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MSP-LSI – Maritime Spatial Planning and Land-Sea Interactions

Targeted Analysis
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Final Case Study Report: Pomeranian Bight

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Case Study Report: Pomeranian Bight

MSP-LSI – Maritime Spatial Planning and Land-Sea Interactions

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Abbreviations

BSH	German Federal Maritime and Hydrographic Agency
DE	Germany
EEZ	Exclusive Economic Zone
ESPON	European Territorial Observatory Network
ESPON EGTC	ESPON European Grouping of Territorial Cooperation
EU	European Union
EUR	Euro
FTE	Full time equivalent
GDP	Gross Domestic Product
GVA	Gross Value Added
GW	Gigawatt
ha	Hectare
km	Kilometre
LEP MV	Mecklenburg-Vorpommern Spatial Development Programme
LSI	Land-Sea Interaction
m	Metre
MSP	Marine Spatial Planning
MW	Megawatt
NSDC	National Spatial Development Concept
NUTS	Nomenclature of Territorial Units for Statistics
PL	Poland
PLN	Polish złoty
R&D	Research and development
ROG	German Federal Spatial Planning Act
SMEs	Small and medium sized enterprises
TWh	Terawatt hour
VASAB	Vision and Strategies around the Baltic Sea

1 Main highlights and executive summary

The present case study report on the Pomeranian Bight is a scientific annex to the final report of an ESPON targeted analysis on Maritime Spatial Planning and Land-Sea Interactions, conducted within the framework of the ESPON 2020 Cooperation Programme. The case study boundaries include in the sea the MSP pilot area in the territorial and exclusive economic zones (EEZ) of Germany and Poland and on land the German region of Mecklenburg-Vorpommern and on the Polish side, the Zachodniopomorskie Voivodeship administrative area. The report focuses on the focal sectors of coastal tourism and offshore wind energy.

1.1 Governance Analysis

The analysis of spatial planning in the Pomeranian Bight at different levels revealed the following.

1.1.1 Transnational Spatial Planning Arrangements

There is a longstanding institutional structure for cross border collaboration. The German-Polish Governmental Commission for Regional and Border Collaboration was established 1991. In 1999, the Commission incorporated a joint Spatial Planning Committee as a forum for discussion and where necessary political decision making on topics such as transport infrastructure, energy, culture, sustainable development, economic growth and investment. The Polish and German authorities (at federal and federal state level) use this Spatial Planning Committee, as well as the Baltic working groups under HELCOM and VASAB and bilateral meetings for regular formal and informal exchanges with other partnering states about their spatial planning activities.

A recent example of transboundary cooperation between Polish and German authorities is a shared vision known as the "Joint Future Concept 2030 for the German-Polish Interdependence Area" (2016)[1] with action planned by the year 2030 along several axes many of which have relevance to MSP, maritime sectors and LSI.

The two countries also established an MSP working group in 2014 to support exchange and intensified cross-border cooperation on MSP strategies and consultations. Nevertheless the organisation of spatial planning on both land and sea remains embedded in national practices.

1.1.2 Spatial Planning in Germany

Spatial planning in Germany is organised according to its federal structure with competences and functions distributed across Bund and Länder levels with each performing a distinct

[1] Ministerstwo Inwestycji i Rozwoju and Bundesministerium des Inneren, für Bau und Heimat (2016): Joint Future Concept 2030 for the German-Polish Interdependence Area. https://www.kooperation-ohne-grenzen.de/wp-content/uploads/2018/09/Gemeinsames_Zukunftskonzept_2030_Download.pdf

function. Activities at the different levels are however interlinked by the mutual feedback principle as well as complex and specific requirements of notification, participation, coordination and compliance. The Bund mainly provides the legal basis for spatial planning at lower level and has limited control over specific planning tools. It is however responsible for MSP in the German EEZ. In 2001 the German Ministerial Conference on Regional Planning asked the Länder to extend their terrestrial planning out to the territorial water boundary of 12 km. Indeed the federal State of Mecklenburg-Vorpommern was one of the first authorities to integrate terrestrial and marine planning activities and this approach is reflected in its most recent spatial plan: Mecklenburg-Vorpommern Spatial Development Programme (2016). The Bund published its first maritime spatial plan for the German EEZ in the Baltic in 2009.

1.1.3 Spatial Planning in Poland

In Poland, spatial planning on land is based on a hierarchical system, where spatial planning at higher spatial levels has to be taken into account by all lower levels of administration when devising spatial plans. Through this mechanism, priorities set at the national level play an important role in shaping local planning and infrastructure. Spatial planning authority is spread out over the planning entities on all geographic levels, with a special role being played by municipalities in incorporating national and regional guidance into local spatial plans.

The Polish MSP system follows a nested approach and is compiled of one overarching MSP (the "Maritime Spatial Plan of Polish Sea Areas" in the scale 1: 200 000) covering the entire EEZ and territorial sea and the internal sea waters located between the baseline of the Polish territorial sea and the shoreline and the internal sea waters of the Gulf of Gdańsk) and several plans of a smaller spatial scale (1:10000 or smaller) covering major ports area waters and other key areas, such as the plans covering Kamieński and Szczeciński Lagoons. The Maritime Spatial Plan of Polish Sea Areas, as well as several of the spatial plans at lower spatial scale have been drafted, but are still pending official adoption.

Regarding the coordination of sectoral inputs into the MSP processes, it should also be pointed out that Poland had an Inter-Ministerial Group on Maritime Policy on national level, which coordinated all maritime affairs until 2017. This group had the task to ensure a holistic approach to maritime development and should work to integrate maritime spatial development with other governance processes impacting the Polish sea.

1.1.4 Addressing LSI

Overall, LSI is incorporated into both German and Polish spatial planning arrangements in the Pomeranian Bight. Each respective framework includes explicit considerations of LSI within cornerstone national land-based and marine planning legislation. In Germany, the Federal

Spatial Planning Act outlines the requirement for LSI to be considered by both the Bund level when planning in the EEZ and for the other administrative levels when planning in any area of German coastal waters. In Poland, LSI are considered within the Polish National Spatial Development Concept 2030, which stipulates that national-level marine spatial plans need to be accompanied by specifying procedures which will guarantee correlation between the marine and the land parts of the coastal zone. Though Poland is engaged in an ongoing process to develop its MSP, documentation shows that LSIs are being taken into consideration within the MSP process. Furthermore, the Zachodniopomorskie Voivodeship Spatial Management Plan also covers LSI in the event that they have an impact on the Voivodeship's spatial planning. However, the governance of LSIs within the Pomeranian Bight differs between Germany and Poland. Germany has an ongoing process by which the Bund and Länder meet to discuss MSP matters and LSI issues. This presents a forum to address any LSI conflicts should they arise after planning has taken place. Poland, on the other hand, seems to only take LSIs into consideration during the plan making phase and does not yet have an established means by which to address LSIs post plan making.

Nevertheless, both Germany and Poland are actively engaged in transboundary cooperation initiatives related to spatial planning with LSI issues being prominent here (see Section 1.1.1). Furthermore, and what can be viewed as a good practice, was the undertaking of a joint MSP pilot project that explored LSIs within the Pomeranian Bight.

1.2 Value Chain Analysis

1.2.1 Coastal Tourism

Coastal tourism is an important economic activity in the Pomeranian Bight on both sides of the border.

In the Germany, the state of Mecklenburg-Vorpommern is the number one destination for tourism in Germany and within this region, the Baltic coast in particular the area of Vorpommern and the Islands of Rügen and Hiddensee are the most popular areas. 95% of visitors are German national tourists, with only 5% of visitors coming from outside of Germany mainly from Sweden, Denmark, Switzerland, the Netherlands and Austria. In 2018, tourism in Mecklenburg-Vorpommern hit an all-time high of 30.9 million overnight stays - a rise of 9.7% since 2010. The tourist industry in Mecklenburg-Vorpommern is responsible for 11.8% of the gross value added for the region and for 17.8% of employment or 131,300 employees overtaking local employment in manufacturing, health and social care. The local significance of the sector is also illustrated by the fact that 2/5 of the total retail sales in Mecklenburg-Vorpommern can be traced back to travellers/visitors.

On the Polish side of the Pomeranian Bight, the Zachodniopomorskie region is considered among the most tourist-attractive in Poland for both national and foreign tourists. It leads nationally in terms of the number of beds, the number of tourists, as well as the number of

overnight stays. In July and August 2018, over 4 million tourists rested in the province, an increase of almost 10% compared to the previous year. Over 75% of these visitors were from Poland. Foreign visitors were mainly from Germany, Denmark, Sweden and the Ukraine. The tourism sector in Zachodniopomorskie employed 18,195 people in 2015, within the accommodation and food and beverage service activities.

From the above it is evident that Coastal Tourism is of major economic importance to the whole Pomeranian Bight which has seen significant growth in recent times. It is notable though that the growth curve of tourism in Mecklenburg-Vorpommern is flattening out and the region has been losing market share for some time to the competition in neighbouring Schleswig-Holstein and indeed Poland. Early warning signals are visible among customer satisfaction surveys, where Mecklenburg-Vorpommern has dropped from 1st place nationally to 5th place in 2016[2]. Whilst the number of visitors to the region increased by 0.5% in 2017, the number of overnight stays to the region actually fell by 1.8% compared to the previous year[3]. In Zachodniopomorskie continuing growth is anticipated and it is considered that in general the tourism industry in Poland remains relatively undeveloped in comparison to other European countries. On both sides of the border however the sector faces challenges associated for example with the seasonality of the sector (with tourist activities concentrated heavily within summer months) and the related difficulties in finding and retaining trained staff.

Key LSI associated with Coastal Tourism in the Pomeranian Bight include: employment and income generation, impacts on land infrastructure, potential displacement of other sectors; impact of waste management; Impact on coastal processes; invasive non-native species; impact on air quality; pollution, noise or species' disturbance.

1.2.2 Offshore wind energy

Overall conclusions for the production of offshore wind energy in the Pomeranian Bight are skewed. It present Germany has three wind farms with in the EEZ and, so far, none in the territorial waters. The wind farms are: "EnBW Baltic 2" producing 288 MW from 80 turbines, "Wikinger" 350 MW from 70 turbines, and "Arkona" with 385 MW from 60 turbines[4]. In total these produce 1018 MW from 210 turbines. Further farms in the region are in different stages of planning or development. In contrast Poland does not currently have any offshore installations in its marine waters at the present time, although some national estimates have stated that building 6 GW of installed capacity in Polish waters by 2030 is feasible.

This pattern is also reflected in existing employment in the sector. In Germany, 160,200 people were employed in the wind industry in 2016 with 27,200 people particularly associated with

[2] Ostdeutscher Sparkassenverband (2017).

[3] Mecklenburg Vorpommern: State Office of Internal Administration Statistical Office. Statistical Year book 2018. Available at: https://www.laiv-mv.de/Statistik/Zahlen-und-Fakten/Wirtschaftsbereiche/Gastgewerbe-und-Tourismus

[4] Foundation Offshore Wind Energy (2018). "Status Quo Offshore Wind Energy".

offshore schemes.[5] Almost half of these jobs were in North Rhine-Westphalia, Baden-Württemberg and Bavaria and relate to developments not only in German waters but also internationally[6]. Meanwhile total employment for offshore wind in Mecklenburg-Vorpommern increased from 580 jobs in 2012 to over 1,150 jobs in 2015, 38.8% of which were employed in operation & maintenance[7]. According to Wind:Research (2019; see appendix 2) there were 1,250 jobs in offshore wind in Mecklenburg-Vorpommern in the year 2018[8].Value chain analysis reveals overall that the employment effects of the offshore wind energy sector are distributed throughout Germany and generally away from the coast. In addition it highlighted evidence of decline in employment due to wider sector development trends and economic uncertainties, with up to 2,000 jobs reported to have been lost in the sector (combined data for onshore and offshore) in Germany in 2017[9].

At present the employment in offshore wind is not prominent in Poland although with an international reputation in shipbuilding and capacity in related areas there is much potential for employment growth in the future. Studies of possible offshore wind investment in Polish waters have estimated that it could create around 77,000 jobs (directly and indirectly) in Poland as a whole in the period to 2030. As in Germany, the value chain analysis suggests that much associated employment would be generated beyond coastal areas.

Key LSI issues associated with Offshore Wind Energy in the Pomeranian Bight are envisaged to include: Employment and Income generation; Impacts on land infrastructure; Displacement of other sectors, Impact on coastal processes; Invasive non-native species; Impact on air quality; Pollution, noise or species' disturbance.

[5] Bundesverband WindEnergie (2018). "German Wind Energy in Numbers". Available at: https://www.wind-energie.de/english/statistics/statistics-germany/

[6] Bunderverband der Windparkbetreiber Offshore e.V. (2018). Available at: https://bwo-offshorewind.de/en/offshore-wind-energy/

[7] Bundesverband Windenergie, Offshore-Wind-Industrie-Allianz, and Verband deutscher Maschinen- und Anlagenbau (2017). "Beschäftigung in Deutschland durch Windenergie". Available at: https://www.wab.net/fileadmin/media/Downloads/Broschueren/OWIA_Beschaeftigungsstudie_2017.pdf

[8] Wind:Research (2019). Wertschöpfung der Offshore-Windenergie in Deutschland.

[9] Energy Voice: "For Heiner Kleen, Germany's renewable energy revolution looks like it will end in redundancy." Available at: https://www.energyvoice.com/otherenergy/181001/job-losses-mount-in-germany-as-wind-companies-seek-growth-abroad/

2 Introduction

2.1 Case study context

The present case study report on the Pomeranian Bight is a scientific annex to the final report of an ESPON targeted analysis on Maritime Spatial Planning (MSP) and Land-Sea Interactions (LSI), conducted within the framework of the ESPON 2020 Cooperation Programme. Among other objectives the MSP-LSI project has sought to:

- Define and operationalise consideration of land-sea interactions for the purpose of European Territorial Planning (including MSP and terrestrial planning);
- Establish the main impacts on land of key maritime activities and how terrestrial planning can consider them;
- Derive learning from existing practices and approaches in managing LSI in Marine Spatial Planning (MSP).

One of the main outputs of the research is a proposed methodology to explore LSI at various scales for the purposes of MSP/Territorial Planning and this report provides an account of pilot activities in the Pomeranian Bight area related to a draft methodology that was developed in the initial stages of the MSP-LSI research. The methodology is summarised in Figure 1. The approach was designed with a particular focus on examination of LSI associated with maritime sectors in mind and explores the use of value chain analysis as a potentially useful tool in this respect.

Figure 1: A methodology to explore LSI in MSP/Territorial Planning

<table>
<tr><td colspan="4">LSI Scoping for MSP/Territorial Planning</td></tr>
<tr><td rowspan="4">.Governance Analysis</td><td>General context of the case study area and focal sectors</td><td rowspan="4">Value Chain Analysis</td><td>Developing the sector value chains</td></tr>
<tr><td rowspan="3">Spatial planning governance arrangements and LSI coverage in terrestrial/marine plans</td><td>Key sector characteristics</td></tr>
<tr><td>Sector framework conditions</td></tr>
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<tr><td>Key LSI findings</td><td>Sector statistics</td></tr>
<tr><td colspan="4">Mapping</td></tr>
<tr><td colspan="4">Recommendations for Good Management of LSI in MSP/Territorial Planning</td></tr>
</table>

The methodology outlined above is designed to provide a flexible framework for LSI analysis that can be tailored for use in different contexts. It starts with an initial scoping stage where a core area for LSI examination is defined and LSI issues of particular significance in the case study context are identified. The MSP-LSI study was particularly concerned with LSI issues associated with maritime sectors and in each case 2 focal sectors were selected as the basis for more detailed LSI investigation. Following this scoping stage, 2 two aspects of analysis were undertaken related to governance and to the selected sector value chains. These analyses were supported by mapping activities which sought to provide visual material that could aid LSI understanding. Finally, based on these analyses recommendations for good management of LSI in the case studies were proposed, informed in some instances by stakeholder workshops. Further explanation of the methodology can be found in the MSP-LSI draft final report.

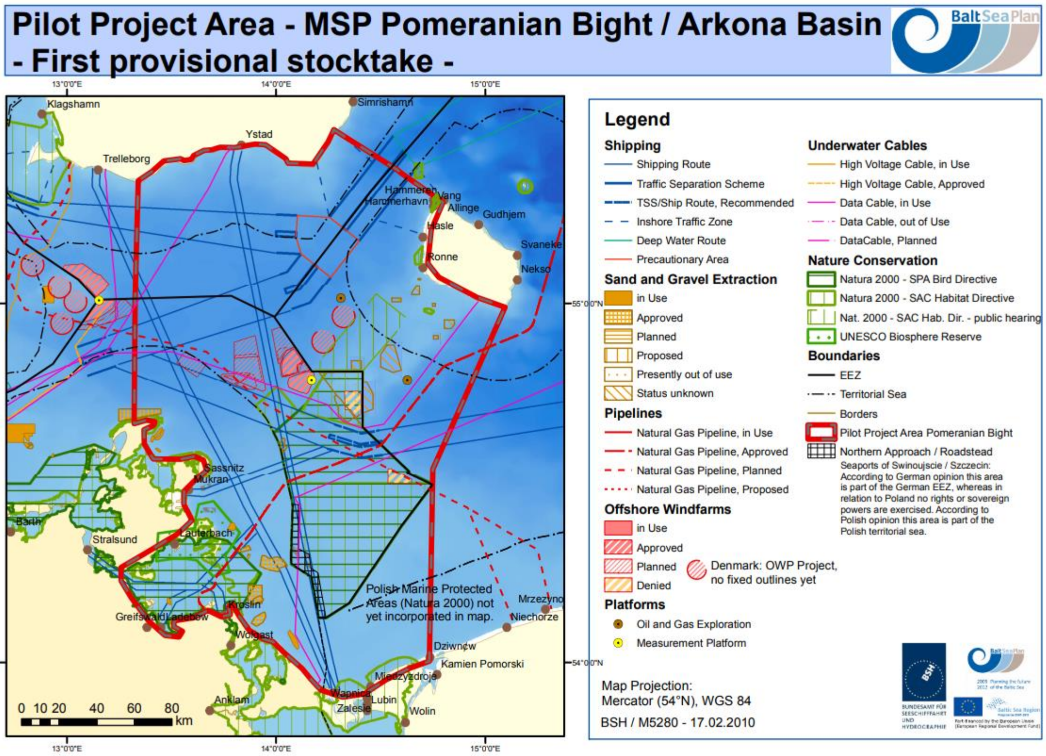
The following sections outline the outputs of the pilot investigations for the Pomeranian Bight case study.

2.2 LSI Scoping for MSP/Territorial Planning in the Pomeranian Bight

This is a transnational case study between Germany (DE) and Poland (PL) and has already been the subject of a marine spatial planning (MSP) pilot project. This pilot was conducted as an informal exercise to explore the issues and challenges of working with different planning cultures and interests in a transnational context. Spatially, the pilot went further than the area of this case study, extending to southern Sweden (Skane) and Denmark, west of Bornhom (see Map 1)[10].

[10] BaltSeaPlan Report No 9 “Developing a Pilot Maritime Spatial Plan for the Pomeranian Bight and Arkona Basin” http://www.baltseaplan.eu/index.php/Pomeranian-Bight;832/1

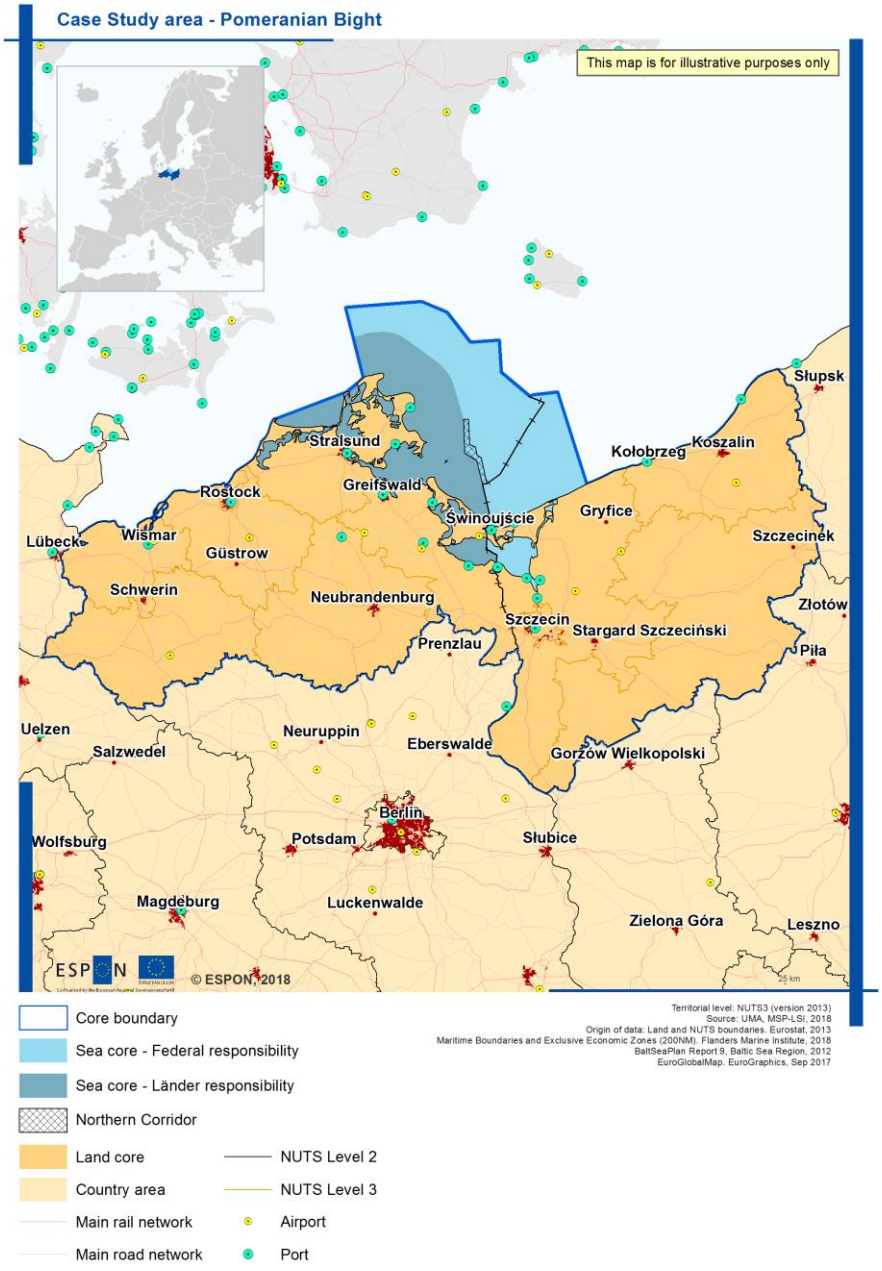
Map 1: MSP Pilot Project Area Pomeranian Bight/Arkona Basin



Source: Balt Sea Plan Project (2012) (http://www.baltseaplan.eu/index.php/Pomeranian-Bight;832/1)

The selected core area boundaries for the MSP-LSI Pomeranian Bight case study are shown in Map 2. The sea core of this case study is intended to reflect the MSP pilot area in the territorial and exclusive economic zones (EEZ) of Germany and Poland. On land, the core has been defined at NUTS 2 level within both countries, corresponding with regional bodies with significant planning responsibilities. The focal sectors selected for the Pomeranian Bight case study are coastal tourism and the production of offshore wind energy.

Map 2:Core area of the Pomeranian Bight Case Study



3 Governance Analysis

3.1 General context of case study area and focal sectors

The transboundary Pomeranian Bight case study is situated in the Baltic Sea along the northeast coast of Germany and northwest coast of Poland.

The Baltic Sea is the second largest body of brackish water in the world with a bathymetry controlled by the presence of sills and deep basins[11]. The south-west Baltic is characterised by cliffs and barrier systems, mainly spits and lagoons. The Pomeranian Bight is situated between Adlergrund and the Oder estuary. It features a relatively shallow sandy bottom with the prominent shoal of Oder Bank. Large sections of this coastline are retreating with approximately 70% of the coastline of the State of Mecklenburg-Vorpommern, extending from Mecklenburg Bight to Oder Estuary, is under permanent retreat[12]. The rivers Peene, from the German side and the Odra/Oder from the Polish side flow into the Stettiner Haff/ Szczecin/Oder Lagoon. This lagoon is shared by the two countries and is separated from the Pomeranian Bight and the Baltic Sea by the popular tourist islands of Usedom (DE) and Wolin (PL). The Świna River to the north west of the lagoon, the Dziwna and the Kamienski Lagoon as well as the strait of Peenestrom connects the Szczecin Lagoon with the Baltic Sea. The area has low current velocities and Oder Bank is subject to frequent winter ice.

The waters of the Pomeranian Bight are characterised by a shallow bottom of between 6 and 30 metres (m) depth with species-poor benthic communities in unique combination with freshwater species such as the macoma balthica (Baltic clam); mya arenaria (soft shell clam); and theodoxus fluviatilis (river snail)[13]. An area of 200,400 hectares (ha) of the Bight is currently protected under the EU Birds and Habitats Directives and its Special Areas of Conservation, Special Protection Areas and Sites of Community Importance host over half a million marine birds each year. At the same time, maritime traffic flows are high, with a steadily increasing demand and claims for economic uses such as offshore wind energy, sand and gravel extraction, mining, laying of pipelines and submarine cables (data and energy). Further spatial claims to the case study area come from the strong presence of coastal tourism and the development of industry and infrastructure e.g. in relation to ports, energy production and transport of fuel.

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[11] Zeiler, M.; Schwarzer, K.; Ricklefs, K. (2008). Seabed Morphology and Sediment Dynamics. Die Küste. Heft 74. Artikel 3. Seiten 31-44. E35 728.

[12] Harff, J.; Emelyanov E.M.; Schmidt-Thomé, M.; Spiridonov, M. (2004). Mineral Resources of the Baltic Sea Exploration, Exploitation and Sustainable Development (Zeitschrift für Angewandte Geologie, Sonderheft 2).

[13] Bundesagentur für Naturschutz (BfN) German Federal Agency for Nature Conservation (2006). Marine Spatial Planning in the German Exclusive Economic Zone of the North and Baltic Seas Nature Conservation Objectives and Principles https://www.bfn.de/fileadmin/MDB/documents/themen/meeresundkuestenschutz/downloads/Raumordnung-in-der-deutschen-AWZ/Marine_Conservation_MSP_EEZ.pdf

The most important urban centres on the German side are: the capitol Schwerin, Rostock (largest city with around 200,000 inhabitants), the medieval brick towns of Neubrandenburg and Stralsund (the latter having UNESCO heritage status). The university town of Greifswald is also the home of HanseYachts, the third-largest producer of yachts in the world and hosts a production site for Berlin-based Solon SE, one of Europe's largest producers of photovoltaic modules. Germany imports 40% of its gas from Russia supplied via the Nord Stream 1 pipeline that comes ashore in the neighbouring town of Lubmin [14]. A further pipeline Nord Stream 2 is planned. Key urban centres on the Polish side are: Szczecin, Koszalin, Stargard and Świnoujście. The region is strong in the marine economy, with international harbours and shipyards and companies from different branches of the sector. Szczecin, the capital of the Voivodeship, is home to the Polish Steamship Company, Polish oldest cargo ship operator. Świnoujście, Poland's furthest north-werstern city situated on a number of islands, is an officially recognized health resort.

The region of Mecklenburg-Vorpommern is one of the larger federal states, but with 1.61 million inhabitants in 2017, it is the nation's least densely populated region (70 inhabitants per square kilometre (km²)). The region was part of the former German Democratic Republic and since reunification the region has been impacted by structural changes such as a total population loss of about 300,000 and with a gross domestic product (GDP) growth rate that is below the German average. In 2017, most employees worked in services (74.9%), 21.4% in industry and 3.6% in the agricultural sector (the latter being more than double the average)[15]. The region's other important sectors are mechanical engineering, maritime technology, automotive and aviation, the food industry, renewable industry, logistics and ports, renewable energies, life science, timber and plastics and tourism[16]. The region's exports are by far the lowest in Germany (0.7% of total exports)[17]. In 2014, the regional unemployment rate (9.6%) was nearly twice as high as the German average (5.0%), although this figure was nearly halved by 2017 when it reached 5.2%[18]. In 2016, 61,184 companies (only 1.8% of the total companies in Germany) were registered in Mecklenburg-Vorpommern; nearly all of these businesses (99.67%) are small and medium sized enterprises (SMEs)[19]. Over the last decades, the region has concentrated on developing its research infrastructure and a technology and science-friendly, innovative environment focussing on science-industry cooperation, partnerships and network structures with targeted support for technology-oriented start-ups[20].

Development on the Polish side of the case study area is highly influenced by its geographical location on the crossroad of important transport routes, on the border with Germany in the west,

[14] https://www.ft.com/content/e9a49e8c-852c-11e8-a29d-73e3d454535d
[15] EUROSTAT Regional Statistics 2018 https://ec.europa.eu/eurostat/web/regions
[16] Invest in MV 2017 https://www.invest-in-mv.de/en/industries
[17] Statistisches Bundesamt (2018) https://www-genesis.destatis.de
[18] EUROSTAT Regional Statistics 2018 https://ec.europa.eu/eurostat/web/regions
[19] Statistisches Bundesamt (2018) https://www-genesis.destatis.de
[20] Information in this section from DG Growth, Regional Innovation Monitor Plus https://ec.europa.eu/growth/tools-databases/regional-innovation-monitor/base-profile/mecklenburg-west-pomerania

with an access to the Baltic Sea in the north and the resulting proximity to the Scandinavian markets. The region's advantages include its highly developed industrial and harbour infrastructure and fast-growing private sector. As of 2017, in the region there were 4 Special Economic Zones and 9 industrial and technological parks. The region's specialisations are modern services (e.g. information and communication technologies and research and development (R&D)), maritime and logistical activities, machine and metal industry, bioeconomy, tourism and healthcare[21].

Despite this potential, in terms of economic indicators, the region performs slightly worse than the Polish national average. As of 31.12.2016, the GDP per capita in current prices was 39,569 Polish złoty (PLN) (around 9,177 euro (EUR)), which is roughly 85% of the national average. The registered unemployment rate of the region was 10.9%, which is slightly higher than the national rate of 8.2%. At the same time, the average monthly wage in the region was almost 10% lower than the national average. The urban population of the region comprises the majority of the overall population (68.5%) with this proportion relatively stable over time (69.2% in 2005)[22].

The territory in the case study core area in Germany falls under the jurisdiction of the federal ('Bund'); the federal state ('Land') of Mecklenburg-Vorpommern, and local municipalities who produce binding land use plans; and, in Poland the national government of Poland, the regional administrative unit ('Voivodeship') Zachodniopomorskie and locally, the municipalities (gminas). In this way, the governance of the Pomeranian Bight can be viewed as being 'multilateral'.

Coastal tourism is an important economic activity in both Germany and Poland, with supporting governance regimes in place at both local and national scales. In Germany the Federal Ministry for Economic Affairs and Energy is responsible for tourism policy at a national level, which provides an overarching framework. The competence for tourism is on the Länder level, the responsible Ministry in Mecklenburg-Vorpommern is the Ministry of Economics, Employment and Health. Coordination is carried out through the Federal Government-Länder Committee on Tourism, which meets bi-annually and is chaired by the Federal Ministry of Economic Affairs and Energy. Within the Pomeranian Bight, the Land of Mecklenburg-Vorpommern published its Integrated State Transport Plan[23], which includes an aim to substantially reduce tourist traffic congestion, especially in the highly frequented seasonal periods. This reduction in traffic seeks to contribute to climate protection and promote positive image effects (positioning as a destination for recreation and nature holidays) and develop new target groups.

[21] https://www.paih.gov.pl/regiony/wojewodztwa/zachodniopomorskie
[22] Statistical Office in Szczecin (2017). "Statistical Yearbook 2017. Zachodniopomorskie Voivodeship". Available at: https://szczecin.stat.gov.pl/download/gfx/szczecin/pl/defaultaktualnosci/752/6/17/1/rw_2017.pdf
[23] Ministerium für Wirtschaft, Arbeit und Gesundheit Mecklenburg-Vorpommern (2018). "Landestourismuskonzeption Mecklenburg-Vorpommern". Available at: https://www.regierung-mv.de/serviceassistent/_php/download.php?datei_id=1606891

In Poland, the key national policy for coastal tourism is the “Tourism Development Programme until 2020”. Regionally, the Zachodniopomorskie province government has published a “Policy in the Tourism Sector” (2016)[24], describing the state of the sector in the region and defining the priorities for its further development. Tourism development is mainly the responsibility of Voivodships and local municipalities, which supervise, register and license various tourism-related initiatives of travel agents and tour operators, mountain guides, and also the classification of hotel facilities. Municipalities are responsible for keeping registers of campsites and non-hotel accommodation service providers, inspecting accommodation facilities, and applying sanctions if necessary.

German and Polish regions on either side are important touristic destinations, but are faced with issues relating to (particularly seasonal) unemployment and are below average in terms of their contribution to the economy. Furthermore, inland infrastructure for tourism relating to nature walks, cycle routes, and others is in need of modernisation on the German side, with some market share being lost to Poland and to the neighbouring region of Schleswig Holstein in recent times. Poland, on the other hand, has recognised the need to improve transport connections and road conditions for visitors- as Zachodniopomorskie ranks very low nationally with respect to its density of railway lines and public roads with a hard surface, though the road surface conditions are viewed as the best in Poland.

Poland does not currently have any offshore wind energy installations in its marine waters. Germany, on the other hand, has developed and installed offshore wind capacity in both in the Baltic Sea and North Sea.

In Germany, offshore wind is well established and has a clear support framework within the country. Its Offshore Wind Energy Act (2016) allocates responsibility for the development and preliminary investigation of areas for offshore wind energy and provides for a tiered planning and tendering process for both territorial waters and German EEZ areas. A site development plan (FEP) does not extend into the territorial sea, which is the jurisdiction of the Land. One FEP is produced for the North and Baltic Sea. The FEP helps establish cross-border spatial arrangements for power lines and interconnections. Though environmental offshore wind conditions are better in the North Sea, there is still ongoing development of offshore wind in the Mecklenburg-Vorpommern marine areas (both within territorial waters and the EEZ). Furthermore, financial support from the Bund has encouraged the growth of offshore wind power and an increase in share of renewable energies is also envisioned in Germany’s Climate Action Plan 2050. Recent tendering of Offshore Wind Areas for development have resulted in offers not including any subsidies, Thus companies seem to be confident that they do not need any additional subsidies on top of feed-in-tariffs.

[24] Pomorze Zachodnie (2016). “Polityka samorządu województwa zachodniopomorskiego w sektorze turystyki”. Available at: http://www.turystyka.wzp.pl/sites/default/files/polityka_turystyczna_2016_0.pdf

Poland is seen to have good conditions for the development of offshore wind, though the development phase of implementing an offshore wind farm is somewhat lacking in Poland due to insufficient facilities for testing offshore wind technologies. As such, should Poland pursue the development of its offshore wind sector, it will need to rely on external capacities from other countries and businesses. Poland has a somewhat stronger position when it comes to manufacturing and assembling, where a significant portion of components needed for building offshore wind farms could be supplied by Polish firms. The country also has the capacity to produce vessels to ship offshore wind components to site locations as well as the potential to undertake operation and maintenance activities of its wind farms. However, Poland's national power transmission system requires investors to build the connection infrastructure at their own cost, both on land and sea.

3.2 Spatial Planning Governance and LSI

3.2.1 Transnational Spatial Planning Arrangements

In 1991, the German-Polish Governmental Commission for Regional and Border Collaboration was established on the basis of Art. 12 of the Bilateral Neighbourhood Treaty. In 1999, the Commission incorporated a joint Spatial Planning Committee. The Committee is a forum for discussion and where necessary political decision making on topics such as transport infrastructure, energy, culture, sustainable development, economic growth and investment. The Polish and German authorities (at federal and federal state level) use this Spatial Planning Committee, as well as the Baltic working groups under HELCOM and VASAB and bilateral meetings for regular formal and informal exchanges with other partnering states about their spatial planning activities.

A recent example of transboundary cooperation between Polish and German authorities is a shared vision known as the "Joint Future Concept 2030 for the German-Polish Interdependence Area" (2016)[25] with action planned by the year 2030 along several axes. These include promoting sustainable growth through i) transboundary economic clusters, particularly between SMEs with common competences for local value creation ii) increased intensity of tourism e.g. through using rural and peripheral spaces iii) improved energy security through reduced consumption, improved energy storage in cross-border electricity grids and structural changes to existing energy systems and iv) sustainable blue growth through coordinated MSPs in the interconnected maritime space. The Vision also seeks to improve the protection e.g. from flood risks and strengthening of ecological connectivity to preserve biodiversity and natural and cultural heritage.

[25] Ministerstwo Inwestycji i Rozwoju and Bundesministerium des Inneren, für Bau und Heimat (2016): Joint Future Concept 2030 for the German-Polish Interdependence Area. https://www.kooperation-ohne-grenzen.de/wp-content/uploads/2018/09/Gemeinsames_Zukunftskonzept_2030_Download.pdf

The two countries also established an MSP working group in 2014 in order to support exchange and intensified cross-border cooperation on MSP strategies and consultations. The members of the working group are the authorities responsible for maritime spatial planning in the respective countries. The group is chaired by the authorities at national level, the German Federal Ministry of the Interior, Building and Community and the Polish Ministry of Maritime Economy and Inland Navigation. Other actors included in the group from the German side are: the Federal Maritime and Hydrographic Agency (BSH); Ministry of Energy, Infrastructure and Digitalization Mecklenburg-Vorpommern, and the State Chancellery of Schleswig-Holstein. From the Polish side, the Sea Ports of Szczecin and Świnoujście, and Maritime Office in Szczecin.

Poland and Germany are also members of the intergovernmental group Visions and Strategies around the Baltic Sea (VASAB), a multilateral initiative of the Baltic Sea Region cooperating on the issues of policy and spatial planning[26].

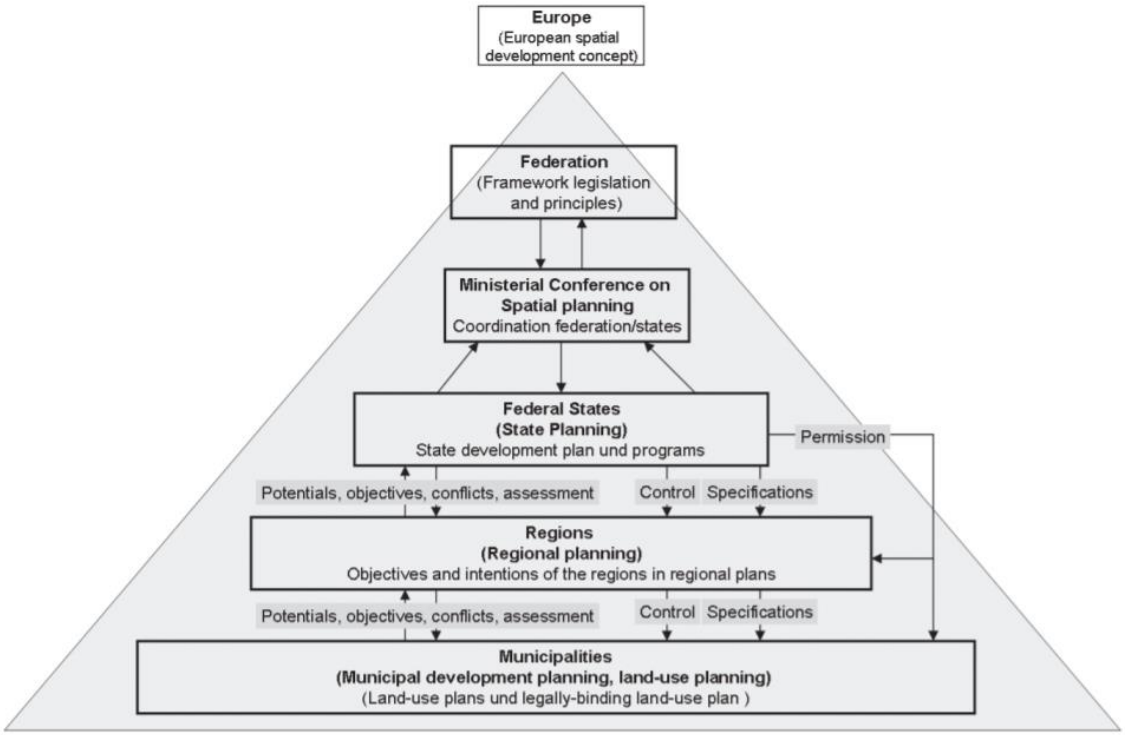
3.2.2 Spatial Planning in Germany

Spatial planning in Germany is organised according to its federal structure with competences and functions distributed across the different levels with each performing a distinct function (see Figure 2). The levels of governance are clearly differentiated both legally and organisationally, but are interlinked by the mutual feedback principle as well as complex and specific requirements of notification, participation, coordination and compliance. At Bund and Länder level in Germany, the responsible authorities coordinate maritime spatial planning. At the Länder level, authorities are responsible for planning both on land as well as out to the territorial water boundary of 12 nm. Maintaining the coordination of both types of spatial planning within one authority provides, in theory, a coherent basis for coordinating activities and competing interests at land and sea and their interactions. The Bund mainly provides the legal basis for spatial planning at lower level and has limited control over specific planning tools apart from MSP in the German EEZ. In addition to MSP in the EEZ the Bund has also the competence to issue nationwide spatial plans on flood protection als well as on location concepts for ports and airports when such matters are of importance to the spatial development and organisation of the federal territory from a national or European point of view (§ 17 ROG)[27]. This is the responsibility of the 'land-based' Federal Ministry of the Interior, Building and Community. The Ministry, together with the Federal Ministry of Transport and Digital Infrastructure and the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety supervise the activities of the Federal Maritime and Hydrographic Agency (BSH). The BSH assists in the MSP process with the preparation of specific plans and is the responsible authority for the approval procedures for offshore windfarms and pipelines

[26] https://www.kooperation-ohne-grenzen.de/en
[27] See: https://www.gesetze-im-internet.de/rog_2008/__17.html

The 2008 Federal Spatial Planning Act (ROG) aims to guide sustainable spatial development in Germany in a way that reconciles the social and economic demands of the space with its ecological functions. The Act allows the Bund to develop "guiding principles for the spatial development of the national territory and covering matters transcending individual states". The Bund also has an overarching influence on spatial planning through its legislative powers in other areas such as economic, financial and transport policy, spatial, urban and development of guiding principles. This act was amended in 2017 to implement the EU Directive on Maritime Spatial Planning[28].

Figure 2: Structure of spatial planning in Germany



Source: Institute of Urban and Regional Planning, University of Karlsruhe (2007)[29]

Through the Federal Spatial Planning Act (§24), Länder and Bund are obliged to notify one another of spatial planning activities which may impact the other party. Article 24 of the act also notes that the two levels are permitted to work together to produce guiding principles that go beyond state and international borders (e.g. the Polish-German border in the Pomeranian

[28] BMWI (2017) Raumordnungsgesetz vom 22. Dezember 2008 (BGBl. I S. 2986), das zuletzt durch Artikel 2 Absatz 15 des Gesetzes vom 20. Juli 2017 (BGBl. I S. 2808) geändert worden ist. Available at: https://www.gesetze-im-internet.de/rog_2008/ROG.pdf

[29] Image by Institut für Städtebau und Landesplanung der Universität Karlsruhe in Scholl, Bernd; Elgendy, Hany; Nollert, Markus (2007) Spatial Planning in Germany: Formal Structure and Future Tasks https://d-nb.info/985186194/34

Bight). The Federal Government and the Länder agree on their spatial planning concepts and guiding principles in the Ministerial Conference on Spatial Planning. Under the Act, Länder are required to adopt state spatial planning acts that implement the nationally prescribed guiding principles and principles of spatial planning in a way that is adapted to the context of the federal state in question. State spatial planning covers two aspects: i) planning for the state as a whole and ii) regional planning which is carried out at the sub-state level (there are four planning regions within the federal state of Mecklenburg-Vorpommern, with three of them with direct access to the coast line).

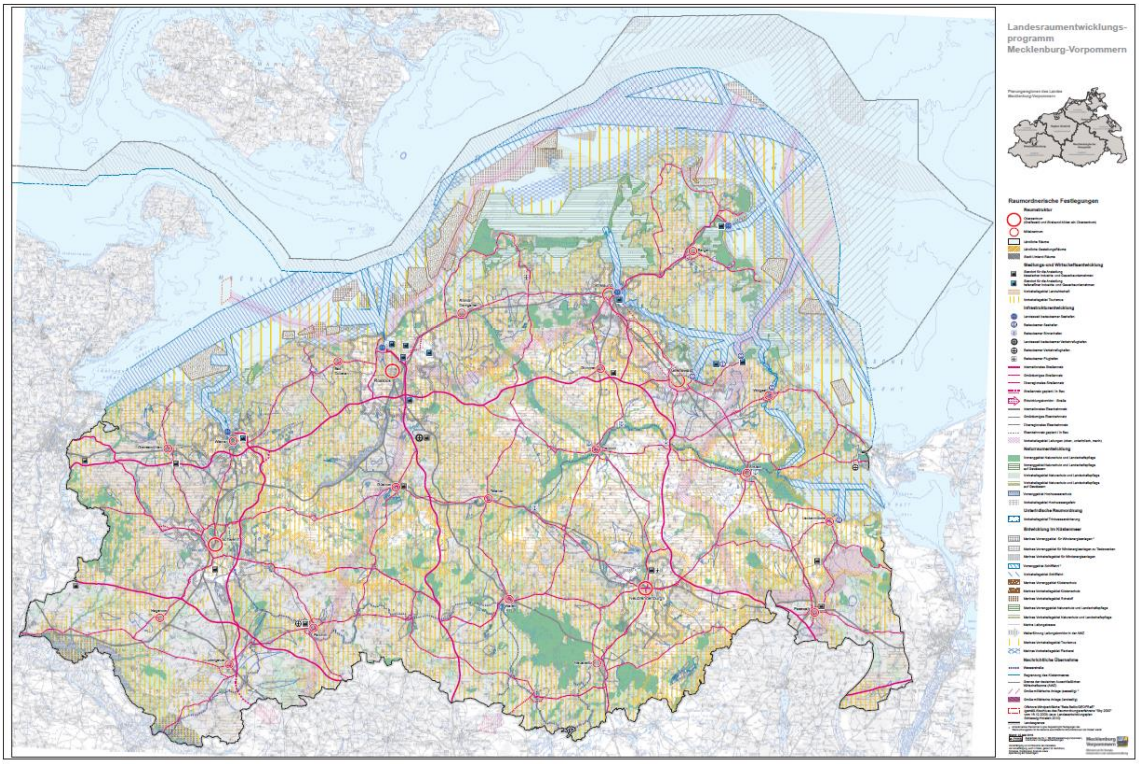
State planning is required to ensure that the goals and principles of national spatial planning are integrated (top-down) in local government planning and to ensure that the goals defined at local level are coordinated (bottom-up) with broader planning goals for the state and national level. The scale of these plans is between 1:100.000 and 1:500.000. Regional planning must conform to federal and state spatial planning and is concerned with detailed elaboration, sectoral integration and implementation of goals set out in state spatial planning. Regional plans are at a scale of 1:50.000 to 1:100.000. The federal states are the responsible authority for both land-based and maritime spatial planning out to the edge of the territorial waters: in the case of the Pomeranian Bight case study area, this activity is carried out by the Ministry of Energy, Infrastructure and Digitalisation of Mecklenburg-Vorpommern. In the Federal State of Mecklenburg-Vorpommern, two documents relevant for the case study are relevant: Mecklenburg-Vorpommern Spatial Development Programme (2016)[30] (broader spatial coverage), and Regional Spatial Development Programme Vorpommern (2010)[31] (smaller spatial coverage), although the draft 2018 update does little more than update individual chapters .

In 2016, Mecklenburg-Vorpommern officially adopted an update of its Spatial Development Plan, which covers its terrestrial areas as well as the respective territorial sea areas within the Baltic Sea. The Mecklenburg-Vorpommern Spatial Development Programme (LEP MV, 2016) addresses several challenges related to spatial development, for example demographic change and the demands related to coastal and inland areas due to climate protection and adaptation strategies. The programme is built around six focal points: spatial structure and spatial development; settlement- and economic development; development of infrastructure; development of natural areas; sub-surface planning; as well as spatial planning of coastal waters and integrated coastal waters management. As the programme includes the section on spatial plan of coastal waters and integrated coastal waters management, it constitutes at the same time a maritime spatial plan. In this respect, it addresses eight issues: wind energy farms and other renewable energies; pipeline and cable infrastructure; sea traffic; fisheries and aquaculture; tourism, free time and leisure; coastal protection, resource securing and extraction;

[30] *Landesraumentwicklungsprogramm Mecklenburg-Vorpommern (2016):* https://www.regierung-mv.de/Landesregierung/em/Raumordnung/Landesraumentwicklungsprogramm/aktuelles-Programm/
[31] *Regionales Raumentwicklungsprogramm Vorpommern (2018)*, https://rpv-vorpommern.de/wp-content/uploads/sites/2/2018/11/RREP_VP_2Aend_Entwurf_Sept2018_4Beteiligung.pdf

and nature protection. The programme includes several land-sea interactions. For example, it recognizes the significant role of coastal tourism and postulates its strengthening and further development. Map 3 below presents the map accompanying the programme[32].

Map 3:The Mecklenburg-Vorpommern Spatial Development Programme 2016



Source: LEP MV (2016) (EN legend available here)

The revised draft of the Second Amendment of the more detailed Vorpommern Regional Spatial Development Programme was adopted in 2018 and recently finished its fourth round of participation consultations. The 2018 update of the Regional Spatial Development Program Vorpommern is still proceeding through the planning processes and has not yet been adopted. In part it focuses on the redesignation of areas suitable for the development of wind energy The maps provided indicate designate areas for onshore wind energy but do not have any listed within marine waters. This revised plan, once officially completed, will update those designations of the previous plan dating from 2010, by which wind energy is regulated. The full spatial planning document focused around four main issues: general spatial development, settlement development, open space development and infrastructure development. The 2010 plan covered several land-sea connections, including several aspects of water transport and harbour infrastructure.

[32] *Landesraumentwicklungsprogramm Mecklenburg-Vorpommern Karte* (2016): https://www.regierung-mv.de/serviceassistent/download?id=1576859

Currently, a second change to the program is being developed (in January 2019 the fourth round of public consultation was closed). The amended plan should address the challenge of the energy transition (German: Energiewende) – it concerns the spatial aspects of wind energy production[33]. Spatial development programmes must be accompanied by a summary declaration on how the results of the EIA and the outcomes of public and authority participation have been taken into account (§10 (3) ROG).

From the above it can be seen that MSP in Germany is principally operationalised as an extension of land-based planning at the state level: These arrangements are longstanding and date back to 2001 when the Länder were required to adapt the objectives and principles of land-based spatial planning to take into account the special circumstances in the territorial sea (12 nautical mile zone)[34].

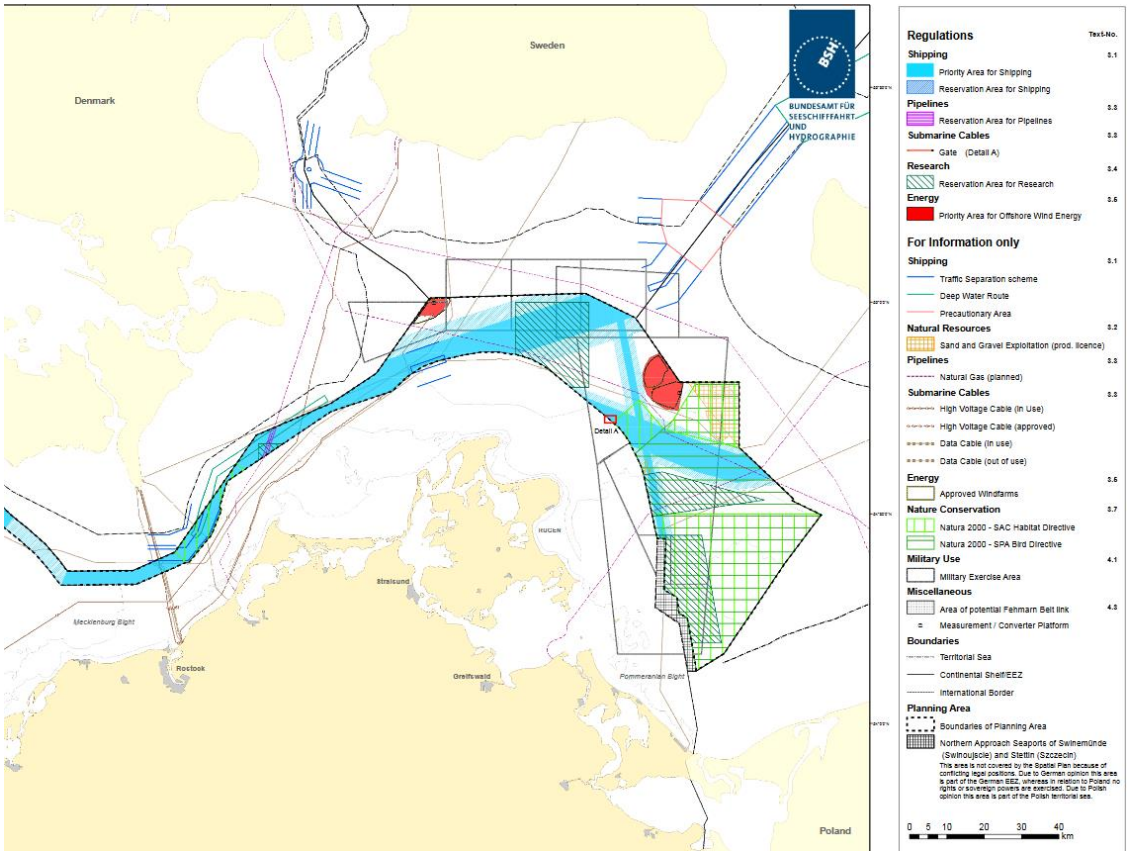
Germany does however also have a national MSP in place covering the German EEZ in the Baltic Sea that was adopted in 2009 (See Map 4) [35]. This does not cover the charted area showing the northern approaches to the harbours of Świnoujście and Szczecin and anchorage no. 3 because of contradictory legal opinions. According to German opinion this area is part of the German EEZ, whereas in relation to Poland no rights or sovereign powers are exercised. According to Polish opinion this area is part of the Polish territorial sea. The MSP for the area took an approach that first identified shipping routes around which all other activities should be planned. The national MSP was devised along five guidelines: (1) safeguarding and strengthening maritime traffic; (2) strengthening economic capacity through orderly spatial development and optimisation of spatial use; (3) promotion of offshore wind energy use in accordance with the Federal Government's sustainability strategy; (4) long-term sustainable use of the features and potentials of the EEZ through reversible uses, efficient use of space, and priority of marine-specific uses; and (5) safeguarding natural environment by avoiding disruptions to and pollution of the marine environment[36].

Years prior to the national MSP adoption in 2009 for the EEZ in the Baltic Sea, the federal State of Mecklenburg-Vorpommern had already initiated its own MSP process within the area and officially adopted its own Spatial Development Plan in 2005. This was updated and became legally binding in 2016. The original plan focussed on coastal tourism and sand and gravel extraction but did not account in detail for shipping routes or offshore wind. The updated plan addressed these issues and provides a comprehensive overview of designations for (1) priority and reservation areas for maritime transport, wind energy, coastal protection (sediment extraction), nature conservation, cables and pipelines; (2) reservation areas for tourism,

[33] https://rpv-vorpommern.de/planung/planung-rrep-vp-zweite-aenderung-2018/
[34] Resolution of the Federal State Ministers Conference for Spatial Planning in Germany (MKRO)
[35] BSH (2009): Spatial Plan for the German Exclusive Economic Zone of the Baltic Sea - Map -. Available at: https://www.bsh.de/EN/TOPICS/Offshore/Maritime-spatial-planning/National-spatial-planning/_Anlagen/Downloads/Raumordnungsplan_Karte_Ostsee.pdf;jsessionid=694CE14E36D3D0A316DC4F1905C839CE.live11294?__blob=publicationFile&v=5
[36] Information in this section is taken from the MSP Country Fiche of the MSP Platform https://www.msp-platform.eu/sites/default/files/download/germany_26.09.2018.pdf

fisheries, commercial sand & gravel extraction; (3) exclusion of oil drilling within territorial waters; and (4) planning objectives for the development of sea ports and landward infrastructure.

Map 4:Map of German national MSP in Baltic Sea (12 nm to boundary of EEZ) in 2009



Source: Bundesamt für Seeschifffahrt und Hydrographie, BSH (2009)(https://www.bsh.de/EN/TOPICS/Offshore/Maritime_spatial_planning/National_spatial_planning/_Anlagen/Downloads/Raumordnung_Karte_Nordsee.html)

In Germany, the Federal Spatial Planning Act, outlines the requirement for LSI to be considered by both the Bund level when planning in the EEZ (§17 (1)) and for the other administrative levels when planning in any area of German coastal waters[37] (§13 (6)). In particular the spatial plans must address how they will ensure the following: (1) safety and ease of shipping, (2) further economic uses, (3) scientific uses and (4) protection and improvement of the marine environment. It also includes the following further environmental conditions: §2 (2) 3 Especially in heavily trafficked areas and corridors, the conditions for shifting traffic to more

[37] Pursuant to § 3 (2) of the Water Resources Act (Wasserhaushaltsgesetz) coastal waters are „the sea between the coastline at medium high tide or between the seaward boundary of the surface waters and the seaward boundary of the territorial sea; the seaward boundary of surface waters which are not inland waterways of the Federation shall be governed by the provisions of Land law"

environmentally friendly modes such as rail and waterways need to be improved. §2 (2) 4 The spatial requirements for a cost-effective, secure and environmentally sound energy supply, including the development of energy networks, shall be taken into account. §8 Outlines the requirement to conduct an environmental impact assessment to take into account the impact of the spatial plan on (1) human beings, including human health, animals, plants and biological diversity; (2) surface, soil, water, air, climate and landscape; (3) cultural goods and other tangible goods; and (4) the interaction between the aforementioned objects of protection. If the implementation of a spatial development plan is likely to have a significant impact on the area of a neighbouring State, this party must be informed and have the possibility to comment. If this includes significant environmental impacts on that neighbouring country, this should be included in the environmental impact assessment as specified through §§ 60 and 61 of the Environmental Impact Assessment Act.

3.2.3 Spatial Planning in Poland

The general principles of land-based planning in Poland are defined by the 2003 Act on Spatial Planning and Management and its numerous amendments (last in late 2018). Article 3 of this Act indicates the authorities responsible for forming and conducting spatial policies. The system of spatial planning in Poland is based on a hierarchical system where spatial planning in broad terms is set out on at a national level, and should to be taken into account by all lower levels of administrations when devising their spatial plans. Lower levels of planning have to not only take into account national policy and regulations for spatial planning, but also national socio-economic development policies to ensure coordination and uniformity of purpose. The aim of this approach is to set the required standards and prioritise public purpose investments to reduce spatial conflicts.Spatial plans can be developed exclusively by the voivodeship a regional form of self-government at the level of voivodeships, and by the gmina (the *gmina* is the self governmental body and the lowest level of administrative division of the country. It can be seen as the equivalent of amunicipality in other countries). Furthermore text of the Act highlights that the spatial plans developed by the gmina are acts of local law and, in principle, are binding.

At the national level, the competent authority is the Council of the Ministers, which is presided over by the Prime Minister. Other Ministers with particularly significant roles in national level spatial planning include the Minister for Regional Development Policy, Construction, Spatial Development and Housing (who coordinates the coherence between Voivodeships' spatial plans and the national spatial concept) and the Minister in charge of Maritime Economy and the Development of Maritime Areas.

The central document, which lays out the current national spatial planning strategy of Poland, is the National Spatial Development Concept 2030 (NSDC 2030)[38]. Prepared by the Ministry of Regional Development (now Ministry of Investment and Economic Development) and approved in 2011, this document describes the strategic vision for the spatial development for the country. Furthermore, it lays out the objectives and directions of the national spatial policy and facilitating the implementation of the strategy. The objectives focus on competitiveness of Poland's major areas, internal cohesion and sustainable territorial development, country's connectivity, preservation of natural environment and landscape and restoring and consolidating spatial order. The concept also indicates the coordination and implementation mechanisms of development policies with a significant territorial significance. The NSDC 2030 stipulates the importance of the implementation of a coherent planning system (as compared to the prevailing high level of dichotomy between national, regional and local activities), which includes the maritime areas of the territorial sea and the EEZ (which was not the case in previous national strategic documents); and broadens the transboundary interactions both on the land and in the maritime area[39]. One of the strategic objectives of the NSDC 2030 with particular importance to environmental aspects is: "To develop spatial structures supporting the achievement and preservation of Poland's high-quality natural environment and landscape." Within this objective, the document describes the current environmental problems of the country, policy challenges and recommends specific actions[40]. The NSDC 2030 is legally binding on the national administration and it exerts a direct influence on spatial plans of regional and local governments. Within this document, there is a planned development of offshore wind, an LNG terminal (around Szczecin-Świnoujście) as well as planned investments to the transmission grid.

The competent authorities for terrestrial spatial planning on the regional and local levels are the regional government, the metropolitan unions (if existing), the district councils (which is comprised of several municipalities), and the municipalities or communes (gminas)[41] which are the lowest level of administration. The regional authorities (Voivodeships) are competent to elaborate planning documents at the regional Voivodeship level. As outlined above, these have to take into account the national spatial development concept and other national government programmes. In order to ensure coherence, the Voivodship spatial development plan should be in line with the Voivodship development strategy. At the regional level, the case study area is covered by the Zachodniopomorskie Voivodeship Spatial Management Plan which outlines the external and internal conditions of the Voivedeship, the aims of the strategic development of the

[38] National Spatial Development Concept 2030 (2011), http://www.esponontheroad.eu/dane/web_espon_library_files/682/national_spatial_development_concept_2030.pdf
[39] National Spatial Development Concept 2030, http://www.esponontheroad.eu/dane/web_espon_library_files/682/national_spatial_development_concept_2030.pdf
[40] *Ibid.*
[41] *Ustawa z dnia 27 marca 2003 r. O planowaniu i zagospodarowaniu przestrzennym,* http://prawo.sejm.gov.pl/isap.nsf/download.xsp/WDU20170001073/U/D20171073Lj.pdf

Voivodeship and the instruments for implementation of the plan[42]. The Plan covers the Voivodship's administrative territory and to some extent the adjacent territories. It also covers the LSI if they have an impact on the Voivodeship's spatial planning – e.g. in the case of natural protection areas or offshore wind farms[43].

Due to the division of competences for terrestrial spatial planning between several local government units in Poland, a special role falls to municipalities, who have the right to determine their own spatial policy and implement local planning documents taking into account the goals of supra-local public authorities (i.e. Voivodships and national level). Municipalities may either draft plans covering the entire municipal area, or only covering specific areas within the municipality, which determine directions to be taken in spatial structure and land use changes by gminas (lowest level of administration). These local spatial development plans constitute local law acts[44]. Spatial plans by the municipalities and regions (Voivodships) only cover land based areas up to the coastline and exclude internal sea waters, territorial sea and exclusive economic zone and enclosed areas, which fall under the maritime spatial planning procedure.

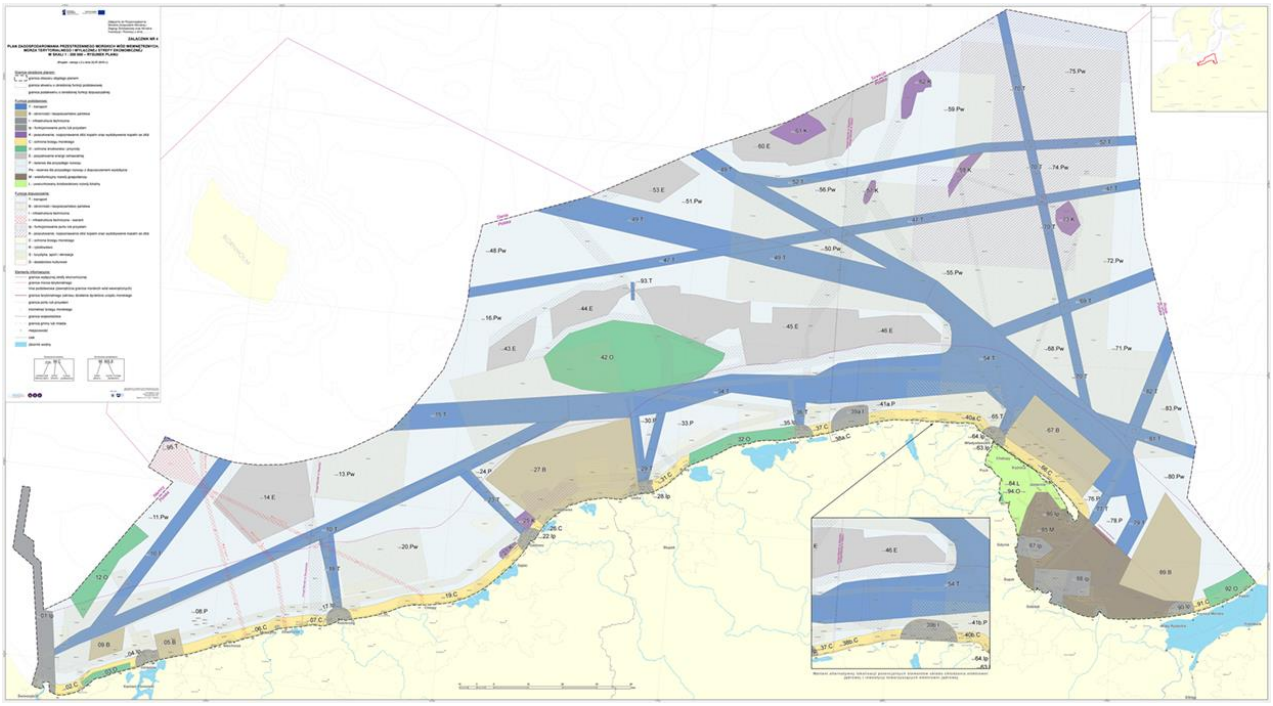
Maritime spatial planning in Poland is governed by the 1991 Act on Sea Areas of the Republic of Poland and the maritime administration[45]. MSP is a national responsibility that lies not only in the competence of the minister for maritime economy, but also with the minister for building, spatial planning and housing (and must be carried out in consultation with ministers responsible for the environment, water management, culture and national heritage protection, agriculture, fishery, internal affairs and the Minister of National Defence). The drafting of the actual maritime spatial plans is a regional responsibility and is carried out by the territorially competent Directors of Maritime Offices who are required by the Act on Sea Areas to consider LSI while addressing submissions in the plan's drafting process. These bodies must also cooperate with local governments of coastal voivodeships and municipalities to ensure coherence between MSP and local spatial planning documents. Moreover, the Act names LSI as one of the issues to be considered by the Director of the Maritime Offices while making decisions regarding comments and motions submitted in the plan's drafting process[46]. The Interministerial Group on Maritime Policy was in operation between 2008 and 2017 and covered coordination of all maritime affairs to ensure a holistic approach to maritime development and spatial planning. It also acted as a liaison between MSP and other governance processes influencing sea space. The group was

[42] *Plan Zagospodarowania Przestrzennego Województwa Zachodniopomorskiego*, http://bip.rbip.wzp.pl/sites/bip.wzp.pl/files/articles/27367_Tekst_planu.zip
[43] *Plan Zagospodarowania Przestrzennego Województwa Zachodniopomorskiego*, http://bip.rbip.wzp.pl/sites/bip.wzp.pl/files/articles/27367_Tekst_planu.zip, p. 10
[44] Założenia Planu Zagospodarowania Przestrzennego Polskich Obszarów Morskich w skali 1 : 200 000 http://www.umgdy.gov.pl/?p=15345
[45] *Ustawa z dnia 21 marca 1991 r. o obszarach morskich Rzeczypospolitej Polskiej i administracji morskiej*, http://prawo.sejm.gov.pl/isap.nsf/download.xsp/WDU19910320131/U/D19910131Lj.pdf
[46] *Ustawa z dnia 21 marca 1991 r. o obszarach morskich Rzeczypospolitej Polskiej i administracji morskiej*, http://prawo.sejm.gov.pl/isap.nsf/download.xsp/WDU19910320131/U/D19910131Lj.pdf

responsible for the elaboration of the Maritime Policy of the Republic of Poland until 2020 (with the 2030 perspective), a strategic document that establishes priorities for sea uses in Poland[47].

In terms of current plans, there is currently no legally binding national maritime spatial plan. Work on the "Draft of the Maritime Spatial Plan of Polish Sea Areas in the scale 1: 200 000" is currently underway and is due for completion by October 2019[48]. Its latest version, which includes modifications resulting from the SEA report and from opinions and motions submitted within public consultation process, has been published together with an updated SEA report in early January 2019[49]. The draft of the plan consists of several documents. It distinguishes a number of areas and subareas of water and assigns to them basic and admissible functions (examples are aquaculture, renewable energy production, research, defence and national security, and fisheries). The draft plan specifies also for the (sub-) areas of water numerous other issues, such as bans and limitations, public investments, terms of using the area, and other. Map 5 below shows the map accompanying the most recent version of the draft.

Map 5: "Map associated with Draft of the Maritime Spatial Plan of Polish Sea Areas in the scale 1: 200 000"



Source: Maritime Office in Gdynia (2019) (https://mapy.umgdy.gov.pl/pzp/home/group.html?id=bec4867931504e4897aa927629c5e03f#overview)

[47] European MSP Platform (2018), Interministerial Group on Maritime Policy of the Republic of Poland and the Maritime Policy of the Republic of Poland, https://www.msp-platform.eu/practices/interministerial-group-maritime-policy-republic-poland-and-maritime-policy-republic
[48] http://www.umgdy.gov.pl/?p=12762
[49] https://www.umgdy.gov.pl/?p=27458

At the regional level, the seaward side of the case study area lies within the competences of the Maritime Office in Szczecin. On this scale, several spatial plans – that are not yet legally binding - are also currently being developed for the Szczeciński and Kamieński Lagoons as well as for the harbours of Szczecin, Świnoujscie, Police, Dziwnów and Trzebież. These plans are expected to be completed towards the end of first half of 2019, with the draft plan for the Szczecin Lagoon being presented to their German neighbours in May or June 2019[50]. The plans of the two lagoons are supposed to define and organize the use of these sea waters. Examples of important functional issues to be addressed are sea mining, fishery, navigation, and tourism and recreation[51]. Similarly, the plans of the harbours are supposed to cover a range of existing and anticipated uses of ports, with important issues being e.g. fisheries, linear infrastructure, navigation, and national defence, among others[52]. Two of the lagoons within the case study area are shown below in Map 6 and 7[53]. Of importance are the bright green and blue shaded areas, which have been designated as areas for tourism and recreation as well as maritime transport, respectively.

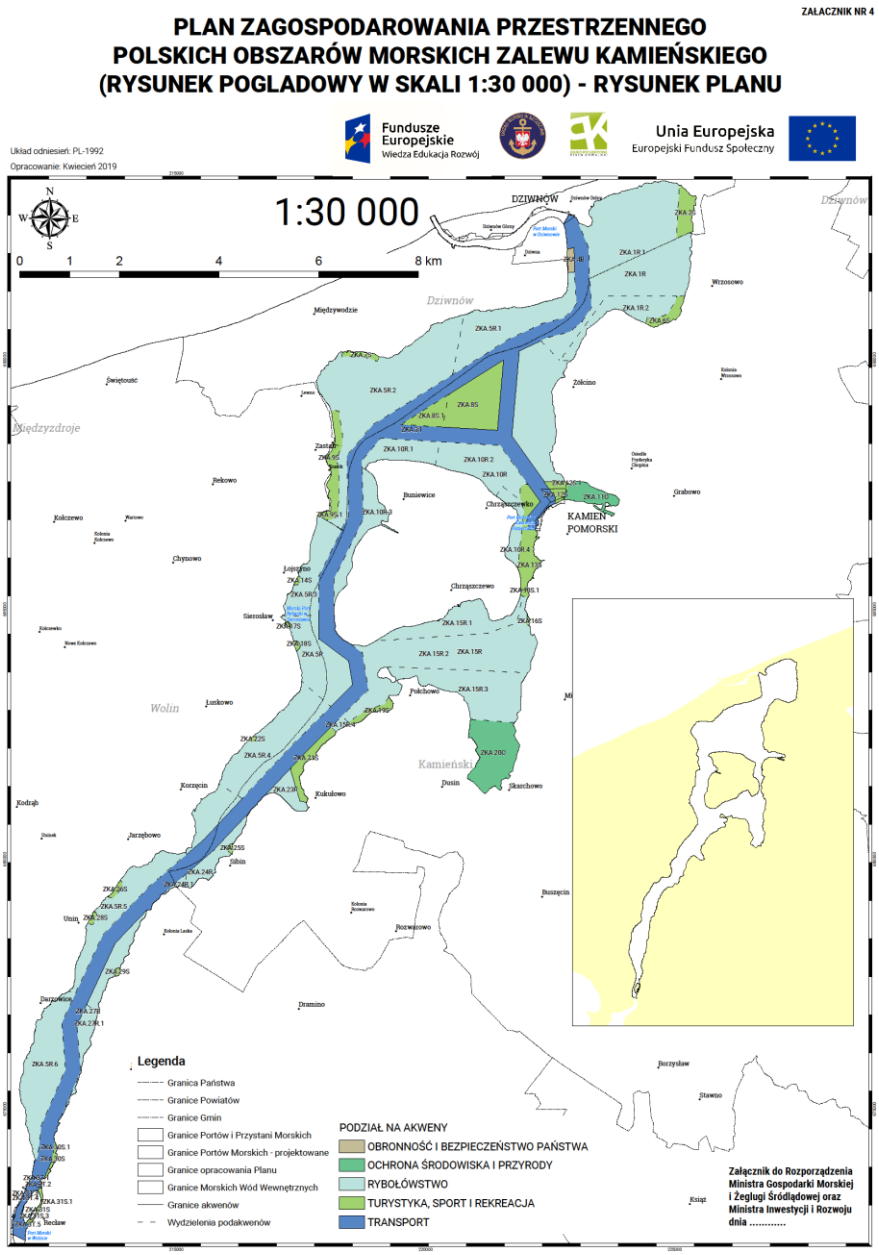
[50] European MSP Platform (2018), *Maritime Spatial Planning Country Information. Poland,* https://www.msp-platform.eu/sites/default/files/download/poland_country_fiche_05.06.2019.pdf, pp. 3-4

[51] http://www.ums.gov.pl/9-informacje/147-projekty-planow-zagospodarowania-przestrzennego-polskich-obszarow-morskich-morskich-wod-wewnetrznych-dla-zalewu-szczecinskiego-i-zalewu-kamienskiego-projekt-powr-02-19-00-00-pm01-16.html

[52] http://www.ums.gov.pl/9-informacje/170-projekty-planow-zagospodarowania-przestrzennego-polskich-obszarow-morskich-porty-w-obszarze-kompetencji-dyrektora-urzedu-morskiego-w-szczecinie-projekt-nr-powr-02-19-00-00-pm02-17-00.html

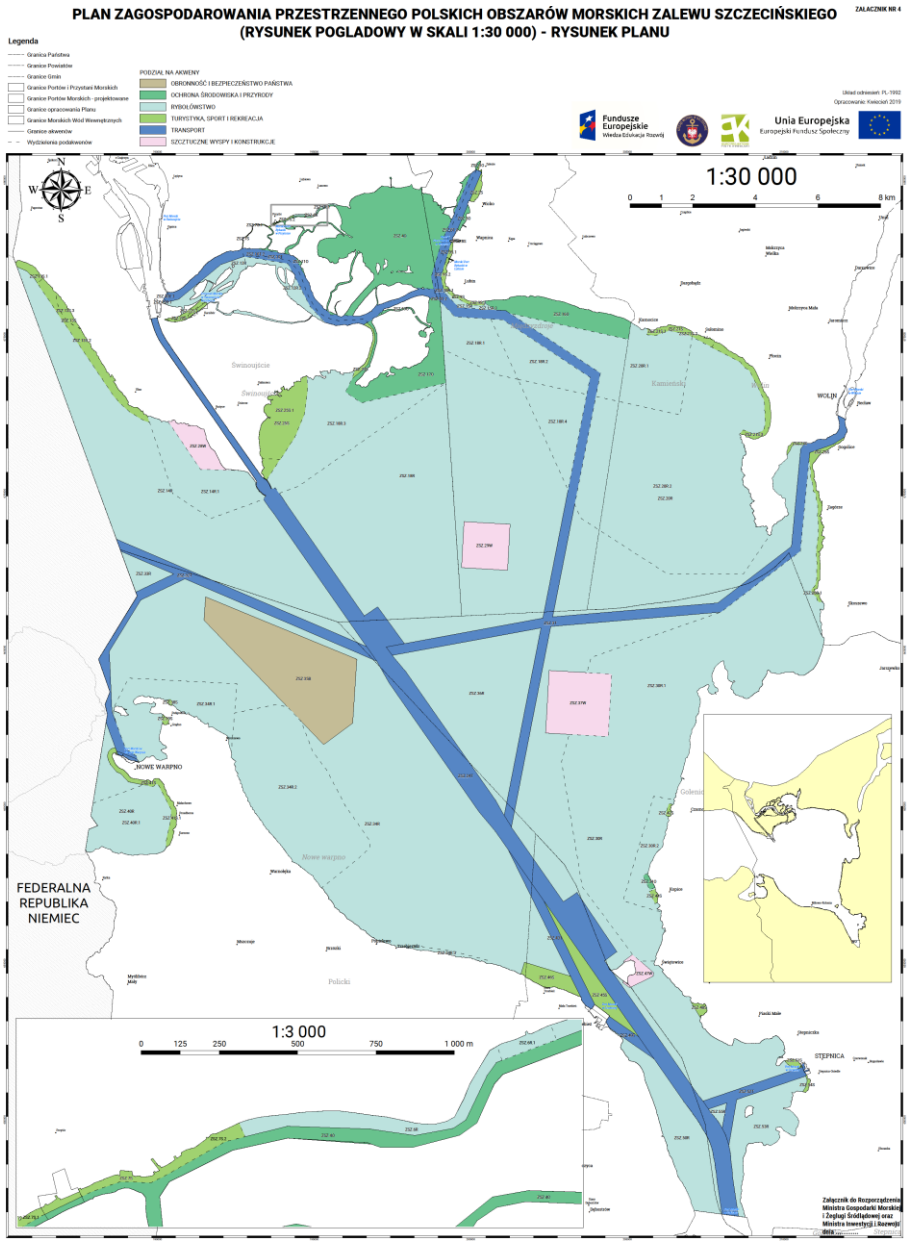
[53] Maps can be found here: http://www.ums.gov.pl/ObszaryMorskie/2018/AKWENY_SZC_2018_13_10K-compressed.pdf and here: www.ums.gov.pl/ObszaryMorskie/2018/AKWENY_KAM_2018_13_10K-compressed.pdf

Map 6: Spatial plans for Kamieński Lagoon - DRAFT



Source: Maritime Office in Gdynia (2019) (http://www.ums.gov.pl/ObszaryMorskie/2019/PZP%20POM_Z_Kam_zal%204_v2_20190415_rysunek.pdf)

Map 7: Spatial plans for Szczeciński Lagoon – DRAFT



Source: Maritime Office in Gdynia (2019). (http://www.ums.gov.pl/ObszaryMorskie/2019/PZP%20POM_Z_Szcz_zal%204_v2_20190412_rysunek.pdf)

With regards to LSI, the Polish National Spatial Development Concept 2030 lays down that national-level marine spatial plans need to be accompanied by specifying procedures which will guarantee coherence between the marine and the land parts of the coastal zone. The document explains further that the preparation of marine spatial plans and spatial plans for land areas alongside marine areas will necessitate consultations among the bodies responsible for the respective plans. These consultations should be conducted in compliance with the Integrated

Coastal Zone Management[54]. Moreover, the Decree of the Minister of Transport, Construction and Marine Economy and the Minister of Regional Development regulates what needs be considered in marine spatial plans. This includes, among others, the aims and directions specified in the country's spatial development concept and decisions made within local spatial plans of coastal municipalities[55]. For Poland's ongoing process of developing its MSP, the documentation of the planning process shows that LSIs have been taken into consideration. Firstly, the study of conditions of MSP of the Polish Sea Areas discusses extensively the conditions resulting from management of coastal areas. It discusses the conditions stemming from physical geography of the region, the issues of demography, economy, tourism and the availability of the coast by road. Interestingly, it points out to the lack of consistency in defining the "coastal area", which leads to certain assumptions being made within the analysis. Furthermore, the study performs an analysis of local and regional strategic and planning documents of the Pomorskie and Zachodniopomorskie Voivodeships (administrative regions with a long coastal line). In the case of Zachodniopomorskie, the analysis finds that tourism and marine economy are particularly important in spatial planning and that their good functioning and development needs to be facilitated. The analysis has also found that certain municipalities oppose investments on the sea related to wind energy and mining activity because they conflict with tourism. The analysis formulates recommendations and identifies information deficits[56]. Another indication of considering land-sea interactions in the planning procedure are consultation meetings accompanying the process. For example, in November 2017, topics related to the coastal zone, e.g. tourism, coastal protection and nuclear power infrastructure were discussed[57].

The Zachodniopomorskie Voivodeship Spatial Management Plan[58] covers the Voivodship's administrative territory and to some extent the adjacent territories. It also covers the LSI if they have an impact on the Voivodeship's spatial planning – e.g. in the case of natural protection areas or offshore wind farms[59]. The Plan also outlines plans for environmental protection through seven topic areas e.g. protection and rational use of soils or preventing climate change and limiting the emissions of pollutants to the atmosphere. The document outlines specific decisions, recommendations and projects regarding these issues. Examples of decisions with

[54] National Spatial Development Concept 2030, pp. 176-177: Recommendation 2002/413/EC of the European Parliament and of the Council of 30 May 2002 concerning the implementation of Integrated Coastal Zone Management in Europe. Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32002H0413&from=EN

[55] *Rozporządzenie Ministra Transportu, Budownictwa i Gospodarki Morskiej i Ministra Rozwoju Regionalnego z dnia 5 sierpnia 2013 r. w sprawie planów zagospodarowania przestrzennego polskich obszarów morskich, http://prawo.sejm.gov.pl/isap.nsf/download.xsp/WDU20130001051/O/D20131051.pdf*

[56] Instytut Morski w Gdańsku. Samodzielna Pracownia Polityki Przestrzennej (2015), *Studium Uwarunkowań Zagospodarowania Przestrzennego Polskich Obszarów Morskich wraz z analizami przestrzennymi*, http://www.umgdy.gov.pl/wp-content/uploads/2015/04/INZ_Studium_Uwarunkowan_Zagospodarowania_Przestrzennego_POM_20032015.pdf, pp. 99-141

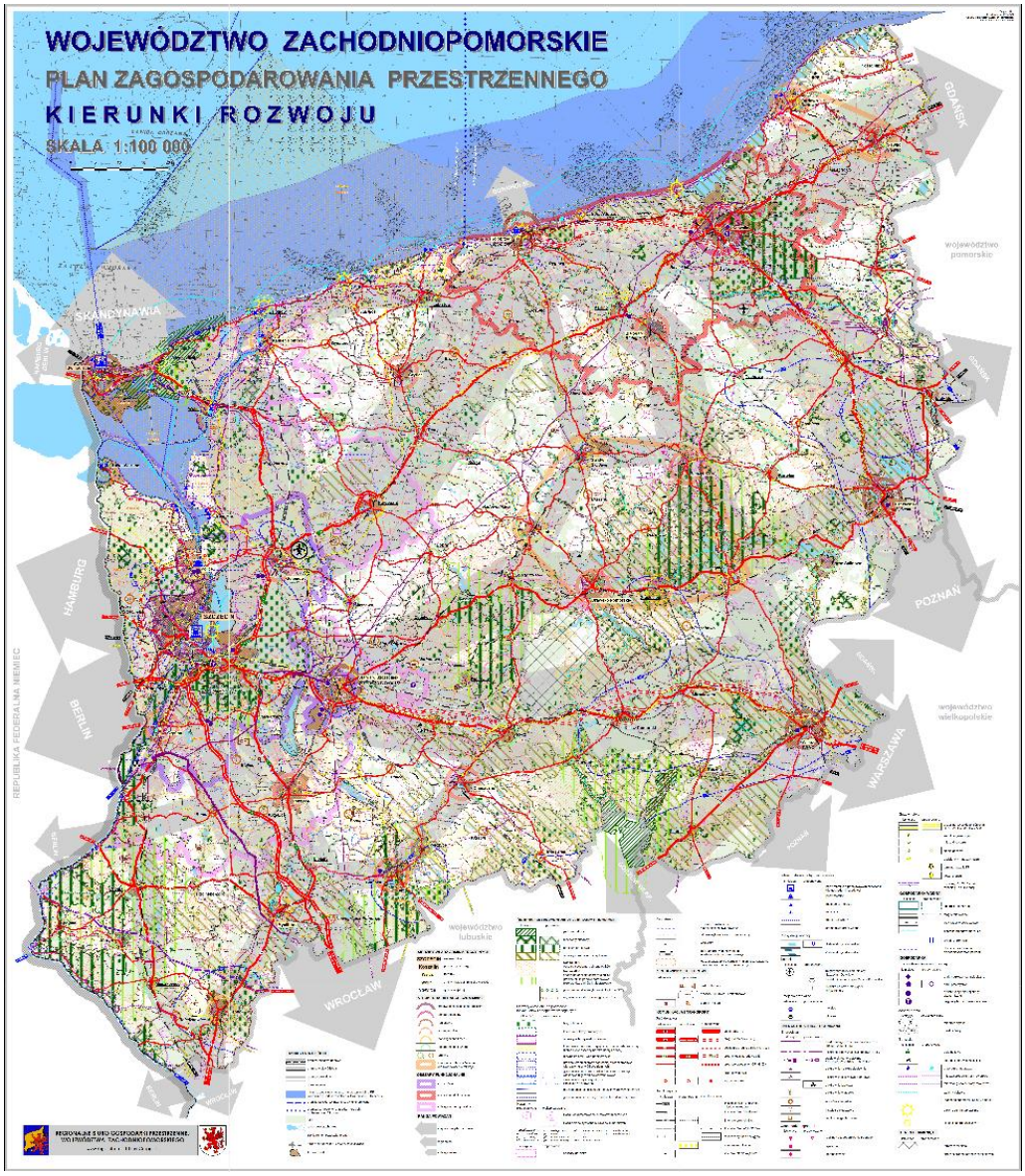
[57] http://www.umgdy.gov.pl/?p=20962

[58] *Plan Zagospodarowania Przestrzennego Województwa Zachodniopomorskiego*, http://bip.rbip.wzp.pl/sites/bip.wzp.pl/files/articles/27367_Tekst_planu.zip

[59] *Ibid.*

relevance to LSI are restrictions regarding investments in the coastal zone at the risk of coast erosion of storm-floods and fostering tourism, including agrotourism as supply base for the Baltic coastal zone.[60]. Map 8 below shows the map accompanying the plan.

Map 8: The Zachodniopomorskie Voivodeship Spatial Management Plan



Source: http://bip.rbip.wzp.pl/sites/bip.wzp.pl/files/articles/27367_Mapy_do_tekstu_planu.zip

Work on a new version of the Zachodniopomorskie Voivodeship Spatial Management Plan is currently underway. The documentation of the process including a draft of the new plan and opinions submitted within the public participation process are available online[61].

The Pomeranian Bight (both Polish and German areas) was part of the territory subject to a pilot transboundary maritime spatial plan conducted within the BaltSeaPlan project which also

[60] *Ibid.*
[61] http://bip.rbip.wzp.pl/tabela/artykuly/763/1030

included Denmark and Sweden in the process. Within the project, several potential conflicts in the Pomeranian Bight involving the environment were considered. In Germany, these included e.g. conflicts between nature conservation and offshore wind energy projects, shipping and fishery. In Poland, issues were identified with respect to water quality. Moreover, stakeholder consultations showed potential conflicts in Poland between nature conservation and uses of the maritime area for such activities as shipping, sand and gravel extraction or dumping of dredging material[62].

[62] Käppeler, B., et al. (2009), *Developing a Pilot Maritime Spatial Plan for the Pomeranian Bight and Arkona Basin*, pp. 57-65, https://www.msp-platform.eu/sites/default/files/baltseaplan-developing-a-pilot-maritime-spatial-plan-for-the-pomeranian-bight-and-arkona-basin.pdf

4 Value Chain Analysis

The following section provides an in-depth look into the two focal sectors of this case study: coastal tourism and offshore wind energy utilising value chain approaches to inform LSI understanding and in particular identification of the main impacts on land of key maritime activities. The sections below detail: the development of the sector value chains; key sector characteristics; the framework conditions that they operate within (including links to governance and strategic plans), their key actors, as well as associated LSI. Analysis of these value chains aims to provide an understanding of their relative importance to the Pomeranian Bight case study area, as well as how they have and are expected to develop in the future. In the context of Blue Growth, these maritime sectors undoubtedly rely on land infrastructure to support and expand their activities, which should be taken into consideration in terrestrial spatial planning. Furthermore, these sectors are important for MSP plans and the development and use of maritime space, should be taken into account within national and local MSP processes.

4.1 Coastal tourism in the Pomeranian Bight

4.1.1 Developing the Value Chain - methodological clarifications

The general value chain for the maritime activity of coastal tourism was built based on the tourism value chain provided by the WTP 2013 report[63]. However, because the tourism value chain from this report is very detailed, includes too many segments and it was not specifically built with the purpose of spatially highlighting the Land Sea Interactions of the Tourism Value Chain, we decided to merge the various segments of this chain into some more general combinations. This is why, the “general” value chain diagrams provided by this work differ in some respects from those existing ones in already available literature.

Although the focus is indeed different, the value chain approach adopted in our work remains coherent with the more general value chains presented in relevant literature e.g. the DG MARE Blue Growth Report[64], and the WTO global value chains. See Figure 9 below showing how the WTP 2013 report value chain for tourism and the one provided by this report connect.

[63] World Trade Organization, 2013. Aid for Trade and Value Chains in Tourism. Page 23/Figure 3. http://www.oecd.org/dac/aft/aidfortradeandvaluechains.htm

[64] https://ec.europa.eu/maritimeaffairs/sites/maritimeaffairs/files/docs/publications/blue_growth_third_interim_report_en.pdf

Figure 3: World Trade Organization 2013 report value chain for tourism and its fit with the general value chain proposed by this report.

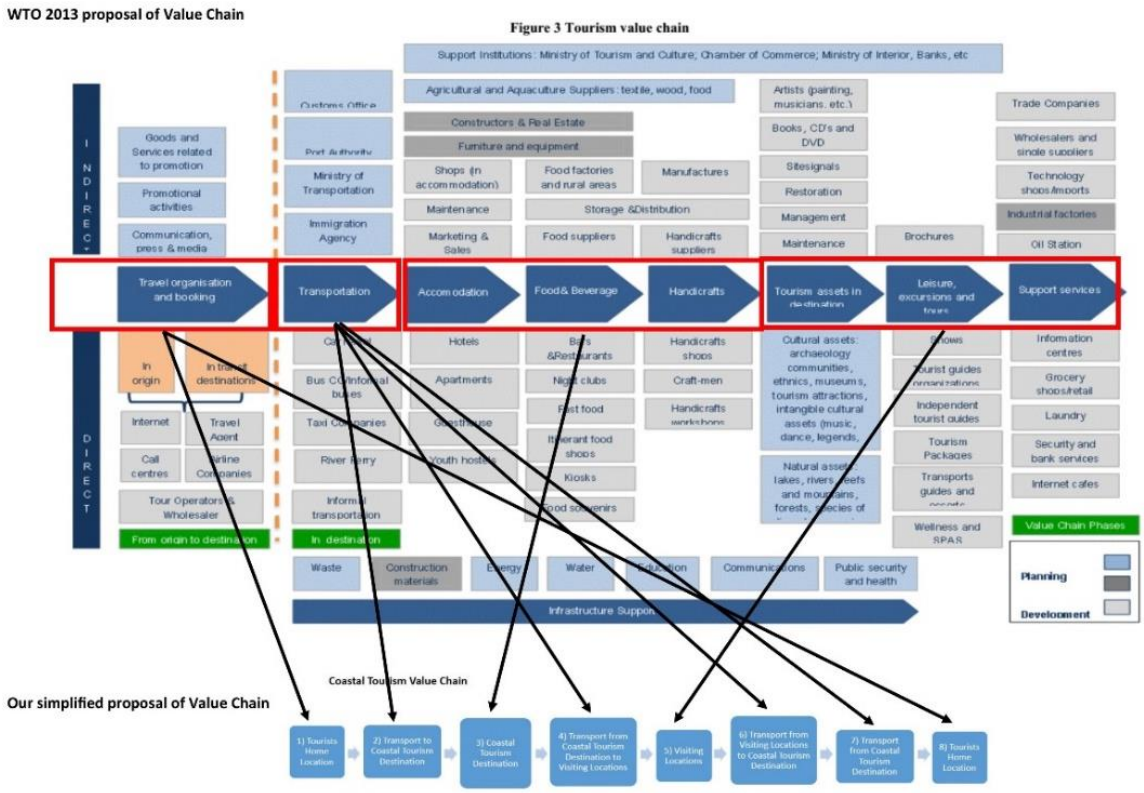


Figure 4 shows the various segments that constitute the general value chain of Coastal Tourism used here[65]:

Figure 4: General Value Chain of Coastal Tourism

The entire coastal tourism value chain can be summarized into the following 8 segments:

- Segment 1) Tourist Home Location. Place of origin of Tourists.
- Segment 2) Transport to Coastal Tourism Destination. Ways in which tourists transport themselves to the coastal tourism destination.

[65] Including Coastal Tourism activity but excluding Passengers Transport and Cruise Tourism

- Segment 3) Coastal Tourism Destination. Tourism destination areas (where they stay most of the time)
- Segment 4) Transport from Coastal Tourism Destination to Visiting Locations. Ways in which tourists transport themselves to visiting places.
- Segment 5) Visiting Locations. Visited places or performed activities outside of main stay area.
- Segment 6) Transport from Visiting Locations to Coastal Tourism Destination. Ways in which tourists transport themselves from visiting places.
- Segment 7) Transport from Coastal Tourism Destination. Ways in which tourists transport themselves out of the coastal tourism destination.
- Segment 8) Tourist Home Location. Place of origin of Tourists.

4.1.2 Key characteristics of coastal tourism in the Pomeranian Bight

Coastal Tourism is an extremely important economic sector in the case study area. In the German part of the Pomeranian Bight, the state of Mecklenburg-Vorpommern is the number one destination for tourism in Germany with 18 overnight stays per inhabitant, triple the national average and ahead of neighbouring Schleswig-Holstein (10 overnight stays) and Berlin (9 overnight stays). Within this region, the Baltic coast, the area of Vorpommern and the Islands of Rügen and Hiddensee are the most popular areas. The coastal area of Vorpommern-Rügen had by far the highest level of overnight stays per inhabitant (43 overnight stays)[66]. 95% of these visitors are German national tourists, with only 5% of visitors coming from outside of Germany. Nearly two thirds of these international visitors to the Mecklenburg-Vorpommern region came from 5 countries: Sweden (19%), Denmark (14.8%), Switzerland (13%), the Netherlands (11.6%) and Austria (6.5%). The largest group of non-European visitors (5,800 visitors) came from the United States (+4.9%). In 2017, foreign guests numbered 382,100 arrivals, with around 1 million overnight stays registered in accommodation establishments (including camping), a slight increase of 0.6% with respect to the previous year. However the total number of overnight stays booked by foreign visitors fell by 3.5%. Of the top 5 visitors, only Swedish visitors had a growth (+6.2%) in overnight stays in 2017[67].

Mecklenburg-Vorpommern attracts the majority (70%) of its tourists due to its nature and outdoor areas and activities, with 17% of the region composed of national protected areas. In 2018, the Landestourismusverband (Regional Tourism Association) lists 7 natural wonders for summer holiday destinations, one third of which are under nature conservation and boasts three national parks, more than any other federal state. The 7 natural wonders include: (1) the

[66] Statistisches Amt Mecklenburg-Vorpommern, Schwerin (2018). “Statistisches Jahrbuch Mecklenburg-Vorpommern 2018”. Available at: https://www.laiv-mv.de/static/LAIV/Statistik/Dateien/Publikationen/Statistisches%20Jahrbuch/Z011%202018%2000.pdf
[67] Tourismusverband Mecklenburg-Vorpommern e.V. (2018). “Incoming-Tourismus”. Available at: https://www.tmv.de/incoming-tourismus/

islands, (2) the chalk cliffs, (3) the cranes, (4) the wilderness, (5) the lagoons, (6) the lake landscapes and (7) the coastal forests. The region's 2,000 or so lakes offer visitors the chance to swim, canoe and houseboat. Along the coast, visitors can surf, sail and kite board along the 2,000 km coastline. In the winter, ice sailors can be observed on frozen bays and lakes[68].

With an annual gross turnover of over 5.1 billion EUR and an estimated share of around 10% of primary income, tourism in Mecklenburg-Vorpommern generates twice as much as the national average. Beach tourism, sailing and other watersports are particularly popular. There is already considerable infrastructure on the German side of the case study: Mecklenburg-Vorpommern has over 350 Marinas, 14,000 moorings along the coast and 7,725 in inland waters (with 190 coastal marinas and about 11,300 berths in the Vorpommern region alone)[69]. Strategic investment and further development has been called for but the development of coastal and maritime tourism (e.g. new marinas, increasing ferry shipping) may result in conflict with nature conservation goals[70].

Mecklenburg-Vorpommern benefits from its beaches and well-developed accommodation infrastructure, though this varies within the region. Vorpommern (including Usedom) and the Baltic Sea coast of Mecklenburg have shown double-digit growth rates since 2011, while Western Mecklenburg and Mecklenburg Switzerland and Lake District are stagnating[71]. Spring and autumn sees cranes come through the Rügen-Bock-Kirr region and in the Mecklenburg Lake District, attracting nature lovers and photographers. The region also attracts tourists with an interest in active holidays, with four out of ten guests in Mecklenburg-Western Pomerania cycling or hiking, three out of ten visit nature destinations or go on water excursions. The Baltic Coast Cycle Route is one of the top 5 most popular long-distance cycle routes in Germany[72]. Indeed, cycle tourism is the most important active segment within the region's tourism. 43% of visitors use bicycles during their stay and 22% of the guests specifically describe their stay as a cycling. The most popular long-distance cycle routes in the region include the Baltic Sea Coast Cycle Route and the Berlin-Copenhagen cycle route (which can be seen in Map 8)[73].

In 2018, tourism in Mecklenburg-Vorpommern hit an all-time high of 30.9 million overnight stays, with 4.95 million of these in camping alone, mainly due to increases in visits to the coastal regions. Since 2010, the number of all statistically recorded overnight stays rose by 9.7%. Coastal towns, in particular Rostock, Stralsund and Wismar are among the biggest drivers of

[68] Tourismusverband Mecklenburg-Vorpommern e. V. (2016). "Evergreens: Mecklenburg-Vorpommerns Naturwunder". Available at: https://www.urlaubsnachrichten.de/2016/06/28/evergreens-mecklenburg-vorpommerns-naturwunder/

[69] http://app-rpv.de/rpv-vorpommern/wp-content/uploads/sites/2/2017/05/Standortkonzept_Sportboothaefen_Planungsregion_Vorpommern_gesamt_2017.pdf

[70] Pentz, Tim-Ake; Janßen, Holger (2012) *ESaTDOR Governance papers BaltSeaPlan: Trans-boundary Maritime Spatial Planning in the Baltic Sea. The case of the Pomeranian Bight*

[71] Ostdeutscher Sparkassenverband (2017). "Sparkassen-Tourismusbarometer: Jahresbericht 2017". Available at: http://www.osv-online.de/fileadmin/osv/dateien/tourismus/S-Tourismusbarometer_2017_komplett.pdf

[72] *Ibid.*

[73] Tourismusverband Mecklenburg-Vorpommern e. V. (2018). "Radwandern". Available at: https://www.tmv.de/radwandern/

growth in Mecklenburg-Vorpommern. As a whole, towns in the region saw an increase of 19% in overnight stays in the year 2016 in comparison to 2011. The above mentioned three Hanseatic towns saw an even more marked improvement of 28% growth during this same period[74]. In 2017, the locations with the highest number of overnight stays were the coastal spa town Heringsdorf (2.34 million), the Hanseatic town of Rostock (2 million), the coastal spa towns of Binz (1.85 million) and Kühlungsborn (1.65 million) and the coastal bathing site Warnemünde (1.2 million) belonging to Rostock[75].

Though Mecklenburg-Vorpommern is an attractive tourist destination, there is an issue of overcapacity in these coastal regions, with only 35.1% of available accommodation (including camping) being occupied in 2017, a decreased of 0.7% from 2016. Hotels (excluding bed and breakfasts) had an occupancy rate of 49.3% in 2017 (2016: 49.6%) and the occupancy rate of bed facilities on camping sites was 17.5% in 2017 (2016: 19.0%). According to the Mecklenburg-Vorpommern Statistical Office, in 2017 the campsites in the state reported around 0.99 million guests booking 4.56 million overnight stays: a reduction of 7.9% for overnight stays and a loss of 4.6% for arrivals[76]. Mecklenburg-Vorpommern accommodation providers in segments such as inns and guesthouses, youth hostels/cottages and camping are coming under increasing pressure. Overall, the relationship between the development of demand and supply led in the medium term to an urgently needed increase in occupancy rates[77].

There is also seasonality with bookings, with the majority of booking being made in the summer months of July and August, numbering 10.1 million overnight stays or 34% of all overnight stays in 2017. Despite this seasonality, the average occupation rate has seen a marked increase and is higher than average for east Germany. Average room prices are among the highest in eastern Germany and continue to increase, while the number of bankruptcies in the hospitality industry is at a positive low. Businesses in this industry have the highest turnovers and profit margins in east Germany and should mean that there are opportunities for investment. Furthermore, businesses are fighting over staff in what is, for many, an unattractive industry with low wages and high seasonality. The growth curve of tourism in Mecklenburg-Vorpommern is also flattening out and the region has been losing market share for some time to the competition in neighbouring Schleswig-Holstein. Early warning signals are visible among customer satisfaction surveys, where Mecklenburg-Vorpommern has dropped from 1st place nationally to 5th place in 2016[78].

In the Polish part of the case study area, coastal tourism also plays an important role. The Zachodiopomorskie Voivodeship has almost 200 km of coastline with bright beaches and high

[74] Ministerium für Wirtschaft, Arbeit und Gesundheit Mecklenburg-Vorpommern (2018). "Landestourismuskonzeption Mecklenburg-Vorpommern". Available at: https://www.regierung-mv.de/serviceassistent/_php/download.php?datei_id=1606891
[75] Statistisches Amt Mecklenburg-Vorpommern, Schwerin (2018).
[76] *Ibid.*
[77] Ostdeutscher Sparkassenverband (2017).
[78] *Ibid.*

cliffs and good conditions for water sports such as sailing or windsurfing[79]. In Poland, mountains in the south and the Baltic Sea coast in the north are the country's most attractive tourist areas[80]. Within the Pomeranian Bight, the Polish side encompasses the "Voivodeship" or province of Zachodniopomorskie. This province has many inland waters and a long coastline along the Baltic Sea. Its extensive network of ports and marinas has helped establish the West Pomeranian Sailing Trail, which runs along the river Oder, via Szczecin, Dąbie Lake, Szczecin Lagoon, into the Baltic Sea. In addition to its large number of protected Natura 2000 sites, most of which are dedicated for birds, the province has two national parks (i.e., Woliński Park and Drawieński Park) and seven landscape parks. Tourists in the region like leisure tourism around the sea and lakes, as well as sightseeing and active tourism, along tourist trails, including cycling routes, horseback riding trails and kayaking routes[81]. It is the second ranked province in terms of the overall length of trails (2017: 7.8 thousand km), with the largest number of lowland hiking trails (3.8 thousand km) and bicycle trails (3.6 thousand km)[82]. Furthermore, the province is developing health-resort and spa tourism (e.g., in Kołobrzeg, Kamień Pomorski, Połczyn Zdrój, Świnoujście and Dąbki)[83]. In all of Poland, Zachodniopomorskie dominates in the number of nights spent in health establishments in 2017 (25.5%). In terms of the number of beds, the number of tourists, as well as the number of overnight stays, Zachodniopomorskie province ranks the highest. Its high position is determined primarily by three factors: its coastal location, the presence of health resorts and low population density[84].

In 2016, the seaports of Zachodniopomorskie served 1.2 million passengers in international traffic, of which 49.7% were arrivals and 50.3% departures. Świnoujście had the highest passenger traffic with 1.1 million people while Międzyzdroje saw 66.7 thousand people. Roughly 900 people started or finished their journey in Szczecin, 27.1% less than in 2015. In total, 1,489 passenger ships arrived in the province (2.3% less than in 2015) with a net tonnage of 191 thousand (2.0% less than in 2015) and a carrying capacity of 85.1 thousand tonnes (5.3% less than in 2015). Passengers from cruise ships amounted to 8,600 passengers in 2016, 4.6% less than in 2015, arriving on 121 cruise ships (21.9% less than in 2015) with a net tonnage of 33.4 thousand (26.9% less than in 2015) and a carrying capacity of 74.8 thousand tonnes (37.6% less than in 2015). Szczecin alone saw 21 passenger ships (net capacity of 4.3 thousand tons and a capacity of 3.7 thousand tons) and 84 cruise ships (net capacity of 22.4 thousand tons and a capacity of 52.4 thousand tons) in 2016[85]. Some of the largest seaports in Poland in

[79] https://www.paih.gov.pl/regiony/wojewodztwa/zachodniopomorskie
[80] Polish Ministry of Sport and Tourism (2015). "Resolution No. 143/2015 of the Council of Ministers of 18 August 2015 on the adoption of the Tourism Development Programme until 2020". Available at: https://www.msit.gov.pl/download/3/12550/TourismDevelopmentProgrammeuntil20201f3c.pdf
[81] Polish Ministry of Sport and Tourism (2015); Pomorze Zachodnie (2018). "Szlaki Turystyczne". Available at: http://www.turystyka.wzp.pl/szlaki-turystyczne
[82] Statistics Poland (2018). "Turystyka w 2017 r". Available at: http://eregion.wzp.pl/obszary/turystyka
[83] Polish Ministry of Sport and Tourism (2015).
[84] Statistics Poland (2018). "Turystyka w 2017 r".
[85] Statistical Office in Szczecin (2017). "Transport w województwie zachodniopomorskim w 2016 r". Available at: http://szczecin.stat.gov.pl/publikacje-i-foldery/transport-gospodarka-morska-zegluga/transport-w-wojewodztwie-zachodniopomorskim-w-2016-r-,5,7.html

terms of the number of border crossings for trips outside the Schengen zone are located in Zachodniopomorskie, including:

- Szczecin Port - 20.1 thousand border crossings (-4.9% compared to 2016)
- Kołobrzeg Port - 15.6 thousand border crossings (-16.6% compared to 2016)
- Świnoujście Port - 7.3 thousand border crossings (+3.4% as compared to 2016)[86]

In 2016, there were 124,091 accommodation facilities in the Zachodniopomorskie Voivodeship, with 112,783 (around 90%) of them located in coastal areas. Similarly, some 88% of tourists in the voivodeship in 2016 visited coastal areas, with this proportion even higher (ca. 94%) in the case of visitors from abroad[87].

In July and August 2018, over 4 million tourists stayed in the province, an increase of almost 10% compared to the previous year (2017: 3.7 million visitors)[88]. The number of visitors from Germany increased to 578,088 in 2017 (an increase of 61,064 - more than 81% of the total number of foreign tourists visiting the region). Furthermore, 2017 saw 31,447 visitors from Denmark (+1,399 from 2016), 19,945 from Sweden (+815 thousand from 2016), and 11,538 from the Ukraine (+4,256 from 2016)[89].

In 2017, 1,449 tourist accommodation establishments, consisting of 281 hotels and 1,168 other establishments were operating in Zachodniopomorskie. A large group of tourist accommodation facilities consisted of guest rooms/private accommodation (442) and holiday resorts (357) with 8.2% and 38.3% of accommodation places at their disposal, respectively. Significant parts of the province's tourist base were also hotels (127), other hotel facilities (109) and complexes of tourist cottages (102)[90].

Tourist accommodation facilities provided approximately 133 thousand beds, 8.5 thousand more than in 2016. The majority of beds were provided in holiday resorts (4.2 thousand), tourist cottages (1.4 thousand) and guest rooms / private accommodation (1.2 thousand). On the other hand, 0.7 thousand beds were lost in training and recreation centres and 0.5 thousand in camping sites. Compared to 2016, the number of year-round accommodation places increased by 2.6 thousand and amounted to 57.4 thousand. Accommodation places available to tourists throughout the year constituted 43.3% of all places in tourist accommodation facilities (44.1% last year). As in the previous year, there were on average 92 beds per tourist facility (96 in hotel facilities and 90 in other facilities). The province also saw an increase of 883 catering facilities

[86] Statistics Poland (2018). "Turystyka w 2017 r".
[87] Statistical Office in Szczecin (2017) *Statistical Yearbook of Maritime Economy*, p. 344
[88] Pomorze Zachodnie (2018). "Turystyka".
[89] Pomorze Zachodnie (2018). "Ruch turystyczny". Available at: http://eregion.wzp.pl/obszary/ruch-turystyczny
[90] Statistical Office in Szczecin (2018). "Turystyka w województwie zachodniopomorskim w 2017 r.". Available at: http://szczecin.stat.gov.pl/opracowania-biezace/opracowania-sygnalne/sport-turystyka/turystyka-w-wojewodztwie-zachodniopomorskim-w-2017-r-,2,10.html

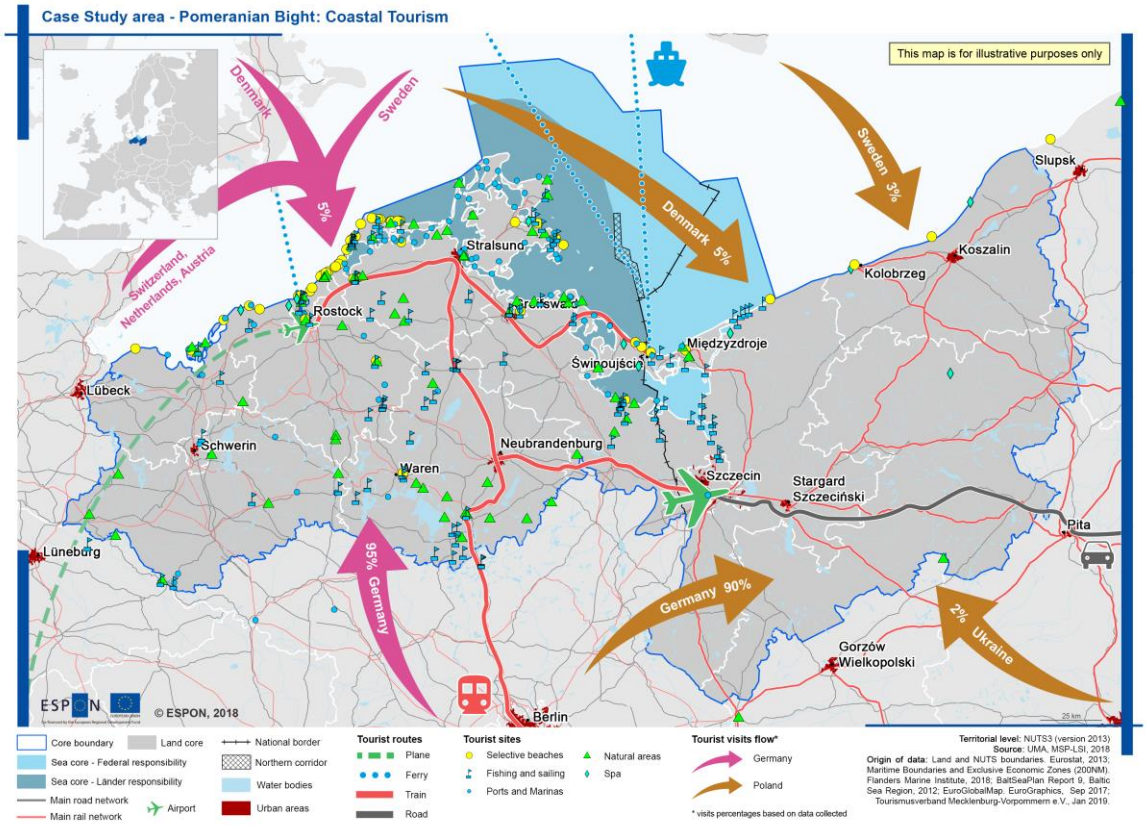
located in tourist accommodation facilities. In 2017, 334 canteens, 270 bars (including cafeterias), 224 restaurants and 55 catering outlets (e.g. frying rooms, pump rooms, ice cream parlours and buffets) were in operation[91].

Zachodniopomorskie is popular with both national and international tourists. The intensity of domestic tourist traffic and the number of domestic trips in total in the first half of 2016 totalled over 1.6 million, ranking third highest in comparison to other Polish provinces[92]. Foreign tourists constituted an important group of people registered in tourist accommodation facilities. In 2017 their number amounted to 711.5 thousand people (25.8% using accommodation facilities), an increase of 73.6 thousand people (11.5%) compared to 2016. Nearly three quarters of foreign guests used accommodation in hotel facilities (72.8%), holiday resorts (9.6%), health resorts (4.6%), campsites (4.1%) and other non-classified facilities (3.2%)[93].

Two health resorts belonging to the self-government of the province are very popular among foreign and national tourists. The Świnoujście Health Resort in the period June - September 2018 had an occupancy rate of 98%, with over 70 thousand overnight stays. It welcomed 4.8 thousand residents to use its spa services, half of which were treated within the framework of referrals from the National Health Fund, and half of which were commercial stays. Among the latter, almost 40% were guests from abroad, with a clear majority from Germany. From Poland, the largest group were inhabitants of the Wielkopolskie province. For the Kołobrzeg Health Resort the occupancy rate was 96%, with over 135,000 overnight stays during the months June-September. Over 11.3 thousand residents took advantage of the health resort's services. In this case there were twice as many individual stays as in the case of referrals from the National Health Fund, and foreigners constituted 20% of them[94].

[91] *Ibid.*
[92] Frąckiewicz, A. (2017). “Problemy i potrzeby zachodniopomorskich pracodawców reprezentujących sektor usług turystycznych”. Available at: https://www.wup.pl/images/uploads/II_DLA_INSTYTUCJI/badania/gospodarka/Raport_z_badania_pn._Problemy_i_potrzeby_zachodniopomorskich_pracodawc%C3%B3w_reprezentuj%C4%85cych_sektor_us%C5%82ug_turystycznych..pdf
[93] *Ibid.*
[94] Pomorze Zachodnie (2018). “Turystyka”.

Map 9: Loactions of key leisure activity locations in the Pomeranian Bight Case Study Area



4.1.3 Framework conditions affecting coastal tourism in the Pomeranian Bight: Germany

At the national level in Germany, the Federal Ministry for Economic Affairs and Energy is responsible for tourism policy. It maintains bilateral relationships at the international level and aims to directly assist the profitability and competitiveness of small and medium-sized businesses – 99% of business in Germany are SMEs – in the tourism industry. However, due to the governance structure of Germany, the central aim of the Ministry is to create an overarching framework; planning, development and investment are the responsibility of the Länder. Coordination of these two levels is carried out through the Federal Government-Länder Committee on Tourism, which meets bi-annually and is chaired by the Federal Ministry of Economic Affairs and Energy.

Overarching framework conditions established at the national level include the following examples. The Second Amendment of the Telemedia Act (2016) clarifies the liability of hotels, restaurants and cafes with open Wi-Fi hotspots in relation to user infringements and is an important step to ensuring availability of easy access to Wi-Fi for tourists. The national river

restoration and renaturation initiative Blue Ribbon Germany Commissioned by the German Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety and the Federal Ministry of Transport and Digital Infrastructure aims to include the economic potential of water sports and tourism when balancing interests.

In the Mecklenburg-Vorpommern region where tourism is of great economic importance much emphasis is given to developing the region's tourism offer in a sustainable and climate-friendly manner. These perspectives are emphasised in the 2018 State Tourism Concept Mecklenburg-Vorpommern (Landestourismuskonzeption)[95]. 95% of visitors to the region are German nationals and 31% of Germans now attach importance to their holidays being ecologically compatible, resource-friendly and environmentally friendly. 38% state that it is important to have a socially responsible holiday. These social and environmental factors are thus crucial to the sector's competitiveness and have become an expectation of – especially German – customers[96].

A regional circular economy ("Regionale Wirtschaftskreisläufe") and integrated value chains are important parts of the new approach to tourism in Mecklenburg-Vorpommern. In the future, this must pursue the goal of balancing out tourism flows even further – both regionally (from the coast to the interior) as well as temporally (from peak to the shoulder or off-season, bed turnover every day). The aim of the tourism concept is to improve public transport and have mobility chains that are so attractive that people can travel comfortably from A to B without their own car, down to the last mile.

According to Integrated State Transport Plan for Mecklenburg-Vorpommern "As far as possible many tourists should arrive without a car or at least leaves their car at the scene." This is about substantially reducing traffic congestion, especially in the highly frequented seasonal periods, a contribution to climate protection and positive image effects (positioning as a destination for recreation and nature holidays) and the development of new target groups[97].

There is also an increasing acknowledgement that there needs to be a qualitative improvement in the touristic offer to remain competitive with other regions and to exploit further opportunities for adding value. Over the past 25 years, there has been an enormous amount of tourism infrastructure built in Mecklenburg-Vorpommern, both in terms of the private sector (hotels, gastronomy, leisure facilities etc.) as well as the public sector (road infrastructure, sites, transport infrastructure etc.). Since 1990 investments have totalled 6.83 billion EUR, with a total

[95]Ministerium für Wirtschaft, Arbeit und Gesundheit Mecklenburg-Vorpommern (2018). "Landestourismuskonzeption Mecklenburg-Vorpommern Available at: https://www.regierung-mv.de/serviceassistent/_php/download.php?datei_id=1606891

[96] Ministerium für Wirtschaft, Arbeit und Gesundheit Mecklenburg-Vorpommern (2018).
[97] Ministerium für Wirtschaft, Arbeit und Gesundheit Mecklenburg-Vorpommern (2018). "Landestourismuskonzeption Mecklenburg-Vorpommern".

grant of 2.48 billion EUR for tourist infrastructure alone[98]. However, improvements are still needed.

Between 2007 and 2014, 116 million EUR was invested in 750 tourism measures under the regional development programme for Mecklenburg-Vorpommern using finance from the European Rural Development Fund as well as funds from the joint Federal/state programme for improving agricultural structures and coastal protection and the joint Federal/state programme for improving regional economic structures. The main focus of these investments were the creation of small infrastructure facilities, the improvement of tourist traffic and pathways, the conversion of existing buildings into tourist facilities, the construction of cycle paths or rest areas for water routes and other basic tourism facilities, including the marketing of tourist services[99]. Nevertheless, despite the overall good figures for Germany's Mecklenburg-Vorpommern coast, competitors such as Schleswig-Holstein and the Polish Baltic Sea coast are increasingly investing, and Mecklenburg-Western Pomerania is losing market share in coastal tourism, especially in the pre- and post-season as well as in the off-season[100].

However, as in previous years, Mecklenburg-Western Pomerania is proving to be the leader among the eastern German federal states. The region has had the highest profit margins for years, at 10.4% this was the second-highest level in the last ten years. Brandenburg and Thuringia follow by a clear margin with around 7% and Saxony and Saxony-Anhalt with values below 6%. Overall, the average annual profit margin rose in all five federal states - most strongly in Mecklenburg-Western Pomerania (+1.6%) and least in Brandenburg (+0.3%). The return on sales in the accommodation sector rose in all eastern German states except Thuringia. In the gastronomy sector, Mecklenburg-Western Pomerania in particular lost ground, but Thuringia saw a slight increase[101].

Regarding employment, since 2006, the number of jobs in the German hospitality industry has been rising steadily. Improved framework conditions combined with the introduction of minimum wage have recently led to a change in the employment structure in the hospitality industry, noticeable in all eastern German states. Overall, more full time jobs subject to social security contributions were created than minor jobs. Nationally, the proportion of part-time employees in the hospitality sector fell from 38.9% to 37.0%, while in eastern Germany the figure fell even more sharply, from 28.5% to 26.5%. However, the hospitality industry still suffers from a poor image and has led to a severe shortage of skilled workers and junior staff, exacerbated by demographic changes. In eastern Germany, 38% of companies and 36% nationwide, state that they are unable to fill vacancies in the longer term. The proportion of unfilled training places is also increasing. In Brandenburg and Mecklenburg-Western Pomerania, every third to fourth training place is vacant. Accommodation companies can respond with image campaigns, a

[98] *Ibid.*
[99] Landesregierung Mecklenburg-Vorpommern (2016). "Mittelstandsbericht Mecklenburg-Vorpommern 2015". Available at: http://auvnb.de/fileadmin/01_content/Sonstiges/Mittelstandsbericht_MV_2015.pdf
[100] Ostdeutscher Sparkassenverband (2017).
[101] *Ibid.*

better work-life balance, more recruitment of older and foreign employees and - taking up current developments - training opportunities for refugees. Around a quarter of East German and 30% of German companies state that they would like to employ refugees as a counter-strategy to the shortage of skilled workers[102].

The shortage of skilled workers and junior staff is and remains one of the key issues for Mecklenburg-Vorpommern tourism. The number of training places offered in the hospitality industry has fallen further since 2010, despite a stable supply volume. In 2015, around 16% fewer training places were available than five years previously. Nevertheless, the number of unfilled training places rose in parallel to this - the proportion of unfilled training places in all training places climbed from 21% (2010) to just under 26% (2015). Vacancies in the hotel and restaurant sector in Mecklenburg-Western Pomerania rose by around 40% between 2010 and 2015, far higher than the national average of 27%. Almost 14% of all vacancies in the northeast fell to the hotel and restaurant industry in 2015. In many places, the quality of supply is already suffering due to overstrained service staff and poorly trained temporary workers. More and more companies are considering whether to restrict their opening hours due to a shortage of labour and skilled workers (e.g. only opening during the day or in the evening), to reduce the number of tables in the gastronomy sector or to close down their business completely. On the other hand, employees criticise the lack of appreciation by both employers and travellers[103]

4.1.4 Framework conditions affecting coastal tourism in the Pomeranian Bight: Poland

On the national level in Poland, the direction of development of the tourism sector is laid out in the "Tourism Development Programme until 2020"[104]. The Programme aims to "manage and modernise areas for development of tourism and touristic infrastructure while respecting the principles of sustainable development and environmental protection regulations". The program highlights the importance of taking measures aimed at counteracting the negative environmental pressures[105].

On the regional scale, the Zachodniopomorskie province authorities have published a Zachodniopomorskie Policy in the Tourism Sector. This document, among others, describes the state of the sector in the region and defines the priorities for its further development[106].

[102] *Ibid.*
[103] Ministerium für Wirtschaft, Arbeit und Gesundheit Mecklenburg-Vorpommern (2018).
[104] Polish Ministry of Sport and Tourism (2015).
[105] Ministerium für Energie, Infrastruktur und Landesentwicklung Mecklenburg-Vorpommern (2016), *Landesraumentwicklungprogramm Mecklenburg-Vorpommern*, p. 63, https://www.regierung-mv.de/serviceassistent/download?id=1576266
[106] Pomorze Zachodnie (2016). "Polityka samorządu województwa zachodniopomorskiego w sektorze turystyki". Available at: http://www.turystyka.wzp.pl/sites/default/files/polityka_turystyczna_2016_0.pdf

According to the Polish Ministry of Sport and Tourism, though Poland's natural and cultural resources and spa facilities are important, their development potential is currently underused[107].

At sub-national level, the primary role in tourism development is played by regional governments (Voivodships) and local governments (municipalities). Their tasks include supervision, registration, licensing and compliance with various standards of travel agents and tour operators, mountain guides, and also the classification of hotel facilities. Municipalities are responsible for keeping registers of campsites and non-hotel accommodation service providers, inspecting accommodation facilities, and applying sanctions if necessary[108].

The Climate fee (in Polish opłata klimatyczna) is a tax paid by physical persons who visit a municipality for tourism, leisure or training purposes in towns with attractive climatic properties (such as seaside) or landscape values and in towns located in areas that have been granted the status of a spa protection area on the terms defined in the Act of 28 July 2005 on spa treatment, spas and protection areas health resort and spa municipalities[109]. Most often, the tax is about PLN 2 (about 0.5 EUR) per day per person, and it is paid to the owner of the accommodation where a person is staying. The exact rates of the climate fee depend on the municipality. The collected money goes to the municipalities' general budget, most often for the current expenses, such as repair of beach crossings, road and pavement repairs, maintenance of cleanliness[110].

In terms of recent legislative changes, from 1 July 2018, a new Act on hotel services and tour guide services entered into force, replacing the Tourist Services Act. The Act fully regulates the rights and obligations of entrepreneurs offering tourist and hotel services. The new legislation defines certain concepts such as: a tourist entrepreneur or related travel services, and it contains new definitions of terms a tourism organiser, a tourist service or a tourist event. The consequence of the change in the definition may lead to the situation where hotel owners, transport operators or tourist agency operators become tourism organisers, which in turn burdens them with duties resulting from the new act. These duties include, for example, payments to the Tourism Guarantee Fund, as well as adequate security in the event of their insolvency[111].

To promote sustainable tourism, Poland will need to invest in improvements to its travel infrastructure. Compared to other 15 Polish provinces, Zachodniopomorskie is not well connected via road or railways in 2016. It has the second lowest amount of public roads with a hard surface per 100 km^2 of total area (network density = 60.9) and is the fifth lowest amount of railway lines operated per 100 km^2 of total area (network density = 5.00). Despite this, the province has the lowest percentage of national roads with poor surface condition (5.4%). In

[107] Polish Ministry of Sport and Tourism (2015).
[108] OECD (2018): COUNTRY PROFILES: TOURISM TRENDS AND POLICIES – POLAND https://www.oecd-ilibrary.org/docserver/tour-2018-en.pdf?expires=1542710597&id=id&accname=guest&checksum=71FB6CFEE79BFB7A03292E99813FAB70
[109] http://prawo.sejm.gov.pl/isap.nsf/download.xsp/WDU20180001445/T/D20181445L.pdf
[110] https://gp24.pl/oplata-klimatyczna-na-co-ida-nasze-pieniadze/ar/10267152
[111] http://gm-legal.pl/2018/06/14/od-lipca-2018-ustawa-o-uslugach-turystycznych/

addition, there are plans to modernise and update the rail lines in Poland, which would help facilitate the movement of tourists between different regions in the Pomeranian Bight, especially between the city of Szczecin with its airport and the very active coastal port area of Świnoujście[112].

Employment in the tourism sector in Zachodniopomorskie employed 18,195 people in 2015, within the accommodation and food and beverage service activities. Actual jobs in full time equivalent (FTE) amounted to a total of 525,662, which was a share of 3.5% of total employment and is the highest ranked in Poland[113].

The province suffers from issues with the high seasonality of the sector, especially along the coastal strip and its surroundings. In some 64% of tourist employers state that seasonal workers account for 75-100% of their employees, mainly to fill positions such as waiters, receptionists and registrars as well as kitchen hands. High seasonality has been recognised as one of the most serious barriers in the sector. This is connected not only with problems in obtaining suitably qualified seasonal workers, but also with restrictions on demand for tourist services. Tourist companies that are particularly exposed to the seasonality of demand for tourist services (e.g. some tourist hotels located at the seaside), have problems in recruiting employees with higher qualifications. This is related to the reduced attractiveness of seasonal job offers for employees who are also sought after in the labour market as permanent employees. As such many employers in the region seek foreign workers. In 2016, 12,487 declarations of intent to entrust work to a foreigner were registered for accommodation and food and beverage activities (> 2% of all submitted declarations). The majority of these were submitted by Ukrainian citizens (96.8%). They were mainly employed as kitchen help, cleaning and room service, as well as catering workers, including cooks and waiters. Other professions, including specialty positions like chefs, physiotherapist, rehabilitation or massage therapist were noted as particularly difficult positions to fill[114].

4.1.5 Framework conditions affecting coastal tourism in the Pomeranian Bight: International

The German-Polish Governmental Commission for Regional and Border Collaboration (see section 2.1) has developed a "Joint Future Concept 2030 for the German-Polish Interdependence Area". Part IV.2 of this concept is ‘Increasing the intensity of tourism’. The future vision for tourism is to increase the offer and attractiveness of tourism in each country to its neighbour. Attractive offers are to be networked and marketed together outside the German-Polish area and rural and peripheral spaces are to be used to open additional development

[112] Statistical Office in Szczecin (2017); Statistics Poland (2018), “Turystyka w 2017 r”.
[113] Frąckiewicz, A. (2017).
[114] *Ibid.*

prospects through tourism. The German-Polish Cooperation Day for the Tourism Industry115, hosted by Enterprise Europe Network Berlin-Brandenburg in February 2019 gave practical recommendations to Polish and German travel service providers on how to develop what is on offer to attract the target group from the other country. The cooperation day, which hosted 89 participants, ran with the theme 'Digitalisation of the Tourism Industry - Trends and Developments' with experts demonstrating new technologies to support cross-border activities through apps and virtual reality.

4.1.6 Framework conditions affecting coastal tourism in the Pomeranian Bight: MSP

The role of MSP in promoting or supporting coastal tourism seems to be a powerfull one, as MSP comes with the power to keep the territorial sea free of measures, projects and uses which are detrimental to tourism. This can be an important mechanism to ensure further development of this important sector of the economy. MSP processes of both Germany and Poland have undergone attempts to highlight conflicts between maritime activities and uses of marine space, thus ensuring conflicts with coastal tourism from other maritime activities are minimised and synergies maximised (e.g. with nature conservation areas).

For Germany's MSP within its territorial waters, these plans have large areas designated as reserved for tourism, both within land and sea areas, although here is no indication about what kind of coastal tourism activities are permitted within these areas, these MSP designations maintain, in particular, the experience of a landscape as unobstructed landscape, both from the land to the sea, and vice versa, as an precondition for near to nature tourism. As the German plans for these waters are the responsibility of the Länder, the territorial and maritime plans are cohesive and well-coordinated. This too can be said of the marine MSP plans for the German EEZ, the planning for which was the responsibility of the Bund.

For the Polish MSP draft, tourism has designated areas along the coast of the Baltic Sea and within the draft MSP plans for the Szczeciński and Kamieński Lagoons. As in Germany, these plans do not explicitly state which coastal tourism activities are permitted in these waters, though they do coordinate with the land plans for these regions. Tourism is not considered as one of the main functions of any of the 81 sea zone areas that were proposed in the draft national MSP, it is however an allowed function, which means it is allowed when it does not constitute an obstacle to the main function or cause conflicts in this field. Tourism is intended to be allowed whenever it is possible, i.e. in the whole area of the Plan except the necessary exclusions (e.g. in the case of closed areas).

[115] http://tourismus2019.talkb2b.net

Overall, though MSP is dealt with differently between both Germany and Poland, especially regarding administrative and spatial planning competence of territorial waters, coastal tourism seems to be mainly driven from a terrestrial planning perspective. And, when looked at jointly, the plans for their respective marine and land areas are complementary, suggesting good cooperation and joint efforts between the two countries' planning authorities.

Policies like the EU Strategy for the Baltic Sea Region aim to strengthen the cooperation among Baltic States to make use of the region's potential. The strategy applies to Denmark, Estonia, Finland, Lithuania, Latvia, Germany, Poland and Sweden, as well as Belarus, Norway and Russia. In the strategy, tourism is one of the priority areas, which mainly argues for the development and promotion of sustainable and innovative tourism products and services at the cross-border and transnational levels. Pursuing this, cooperation in promoting tourism aims to bring economic benefits to the region[116].

4.1.7 Key actors of the coastal tourism value chain

We gathered the most recently available information that was available through the following NACE codes businesses of coastal tourism activities[117]:

Table 1:Coastal Tourism activities and their related NACE codes

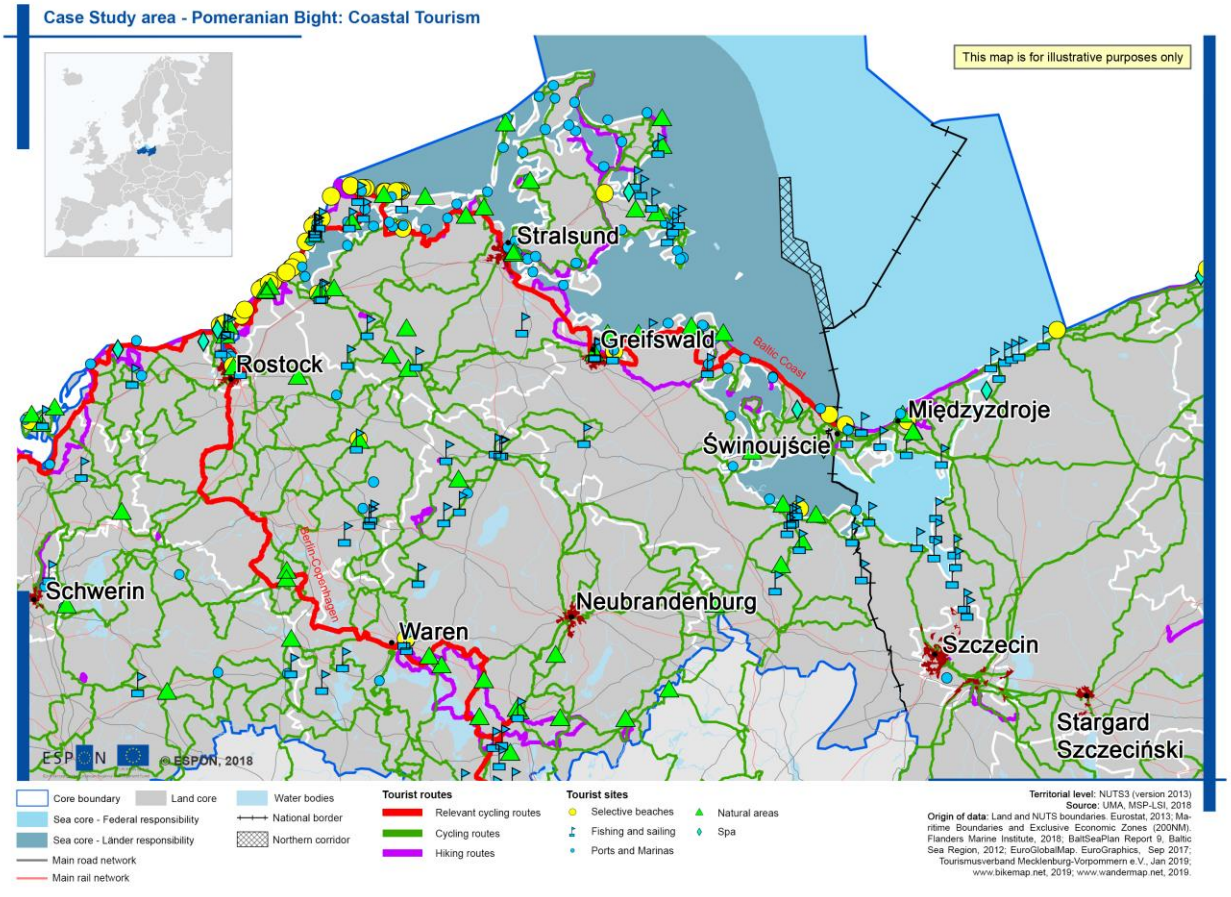
Sector/Group		Activity	Nace code
Coastal Tourism	Tourism: Accommodation	Hotels and similar accommodation	I.55.10
		Holiday and other short-stay accommodation	I.55.20
		Camping grounds, recreational vehicle parks and trailer parks	I.55.30
		Other accommodation	I.55.90
	Tourism: Transport	Retail sale of automotive fuel in specialised stores	G.47.30
		Passenger rail transport, interurban	H.49.10
		Urban and suburban passenger land transport	H.49.31
		Passenger air transport	H.51.10
	Tourism:Other	Retail sale of cultural and recreation goods in specialised stores	G.47.6

[116] European Commission (2017). "Commission Staff Working Document: European Union Strategy for the Baltic Sea Region, Action Plan {COM(2009) 248}, SWD(2017) 118 final". Available at: https://www.balticsea-region-strategy.eu/action-plan?task=document.viewdoc&id=17

[117] NACE Rev 2 Statistical classification of economic activities in the European Community. 2008. Eurostat Methodologies and working papers, European Commission, Luxembourg. ISBN 978-92-79-04741-1. Availble at https://ec.europa.eu/eurostat/documents/3859598/5902521/KS-RA-07-015-EN.PDF

		Retail sale of other goods in specialised stores	G.47.7
		Food and beverage service activities	I.56.00
		Travel agency, tour operator and other reservation service and related activities	N.79
	Cruise Tourism	Cruise tourism (+ cruise transport- H.50.10)	n.a.

Map 10: Key actors of the Coastal Tourism Value Chain in the Pomeranian Bight



The above map highlights main tourism arrival routes, through plane, ferry, train or road, as well as main touristic sites, beaches, natural areas, spas,etc. around the areas of Rostock, Stralsund and Szczecin.

4.1.8 Tailoring the Coastal Tourism Value Chain

The below value chain aims at bringing forward the land-sea component of activities stemming from coastal tourism in the Pomeranian Bight.

Figure 5:Tailored Coastal Tourism Value Chain for the Pomeranian Bight

Each segment of the value chain corresponds to specific activities and their land-sea dynamics. Five boxes are depicted within a green frame and in a bigger size than the remaining ones, suggesting that the value chain segments: 'Transport to Coastal Tourism Destination', 'Coastal Tourism Destination', 'Transport from Coastal Tourism Destination to Visiting Locations', 'Visiting Locations', and 'Transport from Visiting Locations to Coastal Tourism Destination' are particularly relevant to the Pomeranian Bight case study.

The figure above highlights segments 2 to 6 as the Pomeranian Bight area is known as an important tourism destination, both at the Polish side of the Pomeranian and at the German side. In the Polish part of the Pomeranian Bight, the Zachodniopomorskie Voivodeship dominates in the number of nights spent. In the German part of the Pomeranian Bight, the state of Mecklenburg-Vorpommern is the number one destination for tourism in Germany.

However the area is also visited due to its many wonders and travelling in order to arrive to those areas (which are usually not located at the coast) is also a step of the value chain that needs to be highlighted.

As such, in the Polish side, mmountains in the south and the Baltic Sea coast in the north are the country' most attractive tourist areas[118] along with the West Pomeranian Sailing Trail, a large number of protected Natura 2000 sites and two national parks (i.e., Woliński Park and Drawieński Park). At the German side, the coastal area of Vorpommern-Rügen and the Islands of Rügen and Hiddensee are the most popular visited areas.

[118] Polish Ministry of Sport and Tourism (2015). "Resolution No. 143/2015 of the Council of Ministers of 18 August 2015 on the adoption of the Tourism Development Programme until 2020". Available at: https://www.msit.gov.pl/download/3/12550/TourismDevelopmentProgrammeuntil20201f3c.pdf

Transport to those areas is usually done through existing road and railway infrastructures, thus these are of high importance as part of the coastal tourism value chain.

4.1.9 Statistical information on the sector

The following section aims at providing additional insight on the key characteristics of the coastal tourism sector in the Pomeranian Bight. The statistical information has been retrieved from the most recently available sources and generally includes data on production value and, sector employment.

In Germany, the tourist industry in Mecklenburg-Vorpommern is responsible for 11.8% of the gross value added for the region and for 17.8% of employment. The total GVA from tourism is just under 4.1 billion EUR for benefiting sectors. This is led by the hospitality industry which has a value added of 1.4 billion EUR. Around 2/5 of the total retail sales in Mecklenburg-Vorpommern can be traced back to travellers/visitors. Around 15.5% of all employment activities in Mecklenburg-Vorpommern directly take place in businesses that profit from tourism demand. This is equivalent to around 114,600 employees. When indirect employment of 2.3% is taken into account then touristic employment reaches nearly 18% or 131,300 employees. The level of employment based on tourism demand is therefore far above the share of gross value added (GVA)[119].

In terms of comparison with other sectors, there is no detailed data at the federal state level, so only a rough sectoral breakdown is possible. However, the contribution of tourism to the gross value added in Mecklenburg-Vorpommern is comparable with other large economic sectors in the region. In relation to the impact of tourism on employment, it overtakes manufacturing, health and social care[120].

For the year 2017, accommodation facilities with 10 beds or more and camp sites reported around 7.53 million guest arrivals, 0.5% less than in the record year 2016. These guests booked 29.75 million overnight stays. Despite a decline of 1.8% in the number of overnight stays compared with the previous year, in 2017, Mecklenburg-Vorpommern recorded its second-best result since the fall of communism. The average length of stay for guests in 2017 was 4.0 days. Actual turnover in the hospitality industry fell by 4.1% in 2017. This included a 4.6% decline in turnover in the accommodation industry and a 3.8% decline in turnover in the gastronomy sector.

In Germany, sales in the hospitality industry rose both in nominal and real terms, with Mecklenburg-Western Pomerania and Brandenburg leading the inflation-adjusted sales increases. Growth was mainly driven by the accommodation industry, which grew by 1.9%

[119] Ministerium für Wirtschaft, Arbeit und Gesundheit Mecklenburg-Vorpommern (2018).
[120] *Ibid.*

across Germany, while gastronomy sales remained largely stable. In the hotel industry, the establishments in Mecklenburg-Western Pomerania, Saxony and Thuringia performed well[121].

Table 2: Demand in hotels ≥10 beds (incl. camping) by travel area, 2016

	Arrivals	**Overnight stays**	**Duration of stay (days)**	**Change 2016-15 (%)**	**Overnight stays by foreigners**	**Change 2016-15 (%)**	**Proportion of foreigners (%)**
Mecklenburgische Ostseeküste	1,168,087	8,223,249	3.8	3.3	290,590	-4.7	3.5
Mecklenburg. Schweiz und Seenplatte	1,254,522	4,311,493	3.4	-0.6	130,386	-4.0	3.0
Rügen / Hiddensee	1,395,971	6,464,367	4.6	2.2	238,371	2.2	3.7
Vorpommern	2,184,587	9,818,558	4.5	5.2	217,117	5.7	2.2
Westmecklenburg	562,652	1,474,814	2.6	-2.0	157,120	10.9	10.7
Total Mecklenburg-Vormpommern	**7,565,819**	**30,292,481**	**4.0**	**2.8**	**1,033,584**	**1.2**	**3.4**

Tourism in Poland is recognised as an important economic sector. It contributes approximately 5-6% to the national GDP and employed some 760,000 people in 2015[122]. Nevertheless, in 2017 and in comparison to the situation of other EU countries, the Polish tourism sector has a rather small impact on the country's economy and its potential is not fully exploited[123]. In terms of touristic attractiveness, the Zachodniopomorskie Voivodeship is considered to be above the national average, and is considered among the most tourist-attractive regions in Poland for both national and foreign tourists[124].

In 2017, tourism expenditure in the province totalled 0.48 million EUR (2.06 million PLN) and revenue amounted to 11.82 thousand EUR (50.7 thousand PLN)[125]. In the summer season of

[121] Ostdeutscher Sparkassenverband (2017).
[122] Polish Ministry of Sport and Tourism (2015).
[123] Seweryn, R. (2017). "Wkład turystyki w PKB Polski na tle innych krajów Unii Europejskiej". *Handel Wewnętrzny*, 4(369): 220-232 (tom II). Available at: http://yadda.icm.edu.pl/yadda/element/bwmeta1.element.desklight-55c07852-72d4-4715-95ea-567813c8481a/c/IBRKK-handel_wew_4-2017-t2.220-232.pdf
[124] Pomorze Zachodnie (2016).
[125] Statistics Poland (2018); Local Data Bank (2018). Data as of 5th December 2018. Available at: https://bdl.stat.gov.pl/BDL/dane/podgrup/temat

2018, municipality revenues from local fees (including health resort fees) amounted to over 3.19 million EUR (13.7 million PLN), a 7% (210 thousand EUR; 900 thousand PLN) increase from the year before. The biggest increase, by 77%, was recorded by the municipality of Darłowo, though the leader in terms of the amount of income from the spa fee is the city of Kolobrzeg with the amount of almost 0.82 million EUR (3.5 million PLN) for two months of holidays[126].

Though most national tourists will stay with family or friends in the region[127]; in 2017, Zachodniopomorskie saw 14,057.5 thousand overnight stays, an increase of 674.3 thousand (5.0%) from 2016. Overnight stays in peak months of July and August in Zachodniopomorskie was the third highest (37.2%) in all of Poland, with more nights spent in July than August[128]. The majority of overnight stays were provided in holiday resorts (30.6%), hotels (24.0%) and health resorts (18.9%), with an average duration of 5.1 days (compared to 5.2 days in 2016). Overnight stays in health resorts are the highest, with an average 11.4 days (compared to 11.6 days in 2016). Overnight stays of foreign tourists totalled 3461.5 thousand in 2017, an increase of 197.6 thousand (6.1%). They spent on average 4.9 days in an accommodation facility and spent the longest time in creative workhouses and hostels (13.5 days), as well as in agrotourism accommodation (11.6 days), colonial centres (9.7 days) and health resorts (9.4 days)[129]. Of foreign visitors, the largest number of overnight stays were by German tourists (3,028,858; 88% of all overnight stays), followed by Ukrainians (106,081; 3%), Danish (86,190; 2%) and Swedish (51,180; 1%). These foreign tourists preferred the counties of Kołobrzeski (1,282,257 overnight stays) and Świnoujście (979,809 overnight stays)[130].

4.1.10 Identification of Land-Sea Interactions of coastal tourism in the Pomeranian Bight

Apart from the coastal and marine dimension of coastal tourism, the sector has important onshore components and implications.

Hereafter, we focus our attention on specific land and sea impacts of coastal tourism, which are very much related to the economic development of the Pomeranian Bight. They are organized in three typologies: environmental; socio-economic; technical[131].

Environmental LSIs:

- intensive use of space and resources which may lead to poor water and environmental quality;

[126] Pomorze Zachodnie (2018). “Turystyka”.
[127] Frąckiewicz, A. (2017).
[128] Statistics Poland (2018). “Turystyka w 2017 r”. Available at: https://stat.gov.pl/files/gfx/portalinformacyjny/pl/defaultaktualnosci/5494/1/15/1/turystyka_w_2017.pdf
[129] Statistical Office in Szczecin (2018).
[130] Pomorze Zachodnie (2018). “Ruch turystyczny”.
[131] As defined in the European Commission Report “Land Sea Interactions in Maritime Spatial Planning Report”. 2018. Available at http://ec.europa.eu/environment/iczm/pdf/LSI_FINAL20180417_digital.pdf

- pollution, noise or species' disturbance;
- building new marinas, piers or berths has an impact on marine and coastal habitats;
- impacts on fish stocks

Socio-economic LSIs:

- impacts on income and job creation in coastal communities (direct employment at the port, or secondary from increased tourism spend in/at local businesses);
- competition for coastal space with sectors such as research, offshore energy
- impact on fish stocks, potentially leading to changes in commercial fishing activities and subsequent impact on fishermen's income, jobs and fishing communities

Technical LSIs:

- innovation in terms of infrastructure to limit environmental pressures;
- provision of suitable access of boating locations (access to marinas, boat ramps, moorings);
- impacts on land infrastructure (increased beach access through roads and car parks).

The below table provides additional information on specific land-sea implications per each segment of the coastal tourism value chain. Each segment has, in fact, direct or indirect land-sea interactions. Naturally, these are more apparent at the land-sea interface where some segments of the value chain are occurring. The table highlights the key LSIs for two value chain segments of coastal tourism in the Pomeranian Bight: Coastal tourism destination and Visiting locations.

Table 3: LSI linkages to segments of the value chain- Coastal tourism

Segments of the Value Chain	**Main elements characterizing the LSI**
1) Tourists Home Locations	Impact on waste management; Employment and Income generation; Impacts on land infrastructure
2) Transport to Coastal Tourism Destination	Accessibility to Infrastructure; Employment and Income generation, Impacts on land infrastructure
3) Coastal tourism destination	**Impact of waste management; Displacement of other sectors, Employment and Income generation; Impact on coastal processes; Invasive non-native species; Impact on air quality, Impacts on land infrastructure; Pollution, noise or species' disturbance**
4) Transport from Coastal Tourism Destination to Visiting Locations	Accessibility to Infrastructure; Employment and Income generation, Impacts on land infrastructure; Pollution, noise or species' disturbance

5) Visiting locations[132]	**Impact on waste management; Displacement of other sectors, Employment and Income generation; Impact on coastal processes; Invasive non-native species; Impact on air quality, Impacts on land infrastructure**
6) Transport from Visiting Locations to Coastal Tourism Destination	Accessibility to Infrastructure; Employment and Income generation, Impacts on land infrastructure
7) Transport from Coastal Tourism Destination	Accessibility to Infrastructure; Employment and Income generation, Impacts on land infrastructure generation; Impacts on land infrastructure; Pollution, noise or species' disturbance
8) Tourists home location	Impact on waste management; Employment and Income generation; Impacts on land infrastructure

[132] Highlighted LSI if visiting locations are located at the Land Sea interface. Not to be highlights if these are inland.

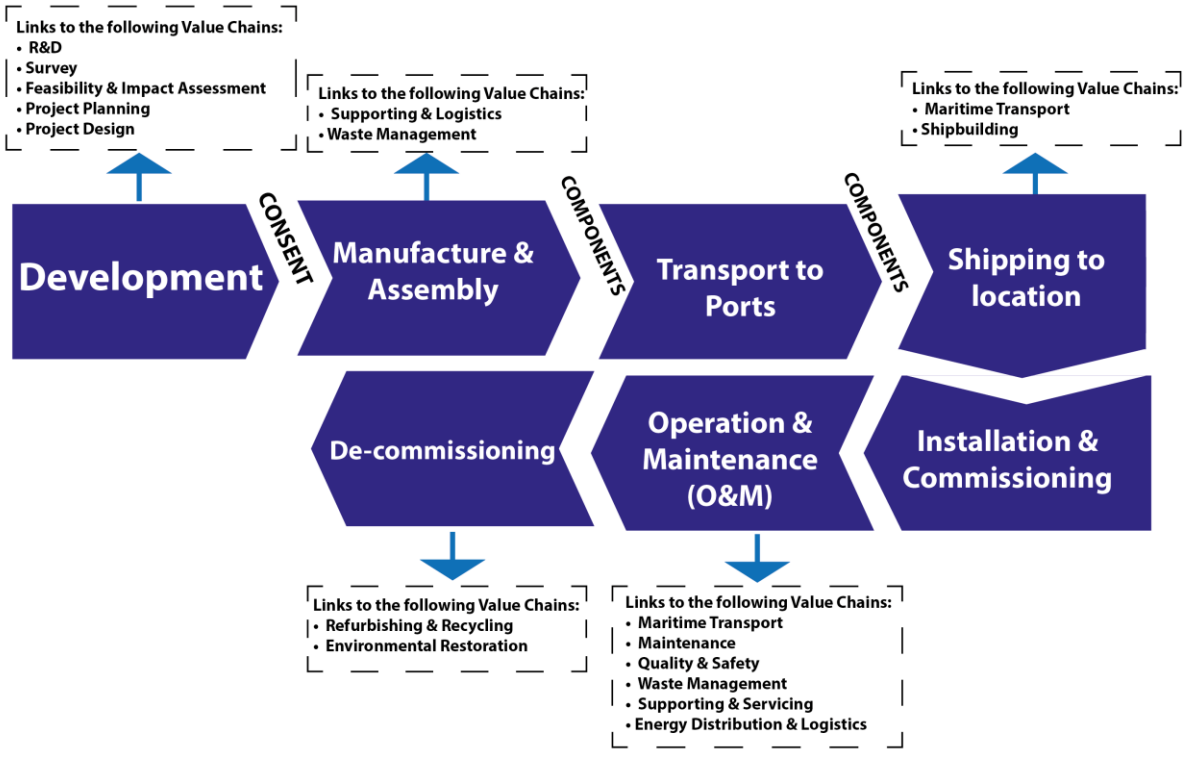
4.2 Offshore Wind Energy in the Pomeranian Bight

4.2.1 Developing the Value Chain - methodological clarifications

The general value chain for the maritime activity of offshore wind energy was built based on previous offshore wind energy value chain literature such as DG MARE Blue Growth Report[133]. However, some other segments were added to these value chains so as to spatially highlighting the Land Sea Interactions of the offshore wind energy value chain process from the development and design of the wind farms to the de-commissioning of these passing through the actual offshore wind energy installation, commissioning and operation and maintenance works. The segments of the value chain where selected in terms of the spatial nature of each of the process steps, so as to show the spatial allocation of these segments for the LSIs analysis.

The following diagram shows the various segments that constitute the general value chain of ocean energy:

Figure 6: General Value Chain for Offshore wind energy.



The entire offshore wind energy value chain process can be summarized into the following 7 segments:

133 https://ec.europa.eu/maritimeaffairs/sites/maritimeaffairs/files/docs/publications/blue_growth_third_interim_report_en.pdf

- Segment 1) Development.
- Segment 2) Manufacturing & Assembling.
- Segment 3) Transport to ports.
- Segment 4) Shipping to location.
- Segment 5) Installation & Commissioning.
- Segment 6) Operation & Maintenance (O&M).
- Segment 7) De-commissioning.

4.2.2 Key characteristics of offshore wind energy in the Pomeranian Bight

In Germany, as of 30 June 2018, the country had 20 offshore wind farms in operation with three located in the Pomeranian Bight and a further four in various stages of development. One project Arkona (operated by E.ON Climate & Renewables Central Europe and Statoil Deutschland) is already in the construction phase and its commissioning is planned for 2019[134]. The three remaining farms located in the Pomeranian Bight have been contracted in 2018 by Parkwind and Iberdrola[135]. To date, the Mecklenburg-Vorpommern area has an installed and connected capacity of 1018 MW and 210 turbines, all located in the Exclusive Economic Zone. This capacity is expected to expand in the coming years as three offshore wind projects were awarded in the Baltic Sea in 2018 for Arcadis Ost 1, Wikinger Süd and Baltic Eagle[136]. However, fears have been expressed within the industry that it might be a victim of its own success, leading to a premature end to government subsidies[137]. However, recent tendering rounds for offshore wind development have resulted in offers, not including a government subsidy, suggesting that companies are confident about the viability of such investments based solely on feed-in tariffs. Offshore wind power is not allowed to constrain ship traffic or inflict permanent damage to natural habitats and wildlife (for example through noise pollution or bird collisions). In addition to the benefits of harnessing renewable energy, offshore wind presents economic opportunities for example for component suppliers, engineering companies, R&D and testing. In the case study area, there is strong competition for areas with favourable average wind rates, water depth and distance to the coast for maintenance and cable connections to land. Offshore wind also requires harbour storage space on land. There are three potential major conflicting issues to be considered in the case study area: (1) Maintaining functional maritime transport, ferry connections and relevant ports; (2) securing the scenic value for maritime and coastal tourism; and (3) protecting sensitive and valuable natural environments including Natura 2000 areas, important seabird wintering

[134] Foundation Offshore Wind Energy (2018). “Status Quo Offshore Wind Energy”. Available at: https://www.offshore-stiftung.de/en/status-quo-offshore-windenergy
[135] Deutsche WindGuard (2018).
[136] Deutsche WindGuard (2018).
[137] Wehrmann, B., (2019) Clean Energy Wire, Factsheet: German offshore wind power - output, business and perspectives 21 January 2019 https://www.cleanenergywire.org/factsheets/german-offshore-wind-power-output-business-and-perspectives

Table 4:Offshore wind parks located in the German Baltic Sea[138]

Name	Capacity (MW)	Status	Operator	Location
Wikinger	353	Completed	Iberdrola Renovables Offshore Deutschland GmbH	EEZ
EnBW Baltic 1	48	Completed	EnBW Baltic 1 GmbH & Co. KG (51% EnBW, 49% verschiedene Stadtwerke)	Territorial waters
EnBW Baltic 2	288	Completed	EnBW Baltic 2 GmbH & Co. KG	EEZ
Arkonabecken Südost	385	Fully commissioned	AWE Arkona-Windpark-Entwicklungs GmbH (50% E.ON Climate & Renewables Central Europe GmbH, 50% Statoil Deutschland GmbH)	EEZ
Arcadis Ost 1	247	Contract Awarded	Parkwind	Territorial waters
Wikinger	350	Fully commissioned	Iberdrola Renovables Offshore Deutschland GmbH	EEZ
Baltic Eagle	476	Contract Awarded	Iberdrola Renovables Offshore Deutschland GmbH	EEZ

In Poland there are currently no offshore wind farms are operating. However, numerous Polish companies (also located in the Pomeranian Bight) are active within several links of the value chain. The draft of the Polish Maritime Spatial Plan foresees several areas designated for the potential installation of wind farms. One of them (Ławica Odrzańska, ang. Oder Shoal, german: Oderbank) is situated within the Pomeranian Bight. The final version of the plan, however, has not been approved yet.

Development

[138] *Ibid*; Foundation Offshore Wind Energy (2018). “Status Quo Offshore Wind Energy”.

When it comes to investment and project development Germany has a well-developed research base focusing on offshore wind energy. In the early 2000s, this topic stood high on the national energy research agenda as a means to prepare the country for deployment of projects. Currently, several institutions work in this area. Apart from universities, they include non-academic institutions. The main actors here are Fraunhofer IWES, ForWind, CE WindEnergy SH and DEWI, though none of these are headquartered in the case study area. There is also one offshore research platform in the Baltic Sea, which focuses on meteorology, wind climatology and ecology and is operated by BSH and IOW (www.fino2.de)[139].

In Poland, large companies like PGE Energia Odnawialna S.A., PKN Orlen and Polenergia S.A. have been identified as potentially the most important players in the sector[140]. According to media reports, all these firms are to different degrees involved in developing offshore wind energy projects on the Polish waters[141]. For example, Polenergia S.A. has plans to install two plants with a total capacity of 1.2 GW in cooperation with Equinor, a Norwegian energy operator (neither of which are located in the Pomeranian Bight).

At the same time, Poland does not seem to be particularly strong in the development of offshore wind technology. In terms of patent applications, Polish offshore wind technology is underdeveloped. On the other hand, because most of the wind farms installed so far are located in European countries, Poland has good conditions for technology absorption[142]. In terms of publications on the offshore wind energy, the Polish Academy of Sciences is the leading Polish organisation. CTO – Ship Design and Research Centre, which specializes in research, design and certification services (with a focus on shipbuilding industry) and provides vessel model studies, is also an important actor. Although no academic programmes in Poland focus specifically on the offshore wind sector, several of them have the potential to offer courses related to this topic if demand arises. Among the listed institutions, some are located within the Pomeranian Bight (the Maritime University of Szczecin, the West Pomeranian University of Technology in Szczecin, the University of Szczecin). Nevertheless, scientific collaboration within the sector in Poland is quite high; however, improvements can be made regarding collaboration between scientists and business[143].

Manufacturing & Assembling

[139] Offshore-Windindustrie.de (2018). “Forschung”. Available at: https://www.offshore-windindustrie.de/forschung
[140] *Ibid*.
[141] E.g. OdnawialneŻrodlaEnergii.pl/ (2018). “Jak pomieścić farmy wiatrowe na Bałtyku? Chętnych przybywa”. Available at: http://odnawialnezrodlaenergii.pl/energia-wiatrowa-aktualnosci/item/3958-jak-pomiescic-farmy-wiatrowe-na-baltyku-chetnych-przybywa
[142] Sawulski et al. (2018). “A Review of the Offshore Wind Innovation System in Poland”. IBS Working Paper 05/2018. Available at: http://ibs.org.pl//app/uploads/2018/09/IBS_Working_Paper_06_2018.pdf
[143] *Ibid*

Germany has a good manufacturing & assembling base for offshore wind components. The production of some components is focused in a close proximity to the coast or ports. This refers, for example, to large components, the transport of which would otherwise generate significant costs[144]. Sometimes, ports themselves serve as production and assembling sites. Particularly well-suited for this function are ports with sufficiently large area, good connection with inland and appropriate infrastructure[145]. Many ports in Germany serve the offshore sector and are classified as "large components ports" ("Großkomponentenhäfen"). To this category belong, among others, "production ports" ("Produktionshäfen"), where components production takes place. Another example, "installation ports" ("Installationshafen"), are ports, in which installations are assembled before being shipped to their final location on the sea. All four offshore ports located in the German Pomeranian Bight facilitate production and installation (i.e. Wismar, Rostock, Stralsund and Sassnitz)[146]. More than 75% of the value added in the offshore wind sector comes from medium-sized companies. The suppliers of components for the turbines have plants all over Germany. For example, the traditional Dillinger Hütte plant in the Saarland region produces high-quality steel for the foundations of wind energy plants. In addition, North Rhine-Westphalia, Bavaria and Baden-Württemberg benefit considerably from the expansion of offshore wind power[147]. 50% of the turnover and 40% of the employees in the industry come from these three federal states. Assembling firms can also be found in the southern state Saarland

Poland has a somewhat stronger position when it comes to manufacturing and assembling. Up to 50% of components needed for building offshore wind farms could be supplied by Polish firms[148]. Several important global players specialising in the supply of foundations, towers and substations have their locations in Poland. These companies supply components of offshore wind projects in the Baltic, including ST3 Offshore, GS Seacon and Aarsleff- all of which have headquarters in the Polish part of the case study area. Moreover, Tele-Fonika Kable, a company located in the southern Poland, belongs to the largest European cable producers supplying the offshore wind sector[149]. The production of some components in Poland, however, is considered underdeveloped, especially nacelles, blades and rotors. The latter two component groups are only produced by two big blade manufacturers Euros (Senvion subsidiary) and LM

[144] Bundesministerium für Wirtschaft und Energie (2015). "Die Energiewende – ein gutes Stück Arbeit. Offshore-Windenergie. Ein Überblick über die Aktivitäten in Deutschland". Available at: https://www.erneuerbare-energien.de/EE/Redaktion/DE/Downloads/bmwi_de/offshore-windenergie.pdf?__blob=publicationFile&

[145] Offshore-Windindustrie.de (2018). "Häfen und Offshore-Schiffe". Available at: https://www.offshore-windindustrie.de/wirtschaft/hafen

[146] ZDS Zentralverband der deutschen Seehafenbetriebe e. V. (2018). "Offshore-Hafenatlas". Available at: https://www.zds-seehaefen.de/offshore-hafenatlas/

[147] Chancen Nutzen Offshore Deutschlands Windstärke (2017). "Wind vom Meer: Power für Wirtschaft und Beschäftigung". Available at: https://www.wind-energy-network.de/files/files/News/20170620_Broschuere%20Initiative%20Offshore/Factsheet_Arbeit.pdf

[148] WindEurope (018). "Ambitious 8 GW of offshore wind planned that will put Poland back on wind energy map". Available at: https://windeurope.org/newsroom/press-releases/ambitious-8gw-of-offshore-wind-planned-that-will-put-poland-back-on-wind-energy-map/

[149] Sawulski et al. (2018).

Wind Power (located in the Pomeranian Bight)[150]. Lastly, Poland has a number of sub-suppliers, which include large producers of steel (ISD Huta Czestochowa) and copper (Polish KGHM)[151]. Working up to the 2030 horizon, development of Polish offshore wind farms might be the most steel-intensive project of the recent years[152].

Shipping to location

German shipyards also serve the offshore wind energy sectors. For example, in 2014, the first wind turbine installation vessel built in Germany (Aelous) was completed. In addition, the four German ports within the Pomeranian Bight (i.e. Wismar, Rostock, Stralsund and Sassnitz) also facilitate shipment of parts and assembled components to the offshore sites[153]. On the other hand, it is recognised that German shipyards face strong international competition with regard to the offshore wind energy sector[154].

The Polish shipbuilding industry is generally recognised as the country's strength in the offshore value chain. For example, Polish shipbuilding companies produce several models of vessels, which are dedicated to offshore wind installations and have been successfully deployed in offshore wind projects abroad[155]. The current estimated value of offshore wind contracts in Poland's shipbuilding sector is around EUR 150 million/year (around PLN 600 million/year), while the projected value of contracts in 2018-2025 may amount to EUR 700 million/year (PLN 2 800 million/year)[156]. Polish seaports can also support offshore wind deployment, such as the DB Port Szczecin Sp. z o. o., in which wind turbines are reloaded. Both Polish seaports in the Pomeranian Bight (Szczecin and Swinoujscie) are assessed to fulfil basic production ports criteria, although they might need additional investments to fulfil the needs of specific projects. Due to high potential investments, experts suggest focusing the production in one of these two ports due to their proximity to Germany, Denmark and Sweden[157].

Installation & commissioning

Due to financial problems emerging in the past due to the lack of time coordination between the construction of the farms and the grid connection, since 2013, grid development in Germany has been coordinated by the Federal Network Agency (Bundesnetzagentur)[158]. In the planning

[150] *Ibid*
[151] *Ibid*
[152] The Polish Wind Energy Association (2017). "The State of Wind Energy in Poland in 2016". Available at: http://psew.pl/wp-content/uploads/2017/06/Stan-energetyki-wiatrowej-w-Polsce-w-2016-r.pdf
[153] ZDS Zentralverband der deutschen Seehafenbetriebe e. V. (2018).
[154] Bundesministerium für Wirtschaft und Energie (2015).
[155] Sawulski et al. (2018).
[156]Zespół ekspertów Fundacji na rzecz Energetyki Zrównoważonej (2013). "Program rozwoju morskiej energetyki i przemysłu morekiego w Polsce". Available at: http://www.fnez.pl/upload/file/334.pdf
[157] *Ibid*
[158] Offshore-Windindustrie.de (2018). "Netzanbindung". Available at: https://www.offshore-windindustrie.de/wirtschaft/netzanbindung

process the Federal Maritime and Hydrographic Agency and the network connections operators (50Herz on the Baltic Sea)also takes part[159]. Currently, within the Pomeranian Bight, offshore facilities are connected through connections in Lubmin and Bentwisch. The offshore network development plan, which is now in force (O-NEP 2030), foresees building in the next years new connections (in Lubmin, Sanitz/Dettmannsdorf and Siedenbrünzow/Alt Tellin/Bartow)[160].

Operation & Maintenance

In Germany, ports play an important role in operation and maintenance. To fulfil this function, they should provide adequate conditions to facilitate fast transport of specialists to the farms, e.g. a suitable space for helicopter operation[161]. “Reaction ports” (“Reaktionshäfen”) serve as departure points for short-term, spontaneous maintenance works, whereas “operational ports” (“Versorgungshäfen”) facilitate mostly regular, planned transport activities. In the Pomeranian Bight, all four ports are classified as reaction ports and operational ports[162].

Though Poland currently lacks installed and operational offshore wind parks, some experts have identified a few actors active in operations & management of the offshore wind energy sector in Poland (mostly subsidiaries of multinational corporations). These include KK Wind Solutions, MEWO, SSC Balticwind and Total Wind. With the progress and investment into offshore wind projects in Poland, this value chain element could further develop in the future[163].

4.2.3 Framework conditions affecting the production of offshore wind energy in the Pomeranian Bight: Germany

In Germany the Offshore Wind Energy Act (WindSeeG) was passed in 2016 and entered into force in 2017. This allocated responsibility for the development and preliminary investigation of areas for the construction and operation of offshore wind energy to the BSH (Das Bundesamt für Seeschifffahrt und Hydrographie; “Federal Maritime and Hydrographic Agency”). The Law provides for a tiered planning and tendering process. First, the BSH defines the areas where wind energy is to be developed and the timing for these developments in the land development plan (Flächenentwicklungsplan - FEP). Second, these areas are subjected to an initial examination after which the sites are auctioned in open competition by the

[159] Bundesministerium für Wirtschaft und Energie (2018). “Übersicht Offshore-Netzanbindungen”. Available at: https://www.erneuerbare-energien.de/EE/Navigation/DE/Technologien/Windenergie-auf-See/Offshore-Projekte/Netzanbindungen/netzanbindungen.html
[160] Bundesnetzagentur (2017). “Bedarfsermittlung 2017-2030. Bestätigung. Offshore-Netzentwicklungsplan“. Available at: https://www.netzausbau.de/SharedDocs/Downloads/DE/2030_V17/NEP/O-NEP2030_Bestaetigung.pdf?__blob=publicationFile
[161] Offshore-Windindustrie.de (2018). “Häfen und Offshore-Schiffe”.
[162] ZDS Zentralverband der deutschen Seehafenbetriebe e. V. (2018).
[163] Sawulski et al. (2018).

Bundesnetzagentur. The winning bidder may construct wind turbines, subject to an approval procedure, and is entitled to the market premium and to connect to the onshore electricity grid[164].

Costs of building offshore wind in Germany are sinking and the 2014 EEG (Renewable Energy Law) reduced the building of offshore wind energy installations from 25,000 MW to 15,000 MW until 2030 with the intention of dampening the costs of the Energiewende. In April 2018, three new windparks were given the go-ahead in Germany. One of these, the Arkona, is in the Pomeranian Bight and is expected to produce 384 MW of power. These new windparks will not receive any subsidy but will join the standard electricity market in 2024-25 at which time the price is expected to be low, at around 5.3 ct/kWh[165].

The FEP (Flächenentwicklungsplan, Site Development Plans) is the main instrument for planning offshore wind energy and power lines from 2026 to at least 2030 within the German Exclusive Economic Zone (EEZ). The first FEP has been drafted and is under public consultation until 2019 and will then be reviewed every four years. The FEP defines how much power is expected from the installations and can be put to use each year and synchronises the location of the installations with the power lines. The Plan also sets out criteria to determine the order in which the different areas will be tendered e.g. land-use conflicts, proximity to the coast, existing and planned power lines, anticipated building capacity, buildability and the suitability of the area. A Strategic Environmental Assessment (SEA) is included as part of the process and is used to assess and significant impacts on the marine environment[166].

With the FEP, the task of Federal Offshore Planning (BFO), which has been carried out since 2011 by the BSH, will be continued. The federal technical plans for the German EEZ of the North Sea and Baltic Sea and parts of the previous Offshore Network Development Plan (O-NEP) are included in the FEP. The demand for offshore connection lines is determined by the Federal Network Agency on the basis of specifications of the land development plan in the land-side network development plan. The FEP does not extend to the territorial sea, which is the jurisdiction of the federal state; in the case of the Pomeranian Bight – the state of Mecklenburg-Vorpommern. BSH would thus need to confer and come to an agreement with the state authorities in order for the FEP to be valid in those waters. A key purpose of the FEP is to establish cross-border spatial arrangements for power lines and interconnections. It is therefore

[164] BSH (2018). “Flächenentwicklungsplan”. Das Bundesamt für Seeschifffahrt und Hydrographie. Available at: https://www.bsh.de/DE/THEMEN/Offshore/Meeresfachplanung/Flaechenentwicklungsplan/flaechenentwicklungsplan_node.html

[165] Chancen Nutzen Offshore Deutschlands Windstärke (2017). “Günstiger Strom vom Meer”. Available at: https://www.wab.net/fileadmin/media/Downloads/Broschueren/2017-06-19-Factsheet-Deutschlands-Windstaerke.pdf

[166] BHS (2018).

of particular interest in the Pomeranian Bight, which includes both German and Polish territories[167].

In Germany, particularly good environmental conditions for developing offshore wind farms are in the west of the country, on the North Sea, where the average wind yields are higher than on the Baltic. Therefore, investors and technology expansion are more attracted to that region. This is clearly visible in the figures: in 2017, the installed capacities on the Baltic Sea corresponding to the Land of Mecklenburg-Vorpommern amounted to less than 15% of the overall offshore wind energy capacities installed in Germany[168].

Another consideration related to development of offshore wind projects in Germany concerns the distance to the coast. Due to environmental and landscape concern, offshore wind farms in Germany are located further away from the shore on deeper waters than commonly practiced by other countries, e.g. in Scandinavia or Great Britain. In effect, components to build the farms are subject to stricter technical requirements and the service and maintenance of the farms is more challenging because of tougher conditions on the deep seas[169].

Many professional groups and companies from all over Germany benefit from the growth of the offshore sector. Electricians, mechatronics engineers and plant mechanics are particularly in demand. Many service and maintenance companies train their own specialists[170]. Although in Germany there are no apprenticeships and only few study programs focusing specifically on the offshore wind sector yet, it is included in the educational offer to some extent, e.g. in the form of thematic focus modules within study programs[171].

In 2017 the employment situation throughout Germany for offshore wind began to look less favourable and future prospects worsened. This is primarily due to the switch from a subsidy system to a tendering system. One industry survey revealed that more than 40% of respondents expect a negative market trend, especially for manufacturers, and expect job losses in just under a quarter of companies. In 2017, up to 2,000 jobs are reported to have been lost (combined data for onshore and offshore wind)[172]. Plant manufacturer Senvion, for example, closed its northern German locations in Husum and Trampe as well as its subsidiary Powerblades in Bremerhaven, which specialised in turbine blades. Carbon Rotec, a wind turbine blade manufacturer, filed for bankruptcy in October 2017. Furthermore, production of offshore wind turbines by Adwen in Bremerhaven is being discontinued by the company's new

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[167] *Ibid;* Bundesverband WindEnergie (2018). "Offshore: Windenergiegewinnung auf See". Available at: https://www.wind-energie.de/themen/anlagentechnik/offshore/

[168] Wehrmann, B. (2018). "German offshore wind power - output, business and perspectives". Clean Energy Wire. Available at: https://www.cleanenergywire.org/factsheets/german-offshore-wind-power-output-business-and-perspectives

[169] Bundesverband WindEnergie (2018).

[170] Chancen Nutzen Offshore Deutschlands Windstärke (2017). "Wind vom Meer: Power für Wirtschaft und Beschäftigung".

[171] Offshore-Windindustrie.de (2018). "Bildung". Available at: https://www.offshore-windindustrie.de/bildung

[172] Energy Voice: "For Heiner Kleen, Germany's renewable energy revolution looks like it will end in redundancy." Available at: https://www.energyvoice.com/otherenergy/181001/job-losses-mount-in-germany-as-wind-companies-seek-growth-abroad/

owner, Siemens Gamesa, who will lay off up to 6,000 of its 27,000 employees worldwide. Nordex also announced that it would be cutting up to 500 jobs.

German government reduced its expansion target in this area from 25,000 to 15,000 MW. In the "Cuxhaven appeal", the industry, IG Metall and state governments joined forces in demanding an increase of the target to at least 20,000 MW. This, they explained, was necessary not only because of climate change, but also to safeguard jobs. Industry associations and politicians now hope to counteract job losses, especially among manufacturers, by increasing the planned expansion of onshore and offshore wind energy[173].

4.2.4 Framework conditions affecting the production of offshore wind energy in the Pomeranian Bight: Poland

In Poland, the recently published Polish Energy Policy until 2040 (2018) contains a clear vision of the offshore wind sector's development. This outlines the country's energy strategy and tasks envisioned in order to obtain its goals – some of them related to the offshore wind energy value chain. The Policy envisions a significant role for the offshore wind energy sector in the country's electricity production. Moreover, it promotes the development and modernisation of the electric network infrastructure (e.g. transmission network, transnational connections)[174]. The Policy is supported by Poland's clear and consistent procedures for gaining the permits required to develop offshore wind farms.

Experience from other countries shows that regulation addressing supply chain issues in offshore wind energy project development is particularly important for the domestic economy to benefit from the growth of the sector, e.g. through securing local content in the components[175]. A high level of local content in the Polish offshore projects is going to be ensured legally by the act on offshore energy, the draft of which is now being developed by the parliamentary Committee for Offshore Wind Energy (Zespół ds. Morskiej Energetyki Wiatrowej) and is expected to be published in 2019[176]. The Committee, appointed in late 2017, aims to promote the development of offshore wind energy in the Baltic Sea and to use the potential of the Polish economy to participate in the value chain.

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[173] Bundesministerium für Wirtschaft und Energie (2018). "Wind Industry in Germany: 2018". Available at: https://www.wind-energie.de/fileadmin/redaktion/dokumente/dokumente-englisch/publications/BWE_Industry_Report_-_Wind_Industry_in_Germany_2018.pdf

[174] Ministerstwo Energii (2018). "Polityka energetyczna Polski do 2040 roku (PEP2040)". Available at: https://www.gov.pl/documents/33372/436746/PEP2040_projekt_v12_2018-11-23_-_wyci%C4%85g.pdf/86ff13fc-11a0-5b63-c311-cd762956c8ca

[175] *Ibid*

[176] GospodarkaMorska.pl (2018). "Projekt ustawy offshorowej w przyszłym roku w Sejmie". Available at: http://www.gospodarkamorska.pl/Stocznie,Offshore/projekt-ustawy-offshorowej-w-przyszlym-roku-w-sejmie.html

The Polish sea area is believed to provide good environmental conditions for developing offshore wind technology. Poland has a long coastal line, as well as favourable seabed and wind condition. On the other hand, environmental matters might also pose some barrier to the sector development because large areas of the Polish waters are protected under the Natura 2000 network.

With proposed plans to initiate offshore wind in Poland, some initiatives are in place to improve and develop a marine network to collect and connect all Polish offshore wind farms to the national power grid.

4.2.5 Framework conditions affecting offshore wind energy in the Pomeranian Bight: International

Both Polish and German value chains can also be affected by the developments in the broadly understood energy sector. Particularly important for the development of the offshore wind energy sector is cost competitiveness of its energy generation and the European policy towards renewable energy[177]. One might expect that in the light of environmental commitments, with time, in both countries now largely dependent on fossil fuels, the renewable energy sector will at least to some extent gain significance. This is reflected in the draft of the Poland's Energy Policy 2040, which envisions future increase of energy obtained from renewable sources, with a particular importance of photovoltaics and offshore wind farms[178]. The increase in share of renewable energies is also envisioned in Germany's Climate Action Plan 2050[179].

The private trade associations are also highlighting the potential of renewable energy in the region. The Baltic Sea Offshore Wind Forum signed an apolitical Baltic Sea Declaration (2017), which seeks to accelerate offshore wind energy development and foster international cooperation in the region. The initiative includes offshore wind energy associations from Denmark, Estonia, Finland, Germany, Latvia, Lithuania, Poland and Sweden. The Declaration recognises the potential of offshore wind to increase security in energy supply, support achievement of EU energy objectives and targets, as well as further diversify the energy production in the region. It stresses the need for regional cooperation in MSP, grid

[177] McKinsey (2016). "Developing Offshore Wind Power in Poland: Outlook and assessment of local economic impact". Available at: https://mckinsey.pl/wp-content/uploads/2016/10/McKinsey_Developing-offshore-wind-power-in-Poland_fullreport.pdf
[178] Ministerstwo Energii (2018).
[179] Federal Ministry for the Environment, Nature Conservation, Building and Natural Safety (2016). "Climate Action Plan 2050. Principles and goals of the German government's climate policy". Available at: https://www.bmu.de/fileadmin/Daten_BMU/Pools/Broschueren/klimaschutzplan_2050_en_bf.pdf

development, support schemes and capacity planning to utilise the full potential of offshore wind energy and to develop a well-functioning integrated energy market[180].

4.2.6 Key actors in the offshore wind energy value chain

We gathered the most recently available information that was available through the following NACE codes businesses of the production of offshore wind energy activities[181]:

Table 5:Production of offshore wind energy activities and their related NACE codes

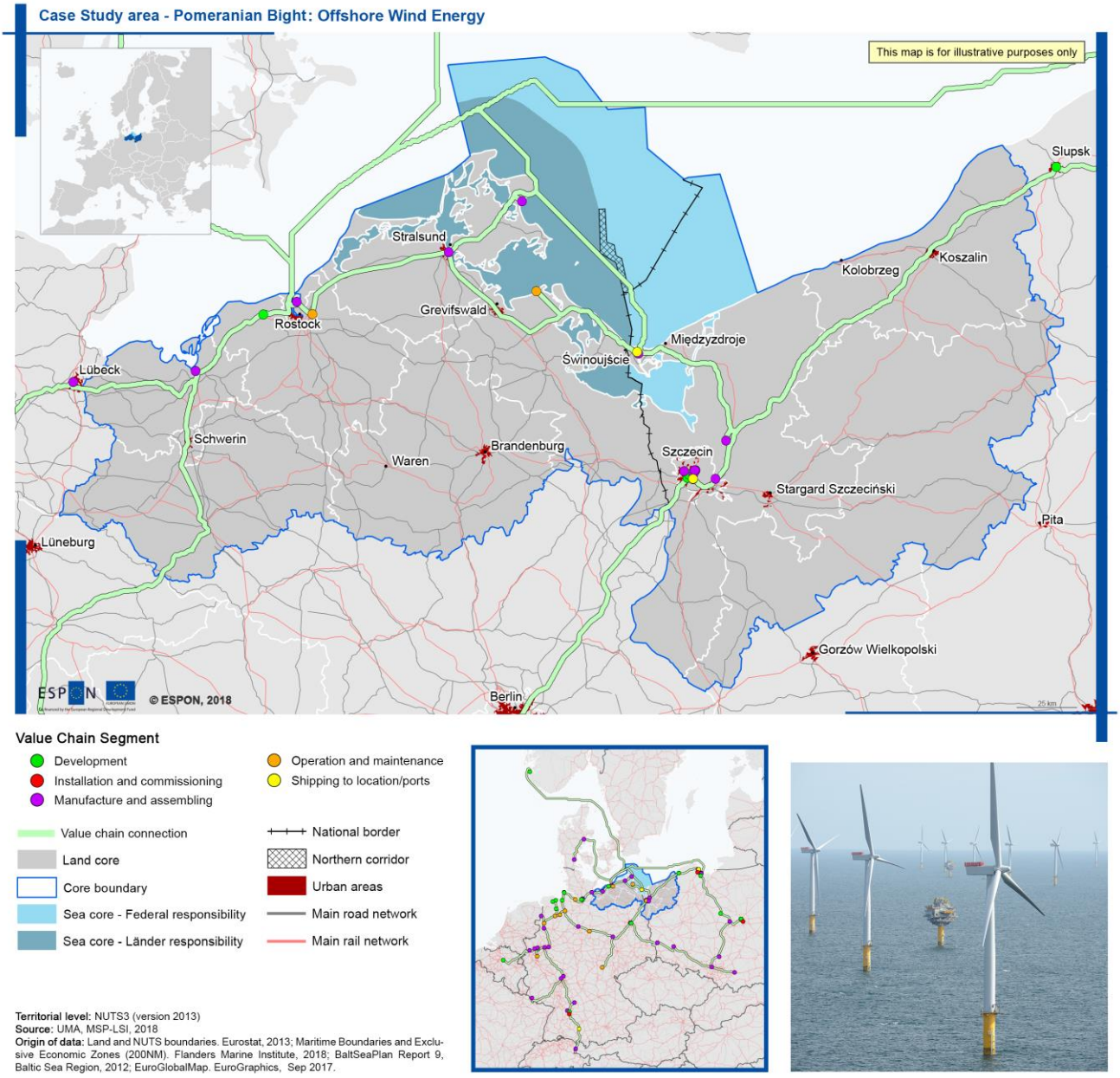
Sector/Group		**Activity**	**Nace code**
Production of energy	Production of energy	Offshore wind energy	N/A
		Production of electricity	D.35.11
		Transmission services of electricity	D.35.12

As revealed in the discussions above we observe that offshore wind energy in Pomeranian Bight involves, amongst others, the following Actors within its value chain: Energy companies; Operators; Wind Farms/Parks businesses; Universities; Non-academic institutions; Manufacturing and assembling businesses and Academies of Sciences.

[180] Baltic Sea Offshore Wind Forum (2017). "The Baltic Sea Declaration". Available at: http://www.baltic-integrid.eu/files/baltic_integrid/news/Baltic-Sea-Declaration.pdf

[181] NACE Rev 2 Statistical classification of economic activities in the European Community. 2008. Eurostat Methodologies and working papers, European Commission, Luxembourg. ISBN 978-92-79-04741-1. Availble at https://ec.europa.eu/eurostat/documents/3859598/5902521/KS-RA-07-015-EN.PDF

Map 11:Key actors in the Offshore wind energy Value Chain in the Pomeranian Bight



The above map shows how most of these offshore wind energy actors at Pomeranian Bight are mostly located in Poland around Szczecin (due to its port and universities) and Swinoujscie (due to its port), and in Germany around the Mecklenburg-Vorpommern area where the four offshore ports (i.e. Wismar, Rostock, Stralsund and Sassnitz) are located. However, this mapping of the actors also allows us to see how this offshore wind energy value chain is spread including other more central inland regions in Germany such as the Saarland region (due to its production of high-quality steel for the foundations of wind energy plants) and the North Rhine-Westphalia, Bavaria and Baden-Württemberg federal states (as they benefit considerably from

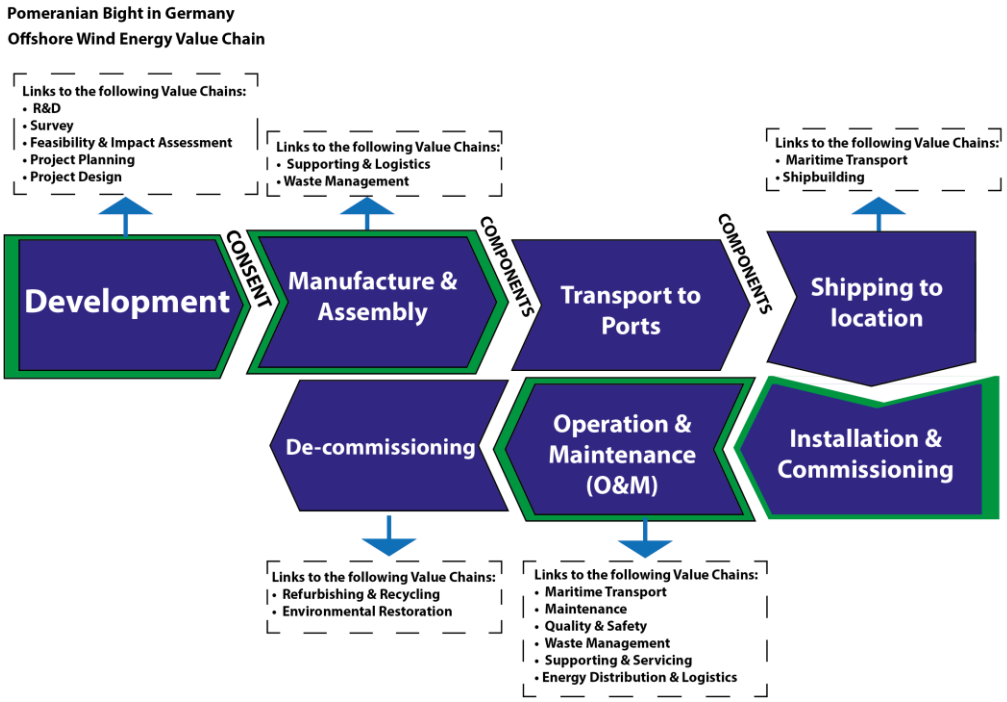
the expansion of offshore wind power[182] with 50% of the turnover and 40% of the employees in the industry coming from these three federal states). Furthermore, this map suggests that Poland has the capacity necessary to initiate and develop its offshore wind energy sector, as elements of the value chain exist and are well-located within this region. Though these parts of the value chain are currently being exported to other countries (i.e. manufacturing parts and building offshore service vessels), the feasibility of utilising such capacity internally to build up this sector is high.

4.2.7 Tailoring the Offshore Wind Energy Value Chain

The below value chain aims at bringing forward the land-sea component of activities stemming from offshore wind energy in the Pomeranian Bight Case Study Area:

We have created two separate figures as the value chain tailoring differs between the German and the Polish part of the Pomeranian Bight:

Figure 7: Tailored Offshore wind energy Value Chain for Germany in the Pomeranian Bight

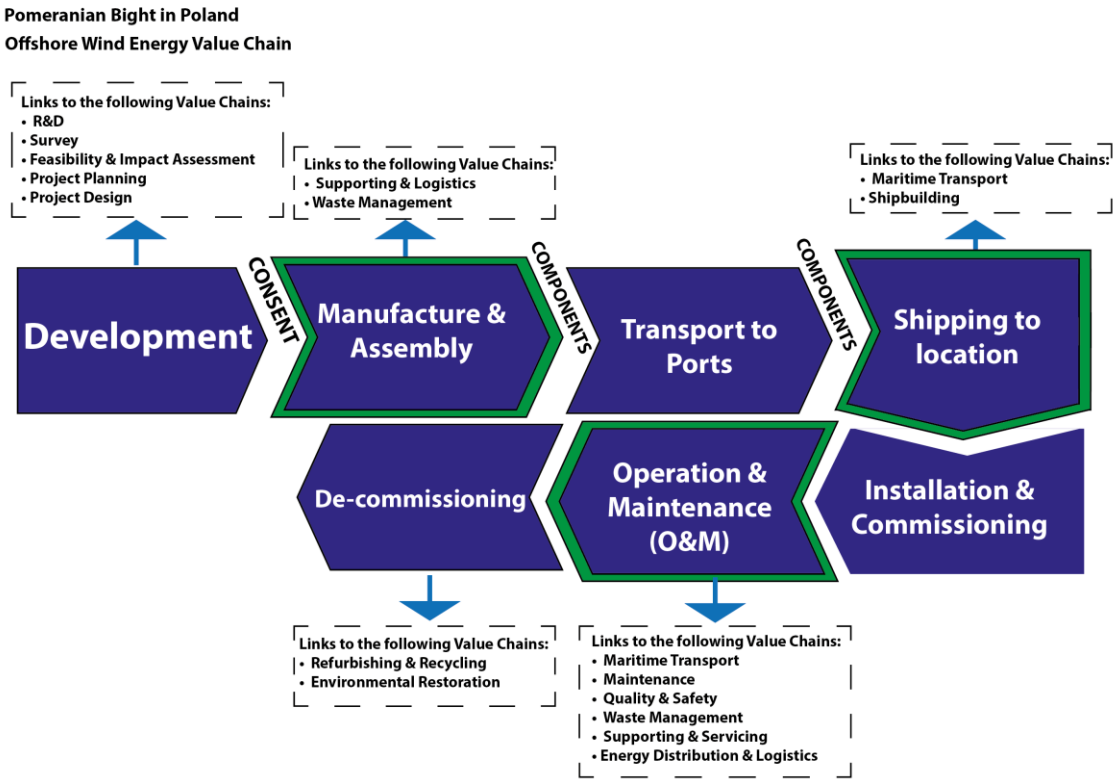


[182] Chancen Nutzen Offshore Deutschlands Windstärke (2017). "Wind vom Meer: Power für Wirtschaft und Beschäftigung". Available at: https://www.wind-energy-network.de/files/files/News/20170620_Broschuere%20Initiative%20Offshore/Factsheet_Arbeit.pdf

Each segment of the value chain corresponds to specific activities and their land-sea dynamics. For Germany four boxes are depicted within a green frame and in a bigger size than the remaining ones, suggesting that the value chain segments: 'Development', 'Manufacturing & Assembling', 'Installation & Commissioning' and 'Operation & maintenance' are particularly relevant to the German side of the Pomeranian Bight case study.

The figure above highlights segments 1, 2, 5 and 6 as development, manufacturing & assembling, installation & commissioning, and operation & maintenance steps are those that are more developed in the German part of the Pomeranian Bight. In terms of the development segment of the value chain, Germany has a well-developed and established research base focusing on offshore wind energy. In terms of the manufacturing & assembling segment of the value chain, Germany also has a good base for offshore wind components. The production of some components is focused in a close proximity to the coast or ports (so as to minimize transport costs). Ports themselves may even serve as production and assembling sites. At the same time, Germany as three offshore wind farms installed and located within or in a close proximity to the Pomeranian Bight. In what regards to operations and maintenance, German ports play an important role and are classified as "Reaction ports" or "Operational ports".

Figure 8: Tailored Offshore wind energy Value Chain for Poland in the Pomeranian Bight



Each segment of the value chain corresponds to specific activities and their land-sea dynamics. For Poland three boxes are depicted within a green frame and in a bigger size than the remaining ones, suggesting that the value chain segments: 'Manufacturing & Assembling', 'Shipping to location', and 'Operation & maintenance' are particularly relevant to the Polish side of the Pomeranian Bight case study.

The figure above highlights segments 2, 4 and 6 as manufacturing & assembling, shipping to location and operation & maintenance steps are those that are more developed in the Polish part of the Pomeranian Bight. In terms of the manufacturing & assembling segment of the value chain, Poland has a somewhat stronger position as up to 50% of components needed for building offshore wind farms (i.e. foundations, towers, substations and cables) could be supplied by Polish firms[183]. At the same time, Polish shipbuilding companies produce several models of vessels, which are dedicated to offshore wind installations and have been successfully deployed in offshore wind projects abroad. Similarly, offshore wind farms might be one of the most steel-intensive activities in the future and both Poland and Germany are also important sub-suppliers of steel and cooper. The Installation and Commissioning step is not much developed in the region as there is currently no offshore wind farms operating in Poland.

4.2.8 Statistical information on the sector

The following section aims at providing additional insight on the key characteristics of the ocean energy sector in the Pomeranian Bight. The statistical information has been retrieved from the most recently available sources and generally includes data on economic contribution and, sector employment.

In Germany, 160,200 people were employed in the wind industry in 2016 (27,200 people in offshore and 133,000 people in onshore)[184]. Almost half of these offshore jobs employ persons in North Rhine-Westphalia, Baden-Württemberg and Bavaria[185]. Due to a large amount of new installations in the country in 2016, offshore installation employment increased by almost 25%, or just under 5,000[186]. These employment effects are distributed throughout Germany and away from the coast. Final manufacturing processes for both onshore and offshore turbines takes place predominantly in northern Germany, but supplies for these are spread everywhere, predominantly in Lower Saxony (32,300 employees in 2015), North Rhine-Westphalia (18,490 employees), Bavaria (11,820 employees) and Baden-Württemberg (9,490 employees)[187].

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[183] WindEurope (018). "Ambitious 8 GW of offshore wind planned that will put Poland back on wind energy map". Available at: https://windeurope.org/newsroom/press-releases/ambitious-8gw-of-offshore-wind-planned-that-will-put-poland-back-on-wind-energy-map/

[184] Bundesverband WindEnergie (2018). "German Wind Energy in Numbers". Available at: https://www.wind-energie.de/english/statistics/statistics-germany/

[185] Bunderverband der Windparkbetreiber Offshore e.V. (2018). Available at: https://bwo-offshorewind.de/en/offshore-wind-energy/

[186] Bundesministerium für Wirtschaft und Energie (2018).

[187] *Ibid*

For the Pomeranian Bight, within the state of Mecklenburg-Vorpommern, expansion of renewable energy has allowed the area to develop into a major electricity exporter, with expectations to continue such exports in the future. With respect to the area's 2015 energy policy concept, the state wants to contribute 6.5% to German electricity generation by 2025. As such, strong growth in both onshore and offshore wind energy is expected to continue (12 terawatt hours (TWh) onshore and 8.25 TWh offshore)[188]. Total employment for offshore wind in Mecklenburg-Vorpommern increased from 580 jobs in 2012 to over 1,150 jobs in 2015, 38.8% of which were employed in operation & maintenance in 2015[189]. Though total employment in offshore wind energy is less than that for coastal tourism, employment conditions tend to be more stable (i.e. less seasonality), demand specialised skills and knowledge, and therefore generally higher salaries. As there are plans to increase installed capacity of offshore wind turbines in the Mecklenburg-Vorpommern area up to 6.5 GW in 2020 and up to 15 GW in 2030, this will also correspond to an increase in employment for the area[190].

For Poland, though the country currently lacks operating offshore wind farms, some national estimates have stated that building 6GW of installed capacity by 2030 is feasible. If Poland pursues this, and taking into account expansion costs of onshore transmission infrastructure, then 16.3 billion EUR (70 billion PLN) of capital expenditure would be required. Grid modernisation and expansion alone would account for 700 million EUR (3 billion PLN)[191].

Though development of Polish offshore wind, much of the supply chain would be localised within the country and generate economic growth of an estimated 14 billion EUR (60 billion PLN) in additional GDP by 2030. Most of this additional GDP could be generated from the construction of rotor components (mainly blades), building foundations, and installation of structures. Direct impact from investments is estimated to generate 4.9 billion EUR (21 billion PLN), indirect impact from the development of the offshore wind value chain would generate 5.13 billion EUR (22 billion PLN), and induced impact in other economic sectors would generate roughly 4 billion EUR (17 billion PLN) (i.e. from the income of people working in the offshore wind value chain)[192]. When looking at this 14 billion EUR along the value chain, 11 billion EUR (47 billion PLN) would be generated in project preparation and development while the rest 3 billion EUR (13 billion PLN) would result from additional exports by Polish offshore wind companies, from O&M for offshore wind farms, and from investments in on-shore electricity assets[193].

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[188] Tartu (2018). "Report on regional added value of renewable energy in BSR. WP2.3 Fostering regional development through renewable energy in BSR". Available at: https://www.balticenergyareas.eu/images/achievements/BEA_Report-on-regional-added-value-of-renewable-energy-in-BSR_180628.pdf

[189] Bundesverband Windenergie, Offshore-Wind-Industrie-Allianz, and Verband deutscher Maschinen- und Anlagenbau (2017). "Beschäftigung in Deutschland durch Windenergie". Available at: https://www.wab.net/fileadmin/media/Downloads/Broschueren/OWIA_Beschaeftigungsstudie_2017.pdf

[190] Tartu (2018).

[191] McKinsey (2016).

[192] *Ibid.*

[193] *Ibid.*

Employment growth from this investment into offshore wind could create around 77,000 jobs in Poland in the construction period on a yearly average basis in the period to 2030. Direct employment would create roughly 27,000 jobs in the development and operation of offshore wind farms; indirect employment would create around 26,000 jobs and induced job creations would be around 24,000 jobs. Up to 70,000 jobs in total (direct, indirect and induced impacts) could be created in the planning and construction of 6 GW of offshore wind farms, while 3,000 jobs would be in onshore grid infrastructure and 4,000 in operations and maintenance. Employment would mostly benefit the installation phase of the offshore wind value chain, followed by foundations, offshore and onshore substations and nacelle and rotors (see table below) [194].

Table 6: Estimated economic statistics on phases of offshore wind production in Poland

Impact	**Project phase**	**Turbine supply**		**Balance of the plant supply**			**Installation**	**Operation & Maintenance**	**Onshore grid infrastructure**	**Total**
		Nacelle & rotor	*Tower*	*Cables*	*Foundation*	*Offshore & onshore*				
GDP (billion EUR)	0.70	1.63	0.93	0.93	2.80	0.93	4.90	0.93	0.70	14
Employment (no. of jobs)	5,000	9,000	8,000	1,000	18,000	9,000	19,000	4,000	3,000	77,000

Specifically for the provinces of Pomorskie and Zachodniopomorskie, total direct impact on the GDP is estimated to be roughly 2.6 billion EUR (11.1 billion PLN) by 2030. Of this, 1.54 billion EUR (6.6 billion PLN) would be generated from direct impacts from construction and exports, 0.16 billion EUR (0.7 billion PLN) from direct impacts from operation and maintenance, and 0.86 billion EUR (3.7 billion PLN) from indirect and induced impacts. In addition, around 15,300 new jobs could be created, 9,200 from construction and export, 1,300 from operation and maintenance, and 4,700 from indirect and induced impacts[195]. As offshore wind farms are expected to operate for approximately 20 years, servicing, monitoring and repairs of Polish offshore wind farms could employ over 1,200 people. An additional 1,000 jobs could be created in the industries supporting offshore wind farms – port services, transportation, and service of vessels. This demand for employment could significantly reduce unemployment in potential operating ports of Władysławowo, Ustka, Darłowo, Łeba and Kołobrzeg, although questions of

[194] *Ibid.*
[195] *Ibid*

training and retraining to meet the skills needs of this industry will need to be addressed, if migrant workers do not fill this potential employment growth[196].

4.2.9 Identification of land-sea interactions of offshore wind energy in the Pomeranian Bight

Apart from the coastal and maritime dimension of offshore wind energy, the sector has important onshore components and implications.

Hereafter, we focus our attention on specific land and sea impacts of offshore wind energy, which are very much related to the economic development of the Pomeranian Bight. They are organised in three typologies: environmental; socio-economic; technical[197].

Environmental LSIs:

- intensive use of space;
- pollution, noise and species' disturbance;
- collision risk risk of birds with offshore wind turbines;
- building new offshore and/or landside infrastructure has an impact on marine and coastal habitats;
- impacts on coastal processes (i.e. presence of offshore structures affecting physical process (wave and tidal streams) leading to changes in local coastal processes and potential impacts at the coastline e.g. beach erosion);
- impacts on fish stocks

Socio-economic LSIs:

- impacts on income and job creation in coastal communities (direct employment at the energy platforms (operation and maintenance works), ports, or secondary from development, manufacture and design of pieces or parts of the energy infrastructures (R&D));
- competition for actual sea and coastal space with sectors such as shipping, recreational activities, fisheries and port development;
- potential displacement of some of these sectors stated above;
- impact on the jobs and income of these competing activities (i.e. potential subsequent impact on fishermen's income, jobs and fishing communities)
- impact on other coastal activities such as coastal tourism through the visual impact of the offshore wind energy infrastructure;

Technical LSIs:

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[196] *Ibid.*

[197] As defined in the European Commission Report "Land Sea Interactions in Maritime Spatial Planning Report". 2018. Available at http://ec.europa.eu/environment/iczm/pdf/LSI_FINAL20180417_digital.pdf

- innovation in terms of infrastructure to limit environmental pressures;
- provision of suitable access to offshore wind energy infrastructures and to coastal infrastructures;
- accessibility to land electricity grid;
- technical capabilities and limitations for cable laying;
- impacts on land infrastructure (increased need for infrastructures at coastal areas);

The below table provides additional information on specific land-sea implications per each segment of the offshore wind energy value chain. Each segment has, in fact, direct or indirect land-sea interactions. Naturally, these are more apparent at the land-sea interface where segments of the value chain are occurring. The table highlights key LSIs for four value chain segment of offshore wind energy in the Pomeranian Bight: shipping of the material to the offshore wind energy infrastructures site, the works for the installation and commissioning of the infrastructure, the operation and maintenance service works and the potential de-commissioning works (once the lifetime of the infrastructure has reached its limits).

Table 7: LSI linkages to segments of the value chain- Offshore wind energy

Segments of the Value Chain	**Main elements characterizing the LSI**
1) Development	Impact on waste management; Employment and Income generation; Impacts on land infrastructure
2) Manufacture & Assembling	Impact on waste management; Employment and Income generation, Impacts on land infrastructure
3) Transport to ports	Accessibility to Infrastructure; Impact of waste management; Employment and Income generation; Impact on coastal processes; Impact on air quality, Impacts on land infrastructure; Pollution, noise or species' disturbance
4) Shipping to location	**Accessibility to Infrastructure; Impact of waste management; Displacement of other sectors, Employment and Income generation; Impact on coastal processes; Invasive non-native species; Impact on air quality, Impacts on land infrastructure; Pollution, noise or species' disturbance**
5) Installation & Commissioning	**Accessibility to Infrastructure; Impact of waste management; Displacement of other sectors, Employment and Income generation; Impact on coastal processes; Invasive non-native species; Impact on air quality, Impacts on land infrastructure; Pollution, noise or species' disturbance**
6) Operation & Maintenance (O&M)	**Accessibility to Infrastructure; Impact of waste management; Displacement of other sectors, Employment and Income generation; Impact on coastal processes; Invasive non-native species; Impact on air quality, Impacts on land infrastructure; Pollution, noise or**

	species' disturbance
7) De-commissioning	**Accessibility to Infrastructure; Impact of waste management; Displacement of other sectors, Employment and Income generation; Impact on coastal processes; Invasive non-native species; Impact on air quality, Impacts on land infrastructure; Pollution, noise or species' disturbance**

5 Summary and Outlook

5.1 Governance Analysis

The analysis of spatial planning in the Pomeranian Bight at different levels revealed the following.

5.1.1 Transnational Spatial Planning Arrangements

Transnational and cross border collaboration between Germany and Poland are well established and have the capacity to deal with the LSI issues associated with MSP and its associated key maritime sectors. Nevertheless planning for the land and the sea in each country remains an exclusive competence and planning spaces, both on the land sea are the responsibility of different levels of governance. For example in Germany the Land and Bund are jointly responsible for different parts of the marine space, whilst in Poland the marine space is a national competence. Nevertheless there are good cross border collaboration and indeed the risks and opportunities for blue economy sectors are similar and this facilitates a collaborative arrangement.

5.1.2 Spatial Planning in Germany

Spatial planning in Germany is what might be described as mature, both on the land and sea, with marine spatial plans already having been developed and approved, although new challenges risks and opportunities means that changes in policy priorities will have implications for sea use space

5.1.3 Spatial Planning in Poland

In Poland, marine spatial planning is in its infancy with formal plans for the whole of the Polish Sea Areas likely to be adopted during 2019. On land municipal plans, once adopted are have legally binding affect and are being revised to take into account new ideas and agendas. It is perhaps too early to determine how planning on the land and planning for the sea really interacts, but it is clear that a great deal of collaborative effort has taken place to ensure that the zoning that occurs within sea space supports the potential development of maritime sectors, although, much of their impact will be felt on the land.

5.1.4 Addressing LSI

Overall, LSI is incorporated into both German and Polish spatial planning arrangements in the Pomeranian Bight. Each respective framework includes explicit considerations of LSI within cornerstone national land-based and marine planning legislation. In Germany, the Federal Spatial Planning Act outlines the requirement for LSI to be considered by both the Bund level when planning in the EEZ and for the other administrative levels when planning in any area of German coastal waters. In Poland, LSI are considered within the Polish National Spatial

Development Concept 2030, which stipulates that national-level marine spatial plans need to be accompanied by specifying procedures which will guarantee correlation between the marine and the land parts of the coastal zone. Though Poland is engaged in an ongoing process to develop its MSP, documentation shows that LSIs are being taken into consideration within the MSP process. Furthermore, the Zachodniopomorskie Voivodeship Spatial Management Plan also covers LSI in the event that they have an impact on the Voivodeship's spatial planning. However, the governance of LSIs within the Pomeranian Bight differs between Germany and Poland. Germany has an ongoing process by which the Bund and Länder meet to discuss MSP matters and LSI issues. This presents a forum to address any LSI conflicts should they arise after planning has taken place. Poland, on the other hand, seems to only take LSIs into consideration during the plan making phase and does not have an established means by which to address LSIs post plan making.

Both Germany and Poland are actively engaged in transboundary and cross border cooperation initiatives related to spatial planning with LSI issues being prominent here. These include for example in the "Joint Future Concept 2030 for the German-Polish Interdependence Area" (2016)[198] and the joint MSP working group, which supports exchange and intensified cross-border cooperation on MSP strategies and consultations. In addition, Poland and Germany are members of the intergovernmental group VASAB, where they also have the opportunity to discuss issues of policy and spatial planning. Furthermore, and what can be viewed as a good practice, was the undertaking of a joint MSP pilot project that explored LSIs within the Pomeranian Bight.

5.2 Value Chain Analysis

5.2.1 Coastal Tourism

Coastal tourism is a very important economic activity in the Pomeranian Bight on both sides of the border.

Looking to the future, in Mecklenburg-Vorpommern much emphasis is given to developing the region's tourism offer in a sustainable and climate-friendly manner. As part of this a regional circular economy ("Regionale Wirtschaftskreisläufe") and integrated value chains are important parts of the approach. In addition the goal of balancing out tourism flows – both regionally (from the coast to the interior) as well as temporally and development of sustainable transport provision is the focus of attention. In Poland similar ambitions are evident in the national "Tourism Development Programme until 2020 which aims to "manage and modernise areas for development of tourism and touristic infrastructure while respecting the principles of sustainable development and environmental protection regulations". Also of note in this context is the "Joint Future Concept 2030 for the German-Polish Interdependence Area". This aims to increase the

[198] Ministerstwo Inwestycji i Rozwoju and Bundesministerium des Inneren, für Bau und Heimat (2016): Joint Future Concept 2030 for the German-Polish Interdependence Area. https://www.kooperation-ohne-grenzen.de/wp-content/uploads/2018/09/Gemeinsames_Zukunftskonzept_2030_Download.pdf

offer and attractiveness of tourism in each country in a complementary and networked manner and promote joint marketing of the Pomeranian Bight's immensely significant tourism offer.

5.2.2 Offshore wind energy

The current production of offshore wind energy in the Pomeranian Bight is skewed. At present Germany has three offshore wind farms located within the Pomeranian Bight with other developments in the pipeline. In contrast Poland does not currently have any offshore installations in its marine waters, although some national estimates have stated that building 6GW of installed capacity in Polish waters by 2030 is feasible.

This pattern is also reflected in existing employment in the sector. In Germany, in 2016 27,200 people particularly associated with offshore schemes. Almost half of these jobs were in North Rhine-Westphalia, Baden-Württemberg and Bavaria and relate to developments not only in German waters but also internationally. Meanwhile total employment for offshore wind in Mecklenburg-Vorpommern increased from 580 jobs in 2012 to over 1,150 jobs in 2015, 38.8% of which were employed in operation & maintenance. According to Wind:Research (2019; see appendix 2) there were 1,250 jobs in offshore wind in Mecklenburg-Vorpommern in the year 2018[199]. Value chain analysis revealed how the employment effects of the offshore wind energy sector were distributed throughout Germany and generally away from the coast.

Studies of possible offshore wind investment in Polish waters have estimated that it could create around 77,000 jobs (directly and indirectly) in Poland as a whole in the period to 2030. As in Germany, the value chain analysis suggests that much associated employment would be generated beyond coastal areas. These statistics highlight how the benefits of offshore wind energy might be experienced a long way from the coast, and the local tourism perceive such development to potentially have an adverse impact on their sector.

Looking to the future further growth in the offshore wind energy sector can be envisaged involving further built windfarm capacity in the Pomeranian Bight and associated opportunities and challenges in the region and elsewhere. This is reflected in the draft of the Poland's Energy Policy 2040, which envisions future increase of energy obtained from renewable sources, with a particular importance of photovoltaics and offshore wind farms[200]. An increased share of renewable energy is also envisioned in Germany's Climate Action Plan 2050. Furthermore, the Baltic Sea Declaration (2017), and industry based partnership also seeks to accelerate offshore wind energy development and foster international cooperation in the region in order to increase security in energy supply, support achievement of EU energy objectives and targets, as well as further diversify the energy production in the region.

[199] Wind:Research (2019). Wertschöpfung der Offshore-Windenergie in Deutschland.

[200] Ministerstwo Energii (2018).

5.3 Recommendations for Good Management of LSI in the Pomeranian Bight

Drawing upon the case study governance and value chain analyses the following recommendations are put forward for good management of LSI in the Pomeranian Bight.

On the one hand, Germany's spatial planning arrangements which since 2001 have required integrated planning of land and sea at the Länder level and the associated planning experience of Mecklenburg-Vorpommern are put forward as examples of exemplary 'one space' territorial planning in addressing LSI.

On the other hand, for countries where terrestrial and marine planning is developing as separate systems the experience in Poland provides valuable examples of good practice. These include the NSDC 2030 stipulation that the preparation of marine spatial plans and spatial plans for land areas adjoining marine areas will necessitate consultations among the bodies responsible for the respective plans. In addition the process of considering LSI developed in The Study of Conditions of MSP of the Polish Sea Areas and the subsequent LSI policy and management approaches in the draft MSP for Polish Sea Areas are commended.

The Pomeranian Bight case study also reveals inspiring practice in collaborative approaches to addressing LSI in cross border spatial planning. Examples here include activities associated with the German-Polish Governmental Commission for Regional and Border Collaboration (including the joint Spatial Planning Committee, joint MSP working group and Joint Future Concept 2030 for the German-Polish Interdependence Area" (2016). Equally wider collaborative activities under HELCOM and VASAB are already internationally recognised as generating innovation approaches to LSI.

Looking to the future and recognising the transnational nature of this case study the following recommendations are put forward for consideration.

Recommendation 1

As a response to the "Joint Future Concept 2030 for the German-Polish Interdependence Area" and its collaborative ambitions (for example, for Coastal Tourism development in the Pomeranian Bight) consideration could be given to utilising a value chain approach in prioritising implementation activities.

The MSP-LSI value chain approach with its emphasis on understanding the spatial impacts of maritime sectors, framework conditions and 'stickability' of benefits within a core area, has revealed distinctly different patterns of experience in relation to LSI associated with offshore wind energy and coastal tourism. Such insights for these and other maritime sectors could be used to inform future planning for the Pomeranian Bight region.

Recommendation 2

As a response to the Baltic Sea Declaration 2017 and its ambition to accelerate offshore wind energy development, consideration could be given to development a joint German/Polish Pomeranian Bight focussed approach utilising the MSP-LSI Value Chain insights.

This research has shown how at present much of the benefit of offshore wind energy in the Pomeranian Bight are felt beyond the core area, both in terms of the jobs created and where the energy is consumed. In looking to future offshore wind energy production there may be scope to maximise new employment opportunities within the region as a whole through closer collaboration on this issue.

Recommendation 3

Whilst tourism is likely to remain the dominant sector on both sides of the German / Polish border, there are signs that the growth rates for this sector may be weaken in the long term, particularly in Germany. In addition the sector as a whole suffers from seasonality and part time and low wage employment. With this in mind an innovation dynamic is needed in the tourism sector and more attention needs to be given to broader diversification of the areas' economies, recognising that both regions are relatively peripheral in national space and that alternative development opportunities might lie in their maritime location.

The Pomeranian Bight is a leading tourism destination for German and Polish residents. Whilst future growth is being promoted, signs of overcapacity and stabilising demand in some areas are also evident. Equally the sector suffers from local labour shortages and seasonality and alternative, year round and better paid employment would help to diversify the region's economic base in a positive way.

ESPON 2020 – More information

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