

BLUE GROWTH CHECKS MAPPING THE BLUE ECONOMY IN THE CASE STUDY REGIONS

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Summary

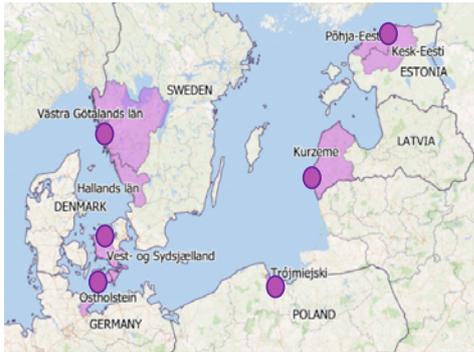
This report aims at mapping the state of the Blue Economy in the case study regions of the Land-Sea-Act project. As a relatively new concept, the Blue Economy still suffers from a severe problem, i.e. data limitations occur in particular on the regional level, even for the established sectors (marine living and non-living resources, marine renewable energy, port activities, shipbuilding, maritime transport, coastal tourism). To fill this void, an expert survey amongst local Blue Economy experts was conducted. The case study regions showed heterogeneous local economic structures. The regional potentials for Blue Growth were evaluated via a SWOT-analysis.

Although coastal tourism dominates employment in the Blue Economy in the case study regions, each regional Blue Economy turned out to have its specific mix of Blue Economy sectors. Similarly, the regional preconditions, the environment of stakeholders and the prospects for growth differ significantly. Therefore, solutions for sustainable future growth need to be found for each region individually on the regional level. Regional and local planners should elaborate a sustainable strategy for their Blue Economy and supervise its implementation. So-called Emerging Sectors (blue bioeconomy, coastal protection, marine research and education) are promising fields of high future growth in the regional economies, especially in the context of the new European Green Deal. Nevertheless, monitoring those sectors is even more challenging due to data restrictions.

Research has to audit the developments and work on harmonised measures for Blue Economy sectors. The annual EU Blue Economy Report gives guidance on measurements and data on the national level. These measurements have to be transferable to the regional and local levels and need to be fed with publicly available data to be a valuable input for regional planning.

BLUE GROWTH CHECKS

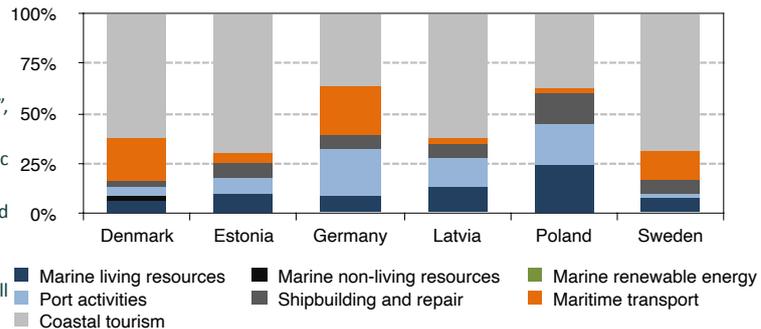
Mapping the Blue Economy in the case study regions



Case study	NUTS 2	NUTS 3	Case study area
Latvia	Latvia	Kurzeme	Southwestern Kurzeme coast
Poland	Pomorskie	Trójmiejski	Gulf of Gdansk
Germany	Schleswig-Holstein	Ostholstein	Fehmarn island
Estonia	Estonia	Põhja-Eesti & Kesk-Eesti	Hajjala and Vihula municipalities
Denmark	Sjælland	Vest- og Sydsjælland	Holbæk Municipality
Sweden	Västsverige	Halland & Västra Götaland	Coastal area of Gothenburg (sub)region

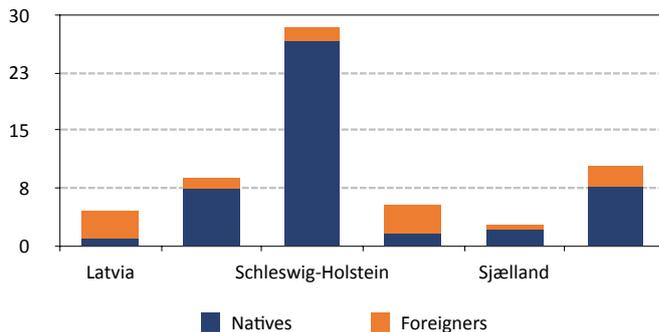
Blue Economy jobs in the case study countries, 2018

- In Estonia, more than 7% of all jobs are “blue”, followed by Latvia and Denmark (5%)
- All Land-Sea-Act countries have their specific sector structure
- Vital maritime transport in Denmark, Germany and Sweden
- Great importance of fishing industry in Poland
- Coastal tourism as the dominating blue sector in all countries



Sources: The EU Blue Economy Report 2020, HWWI (2020).

in millions



Sources: Eurostat (2020): [tour_occ_nin2c]; HWWI.

Nights spent in coastal tourist accommodation, 2019

- Schleswig Holstein hosts almost as many tourists as the regions together
- Strong dependence on foreign tourists in Latvia and Estonia

Gross investment in tangible goods in Mio. Euro, 2018 (change between 2009 and 2018)

	Latvia	Poland	Germany	Estonia	Denmark	Sweden
Marine living resources	8.2 ↓ (-22%)	103.6 ↑ (78%)	228.4 ↑ (84%)	6.1 ↓ (-12%)	60.3 ↓ (-38%)	23.6 ↓ (-43%)
Marine non-living resources	0	3.3 ↓ (-47%)	7.2 ↓ (-75%)	0	694.4 ↑ (22%)	0
Port activities	86.6 ↑ (336%)	81.4 ↓ (-27%)	899.7 ↑ (15%)	46.7 ↓ (-68%)	180.3 ↑ (27%)	173.6 ↑ (95%)
Shipbuilding and repair	5.4 ↓ (-45%)	76.1 ↑ (7%)	282 ↑ (41%)	10 ↑ (47%)	31.3 ↑ (64%)	50.6 ↑ (28%)
Maritime transport	8.9 ↓ (-13%)	14.7 ↓ (-30%)	5,087.50 ↑ (132%)	60.5 ↑ (314%)	3,447.30 ↑ (2%)	350.6 ↓ (-19%)
Total	109.1 ↑ (116%)	279.2 ↑ (4%)	6,504.80 ↑ (95%)	123.2 ↓ (-28%)	4,635.20 ↑ (8%)	598.3 ↓ (-1%)

Future challenges and opportunities

- Climate change
- General economic development
- COVID 19: Strong impact on (foreign) coastal tourism
- Chinese Belt and Road Initiative: Growth potentials of port activities and maritime transport
- Green Deal: Blue growth opportunities, especially for emerging blue sectors
 - Blue Bioeconomy
 - Marine minerals/Deep-seabed mining
 - Coastal and environmental protection
 - Marine research and education



Recommendations

- The economic sustainability of the specialisation niche of each region should be subject to regular checks and updates within strategic planning.
- Once a strategy is drafted, regional planners need to ensure it is implemented and regularly monitor it.
- For effective monitoring, comprehensive, consistent and comparable EU-wide data sets on the Blue Economy are necessary.
- National and regional statistical offices must be required to report economic data at the NUTS2 and NUTS3-level for both established and emerging sectors.
- Apart from economic data, knowledge on good practices regarding governance, entrepreneurial discovery processes and the legal framework must be shared to improve the regional preconditions for Blue Growth.

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1

The EU Blue Economy

1.1 Political framework

The EU aims to promote the Blue Economy via its long-term Blue Growth strategy launched in 2012. Taking the goals of the Europe 2020 strategy for smart, sustainable and inclusive growth into consideration, it seeks to foster sustainable development in the marine and maritime sectors by (1) supporting sectors with high potential for jobs, (2) providing knowledge and a legal basis and (3) developing sea basin strategies to strengthen cooperation between countries.¹ In 2021, the EU Commission published its new approach, shifting the focus from “Blue Growth” to “Sustainable Blue Economy” to account for the European Green Deal’s aims of a modern, resource-efficient and competitive economy.² With regards to the Blue Economy, this will have huge impacts on fishing, ocean energy, maritime transport and coastal tourism.³

To monitor progress regarding Blue Growth, the European Commission has been publishing an Annual Economic Report on the EU Blue Economy since 2018⁴. The report collects information about economic activities related to oceans, seas and coasts covered under the Blue Economy concept. Blue Economy activities could either be marine-based, i.e. located in the sea, sea or coastal areas, or marine-related, using and producing marine-based products and services.

The recent third EU Blue Economy Report 2020⁵ report further shows the dynamic development of the still relatively new concept of Blue Economy, already listing a handful of policies and financing structures that are in place. Most of these policies had been established before the idea of Blue Economy gained importance, such as Maritime Spatial Planning, but now serve as essential instruments in the Blue Economy context. Furthermore, the EU emissions trading system and the Marine Strategy Framework Directive play an important role. With regards to financing, the report promotes the “Blueinvest Platform”, a joined project by the European Commission and the European Investment Fund (EIF) to support SMEs. On top, the European Bank for Reconstruction and Development (EBRD) finances multiple projects in the Blue Economy in regions that undergo a transition process. Besides this financing platform, the European Investment Bank (EIB) launched their “Clean and Sustainable Ocean Programme”, establishing guiding principles for future ocean-based activities underlining the ambition to aid environmental sustainability in the European Blue Economy.

For a better understanding, the report defines sectors subsumed under the term Blue Economy. The definition distinguishes between “established sectors” and “emerging sectors” of the Blue Economy (Table 1). These sectors have been established long term in the EU and can be measured quite well. Emerging sectors are not necessarily new, but show high potential for future development. Those emerging sectors generally lack good data sources, so the goal for future reports was to add data on them to assess their share in the EU blue economy. In terms of data availability, noticeable progress has been made. While Renewable Energy as a whole was classified as an emerging sector in 2018, at least in parts (namely Offshore Wind), the report now categorises it as an established sector. Among those emerging sectors, desalination is not relevant for the Baltic Sea Region, but rather in warmer regions that have potential struggles with freshwater supply⁶.

1 Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: Blue Growth opportunities for marine and maritime sustainable growth /* COM/2012/0494 final */

Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: Innovation in the Blue Economy: realising the potential of our seas and oceans for jobs and growth /* COM/2014/0254 final/2 */

Commission Staff Working Document: Report on the Blue Growth Strategy Towards more sustainable growth and jobs in the blue economy SWD(2017)128/F1

2 Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: The European Green Deal /*COM(2019) 640 final*/

3 Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions on a new approach for a sustainable blue economy in the EU Transforming the EU’s Blue Economy for a Sustainable Future / COM/2021/240 final

4 European Commission (2018): The Annual Economic Report on EU Blue Economy. Publications Office of the European Union. Luxembourg, DOI: 10.2771/305342

5 European Commission (2020a): The EU Blue Economy Report 2020. Publications Office of the European Union. Luxembourg, DOI: 10.2771/363293

6 European Commission (2020a): The EU Blue Economy Report 2020. Publications Office of the European Union. Luxembourg, DOI: 10.2771/363293

Table 1:
 Sectors of the Blue Economy

Established sectors	Emerging sectors
<ul style="list-style-type: none"> • Marine living resources • Marine non-living resources • Marine renewable energy • Port activities and construction of water projects • Shipbuilding and repair • Maritime transport • Coastal tourism 	<ul style="list-style-type: none"> • Desalination • Blue Bioeconomy • Marine minerals/Deep-seabed mining • Coastal and environmental protection • Defence and security • Marine research and education

1.2 Concepts of measuring Blue Economy

Since statistical offices at the EU or national level do not measure the Blue Economy as one particular sector, the EU Blue Economy report refers to the most recent Structural Business Statistics (SBS)⁷ provisional data from 2018. With regards to fisheries and aquaculture though, 2017 and 2016 data, respectively, were the most recent. The report groups economic activities based on the statistical classification of economic activities in the European Community (NACE Rev.2). NACE lists 615 business sectors at the four-digit level, from which 46 have a “principal or significant maritime component”. In addition, 20 more NACE-codes belonged to industries with an “important maritime component”. However, these sectors are not solely “blue”. For sectors that have a maritime and a non-maritime component, maritime proportions were computed using Eurostat statistics on manufactured goods (PRODCOM)⁸. In some cases, imputations are necessary. On- and offshore oil and gas production was estimated using Rystad Energy UCube data⁹. Coastal tourism is different from other sectors, since it is a set of activities rather than a single economic activity. Therefore, the report developed a specific methodology to grasp coastal tourism. Based on these different sources, gross value added, gross operating surplus, net investment, persons employed as well as gross and net investments are calculated.

⁷ Eurostat: Structural Business Statistics, <https://ec.europa.eu/eurostat/web/structural-business-statistics/overview>

⁸ Eurostat: Statistics on the production of manufactured goods, <https://ec.europa.eu/eurostat/web/prodcom/data/database>

⁹ Rystad Energy: UCube database, <https://www.rystadenergy.com/energy-themes/oil--gas/upstream/u-cube/>

Table 2:

Established Sectors of the Blue Economy with their corresponding NACE-Sectors 2018

Extraction of Marine Living Resources		Extraction of marine non-living resources	Shipbuilding and Repair		
10.20	Processing and preserving of fish, crustaceans and molluscs	06.10	Extraction of crude petroleum	30.11	Building of ships and floating structures
46.38	Wholesale of other food, including fish, crustaceans and molluscs	06.20	Extraction of natural gas	30.12	Building of pleasure and sporting boats
47.23	Retail sale of fish, crustaceans and molluscs in specialised stores	09.10	Support activities for petroleum and natural gas extraction	33.15	Repair and maintenance of ships and boats
Port, Warehousing and Construction of Water Projects		Marine renewable Energy			
52.10	Warehousing and storage	52.24	Cargo handling	35.11	Production of electricity
52.22	Service activities incidental to water transportation	42.91	Construction of water projects	35.12	Transmission of electricity
Coastal tourism		Maritime Transport			
55.10	Hotels and similar accommodation	49.30	Urban and suburban passenger land transport	50.10	Sea and coastal passenger water transport
55.20	Holiday and other short-stay accommodation	50.10	Sea and coastal passenger water transport	50.20	Sea and coastal freight water transport
55.30	Camping grounds, recreational vehicle parks and trailer parks	51.10	Passenger air transport	50.30	Inland passenger water transport
55.90	Other accommodation	47.6	Retail sale of cultural and recreation goods in specialised stores	50.40	Inland freight water transport
47.30	Retail sale of automotive fuel in specialised stores	47.7	Retail sale of other goods in specialised stores	77.34	sRenting and leasing of water transport equipment
49.10	Passenger rail transport, interurban	I56	Food and beverage service activities		

This complex methodology with detailed information at the NACE four-digit level, in combination with production statistics and additional sources, makes it impossible to replicate the results at the regional or local level, as information at this low aggregation level is not available at all is or subject to too many anonymisations. Nevertheless, other studies have tried to approach the issue with different methodologies. Szejgiec-Kolenda and Zaucha (2018)¹⁰ stress the difficulty of distinguishing Blue Economy sectors. They focus on single economic entities operating in “blue” activities instead of industries as a whole. Katila et al. (2018)¹¹ face similar problems measuring the Blue Economy in the Gulf of Bothnia. In terms of data sources, they complemented Statistics Finland data with numbers of blue entities from internet sources and a survey amongst companies that belong to the Blue Economy sector. The main Blue Economy sectors in their region turned out to be aquaculture, maritime transport and tourism. Total numbers of companies were higher than Statistics Finland suggested,

10 Szejgiec-Kolenda, B. and Zaucha, J. (2018): Dealing with Maritime Economy at the Local Level. Trends along the Coastal Poland, SHS Web of Conferences 58, 01028.

11 Katila, J.; Ala-Rämi, K.; Repka, S.; Rendon, E.; Törrönen, J. (2019): Defining and quantifying the sea-based economy to support regional blue growth strategies – Case Gulf of Bothnia, Marine Policy, Volume 100, February 2019, pp. 215-225.

but many companies turned out to not be involved in the Blue Economy, or only partly. In conclusion, they emphasised the need to collect more profound data from various sources. Furthermore, only including the number of businesses turned out to give relatively little insight into the actual importance of the Blue Economy for employment or income.

1.3 Development of the Blue Economy in the European Union

The recent third Blue Economy report by the European Commission provides the newest data on the development of the Blue Economy on the national level. As we briefly touched on under 1.2, the European Commission currently considers seven sectors as established sectors within the Blue Economy framework. Employment has developed differently in these sectors. After a decline following the financial and economic crisis in 2008/2009, the Blue Economy, driven by its most important sector coastal tourism, gained momentum in recent years and reached its 2009 level again (Figure 1). In 2018, with 3 million employees, coastal tourism had six times as many as the second most important sector, extraction of marine living resources. Coastal tourism underwent a significant downward trend in the first half of the last decade, which saw the employment shrink from over 3 million in 2009 to 2,1 million in 2015. Afterwards, however, it recovered, so that the numbers in 2018 were almost the same as they were in 2009. Amongst the other sectors, port activities, and maritime transport increased, while jobs in the extraction of marine living resources and shipbuilding and repair were slightly reduced (Figure 2). Similar, the extraction of marine non-living resources saw a downturn since 2015 (Figure 3) Although it has been growing in recent years, marine renewable energy still accounts for the fewest employment in total.

Figure 1:

Blue Economy jobs (total, coastal tourism), 2018

Sources: *The EU Blue Economy Report 2020, HWWI.*

in thousands

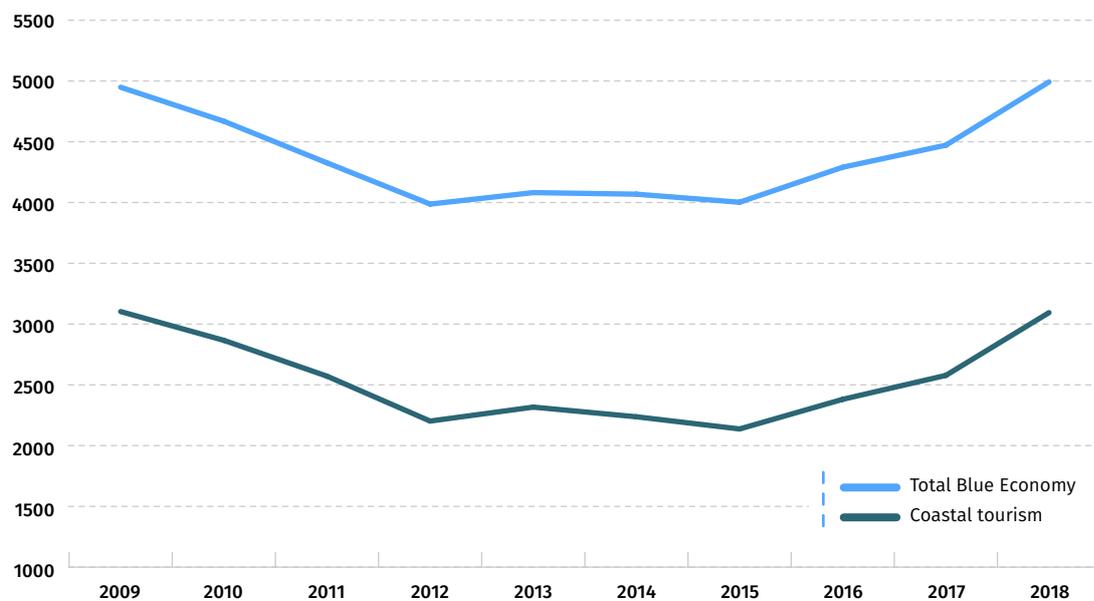


Figure 2:
 Blue Economy jobs (further sectors), 2018

Sources: *The EU Blue Economy Report 2020, HWWI.*

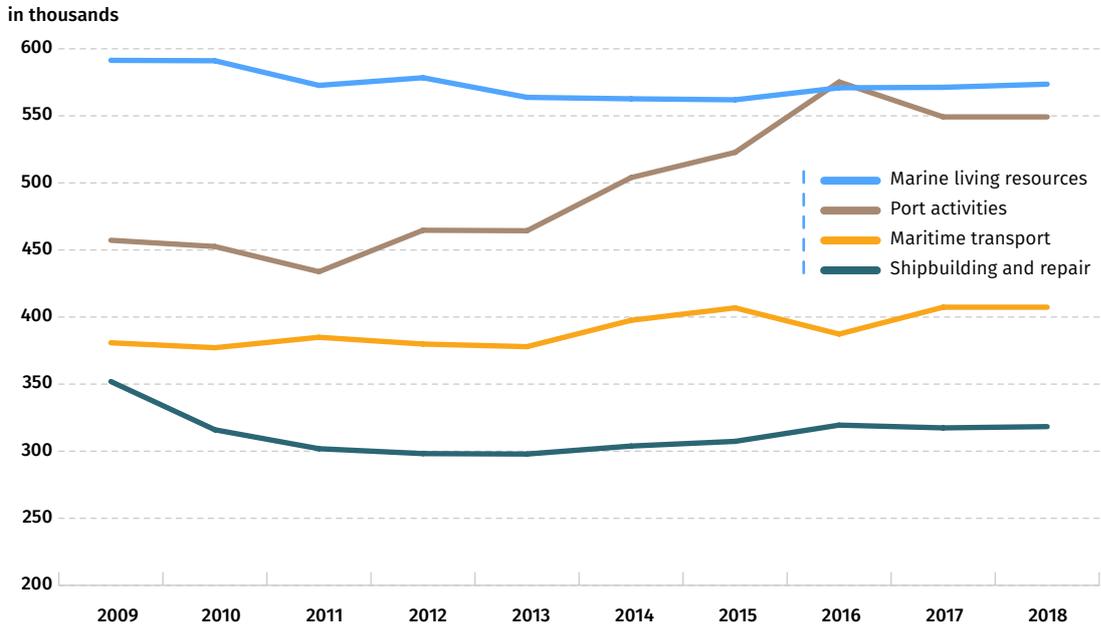
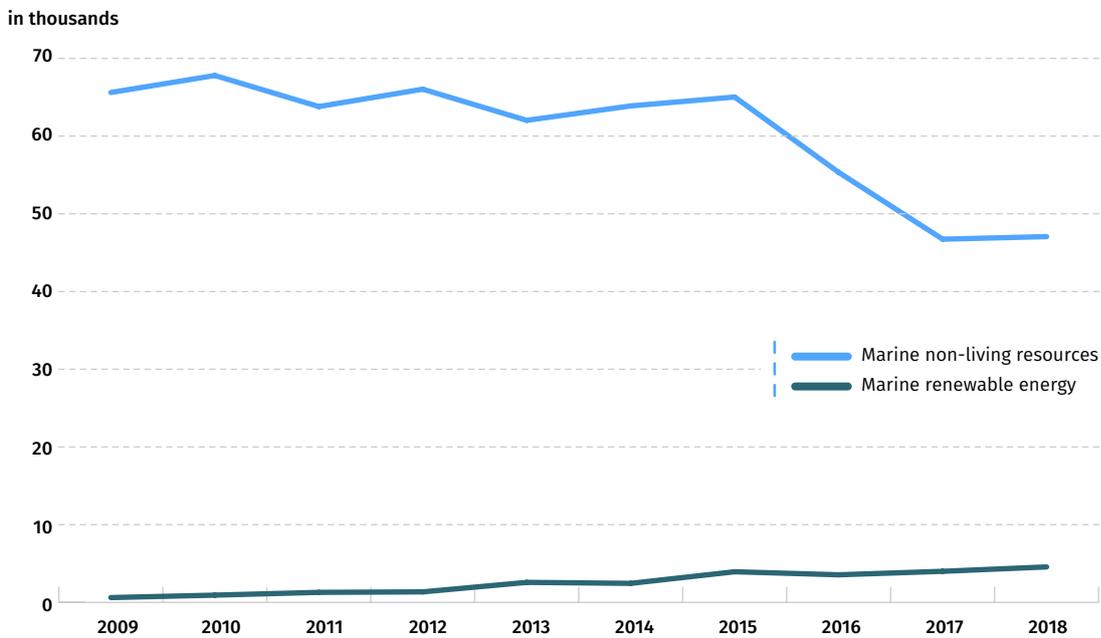


Figure 3:
 Blue Economy jobs (marine non-living resources, marine renewable energy), 2018

Sources: *The EU Blue Economy Report 2020, HWWI.*



2

The Blue
Economy
in the Land-
Sea-Act case
study regions

2.1 Methodological framework

This report aims to (1) map the state of play of the Blue Economy in the pilot regions of the project, (2) identify critical drivers of Blue growth, (3) identify crucial areas to foster Blue Growth in the case study regions and, based on these findings, (4) draw recommendations for future action.

To shed light on particular aspects of the Blue Economy in the case study regions of the Land-Sea-Act project¹², we use different data sources. Eurostat and the EU Blue Economy Report serve as primary sources for comparable Blue Economy related data. This data is available at different geographical levels following the NUTS classification of the European Union¹³.

Table 3 gives an overview of the location of the case studies at NUTS-2 and NUTS-3 levels:

Table 3:

Location of the case studies

Case study	NUTS-2	NUTS-3
Latvia	LV00 Latvia	LV003 Kurzeme
Poland	PL63 Pomorskie	PL633 Trójmiejski
Germany	DEF0 Schleswig-Holstein	DEF08 Ostholstein
Estonia	EE00 Estonia	EE001 Põhja-Eesti EE006 Kesk-Eesti
Denmark	DK02 Sjælland	DK022 Vest- og Sydsjælland
Sweden	SE23 Västsverige	SE231 Halland SE232 Västra Götaland

As two pilots (Estonian and Swedish case) are located in two NUTS-3 regions, we will consider information for both NUTS-3 regions in these cases. For Latvia and Estonia, the NUTS-2 level coincides with the national level. To capture the specific circumstances in the project region, we try to provide information on the lowest geographical level possible.

However, as Blue Economy is a relatively new concept, official statistical data is only informative regarding specific indicators. Hence, we supplement this data with information generated within the INTERREG BSR project “Smart Blue Regions”¹⁴. Furthermore, we seek to base our evaluation not on quantitative data only but also qualitative assessments and therefore, collected experts’ judgement of Blue Growth potentials and preconditions through a questionnaire among local Blue Economy experts from the partner regions. For this purpose, HWWI created a structured online questionnaire¹⁵, which was spread among local experts, such as, strategic planners, practitioners of coastal municipalities, regional planning authorities, private companies, cluster organisations and research institutions by the partners of the project. In total, we received 25 replies, including one qualified response from each project region. All information will be condensed via a SWOT (Strengths, Weaknesses, Opportunities and Threats) analysis for each region of the case studies.

¹² Land-sea interactions advancing Blue Growth in Baltic Sea coastal areas

¹³ Eurostat: NUTS- Nomenclature of territorial units for statistics, <https://ec.europa.eu/eurostat/web/nuts/background>

¹⁴ For more information see: <https://www.submariner-network.eu/smartbluregions/33-projects/smart-blue-regions/130-about-smart-blue-regions>

¹⁵ See Annex

2.2 General economic overview

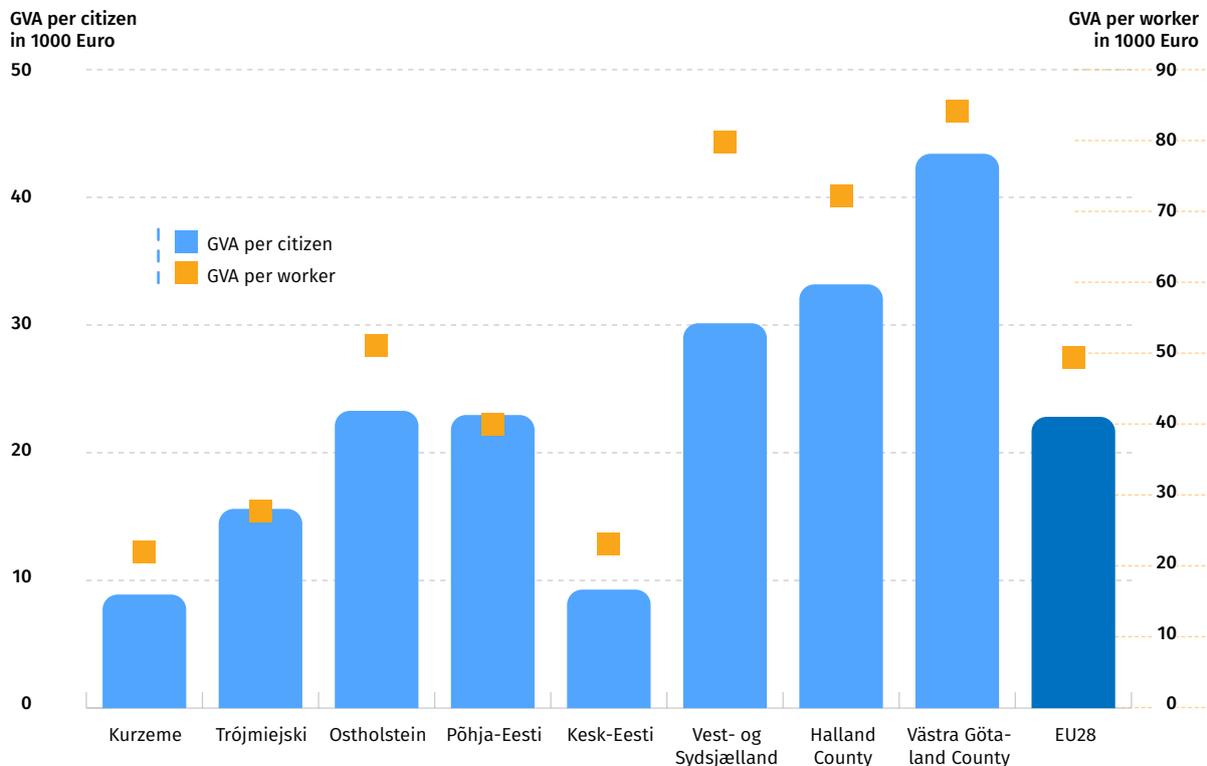
Before looking at data which directly measures aspects of the Blue Economy, this chapter gives a short overview of the general economic situation in the regions involved in the project.

Gross value added (GVA) is a useful measure to assess the economic activity and productivity of a region. It comprises the value created by economic units in the production of goods and service. Figure 4 shows the GVA per citizen and per worker in 1000-EUR at NUTS-3 level for all partner regions in 2017. In terms of economic activity (GVA per citizen), Västra Götaland exhibits a level twice as high as the EU average. In contrast, it is half as high in Kurzeme and Kesk-Eesti. The indicator for productivity (GVA per worker) shows similar patterns with high levels in the Swedish and Danish region and relatively low productivity in Kurzeme, Trójmiejski and Kesk-Eesti.

Figure 4:

GVA per citizen and worker 2017 (in 1000 Euro)

Sources: Eurostat (2020): [demo_r_pjangrp3, nama_10r_3empers, nama_10r_3gva]; HWWI.



A further indicator regarding the economic situation of a region is the unemployment rate. Figure 5 shows the development between 2012 and 2019. A downward trend for all regarded NUTS-3 regions, as well as for the EU28, is visible. In 2012, Latvia and Estonia stood out with unemployment rates of more than 8%. During the period mentioned above, however, employment increased significantly, with an unemployment rate of below 4% in 2019. Trójmiejski underwent a similar development, with unemployment numbers dropping from 6% in 2012 to 2,3% in 2019, the lowest of all considered regions. The 2019 level was highest in Västra Götaland and Ostholstein and the decline from 2012 relatively weak. Generally, one should bear in mind that recent developments around the COVID-19 pandemic are likely to harm these positive trends.

Figure 5:
 Unemployment rate in % as percentage of the active population

Sources: National statistical offices; HWWI.

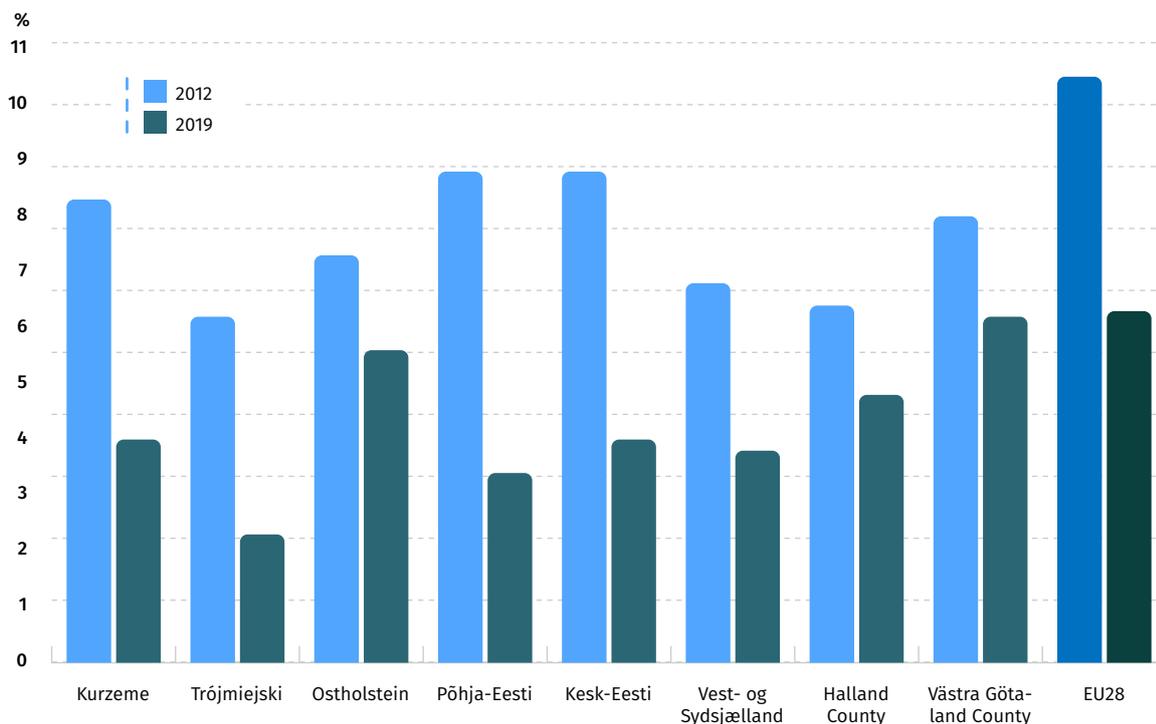


Figure 6 and Figure 7 show employment by sector for NUTS-3 partner regions. For all regions, industry, wholesale and retail trade and public administration stand out as the main employment sectors. Arts, professional and scientific activities, real estate and financial activities across the board have lower shares on total regional employment. Construction has very constant employment shares for all regions, around 5%. In Kurzeme, agriculture, forestry and fishing account for more than 10% of total employment, more than in any other part. While in Vest- og Sydsjælland the share of industry is lower, in comparison with the other regions, with over 30% of labour operates in public administration. Põhja-Eesti has minimal employment numbers in agriculture, forestry and fishing and also rather few employees in public administration, but slightly more specialisation in information and communication and professional, scientific and technical activities. Trójmiejski's employment shows a low share in agriculture, forestry and fishing and a lot of service sector employment (financial and insurance activities, information and communication, professional, scientific and technical activities). The Swedish regions Halland County and Västra Götaland County balance out their lesser involvement in agriculture, forestry and fishing and industry with a higher workforce in public administration. Data for Ostholstein and Kesk-Eesti respectively was not directly comparable to the other regions, as sectors were aggregated differently. However, the numbers for Ostholstein show very little involvement in agriculture, forestry and fishing and industry, but a lot of employment in public administration, arts, entertainment and recreation and wholesale and retail trade. Kesk-Eesti data points towards the fact that a high share of people works in the industry sector.

Figure 6:
 Employment by sector, 2017

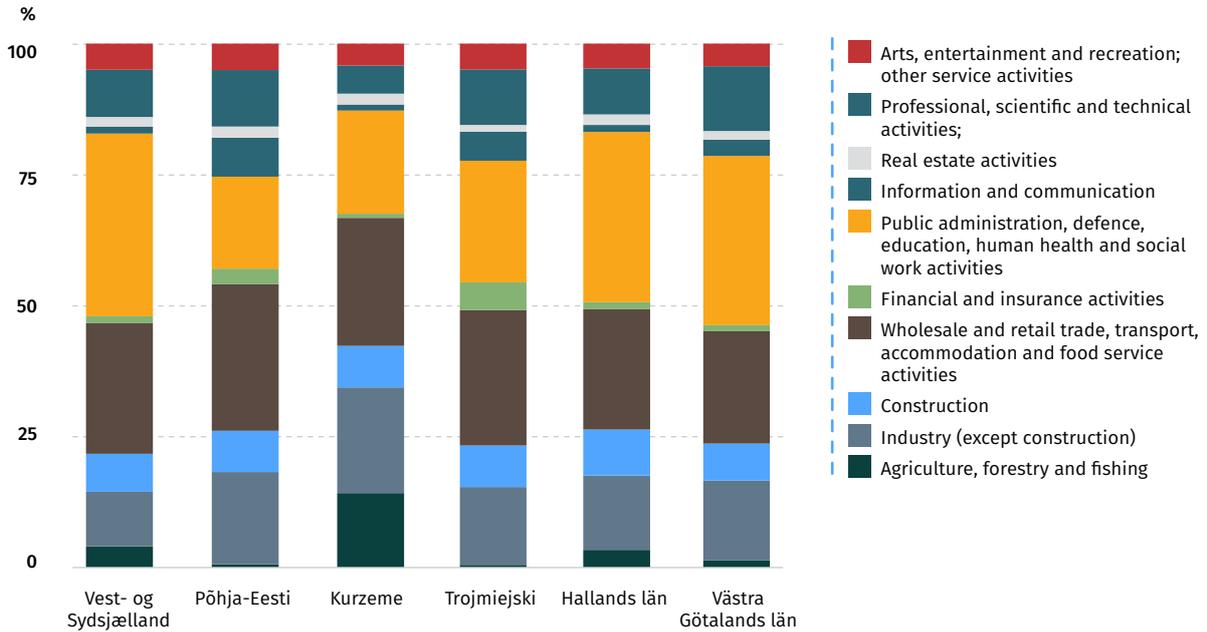
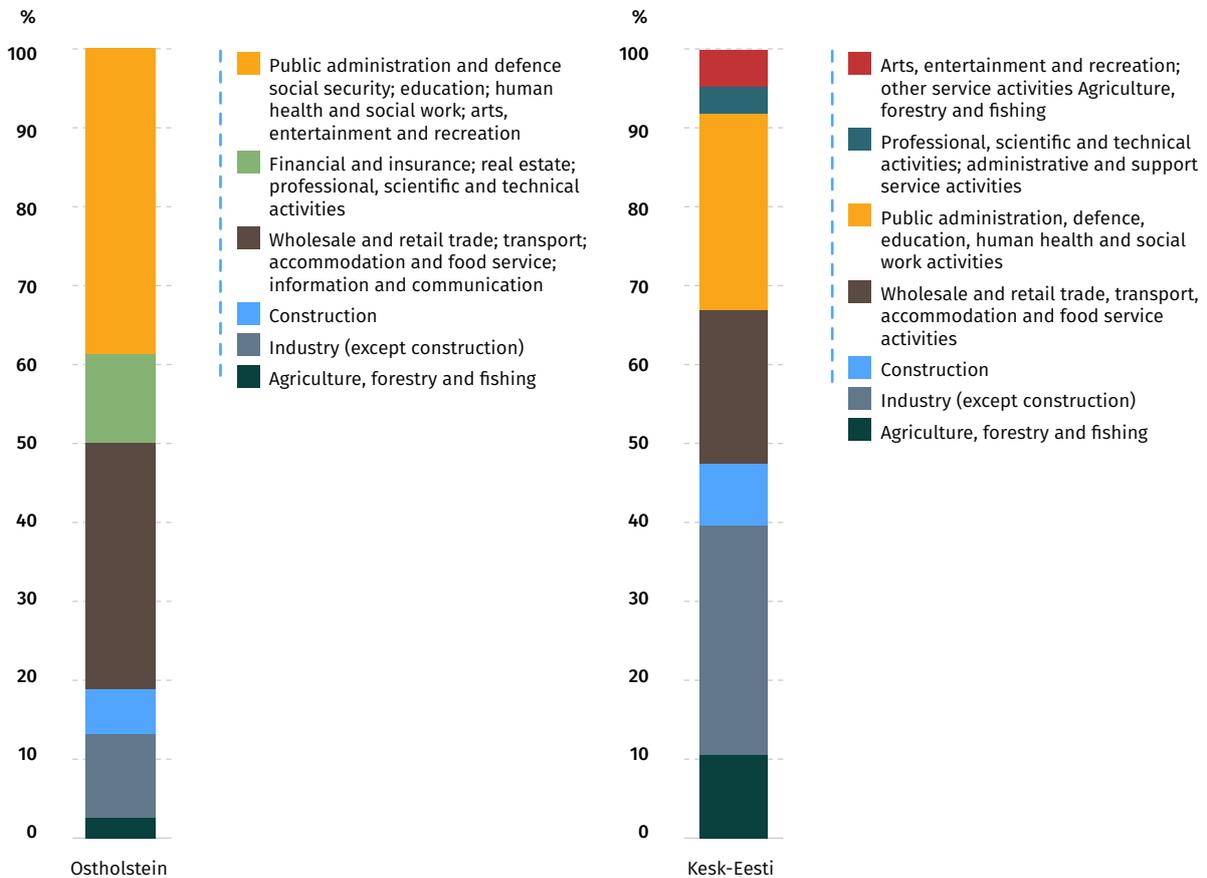


Figure 7:
 Employment by sector, 2017 (Ostholstein, Kesk-Eesti)

Sources: Eurostat (2020): [NAMA_10R_3EMPERS]; HWWI

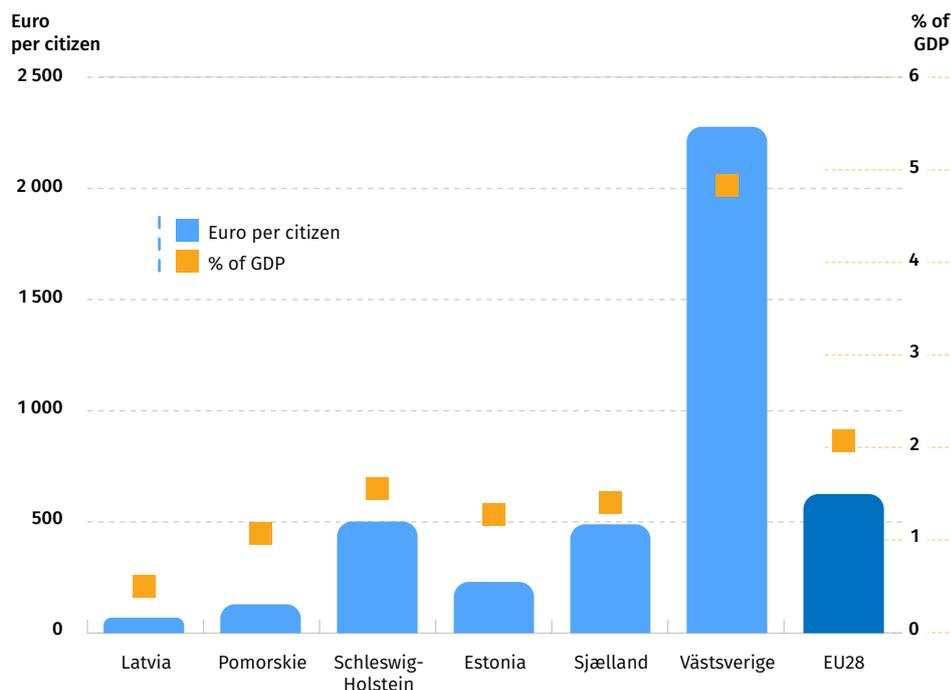


Lastly, Figure 8 sheds light on R&D spendings in the partner regions at NUTS-2 level in 2017. For a meaningful comparison, the total numbers of R&D expenditures were scaled per citizen, on the one hand, and as a share of gross domestic product (GDP), on the other hand. In both categories, Västsverige comes out on top, with more than 2.000 Euro per citizen and almost 5% of GDP as R&D expenditures. Spendings in all other regions/countries are far below the Swedish level and even below the EU28 average, amounting to around 1% of GDP in Pomorskie, Schleswig-Holstein, Estonia and Sjælland. Expenditures in Latvia are the lowest, with only 70 Euro per citizen and 0.5% of GDP.

Figure 8:

Research and Development expenditures 2017

Sources: Eurostat (2020): [rd_e_gerdreg]; HWWI.



2.3 The Blue Economy in the case study regions

Following the rather general economic overview, chapter 2.3 gives an insight into the Blue Economy in the involved partner regions. As mentioned above, the Blue Economy concept, as measured in the EU Blue Economy Report, can only be applied to the country level. Thus, part 1 of this chapter is limited to the national perspective. Information at the national level cannot necessarily provide knowledge about the situation in the regions. It is, however, still useful, as it is to a certain degree informative about the Blue Economy infrastructure in or in the vicinity of the areas of the case studies. Moreover, one region causes considerable spill-over effects on all other regions within one country, which is why it is worth looking at the whole country. Part 2 provides information at the regional level (as far as possible).

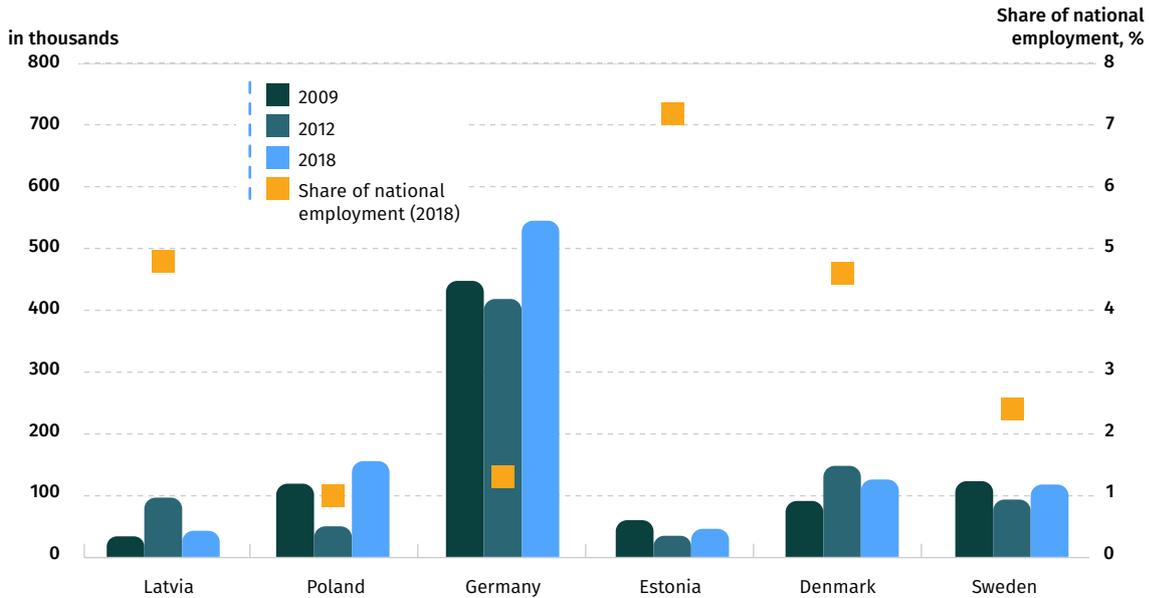
National level

Figure 9 visualises the development between 2009 and 2018 of the Blue Economy in these states in terms of jobs. Germany had the highest number of jobs in the Blue Economy in 2009 and 2018. After a slight phase of decrease until 2012, the employment grew to almost 550.000 in 2018. Relatively speaking, Denmark increased its Blue Economy employment the most, with numbers up 38% compared to 2009. Poland, second in total turnover numbers, also had a growth rate above 30%. However, Poland has only generated growth of 6% since 2012, seeing their Blue Economy somewhat stagnating in the last years. Sweden and Estonia had negative growth rates since 2009. Sweden was recovering from a drastic decrease in the period from 2009 to 2012, since then following a positive trend. To put the im-

portance of the Blue Economy into perspective, Figure 9 also shows the Blue Economy share of total national employment. It illustrates, how minor the importance of Germany’s allegedly high total employment number is in the context of their national economy. Blue jobs only account for 1.3% of the national employment; only in Poland is the share lower (1%). In Denmark and Latvia in comparison, Blue Economy jobs make up almost 5%, in the case of Estonia even 7.2%.

Figure 9:
 Blue Economy jobs, 2009, 2012 and 2018

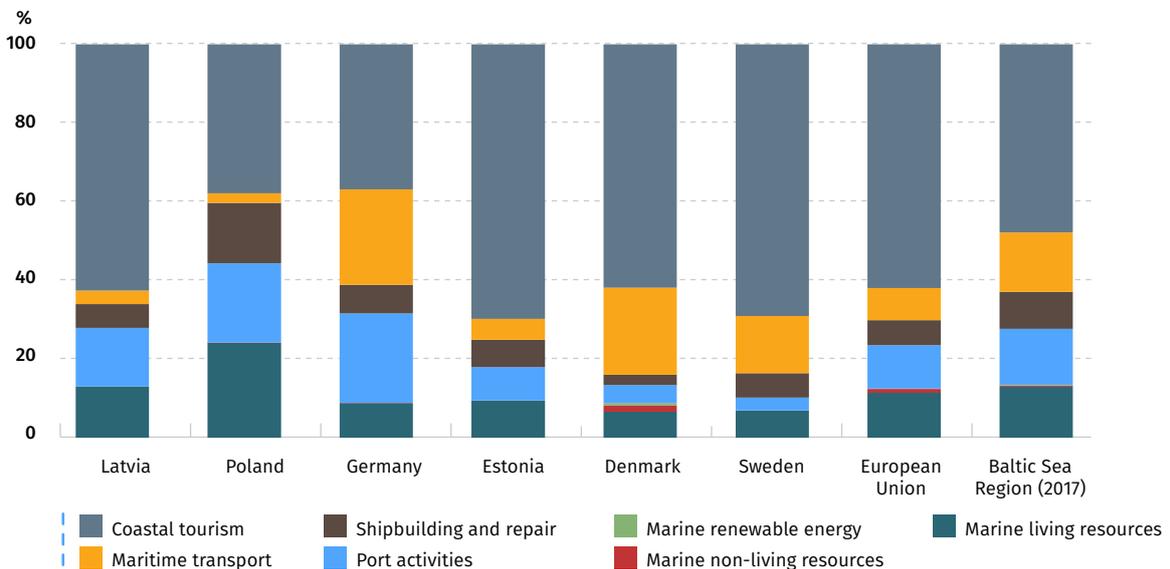
Sources: *The EU Blue Economy Report 2020; HWWI.*



Amongst the countries, the share of Blue Economy sectors as a percentage of all Blue Economy jobs shows strong differences. As Figure 10 reveals, the Baltic Sea Region differs significantly from the European Union average. With fewer Coastal Tourism and a greater focus on Port activities and Maritime transport, Baltic Sea Regions Blue Economy profile is more diverse than the European Union in general, where Coastal tourism amounts to more than 60% of all jobs. In Germany and Poland, Coastal Tourism is of lower importance, at less than 40% of total Blue Economy jobs. In Poland, especially the Extraction of marine living resources is essential, but also the share of Shipbuilding is high.

Figure 10:
 Blue Economy jobs: share by sector, 2018

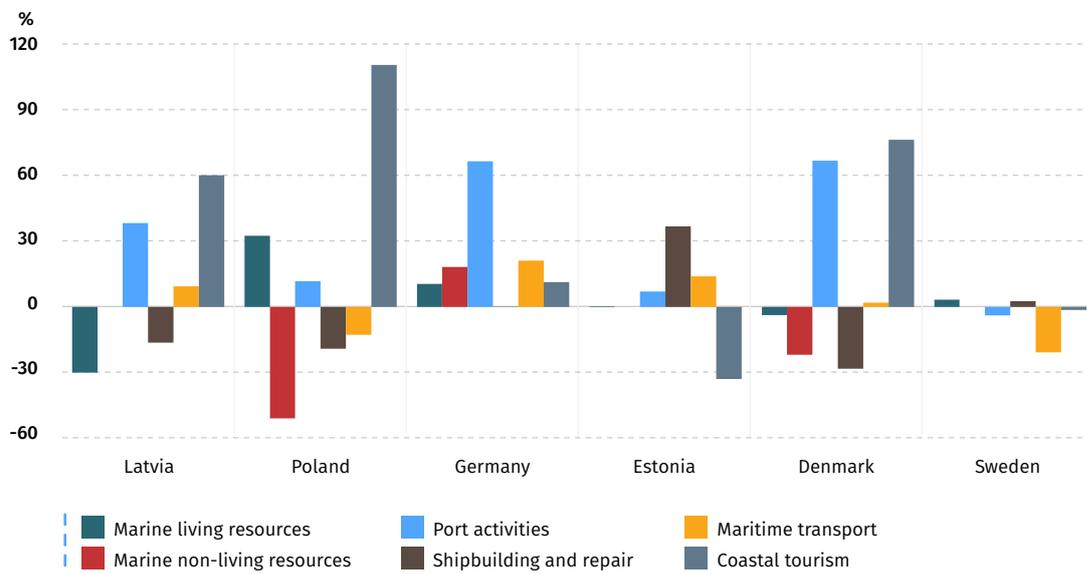
Sources: *The EU Blue Economy Report 2020; HWWI.*



Within the countries and the Baltic Sea Region, these sectors developed differently over the last few years (Figure 11). With a growth of 9% since 2009, the established sectors in the Baltic Sea Region significantly outperformed the European Union average (0.9%). The main drivers of the growth are Ports activities, followed by coastal tourism and the extraction of marine living resources. In contrast, shipbuilding and the extraction of marine non-living resources shrunk over time. A structural change seems to have taken place in the Polish Blue Economy, where maritime transport jobs more than doubled over time, while the extraction of marine non-living resources saw its employment decrease over 50% since 2009. In Latvia and Denmark, coastal tourism rose 60% and 76%, respectively. With a growth beyond 60%, port activities dominated Germany's and Denmark's upward trend in overall Blue Economy employment. The general reduction in Blue Economy jobs in Sweden mainly resulted from a 21% shrinkage in maritime transport. In Estonia, coastal tourism caved in by 33%.

Figure 11:
Change in Blue Economy jobs by sector, 2009-2018

Sources: *The EU Blue Economy Report 2020*; HWWI.



Regional level

Due to the data problems stressed above, the same in-depth analysis of the Blue Economy and its sectors and the development over time is not possible for the regions. Nevertheless, individual Blue Economy branches are measured by the NUTS-2 level, i.e. coastal tourism and employment in shipping. Figure 12 displays the total nights spent in tourist accommodation in coastal areas for 2012 and 2019, respectively. Moreover, it distinguishes between native and foreign guests. Coastal tourism has increased in all regions from 2012 to 2019. Schleswig-Holstein had the most nights spent by guests of all partner regions, with over 25 million nights in 2019. There were striking differences in the dynamics of coastal tourism. The highest growth of tourist nights was in Pomorskie, with approximately 61% more nights in 2019, relative to 2012. Latvia and Schleswig-Holstein increased their tourism numbers too, with 54% and 59% more nights spent. On the other hand, Estonia, Sjælland and Västssverige only managed slight tourism growth relative to 2012 (each < 30%). Interestingly, tourism structures in the Baltic States are different from the other regions: Latvia and Estonia attract more foreign than native visitors. In other areas, the majority of tourists are natives.

Figure 12:
 Nights spent in tourist accommodations in coastal areas, 2012 and 2019

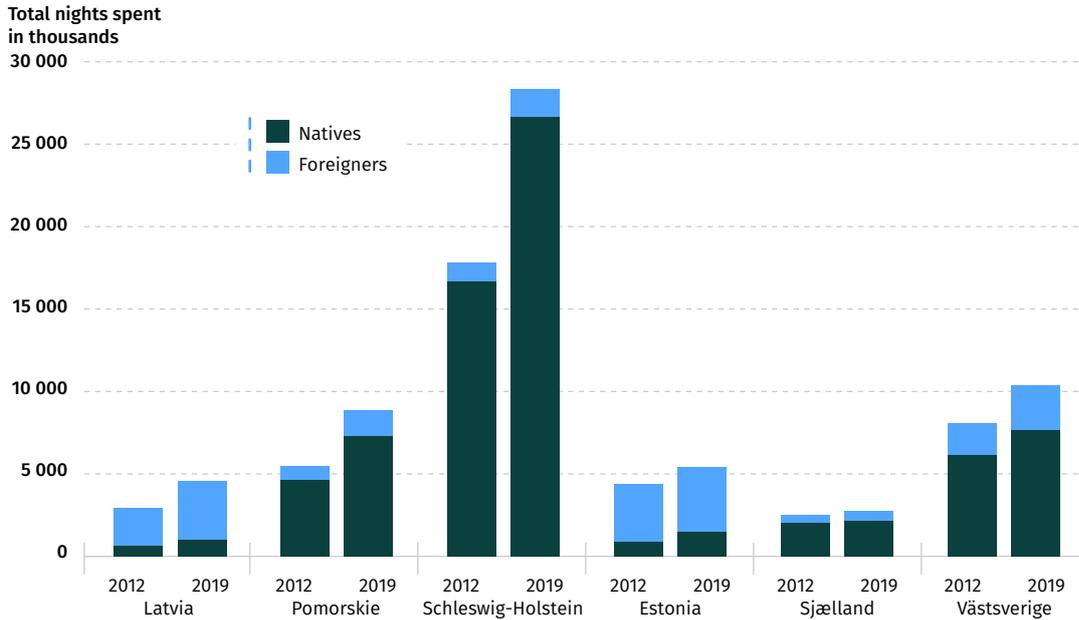
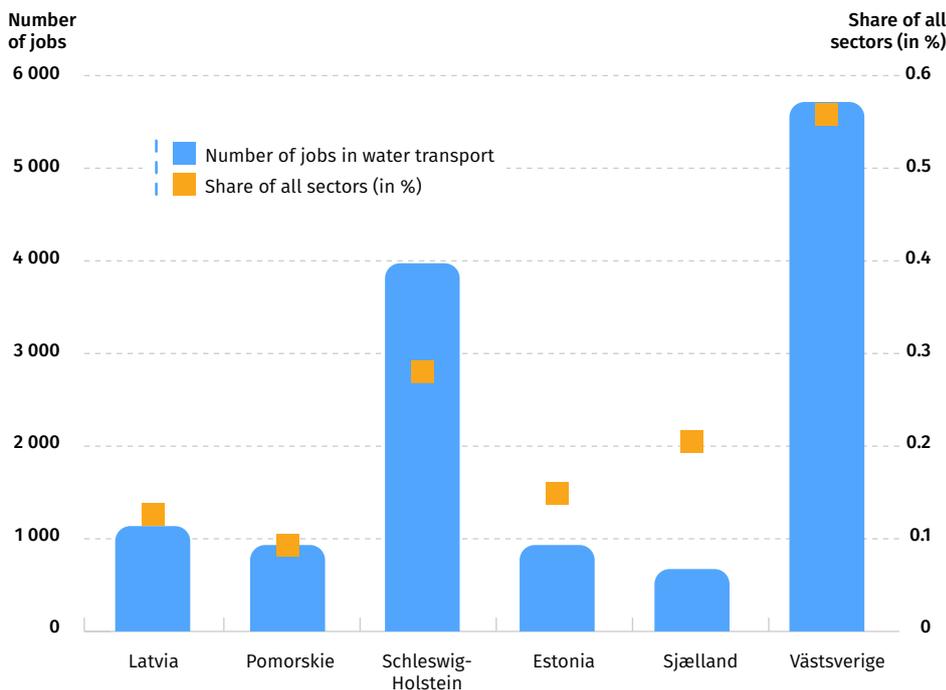


Figure 13 depicts the number of jobs in water transport and their share of all jobs. In Latvia, Pomorskie and Estonia, the number of those employed in water transport was around 1.000, and their share was approximately 0.1% of total employment. In Sjælland and Schleswig-Holstein, the percentage was slightly above (0.2% or 0.3% respectively). In cross-region comparison, water transport played the most critical role in Västssverige with around 6.000 jobs, which make up almost 0.6% of total employment. Although these shares are relatively low compared to total employment, water transport is still a crucial facet of the Blue Economy, as it includes person and freight transportation and, thus, is an essential part of the infrastructure in some regions.

Figure 13:
 Workforce in water transport, 2018*

Sources: Eurostat (2020): [SBS_R_NUTS06_R2]; HWWI.
 *Estonia: data from 2016

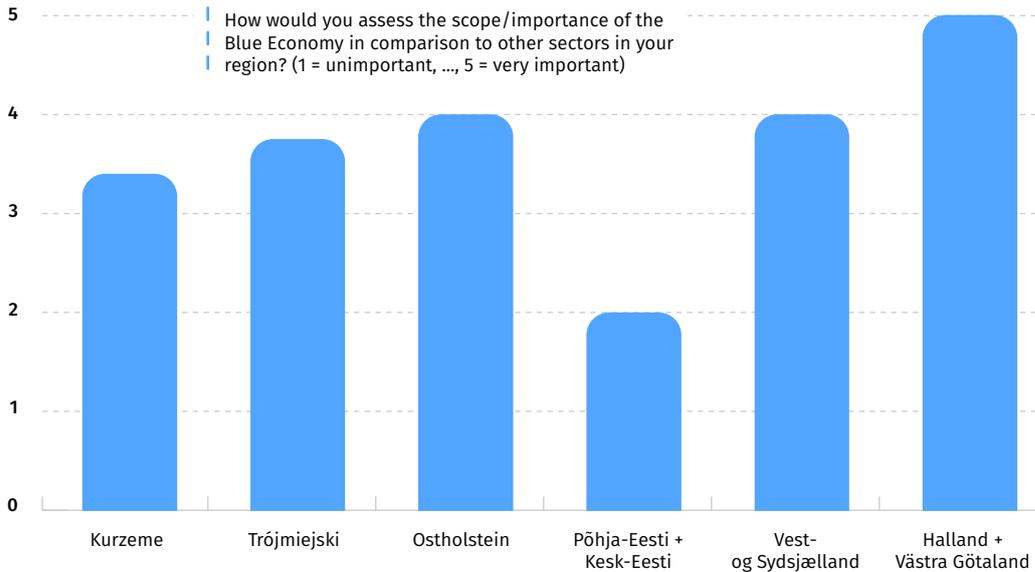


Since we had problems mapping the Blue Economy in the regions adequately, we asked regional experts on a scale from 1 (unimportant) to 5 (very important) about their assessment concerning the importance of the Blue Economy in the case study regions. While the Blue Economy is considered relatively unimportant for the Estonian regions, it is seen as very important in the Swedish project regions. For Kurzeme, Trójmiejski, Ostholstein and Vest- og Sydsjælland, experts assessed the importance at between 3 and 4.

Figure 14:

Importance of the Blue Economy

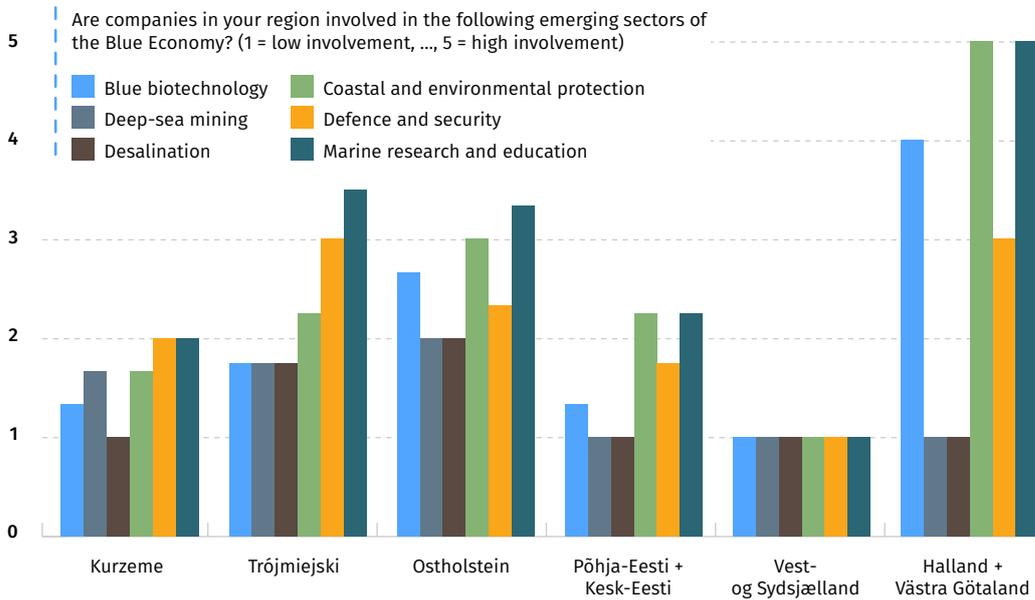
Sources: *Baltic Sea Blue Growth Questionnaire, HWWI.*



The involvement of companies in the emerging sectors for the partner regions is shown in Figure 15, on a scale from 1 (low involvement) to 5 (high involvement). The results vary a lot between the countries. Danish experts attest low involvement all over the board. The Baltic region shows a similar profile, with some involvement in coastal and environmental protection, defence and marine research, but no grade above 3. Sweden and Germany have moderate involvement, at least for coastal protection and marine research, while deep-sea mining and desalination do not play a significant role in regional economies. Poland lies in the middle, with higher than moderate involvement (=3) only in marine research. In general, coastal protection and marine research are of greater importance for companies in the case study regions than the other sectors. With higher expenditures being discussed in politics recently, future research could see regional involvement in defence and security thrive.

Figure 15:
 Involvement in emerging sectors

Sources: Baltic Sea Blue Growth Questionnaire, HWWI



2.4 Strategies, stakeholders and preconditions

Strategies

To assess how far regional and national policies and strategies take Blue Growth aspects into account, Table 4 shows Blue Growth areas mentioned in Research and Innovation Strategy (RIS3) documents in the partner regions. RIS3 was a precondition for regions to apply for funding from the European Regional Development Fund in the period between 2014 to 2020. The funding process required regions and countries to develop smart specialisation strategies to support specific economic specialisation fields, fostering cooperation and strengthening macro-regional value chains. Information on Blue Economy was collected from national and regional RIS3 documents for all Land-Sea-Act regions except Sjælland in the INTERREG project Smart Blue Regions and categorised in 9 Blue Growth focus areas. The Smart Specialisation Platform Eye@RIS3¹⁶ by the European Commission helped to add information for Sjælland.

Pomorskie and Sjælland involved every focus area in its portfolio. Schleswig-Holstein, Põhja-Eesti and Västra Götaland also named several sectors in their respective research and innovation mix, too. Kurzeme and Kesk-Eesti mentioned only a few focus areas in RIS3 documents. While Shipping and Ports are crucial in all observed regions, the operation and maintenance of renewable energy and health treatments are of minor importance.

16 Smart Specialisation Platform Eye@RIS3: <https://s3platform.jrc.ec.europa.eu/map>

Table 4:**Blue Growth focus areas***Sources: Weig (2017); HWWI.*

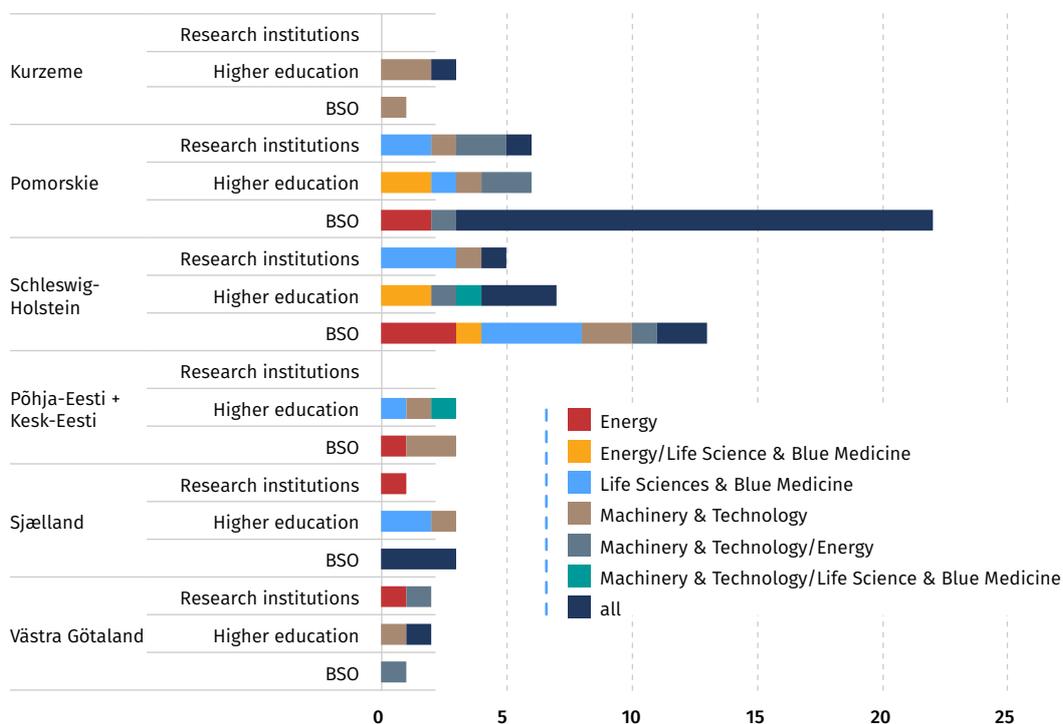
	Kurzeme	Pomorskie	Schleswig-Holstein	Põhja-Eesti	Kesk-Eesti	Sjælland	Västra Götaland
Maritime Technology (e.g. shipbuilding companies and suppliers)		×	×	×		×	×
Monitoring and other Marine Technologies		×	×	×		×	×
Shipping (e.g. transportation)	×	×	×	×	×	×	×
Ports	×	×	×	×	×	×	×
Energy: Building of Plants and Systems		×	×	×		×	×
Energy: Operation & Maintenance		×	×	×		×	
Blue Biotechnology		×	×	×		×	×
Marine Aquaculture	×	×	×			×	×
Health Treatments (e.g. spa tourism)	×	×		×		×	

Stakeholders

The development of the Blue Economy is not only determined by political actors, e.g. via RIS3 strategies, but also by further stakeholders, such as business support organisations (BSO), institutions of higher education and research institutes. Figure 16 lists the number of these types of Blue Growth actors by their specialisation field (energy, life science and blue medicine, machinery and technology, all without specialisation). Once again, Pomorskie stands out clearly with the highest number of actors. Especially BSOs are strongly involved in Blue Growth topics. Schleswig-Holstein comes second in terms of BSO, but with a more distinct assignment of responsibilities concerning specialisation fields. Both research institutions and higher education still contribute actively in Schleswig-Holstein and Pomorskie. Although in Västra Götaland and the Estonian regions RIS3 documents mention specialisation across many focus areas, only a few actors are involved in Blue Growth activities. In Kurzeme, the low number of stakeholders mirrors the low number of Blue Growth focus areas. Denmark is highly active in Blue Economies in terms of jobs and also regarding Blue Growth focus areas. However, these activities seem mainly to be located in other regions of the country than our partner region, which is why further stakeholders are also rare.

Figure 16:
 Blue Growth stakeholders

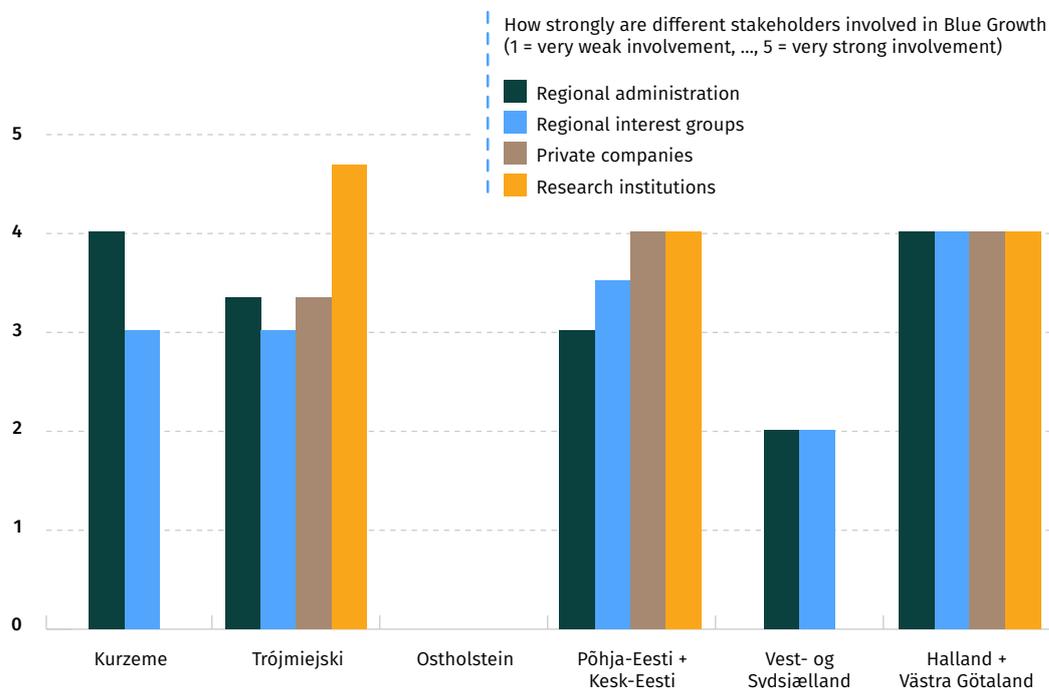
Sources: Weig (2017), HWWI.



Apart from these actors, further actors such as regional administration, regional interest groups, research institutions (including universities), and private companies play a role when it comes to Blue Growth strategies. However, we were not able to map them similarly. Nevertheless, stakeholder involvement was ranked on a scale from 1 (very weak involvement) to 5 (very strong involvement) by regional experts via our questionnaire. As answering this question required a lot of insight into the regional stakeholder ecosystem, not all experts responded to this question, resulting in limited results. German interviewees did not respond to the question. Denmark and Latvia responses lack results for private companies and research institutions. In general, research institutions seem to be involved more intensively than other stakeholders. Except for Denmark, all stakeholder groups help shape Blue Growth to some degree, with involvement at least at the medium level in all regions.

Figure 17:
 Stakeholder involvement in Blue Growth strategies

Sources: Baltic Sea Blue Growth Questionnaire, HWWI.

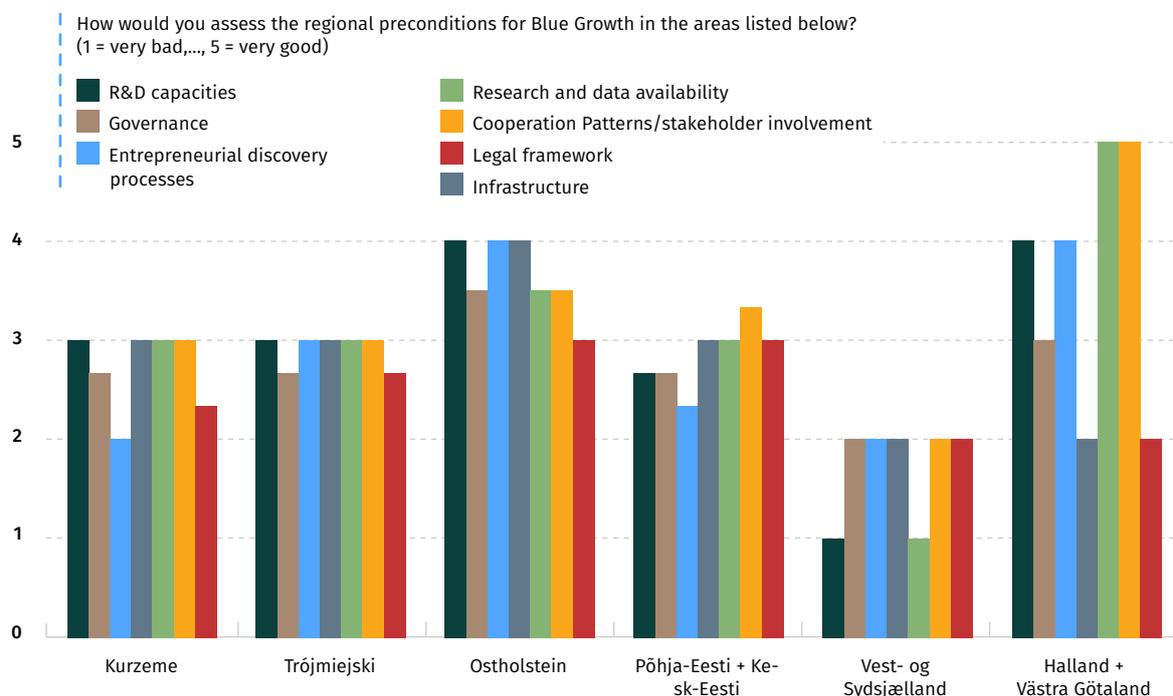


Preconditions

Figure 18 shows regional preconditions for Blue Growth as ranked by the experts. Preconditions were assessed on a scale from 1 (very bad) to 5 (very good.) The Polish, Estonian and Latvian regions show a similar profile, with all values around 3, most of them slightly below. Entrepreneurial discovery processes are the worst-ranked precondition for the Baltic states, while Poland lacks effective governance structures and a robust legal framework. The Danish project region is the worst performing amongst the partner regions with an average below 2, and no precondition ranked better than 2. In R&D capacities and research and data availability, it even ranks “very bad”. Sweden shows quite mixed results. While data availability and stakeholder involvement here earn a “very good”, infrastructure and legal framework are graded at 2. However, the average, with over 3,5, comes very close to Germany’s, which is on top in terms of regional preconditions. German expert opinions deliver a homogenous picture, grading all aspects of regional preconditions between 3 and 4.

Figure 18:
 Regional preconditions for Blue Growth

Sources: Baltic Sea Blue Growth Questionnaire, HWWI.



In an open-ended question, experts from all countries except Sweden underline that reliable Blue Economy data for measuring the size of the sector is not collected or provided at the local/regional level (Poland, Latvia, Estonia, Denmark) or cannot be accessed centrally (Germany). This situation poses a severe limitation for development and research (Poland) or assessing the current situation and providing information for developers (Latvia). Moreover, a long-term perspective (Poland) and social data (Latvia) were named as information that is scarcely available but would be of great use. Estonian experts stressed the difficulty of distinguishing which companies belong to the Blue Economy. Only for Sweden is data accessibility not considered the main challenge, even though existing regional data does not capture all aspects of the Blue Economy.

2.5 Future development

In terms of future development of Blue Growth sectors, gross investment hints at the growth potentials and existing, as well as possibly emerging, specialisations. Table 5 and Table 6 show the gross investment in tangible goods (in Mio. EUR) in 2018 for Blue Economy sectors and the changes of gross investment in tangible goods from 2009 to 2018 in those sectors. For coastal tourism, no data were available, and only Denmark reported numbers for marine-renewable energy. Overall, the countries perform very differently in terms of gross investments in Blue Economy sectors and in which sector these investments are located. With 6.5 billion EUR, the total gross investment in all sectors was highest in Germany in 2018, followed by Denmark with 4.6 billion EUR. Germany and Denmark made considerable investments in maritime transport of over 5 billion EUR and 3.4 billion EUR respectively. While this only means a 2% increase in Danish investments in maritime transport compared with 2009, Germany's numbers are 132% higher. Germany generally had increasing total investments compared with 2009 (+95%). For Denmark, the most significant growth was in renewable energy. Without data for the other countries, this 302% increase in renewable energy investment expenditures is not comparable. Still, it already results in renewable energy being the Blue Economy sector with the third highest investments in Denmark. This development is likely to accelerate in the current Green Deal context. Latvia generated the highest growth in total investments, with an increase of 116% relative to 2009. The leading destination of investments is port activities, which accounted for 79% of the in-

vestments for all sectors and are up 336% compared with 2009. Investment in all other sectors shrank compared with 2009. The opposite is true for neighbouring Estonia, whose port activities investments decreased by 68%. In Estonia, the focus shifts to maritime transport, expressed by a 314% increase in investments. Total investments development is negative for Estonia (-28%). This trend also holds for Sweden (-1%), where the decreasing investments in marine living-resources and maritime transport compensate the 95% higher investment in port activities. In Poland, marine-living resources were an important investment opportunity of the sectors and have raised their investment 78% in comparison with 2009.

Table 5:**Gross investment in tangible goods (in Mio. Euro), 2018***

Sources: *The EU Blue Economy Report 2020, HWWI.*

	Latvia	Poland	Germany	Estonia	Denmark	Sweden
Marine living resources	8.2	103.6	228.4	6.1	60.3	23.6
Marine non-living resources		3.3	7.2		694.4	
Marine renewable energy					221.5	
Port activities	86.6	81.4	899.7	46.7	180.3	173.6
Shipbuilding and repair	5.4	76.1	282.0	10.0	31.3	50.6
Maritime transport	8.9	14.7	5,087.5	60.5	3,447.3	350.6
Total	109.1	279.2	6,504.8	123.2	4,635.2	598.3

*No information for coastal tourism, marine renewable energy data only for Denmark

Table 6:**Gross investment in tangible goods: change between 2009 and 2018 (in %)***

Sources: *The EU Blue Economy Report 2020, HWWI.*

	Latvia	Poland	Germany	Estonia	Denmark	Sweden
Marine living resources	-22%	78%	84%	-12%	-38%	-43%
Marine non-living resources		-47%	-75%		22%	
Marine renewable energy					302%	
Port activities	336%	-27%	15%	-68%	27%	95%
Shipbuilding and repair	-45%	7%	41%	47%	64%	28%
Maritime transport	-13%	-30%	132%	314%	2%	-19%
Total	116%	4%	95%	-28%	8%	-1%

*No information for coastal tourism, marine renewable energy data only for Denmark

Apart from this economic aspect, other (external) factors will impact the future development of the Blue Economy. Participants of the survey evaluated general global trends which they think will most likely have an impact on the Blue Economy. Notably, every single respondent marked climate change as an important global trend for the Blue Economy in general. The general economic development and dynamic technology came second and third, respectively, each being mentioned by more than 60% of the experts. Still around half of the experts eyed political developments and digitalisation as influential trends. For demographic change and urbanisation, however, only every fifth expert highlighted their impact on Blue Economy in general.

Experts further answered which trends they considered to be relevant for their respective case study region (Table 7). Similar to the general perspective, all experts mentioned the economic development to have a substantial impact on the future development of the Blue Economy. Consequently, it is necessary to have a closer look at other sectors outside the Blue Economy as well, when assessing regional Blue Growth perspectives. Furthermore, climate change was named by most experts (except for the Swedish case study regions). All experts mentioned technological issues except participants from the Scandinavian regions.

Figure 19:

Sources: Baltic Sea Blue Growth Questionnaire, HWWI.

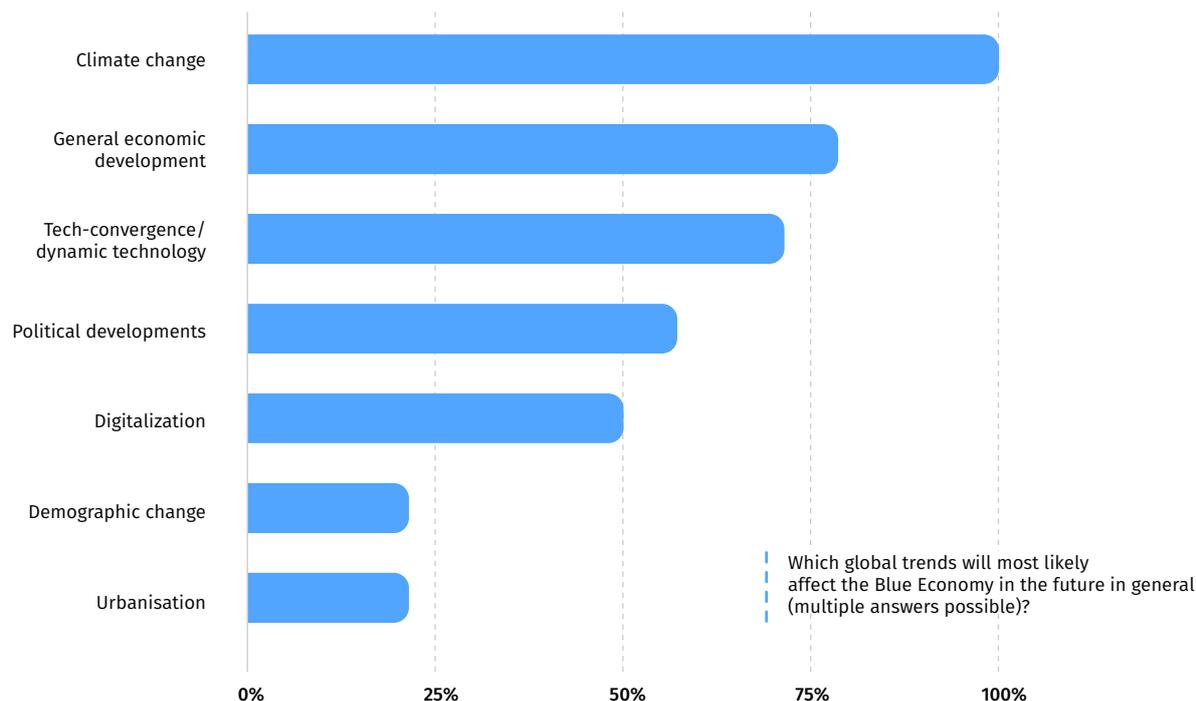


Table 7:

Which global trends will most likely affect the Blue Economy in the future in your region?

Sources: Baltic Sea Blue Growth Questionnaire; HWWI.

	Kurzeme	Trójmiejski	Ostholstein	Põhja-Eesti+Kesk-Eesti	Vest- og Sydsjælland	Halland+Västra Götaland
Climate change	×	×	×	×	×	
General economic development	×	×	×	×	×	×
Tech-convergence/dynamic technology	×	×	×	×		
Political developments	×		×	×		
Digitalisation	×			×		
Demographic change				×		
Urbanisation			×	×		

Impact of the COVID-19 pandemic

Since exact data is not yet available, it is hard to assess the impacts of the COVID-19 crisis in detail and make accurate predictions. However, the Blue Economy Report provides a preliminary assessment of the initial impact as well as the recovery path for the established and emerging sectors (Table 8). Most of the established sectors face a strong initial impact. The sectors marine living resources, shipbuilding and repair and especially coastal tourism are expected to suffer in the longer run. All emerging sectors are likely to recover soon and were not hit strongly except the blue bioeconomy. Taking these assessments of short and medium-term impacts into consideration, it is likely that regions will be hit differently by the COVID-19 crisis, depending on their respective Blue Economy sectoral structure.

Table 8:

Impact of the COVID-19 crisis

Sources: *The EU Blue Economy Report 2020; HWWI.*

Sector	Initial impact	Recovery path
Established sectors		
Marine living resources	Strong	Lagged
Marine non-living resources	Medium	Prompt
Marine renewable energy	Strong	Prompt
Port activities	Strong	Prompt
Shipbuilding and repair	Medium	Lagged
Maritime transport	Strong	Prompt
Coastal tourism	Strong	Very lagged
Emerging sectors		
Blue bioeconomy	Strong	Prompt
Ocean energy	Small	Prompt
Desalination	Small	Prompt
Maritime defence	Small	Prompt
Cables	Small	Prompt
Research and Education	Small	Prompt
Marine observation	Small	Prompt

3

Blue Growth potentials in the case study regions

The following chapter narrows down the results of the comparative analysis in Chapter 2 via a SWOT analysis. A SWOT analysis identifies internal strengths (S) and weaknesses (W), as well as broader external opportunities (O) and threats (T). It is commonly applied in businesses to facilitate strategic planning and decision-making. However, it is also used in spatial planning¹⁷ and the development of RIS3 strategies¹⁸. Moreover, several studies resort to SWOT analyses for the assessment of the Blue Economy¹⁹. The primary inputs for the following regional SWOT analyses are based on the findings in Chapter 2. But as Karppi et al. 2001 recommend, we enhance the analysis with further region-specific Blue Growth-related aspects.

17 Comoni, E.; Ferretti, V. (2016): Indicator-based spatial SWOT analysis: Supporting the strategic planning and management of complex territorial systems. *Ecological Indicators*, Vol.60 January 2016, pp1104-1117

18 Griniece et al. (2016): State of the art report on methodologies and online tools for smart specialisation strategies. Report produced in the framework of Horizon 2020 project Online S3: ONLINE Platform for Smart Specialisation Policy Advice

19 WWF Baltic Ecoregion Programme (2015): All Hands on Deck -Setting Course towards a Sustainable Blue Economy, WWF Report 2015, http://d2ouvy59p0dg6k.cloudfront.net/downloads/15_6802_final_all_hands_on_deck_lr_151001_3.pdf.

European Commission (2020b): Methodological Assistance for the Outermost Regions to Support their Efforts to Develop Blue Economy Strategies, Publications Office of the European Union, Luxembourg; <https://op.europa.eu/de/publication-detail/-/publication/5a9aefc0-02c8-11eb-8919-01aa75ed71a1>

3.1 Kurzeme (Latvia)

Latvia and Region Kurzeme face the challenge of having the lowest GVA per citizen of all case study regions. Although unemployment in general dropped considerably since 2012, Blue Economy jobs in 2018 were lower than in 2012. The Blue Economy seemingly is not yet part of the positive economic trend. To stimulate further growth potentials, Latvia has partnered with China in its “Belt and Road Initiative” and plans for pilot road tracks to Riga may signal, that Latvia that Chinese goods access to the Baltic Sea. Investments in ports were high in 2018 and employment in port-related activities also rose lately, which did not change the dominant position of coastal tourism amongst Blue Economy sectors, though. However, it remains open in how far Kurzeme can profit from a stronger focus on port and transportation activities.

Strengths	Weaknesses
<ul style="list-style-type: none"> • High share of national jobs in the Blue Economy • Coastal tourism is employment-wise a vital sector in Latvia • High relative employment in the industry. sector agriculture, forestry and fishing in Kurzeme • High investments in port activities in 2018. Positive change in port-related employment (+38%). Recent development in freight turnover at Latvian ports has been negative¹ • Strong increase in international trade between 2016 and 2020 (exports +35.4%, imports: +30.5%)¹ • Substantial decrease in regional unemployment rate since 2012 	<ul style="list-style-type: none"> • Decrease in national Blue economy jobs in between 2012 and 2018 • Lowest national total gross investments in the BE sectors, lower relative gross investments in 2018 in 3 sectors (namely Marine living resources, maritime transport and shipbuilding and repair), compared with 2009 • Lowest national R&D expenditures per citizen and in % of GDP, which is far below the target of 1.5% for 2020 defined in Smart Specialisation Strategy² • Low employment in professional, scientific and technical activities in Kurzeme • Low involvement of stakeholders from the business sector in Blue Growth • Lowest regional GVA of all partner regions
Opportunities	Threats
<ul style="list-style-type: none"> • Low expected climate change adaptation costs³ • Strong involvement of Latvia in the Chinese “Belt and Road Initiative” (port of Riga, pilot train tracks Yiwu-Riga and Riga-Kashgar). • Strong involvement of higher education in Blue Economy topics • Investments in port activities may start to pay off trade-wise (2016-2020: +35.4% exports, +30.5% imports)¹. Trade and port activities are expected to bounce back rather prompt after the crisis. 	<ul style="list-style-type: none"> • COVID-19 pandemic: Hotel bed occupancy rate in July dropped from 73.2% in 2019 to 45.2% in 2020¹. Foreign tourists, which account for the majority of tourism in Latvia, face travel restrictions. • Pre-COVID-19 numbers do not suggest a diversification of Blue Economy in Latvia, with the main sector, coastal tourism, having had the strongest recent increase in employment. • Too strong focus on the port of Riga might leave neighbouring Kurzeme region out

¹ Central Statistical Bureau of Latvia 2021

² Ministry of Education and Science – Republic of Latvia 2018

³ European Commission 2020a

3.2 Trójmiejski (Poland)

For Pomorskie, the low general level of GVA per citizen shows a low economic development, but also the potential for future growth. A substantial decrease in regional unemployment over the period suggests a positive trend in the regional economy recently. The region has a clear focus on port activities, with the countries two most essential and dynamically evolving ports located in Pomorskie. Relatively low R&D spending and nationally few Blueinvest platform projects signal the need to enhance future-oriented technology and knowledge in the region. Maritime institute of Gdansk's new project "liquid energy", which shows clear links to RiS3-priority of Eco-effective energy and fuel usage, constitutes a role model in this regard.

Strengths	Weaknesses
<ul style="list-style-type: none"> Pomorskie accounts for more than 40% of Polish Blue Economy¹ Relatively high employment in port activities, marine living resources and shipbuilding and repair 93.5% of gross investment in port activities, marine living resources and shipbuilding and repair Strong cargo turnover: 67% of the national cargo turnover in Pomorskie¹ Port of Gdansk (64.9%) and Port of Gdynia (35.1%) is where the cargo turnover is from; 43.5% of national cargo turnover in Port of Gdansk¹ Dynamic development of large container cargo, 26.7% increase from 2015-2017. Port of Gdansk: +1340% change in container volume 2007-2016. ¹ General economic prosperity: strong decrease in unemployment rate, high total employment 	<ul style="list-style-type: none"> Blue GDP and employment have relatively little share on national economy Strong reduction of employment in marine living resources between 2009 and 2018 in Poland Overall gross investment well below levels in Germany, Denmark and Sweden Only one registered project in the Blueinvest Pipeline in Poland. Very low GVA compared to EU-mean Low R&D spending
Opportunities	Threats
<ul style="list-style-type: none"> Low share of Polish Blue Economy is located in coastal tourism. Thus, it will not be hit as hard by the COVID-19 pandemic "Off-shore, port and logistics technologies" and "co-effective energy and fuel usage" as RiS3-priorities European Commission – "Fisheries areas network" project "FLAG" supports integration of local fisheries in Pomorskie into communities, supporting diversification. Maritime institute of Gdansk as the lead partner in new project "Liquid energy", which aims at promoting alternative fuels like LNG gas as independent power supplies for Blue Economy. 2009-2018 30% or more expansion of GVA and employment generated in the established sectors in Poland Hong Kong-based conglomerate HDH holds 100% of shares of the Container terminal in the port of Gdansk à Poland as a possible partner for China in 'Belt and Road Initiative' 	<ul style="list-style-type: none"> (recent) smouldering conflict with EU about free judiciary and human rights, EU-subsidies could be at stake Strong focus on port activities and, therefore, dependency on the global economy

¹ Statistical Office in Gdańsk (2018): Maritime economy in Pomorskie Voivodship in the years 2015-2017

3.3 Ostholstein (Germany)

The regional Blue Economy in Ostholstein differs from the national profile. While statistics for Germany suggest less dependence on coastal tourism, Schleswig-Holstein reports the highest numbers for tourist accommodation nights of all partner regions. Diversification into more sectors could lower the dependence and risk for the regional economy. Policy-makers should eye the possibility of initiating infrastructure projects, for which R&D expenditures need to be enhanced. First steps in this direction could be taken in the form of the “Fehmarn Belt” project. However, it might also reduce the attractiveness for tourists. The attractiveness of the region is very much based on its nature. From a medium and long term perspective, sustainable Blue Growth can only be ensured if environmental concerns are seriously taken into account, even though this might undermine short economic growth. The mitigation of questions concerning the interests of stakeholders in tourism, infrastructure and maritime transport will be crucial. Furthermore, the regional cluster in renewable energy is a focal point of regional economy in a sector with promising potential. Local planners should actively promote Ostholstein for more projects on the wind-power supply chain like the Neustadt service centrum.

The German case study is insofar special as it located on Fehmarn island, where trends and patterns can be very different from the observations at the NUTS-3 level. Therefore, we add further aspects which specifically address Fehmarn.

Strengths	Weaknesses
<ul style="list-style-type: none"> • 21.8% employment growth in national Blue Economy, especially port activities (66%) • Strong focus on coastal tourism: Schleswig-Holstein is especially for natives a popular destination • Nights spent in coastal areas increased by 59% between 2012 and 2019, e.g. Fehmarn is very popular with kites and windsurfers, who (incl. other tourists) accounted for 4,055 Mio. in 2019. • On Fehmarn, deficits in tourism due to a COVID-19 lockdown in spring 2020 had already been compensated y October due to high numbers of camping tourists. 	<ul style="list-style-type: none"> • Only moderate involvement in emerging sectors, as stated by the experts • Lower R&D expenditures than EU28 average • Neither a “Business Region” nor a Research & Development institute from the Cluster Policy of Schleswig-Holstein is located in Ostholstein
Opportunities	Threats
<ul style="list-style-type: none"> • 21.8% employment growth in national Blue Economy, especially port activities (66%) • Strong focus on coastal tourism: Schleswig-Holstein is especially for natives a popular destination • Nights spent in coastal areas increased by 59% between 2012 and 2019, e.g. Fehmarn is very popular with kites and windsurfers, who (incl. other tourists) accounted for 4,055 Mio. in 2019. • On Fehmarn, deficits in tourism due to a COVID-19 lockdown in spring 2020 had already been compensated y October due to high numbers of camping tourists. 	<ul style="list-style-type: none"> • Only moderate involvement in emerging sectors, as stated by the experts • Lower R&D expenditures than EU28 average • Neither a “Business Region” nor a Research & Development institute from the Cluster Policy of Schleswig-Holstein is located in Ostholstein

¹ Ministerium für Energiewende, Landwirtschaft, Umwelt, Natur und Digitalisierung 2020

² Ministerium für Wirtschaft, Verkehr, Arbeit, Technologie und Tourismus 2020

³ Landesregierung Schleswig-Holstein 2020

⁴ Hausner (n.d.)

⁵ Statistikamt Nord 2020

3.4 Põhja-Eesti/Kesk-Eesti (Estonia)

As 7% of national employment occurs in Blue Economy sectors (highest share amongst all case study regions), the Blue Economy is of great importance for Estonia. Lower gross investments in BE sectors and lower shares on national employment and GVA in 2018 compared with 2009 in Estonia suggest a decreasing development of the regional Blue Economy, though. Nevertheless, even before the COVID-19 pandemic, the dependence of the Estonian Blue Economy on coastal tourism decreased. Fish farming and jobs in the maritime transport sector could represent new focus areas. Most interestingly, biotechnology as an emerging sector is part of the RIS3 strategy and the “Baltic Blue Biotechnology Alliance”, a network that seeks to improve knowledge and ideas of Blue Biotechnology in Baltic Countries, announced first successes for Estonia.

In general, sea-related issues have gained public attention due to discussion about MSP in Estonia, the possibility to go to sea for laymen after the fall of the iron curtain and the close link between the Blue Economy and considerations about sustainability, health and climate change.

Strengths	Weaknesses
<ul style="list-style-type: none"> Estonia, by far, has the highest share of BE jobs on total national employment. Blue Economy is therefore essential for the national economy. National statistics show an increase in fish farming production of 62% from 2009 to 2019. However, Western regions have more favourable natural conditions for fish farming than the northern regions (incl. Põhja-Eesti and Kesk-Eesti) and according to research conducted for MSP. National maritime transport was boosted by high gross investment; investments increased by 314% from 2009 to 2018. However, the majority of shipping routes is centred around the capital city Tallinn and not within the case study area. 41% increase in total international passenger transport through ports from 2009 to 2019 in Estonia.¹ 	<ul style="list-style-type: none"> Gross investment in tangible goods in BE-sectors have been decreasing between 2009 and 2018. The majority of the Estonian Blue Economy employees work in coastal tourism. The tourism sector in Estonia showed only moderate growth in nights spent compared with 2012 (even before the pandemic) and shrinking gross investment and employment numbers. R&D expenditures as a share of GDP did not increase in recent years.
Opportunities	Threats
<ul style="list-style-type: none"> Workforce in 2018 in water transport was only fourth highest amongst partner regions, however, leaving enough room for further development. Decreasing dependence on coastal tourism: Estonian employment in all other sectors soared from 2009–2018. Especially in shipbuilding and repair, a sector that had also growing gross investments recently, labour force grew 37% between 2009 and 2018. However, those companies are not in the case study area. An explicit field of future Smart Specialisation mentioned in the Estonian Smart Specialisation Analysis is biotechnology. Although experts ranked the involvement of Estonian companies in blue biotechnology as generally low, the Interreg project “Baltic Blue Biotechnology Alliance”, was able to report first success stories.³ Fish farming is almost established, new arrays for other fields of aquaculture: algae, molluscs etc. 	<ul style="list-style-type: none"> Estonian experts value their regions’ BE compared to other sectors as the least important amongst all partner regions. COVID-19 pandemic: tourism in Estonia has been particularly dependent on foreign tourists. However, the lack of foreign tourists could be partly compensated by domestic tourism. All sea-related processes take a lot of time to be developed to see visible income due to NIMBY attitudes. In MSP all natural conditions favour Western Estonia over Northern one.

¹ Eesti statistika 2021

² Estonian Development Fund 2013

³ Interreg Baltic Sea Region 2021

3.5 Vest- og Sydsjælland (Denmark)

GVA per capita-wise, the region Holbæk is economically one of the most vital regions amongst the case studies. It had low unemployment in 2018; and on the national level, the Blue Economy accounts for a high share of total employment, compared with other countries. The expert survey gives reasons for concern though, where local experts rated Blue Economy preconditions, stakeholder involvement and future growth potential low across the board. Moreover, despite the rising investments in port activities, seaports mostly stagnate since 2009 in terms of throughput of goods. A coherent local maritime strategy could ensure that the region still exploits its economic potential in the future. The Hesselø wind farm is a flagship project that should excite local planners and given the right projects are in place, the high recent R&D expenditures will likely satisfy the local stakeholders' needs in the upcoming decade.

Strengths	Weaknesses
<ul style="list-style-type: none"> • High share of Blue Economy jobs on total Danish employment. • Nationally high and strongly increasing employment numbers in tourism; high number of employees in maritime transport. • National fish production almost doubled since 2009. • At least moderate regional employment in maritime transport. • “Danish Energy Model”: Onshore wind is the cheapest power generation technology when introducing new capacity today. Energy prices have not increased despite the energy transition². • Second highest GVA per worker of partner regions. • Low regional unemployment. 	<ul style="list-style-type: none"> • Experts rated the Blue Economy preconditions, stakeholder involvement and future growth potential as bad across the board. • In Sjaelland, since 2009, -40% fishing vessels¹. Nationally shrinking numbers of investment in marine living resources since 2009. • Despite rising port activities investments, in Denmark the seaports mostly stagnate since 2009 in terms of throughput of goods. In Holbaek Havn the throughput of goods has almost completely stopped, and total passenger numbers are decreasing, too, compared with 2009.
Opportunities	Threats
<ul style="list-style-type: none"> • Hesselø Offshore Wind Farm will be placed in Hesselø Bay, approx. 30km north of Sealand. The tendering process starts 2021 and the offshore wind farm has to be installed until 2027³. • Regionally relatively low involvement in tourism, therefore not as affected from COVID-19 outbreak as others. • The City Board of Holbaek has approved a harbour development plan, which is supposed to change the functionalities of the harbour and in that way compensate for the decreased income from the transportation activities. 	<ul style="list-style-type: none"> • Denmark is expected to be struck by climate change damages⁴. Nevertheless, total public sector environmental protection expenditures only increased by 5% between 2009 and 2018¹.

¹ Statistics Denmark 2021

² Danish Energy Agency 2021a

³ Danish Energy Agency 2021b

⁴ European Commission 2020a

3.6 Halland/Västra Götaland (Sweden)

Västsverige has the highest GVA per citizen of all case study regions. To solidify this comfortable position, the region also distinctly accounts for the highest R&D expenditures in percent of GDP. The Blue Economy, however, generated lower total gross investments in 2018 compared with 2009. To counter this development, a national maritime strategy is in place, which fits Västsverige's profile in terms of a focus on maritime transport. A new freight service link off of the port of Gothenburg to Norway and Poland should reinforce the upward trend in port activities and adds short sea traffic to the local repertoire, as the maritime strategy recommends. The three "Blueinvest pipeline projects" concerning wave energy are setting up the possibility of a developing cluster around wave energy, boosted by research from the "Department of marine sciences" of the University of Gothenburg.

Strengths	Weaknesses
<ul style="list-style-type: none"> Survey: experts rate importance of Blue Economy in comparison to other sectors as "very important" Maritime transport is acknowledged as an essential sector within the Swedish maritime strategy and has in Västsverige compared to the other partner regions the highest share on total employment. Similarly, the regional "Maritime Strategy for Västra Götaland" sets out objectives for the Blue Economy.¹ Stakeholder-involvement: According to the "Regional Innovation Scoreboard", one of West Sweden's best performance indicators is public-private co-publications². This corresponds with results of the survey, where experts rated the involvement of all stakeholders in Blue Growth strategies/measures as 4 out of 5. Active actors include the Region Västra Götaland, Chalmers University of Technology, University of Gothenburg, RISE, SSPA, Swedish Agency for Marine and Water Management and County Administrative Board of Västra Götaland. Vital economic region: highest GVA per citizen of partner regions Highest R&D expenditures in % of GDP amongst partner regions 	<ul style="list-style-type: none"> Maritime transport nationally shows lower employment and gross investment, compared with 2009 Unemployment rates did not drop as much as in other countries since 2012 Lower total investment in Blue Economy sectors than in 2009
Opportunities	Threats
<ul style="list-style-type: none"> New freight service links to Norway and Poland provided by Norwegian shipping company "Sea-Cargo" in Port of Gothenburg could reinforce upward trend in port activities. "Short sea traffic" was previously not in the local repertoire and will now replace transport by road. This aligns perfectly with the Swedish maritime strategy, that demanded such switch to improve sustainability³. Swedish maritime strategy highlights blue energy as a sector with growth potential. Sweden already has 3 "Blueinvest pipeline projects" concerning wave energy à a possible cluster could develop. "Department of marine sciences" of University of Gothenburg provides research about wave energy converters. As ranked by the local experts, highest average involvement in 3 emerging sectors (Blue biotechnology, coastal and environmental protection and marine research and education) à excellent growth potential but moreover tend not to be affected by COVID-19 crisis as the established sectors. "Klimat 2030": Västra Götaland region will reduce emissions from greenhouse gases by 80% compared to 1990 level⁴. 	<ul style="list-style-type: none"> The COVID-19 crisis poses a threat to every established sector. Especially coastal tourism is expected to have a lagged recovery plan, for Sweden, coastal tourism accounts for up to 70% of Blue Economy jobs

¹ Västra Götalandsregionen 2015

² Ministry of Enterprise and Innovation – Government Offices of Sweden 2015. Maritime Forum 2021

³ Port of Gothenburg 2020

⁴ Västra Götaland region 2020

4

Conclusion and recommendations

This study analyses the Blue Economy in the case study regions of the Land-Sea-Act project. Primarily Eurostat data and data from the EU Blue Economy Report provided a first overview of the state of the Blue Economy in the case study regions. Data limitations and gaps occurred particularly on the regional and local level as well as concerning the emerging sectors. This problem was addressed by a supplementary expert survey answered by local stakeholders. To assess local Blue Economy strategies, preconditions for Blue Growth, and stakeholder involvement in the process, the qualitative approach was supplemented by RIS3 documents from the INTERREG project Smart Blue Regions. Lastly, a SWOT analysis contextualised the results so that recommendations could be drawn for each region individually.

Due to the data limitations, it was almost impossible to map the Blue Economy below the country level. Measurement of the profile of regional Blue Economy is highly complex and therefore not applicable for local communities or even regions. The existing data does not provide us with enough information to draw concrete recommendations for the difficult process of regional planning. Nevertheless, the data can be seen as a starting point for political activities and strategies.

The analysis conducted in this study points towards differently developing case study regions of the Land-Sea-Act project. There is not the one typical pathway for Blue Growth, but rather distinct emerging Blue Economy specialisation clusters in every region. As Blue Economy consists of diverse business sectors across all sectors of the economy, stakeholders within a region differ in business models and interests. Local and regional planning is well advised to find a Blue Economy-mix, that satisfies needs and fits regional characteristics (central vs. peripheral; rural vs. urban; densely vs. loosely populated).

Case study regions in Poland, Estonia and Latvia face the challenge of lesser developed regional economies (as GVA per citizen/worker). They all managed to decrease unemployment in the observed period drastically, though. Pomorskie profiles as a region in which two important, rapidly growing ports are located. Increasing investments and employment in port-related activities can complement Kurzeme's current focus on coastal tourism, that could be boosted by the prospect of playing an integral role in the Chinese Belt and Road initiative. Põhja-Eesti and Keski-Eesti's Blue Economy is diversifying, with shrinking dependence on coastal tourism and possibly more involvement in marine living resources, maritime transport and blue biotechnology in the future.

For the case study regions in Sweden, Denmark and Germany, higher GVA per citizen/worker can be observed. Västsverige shows a coherent mix of maritime strategy, current state of Blue Economy and future planning. The exceptionally high regional R&D investments fit the picture of a research-driven economic region, which focuses on emerging sectors like wave energy. In Holbæk, such a consistent strategy is not yet in place; experts rated the circumstances for Blue Growth as bad, but the implementation of the 'Danish Energy Model' and the 'Hesselø wind farm' could become corner pillars to build on for such a strategy in the future. Ostholstein has enormous tourist potential, which could even be exploited despite the COVID-19 restrictions. Regional planners will have to find solutions to conflicting interests of tourism and wind energy as well as for tourism and the new Fehmarn Belt link to Scandinavian countries or find ways to link tourism with the high potential of blue biomedicine.

FROM THE ANALYSIS, WE CAN DERIVE SEVERAL RECOMMENDATIONS:

- The short profiles of the case study regions' Blue Economies show how each regional Blue Economy has its **specialisation niche**. The economic sustainability of these niches should be subject to regular **checks and updates within strategic planning**.
- Once a strategy is drafted, regional planners need to make sure it is implemented and **regularly monitor** it.
- For effective monitoring, **comprehensive, consistent and comparable EU-wide data sets** on the Blue Economy are necessary.
- National and regional statistical offices must be required to report **economic data at the NUTS-2 and NUTS-3 level for both established and emerging sectors**.
- Apart from economic data, **knowledge on good practices regarding governance, entrepreneurial discovery processes and the legal framework** must be shared to improve the regional preconditions for Blue Growth.

Generally, one should bear in mind that the analysis has been conducted before the COVID-19 pandemic hit European and global economies. Although the EU 2020 Blue Economy Report already included a small assessment of the impact this will have on Blue Economy sectors, the consequences are not yet predictable. The fact that Blue Economy in the Baltic-Sea region is less dependent on coastal tourism, which is the sector that is likely damaged the most by the recession, could become a trump in favour of the case study regions of the Land-Sea-project. As many experts expect, the COVID-19-caused recession will accelerate already existing trends like digitalisation. The next decade could see the emerging sectors thrive in the following years; a trend that investments from the European Green Deal will only promote further, which underlines the necessity for research to catch up and find solutions to grasp these sectors with data.

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Annex

Baltic Sea Blue Growth Questionnaire²⁰

The EU's Blue Growth strategy is based on innovative, sustainable and inclusive growth and employment opportunities in Europe's Blue Economy. The Blue Economy is a relatively new concept that is still lacking a final sectoral classification. According to a definition used by the EU the Blue Economy includes all economic activities related to oceans, seas and coasts. It covers a wide range of interlinked established and emerging sectors. The availability of official statistics for the Blue Economy is scarce such that the state of play of the regions' Blue Economies is difficult to measure. The following short questionnaire will take a maximum of 15 minutes. It is intended to complete official data by your expert knowledge, assessment and experience regarding regional Blue Growth. We assure you the confidential treatment of all data.

Thank you very much for your time and support.

Background

1. In which type of organisation are you employed? From which perspective do you view the Blue Economy?

- Private Sector
- Science & Research
- NGO
- Authorities

2. What is your position within your organisation?

3. Please indicate the NUTS-3 region (district/province) that your answers in this questionnaire refer to

Current economic situation

4. How would you assess the economic scope/importance of the Blue Economy in comparison to other sectors in your region?

- (1) Very important
- (2) Important
- (3) Moderately important
- (4) Of little importance
- (5) Unimportant

²⁰ Note that the scale of question 4, 6, 9 and 11 was reversed in the visualisation in Figure 14, Figure 15, Figure 17, Figure 18

5. According to your knowledge, in your region’s Blue Economy what share of jobs is located in the following sectors? Please indicate approximate percentage shares.

	0%	1-20%	21-40%	41-60%	61-80%	81-100%	Not known
Extraction of marine living resources	0	0	0	0	0	0	0
Offshore oil and natural gas	0	0	0	0	0	0	0
Ports, warehousing and construction of water projects	0	0	0	0	0	0	0
Shipbuilding and repair	0	0	0	0	0	0	0
Maritime Transport	0	0	0	0	0	0	0
Coastal tourism	0	0	0	0	0	0	0

Others (please indicate with percentage share)

6. Are companies in your region also involved in the following emerging sectors (i.e. new sectors showing high potential for future development) of the Blue Economy? (1 = high involvement, ..., 5 = low involvement)

	1	2	3	4	5
Renewable energy	0	0	0	0	0
Blue biotechnology	0	0	0	0	0
Deep-sea mining	0	0	0	0	0
Desalination	0	0	0	0	0
Coastal and environmental protection	0	0	0	0	0
Defence and security	0	0	0	0	0
Marine research and education	0	0	0	0	0

7. To what extent is the Blue Economy interconnected with other sectors in your region and/or other regions in the world?

a. From which sectors do companies of the Blue Economy in your region mainly receive their intermediate inputs (i.e. goods and services including energy, raw materials, semi-finished goods that are used in the production process to produce other goods or services rather than for final consumption)?

b. From where do companies of the Blue Economy in our region mainly receive their intermediate inputs? Please rank the following alternatives: 1 = most important,..., 4 = least important.

- Same region
- Same country
- EU
- Worldwide

c. To whom (e.g. sector/private consumption) are products from the Blue Economy sold?

d. Where are products or services from the Blue Economy mainly sold? Please rank the following alternatives: 1 = most important,..., 4 = least important.

- Same region
- Same country
- EU
- Worldwide

Strategies, stakeholders and preconditions

8. Are you aware of specific strategies and/or concrete measures to promote Blue Growth in your region?

Strategies: _____

Concrete measures: _____

9. How strongly are different stakeholders involved in the development or implementation of these strategies/measures? (1 = very strong involvement,..., 5 = very weak involvement)

	1	2	3	4	5
ADMINISTRATION					
Local	0	0	0	0	0
Regional	0	0	0	0	0
National	0	0	0	0	0
EU	0	0	0	0	0
INTEREST GROUPS					
Local	0	0	0	0	0
Regional	0	0	0	0	0
National	0	0	0	0	0
EU	0	0	0	0	0
Private companies	0	0	0	0	0
Research institutions	0	0	0	0	0

10. How are issues of sustainability and environmental considerations taken into account with respect to the above strategies/measures?

11. How would you assess the regional preconditions for Blue Growth in the areas listed below? (1 = very good, ..., 5 = very bad)

	1	2	3	4	5
Research & Development capacities	0	0	0	0	0
Governance	0	0	0	0	0
Entrepreneurship	0	0	0	0	0
Infrastructure	0	0	0	0	0
Research and data availability	0	0	0	0	0
Cooperation patterns/stakeholder involvement	0	0	0	0	0
Legal framework	0	0	0	0	0
Others (please indicate):	0	0	0	0	0

Future development

12. How would you assess the future development of the Blue Economy in the areas listed below? (1 = very good, ..., 5 = very bad)

	1	2	3	4	5
R&D capacities	0	0	0	0	0
Governance	0	0	0	0	0
Entrepreneurship	0	0	0	0	0
Infrastructure	0	0	0	0	0
Research and data availability	0	0	0	0	0
Cooperation patterns / stakeholder involvement	0	0	0	0	0
Legal framework	0	0	0	0	0
Others (please indicate):	0	0	0	0	0

13. Which global trends will most likely affect the Blue Economy in the future?

a. In general

- Climate change
- Digitalisation
- Political developments

- General economic development
 - Demographic change
 - Urbanisation
 - Tech-convergence/dynamic technology
 - Others (please indicate):
-

b. In your region

- Climate change
 - Digitalisation
 - Political developments
 - General economic development
 - Demographic change
 - Urbanisation
 - Tech-convergence/dynamic technology
 - Others (please indicate):
-

Data availability

14. To what extent are limitations in data accessibility a challenge for assessing the current situation of the Blue Economy in your region?

15. How could a better data availability improve the cooperation between stakeholders of the Blue Economy?

16. Are you aware of any additional quantitative data sources regarding the state of the Blue Economy in your region (e.g. databases, studies, reports, scientific papers, etc.)? If yes, please indicate.

Further comments

17. Do you have any further comments or recommendations? If yes, please indicate

The project Land-Sea-Act (#R098 Land-Sea-Act Land-sea interactions advancing Blue Growth in Baltic Sea coastal areas) aims to bring together stakeholders involved in coastal management and planning, to find solutions to Maritime Spatial Planning and Blue Growth challenges around the Baltic Sea and to elaborate Multi-level Governance Agenda on Blue Growth and Spatial Planning in Baltic Sea Region. The project will guide national, regional and local authorities, as well as stakeholders of various sectors to:

- improve transnational cooperation and facilitate knowledge exchange to foster Blue Growth
- raise awareness, knowledge and skills to enhance Blue Growth initiatives and integrated development in coastal areas
- balance development of new sea uses with coastal community interests by improving coastal governance

Project implementation duration:	January 2019 – December 2021
Project budget:	2.21 million EUR, including European Regional Development Fund co-financing 1.76 million EUR
Project is financed by:	Interreg Baltic Sea Region Programme

Our project homepage: www.land-sea.eu
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EUROPEAN REGIONAL DEVELOPMENT FUND

