

11

Regulation and Planning in Sea Basins – North and Baltic Seas

Hester Whyte* and Shona Paterson

Future Earth Coasts, MaREI Centre, ERI, University College Cork,
Ireland

*Corresponding Author

11.1 Introduction and Geography

The Baltic Sea is an almost completely enclosed sea basin (Figure 11.1). Located in the North-Eastern part of Europe, and it covers a surface area of 377,000 km². The basin includes, amongst others, the Gulf of Bothnia, Gulf of Finland, Gulf of Riga, and the Kattegat. In general, Baltic Sea is a shallow, with an average depth is 55m (Walday and Kroglund, 2002a). Due to, among other biophysical characteristics, its low salinity levels, the marine environment is very vulnerable. In particular, eutrophication, the build-up of nutrients from urban waste water, coastal agriculture, industrial pollution and atmospheric deposition, poses a major threat to this basin (Ferreira et al., 2010; HELCOM, 2014). The Baltic Sea region encompasses eight countries (Sweden, Denmark, Estonia, Finland, Germany, Latvia, Lithuania and Poland) with a collective 85 million inhabitants (17% of the EU population) that share common features and challenges.

The North Sea is a semi-closed sea basin, adjacent to the Atlantic Ocean. The sea basin is more than 970 km long and 580 km wide, with an area of around 570,000 km². The North Sea is mostly shallow, less than 200m, with an average depth of 95m (European Environment Agency, 2012). However, in the northern part of the sea, off the coast of Norway, there is a deep trench measuring up to 700m in depth. The southern part of the North Sea is generally the shallowest but also the most congested in terms of human activities.

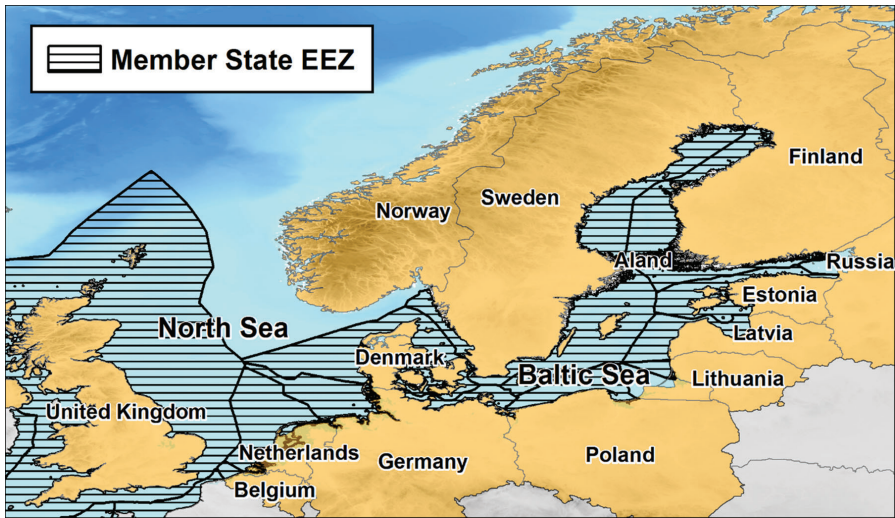


Figure 11.1 The North and Baltic Sea Basins.

Extreme weather conditions that have a direct impact on hydrography and strong tides are characteristic of this sea (Walday and Kroglund, 2002b). The North Sea region is bordered by the United Kingdom (England and Scotland), France, Belgium, Netherlands, Germany, Denmark, Sweden and Norway (non-EU member but a member of the European Economic Area).

11.1.1 Overview of Key Marine Sectors

Both sea basins not only support extensive marine industry but also face extensive expansion in human activities and potential impacts and conflicts associated with those activities (Table 11.1). While, traditional and novel marine-dependent industries are an important source of jobs, they also represent the cornerstones of a competitive maritime economy which has become a key policy focus for the EU and neighbouring countries (Piante and Ody, 2015; EUNETMAR, 2013). Economic uses such as shipping (The Nautical Institute and World Ocean Council, 2013), recreational uses associated with coastal tourism and nature conservation areas (Papageorgiou, 2016), and industrial infrastructure such as cables and pipelines (Directorate General for Energy, 2010), are sectors that are all expected to grow rapidly (Zauchá et al., 2014). Increased shipping is being/will be further facilitated by expansion and upgrading of ports and harbours in both sea basins and emerging fields

Table 11.1 Key marine sectors in Baltic/North Sea countries

Country	Key Marine Sectors
Sweden	Coastal tourism, cruise tourism, passenger ferry services, marine aquaculture, offshore wind, short-sea shipping (incl. Roll on-Roll off)
Denmark	Offshore wind, marine aquaculture, fish for human consumption, short-sea shipping (incl. RO-RO), passenger ferry services, coastal tourism
Estonia	Short-sea shipping (incl. RO-RO), deep-sea shipping, yachting and marinas, water projects, shipbuilding (excl. leisure boats) and ship repair, fish for human consumption
Finland	Coastal tourism, passenger ferry services, short-sea shipping (incl. RO-RO), shipbuilding (excl. leisure boats) and ship repair, yachting and marinas, offshore wind, water projects
Germany (North Sea (north-west coastline) and the Baltic Sea (north-east coastline))	Offshore wind, coastal tourism, yachting and marinas, short-sea shipping (incl. RO-RO), cruise tourism, shipbuilding (excl. leisure boats) and ship repair, blue biotechnology
Latvia	Shipping and port services, tourism, fisheries
Lithuania	Short-sea shipping (incl. RO-RO), shipbuilding (excl. leisure boats) and ship repair, fish for human consumption, water projects, coastal tourism
Poland	Offshore wind, shipbuilding (excl. leisure boats) and ship repair, coastal tourism, offshore oil and gas, yachting and marinas (leisure boat building), protection of habitats/marine aquaculture/environmental monitoring
Belgium	Offshore wind, construction of water projects (incl. protection against flooding), deep-sea shipping, short-sea shipping, inland waterway transport, cruise tourism, blue biotechnology
The Netherlands	Coastal tourism, offshore oil and gas, yachting and marinas, catching fish for human consumption, inland waterway transport, short-sea shipping (incl. RO-RO), deep-sea shipping
United Kingdom (East Coast)	Offshore oil and gas, coastal tourism, passenger ferry services, short-sea shipping, shipbuilding and repair, fisheries for human consumption, deep-sea shipping
Norway	Oil and gas, aquaculture, shipping (oil and gas related deep-sea shipping)
Russia (St. Petersburg, the Leningrad region, and the Kaliningrad region)	Shipbuilding

Source: European Commission, 2017c.

such as offshore renewables, together with the necessary grid infrastructure, are projected to impact existing landscapes (Konstantelos et al., 2017). The cost and technological constraints are likely to restrict new offshore renewable installations to areas that are already covered by a number of other uses (e.g., shipping, fishing), increasing the potential for conflicts between uses and neighbouring zones (Jansen et al., 2015; Hammar et al., 2017). In contrast, military usage, aggregate extraction, oil and gas extraction, and fisheries are expected to stay stable or decline over time (Zaucha et al., 2014).

11.1.2 Key Features Affecting Maritime Policy

Public policies are influenced by a variety of factors including public opinion, economic conditions, new scientific findings, technological change, interest groups, NGOs, business lobbying, and political activity.

Baltic Sea

The European Union Strategy for the Baltic Sea Region (EUSBSR) is the first macro-regional strategy in Europe (European Commission, 2017a). EUSBSR is organised according to three overall objectives: saving the sea, connecting the region and increasing prosperity. Each objective relates to a wide range of policies and has an impact on the other objectives. EUSBSR provides an integrated framework for improving the environmental condition of the sea, transport bottlenecks and energy interconnections as well as facilitating the development of competitive markets across borders and common networks for research and innovation. EUSBSR also aims to reinforce cooperation within this large region in order to face several challenges by working together as well as promoting more balanced development in the area. Cooperation with neighbouring countries such as Russia, Iceland, Norway and Belarus has also encouraged by the EUSBSR.

North Sea

The North Sea Region 2020 (NSR2020) strategy paper is designed to treat the North Sea region as a territorial cooperation area (CPMR North Sea Commission, 2016). NSR2020 indicates that the North Sea Region has the potential to act as an engine for growth in Europe and as a centre of excellence for wider EU issues through developing existing cooperation efforts, improving policy efficiency and value for public money. The strategic focus of NSR2020

is, therefore, on major challenges and common characteristics where there is added value in transnational action and collaboration.

Closely linked to the EU2020 objectives (European Commission, 2017b), the aims of the NSR2020 are four-fold: i) to help the Region improve performance as a competitive, attractive and sustainable area of Europe, ii) to more efficiently address common transnational challenges and exploit opportunities related to sustainable economic growth, climate, energy, accessibility and management of the maritime space, iii) to ensure a better governed region through cross-sectorial coordination and multi-level governance, and iv) to provide a potential pilot for a macro-regional strategy that is different to the EU strategies for the Baltic Sea and Danube areas (CPMR North Sea Commission, 2016).

Important policies, strategies and organisations to ensure coordination

There are a number of overlapping and complimentary policies and directives that are important to consider and ensure cross coordination (Qiu and Jones, 2013) including:

- The Europe 2020 Strategy is the key EU commitment to jobs and smart, sustainable, inclusive growth (European Commission, 2017b). It has five headline targets: promoting employment; improving the conditions for innovation, research and development; meeting climate change and energy objectives; improving education levels; and promoting social inclusion, in particular through the reduction of poverty, and addressing the challenges of ageing.
- Coordination with National Strategic Reference Programmes (European Commission, 2007) existing in all of the EU member states.
- Consistency with EU legislation and policies is at the core of the NSR2020. Therefore examples like the Strategy for the Single Market (Single Market Act) and the Digital Agenda, TEN-T (currently under revision), White Paper on Transport, energy (TEN-E) networks, the EU post-2010 biodiversity target and strategy, the Water Framework Directive, the Integrated Maritime Policy, the Marine Strategy Framework Directive; the Common Fisheries Policy, the Renewable Energy Directive, the Communication on Offshore Wind Energy all resonate with the NSR2020.
- Other international cooperation such as OSPAR, IMO, Trilateral Wadden Sea Cooperation.

- Interreg IV programmes: Interreg IV B North Sea Region Programme, Two Seas Programme (Belgium, France; Netherlands, UK) – ØKS/KASK (Denmark, Norway and Sweden).

11.2 Environmental Policy

For EU Member States, the EU Marine Strategy Framework Directive (MSFD, 2008/56/EC) establishes a framework within which Member States shall take the necessary measures to achieve or maintain good environmental status of the marine environment by the year 2020 at the latest (Article 1). Member States are required to follow a common approach which involves reiterative six-year cycles. This approach includes a number of targets within the framework that must be achieved:

1. Assessing the current state of the marine environment (Art. 8 MSFD)
2. Determining good environmental status (Art. 9 MSFD)
3. Establishing environmental targets to guide progress towards achieving good environmental status (Art. 10 MSFD)
4. Establishing monitoring programmes for ongoing assessment and regular updating of targets (Art. 11 MSFD)
5. Developing programmes of measures to achieve or maintain good environmental status (Art. 13 MSFD)

Baltic Sea

The Helsinki Commission (HELCOM) is the current governing body of the Convention on the Protection of the Marine Environment of the Baltic Sea Area. The HELCOM Baltic Sea Action plan is a strategy designed to tackle major environmental problems with the aim of restoring good ecological status by 2021 (HELCOM, 2007). In addition, HELCOM proposes the designation of more protected habitats as more ecological and biophysical data become available over time with the view of developing a network of well managed areas (HELCOM Recommendation 15/5).

North Sea

OSPAR is the mechanism by which fifteen Governments of the western coasts and catchments of Europe, together with the European Community, cooperate to protect the marine environment of the North-East Atlantic. OSPAR extends beyond the North Sea basin extending westwards to the east coast of

Greenland, eastwards to the continental North Sea coast, south to the Strait of Gibraltar and northwards to the North Pole. OSPAR's mission is focused on the need to conserve marine ecosystems and safeguard human health in the North-East Atlantic by preventing and eliminating pollution; by protecting the marine environment from the adverse effects of human activities; and by contributing to the sustainable use of the seas (OSPAR, 2006).

11.3 Regulatory Regimes

A detailed list of the most important treaties and legislation is provided in Appendix I. In addition, the main regulatory bodies for the Baltic basin are: Baltic Development Forum; Baltic Sea Parliamentary Conference; Baltic Sea States sub-regional cooperation; Council of the Baltic Sea States; VASAB; Helsinki Commission (Helcom).

11.4 Spatial Impact and Planning

The North Sea is one of the most heavily used sea basins in Europe. It supports a large number of traditional activities, such as fishing, shipping & trade, energy, sand mining, defence and recreation. Increased economic activity in the sea, such as growing shipping traffic and the development of offshore wind farms, has led to increased competition for space (CPMR North Sea Commission, 2016). In this sense, North Sea countries have quite well established MSP processes, and several conflicts between offshore renewables and other sea uses are currently being addressed through on-going or completed projects like C-SCOPE (Smith et al., 2012), PISCES (PISCES, 2012), BLAST and NorthSEE.

In the same way, Baltic Sea countries are already taking steps to improve MSP processes. Within the region, MSP is highly promoted by both the Helsinki Commission (HELCOM) and the Vision and Strategies around the Baltic Sea (VASAB). The Horizontal Action (HELCOM, 2007), clearly encourages “... *the use of Maritime Spatial Planning in all Member States around the Baltic Sea and develop a common approach for cross-border cooperation*”. The EU Strategy for the Baltic Sea Region ensures HELCOM and VASAB a prominent role in promoting MSP in the region together with other stakeholders (European Commission, 2017b). However, a large expansion of offshore wind energy will require more attention through MSP to find adequate space (Kyriazi et al., 2016; Hammar et al., 2017).

Table 11.2 Characteristics of MSP in the Baltic/North Sea

North Sea	MSP is relatively advanced in the majority of the North Sea countries, including use of GIS-based planning tools to map and visualize the spatial uses and pressures. Conflict patterns are fairly well understood and the majority of North Sea countries have made efforts to designate suitable areas for offshore renewable energy (ORE), giving the industry and other uses more certainty in where ORE are likely to develop. However, one can see quite different spatial priorities, for example in the Dogger Bank area. This area spreads over four national sea basins – Denmark, Germany, the Netherlands and UK.
Baltic Sea basin	In most of the countries, a comprehensive MSP legal framework has yet to be developed. However, the Baltic Sea is the basin with the largest number of non-binding cross-border regional cooperation initiatives related to MSP, energy and grid (i.e. VASAB-HELCOM, BaltSeaPlan, the EU Strategy for the Baltic Sea Region and the Baltic Sea Region Energy Cooperation). Even though the planning in the EEZ has been reformed to a more integrated approach there is still a need to co-ordinate the different planning competencies in an overarching informal institution.

Source: Payne et al., 2011.

In particular, opportunities will need to be sought for co-existence or multi-use, such as using the spaces between adjacent wind farms to reduce turbulence and regenerate the wind resource, and for other sea use functions like fishing or lower frequency shipping lanes (Rodríguez-Rodríguez et al., 2016; Astariz and Iglesias, 2016). This opportunity for co-existence will become more relevant as future offshore wind farms are developed in large clusters. Furthermore, sea uses which are not location sensitive, or can be relocated or decreased in size without undue impact, should ideally be investigated to find space for additional low cost offshore renewables. Table 11.2 summaries the main characteristics of both basins in relation to MSP and Appendix II further details the different MSP initiatives adopted by specific countries.

11.5 Related Strategies

11.5.1 Maritime Clusters

The concept of a cluster is defined as a “geographically proximate group of interconnected companies and associated institutions in a particular field, including product producers, service providers, suppliers, universities, and trade associations, from where linkages or externalities among industries

result” (Porter, 1998). To fulfil the mandate of ensuring cooperation with EU partners, it is important for regional clusters to establish collaborative networks (Salvador et al., 2015). Networking with clusters and across complementary clusters is an important factor for their successful development. Maritime clusters across the Baltic and North Sea Basins are discussed below.

11.5.1.1 North Sea Belgium

Four maritime clusters were identified in Belgium; these are Antwerp, Oostende, Zeebrugge and Ghent. Zeebrugge is the only cluster identified as being in the “growing” stage and focused on shipping exclusively. Antwerp is the largest of the clusters and while it can rely heavily on its strategic location its weakness is the lack of flexibility and strong attachment to established activities such as oil and gas or shipping. These can provide a hindrance in opening up towards new activities and innovative ventures.

Denmark

In April 2013, the Ministry of Science, Innovation and Higher Education adopted the Strategy for Denmark’s Cluster Policy. The overall objective of the strategy is for cluster establishment and cluster development to promote enterprise competitiveness, export growth, investment promotion, employment and productivity in Danish businesses, via innovation, innovative solutions to society’s problems and research and competence development. There are cluster organisations located in every part of Denmark. The Danish regions are working on second-generation development strategies, focusing on growth and job creation through the use of cluster organisations. The regions are giving priority to the most significant regional clusters, many of which have main activities that go beyond the regional borders. Every year, more than 6,000 Danish enterprises participate in activities launched by local, regional or national cluster and network organisations. More than 80% are small and medium-size enterprises. There are around 75 clusters in Denmark. The five most relevant ones are: Det Blå Danmark (The Blue Denmark), Europas Maritime Udviklingscenter (Maritime Development Centre of Europe), Offshore Centre Denmark (Offshoreenergy.dk), Energiklyngecenter Sjælland (Energy Cluster Zealand) & Konsumfisk (Edible Fish).

Germany

The maritime economy in Germany is concentrated in the coastal regions and can be described as a cluster alliance with five integrated sub-clusters. The cluster area accounts for almost 160,000 employees in 4,000 enterprises.

- Ems-Axis: region in the north-west of Germany along the river Ems (quite unknown but many shipping companies; important shipyards and fast growing offshore wind industry);
- Metropolitan Region Bremen-Oldenburg: region between and surrounding Bremen and Oldenburg;
- Metropolitan Region Hamburg: Hamburg and its hinterland (most important sub-cluster including Hamburg and the surrounding regions of Schleswig-Holstein and Lower Saxony);
- Schleswig-Holstein: NUTS-3 regions of Schleswig-Holstein not included in Metropolitan Region Hamburg, almost belonging to Germany's Baltic Sea region;
- Mecklenburg-Vorpommern (NUTS-2 region in the north east).

The Netherlands

Three clusters have been identified in the Netherlands, two of which are located in the port regions of Rotterdam and Amsterdam and one 'ship-building cluster' in the Northern Netherlands. The port clusters consist of port activities, shipping and inland shipping activities, maritime services and ship repair activities. Rotterdam is the largest port cluster, with over 70,000 persons employed directly or indirectly in the maritime economy. Amsterdam is also a cluster of substantial size, with 40,000 persons employed directly or indirectly in the maritime economy. Shipbuilding is the core of the cluster in the Northern part of the Netherlands, suppliers and ship operators are included in the cluster. All three clusters have a mature status and contain similar or interlinking activities. This provides considerable concentration of expertise. At the same time, weaknesses such as access to skilled labour are also present.

United Kingdom

Clusters in the UK are located in multiple sea basins: the Atlantic and the North Sea. The cluster relevant to the North Sea is the North east Scotland cluster (Aberdeen). The main maritime economic activity in the cluster is the Oil and Gas industry. Various international oil companies and independent oil

companies and the Institute of Energy University of Aberdeen are associated with this cluster. The strengths of this cluster are the offshore engineering and hydrocarbon exploration and production expertise.

11.5.1.2 Baltic Sea Sweden

The Västra Götaland cluster is Sweden's most advanced maritime cluster and with the broadest coverage. It gathers public agencies (Swedish Agency for Marine and Water Management, Swedish Institute for the Marine Environment), universities (Chalmers University of Technology, University of Gothenburg), research centres (Ocean Energy Centre, Centre for Marine Research, Lighthouse Maritime Competence Centre), industry organisations (Swedish Ship-owners Association), the Port of Gothenburg and large companies (STENA Line, Volvo Penta, SK, SAAB, among others). The sea is one of West Sweden's core assets and entrepreneurship linked to marine environment goes back a long time. The Maritime Forum, based in Stockholm, is a member of the European Network of Maritime Clusters and focuses predominantly on the shipping industry.

Norway

Three main clusters all focusing on different maritime industries. The cluster of Stavanger is a centre for offshore oil and gas activities and is a global leader in terms of industry expertise in deep sea and subsea production. Western Norway hosts aquaculture clusters which build especially on salmon production and have strong research potential for the inclusion of new species. The sectors' continuous growth is sparked by strong demand growth in BRIC-countries. The third main cluster in Norway is the shipping cluster located on the west coast of Norway, which is linked closely to the oil and gas sector and as such it is highly dependent on the willingness by oil and gas companies to continue search and production.

- Oil and gas cluster (Stavanger) – Norway, UK
- Aquaculture cluster Western Norway – Norway, Scotland
- Shipping cluster – Norway, UK, Denmark (Oil and gas related deep sea shipping)

Finland

Five different clusters related to maritime areas have been identified in Finland: Helsinki, Turku, Kotka/Hamina, Vaasa and Meridien (covering all of

Finland). The first four don't have a legal framework but in each case, these clusters gather different sectors and types of organisations (public/private) in a specific geographical area. Helsinki, the largest city of Finland, hosts many maritime activities. It is firstly a tourist site, welcoming passengers from ferries and cruise ships; it is also an industrial centre with shipping and shipbuilding activities. Helsinki shipyard, Arctech, focuses on Arctic shipbuilding technology (icebreakers and other Arctic offshore and special vessels). It started its activities in 2011 and is a joint venture between STX Finland Oy and Russian United Shipbuilding Corporation. The strength of the Helsinki cluster is also the fact that it is a capital city, which means the presence of a large university, headquarters of Finnish companies and public institutions. Turku (165 km west of Helsinki) is not as touristic as Helsinki but is one of the Finnish entrances for ferry passengers and maritime freight. Turku port is a frontrunner in Finland on the implementation of liquefied natural gas (LNG) terminal, the distribution of LNG could begin by the end of 2015 with a EUR 60 million investment (Gasum and Port of Turku signed a letter of intent in 2012). In the Vaasa area, located on the Bothnian Gulf (420 km North of Helsinki), there is a large concentration of SME companies focused on leisure ship construction: design, production, etc. In addition, the Energy Institute is located in Vaasa (research, consultancy, projects, education), which focuses, among other areas, on wind energy. Kotka-Hamina area (130 km east of Helsinki) has developed two major activities related to Marine Economic Activities (MEAs): maritime transport and wind energy. Wind energy is not specifically oriented to offshore wind as at present this MEA is still very limited in Finland, but there are spillover effects from onshore wind research and development on offshore wind activity. The most notable companies involved are Winwind Ltd, TuuliWatti and Cursor Oy. Kotka-Hamina is one of the main seaports of Finland and its location on the way to Russia allows the development of maintenance services for ships. Meridiem is supported by the Maritime Cluster Programme (OSKE). Contrary to the other Finnish clusters mentioned, it has a legal framework and its geographic scope is large, the whole of Finland. It is a networking and coordination organisation for the maritime economy, particularly shipbuilding.

Estonia

It is characteristic of Estonia that cluster creation or cluster building are not taking place in the maritime field, but different maritime actors are involved in clusters of other economic sectors. Estonian ports are mainly

transit transportation ports and are integrated with railway transport, road transport and other transit transport servicing companies in the logistics cluster. The Estonian Logistics cluster is a joint initiative dedicated to the international marketing of the members' services, introduction of the logistic advantages of Estonia to the target markets, research and development and logistics education. Passenger transport between Tallinn-Helsinki and Tallinn-Stockholm along with cruise shipping is tied to the activities of the tourism cluster (tourism companies, accommodation, commerce). The best example of smaller, local clusters is the Saaremaa Small Craft Cluster. Saaremaa small craft construction is characterised by a diverse production range: output varies from renovating old wooden boats to building modern high-end yachts and workboats. Saaremaa boat builders and subcontractors have formed a Small Craft cluster that represents the core of the Association of Estonian Shipyards, a member of the European Boating Industry. The Small Craft Competence Centre looks for cooperation and mutual business opportunities with foreign universities, research institutions and companies. For companies, the Competence Centre provides product development and trial manufacturing opportunities in cooperation with the Competence Centre and local companies. Other clusters are under development (Estonian Wind power cluster, Estonian Cruising Association).

Lithuania

At the time of publication, there are no officially registered marine related clusters in Lithuania. However, there are several initiatives and processes on-going to fill the gap. Several maritime business associations are working actively, with the most promising one being "Baltic valley", which unites maritime business and science. Maritime activities in Lithuania are concentrated around the city of Klaipeda, which has given its name to the Klaipeda Maritime Cluster. It has a national scope, including the whole Lithuanian maritime sector, but the country's small size and the geographical concentration of activities gives it a strong regional character. The main industrial focal points are shipping, shipbuilding and fishing. In general, the Klaipeda Maritime Cluster has strong research capabilities in the marine environment, which is an area where the industry is rather weak. Conversely, the industrial activity is more pronounced in areas relating to maritime technology, where the research capabilities are on the weak end of the spectrum. Within the Klaipeda Maritime Cluster, several organisations work with facilitating and stimulating cluster development, in order to increase its innovation capacity and promote economic development.

Latvia

Latvian maritime clusters are not defined in any official policy document. Creation of clusters is not taking place in the maritime sector, but different maritime sectors are involved in clusters of other sectors. This is due to a lack of some key elements like critical mass, e.g. in the shipping, shipbuilding and maritime equipment sectors, and because cooperation among sectors is generally weak. The port sector and related sectors are almost independent from the shipping sector and other maritime sectors. Shipbuilding is also not linked to the shipping sector as shipbuilding focuses on ship repair activities and there is weak demand on the national market. Cluster type networks of enterprises can be observed around ports, where shipping companies and cargo handling companies have cooperative relationships with the land transportation sector. Vertical cooperation within the value chain is common for Latvian maritime companies. For example, in the maritime logistics sector ports, shipping companies and cargo handling companies have rather close cooperation, and in the maritime industry field shipyards, design and engineering companies have well-functioning networks. In general, there is very weak tendency to cooperate between ports. There are also networks fostering maritime development activities, such as the Association of Latvian major ports (Rīga, Vetspils and Liepāja) and the Association of small ports.

Poland

According to the European Cluster Observatory (ECO), maritime clusters exist in Poland in two seaside NUTS-2 regions: Pomorskie and Zachodniopomorskie. The Zachodniopomorskie maritime cluster is a relatively small cluster (in terms of employment size, specialisation and focus), with a total employment of 4,139 people. The Pomorskie maritime cluster is a larger cluster, employing 7,305 people. Both clusters are mature but as the employment levels are falling they can actually be qualified as declining. They are specialised in traditional maritime activities: fishing, processing of fish and shipbuilding. There are no very large and specialised clusters present in Poland and no other potential maritime clusters. It is worth noting, however, that according to ECO in 2011 the maritime sector (more narrowly defined than in the present study) in Poland employed a total of 32,500 people and was represented by 7,952 enterprises. The number of enterprises is increasing while the employment levels are decreasing. The two identified clusters thus account only for roughly 1/3 of the national potential. The result is highly surprising and seems to be biased, which puts the ECO estimation into question.

11.6 Supporting Blue Growth

Table 11.3 shows the main important funding and supporting schemes to which Baltic/North Sea countries can apply. In addition, Annex 11.1 details the most important support schemes on a country-specific basis.

Table 11.3 European support schemes

Eurostars Programme http://www.eurostars-eureka.eu/	The Eurostars Programme ('Eurostars') is a European innovation programme. Its purpose is to provide funding for market-oriented research and development with the active participation of specifically research and development performing small and medium-sized enterprises (R&D-performing SMEs).
Bonus: Joint Baltic Sea System Research Programme http://www.bonusportal.org/	To integrate the Baltic Sea System research into a durable cooperative, interdisciplinary, well integrated and focused multinational programme to support the region's sustainable development.
Nordic Environment Finance Corporation (NEFCO) http://www.nefco.org/	NEFCO is an international financial institution established by five Nordic countries: Denmark, Finland, Iceland, Norway and Sweden. NEFCO finances investments and projects primarily in Russia, Ukraine, Estonia, Latvia, Lithuania and Belarus, in order to generate positive environmental effects of interest to the Nordic region.
European Investment Bank's (EIB) Loans http://www.eib.org/products/loans/index.htm	Within the EU the EIB has 6 priority objectives for its lending activity: <ul style="list-style-type: none"> ● Cohesion and Convergence; ● Support for small and medium-sized enterprises (SMEs);

(Continued)

Table 11.3 Continued

	<ul style="list-style-type: none"> ● Environmental sustainability; ● Implementation of the Innovation 2010 Initiative (i2i); ● Development of Trans-European Networks of transport and energy (TENs); ● Sustainable, competitive and secure energy.
<p>JASPERS (Joint Assistance in Supporting Projects in European Regions) TA fund if fields of TENs networks, transport, environmental remediation, waste management, renewable energy, water and sanitation services, etc. http://www.jaspers-europa-info.org/</p>	
<p>ELENA (European Local Energy Assistance) http://www.eib.org/products/technical_assistance/elena/index.htm</p>	
<p>Nordic Investment Bank's (NIB) Loans http://www.nib.int/loans/loan_characteristics</p>	<p>NIB focuses in particular on four sectors:</p> <ul style="list-style-type: none"> ● energy; ● environment; ● transport, logistics and communications; ● innovation. <p>The proceeds of NIB loans can be used to cover any part of projects costs.</p>
<p>Baltic Sea Environment (BASE) Lending Facility</p>	<p>The Baltic Sea Environment (BASE) lending facility is established to operate as the financing source for projects with a positive effect on the Baltic Sea. The facility is aimed at assisting in the implementation of the Baltic Sea Action Plan adopted by the Baltic Marine Environmental Protection Commission—HELCOM with the purpose of restoring the ecological status of the Baltic marine environment by 2021.</p>

Table 11.3 Continued

Climate Change, Energy Efficiency and Renewable Energy (CLEERE) Lending Facility	<p>The lending facility supports actions for combating and adapting to climate change around the world.</p> <p>Under the facility, NIB finances projects:</p> <ul style="list-style-type: none"> • in renewable energy; • in energy efficiency; • using cleaner production technologies that reduce greenhouse gas emissions in industries; • dealing with the adaptation of power networks and infrastructure to climate change, such as extreme weather conditions.
European Bank for Reconstruction and Development http://www.ebrd.com/index.htm	<p>The work of the SIDA Baltic Sea Unit seeks to develop cooperation between actors in the Baltic area. It has a special assignment from the Government based on Swedish interests to support activities in the fields of the Environment & Energy, Social and Health issues and Civil Security.</p>
Swedish International Development Cooperation Agency Baltic Sea Unit http://www.sida.se/balticseaunit	<p>The Northern Dimension aims at providing a common platform for promoting dialogue and concrete cooperation as well as strengthening stability and promoting economic integration, competitiveness and sustainable development in Northern Europe.</p>
Northern Dimension http://www.ndphs.org/?about_nd	

11.7 Key Lessons

In both North Sea and Baltic Sea basins, the need and importance of an integrated way of planning limited maritime space is the agreed way forward to secure Blue Growth. However, the policy, legislation and planning

mechanisms are not fully in place. A major constraint is the implementation cost. The Sustainable Blue Growth Agenda for the Baltic Sea Region, adopted by the European Commission in 2014 highlights the potential for development of the maritime economy in the Baltic. An extensive stakeholder dialogue in the region was undertaken by the European Commission in 2016 to identify the main drivers and challenges of Blue Growth and work towards a desired vision for 2030. Shipping, blue bioeconomy (incl. aquaculture), coastal and maritime tourism and environmental and monitoring technology were identified as the main thematic areas for growth. Although the Baltic Sea Region is a good example of transnational cooperation much still appears to happen within one single sector and increased understanding of other sectors is needed. In addition, a robust funding strategy is needed to enable smaller companies to access technical advice and support services on marketing and market research, risk assessment as well as investor readiness. Clusters could play a key role here (European Commission, 2017d).

“The expected intensification in the use of the North Sea, which is partly the result of an increase in the number of designated uses, demands responsible use of the limited available space. Increasing use is exerting pressure on the marine ecosystem. Policy is a prerequisite for harmonising the various designated uses of the North Sea and ensuring a healthy ecosystem.” (Dutch Ministries of I&E and EA, 2015, p. 8).

A policy document on the North Sea for 2016–2012 published by the Dutch Government sets out the desired policy for the use of space, within the limits of the marine ecosystem. It sets the spatial frameworks, allowing the use of space in the North Sea to develop in an efficient and sustainable way. Multiple use of space is considered an important principle in this regard, offering balanced opportunities for all uses of the North Sea within the European frameworks (Water Framework Directive, Marine Strategy Framework Directive, Birds Directive, Habitats Directive and the Malta Convention). A number of actions have been set out in regards to renewable energy namely drawing up a North Sea Energy Master Plan 2030–2050 and more research into combined energy farms to ensure this is implemented wherever possible. The North Sea 2050 Spatial Plan specifically emphasizes that energy areas at sea in which electricity is generated using different techniques is the vision of the North Sea in 2050. The spatial agenda shows that such energy farms, combining wind, tidal and wave energy, are promising, but that

the combination of aquaculture and/or mariculture with wind farms is less obvious, unless the wind farms were to be located close to the coast (Dutch Ministries of I&E and EA, 2015).

As administrative and political division of responsibilities especially for the territorial waters differ per country, international cooperation and aligned spatial strategies are key to facilitate sustainable Blue Growth.

Annex 11.1 – National support schemes in Baltic & North Sea

Latvia	Operational Programme “Entrepreneurship and Innovations” www.esfondi.lv	The Programme aims to contribute to improved innovation and the use of knowledge, high value-added production, and enhanced export capacity among the existing enterprises, as well as to encourage the formation of new knowledge-based and technology intensive enterprises.
Finland	European Fisheries Fund www.mmm.fi	Priority 1: Adaptation of the EU fishing fleet; Priority 2: Aquaculture, inland fishing, processing and marketing of fishery and aquaculture products; Priority 3: Measures of common interest; Priority 4: Sustainable development of fisheries areas.
Lithuania	Operational Programme ‘Economic Growth’ www.esparama.lt	The programme is dedicated to increase business productivity especially by creating a favourable environment for innovations and SMEs, promote R&D, increase efficiency of transport and energy infrastructure.
Estonia	Operational Programme for the European Fisheries Fund www.agri.ee	The main goal of the programme is to restructure the fisheries sector in order to ensure sustainable management in the fisheries sector and an increase of the income of the persons engaged in fishery.
Sweden	Operational Programme for the Swedish Fisheries Sector www.fiskeriverket.se	The programme aims at promoting an ecologically, economically and socially sustainable fisheries sector in Sweden by creating a balance between fish resources and fleet capacity, increasing profitability in the fisheries sector, promoting employment in rural areas in relation to the fisheries sector, decreasing the negative environmental effects brought about by the fisheries sector and ensuring the sustainability of both the environment and natural fish stocks.

(Continued)

Annex 11.1 Continued

Denmark	<ul style="list-style-type: none"> • European Fisheries Fund www.ferv.fvm.dk/ Fiskeriudvikling • Operational Programme “Innovation and Knowledge” www.ebst.dk 	<ul style="list-style-type: none"> • Core targets of the programme refer to four “Growth Drivers” seen as crucial to promoting growth (innovation, entrepreneurship, new technology, human resources)
---------	---	--

Source: <http://www.balticsea-region.eu/funding-sources>

References

- Astariz, S. & Iglesias, G. 2016. Co-located wind and wave energy farms: Uniformly distributed arrays. *Energy*, 113, 497–508.
- CPMR North Sea Commission 2016. North Sea Region 2020: North Sea Commission Strategy – Contributing to the Europe 2020 Gothenburg, Sweden: CPMR North Sea Commission.
- Directorate General for Energy 2010. Energy Infrastructure Priorities for 2020 and Beyond – A Blueprint for an Integrated European Energy Network.
- EUNETMAR 2013. Study on Blue Growth, Maritime Policy and the EU Strategy for the Baltic Sea Region.
- European Commission 2007. Cohesion Policy 2007–13. National Strategic Reference Frameworks. Luxembourg: Office for Official Publications of the European Communities, 2007.
- European Commission 2017a. Commission Staff Working Document: European Union Strategy for the Baltic Sea Region Action Plan {COM(2009) 248}. Brussels.
- European Commission 2017b. *Europe 2020 Strategy* [Online]. Available: https://ec.europa.eu/info/strategy/european-semester/framework/europe-2020-strategy_en [Accessed 07/04/2017].
- European Commission 2017c. *European MSP Platform* [Online]. Available: <http://msp-platform.eu/msp-practice/countries> [Accessed 07/04/2017].
- European Commission 2017d. Directorate-general for Maritime Affairs and Fisheries. Towards and implementation strategy for the sustainable blue growth agenda for the Baltic Sea region. ISBN 978-92-79-69371-7
- European Environment Agency. 2012. *North Sea physiography (depth distribution and main currents)* [Online]. Available: <http://www.eea.europa.eu/data-and-maps/figures/north-sea-physiography-depth-distribution-and-main-currents> [Accessed 7/4/2017].

- Ferreira, J. G., Andersen, J. H., Borja, A., Bricker, S. B., Camp, J. & Cardoso Da Silva, M. 2010. Marine strategy framework directive, Task Group 5 Report, Eutrophication. JRC 58102, EUR 24338 EN. ISBN 978-92-79-15651-9. ISSN 1018-5593. Luxembourg: Office for Official Publications of the European Communities, European Union and ICES.
- Hammar, L., Gullström, M., Dahlgren, T. G., Asplund, M. E., Goncalves, I. B. & Molander, S. 2017. Introducing ocean energy industries to a busy marine environment. *Renewable and Sustainable Energy Reviews*, 74, 178–185.
- HELCOM 2007. HELCOM Baltic Sea Action Plan. Krakow, Poland.
- HELCOM 2014. Eutrophication Status of the Baltic Sea 2007–2011 – A Concise Thematic Assessment. Baltic Sea Environment Proceedings, No. 143.
- Jansen, J., Van Der Welle, A., Kraan, C., Nieuwenhout, F. & Veum, K. 2015. Sharing benefits and costs of integrated offshore grid structures. NorthSeaGrid Policy Brief.
- Konstantelos, I., Pudjianto, D., Strbac, G., DE Decker, J., Joseph, P., Flament, A., Kreutzkamp, P., Genoese, F., Rehfeldt, L., Wallasch, A.-K., Gerdes, G., Jafar, M., Yang, Y., Tidemand, N., Jansen, J., Nieuwenhout, F., Van Der Welle, A. & Veum, K. 2017. Integrated North Sea grids: The costs, the benefits and their distribution between countries. *Energy Policy*, 101, 28–41.
- Kyriazi, Z., Maes, F. & Degraer, S. 2016. Coexistence dilemmas in European marine spatial planning practices. The case of marine renewables and marine protected areas. *Energy Policy*, 97, 391–399.
- OSPAR 2006. Convention for the Protection of the Marine Environment of the North-East Atlantic.
- Papageorgiou, M. 2016. Coastal and marine tourism: A challenging factor in Marine Spatial Planning. *Ocean & Coastal Management*, 129, 44–48.
- Payne, I., Tindall, C., Hodgson, S. & Harris, C. 2011. Comparison of national Maritime Spatial Planning (MSP) regimes across the EU. Seanergy 2020.
- Piante, C. & Ody, D. 2015. Blue Growth in the Mediterranean Sea: the Challenge of Good Environmental Status. MedTrends Project. WWF-France.
- PISCES 2012. PISCES: Partnerships Involving Stakeholders in the Celtic Sea Ecosystem. Towards Sustainability in the Celtic Sea.
- Porter, M. 1998. “Clusters and the New Economics of Competition”. *Harvard Business Review* 76, 77–90.

- Qiu, W. & Jones, P. J. S. 2013. The emerging policy landscape for marine spatial planning in Europe. *Marine Policy*, 39, 182–190.
- Rodríguez-Rodríguez, D., Malak, D. A., Soukissian, T. & Sánchez-espínosa, A. 2016. Achieving Blue Growth through maritime spatial planning: Offshore wind energy optimization and biodiversity conservation in Spain. *Marine Policy*, 73, 8–14.
- Salvador, R., Simoes, A. & Soares, C. G. 2015. Features of the European Maritime Clusters. 55th Congress of the European Regional Science Association: “World Renaissance: Changing roles for people and places”, 25–28 August 2015, Lisbon, Portugal.
- Smith, N., Belpaeme, K., Maelfait, H., Vanhooren, S. & Buchan, K. 2012. Why one size won’t fit all: Marine spatial planning in Belgium & Dorset. The Dutch Ministry of Infrastructure and the Environment & The Dutch Ministry of Economic Affairs, 2015. Policy Document on the North Sea 2016–2021. www.noordzeeloket.nl
- The Dutch Ministry of Infrastructure and the Environment & The Dutch Ministry of Economic Affairs, 2014. North Sea 2050 Spatial Agenda.
- The Nautical Institute & World Ocean Council 2013. The shipping industry and Marine Spatial Planning: A professional approach.
- Walday, M. & Kroglund, T. 2002a. The Baltic Sea. *In*: Pinborg, U. & Larsson, T.-B. (eds.) *Europe’s biodiversity – biogeographical regions and seas*. UNEP/GRID Warsaw.
- Walday, M. & Kroglund, T. 2002b. The North Sea. *In*: Pinborg, U. & Larsson, T.-B. (eds.) *Europe’s biodiversity – biogeographical regions and seas*. UNEP/GRID Warsaw.
- Zaucha, J., Vision & Secretariat, S. A. T. B. S. 2014. *The Key to Governing the Fragile Baltic Sea: Maritime Spatial Planning in the Baltic Sea Region and Way Forward*, VASAB Secretariat.

Additional Web-Based Resources on Blue Growth and Maritime Policy

- http://ec.europa.eu/maritimeaffairs/atlas/seabasins/balticsea/long/index_en.htm
- <https://www.havochvatten.se/4.732980de143b1b1de53286b.html>
- <https://webgate.ec.europa.eu/maritimeforum/en/node/3550>
- http://www.unesco-ioc-marinesp.be/spatial_management_practice/belgium
- <http://www.mermaidproject.eu/sharepoint/func-startdown/355/>

- <http://oceana.org/>
- http://ec.europa.eu/maritimeaffairs/policy/maritime_spatial_planning/index_en.htm
- <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2013:0133:FIN:EN:PDF>
- http://ec.europa.eu/maritimeaffairs/policy/maritime_spatial_planning/index_en.htm
- <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2013:0133:FIN:EN:PDF>

