the necessary building and construction resources in the future, zones for the extraction of sand, gravel, and filler sand have been allocated in the MSP The designation of possible mineral resource areas has focused on currently existing mineral resource areas, on already mapped mineral resource areas, as well as on areas, where other sectors are impacted as little as possible – see figure 8. Furthermore, geographical considerations have been included to minimise transportation needs as much as possible. (Danish Maritime Authority, 2021).

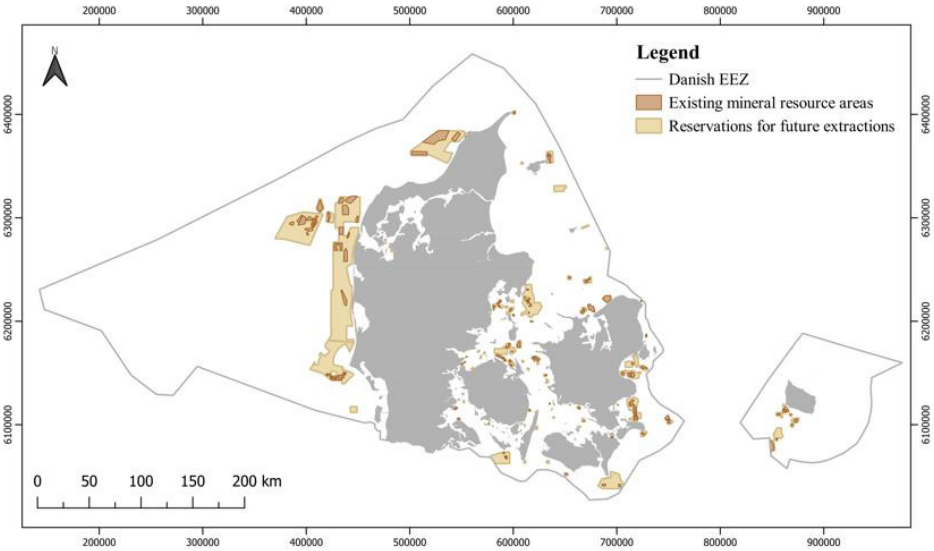

Figure 8: Danish MSP (www.havplan.dk) – Mineral resource extraction (Data source: Danish Ministry of Environment, 2021)

Transport infrastructure

To ensure a well-functioning transport infrastructure across the sea including connections between different parts of Denmark as well as neighbouring countries, Europe and the rest of the world, the government aims to maintain and expand Danish transport infrastructure in order to meet the needs of the future. Areas for future transport infrastructure have been allocated, if transport projects have already been initiated, e. g. adopted through a construction act or other political policies, or whether feasibility studies have already commenced, or funds been set aside for such studies. Allocations in the MSP for future bridges and tunnels are not indicators of whether the projects in question will be realised or not. Furthermore, allocations have been made to allow for future compensatory dredging by the Great Belt Bridge, the intention being to ensure that the hydrographic conditions of the Baltic Sea are sustained throughout the lifetime of the bridge. Finally, protective measures for aviation have been allocated. These include current air transport approach plans as well hindering future constructions, which may affect air-based traffic safety, regularity or capacity – see figure 9 (Danish Maritime Authority, 2021).

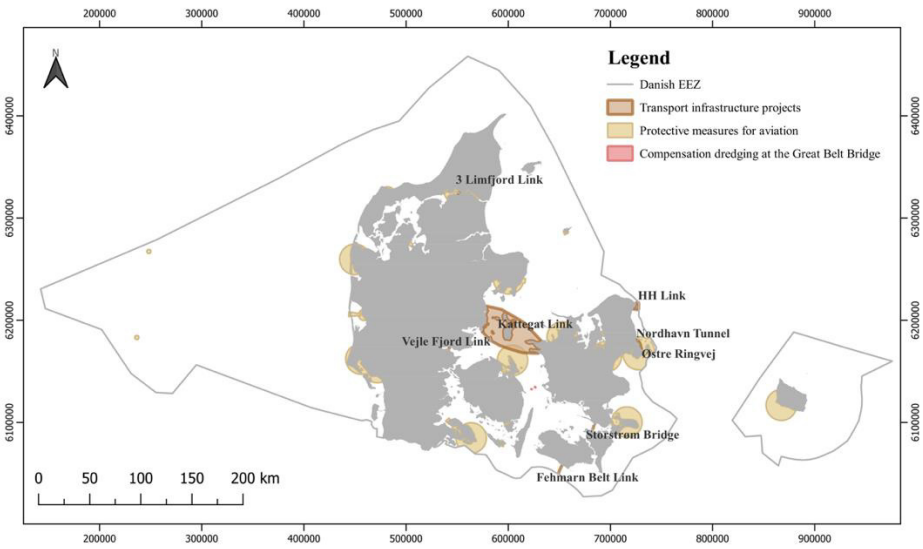

Figure 9: Danish MSP (www.havplan.dk) – Transport infrastructure (Data source: Danish Ministry of Environment, 2021)

Land reclamation projects

The maritime spatial plan can exempt sea areas from being allocated to other uses, if there is a planned land reclamation project that is of major importance for society. Concretely, the maritime spatial plan has allocated an area for Hvidovre municipality's land reclamation project, allowing for an extension of the current area, Avedøre Holme – see figure 10. As pointed out in the explanatory notes, the allocation of areas for land reclamation projects in the MSP does not limit the possibilities of carrying out land reclamation elsewhere in the sea at alter dates, provided that such projects do not conflict with the sea area's other allocations. (Danish Maritime Authority, 2021)

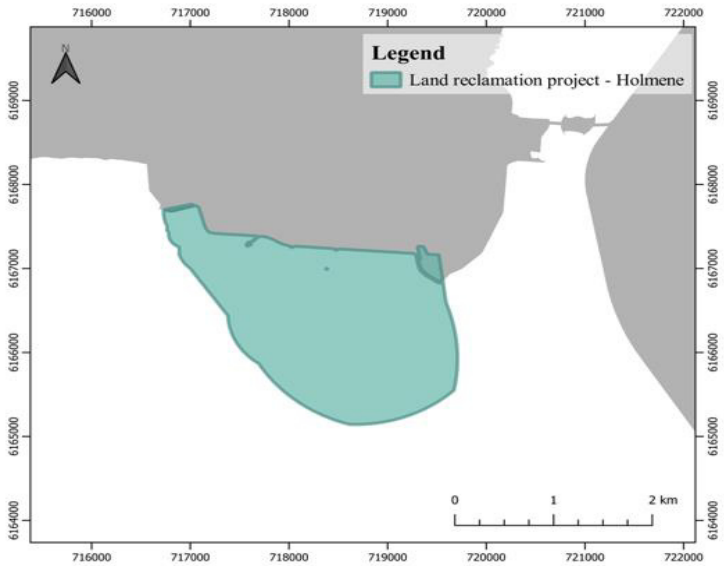

Figure 10: Danish MSP (www.havplan.dk) – Land reclamation projects (Data source: Danish Ministry of Environment, 2021)

Maritime transport

Denmark is among the world's leading maritime nations and approximately 60,000 commercial ships pass through the Great Belt or Øresund annually connecting the Baltic Sea with the North See via Kattegat. There is freedom of navigation in Denmark, but to ensure the safest and most direct routes through Danish waters, the maritime spatial plan allocates the most important shipping corridors based on current usage. In collaboration with neighbouring countries, the best and most efficient routes have been designated. To enhance cohesion across Denmark, the plan includes shipping corridors for national ferry routes as well as connections to neighbouring countries – see figure 11 (Danish Maritime Authority, 2021).

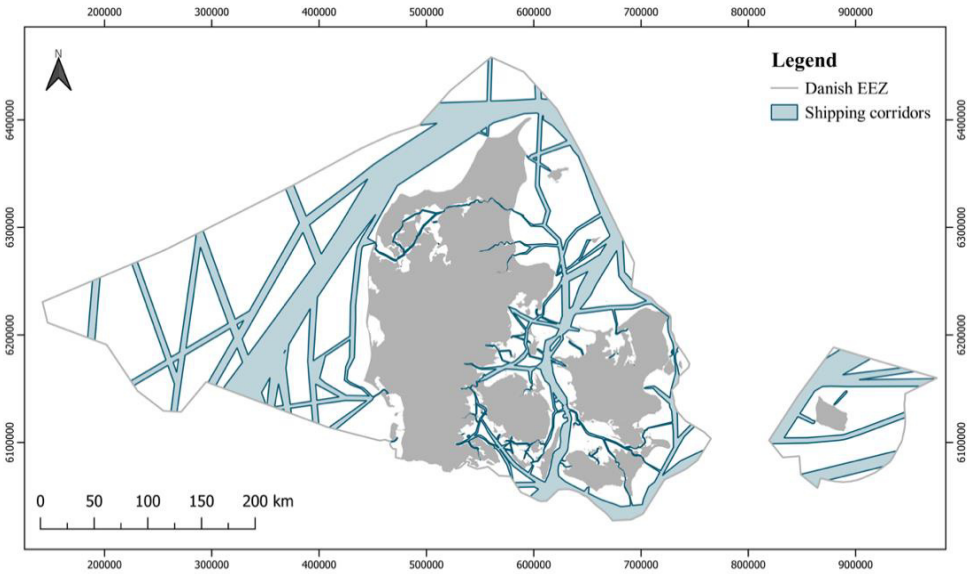

Figure 11: Danish MSP (www.havplan.dk) – Maritime transport (Data source: Danish Ministry of Environment, 2021)

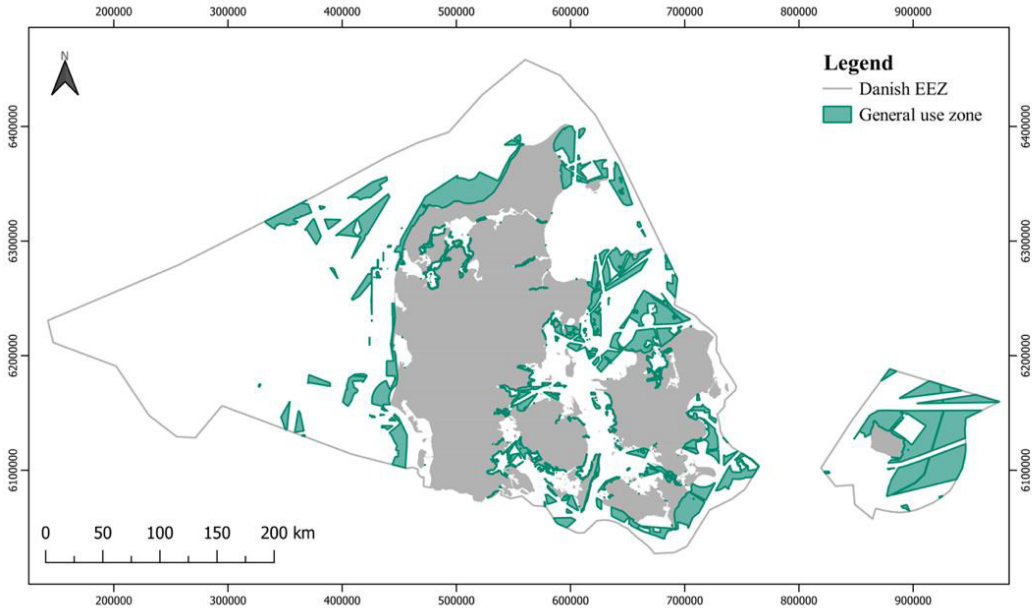

Figure 12: The Danish MSP at www.havplan.dk: General use zone (Data source: Danish Ministry of Environment, 2021).

Other activities

The maritime spatial plan supports a governmental priority to ensure that Danish sea areas continue to be used for tourism and leisure activities. This has been done by means of a general use zone which encompasses all the sea areas in the maritime spatial plan not allocated for specific purposes. Also, the MSP has limited or prohibited land expropriation for new, large facilities, which could have a negative effect on leisure activities – see figure 12. All areas designated under the general use zone in the maritime spatial plan, can be used as they are today until facilities are built or new activities initiated that may restrict such use. (Danish Maritime Authority, 2021)

4 Planning in the Danish coastal zone

The MSP covers all parts of the Danish sea territory ending at the official coastline, where its jurisdiction meets the borders of the Danish Planning Act and the jurisdiction of the municipalities. During the Danish MSP hearing process which ended on September 30th 2021, a dedicated meeting for municipalities concluded that further clarification was needed, regarding legislative overlaps in coastal zone planning, particularly regarding overlaps between the Danish Coastal Authority's tasks under the Coastal Protection Act and municipal planning jurisdiction. Referring to an explanatory document made by the Danish Maritime Authority in collaboration with the Danish Housing and Planning Authority, the following section describes how the proposed MSP meets municipal planning as well as existing procedures for permissions regarding the sea territory. This may be revised, once the MSP has been announced as a ministerial order by the Minister of Industry, Business and Financial Affairs revisions in response to the outcomes of public hearing process and consequential changes in the plan. (Danish Maritime Authority, 2021). The following refers to the Explanatory Notes accompanying the Danish Maritime Spatial Plan and supplemented by the explanatory text provided by the Danish Maritime Authority in August 2021.

The interrelationship between the maritime spatial plan and municipal planning

In cases, where municipalities are authorised to plan the sea territory, this planning must not conflict with the maritime spatial plan, cf. §14 of the Maritime Spatial Plan Act.

Existing municipal plans or local municipal development plans will not be affected by the MSP, while pending municipal plans or local municipal development plans entering into force after 31st March 2021 have to be in accordance with the MSP. The MSP in its current state as well as future changes to the proposal, is legally binding as soon as it is published. Public authorities are not allowed to grant permissions or make plans, which are not in accordance with the existing MSP plan nor published plan proposals or other proposals for changes to an existing plan.

Regarding municipalities' planning jurisdiction for the sea territory, referring to §11a(1) of the Danish Planning Act, §11a(1), no. 20, municipalities may make guidelines for the use of coastal waters, including guidelines for water quality, outdoor facilities, construction of bathing beaches, restrictions to traffic, et cetera. Referring to the Maritime Spatial Plan Act, §5(3), plans can also be developed to promote sustainable tourism, recreational activities, outdoor life, etc.

As emphasised by the Maritime Authority, municipal activities at sea can continue to take place as before with few modifications, within the framework of the Planning Act. The allocation of areas for development zones does not hinder the issuing of licenses nor novel planning conducted for land use within the zones for other purposes. However, licenses must be compatible with the stated purpose of the particular development zone, and licenses will only be granted after consultation with the responsible minister.

The guidelines of the municipal plans must not conflict with the maritime spatial plan, cf. §11 of the Planning Act, while local development plans that overlap with the sea must not conflict with the maritime spatial plan.

The Danish Planning Act

The Danish Planning Act provides the legal framework for spatial planning on land in Denmark. Although the Act focuses on spatial planning for land areas, there are a few exceptions regarding planning that can take place at the sea territory.

Planning coastal waters:

Referring to the Planning Act, municipal plans must include guidelines for the use of coastal water areas. This includes, for instance, recreational uses such as bathing, sailing, and fishing. Conversely, municipal plans cannot define frameworks for the content of local plans or legally binding regulations for the use of coastal waters.

Planning water areas within or in relation to harbour works in a city development area:

Referring to the Danish Planning Act, the municipal council can define the use of as well as establish facilities on water areas as long as it is within or in relation to harbour works and in urban transformational areas.

This means that the municipal council can establish municipal planning frameworks for local development plans as well as legally binding regulations regarding:

1. the use of water areas in a city development area, as long as it is within or in relation to harbour works. This could include beach facilities, bathing, other recreational water activities or lay outs for houseboats.
2. installing facilities in a city development area, as long as it is within or in relation to harbour works. This could include dredging works and the establishment of moorings as well as placement of vessels to be used for other purposes than sailing, dredging etc (e.g. house boats).

Planning of built-up areas and facilities in the coastal zone:

Referring to the Danish Planning Act, municipal plans must include guidelines for the use of the coastal zone. The coastal zone must be kept free of buildings and facilities, unless these are dependent on a near-coastal location or appointed as a specific 'area of development' (Planloven, 2020).

Regarding planning in the coastal zone, it will normally not be possible to plan for general infrastructure facilities on land, which require access to the territorial sea or coastal protection. Exceptions can be made in special cases in relation to commercial harbours and other infrastructure constructions,

This regulation does not apply to coastal protection measures in relation to existing built up areas and facilities.

Planning coastal protection measures in pursuance of climate change regulations:

Referring to the Planning Act, the municipal council must provide guidelines in the municipal plan as well as include legally binding regulations in local development plans in order to ensure mitigation measures in areas identified in the municipal plan as being exposed to flooding. A mitigation measure could be a flood protection construction placed on land as well as in the water (Planloven, 2020).

Explanatory notes for municipal plans:

The municipal plan must be accompanied by explanatory notes stating their conditions, including planning conditions regarding protected areas. The explanatory notes must also describe the legislative relation between the municipal plans and other legislation as well as land use reservations in pursuance of sectorial legislation as well as planning and construction laws (Planloven, 2020).

Municipal planning is not allowed to conflict with the MSP:

Municipal plans as well as local development plans are not allowed to conflict with the actual MSP plan in force nor with planning proposals or proposals for changes to an existing plan published for hearing (Planloven, 2020).

Relations between the maritime spatial plan and existing permissions concerning the territorial seas

The Coastal Authority grants permissions to constructions and activities in the territorial sea in accordance with §16a of the Danish Coastal Protection Act. Furthermore, The Coastal Agency provides licenses to regulate coastal protection initiated by the state, as well as permissions related to sediments.

The Danish Coastal Authority also grants permission for state coastal protection pursuant to §3(5) of the Act and bypass pursuant to §16b of the Act. Grants that permit non-state coastal protection pursuant to §3(2) of the Act, are the responsibility of the municipalities. The same applies for some minor coastal constructions such as bathing jetties and landing stages.

It is the responsibility of the granting authority, that permissions are not in conflict with the MSP. Havplan.dk has to be checked, and the minister in charge of the relevant jurisdiction must be consulted. If the minister judges, that there is a conflict, permission cannot be granted according to the Danish Act on Maritime Spatial Planning. Existing permissions will not be affected.

The Coastal Protection Act

The Coastal Protection Act regulates permissions for coastal protection as well as permissions for facilities and activities in the territorial sea.

The Maritime Spatial Plan does not change existing jurisdictions amongst public authorities, and the MSP does not replace permissions relating to other existing legislation.

Permissions to facilities in the territorial sea:

The sovereignty of the state regarding the Danish territorial seas is incorporated in §16a of the Coastal Protection Act, on which basis, *the Danish Coastal Authority* grants licenses for the placement of fixed or anchored facilities as well as activities, which are not regulated by the legislation of another authority.

- *Facilities* refers to all fixed or anchored devices or objects in the territorial sea such as marinas, seaweed production facilities, reefs, moorings, cables, pipelines, harbour baths, etc.
- *Activities* refers, for instance, to dredging and long-term anchoring. Furthermore, the Coastal Authority can grant permission to vessels for other purposes than sailing, like house boats etc.

More details on different kinds of facilities and activities can be found in the official guidelines from the Coastal Authority (Kystdirektoratet, 2015).

Permissions in pursuance of §16a of the Coastal Protection Act are not dependent on municipal planning. However, the Coastal Authority will always consult the municipalities when handling applications for permissions.

Permissions for bypass and utilisation of sediments:

Sediments may accumulate, and it may be necessary to dredge sediments to keep shipping routes, harbours and other facilities open. At the sea territory as well as at beaches and other inshore coastal areas without vegetation, it is possible in accordance with §16b the Coastal protection act to get permission to

1. Bypass – permission to dredge sediments deposits downstream along the coast. Thus, littoral deposits are allowed to be utilised elsewhere in close proximity to the fixed construction, fairway or harbour basin, which has caused its build-up.
2. Utilisation – permission for usage for other purposes than bypass, e.g. filling or sand feeding at coast stretches outside proximate bypass areas.

The Danish Environmental Agency works in close collaboration with the Coastal Authority and assesses if the sediment, which is going to be dredged, is free of pollutants or is an environmental contaminant.

Permissions pertaining to bathing jetties and landing stages:

Since 2007, municipalities have been authorised to grant permissions for simple bathing jetties and landing stages, in locations where water flows without hindrance, and outside commercial ports and marinas.

Pursuant to§2 of the Act on Bathing Jetties and Landing Stages,

- the municipality can provide guidelines and terms for the application procedure and conditions for granting permissions as well as restrict possible constructions
- If the bathing jetty or landing stage is constructed as a pier or similar construction hindering water flow, the permission has to be granted by the Coastal Authority.

If the construction consists of larger bridges with terraces, large pierheads or furnishing, permission has to be granted by the Coastal Authority in accordance with §16a the Coastal Protection Act.

Permissions for Coastal protection:

Pursuant of the Coastal Protection Act, coastal protection is only allowed if permission is granted. The municipality has the authority to grant permissions for coastal protection of individual properties as well as municipal projects including longer coastal stretches. State projects must be granted permission by the Minister of the Environment.

Coastal protection projects can be established inshore or offshore or as a combination. Examples could be sand feeding, establishing slope protection, groynes, breakwaters or dikes.

In cases where comprehensive construction works are required, local development plans or amendments to existing municipal plans may be carried out.

5 The fully digital legally binding Danish MSP

MSP processes are dependent on access to data. In the following the Danish maritime spatial data infrastructure will be introduced as well as the Danish digital MSP. Finally, examples of digital decision support tools, which can facilitate stakeholder involvement in MSP will be provided.

Marine spatial data infrastructures

Spatial data infrastructure (SDI) allows data to be shared between people within organisations, states or countries. In the EU, a major step towards a pan-European spatial data infrastructure has been taken through Directive 2007/2/EC on establishing an Infrastructure for Spatial Information in the European Community (INSPIRE), which entered into force in 2007 (Hansen, H. S., Reiter, I and Schroeder, L, 2017). Regarding the marine environment, the term Marine Spatial Data Infrastructure (MSDI) applies. In 2015 the Danish Geodata Agency, in collaboration with ten other Danish agencies, initiated the implementation of a Danish MSDI to support the exchange and sharing of spatial data concerning the marine environment (Danish Geodata Agency, 2015). This service, the Marine Map of Denmark, provides a joint administrative basis through which authority activities regarding the use of the sea and

its resources, can be coordinated and optimised while balancing the interests of economic development and the marine environment. The MSDI has thus been a backbone in implementing the directive on maritime spatial planning in the Danish context, where a central goal during the MSP process has been to be able to launch a fully digital, legally binding plan (see figure 13).

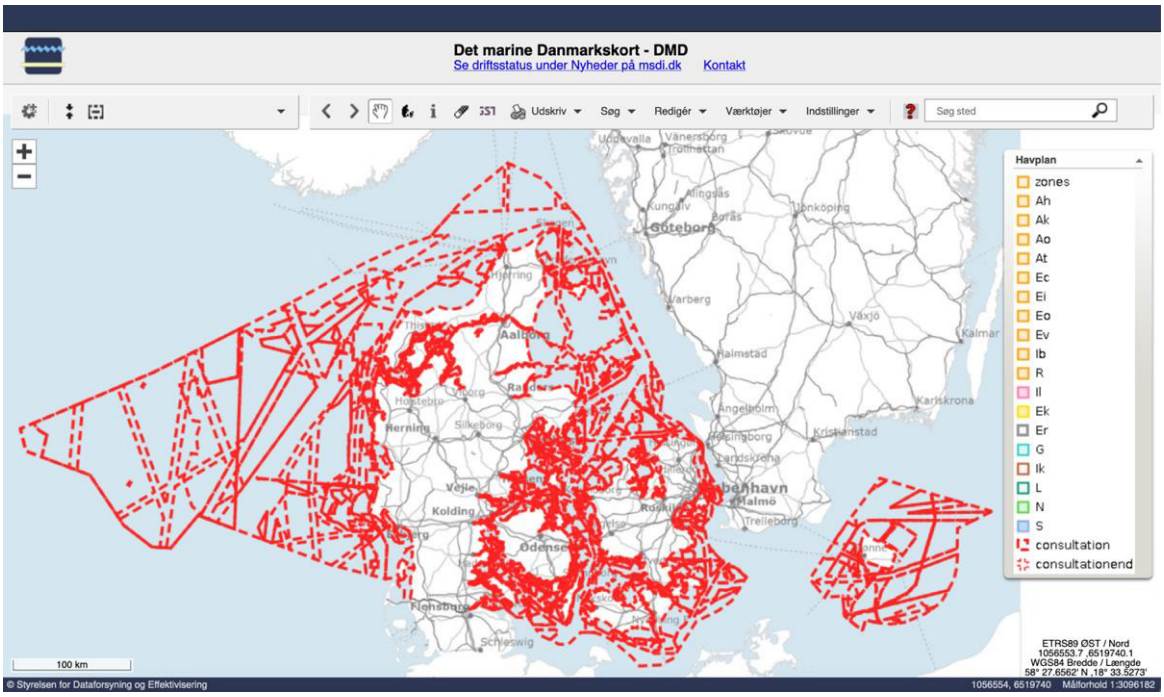

Figure 13: The public part of the Danish MSDI "The marine map of Denmark" at www.msdi.dk: Here showing the zones of the MSP while being in hearing (Data source: Danish Ministry of Environment, 2021)

The digital MSP

The Danish Maritime Spatial Plan is the first legally binding digital plan in the country. As pointed out in a leaflet from the Danish Maritime Authority, map attachments and coordinates have until now been published as pictures or text in the Danish Law Gazette (Danish Maritime Authority, 2019). In order to make data available digitally to administrative systems, publication of spatial data should, in future, occur digitally. The purpose is to use such data in their digital form, without hindrance, in administration processes and be directly comparable to other published spatial data. The development of the Danish digital MSP has been supported by the Pan Baltic Scope project funded by the EU European Maritime and Fisheries Fund. In order to establish an infrastructure for digital publication of the geography of legal rules, the Agency for Data Supply and Efficiency (SDFE) has described a number of issues regarding background maps, history, interoperability, and storage, which can also be utilised by other countries. Due to the Order on the promulgation of the maritime spatial plan, published in December 2020, the Danish Maritime Spatial Plan and Amendments to the Maritime Spatial Plan will not be promulgated in the Danish Law Gazette (Lovtidende), but at the digital portal, www.havplan.dk – see figure 14. Consultations on proposals for the Maritime Spatial Plan and proposals for amendments to the Maritime Spatial Plan will be published at www.havplan.dk as well as at the Danish consultation portal (www.hoeringsportalen.dk).

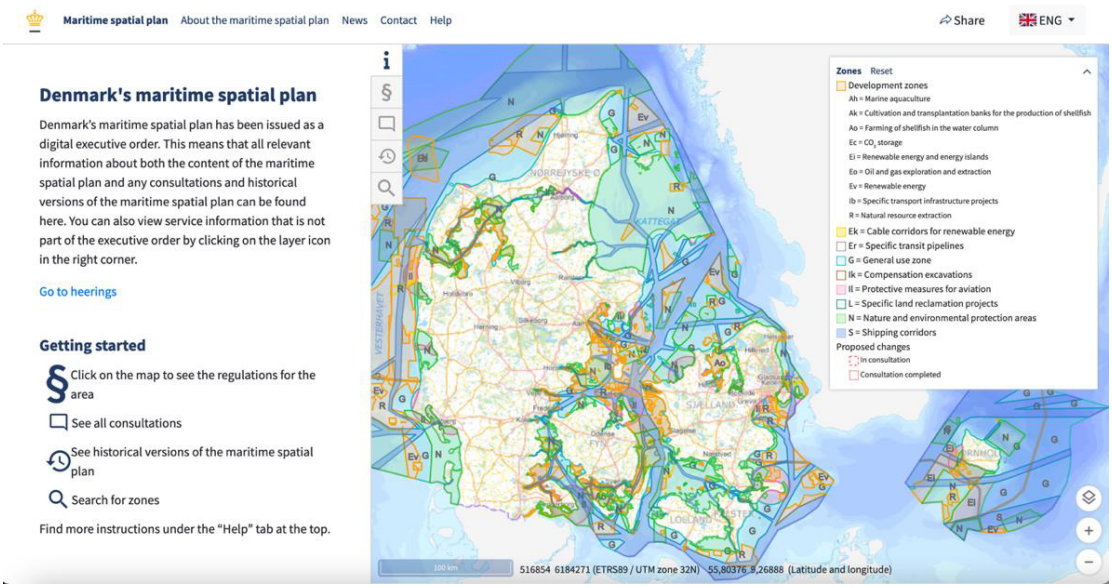

Figure 14: The interface to the English version of the digital and legally binding Danish MSP at on www.havplan.dk/en (Data source: Danish Ministry of Environment, 2021)

The digital maritime spatial plan allows local development plans and municipal plan frameworks to be displayed as service information for the maritime spatial plan, so that one can navigate the plans that a municipality may have adopted for a given coastal area. This allows municipalities and citizens to view coastal local development plans and municipal plan frameworks in one place.

6 Conclusions

The maritime spatial planning process is a very new task in the Danish planning context, and especially when it comes to the coastal zone, where the MSP meets the municipal plans at the coastline, the picture gets a little blurred. The involvement of coastal municipalities in the MSP process has, so far, been very limited. It is emphasised by the Maritime Authority (2021), that municipal activities at sea can continue to take place as before, with few modifications, within the framework of the Planning Act. The allocation in the MSP of development zone areas, means that planning may still be conducted for land use within the zones for other purposes. The legally binding MSP makes it possible to make changes and amendments to the plan when needed.

The public consultation period for the Danish MSP ended 30. September 2021 and consultation responses are, at the time of publication, still being processed by the Danish Maritime Authority. All consultation responses are, however, available to the public via the digital MSP at www.havplan.dk (Danish Maritime Authority, 2021 -c).

It is beyond the scope of this manual to go through all consultation responses to the current MSP. However, a few central stakeholder positions as expressed in their consultative responses are presented here.

In all, 256 consultation responses have been received. Of these, 47 municipalities, which corresponds to just under 50 % of all municipalities in Denmark, have submitted consultative responses. Six of these are coastal municipalities bordering up to the South Baltic Sea. See chapter 2.3 for more information. On behalf of all municipalities, KL – Local Government Denmark, the representative association for all Danish municipalities, has submitted a consultative response in which they question administrative planning practices between the national MSP on the one hand and municipal plans and local development plans on the other. In particular, they are concerned that the MSP overrides all municipal and local plans, allocating large offshore zones for different sea-oriented uses, without

consulting already existing municipal and local development plans and thus missing an opportunity to ensure coherence between land and sea planning along the coastal zone in the MSP. The shipping industry is generally positive toward the current MSP, which is also the case for most commercial ports. However, many commercial ports have submitted requests for allocation of increased space for further development into the sea.

The wind and energy sector expresses satisfaction with the allocation of extensive areas for the development of offshore renewable energy production, but also state that future demands for green energy will require much larger areas than allocated in the current MSP. Simultaneously, many of the other stakeholder groups have expressed satisfaction that most of the allocated areas for renewable energy are placed relatively far out to sea, i.e., not or hardly visible from the shore.

Consultative response concerning the aquaculture sector diverge vastly. On the one hand, stakeholders representing the monocultural aquaculture business sector express concern that limiting marine food production areas in the sea, will hinder the transition away from unsustainable land-based food production systems. Other actors, who represent the development of a more sustainable aquaculture sector, including research on more polycultural production forms and aquacultural products based on mussels which clean pollutants in the sea, stress the need to address a necessary transition toward more sustainable production forms within aquaculture in the sea. Finally, environmentally focussed stakeholders argue that too much space has been allocated to aquacultural production.

The fishing industry, both at local and national levels, express great concern with the current MSP, criticising it for not allocating specific areas for fishing. Particularly, they are critical of the allocation of areas for renewable energy production in areas that are primary fishing grounds. They argue for an MSP that has planned for multi-use of such areas, rather than simplistic zoned space allocation that favour one dominant sector, i.e., renewable energy.

Stakeholders representing the tourism and recreational sectors express general disappointment that the Danish MSP has chosen to distinguish between economic sectors that, according to the Danish Act on Maritime Spatial Planning MUST be included in the MSP and economic sectors, which CAN be included in the MSP. Thus, the MSP has chosen not to use the MSP as a tool to push sustainable goals on more sustainable tourism, recreational, and outdoor activities. They argue that the MSP cannot be a comprehensive nor inclusive plan until these sectors are included on the same foot as for example shipping, green energy, etc. They also call for a more integrated land-sea perspective.

A large number of stakeholders within the environmental and nature conservation section have submitted consultative responses at local as well as national levels. They argue that the MSP lacks a comprehensive environmental approach that takes nutrient emissions from land that flow into the sea into consideration. They welcome the increase in Marine Protected Areas from current levels to 4% of the Danish territorial seas but argue that the dire environmental state of the seas call for Denmark's adherence to EU policies on allocating 10 % to MPAs. In relation to this they argue that the MSP fails to use an ecosystem-based approach and do not take the cumulative effects of all MSP activities into account.

This is very much in line with the consultative responses from researchers at Danish universities. Additionally, they refer to research, including planning tools, that have been developed through EU-funded research projects, which are NOT used in the MSP, for example a planning tool to ecosystem-based planning. They also argue that a continual planning process calls for the establishment of a strategic development and research initiative (Danish Maritime Authority, 2021 -c).

As can be seen from these consultative responses, the MSP in Denmark is probably not in its final version yet, although it is unknown how the response will be to diverging stakeholder inputs. Some consultative responses express a true conflict in space allocation between different interest groups, while others express a more profound criticism of whether the current MSP actually conforms with legislative frames, as expressed in the Danish Act on Maritime Spatial Planning from 2016.

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Maritime activities in the South Baltic Region and in Denmark

1 Introduction to human and economic activities in MSP

The primary purpose of MSP is to function as a tool for multilevel and multidimensional governing of the common resources that seas and oceans - in this case the Baltic Sea – can provide. As a source of an abundant variety of resources, many livelihoods depend directly (for food) and indirectly (for economic value) on the Baltic Sea.

The Baltic Sea is facing serious environmental challenges that threaten its multilevel ecosystems' abilities to function properly and thereby to renew themselves sustainably. A large share of environmental challenges facing the Baltic Sea's eco-systems are human made, i.e., generated by humans' over-use and unsustainable exploitation of different types of natural resources, as well as humans' emissions of different types of materials that pollute such ecosystems (Taminskas & Povilanskas, 2021). MSP is not primarily a tool to assess or mitigate such environmental challenges, but instead, builds on an understanding, that all human use of marine resources should be sustainable, hence the ecosystem-based approach that is integrated in the MSP concept. It is in the interests of the people and economies that use and rely on the qualities, values, and resources that the Baltic Sea represents, that those resources continue to be provided.

This chapter gives a brief overview of the economic sectors that rely on the resources generated by the Baltic Sea as well as the people who rely on them. First, there will be a brief introduction to the demography of the South Baltic Region, followed by a brief introduction to the coastal municipalities in Denmark, particularly those that border on the Baltic Sea. The second half of the chapter focuses on the socio-economic sectors that are marine- and maritime-based. Again, the structure is to start with the Baltic Sea Region as a whole, followed by a description of the socioeconomics of the maritime economy in Denmark.

2 Demography of the South Baltic Region

Nine countries border the Baltic Sea and a further five countries are partly within its catchment area, encompassing a total population of around 85 million. The catchment area of the Baltic Sea is defined as all the countries that have borders directly on the Baltic Sea Coast, but also the adjacent countries from which tributary rivers and waterways that run into the Baltic Sea are included. All countries bordering the Baltic Sea, except Russia, are EU Member States.

The Baltic Sea coastal regions, defined as regions that have a coastline and where more than 50% of the population live within 50 km of the coast, have a population of more than 9 million people. That number is increasing, at the expense of the northern- and easternmost regions and are indicative of general urbanization trends. In Poland, there is demographic growth particularly in the city ports of Gdańsk and Szczecin-Świnoujście, while Nordic countries are experiencing a population decline in the rural north and population growth in the urban south, as well as micro-urbanisation, i.e., the movement within rural regions of people toward regional small cities (Burchaez & Kalinowski, 2021)

In summary, it may be stated that the livelihoods and practices of 85 mill. people affect the condition of the Baltic Sea, while the livelihoods and well-being of 9 mill. people, who live next to the Sea, depend more or less directly on it.

Table 1: Coastal region population for each South Baltic country:

Country	Number of coastal regions	Total population
Denmark	5	1,042,226
Germany	3	874,739
Lithuania	3	556,884
Poland	10	4,493,006
Sweden	3	1,945,116
Total	24	8,911,970

3 Danish municipalities bordering the Baltic Sea

Danish coastal municipalities are some of the most central stakeholders in the new, national MSP process. As mentioned in chapter 1, there is a potential planning dilemma in that municipal planning jurisdiction stops at the waterfront, whilst many municipalities have stakes and interests beyond the coastline. In June 2021, the KL Local Government Denmark, the joint umbrella organisation for all 98 municipalities in Denmark, organised a webinar on Denmark's public consultation process, targeting municipal administrators in planning and environmental departments. The purpose of the webinar was to focus on the municipal interface between land and sea planning from a municipal perspective. Besides concern regarding how to deal with the new legal aspects of planning in the coastal zone with the regulatory framing of the MSP (see chapter 1), the webinar indicated that municipalities, to a large extent, were generally very uncertain about the implications for the MSP as such.

In the South Baltic Region, 16 municipalities border the sea, Bornholm, Greve, Solroed, Koege, Stevns, Faxe, Naestved, Vordingborg, Guldborgsund, Lolland, Slagelse, Kalundborg, Odsherred, Holbaek, Lejre, and Roskilde.

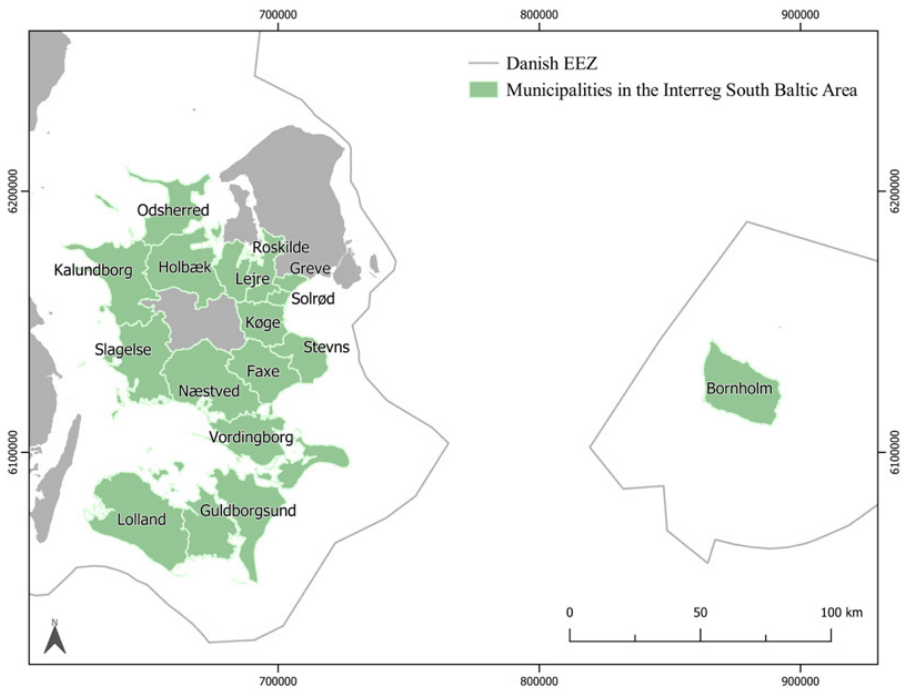

Figure 1: In the South Baltic Region, 16 municipalities are bordering the sea (Data source: Danish Ministry of Environment, 2021)

In the following section, we present some of the known MSP interests, that some of the municipalities located in and around the South Baltic Sea have. The MSP interests of many of the Zealand coastal municipalities pertain to: the development of harbours in relation to shipping, and in particular to the development of the offshore wind industry; the construction and expansion of the Femern Belt development connecting Denmark and Germany through the island of Lolland; the development of specific coastal business sectors such as aquaculture and tourism; and, finally, concerns about the effects of pollution, including eutrophication and climate change for the future quality of life along the coastal regions.

3.1 Bornholm

Bornholm municipality, covering the island of Bornholm, is located to the east of the rest of Denmark in its own individual part of the Danish sea territory: south of Sweden, northeast of Germany and north of Poland. Bornholm municipality covers an area of 588.36 square kilometres and has a total population of 39,570 (2021). The island is unique in a Danish context due to its geology, where the main part of the island consists of granite, except along the southern coast.
The Municipal Council of Bornholm has submitted a consultation response to the MSP in September 2021.

Although the Council welcomes a comprehensive plan for the sea and use of marine/ maritime spaces surrounding Bornholm, the Council points to a number of local development plans that require allocation of space or licence to use, which is not included in the current MSP. These are presented here.

The municipality is interested in a flexible, speedy and "positive" administration of the environmental approval of the highspeed ferries that connect Bornholm with southern Sweden, and which must pass through the Natura 2000 bird protection area that surrounds Roenne harbour.

Bornholm has been deemed a renewable `energy island´ by the Government and by the Danish Parliament – and space has been allocated in the MSP for the establishment of two 1GW offshore wind farms parks located 20 kilometres southeast of Roenne. It is also planned to establish cables connecting the windmill farms to Poland, Germany and Sweden, thus developing Bornholm's position as a hub for energy distribution as part of the European energy grid. In its consultancy response, the Municipality of Bornholm expresses concern that the Natura 2000 bird protection zone has been allocated adjacent to the outer perimeter to the renewable energy zone will interfere with these plans. Although space has been allocated for a buffer zone, the bird protection area specifically concerns the long-tailed duck, and there is lack of knowledge about this species and whether the buffer zone allows for sufficient space. The municipality thus is asking for further research/ analyses on the size of the buffer zone as well as the cumulative effects of differentiated activities in the area. The municipality also expresses concern about a shipping corridor, which has been placed right through one of the zones for renewable energy, and whether this allocation will interfere with Bornholm's development into an `energy island´.

The council also asks for allocation of space for an 100MW offshore windfarm within the coastal zone, that the Municipal Council has already made local development plans for. The energy produced from this (smaller) coastal windfarm is to be used locally and support sustainable energy transition on the island itself.

The Municipal Council also points out that Bornholm – taking its point of departure in Port of Roenne – is planning to expand its South Baltic Sea position as installation harbour for the construction, servicing and maintenance of renewable energy installations. This will encompass traffic within the Natura 2000 zone, which is allocated close to Bornholm. The municipality wishes an open dialogue about multi-use planning for this area.

Furthermore, the municipality is planning to support the development of Port of Roenne as a sustainable bunkering hub with power-to-x facilities just outside Roenne harbour. Such a bunkering

hub would support the transition toward more sustainable shipping in the Baltic Sea, targeting the more than 60.000 vessels as they pass between southern Sweden and Bornholm. This would require unhindered access to establishing a bunkering facility in a radius of 3-5 nautical miles outside Roenne harbour.

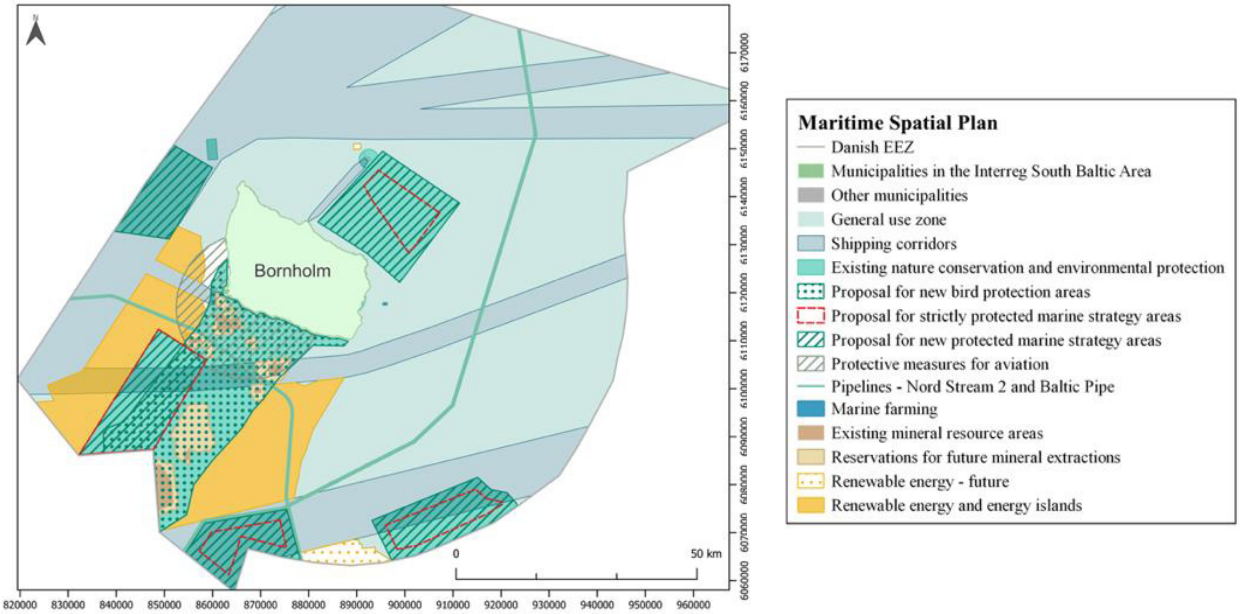

Figure 2: The first version of the Danish MSP as it looks around the coast of Bornholm (Data source: Danish Ministry of Environment, 2021)

The municipality also has a continued interest in mineral resource extraction in the sea territory surrounding Bornholm. In the current MSP, the existing areas for such usage are already allocated and the municipality is expressing its continued interests in such activities, expressing a need for speedy environmental assessments when needed.

Finally, the municipality wishes for an allocation of space for blue mussel production off coastal Bornholm for future development of this economic sector. The municipality argues that, provided such a production adheres to environmental impact assessments, would aid the transition toward a more sustainable food production system based on marine food sources rather than land-based meat production (Danish Maritime Authority, 2021b).

3.2 Greve

Greve is a municipality about 21 km south-west of Copenhagen on the east coast of the island of Zealand in eastern Denmark. The municipality covers an area of 60 km² and has a total population of 50,514 (2021).

Greve Municipality has not submitted a consultative response to the MSP. As a municipality along the Bay of Koege with attractive beaches along its coastline, it has MSP stakes in tourism development, but also issues pertaining to access to ensuring water quality along its coast, which has historically been a bay functioning as a run-off of polluted industrial wastewater and sewage. The municipality also has interests in coastal protection against flooding.

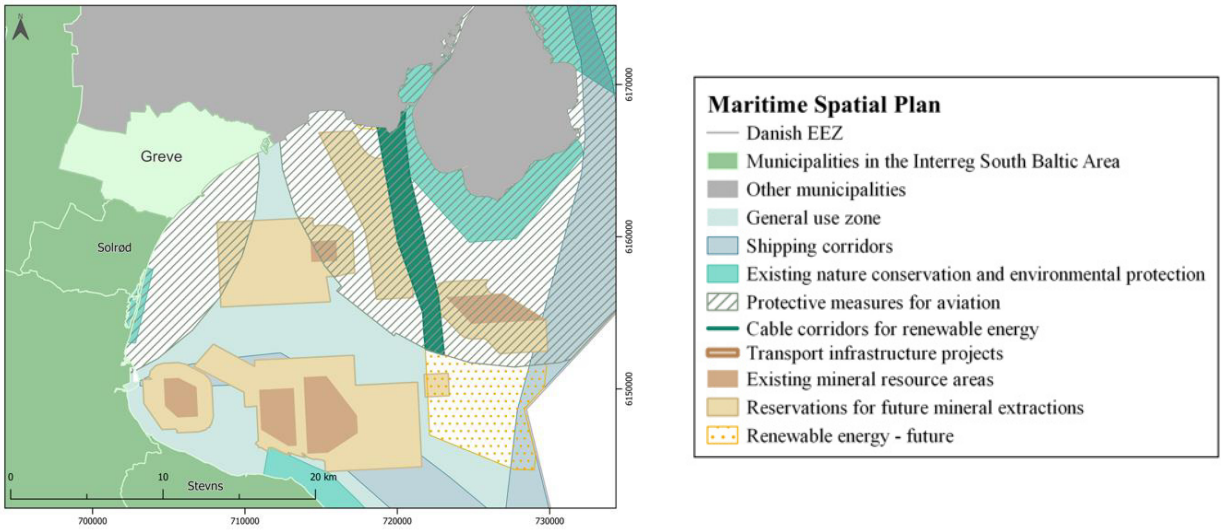

Figure 3: The first version of the Danish MSP as it looks around the coast of Greve Municipality (Data source: Danish Ministry of Environment, 2021)

3.3 Faxe

Faxe municipality covers an area of 406 km² and has a population of 36,713 (2021). Faxe has not submitted a consultative response to the MSP.

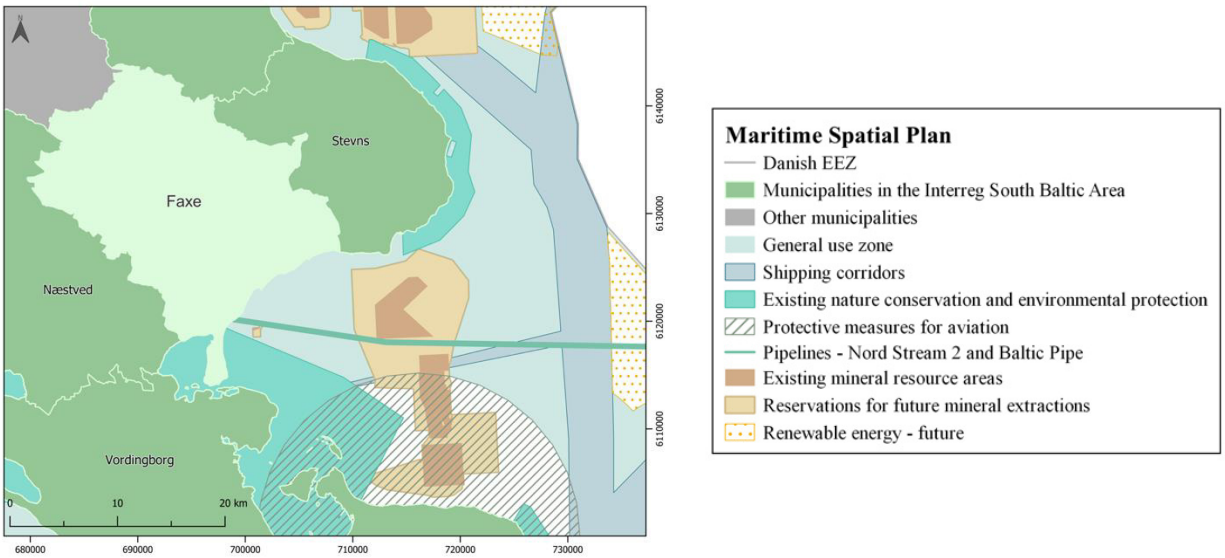

Figure 4: The first version of the Danish MSP covering the coast outside Faxe municipality (Data source: Danish Ministry of Environment, 2021)

3.4 Guldborgsund

Guldborgsund municipality is located on two islands, Lolland in the west and Falster in the east, both bordering the Guldborgsund strait. The municipality covers an area of 903.15 km² (2013) and has a total population of 60, 328 (2021). The municipality has the southernmost point in Denmark, Gedser Odde, and the main town is Nykøbing Falster.

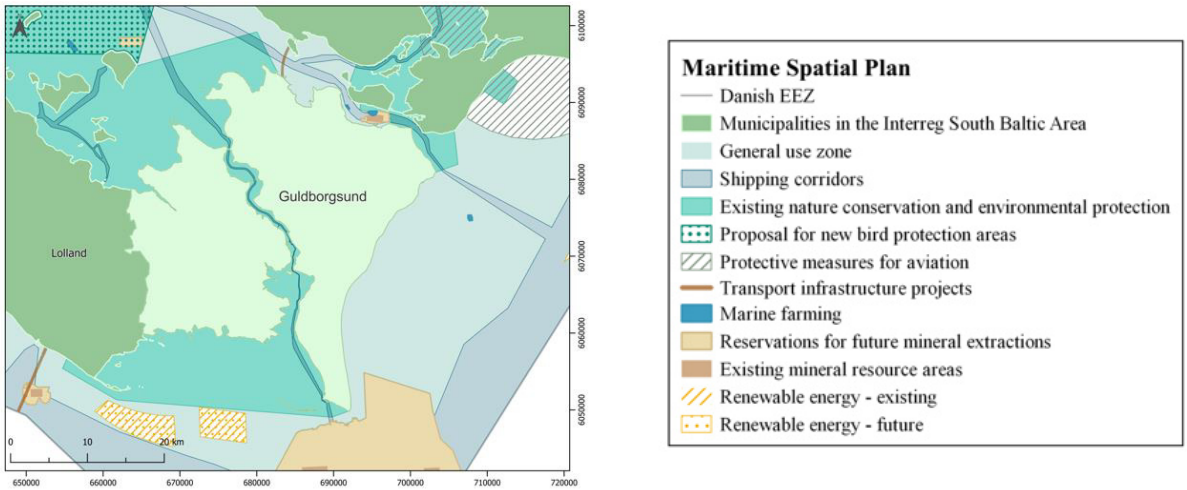

Figure 5: The first version of the Danish MSP covering the coast around Guldborgsund municipality (Data source: Danish Ministry of Environment, 2021)

Guldborgsund municipality has submitted a consultative response to the MSP and expresses a general approval of planning for the sea. The municipality notes that it has one of the longest littoral zones in Denmark, hence how the sea territory is used has great consequences for the municipality, particularly for its tourism sector.

The municipality notes that Natura 2000 areas in the MSP have been allocated for nature conservation and environmental protection, whilst other coastal zone areas have been allocated as general use zones.

The municipality recognises that it is without jurisdiction in the territorial sea, but notes that it has interests, which affect perceived qualities on land. This concern locations for aquaculture, boating and other tourism forms.

The municipality would like the MSP to recognize and allocate space for mussel production in the sea territory outside the municipality in order to support economic development as well as the realisation of the state's Water and Wetlands Plan for 2021-2027. Guldborgsund Municipality suggests that muscle production should be regulated is the same way as is the case for seaweed.

The municipality would also like the MSP to recognise that the eastern coast of the island of Falster has great regional significance for tourism and recreation development. In the current MSP version, the area is allocated as a `general use zone´, meaning that other activities such as commercial fishing, commercial port construction, coastal protection etc. can take place along with tourism and recreation. The municipality would like the area to be specially allocated to tourism and recreation, in order to protect these interests specifically.

Finally, the municipality points out that the MSP has allocated space for the extraction of mineral resources south of Gedser, an area that is quite proximate to the tourism areas mentioned above. The municipality is experiencing erosion of the littoral zone in the area, a situation the effects of which are not analysed in the MSP. In other words, the MSP has merely mapped and allocated space for an existing usage without assessing current environmental impacts. The municipality perceives that the allocation of space for larger mineral extraction areas in the coastal zone is inadvisable due to erosion (Danish Maritime Authority, 2021b).

3.5 Kalundborg

Kalundborg is a municipality on the west coast of the island of Zealand. The municipality covers an area of 604 km^2, and has a total population of 48,487 (2021). The municipality is surrounded by water on three sides:

- Samsø Bælt: the strait which separates the municipality from the island of Samsø and Sejerø Bay, which is located to the north
- The Great Belt: the strait which separates Zealand from the island of Funen) and the Kattegat to the west
- Jammerland Bay to the south.

Kalundborg municipality has filed a response to the hearing process expressing a concern regarding the potential locations of offshore windfarms, particularly pertaining to Jammerland Bay, which has been allocated as a zone for renewable energy production. The municipality is opposed to this allocation as it will potentially place an offshore windfarm facility close to local coastal areas with many summer houses, camp sites, popular beaches and recreational areas.

The municipality also draws attention to national water improvement plans, drawn up by the Ministry of the Environment with the purpose of improving water qualities. The municipality has noted that these plans are not integrated in the MSP and would like clarification on whether the current MSP will be a hindrance to reaching the goals set in the water improvement plans (Danish Maritime Authority, 2021b).

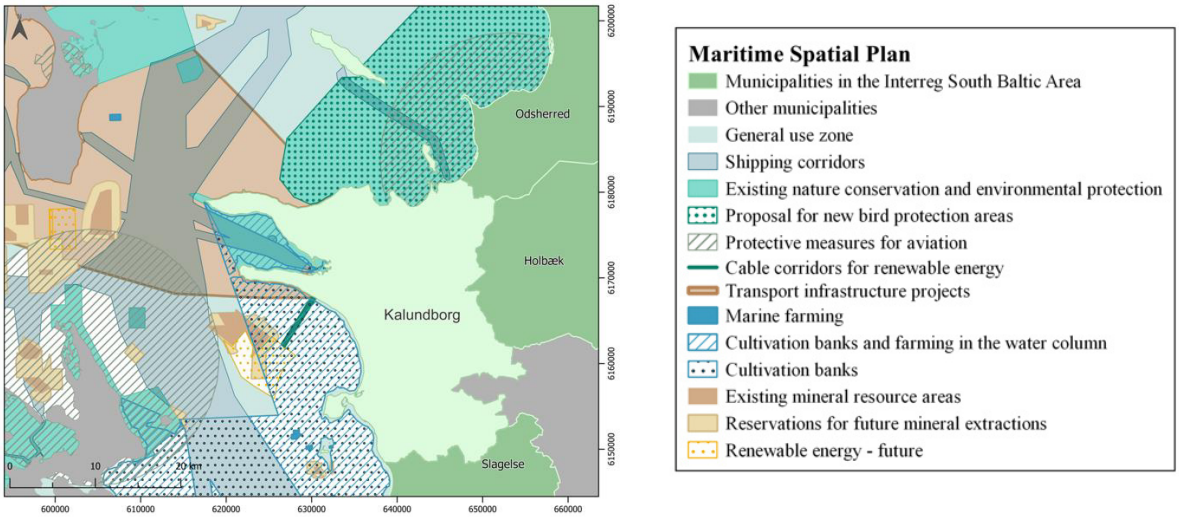

Figure 6: The first version of the Danish MSP as it looks around the coast of Kalundborg Municipality

3.6 Koege

Koege municipality is located on the east coast of the island of Zealand approx. 40 km southwest of Copenhagen and covers an area of 255 km² with a total population of 61,475 (2021).

Koege Municipality is one of the few municipalities that have carried out a political process in the municipal council (Koege Municipality, 2021). In its filed consultation response, the Municipal Council of Koege note positively, that the current MSP contains an area for production of sustainable energy in the bay of Koege, in the form of offshore wind energy. However, concern is expressed regarding potential gravel extraction along the coast exacerbating the risk of further erosion along the coast with negative consequences for flora and fauna. Furthermore, the municipality suggests

establishing artificial reefs and more areas for environmental protection (Danish Maritime Authority, 2021b).

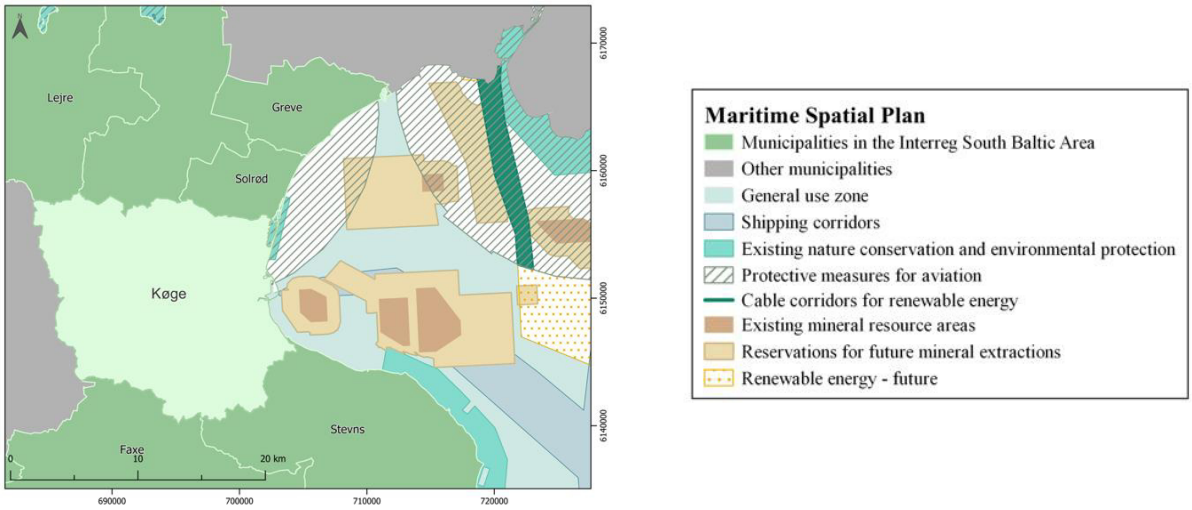

Figure 7: The first version of the Danish MSP covering the coast of Koege Municipality (Data source: Danish Ministry of Environment, 2021)

3.7 Lejre

Lejre municipality lies in the middle of Zealand bordering the south part of Roskilde Fjord. It covers an area of 240,1 km² and has a total population of 28.173 (2021). Lejre Municipality has not submitted a consultative response to the MSP.

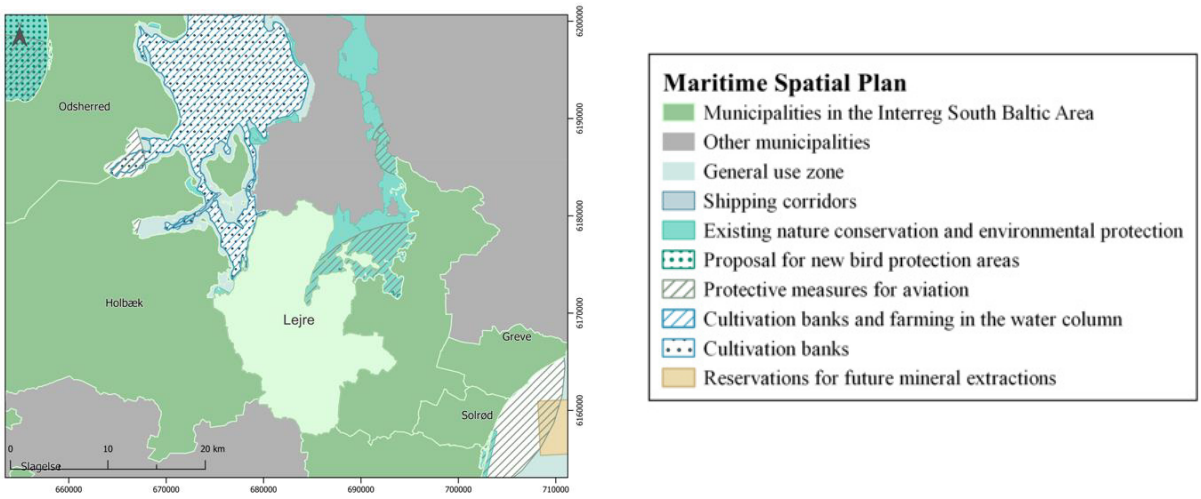

Figure 8: The first version of the Danish MSP with a focus on the coast of Lejre municipality (Data source: Danish Ministry of Environment, 2021)

3.8 Lolland

Lolland municipality is located in the South-western part of Zealand. It covers an area of 892,9 km² and has a total population of 40.539 pr. 2021. In general, the municipalities on the islands of Zealand, Lolland, Falster and including municipalities that cover a large number of small islands in the area –

ranging from Møn and Bogø to Masnedø etc. - perceive the ongoing construction and development project connecting Germany through the Femern Belt to Denmark, as an important development opportunity, but also a land-sea connection that will change the region permanently (Altinget, 2016, Lolland Municipality, 2019).

Lolland Municipality has not submitted a consultative response to the MSP.

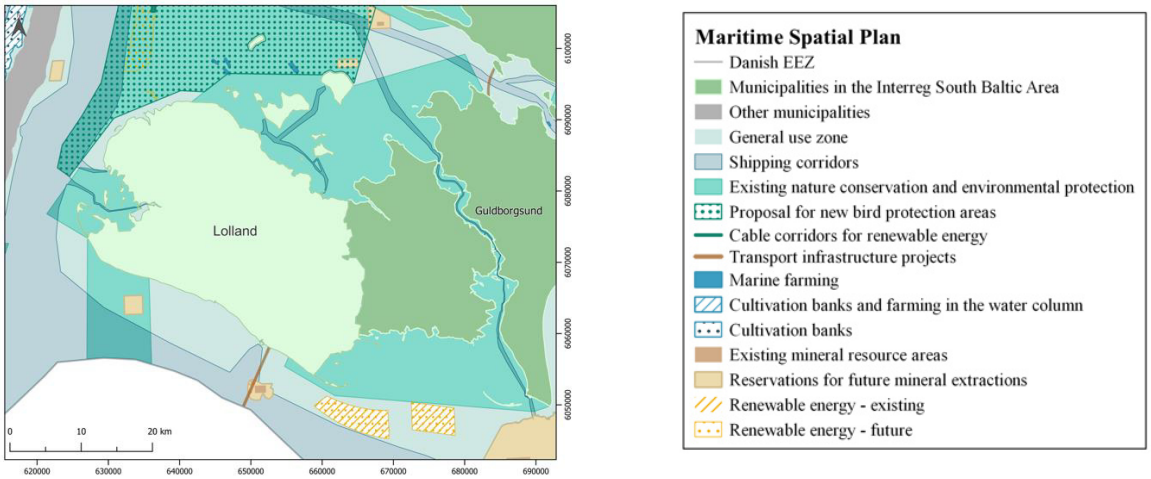

Figure 9: The first version of the Danish MSP covering the coast of Lolland municipality (Data source: Danish Ministry of Environment, 2021)

3.9 Odsherred

Odsherred municipality is located in the North-western part of Zealand. It covers an area of 356,6 km² and has a total population of 32.923 (2021). Odsherred Municipality has not submitted a consultation response to the MSP. However, Odsherred is a peripheral municipality highly reliant on coastal tourism with many summer cottages and second homes within the interzonal coastal areas. The municipality therefore is heavily reliant on good water quality and clean beaches.

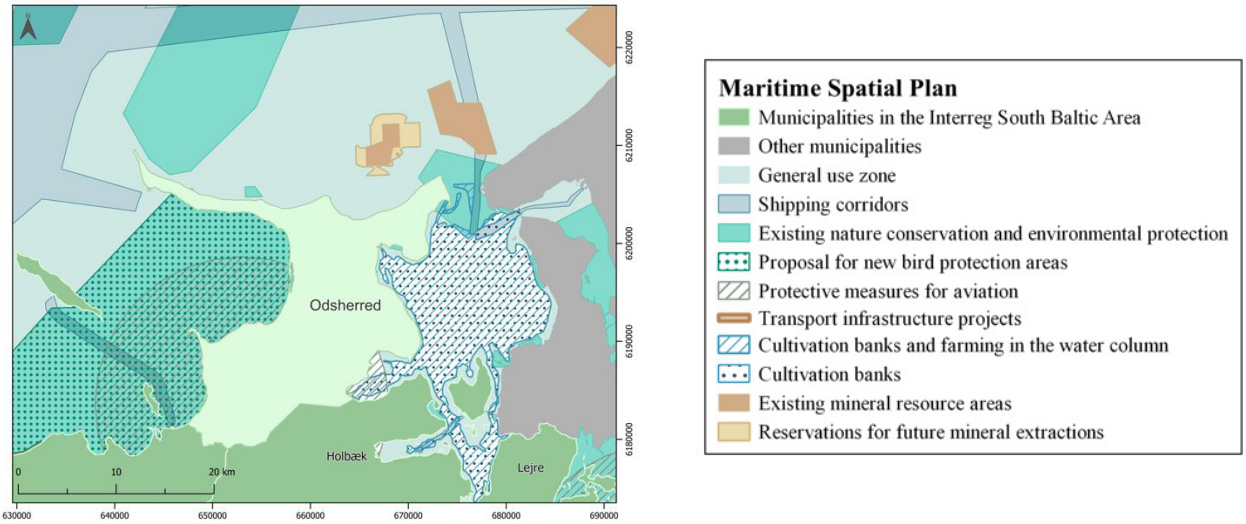

Figure 10: The first version of the Danish MSP viewing the coast of Odsherred municipality (Data source: Danish Ministry of Environment, 2021)

3.10 Solrød

Solrød Municipality, on the east coast of the island of Zealand, covers an area of 40 km² and has a total population of 29,99321,582 (2021). Popular recreational beaches and summer house areas are located along the coast of Koege Bay.

The municipality has not submitted a consultative response to the MSP.

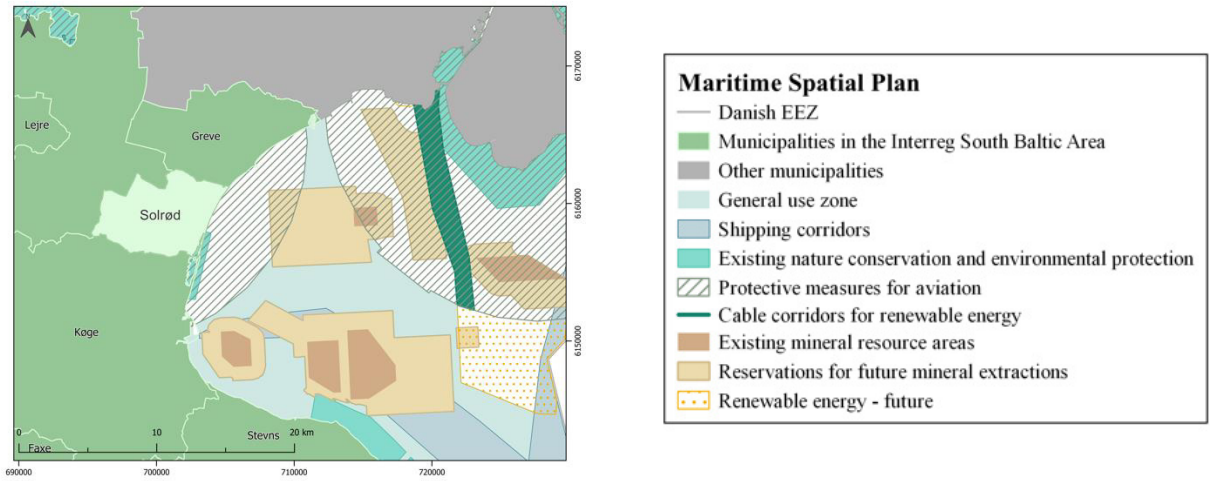

Figure 11: The first version of the Danish MSP showing the coast of Solrød municipality (Data source: Danish Ministry of Environment, 2021)

However, Solrød, along with other municipalities along Køge Bay, has an interest in the development of coastal protection against floods and climate-change induced flooding. In 2020, the Municipality of Solrød adopted the final of a series of local coastal protection plans. Køge Bay has been identified as one of 10 areas in Demark, that are most at risk from flooding due to climate change and co-related increases in extreme weather events (Solrød Municipality, 2021).

3.11 Stevns

Stevns Municipality is located on the southeast coast of the island of Zealand (Sjælland).

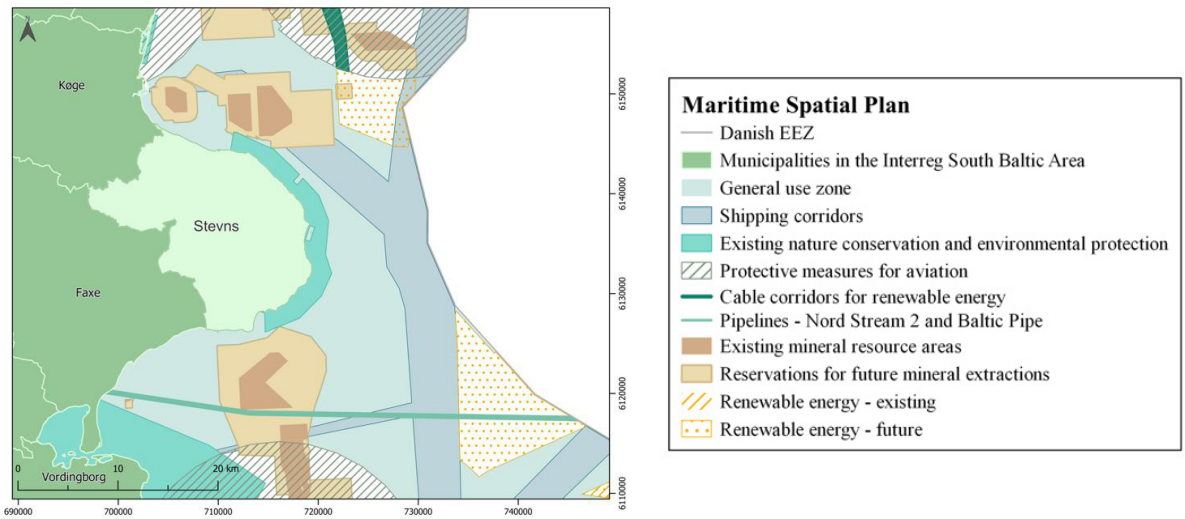

Figure 12: The first version of the Danish MSP with a focus on Stevns municipality (Data source: Danish Ministry of Environment, 2021)

The municipality covers an area of 250 km^2 and has a population of 23,034 (2021). The municipality covers most of Stevns Peninsula.

The area is known for its white chalk cliffs, which are quite rare in Denmark. In 2014 the cliff, Stevns Klint, was listed on the UNESCO List of World Heritage Sites in Northern Europe, and most of the coastline is categorised in the MSP as part of an existing nature protection and environmental protection area. Furthermore, the municipality has stakes in the development of the offshore wind energy park called `Aflandshage Vindmøllepark´ (Stevns Municipality, 2021).

The municipality has not submitted a consultative response to the MSP.

3.12 Slagelse

Slagelse municipality is located on the west coast of the island of Zealand (Sjælland). The municipality covers an area of 570,1 km² and has a population of 79.122 (2021).

Slagelse municipality is surrounded by several waters: the Great Belt which runs between the central islands of Fynen and Zealand, the bay of Musholm, Agersø Sound, Skælskør Fjord, Skælskør Cove and the fairway `Smålandsfarvandet´.

The municipality of Slagelse has submitted a municipal consultative response to the national government concerning the MSP.

The municipality is pleased that a number of interests and stakes have been included in the plan: shipping corridors, Nature 2000 and other coastal environmental protective areas, limited development zones for raw material extraction and aqua culture, and larger zones for offshore wind energy development, whilst there are no restrictions on a number of increased usages such as tourism. The Municipal Council does remark, however, that the MSP has not included an Environmental Assessment, including the effects of fisheries, raw material extraction, or the effects of continued nutrient emissions, just as the MSP does not contain planned actions to conserve, protect and improve the environment in accordance with UNs SDGs nor other marine environmental acts or water management plans.

Finally, the municipality expresses concern regarding the lack of detailed descriptions for fisheries and gravel extraction (Danish Maritime Authority, 2021b).

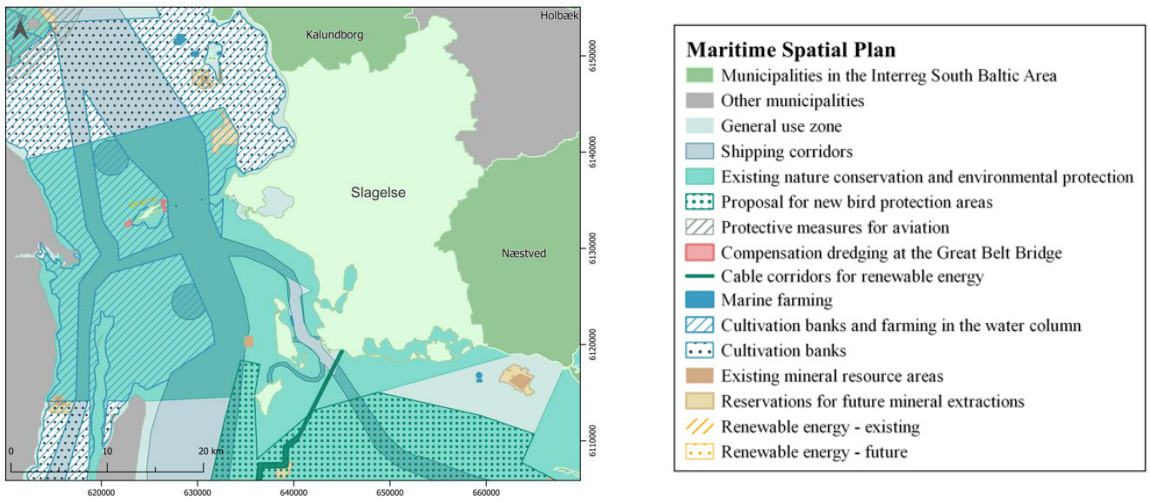

Figure 13: The first version of the Danish MSP focussing on Slagelse Municipality (Data source: Danish Ministry of Environment, 2021)

3.13 Vordingborg

Vordingborg Municipality is on the southeast coast of the island of Zealand (Sjælland) and covers an area of 621 km². It has a total population of 45,268 (2021). The Masnedsund Bridge connects the town of Vordingborg to the island of Masnedø. The Storstrøm Bridge connects Masnedø to the neighboring municipality of Guldborgsund. The Farø Bridges connect the two municipalities from the town of Bakkebølle Strand over Farø island to Falster. Bogø island is also part of the municipality.

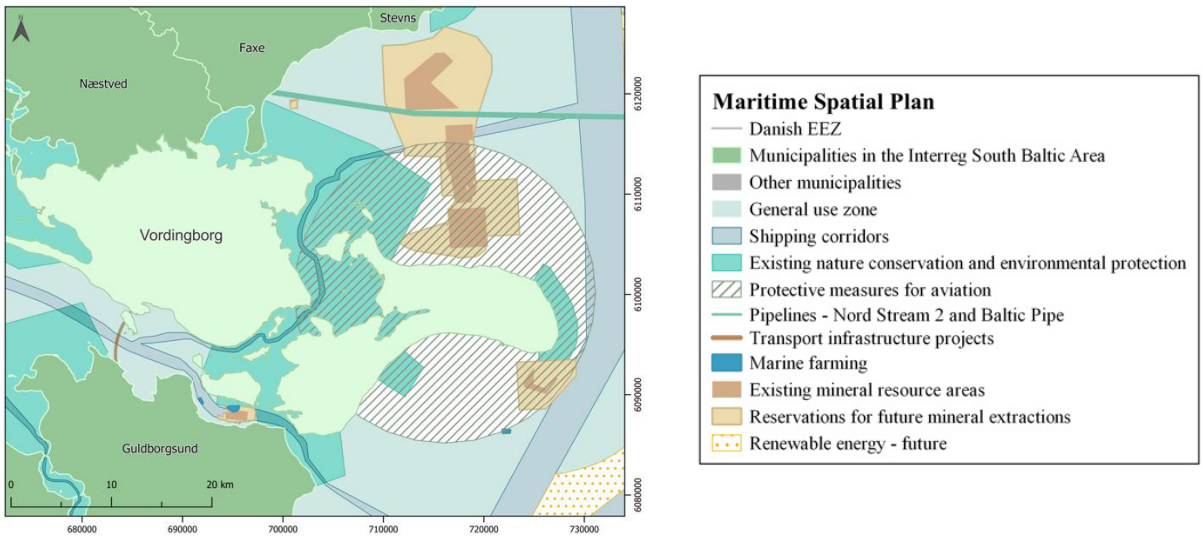

Figure 14: The first version of the Danish MSP with a focus on Vordingborg Municipality (Data source: Danish Ministry of Environment, 2021)

Vordingborg Port is involved in an EU project on sustainable port operation and maintenance called DUAL Ports. Focus is on re-use of materials in the port expansion project as well as development of specific port lighting based on renewable energy sources (Vordingborg Municipality 2021).

Vordingborg municipality has filed a response to the hearing process expressing concern regarding potential gravel extraction along the coast, especially along the cliffs of Moen. The municipality also expresses concern about the allocation of space for aquaculture production, as it would be detrimental to the environmental improvements laid out in the water improvement plans from the Ministry of the Environment. The municipality states, that it was previously in favour of developing such aquaculture production in the area, due to a need to create jobs. However, this goal is now superseded by environmental concerns – and job creation in the area has instead been made possible by Klintholm Port on Møn winning concessions as service harbour for Krigers Flak and Baltic II windfarms (Danish Maritime Authority, 2021b).

3.14 Holbaek

Holbaek Municipality is located on the island of Zealand, 60 km from Copenhagen, bordering the west coast of Roskilde fjord, the municipality covers an area of 578,33 km², and it has a total population of 71.913 (2021). The biggest city is Holbaek, which was established in 1236.

Holbæk Municipality has not submitted a consultative response to the MSP.

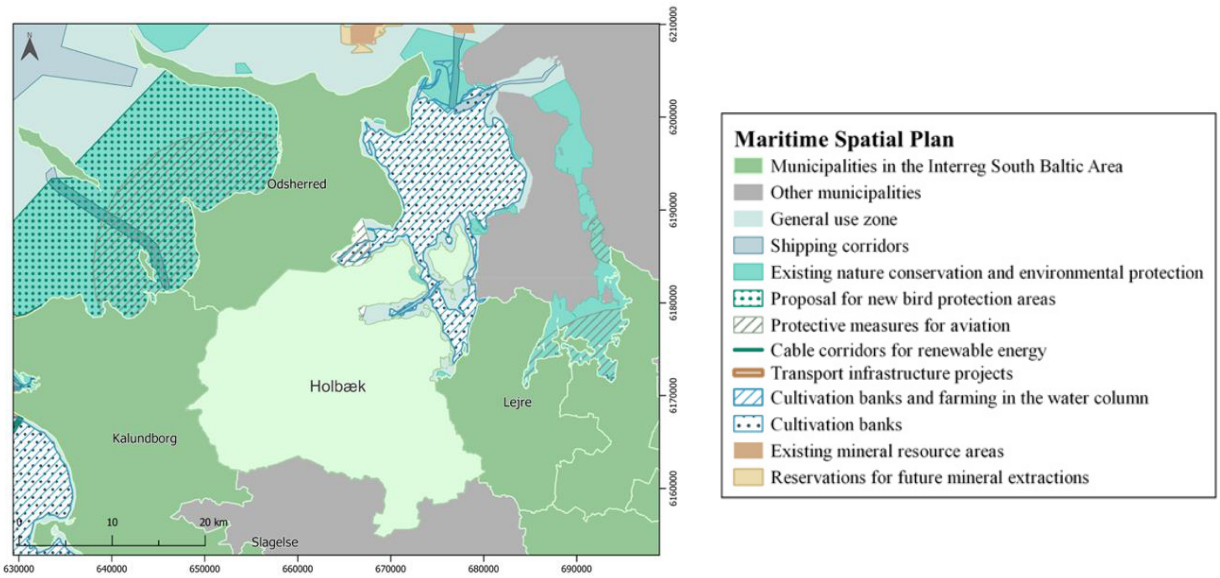

Figure 15: The first version of the Danish MSP focussing on Holbæk municipality (Data source: Danish Ministry of Environment, 2021)

3.15 Roskilde

Roskilde Municipality is located on the island of Zealand and is located 30 km west of Copenhagen.

The largest city is Roskilde, the municipality covers an area of 212 km², and has a total population of 88,889 (2021). To the north-west is Roskilde Fjord.

The Municipality of Roskilde has not submitted a consultative response to the MSP.

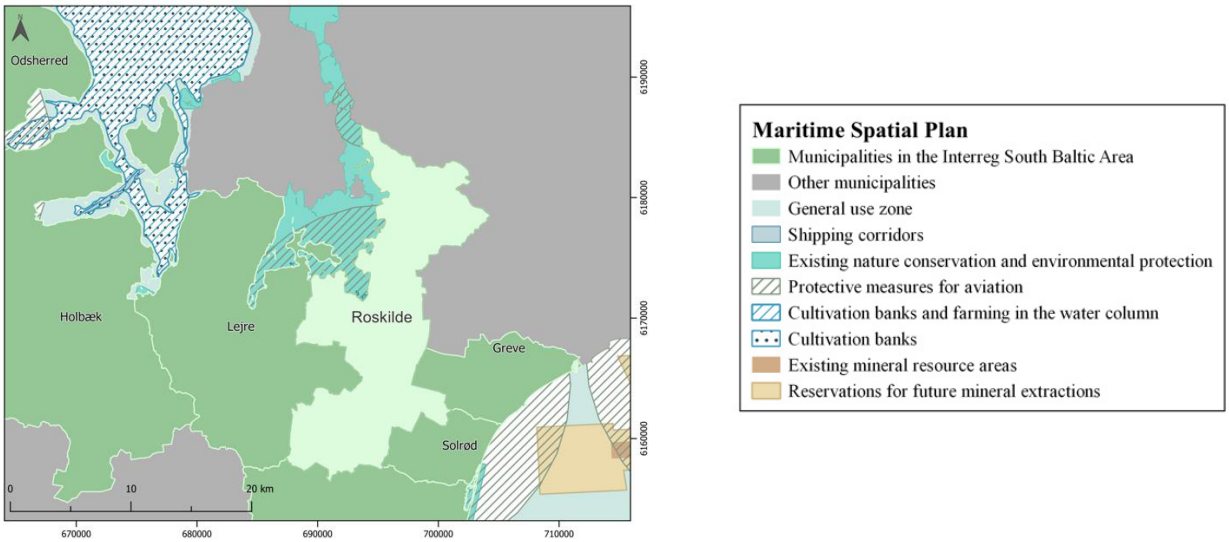

Figure 16: The first version of the Danish MSP as it looks around the coast of Roskilde municipality (Data source: Danish Ministry of Environment, 2021)

4 The Blue Economy in the South Baltic Region

According to the EU (European Commission, 2020), the blue economy comprises economic activities connected to oceans, seas and/ or coastal areas, i.e., industries and manufacturing sectors as well as coastal and maritime workers involved in the marine environment such as shipping, fisheries and,

energy production, including activities on land such as ports, shipyards, land-based aquaculture, algae production and coastal tourism. Others, like the Centre for the Blue Economy, argue that the blue economy has three related but distinct uses and meanings: (1) the overall contribution of the oceans to economies; (2) the need to address environmental and ecological sustainability of the oceans, and (3) the ocean economy as a growth opportunity for both developed and developing countries (Rousseau, 2020). In this section, we define and use it in the sense of the ocean economy as a growth opportunity for the Baltic Sea area, whilst being aware of the need to address the environmental and ecological sustainability of the ocean and its resources as a prerequisite for sustainable development.

Traditional maritime sectors and innovative marine activities are at the heart of the economies of South Baltic coastal regions. People have used the Baltic Sea for a very long time, especially as a transportation route and source of food. Today the surface and seabed of the Baltic are the locations of extremely varied and intensive human activities. These include maritime transportation and fisheries as well as aquaculture, oil and gas exploitation, offshore wind production, cables and pipelines as well as leisure and recreative activities including coastal and cruise ship tourism as well as boating and angling.

On top of these more traditional sectors, several blue economy and innovative sectors including blue energy, i.e., offshore wind energy, ocean energy (wave and tidal), blue bio economy and biotechnology, marine minerals, desalination and maritime defence, are emerging. These sectors offer significant potential for growth and jobs, especially in the field of renewable energy. Offshore wind for instance has seen an exponential growth, which has led to a similar increase in jobs in EU coastal communities. (Burchaez & Kalinowski, 2021)

In 2014, the European Commission adopted the Sustainable Blue Growth Agenda for the Baltic Sea Region, which focused on developing the potential of the maritime economy in and around the Baltic Sea. This was followed in 2016 by a stakeholder-based dialogued on which areas the implementation stage of the Blue Growth Agenda should focus on (Schultz-Zehden et al, 2017). In the following section, some of the most dominant blue economy sectors in the Baltic Sea are briefly introduced.

5 Key maritime sectors in the South Baltic and their socio-economic opportunities and challenges

5.1 Fishing activities

The fishing industry representants the most traditional economic sector in the Baltic Sea Region where it has long and rich traditions. As early as the Middle Ages, it was one of the most important economic and social activities, and it experienced an unprecedented boom during Hanseatic times. Today, the people whose livelihoods and lifestyles depend on the fisheries sector face both environmental, economic and social crises.

The principal species targeted in the commercial fishery are cod, herring, and sprat, which collectively constitute about 95% of the total catch. However, for many of the Baltic Sea's most important commercial fish stocks, the situation is critical. The species worst off, is the Eastern Baltic cod stock, which is on the verge of collapse (ICES, 2019).

Economically, drastic reductions in catch quotas are endangering the existence of many businesses. The catch quotas in the Baltic Sea for 2021, agreed upon by the Fisheries Ministers of the EU Member States exceeded the fishing industry’s worst expectations, with further cuts for cod and herring, the most economically important species of fish for Baltic Sea fisheries (Klinkhardt, 2021).

Collectively, small-scale fishing is on the verge of collapse, which has an enormous economic and social impact on many residents in coastal areas of the Baltic Sea. Since the start of the 1980s, the number of cutters in most Baltic Sea states has decreased significantly. Many full-time fishermen are switching to part-time or giving up the occupation completely. The market-based fisheries management system has been widely criticized for (1) on the one hand, not sufficiently lowering the

catch quantities, whilst (2) ruining the livelihoods of fishermen and fishing communities. Due to the fishing management system of quotas, future generations of fishers face increasingly high economic barriers to enter the system (Høst and Christiansen, 2018).

5.2 Aquaculture activities

Aquaculture is the controlled production of aquatic organisms, whether at sea, in estuaries or inland. As an economic activity, aquaculture today provides half of all fish for human consumption worldwide and has experienced vigorous global growth during recent decades. Many Baltic Sea coastal countries, for example in Denmark, Germany and Poland, have a long history with inland aquaculture of rainbow trout, but also of other species such as common carp. There are 332 aquaculture sites in the Baltic Sea. In terms of volume nearly 90% of aquaculture production for human consumption in the Baltic Sea waters is cultivation of rainbow trout (Eurofish et al, 2015).

It is very difficult to assess the socioeconomic challenges to aquaculture in the Baltic due to lack of statistics and knowledge. Based on Eurostat, the Coalition Clean Baltic (CCB) has assessed that during the period 2009-2016, ca. 138.000 tons were produced annually in the Baltic Region. By means of comparison, total EU production of 1,2 Mil. tons and Norway's production of 1,3 mil. tons annually. The number of employed within the sector is relatively low, ca. 3000-3200 persons in the entire Baltic region (Coalition Clean Baltic, 2021).

Commercial sea-based aquaculture of seaweeds in the region is currently restricted to Denmark and Germany. As along other cold temperate coasts of Europe the main target species is the kelp Saccharina latissima, which is generally capable of relatively fast growth. However, the species reaches its distribution limit in the Baltic Sea salinity gradient at Bornholm (Møller Nielsen et al, 2016).

While commercial seaweed farming is still restricted, a number of pilot projects have been launched to develop seaweed farming in the area. The low salinity in the inner parts of the Baltic Sea is still seen as a major limitation to seaweed farming (Blidberg and Gröndahl 2012).

5.3 Offshore windfarms

Wind power and other offshore renewables, such as wave power, are parts of the solution in the ongoing global move away from coal, oil, gas and nuclear power toward more sustainable forms of energy production. The first offshore windfarm in the world, the Danish Vindeby, was constructed in 1991 in the western part of the Baltic Sea. However, it is especially during the last ten years that the interest in offshore wind energy in the Baltic Sea has taken off. Denmark and Sweden were the first countries to develop offshore windfarms in the region during the 1990s, but since 2011 Germany has quickly established itself as a major offshore wind country in the region. 95% of the existing capacity is located in the south-west of the BSR in the territorial waters of Denmark, Sweden and Germany. There are currently many planned projects active in Poland as well as in Finland, Denmark, Sweden and Germany. Currently, there are many planned projects active in Poland as well as Finland, Denmark, Sweden and Germany. Despite the quick developments offshore, the bulk of wind power developments today take place on dry land. As an example, in the EU in 2016, 10 923 MW were installed onshore compared to 1 567 MW offshore. However, this ratio is changing as cost-efficiency of offshore developments is improving (Tonderski & Jedrzejewska, 2013)

5.4 Offshore oil and gas

Offshore oil and gas exploration is not large-scale activities in the southern BSR. These activities are likely to increase, though, as there are plans to exploit a number of new fields in the Polish Exclusive Economic Zone.

5.5 Port industry and shipping

The Baltic Sea is one of the most heavily trafficked seas in the world, accounting for up to 15% of the world's cargo transportation (Madjidian et al. 2013). According to the HELCOM Automatic Identification System (AIS) for monitoring maritime traffic, established in mid-2005, there are about 2,000 ships in the Baltic marine area at any given time, and each month around 3,500–5,000 ships ply the waters of the Baltic Sea (Stankiewicz et al. 2010, Madjidian et al. 2013). In 2019, the IMO-registered fleet was by far represented by cargo ships with more than 3800 ships operating in the Baltic Sea (about 45,4% of the total fleet), while tanker ships represented 23,5% of fleet with almost 2000 vessels. Passenger ships were equal to 5,2% of the fleet (445 vessels) (Niemelä et al, 2021).

Shipping is one of the main users of the Baltic Sea and is a central determinant for development and trade in the region, and, therefore, also one of the most economically important sectors in the Baltic Sea. There are approximately 400 ports in the BSR, 90 of which are of international importance, all of them functioning as traffic nodes between land and sea and for commercial as well as passenger traffic. As such, Baltic ports have become crucial nodes in the international flow of goods and as significant wealth generators.

Amongst the 3500-5500 ships that navigate through the Baltic Sea per month, more than 50% are general cargo ships. Approximately 20 % of ships are tankers carrying over 200 mil. tons of oil, whilst ca. 11% are passenger ships operating about 50 mil. Passengers (Stankiewicz et al. 2010, Parsmo et al. 2016).).

The main development factors for shipping in the Baltic concern global economic development trends, the law framework for shipping in the future, change in global trade flows, i.e. a re-routing of international trade, and change in environmental factors. Shipping is likely to increase on a European as well as global scale due to global population growth, economic growth and effects of increasing globalization. It is also expected that a model shift from road-based transport to sea-based transport will take place in Europe. The Baltic Sea favours waterborne traffic over shorter distances because of the high density of harbours, meaning that Short Sea Shipping shortens travel distances compared to road-based transport. Both road- and shipping-based transport is expected to become more expensive. It is also expected that there will be a greater number and shore of larger vessels to enable more efficient and cost-saving freight transport. Larger ships with deep draught represent a major challenge for routes entering the Baltic Sea, for crossing shallow areas as well as for port development (Matcek et al., 2018).

5.6 Coastal and marine tourism and recreation

In 2016 the BALTIC SEA REGION tourism industry generated 88 million international arrivals, a rise of more than 10% since 2014 – and more than 227 million overnight stays were registered. Of these, approximately 24% were from international visitors. This provided jobs for more than 640,000 persons, measured as jobs within the tourism and hospitality industry. The indirect job provision is much higher (for example within retail and the economic activity that employees generate in other sectors If the Baltic Sea Region is considered a macro-destination, a majority of its international tourists come from within the BSR region, i.e., Germans, Poles, Danes, Swedes, Lithuanians (Jacobsen, 2018).

There is great variance in the tourism industries between the South Baltic countries, but they are all experience an increase in number of arriving tourists as well as number of overnight stays.

Tourism along the German Baltic Sea coast is characterised by a relatively low share of international tourists (9,6 %) and a relatively high share of total employment (5,4%) compared to the other South Baltic Region tourism areas. Tourism along the Lithuanian coast has a different character and has a relatively high share of international tourists (46,8%), with many tourists from Belarus and the Russian Federation. This dominance is, however, declining with a rising share of tourists from Latvia, Germany and Poland. In Sweden, tourism is also on the increase. Here, some 24,5% are international

tourists – mostly from Norway, Germany, Denmark, the UK and the Netherlands. Finally, tourism along the Polish Baltic Sea Coast is characterised by an increase of just over 17%, which is also the share of international tourists, a vast majority of which come from Germany (Jacobsen, 2018). Coastal and marine tourism in Denmark, is presented in chapter 1.

Collectively, coastal and maritime tourism is an economic sector in each of the South Baltic countries, and it is indicative that tourist number are rising, just as the tourism product is diversifying. These are trends that will demand more space – on land, on the coast and in the (primarily) shallow sea territory, but increasingly also further out to sea) and also intensify the use of that space in the near future.

6 The Blue Economy in Denmark – challenges and opportunities

Denmark is among the world's leading maritime nations and its maritime economy, called Blue Denmark, is one of the country's industrial strengths. The sector consists of shipowners, -yards, equipment manufacturers, service and repair businesses, ship designers, shipping and logistics companies, shipbrokers, ports, offshore organisations within both oil and gas as well as offshore wind production, maritime scrapping and recycling industries, maritime educational institutions, - trade organisations etc.

In 2017, the gross value added in the Danish maritime industry was approximately DKK 96 billion and Danish maritime organisations' exports constituted ca. 25% of all Danish exports. The Danish maritime sector is competitive globally based on high technological and specialised products and innovative solutions.

Denmark has the world's fifth largest merchant fleet measured in number of ships operated by Danish shipping companies – after Greece, Singapore, China and Japan.

In the Danish MSP, the Danish Government stresses its perception of understanding marine-based resources as a simultaneous source of economic and social wealth, but the MSP also stresses its central role in supporting a green transition through the development and expansion of green technologies on the oceans as a central instrument. More specifically, the establishment of large offshore wind farms and the creation of energy islands is planned. The Danish MSP states that it does not want large unsustainable aquaculture in the sea, and in the future most aquaculture is to take place on land (Søfartsstyrelsen, 2021).

In 2019, the production in Blue Denmark amounted to DKK 394 billion and gross value added (GVA) amounted to DKK 104 billion. This corresponded to 9.7 per cent of total production and 5.1 of GVA, respectively, of the overall economy. If the indirect contribution is included, the total contributions amounted to 11.4 and 7.3 per cent, respectively (Cowi, 2020). In other words, this is a significant economic contribution.

Exports from firms in Blue Denmark amounted to almost DKK 287 billion in 2019. This is a little more than the previous year and corresponded to 26.5 per cent of total exports. If indirect exports are included, the proportion corresponded to 29.1 per cent (COWI, 2020).

In terms of employment and jobs in the Blue Economy in Denmark, the Ministry of Higher Education and Science is concerned about a lack of skilled labour that can support the further development of the Danish maritime sector. Approximately 97 000 persons are directly or indirectly employed in Blue Denmark, which corresponds to 3,4% of all employment in Denmark (Marcod) and includes the indirect contribution from the demand for goods and services in other Danish sectors. In 2019, Blue Denmark accounted for the direct employment of 60,880 persons. This corresponded to 2.1 per cent (direct) and 3.4 per cent (direct and indirect) of all employment in Denmark.

However, the total employment contribution of Blue Denmark has decreased during the period from 2009 to 2019, a direct employment decrease of 12,087 persons (Cowi, 2020)

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Economic sectors with MSP interests – Danish examples

1 Introduction

This chapter focuses on a number of specific economic sectors that have interests in marine and maritime spatial planning (MSP) in Denmark. Each sector and its MSP interests is exemplified through a case description, the purpose of which is to point out some current developments in and along the Danish Baltic Sea coasts which showcase MSP aspects and highlights different MSP dilemmas. The purpose is to function as a reference section for further reading or investigation. The case examples included are:

- Commercial harbour expansion in relation to the development of the offshore energy sector. The case is Port of Roenne on Bornholm
- MSP perspectives in local development plans based on coastal and maritime tourism. The case is the island of Bornholm
- Maritime cultural heritage in the South Baltic Area

2 Roenne Harbour and Bornholm – into the offshore wind industry

Port of Roenne A/S operates Bornholm's supply port and is Denmark's easternmost commercial port. An essential aspect of the harbour's business model is its' central location in the Baltic Sea, which gives it rich opportunities to provide a varied range of maritime services encompassing both ferry traffic, cruise ships, bulk transportation and offshore wind energy services.

Port of Roenne has undergone a long strategic process, transforming it from a 100% municipally owned port, into a highly ambitious commercially run joint stock company. The regional municipality of Bornholm continues to be the majority stockholder and there is a close collaboration between the harbour and the municipality. The choice to change the harbour into a joint-stock company has been carried out in order to act on a truly commercial basis and to drive the expansion of the blue economy on Bornholm.

The harbour's stocks are now owned jointly by the local Bornholm sections of The Confederation of Danish Industry (employer association) and FH – the Danish Trade Union Confederation (employee association). A masterplan for the development of Roenne as a commercial harbour was made in 2016, stipulating that the harbour infrastructure needed to expand substantially, and the harbour needed to be managed commercially, in order to make enough money to finance this expansion (Rønne Havn A/S Masterplan, 2016). Besides the 5 core board members that represent the stockholders, the board consists of a further five independent members with special competences.

The expansion of Roenne Harbour was completed in October 2019 and its new infrastructure has made the harbour especially attractive for the offshore wind-energy market (Sylvest, 2020).

Port of Roenne A/S has four central business areas, each of which has different MSP interests and stakes.

2.1 Ferry traffic

Rønne Harbour is Bornholm's most important traffic hub, from which ferries depart and arrive on a daily basis from Ystad in Sweden, Koege in Zealand and Sassnitz in Germany.

Ferry traffic is relevant for MSP on several counts concerning sail routes, i.e., planning spatial use in relation to other users, including transportation to offshore wind energy areas, safety as well as the environmental effects of ferry vessel emissions and wave activity on marine animals, fauna and coastal areas.

2.2 Cruise ships

The cruise tourism industry perceives Bornholm to be an important tourist attraction and Roenne Harbour is ideally positioned in relation to the already well-established cruise ship routes in the Baltic Sea.

The COVID19 Pandemic has been extremely detrimental to the cruise industry and Port of Roenne experienced a large number of cancellations on that account in 2020 and 2021. But until the crisis, Port of Roenne experienced an increase in the number of cruise ship passengers by almost 50% from 2018 to 2019. Whilst 26 cruise ships used Roenne Harbour as port of call in 2018 (encompassing 12.500 guests), that number increased to 42 cruise ships in 2019, bringing 19.000 guests.

Port of Roenne A/S has completed a harbour construction project in 2019, which has meant that the port can offer improved infrastructural and other conditions upon calling into the port for the largest of the cruise ships on the market. Since the summer of 2019 the Port's new 300-meter multi-purpose wharf can receive ships up to 350 meters long. This means that the harbour has increased its volume, not just in terms of being able to receive more ships, but also much larger ships.

By expanding the port, the traffic patterns of which cruise ships can be received have changed, affecting the the patterns of cruise ships' routes in the entire South Baltic area. It has also changed the number of and flows of cruise tourists that travel around on the island, as the number of tourists on the island at any given changes dramatically with the arrival of potentially 5,000 people from one ship. Thus, land-based infrastructures are affected and need to be planned for in order to avoid overcrowding.

2.3 Bulk

More than 1 m tons of dry and liquid bulk goods pass through Port of Roenne each year. The liquid bulk primarily consists of petrol and diesel for road transport on Bornholm as well as bunkers for ships sailing to and from the island. Ships up to 120 m in length can bunker at the oil pier, where the depth is 7 meters. Larger ships can bunker using trucks or using a 65 m3 bunker barge located at the port.

The dry bulk consists of both imported and exported dry bulk like grain, feed, fertiliser, sand, gravel and wood chip. The port has wharfs with depths of 7, 9 and 11 m, where dry bulk ships can be (un)loaded, either using one of the port's two mobile cranes or by ship cranes.

2.4 Offshore Wind

The Baltic Sea has a huge potential for windfarms and Port of Roenne A/S is chosen as pre-assembly port for several projects at sea. Siemens Gamesa and MHI Vestas have already selected Port of Roenne A/S because of its unique infrastructure.

In a recent Climate statement report (May 2021), the Danish Government has proposed that Bornholm should be appointed status as an `energy island´ by establishing and connecting up to a 2 GW offshore windfarm with connections to Zealand and Poland by 2030. Bornholm has the infrastructure to be a trans-European centre of green energy for the Baltic Sea-region.

The proposal/decision to establish a 2 GW offshore wind farm to be located in proximity to Bornholm, is also an indication that the Baltic Sea-region has been given political priority in offshore renewable energy production, after many years of focussing on the North Sea, thus shifting the national climate- and energy ambitions to include the Eastern part of Denmark and the regions in the Baltic Sea as well.

The idea of making Bornholm 'an Island for green energy' came to life when the Danish energy company, Ørsted, in November 2019 suggested to place a gigantic offshore wind farm next to the island, on the already screened sea-area at 'Rønne Banke'. At the same time, it was suggested to locate a transformer station on the island as the logical cable-link between Sweden, Denmark, Germany and Poland, in order to develop a mutual energy- and climate cooperation between the European countries

in the south Baltic Sea area. The business-services infrastructure concerning the development of Bornholm for such ventures continues to develop, often in public-private collaborations.

2.5 Community-based ferry services & Power-to-X

The Danish government has also proposed to promote the new Power-to-X technologies. Specifically, the technologies that transform green power into green hydrogen, that can be further refined to fossil free fuels, in order to provide more sustainable sea-based transportation.

The port of Roenne has proposed that the community-based ferry services on Bornholm could be a good place to start, as case for research and testing facilities for further development and qualification of the PtX-technologies (www.roennehavn.dk)

Danish Shipping, Danish Energy and Wind Denmark, who are all sector- and stakeholder organisations within the maritime and energy sectors, have commissioned an analysis of the socioeconomic effects of the offshore windmill industry for different localities – including for port of Roenne and Bornholm (Sylvest, 2020).

The report concluded that although Bornholm has the lowest number and share of employees in the offshore wind industry compared to other publicly owned (municipal) ports in Denmark, an investment in offshore windfarms would still generate thousands of workplaces through-out the service-life of the offshore windfarms, which is approximately 25 years. How large a share of these jobs would benefit Bornholm depends on the competency profile of the local work force (Wind Denmark, 2019; Sylvest, 2020). Currently, Bornholm's skills' profile reflects a high skills level within general shipping and maritime services and repairs, but limited skills within specific job profiles in the offshore wind farm industry.

In connection to this, the same stakeholders have calculated that designating Bornholm as `Green Energy Island´ and constructing offshore windfarms parks as planned, as well as establishing an energy-transformer hub on Bornholm with connections to Poland, Germany and Sweden, would demand 27.617 fulltime workers during the 25-year span that the offshore windmill park would be expected to function. How large a share of these jobs would go to Bornholm, would, again, depend on which firms win the contracts and their terms of procurement. (Sylvest, 2020).

3 MSP and Bornholm's strategic plans within the offshore wind energy sector

As can be seen, the Danish state and the local municipality on Bornholm are highly ambitious about the potential future role of Bornholm as green energy hub in the South Baltic. For each new development, new spatial needs will evolve, including installation and servicing traffic between Bornholm and the offshore installations.

Both the Municipality of Bornholm and Port of Roenne A/S have submitted consultancy responses to the MSP. As presented in Chapter 2, Bornholm Municipality has expressed concern about the lack of allocated space for expansion of the Port of Roenne, as well as questioned the overlap between the Natura 2000 bird protection area, international shipping lines and offshore windfarms south of Bornholm. Port of Roenne A/S is more directly critical of the MSP in their consultative response. They question the viability of allocating space for development zones bordering right up to the existing harbour, rather than allowing multi-use space for harbour development and expansion. Without space to develop, it will not be possible in the future to establish a ferry connection to Poland, just as the `Energy Island´ project is threatened by lack of allocation for spatial expansion of the harbour, and by the Natura 2000 bird protection area right between the offshore windfarms and international shipping routes. The Port of Roenne suggests that (1) harbours are allocated a buffer zone for expansion and safe trafficking, in much the same way as has been allocated for airports; and, (2) that the MSP should consider exercising appropriative rights to deviate from Natura 2000 protection responsibilities in connection with the development of Bornholm as renewable `Energy Island. Finally,

the consultative response expresses a disappointment in the MSP for establishing an extra planning layer, which makes development plans more, rather than less, complex. Port of Roenne A/S had hoped that the MSP would collect and organise all directives, legislature, agreements and allocations in one `master plan´

This example from the Port of Roenne and Bornholm is indicative of the complexity of considerations that need to be taken into account. Some of the potential spatial conflicts pertain to conflicting interests, others are more related to complexity in and of itself.

The example stated above, is only based on national discussions within Denmark. The development of offshore windfarms and an international renewable energy hub, calls for further international coordination, testing the important purpose of a joint EU directive in practice, where several nations must coordinate not only their current use of maritime space, but jointly plan and strategize a common development of green energy production in the South Baltic, with multiple national economic interests at stake.

Transforming the port of Roenne into a green energy hub may, paradoxically, create new environmental issues which need to be addressed as an integrated aspect of an international planning process. What are the assessed environmental impacts of a substantial expansion of offshore wind energy production and creation of a green energy transformer on an island that functions as the geographical hub of supplying four countries with electricity and Power-to-X-technologies? And how can we compensate the environment in order to ensure that such economic expansion (even though it concerns a phasing out of fossil fuels) takes place within an eco-system-based approach, which must continue to be at the very heart of all MSP processes? Otherwise, the transition from fossil-based energy to sustainable energy sources will be self-defeating.

Facts about Arcadis Ost 1

Arcadis Ost 1 is scheduled for installation in early June 2022 to end of February 2023

The project will consist of 27 x V174-9.5 MW offshore wind turbines

The 27 offshore wind turbines will have a total output capacity of 257 MW

The project site is located 74 kilometres from Port of Roenne, Bornholm.

Arcadis Ost 1 will be able to supply 300.000 German households with clean energy

Facts about Krieger's Flak

Krieger's Flak is located in the Baltic Sea approximately 30 miles west of Bornholm, which is equivalent to approximately 3 hours of sailing.

It consists of 72 SWT-8.4-167 wind turbines.

These are 230 meters high and have a total output of 604.8 MW.

Construction of the wind farm started in 2020 and when it is completed, it will supply power to ca. 600,000 Danish households.

4 Coastal and Maritime Tourism in Denmark – and the case of Bornholm

This chapter introduces coastal and maritime tourism in Denmark and discusses the potential role of the Danish national MSP as well the EU MSP directive on the development of tourism in Denmark. This case description contains three overall parts. Firstly, there is an introduction to coastal and

maritime tourism in Denmark as a specific (economic) activity. Secondly, the chapter presents a number of general planning aspects that pertain particularly to tourism, focusing on specific spatial needs for different coastal and maritime tourism forms. Finally, the chapter describes a specific Danish tourism case: the role of the Danish MSP in relation to tourism development on the island of Bornholm.

4.1 Why is MSP important for coastal and maritime tourism in Denmark?

Coastal and maritime tourism represents over one third of the maritime economy in the EU and has been identified as a sector with special potentials for supporting sustainable growth under the EU Blue Growth Strategy (The European Commission, 2014).

Coastal and maritime tourism depends heavily on the quality of the environment, including both water quality and coastal zone land attraction, just as it relies on a good co-existence of simultaneous and various uses of marine and maritime space.

MSP is therefore – or can potentially be – an important leverage for the growth and sustainability of the tourism sector. The approach in this chapter is therefore to help us understand how, by applying MSP processes, we can enhance the development of a more sustainable tourism sector in coastal and maritime spaces. In other words, we can paraphrase the American 1960s President Kennedy: Ask not what tourism can do for Maritime Spatial Planning, but what Marine Spatial Planning can do for coastal and maritime tourism.

4.2 Definitions

Coastal and maritime tourism consists of a large number of differentiated activities illustrated below. It is indicative of those examples that the activities themselves are not just carried out by tourists, but also by residents and other day-visitors as a recreational activity.

The UNWTO (United Nations World Tourism Organization) defines tourism as:

> *"…a social, cultural and economic phenomenon which entails the movement of people to countries or places outside their usual environment for personal or business/professional purposes" (UNWTO, REF)*

Tourism can, as an economic activity, be further divided into two types:

- Commercial tourism, measured as the number of paid overnight stays.
- Non-commercial tourism, covering people who travel to their own summer houses, or travel to stay with family and friends in other locations than their primary home.

Recreational activities can, on the other hand, be defined as non-work-related activities undertaken by residents for leisure.

There is thus no clear distinction between the actual tourism and recreational activities in terms of spatial use, but there will be a clear economic difference in terms of tourism spending as opposed to recreational and non-commercial tourism spending.

Be aware that not all tourists engage in recreational activities and that variations in tourism form – i.e. urban tourism, meeting tourism etc. often take place in other areas that within the coastal zone. This is why this chapter specifically takes it point of departure in coastal and maritime tourism, but not all national statistics are able to make such differentiations.

4.3 Characteristics of coastal and maritime tourism in Denmark

In Denmark, 78 out of a total of 98 administrative municipalities are defined as coastal municipalities, meaning that the municipality partially consists of a coastal zone stretching 3 km from the seaside. The four municipalities with the four largest cities in Denmark: Copenhagen, Aarhus, Aalborg and Odense are an exception, where the coastal area is defined as a one-kilometre zone from the shoreline, due to diversified specialisation of economic activities and a mixed-use of lands in larger urban areas.

The Centre for Regional and Tourism Research has, in collaboration with the Institute of Geoscience and Nature Management (IGN) at Copenhagen University, created the Danish Coastal Tourism Model (DCTM), which specifically measures the socio-economic effects of tourism in the 3 kilometre zone along the coasts of Denmark. The model has shown that the regional and socioeconomic effects of coastal and maritime tourism are strong along the Baltic Sea – both along the coastal municipalities south of Zealand and on Bornholm. In these localities, tourism is one of the main economic contributors for production of goods and services and for the local labour market. Coastal and maritime activities include services, such as tackle shops, hotels, restaurants, boat and equipment rentals and charter boats etc. All tourists who have conducted an activity connected with the coast or sea are defined as coastal and maritime tourists. By this definition, summer-cottage tourists (only those cottages situated in the coastal zone), cruise tourists and leisure yacht tourists are defined as coastal and maritime tourists, as their primary purpose is to stay at the beach-side or make activities at the sea. In Denmark 95% of summer cottages are located within a 3 km distance to the sea.

Coastal and maritime tourism in Denmark accounts for 37% of the total tourism revenue. In 2018, coastal and maritime tourism provided 22,766 fulltime jobs and 9,972 million DKK in gross value added directly to the Danish economy. This means that coastal and maritime tourism in Denmark accounts for approximately one third of all tourism revenue in Denmark, a share that is on the rise (Nielsen, Zhang & Javakhishvili-Larsen, 2019).

4.4 General trends in the spatial requirements within tourism

Mass tourism, defined as high volumes of visitors with a relatively low spending potential, is not expected to expand spatially, i.e., no new allocations of land, coast and sea use for the purpose of mass tourism accommodation. However, the use of space already allocated to mass tourism is expected to be intensified. This will have an impact on the sea environment and water quality in particular and environmental pressure on mass tourism areas (coastal zone) are among the factors requiring special attention in MSP processes.

Tourism-related infrastructure and services, defined as the facilities and services necessary to develop tourist destinations (accommodation, catering, transport, information, museums and tourist attractions) are generally expected to increase in connection to the increased volume of tourists as well as their expectations of increased quality and value of services.

Niche tourism, defined as specific added-value services or demand for specific locations with special qualities, is on the increase. This includes an increase in the demand for accommodations types located in specific landscapes. Many of these tourist demands are dependent on access to specific locations, for example bird migration tourism. The impact of this type of tourism is expected to be on locations with high environmental sensitivity, thus requiring specific infrastructures and specific solutions in order to mitigate negative environmental effects, for example by allocating space for natural and protected areas (on land, coast and the sea).

Tourism products are defined by UNWTO as "a combination of tangible and intangible elements, such as natural, cultural and man-made resources, attractions, facilities, services and activities around a specific centre of interest which represents the core of the destination marketing mix and creates an overall visitor experience including emotional aspects for the potential customers. A tourism product is priced and sold through distribution channels, and it has a life-cycle". (UNWTO, no date) is expected to increase in diversification. The progressive diversification of the tourism product in specific locations can lead to spatial conflicts among tourist segments at the local level.

4.5 Anticipated tourism industry developments, which are of MSP relevance

The expected continued growth of coastal tourism, including the increase in spatial demands, as mentioned above, is characterised by the intensification of spatial use in mass tourism areas, the

increase in more specific or even niche tourism forms, the increase in tourism-related infrastructure and services and the diversification of tourism products, all have implications for onshore, coastal and off-shore spatial planning. The environmental impacts of the tourism sector need to be addressed in MSP processes.

1. The environmental impacts of other sectors on tourism:

Notwithstanding the impacts on the environment of tourism itself, tourism, as an attractive human activity, depends on favourable environmental conditions, particularly for coastal tourism, on high water quality. Land-sea interactions are especially relevant here.

2. Adaptation to climate change:

Apart from the direct environmental impacts of tourism and other economic sectors, coastal tourism is also highly vulnerable to the effects of climate change. Coastal areas are especially dependent on the effects of a number of climate change-related impacts, for example flooding, erosion and increased draught and, thus, have direct and indirect effects on coastal and maritime tourism. Coastal defence may be necessary and such solutions may impact on spatial needs and the attraction of coastal areas, and thus require planning.

3. The transformative potential of tourism:

However, tourism, as a human activity, also has specific potential as a learning platform, whereby the time spent as tourism in a specific environment may be perceived as a potential opportunity to teach tourism about, for example, sustainability, climate change and environmental effects on natural environments on different behaviours. Tourism today is less about rest and relaxation and more about engagement and may, therefore, be a potential opportunity to support change through specific tourism products with such planned effects.

4.6 Spatial implications of the Cruise industry as a specific tourism form

In this section, different MSP planning needs, based on structure and development trends within the cruise tourism industry are presented.

The cruise industry is a major component of the coastal and maritime tourism sector and the Baltic cruise industry is on the rise. The global market share of cruise tourism in north-western Europe was 9,4% in 2019 (with the Caribbean holding 38,7% and the Mediterranean with 14,8%)(. Cruise trends & industry look 2019). But, whilst world cruise activity increased from index 100 in 2002 to index 300 in 2018, Baltic Sea cruise activity rose from index 100 in 2002 to index 480 in 2018. It thus has increased much more rapidly than at the global scale.

There are a number of issues related to spatial planning and the cruise business which should be made clear:

- The cruise industry is extremely seasonal – not just in terms of annual seasons, but also in terms of changing their itinerary from year to year. The inconsistency of cruise ships' spatial needs is a challenge to planning efforts, especially in terms of planning co-existence with other users regarding sea access, space utilization and in terms of navigation and safely.
- There is a high level of competition between potential ports of call for cruise ships, with many cities vying for the position of "home port", since studies have shown that cruise tourists often arrive ca. 2.5 days before a cruise departure ends, spending funds on both accommodation, food, drink and other related services. In fact, cruise tourists spend 7 times more in home ports than in the other ports of call along the route. One of the forms in which cities can compete is by supplying ample docking/pier space, so that cruise passengers may have easy access to

ports, i.e. direct pier-access, rather than by anchoring offshore and transporting tourists by a tender (a small boat that ferries passengers ashore in groups).

- Navigation and safety issues affect the cruise ship choice of ports and itineraries.
- The establishment of, for example, new offshore infrastructure, such as wind farms also affects shipping lines and anchorage areas.
- In terms of actors involved in MSP processes, the cruise industry is mainly composed of large enterprises from the shipping and tourism sector. Ports and their DMOs (Destination marketing organisations) are also large stakeholders.
- The cruise industry has been criticised for its negative environmental impacts, including habitat loss for different marine species due to the construction of coastal infrastructures, dredging and anchoring; the degradation of water quality through sewage and grey water discharges, ballast water, water incineration; the introduction of invasive species; ship strikes with marine mammals; noise and air pollution, as well as the disturbance of spawning and nursery fish habitats. However, the industry has greatly improved its practices and reduced its environmental impact over the years. In the Baltic … However, the cumulative effects of …
- Finally, cruise shipping more than any other tourist activity, underlines the aspect of land-sea interaction in MSP. The character of many smaller ports of call (and even larger ones) completely change when several thousand cruise tourists disembark within a short space of time and move around in very limited physical spaces.

4.7 MSP as a process in tourism

In terms of MSP processes, there are three primary planning aspects that are especially pertinent in relation to MSP and tourism. These are:

- The need for stakeholder participation
- Protection of the marine environment
- Better integration for land-sea interaction.

These will be elaborated on below.

Stakeholder participation in tourism:

As within all areas of planning, consulting relevant stakeholders – preferably early in the planning process, is an important part of ensuring that all interest groups are heard – and to bring transparency in spatial uses and the interests that lie behind it, to the foreground. The purpose is to identify important areas of potential conflicts or multi-use potentials, to characterize each activity and allow for the identification of possible mitigation measures. The three examples shown above, prove that this is not without challenges. Stakeholders within tourism are extremely varied and may be difficult to bring together on equal terms – stemming from large shipping companies to small recreational associations.

Skriver Hansen (2019) has argued, based on studies from the recreational MSP area, that many recreational activities along the coast and in marine environments are unmapped – often also because such use does not involve built structures and as mobile in their spatial use patterns. Many are temporally limited. However, mapping some of these activities is an important prerequisite for MSP processes.

The tourism sector is highly diverse and most activities are very fragmented, This has proven to be a challenge when developing MSP.

Protecting the marine environment:

Maritime activities have often been developed on a sectorial basis with little consideration for other uses or the cumulative impact of all activities on the marine environment. This has led to the deterioration of sea water quality and the loss of marine biodiversity. A holistic approach is needed.

Coastal and maritime tourism is an economic activity, but also a human activity of high value – and it is heavily dependent on the preservation of the marine environment and should benefit from a more integrated approach (between sectors and between the land and sea).

Using an ecosystem-based approach, MSP can also facilitate the development of coherent networks of MPAs to maximize their benefits.

Better integration of land-sea interactions

Coherence between terrestrial and maritime planning is required in order to give access to the coastline for the development of coastal and maritime tourism and develop coastal infrastructures. Offshore infrastructures also affect the coastal zone, both environmentally, but also aesthetically.

Planning of the coastline into more natural areas, residential areas, cultural and urban areas is an integrated aspect of the development of maritime uses.

4.8 The case of MSP and tourism on Bornholm

In this section, MSP is presented in relation to the tourism sector and its development potentials on the Danish Island of Bornholm. The purpose is to understand the potentials of Marine/Maritime Spatial Planning in relation to a specific context, both in terms of enhancing a more sustainable environment as well as in terms of supporting a more sustainable tourism development.

Bornholm is located in the Baltic Sea, close to the south coast of Sweden and east of the rest of Denmark. In Denmark, the island is often called the `sunny island´ (due to its relatively many hours of sun compared to the rest of Denmark and its reputation as a summer holiday destination) as well as the `rocky island´ referring to its unique geological features compared to the rest of Denmark. Its size is 588,36 km² and had a population of 39.570 inhabitants on 1.1.2021 but is visited by more than 600,000 tourists a year.

The tourism sector on Bornholm consists of many small- and medium-sized firms offering services concerning accommodation, restaurants and attractions. Destination Bornholm is their joint development and marketing platform, representing approximately 560 tourism enterprises. The local regional municipality of Bornholm supports Destination Bornholm and is also a significant actor within the field. Destination Bornholm has organized the sector's joint tourism strategy for the development of tourism on Bornholm for the period 2020-2023 (Destination Bornholm, 2019).

In the strategy, Bornholm is deemed the "Saint Tropez of the North", referring simultaneously to Bornholm's status as one of Denmark's prime coastal destinations, but also to its wide range of social and cultural offers, many of which attract a more exclusive group of tourists, who demand high-end food, accommodation and other shopping and experience amenities.

According to the strategy, Bornholm's strengths in terms of tourist attractions are its' unique nature compared to the rest of Denmark, its' strong and distinct cultural position, in terms of it being the home of many ceramic artists and painters and it being bestowed with the title of World Craft Region in 2017 by the World Craft Council (WCC), which is the largest international organization for Arts and Crafts and is recognized by UNESCO. Bornholm also has a strong brand within the outdoor market, being well known for its many recreational and coastal tourism offers. Finally, it has a strong regional culinary position, and has been one of the first areas in Denmark to develop a regional variety of new Nordic food (Destination Bornholm, 2019).

In terms of the number of tourists and the economic value of the tourism sector for Bornholm, both were rising rapidly until the Covid-19 pandemic.

Table 1: Guests and turnover 2010-2018, Bornholm

Indicator	2010	2017	2018
Number of guests	528.000	624.000	
Tourism turnover	253 million Euros	347 million Euros	354 million Euros
Foreign guests			130 million Euros
Danish guests			224 million Euros
Number of generated jobs	2.000	3.000	

Source: Centre for Regional and Tourism Research (Den Regionale Model for Turisme, SAM-K/LINE®_RTSA)

Table 2: Overnight accommodations 2018

Accommodation type	Number of overnight stays, International tourists	Number of overnight stays, Domestic tourists
TOTAL	795.499	2.240.865
Hotel	83.893	175.947
Rented summer house	508.152	423.830
Camping	99.748	167.410
Rented house	17.346	8.555
Yachts & boats	24.160	9.872
Cruise	21.277	-
Private summer house	-	466.203
Holiday centre	-	98.507
Family/ friends	-	672.874

Source: Centre for Regional and Tourism Research (Den Regionale Model for Turisme, SAM-K/LINE®_RTSA)

As can be seen in Table 1, both the number of guests as well as the economic turnover generated by the tourism sector on Bornholm, has risen greatly in the period 2010-2018. The table also shows that domestic tourists make up approximately 2/3 of all visitors. International tourists primarily come from Germany, Sweden, Norway, the UK and USA.

The table also shows that the number of jobs generated by the tourism sector has risen from 2,000 in 2010 to approximately 3,000 persons in 2017. The total size of the Bornholm labour market is approximately 20,000 persons. However, many employees live far away from Bornholm outside the tourist season, for example young people who have grown up on Bornholm but have moved away to study may return to the island during the summer holidays and work within the tourism sector.

Table 2 shows the types of accommodations that international and domestic tourists on Bornholm use. Apart from showing that international and domestic visitors use different accommodation types, the table also shows that most of the accommodation forms are coastal, apart from rented houses and staying with family/friends, who can be located all over the island, almost all the accommodation forms above, take place near the coast. Almost all summer houses on Bornholm are located within 3 kms from the sea.

Strategic tourism goals

Bornholm's tourism strategy 2020-2023 states that Bornholm's strong brand, based on the strengths mentioned above, could easily increase the number of tourists who were attracted to the island during the summer months. However, this is neither possible, nor desired.

Capacity, both in terms of access to ferries (from Sweden, Denmark, Germany, and Poland) and accommodation, are at their full capacity during the summer months.

The Bornholm tourism strategy still intends to support further economic growth and plans to do this by expanding the number of overnight stays by 5% annually. This can only be achieved by expanding the visiting period to the spring, autumn and winter.

This calls for further planning of the use of the coastal zone throughout the year. The following three types of tourism that are planned to expand on Bornholm are all relevant in terms of MSP-ing and will be elaborated on below. They are outdoor tourism, climate and environmental tourism and cruise tourism.

Outdoor tourism

Outdoor tourism is defined as recreational life in a commercial context. In other words: recreational activities that businesses can make money off.

Bornholm's natural resources create unique opportunities for outdoor recreation. Many of these relate to the coastal zone and marine environments.

Outdoor is no longer a niche, but a mainstream activity for the everyday tourist, who seeks exercise and social contact in a natural setting: "Nature is today's sports centre/ gym".

In terms of MSP, a tourism strategy banking on outdoor tourism and on doing so not only during the summer, but throughout the year, requires an increased use of coastal zone spaces and an intensification of usage of natural resources and space. At the same time, it is also a tourism form that is especially reliant on a safe and attractive environment in the coastal zone and on high water quality.

Climate and environmental tourism

This aspect of the Bornholm tourism strategy is based on an understanding that destinations which do not address the concerns of tourists for environmental challenges, climate change and C02 emissions will lose customers.

On Bornholm a brand called Bright Green Island was developed approximately 10 years ago and it attempts to build a narrative around Bornholm as an environmentally sustainable island, encompassing

the circular economy and circular energy forms, including sustainable waste-treatment. In this narrative, the construction of offshore windmill parks is supportive of such a vision and will further position Bornholm as a green island. Although limited in scope, tourism products based on food- and energy tours, have been developed.

In terms of MSP, climate and environmental tourism, goes hand in hand with an ambitious maritime spatial plan in which the sustainable use of marine-based natural resources is planned for.

Cruise tourism

The development of cruise tourism is an economic activity that has been worked on strategically by Bornholm tourism stakeholders for several years, now formally organized in the local collaboration cluster called Cruise Network Bornholm. In 2012, nine out of ten cruise ships that sailed around Bornholm, did so without calling at any local ports.

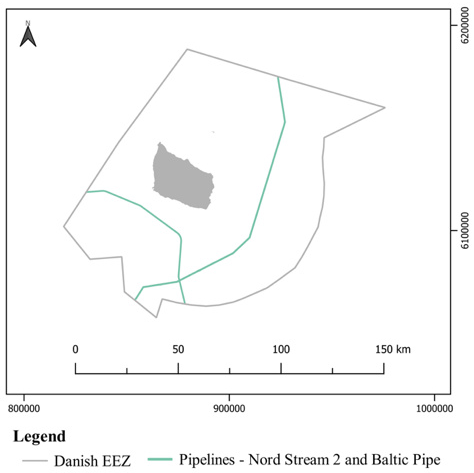
In collaboration with the expansion of Roenne Harbour, a new cruise ship pier was established, which allows for much larger cruise ships to dock directly in Roenne harbour.

Guests spend 65 Euros per guest whilst on Bornholm, which corresponds to what they spend in Copenhagen and Stockholm, making this tourism form attractive for local tourism stakeholders. Tourism stakeholders on Bornholm are aware of the cruise industry's tarnished reputation in terms of environmental issues and is therefore working as a destination to forward more sustainable cruise tourism forms and push for the development of international standards.

4.9 Positioning tourism in the Danish MSP

As described in Chapter One, the Danish MSP has given a special position to four economics activities. These are fishing, sailing, recreation and tourism. Activities within these areas have not been `planned´ in the sense that specific spaces have been allocated to them or that specific locations have been set aside for future development. Instead, tourism, recreation, fishing and sailing can take place in all zones unless specific legislation prevents this or until fixed and regulated structures are built in these areas.

The following figures are maps which focus on different elements from the Danish MSP for the sea territories around Bornholm, indicating the MSPs spatial allocation for specific purposes. The grey island in the middle is Bornholm, while the grey line framing the figure is the Danish Exclusive Economic Zone (EEZ) demarcation.



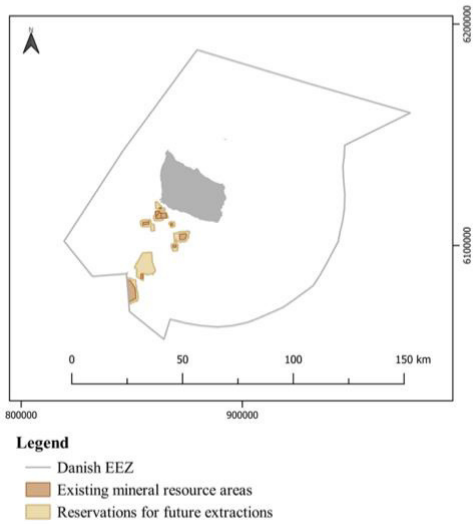
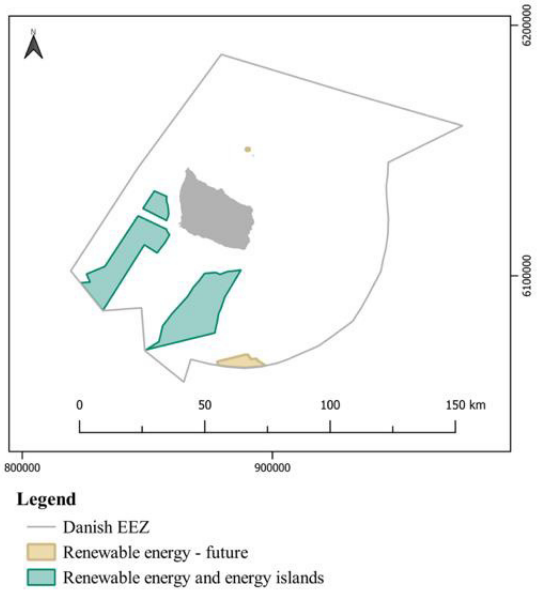


Figure 1 (left): Baltic Pipes & Nord Stream 2

Figure 2 (right): Natural resource extraction



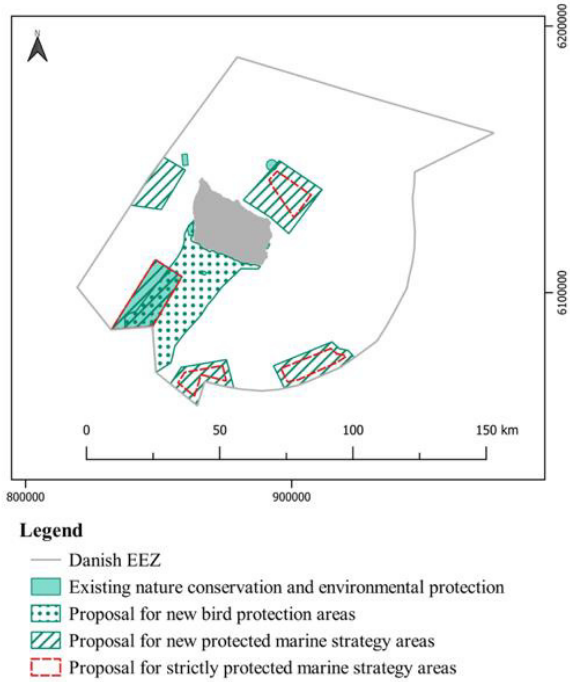
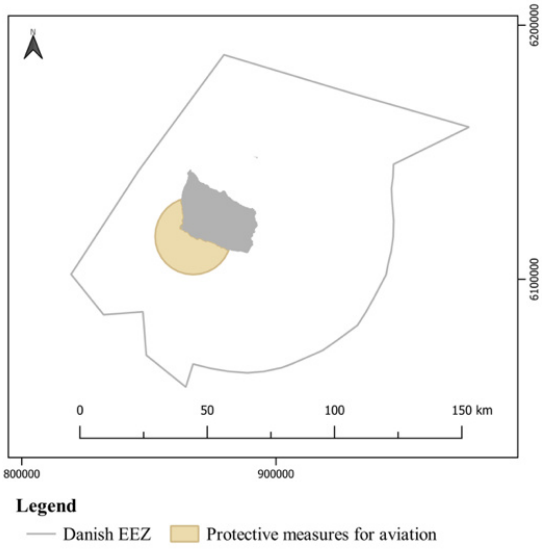


Figure 3 (left): Offshore wind farm areas

Figure 4 (right): Environmental protection



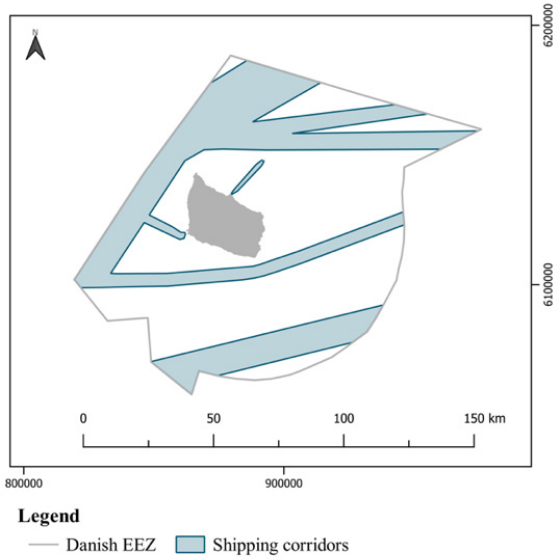


Figure 5 (left): Air traffic security

Figure 6 (right): Shipping corridors

In Figure 1, the pipelines leading oil and gas across the Baltic Sea, and which run through the Danish EEZ close to Bornholm, is demarcated. Figure 2 shows the areas that have been allocation to natural resource extraction, with the darker shades indicating historic extraction sites and the lighter areas, indicating planned extraction sites. Figure 3 shows the areas that have been allocated to place large

offshore wind farms, an activity that is expected to develop Bornholm as an `energy island´. This will be elaborated elsewhere. Figure 4 shows the areas the Danish MSP have reserved for environmental protection. It consists of four parts. One (solid green) indicates an already existing nature- and environmental protection area. The other three are proposed environmental protection areas. The dotted area is a proposed bird protection area, the green-lined areas are proposed protected Ocean Strategy areas, while the red zones are prosed Marine Protected Areas with a high protection level.

Figure 5 just shows the area that has been allocated to the ascent and descent of flights coming into and leaving from Roenne airport, in order to ensure that no tall constructions – such as windmills, may be placed within this zone for security reasons. Figure 6 shows the allocated (and already existing) shipping corridors within the Danish EEZ around Bornholm. As shipping traffic in the Baltic is substantial this is an important zone, and as offshore windfarms will be constructed in area.

5 Discussion: The Danish MSP and tourism on Bornholm

When looking at the Danish MSP and the case of tourism on Bornholm, there are a number of positive elements as well as some critical points to address.

Some of the aspects that support a sustainable development of tourism on Bornholm, including the current Bornholm Tourism strategy in the current Danish MSP are:

- Overall environmental concerns addressed: focus on renewable energy
- Bornholm as (renewable) energy-island
- Marine Protected Areas north of Bornholm
- Proposed (off-shore) bird protection area
- Lots of room for tourism – coastal and sea-based activities (no space limits)

However, there are a number of issues that have not been addressed in the Danish MSP. It is not so much a question of allocating space to economic activities that are detrimental to sustainable tourism development on Bornholm, as it is a missed opportunity to address some specific aspects of MSP. These points are:

1) Extremely limited local stakeholder participation

2) Lack of mapping tourism and recreational activities. The MSP has missed an opportunity to map how the space is used

3) The effects of densification and diversification of tourism products are not addressed

4) Land-sea interaction has not been addressed: the municipal coastline is respected, but not addressed.

In this sense, planning has been reduced to being an act of reserving space/place for several definable activities in the future, including the establishment of offshore windfarms. Yet the opportunity to focus on the proces of planning has been missed.

It is also noteworthy to point to the pan-Baltic and pan-European scope of the MSP directive. When all EU countries have adopted their national MSP, it will be possible to `compare notes´ and learn from each other how different types of activities or aspects (for example `coastal and maritime tourism´) are addressed in different countries. It does not have to be the lowest common denominator that sets the bar for the ambitions of national MSP. It is possible to be inspired by well-functioning MSP and thus to adopt similar plans in your own country in the future.

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