Update of the VASAB Long-Term Perspective for the Territorial Development of the Baltic Sea Region

FINAL DRAFT REPORT

BACKGROUND SYNTHESIS REPORT

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ABBREVIATIONS

BEMIP	Baltic Energy Market Interconnection Plan
CAP	Common Agricultural Policy
EBSA	Ecologically or Biologically Significant Marine Area
EEZ	Exclusive Economic Zones
ERDF	European Regional Development Fund
EU	European Union
EUSBSR	European Union Strategy for the Baltic Sea Region
FDI	Foreign Direct Investment
FUA	Functional Urban Area
GDP	Gross Domestic Product
GHG	Greenhouse Gases
HELCOM	Helsinki Commission
KM	Kilometres
IUCN	International Union for the Conservation of Nature
ICZM	Integrated Coastal Zone Management
MPA	Marine Protected Areas
MSP	Maritime Spatial Planning
NGO	Non-Governmental Organisation
PPP	Power Purchase Power
RPI	Regional Potential Index
SDG	Sustainable Development Goal
VASAB	Vision and Strategies around the Baltic Sea
VASAB CSPD/BSR	Vision and Strategies around the Baltic Sea (VASAB) Committee of Spatial Planning and Development / Baltic Sea Region

DISCLAIMER

Statement of the Member States of the European Union participating in the VASAB Committee on Spatial Planning and Development of the Baltic Sea Region

VASAB (Vision and Strategies around the Baltic Sea) is a cooperation of ministers responsible for spatial planning and development of the Baltic Sea Region countries, established in 1992.

The main VASAB mission is to prepare policy options for the territorial development of the Baltic Sea Region, to provide forum for exchange of knowledge, promote and participate in cooperation projects which provide added value to achieve well - integrated and coherent region as well as collaborate with other pan-Baltic, macro-regional, European and other international organisations and initiatives. VASAB also coordinates Policy area 'Spatial planning' of the EU Strategy for the Baltic Sea Region (EUSBSR) in two action fields – land-based and maritime spatial planning aiming to increase the territorial cohesion in the Baltic Sea Region.

The Member States of the European Union participating in VASAB – Estonia, Finland, Germany, Latvia, Lithuania, Poland, Sweden – are deeply concerned and strongly condemn the military aggression to Ukraine by the Russian Federation, supported by Belarus. This unprovoked and illegal military attack breaks international laws and violates the fundamental principles and aims of peace, cohesion and democracy. Due to these circumstances, we have decided to suspend Russia and Belarus from the VASAB Committee on Spatial Planning and Development of the Baltic Sea Region and Steering Groups of the EUSBSR Policy area 'Spatial planning' for land-based and maritime spatial planning and participation in related activities. Our countries are at the same time also founding members of the Council of the Baltic Sea States where a similar decision on suspension of participation by Russia and Belarus has been made and is in effect.

The current decision may be reassessed when cooperation under the fundamental principles of international law has become possible again.

Decision

Due to the armed aggression by the Russian Federation with support of Belarus against the sovereign state Ukraine, the Member States of the European Union participating in VASAB decide to suspend Russia and Belarus from the VASAB Committee on Spatial Planning and Development of the Baltic Sea Region and Steering Groups of the EUSBSR Policy area 'Spatial planning' for land-based and maritime spatial planning and participation in related activities.

4th March, 2022

1. UPDATING THE VASAB LONG-TERM PERSPECTIVE

Since the first VASAB vision "VASAB 2010. Towards a Framework for Spatial Development in the Baltic Sea Region" in 1994 and over the years VASAB has been forward looking. A proof for that is not only the development of its Long-Term Perspective for the Territorial Development of the Baltic Sea Region, which is a forward-looking document per se, but also the update of this living document throughout time for different time horizons. Since its adoption in 2009 several things have changed in the Baltic Sea Region, in Europe and globally. Integration have been strengthened and new cooperation frameworks emerged. Under these new conditions, VASAB is currently adjusting to these changes updating its Long-Term Perspective for a new time horizon, namely by 2040.

The update of the Long-Term Perspective is a process that combines content updates and co-creation processes in parallel, involving to the largest extent the VASAB Committee on Spatial Planning and Development of the Baltic Sea Region (VASAB CSPD/BSR) members, as well as external players in a number of workshops. This co-creation approach aims to involve VASAB throughout, increase ownership and create commitment. The process for updating the Long-Term Perspective capitalises on the work done so far and builds upon the strong metaphors developed by VASAB, namely the pearls (urban networking and urban-rural cooperation), the strings (internal and external accessibility), the patches (areas supporting dynamism and quality of life) and the system (comprehensive terrestrial/land-based and maritime spatial planning). Nevertheless, they will be seen through a fresh spectrum, given the current challenges, trends and changes.

Another important element for the update of the Long-Term Perspective is a focus on being extrovert, i.e. looking at VASAB in the Baltic Sea Region and beyond. Given the high mutual interdependencies of places today, where changes in one place have an influence in other places, going inward and focusing on national policies is not optimal anymore. One needs to think and look at the wider picture.

Lastly, the update of the VASAB Long-Term Perspective has focused on an integrating picture of a number of elements. First, this results the Baltic Sea Region territory. VASAB is comprised by both EU and non-EU members that are driven by cooperation and shared interest for this desirable change. The VASAB vision looks at the whole Baltic Sea Region as an integrated region, without distinguishing between EU and non-EU members. Second, the vision recognises the importance of both spatial and maritime planning in the region and therefore presents the land and sea interactions in an integrated way and comprises both spatial and maritime elements, without again making a distinction. Third, the vision also looks at sustainability from an integrated perspective, with sustainability being blended in all four metaphors throughout the vision document.

The VASAB vision is developed and embedded in the framework of a number of European, intergovernmental, transnational and national policies, strategies, programmes,

plans, visions and initiatives, as shown in Figure 1. More information on these can be found in sections 3.1 and 4.8. Indicative scenario exercises developed in the Baltic Sea Region are presented in Text box 17.

Figure 1The policy framework around the VASAB Long-Term Perspective 2040
Source: Authors' own

The Final Draft Report is comprised by four elements. The first element is the final draft of the background synthesis report. The background report forms the basis for preparing the vision, by presenting selected items and topics of the present situation of the Baltic Sea Region that are most relevant for the vision. The report also presents the relevant future-oriented projects and also trends that provide the first steps towards looking at the future of the Baltic Sea Region. The background report will accompany the vision document. The second element is a report on the vision process. This regards the results of the co-creation process, i.e. the internal and external workshops, the outreach activities and survey, as well as presents the concept for the implementation and assessment framework of the vision and the players to bring along. The third element regards the latest update of the vision document, complemented with the latest input and feedback. The fourth element regards the concept for the stakeholder consultation process, including presentation material.

The final draft background synthesis report is an updated background report, setting the scene and informing the vision process, by presenting the situation in the Baltic Sea Region 'as is', i.e. reflects on the present situation of the pearls, strings, patches and system. It then gradually shifts towards first indications about the Baltic Sea Region 'to be'. Its sections present the current situation of the Baltic Sea Region, the path towards the development of

the vision and some first insights towards the future, addressing the comments and feedback sent by the VASAB CSPD/BSR. The report concludes with points for the future steps. The scope of the background synthesis report focuses on selected items that are relevant for the development of the vision. This report informs the update of the vision and it is not the vision itself.

Chapter 2 gives a short overview of the Baltic Sea Region's achievements so far. Chapter 3 gives the overall context of the vision process and highlights the way of thinking when designing a vision. It also introduces two key elements that influence the future, namely policies and future trends. Based on these a first indication towards the shared value-base for the vision is introduced.

Chapter 4 presents the Baltic Sea Region of today going through the future from a territorial perspective. Taking as starting point the four key metaphors of the VASAB Long-Term Perspective, namely the pearls (urban networking and urban-rural cooperation), the strings (internal and external accessibility), the patches (areas supporting dynamism and quality of life) and the system (comprehensive terrestrial/land-based and maritime spatial planning), it gives a description of the current situation, gradually shifting towards the future by describing possible future potential and trends that will influence the Region.

2. THE BACKGROUND

Over the past twelve years the Baltic Sea Region has experienced considerable growth and respective territorial developments, great part of which could be attributed to having a common vision on the long-term development. 'Part of the strong Baltic Sea Region growth story was due to domestic policy choices and good economic management. But part of the success was due to the process of Baltic Sea Region integration – which provided a strong basis for GDP growth and for income convergence' (Skilling, 2018). The Long-Term Perspective for the territorial development and the European Union Strategy for the Baltic Sea Region (EUSBSR) as the first macro-regional strategy in the European Union have had a significant impact on the regional integration. VASAB plays a prominent role in the governance framework of both strategic processes.

Having recovered after 2008-2009 economic crises, since 2012 the Baltic Sea Region economies have generated strong GDP growth rates relative to the rest of Europe over the past 20 years. 'Exports between Baltic Sea Region countries account for just under 20% of total exports from the Baltic Sea Region economies. This is led by Latvia and Estonia (with intra-Baltic Sea Region export shares of 40-55%), well ahead of the Nordic countries that export more to other European countries. And about one third of the inward Foreign Direct Investments (FDI) stock into Baltic Sea Region economies comes from other Baltic Sea Region countries: again, this is dominated by the Baltic countries, who have received substantial investment from the Nordic countries. Integration has allowed for comparative advantage to be exploited, as capital has flown from the richer countries to the poorer

countries in the region. Further eastwards economic integration has been hindered by the escalating sanctions on Russia, and the counter-sanctions by Russia, which has constrained cooperation and exchange between the these parts of the Baltic Sea Region, incl. complicating export and also the situation for people and businesses directly or indirectly affected by this (Skilling, 2018).

Below are the key achievements linked to the overall objectives of the Long-Term Perspective by the three main thematic areas and actions adjusted in 2014.

Probably the most pronounced advancement has been achieved in 'Enhancing maritime spatial planning and management'. Since 2010 the Baltic Sea region has been among the EU frontrunners in drawing up and applying maritime spatial plans which are coherent across borders and apply the ecosystem approach throughout the region. The process was reinforced following adoption of the EU maritime spatial planning directive in 2014. Nearly all Baltic Sea Region countries are engaged in maritime spatial plans with Russia being slightly behind in the process. The country specific plans in EU member states are expected to be finalised within 2021. Baltic Sea Region maritime spatial plans can be considered as one of the most prominent achievements of the Long-Term Perspective which is being developed thanks to active cooperation of all the Baltic Sea Region countries within a joint HELCOM-VASAB Maritime Spatial Planning Working group.

In the area of 'Improving Internal and External Connectivity' infrastructure investments into the sections of core network corridors of the Baltic Sea Region were listed in the Long-Term Perspective. Of these investments, the *Rail Baltica* project stands out as a completely new section of the TEN-T North Sea-Baltic Corridor. In 2019, this backbone for the integrated railway system in the eastern part of the Baltic Sea Region has entered its construction phase. Its completion is envisaged in 2026.

Overall, the macro-regional transport development perspective has been high on the EUSBSR agenda, inter alia, thanks to the active role of VASAB. In 2019, VASAB has prepared the joint transnational spatial vision on regional development, logistics and mobility along the North Sea Baltic corridor which has been disseminated among spatial planning and transport experts (Interreg Baltic Sea Region et al., 2019). It is intended to serve as a conceptual reference for public officials, advancing implementation of the transport and development corridor that is stretching from Hamburg to Umeå.

'Promoting Urban Networking and Urban – Rural Cooperation' has been the third thematic area of Long-Term Perspective to enhance cooperation of urban areas, promote urban-rural relations and labour market trends and activities. Broad partnerships representing various governance levels and sectors have been brought together around the VASAB Long-Term Perspective to jointly the territorial disparities and evolving tendencies by long-term policies. Here, such actions as the Baltic Metropoles Network or presently the Nordic-Baltic Network within METREX (the network of European metropolitan regions and areas), elaboration of the Nordic-Baltic Space Transnational Development Perspective (METREX,

2019) and VASAB events sharing development experiences of small and medium-sized cities and towns and demographic challenges can be mentioned.

In 2019, an ESPON Targeted Analysis 'Territorial scenarios for the Baltic Sea – BT2020' acknowledged possible events that may take place in the future and made a comparison between them and the VASAB Long-Term Perspective. The comparison indicated at the present Long-Term Perspective actions that should be continued adapting them to the new situation as well as those that are no longer relevant. The convergence of VASAB Long-Term Perspective recommendations and integrated actions was proposed to focus on (i) medium-size cities, (ii) secondary regional networks, (iii) wise use of local endogenous assets, but the Baltic sea, in particular, (iv) increased residential attractiveness, (v) immigration to compensate demographic decline, (vi) development of public services of general interest (SGI) and (vii) cross-border service networks based on new technologies (viii) increased focus on climate change adaption, water resources and renewable energy as well as (ix) further Baltic Sea Region integration through monitoring, research and spatial planning (ESPON, 2019b).

3. THE OVERALL CONTEXT

A vision for VASAB 2040. The update of the VASAB Long-Term Perspective is about the development of a shared spatial vision for the entire Baltic Sea Region in 2040, comprising both the land-based/terrestrial spatial and maritime spatial aspects, that respects the characteristics, challenges and potential of the Baltic Sea Region, putting its places, people and the health of the Baltic Sea in focus. It is a 'we-ssion' – a mission towards improving together the Baltic Sea and its territories for a better quality of life of the future generations.

A desirable future for 2040. Visions define a desirable picture of the future. This picture is based on a core set of shared ideas, values and principles of the stakeholders developing a vision. Shared visions matter, as they bind together people who share a common aspiration. Visions raise their power from a common caring of people for the future. They are coherent, concrete and powerful forces to make a desirable change. They give people a purpose and direction to actions, offering guiding principles for their thoughts and actions.

Thinking of 2040 and beyond – visions fighting short-termism. Our attitude towards the future can often be described as 'tempus nullius', where the future is seen as 'nobody's time' and our view for the future is characterised by a political and social myopia (Krznaric, 2020). Long-term thinking is a challenge and a weakness in current democracies, which seem to have difficulties tackling longstanding challenges such as climate change (Randers, 2012). This often results in a dead end of short-sighted political decisions that prioritise current to future generations with the latter being mostly affected by the current decisions. Long-term thinking is pivotal for the survival and the well-being of future generations. An antidote to presentism can be the so-called 'cathedral thinking' (Krznaric,

2020). The term is inspired by the epic acts of past generations of the medieval times who built huge cathedrals that require years of work and which only their grandchildren may be able to see finalised. Cathedral thinking gives the direction for the vision thinking: visions require long-term thinking and not short-term decisions so that future generations and the grandchildren of our grandchildren can enjoy a fulfilled life and past generation can leave a remarkable legacy. Therefore, although the VASAB vision looks at the Baltic Sea Region in 2040, the way of thinking through the whole process needs to go beyond this timeframe.

Visions need to be combined with actions. Reflecting on possible desirable futures may easily be turned into daydreaming, lacking concrete focus and direction. Visions need to be combined with actions and vice versa (Böhme and Lüer, 2016). The VASAB 2040 vision shall describe a desirable future and give the overall direction of where the Baltic Sea Region should go. This direction in itself paves the way for coordinated actions and steps to be taken to get closer to the overarching future of the vision. Actions linked to the VASAB vision for 2040 shall inform policy makers to realise this desirable future.

Future is shaped by policies and trends. The future, however, is unpredictable. In fact, the only constant is that things in the future will change. Two key elements may radically shape changes and hence the future: policies and trends. Policies are shaped by our choices. In our interconnected world, lives have got more complicated and people explicitly but very often also implicitly make daily dozens of choices. Well informed future-relevant choices of today, may be the chance to define a future legacy and gradually build a desirable future. At the same time, trends and changes take place daily, influencing territories and peoples' lives in the short or longer term. Trends may influence policies and policies may define new trends. Looking at both will give us a better picture of how a desirable future for the Baltic Sea Region may be built.

3.1 RELEVANT POLICIES

The VASAB Long-Term Perspective takes account of various existing or emerging policies in the region and its neighbourhood. They can be distinguished by geographical or geopolitical areas as well as policy areas they cover. First of all, for most of the Baltic Sea Region countries various EU policies, such as cohesion, rural and transport policies are of high relevance. As of 2021 the European Commission (EC) launches several new strategic frameworks both due to the start of the new programming period as well as in response to the COVID-19 crises. They offer notably new policy approaches, such as, for example, NextGenerationEU and New European Bauhaus, which are also relevant for the Long-Term Perspective update. Secondly, the Northern Europe and its countries have a number of common initiatives, of which the EUSBSR and the Northern Dimension should be mentioned among the most significant. Thirdly, the region is located in an area where interests of Russia and the Euro-Atlantic community collide defining a necessity to consider also relevant Russian and Byelorussian policies as well as the overall geopolitical security aspects of the

region. Last, but not least the region is committed to reaching the Sustainable Development Goals (SDGs) adopted by all United Nations member states in 2015. The UN 2030 Agenda for Sustainable Development (UN Agenda 2030) recognises that ending poverty and other deprivations must go hand-in-hand with strategies that improve health and education, reduce inequality, and spur economic growth – all while tackling climate change and working to preserve our oceans and forests. Achieving the 17 SDGs require a global partnership of all countries which should be brought down to more regional and local level cooperation. VASAB is highly involved in this process, contributing to and working closely towards four SDGs. These are namely SDG 9 'build resilient infrastructure, promote inclusive and sustainable industrialisation and foster innovation', SDG 10 'reduce inequality within and among countries', SDG 11 'make cities and human settlements inclusive, safe, resilient and sustainable', and SDG 14 'conserve and sustainably use the oceans, seas and marine resources for sustainable development'.

The EU Regional development and Cohesion policy beyond 2020 will drive EU investments towards achievement of five main objectives: (i) Smarter Europe, (ii) Greener, carbon free Europe, (iii) a more Connected Europe, (iv) more Social Europe and (v) a Europe closer to citizens. European Structural and Investment Funds implementing Cohesion Policy, also offer additional territorial tools to further support cooperation, such as the Integrated Territorial Investments and the Community-led Local Development tools. In addition to the initiatives by the European Commission and the European Parliament, there are also several initiated and maintained by direct collaborative processes of the member states, such as, for example the Territorial agenda 2030 and Leipzig Charter. All of them aimed at reaching the above objectives.

The European Green Deal aims at a more sustainable EU economy and the Union becoming climate neutral in 2050. The EU Green Deal plans boosting efficient use of resources by moving to a clean, circular economy, restoring biodiversity and cutting pollution (European Commission, 2019). Its ambitions are fully in line with the Baltic Sea Region priorities defined in the EUSBSR and thus will provide support in reaching them. The region is expected to benefit greatly from the EU Green Deal action plan that foresees (i) investing in environmentally friendly technologies, (ii) supporting industry to innovate, (iii) rolling out cleaner, cheaper and healthier forms of private and public transport, (iv) decarbonising the energy sector, (v) ensuring buildings are more energy efficient and (vi) working with international partners to improve global environmental standards. The **Sustainable Europe Investment Plan** is the investment pillar of the EU Green Deal, while the **Just Transition Mechanism** is a key tool to ensure that the transition towards a climate-neutral economy happens in a fair way, leaving no one behind.

The EU Biodiversity strategy for 2030 acknowledges that "protecting and restoring biodiversity and well-functioning ecosystems is key to boost our resilience and prevent the emergence and spread of future diseases" (COM(2020) 380 final, 2020). It recognises that 'investing in nature protection and restoration will also be critical for Europe's economic

recovery from the COVID-19 crisis'. For the good of our environment and our economy, and to support the EU's recovery from the COVID-19 crisis more nature needs to be preserved. In this spirit, at least 30% of the land and 30% of the sea should be protected in the EU. This is a minimum of an extra 4% for land and 19% for sea areas as compared to today. Hence, VASAB Long-Term Perspective update needs to consider also this aspect.

The European Digital Strategy[1] acknowledges that development, deployment and uptake of technology makes a real difference to people's daily lives and supports a strong and competitive economy that masters and shapes technology in a way that respects European values. It provides for a frictionless single market, where companies of all sizes and in any sector can compete on equal terms, and can develop, market and use digital technologies, products and services at a scale that boosts their productivity and global competitiveness, and consumers can be confident that their rights are respected.

Sustainable blue economy policy acknowledges a shift from blue growth to sustainable blue economy in support of the European Green Deal (European Commission, 2021b). Sustainable blue economy will create new opportunities for jobs and businesses, contribute in addressing climante and biodiversity challenges, transform the blue economy value chains, support green maritime transport, aquaculture, offshore renewable energies and others.

Through the **Trans-European Transport Network policy**[2] (TEN-T), the EU builds an effective EU-wide transport infrastructure network. The Connecting Europe Facility is a key EU funding instrument that promotes growth, jobs and competitiveness through targeted infrastructure investment at European level. It supports the development of high performing, sustainable and efficiently interconnected trans-European networks in the fields of transport, energy and digital services. Connecting Europe Facility investments fill the missing links in Europe's energy, transport and digital backbone. For VASAB Long-Term Perspective update such TEN-T initiatives as the **Motorways of the Sea** and **Rail Baltica** are of a high relevance, in addition to the comprehensive railway network.

Motorways of the Sea. In the 2001 Transport White Paper: European transport policy for 2010, the EC set out an ambition to shift transport from road to sea. Motorways of the Sea became an important tool facilitating this multi-modal shift and forms the maritime pillar of TEN-T. Motorways of the Sea builds on the TEN-T core network corridors, ports and logistics centres throughout Europe, shall increase connectivity between the member states and facilitate concentration of freight flows to sea-based routes reducing road congestion. From 2020, Motorways of the Sea align sustainable, smart and seamless European Maritime Space as key priorities. Related funding comes from Connecting Europe Facility where Motorways of the Sea priorities for Connecting Europe Facility 2021-2027 focus on implementing the European Green Deal, promoting digitalisation and multi-modal integration (European

[1] https://ec.europa.eu/digital-single-market/en/content/european-digital-strategy
[2] https://ec.europa.eu/transport/themes/infrastructure/ten-t_en

Commission, 2021a). The Baltic Sea is one of the six major sea basins included in the programme, with 19 Core Network Corridor ports connecting the Baltic Sea shipping routes with four Core Network Corridors (Baltic-Adriatic; North Sea-Baltic; Orient-East Med, and Scandinavian-Mediterranean) (European Commission, 2020d).

Rural development is the "second pillar" of the EU Common Agricultural Policy (CAP) reinforcing its "first pillar" by strengthening social, environmental and economic sustainability of rural areas. The "second pillar" safeguards a balanced territorial development of rural economies and communities including creation and maintenance of employment. The new CAP 2021-2027 aims to foster a sustainable and competitive agricultural sector that can contribute to the EU Green Deal, especially with regard to the **Farm to fork strategy** and **Biodiversity strategy** (European Commission, 2020e).

The long-term vision for rural areas is a European Commission initiative for developing a common European vision for vibrant, connected, and sustainable rural areas. The four key elements of the vision for rural areas towards 2040 are: (i) stronger rural areas, with vibrant local communities, increased service provision and digital tools, (ii) connected rural areas, focusing on improved public transport and digital infrastructures, (iii) resilient rural areas that foster wellbeing, focusing on climate change, natural hazards and economic crises resilience, iv) prosperous rural areas, which are attractive places to companies, improve the added value of agricultural practices and are based on local economies .

Farm to Fork strategy as a part of the EU Green Deal aims at speeding up the shift to fair, healthy and environmentally friendly food systems. The strategy acknowledges the tangled connections between healthy people (universal access to sufficient, safe, nutritious and sustainable food), healthy societies (affordability of food while fairer economic returns, fostering competitiveness of the EU supply sector and promoting fair trade) and healthy planet (neutral or positive environmental impact) (European Commission, 2020c) and addresses challenges and means in all food systems phases (production, distribution, consumption and disposal).

The New European Bauhaus[3] initiative connects the EU Green Deal to our living spaces. The COVID-19 crisis has shown that many topics are interlinked and that new thinking comes from breaking silos, just as the New European Bauhaus movement did one hundred years ago. The New European Bauhaus would like to facilitate the exchange of knowledge between people across Europe and to create an interdisciplinary project. It focuses on green transition, through more sustainable building renovations, affordable housing and improving living spaces across the EU. It wants to make the EU Green Deal a cultural, human centred and positive, "tangible" experience calling on all Europeans to imagine and build together a sustainable and inclusive future that is beautiful for eyes, minds, and souls.

[3] https://europa.eu/new-european-bauhaus/about/about-initiative_en

Territorial Agenda 2030 (TA 2030) is a strategic policy document for spatial planning in Europe, its regions and communities and, hence, it is highly relevant also for VASAB Long-Term Perspective. TA 2030 provides a framework for action towards territorial cohesion and a future for all places in Europe. Adopted by the Ministers of EU member states, as well as Norway and Switzerland, responsible for spatial planning, territorial development and/or territorial cohesion in December 2020 it underlines the importance of and provides orientation for strategic spatial planning and calls for strengthening the territorial dimension of sector policies at all governance levels. It seeks to promote an inclusive and sustainable future for all places and to help achieve SDGs in Europe (Territorial Agenda, 2020).

The New Leipzig Charter 2020 agreed upon by the Ministers of EU member states responsible for urban matters re-emphasises the pursuit of the common good using the transformative power of cities. It provides a policy framework to envision and realise European and global agreements, such as the Paris Agreement and the EU Green Deal at the urban scale. It promotes integrated and sustainable urban development and recognises that the urgent global challenges may intensify social disparities. The Charter emphasizes the need for inclusive and affordable urban policy that ensures safe services and infrastructure. Particular consideration is given to comparable living conditions for citizens in small and medium-sized towns and cities in shrinking areas (New Leipzig Charter, 2020).

EUSBSR is the most relevant regional level strategy for the VASAB Long-Term Perspective update. It aims at "embedding" all the above EU policies into the regional context and vice-versa, i.e., ensure that the regional interests are reflected in the EU policies. Introduced in 2009, the EUSBSR was the first macro-regional strategy of the EU. One of its policy areas - 'Spatial Planning' -aims at increased territorial cohesion of the region and provides the roots for this update. Development in most of the other 13 policy areas are directly related to the spatial planning activities. The 2021 revised Action Plan is now more focused and considers the emerging global challenges, the EU´s new strategic frameworks, the 2021-2027 Multiannual Financial Framework, as well as the governance challenges of the EUSBSR. Policy areas are more streamlined and placed into a strategic context. Their contribution to the UN SDGs is defined.

Interreg – European Territorial Cooperation. Cross-border and transnational Interreg programmes are an important cooperation platform and funding source for players in the Baltic Sea Region. The programmes focus on a number of priorities and objectives, following the Common Provisions Regulations. A number of transnational and cross-border cooperation programmes take place in the area. Transnational cooperation programmes are the Interreg Baltic Sea Region Cooperation programme, the Interreg Central Baltic Cooperation programme, the. Cross-border cooperation programmes are the Interreg Germany (Mecklenburg-Vorpommern-Brandenburg)-Poland, Germany-Denmark, the Interreg South Baltic Cooperation programme, the Interreg Sweden-Denmark-Norway, the

Interreg Sweden-Finland-Norway, the Interreg Latvia-Lithuania, the Interreg Lithuania-Poland, the Interreg Estonia-Latvia.

Rail Baltica[4]: stands for the construction of 870 km railway line complying with all technical specifications for interoperability (TSIs) in the European standard gauge rail network and implementation of high-speed trains connecting the Baltic States with the western European railway network. Planned to be finalised by 2026, the new railway line will eliminate the missing rail link of the EU's North Sea Baltic TEN-T corridor the EU's North Sea by connecting Helsinki, Tallinn, Pärnu, Riga, Panevežys, Kaunas, Vilnius and Warsaw. This investment will enable a better integration of the Baltic States to the European market and it is estimated to generate societal and economic benefits (e.g. integration of labour markets, increase accessibility to services) that will exceed the investments of 5.8 billion Euros necessary for its implementation and operability.

The Baltic Energy Market Interconnection Plan[5] (BEMIP) was agreed in 2009. Its primary objective is to achieve an open and integrated regional electricity and gas market in the Baltic Sea Region. The initiative's members are Denmark, Germany, Estonia, Latvia, Lithuania, Poland, Finland and Sweden. Norway participates as an observer. The three Baltic States' electricity grid still operates synchronously with the Russian/Byelorussian systems. BEMIP aims at synchronisation of the Baltic grid with the continental European network by 2025. A number of cross-border and domestic infrastructure projects have been completed across the Baltics to improve their integration with the Nordic electricity market. A notable externality of the BEMIP initiative is **the Baltic Sea Offshore Wind Joint Declaration of Intent**. Recognising the substantial potential for offshore wind power in the Baltic Sea to be most efficiently achieved through a cooperative regional approach such an initiative was signed in 2020.

The Northern Dimension[6] is a mutual regional policy framework between EU, Russia, Norway, and Iceland, launched in 1999 and renewed in 2006. Covering a broad geographic area - European Arctic and Sub-Arctic, Baltic Sea, north-west Russia, Iceland and Greenland - this policy aims to foster dialogue, improve stability, well-being and economic cooperation and integration, to boost competitiveness and sustainable development in Northern Europe. As one of the instruments for promoting regional development this framework supports sub-national and governmental cross-border and trans-boundary cooperation. One of the means to facilitate the development of a globally competitive area, the Northern Dimension supports the cooperation between urban areas in the region to create a strong urban network and a well-functioning territorial structure.

[4] https://www.railbaltica.org/wp-content/uploads/2017/04/R_B_buklets_21x21.pdf
[5] https://ec.europa.eu/energy/topics/infrastructure/high-level-groups/baltic-energy-market-interconnection-plan_en
[6] https://www.ndphs.org/?about_nd

The Northern Sparsely Populated Areas network[7], stands for the partnership between 13 northernmost regions from Sweden, Finland and Norway. Focusing on the specificities of these regions (e.g. sparsity, remoteness, dispersed settlement patterns) and their challenges (e.g. lack of critical mass, isolated labour markets, weak public service provision) this network strives to influence EU policy and also provides a platform for best practices.

The Russia Spatial Development Strategy 2025[8] aims at sustainable and balanced territorial development of the country and reduction of the existing regional disparities, increased economic growth and technological development as well as ensuring national state security. Its main tasks include reinforcement of regional cooperation and coordination within 12 macro-regions of the country, increased sustainability of national settlement system through the socio-economic development of cities and rural areas, greater territorial accessibility of social services, socio-economic development of promising large centres of economic growth of the Russian Federation, i.e. significant urban agglomerations, such as St. Petersburg, and safeguarding national security through socio-economic development of geostrategic territories. Transformation of spatial structure of the national economy is planned by, inter alia, accelerating the manufacturing of consumer goods in the central regions of the European part of the Russian Federation having access to the Baltic and the Black Seas and shifting production of hydrocarbon raw materials to underdeveloped territories of Eastern Siberia and the Far East and the water area of the shelves of the Far Eastern and Arctic basins (Government of Russian Federation, 2019). The Baltic Sea is seen as one of the five key areas for the sea trade. Its ports already account for almost half of the country's total cargo turnover[9]. Overall Russia aims at increased throughput of the East-West transport systems including its seaports.

As for the Arctic region, **the Fundamentals of the state policy of the Russian Federation in the Arctic for the period up to 2035** (Security Council of the Russian Federation, 2020) have been developed by the Security Council of the Russian Federation[10]. Its main policy objectives include 'maintaining sovereignty and territorial unity of the country and preserving the Arctic as a global territory in a stable mutual partnership'. In 2020 also **Strategy for Developing the Russian Arctic Zone and Ensuring National Security through 2035** has been adopted (Government of Russian Federation, 2020). It aims to advance development of the region's abundant resources, first and foremost oil and gas, and improve living conditions for the population, and possible the Northern Sea Route as a new

[7] NSPA Northern Sparsely Populated Areas | NSPA Northern Sparsely Populated Areas (nspa-network.eu)

[8] https://www.economy.gov.ru/material/directions/regionalnoe_razvitie/strategicheskoe_planirovanie_prostranstvennogo_razvitiya/strategiya_prostranstvennogo_razvitiya_rossiyskoy_federacii_na_period_do_2025_goda/

[9] https://www.statista.com/statistics/1023550/russia-cargo-throughput-by-port/

[10] http://www.scrf.gov.ru/security/economic/Arctic2035/

global shipping artery in the long-run. An increasingly ice-free Arctic brings new opportunities about also new territorial vulnerabilities in its Far North (Kluge et al., 2020).

3.2 OVERARCHING TRENDS

In addition to policies, mega-trends, trends and changes that take place daily at global and EU level may influence the future. The Baltic Sea Region is comprised by EU and non-EU countries and their developments and changes are also linked and influence the development of the Baltic Sea Region. Different trends and developments may play out differently in different types of territories and have different consequences at all levels from global to local. Furthermore, besides all the trends and developments, the dawn of the new decade came along with an unprecedent event that nobody was expecting and nobody was prepared for: a pandemic. The coronavirus, or COVID-19, is the latest proof of sudden global changes, which has shaken most aspects of businesses' progress and people's lives, questioned political decisions, social structures and economic systems bringing consequences and a new 'post-pandemic' reality that are yet to be fully seen. Our response to these challenges, changes and trends will shape our future value-base and the focus of our future actions. Trends are interrelated and often one influences others and vice versa. This chapter and the respective sections on trends do not aim to make a thorough collection and analysis of existing trends, but rather present a short selection of a few trends that may be relevant for this background report.

Trends are emerging patterns of change likely to impact large social groups or governments and require a response (ESPON, 2018d). Mega-trends are great forces in societal development likely to affect the future and influence a wide range of activities and perceptions (ESPON, 2018d). They are multifaceted and broad trends that influence the future in the long-term to a large extent.

Trends can be of different magnitude, impact, maturity level and uncertainty. Some trends may be already at a maturity stage or emerging, others may have a strong impact and influence other trends, i.e. be megatrends, such as climate change and demographic change. Others may be of less influence, such as social distancing trends and hygiene measures due to COVID restrictions or trends that are outcomes of policies, such as blue growth related trends. In addition, others may have a high uncertainty, such as the continuation of anthropocene and its effects on several aspects of peoples' and societies' lives.

The following mega-trends are particularly relevant for the process:

- Urbanisation. The future of the world is urban, as by 2050 it is estimated that the share of people living in urban areas will rise to 68%, while small and medium-sized towns are also expected to grow further. (ESPON, 2019b)
- Climate change. Climate change has and will continue having immense consequences on people's lives and on territories. The Intergovernmental Panel on Climate Change

reported in 2021 that human influence has warmed the atmosphere, ocean and land and that a global warming of 1.5°C and 2°C will be exceeded during the 21st century if no action is taken, with severe consequences on the sea level rise and ecosystems in the world. (Intergovernmental Panel on Climate Change, 2021)

- Technological advancements and breakthroughs. It has become clear that technology happens. Today it is unavoidable that technology will progress in unimaginative ways, influencing business models, social aspects, the economy and environment.
- Shifting power from West to East. An overall shift of global powers has been noticed the last years and is expected to play an important role in the economy and geopolitics in the future. (ESPON, 2019b)
- Demographic changes, ageing and migration. Demographic changes particularly driven by depopulation, ageing and migration movements will continue. Europe is ageing which in combination with longer life expectancy and technological advancements, as well as the migration movements are the demographic dynamics that may have important social, environmental and economic implications. (JRC, 2021; Lutz et al., 2019)
- Anthropocene. Anthropocene is a new, yet unofficial but highly discussed, term to define a new geologic epoch that humanity and world have entered. The term describes the new epoch characterized by a significant impact on the planet's climate and ecosystems consciously caused by human activities (National Geographic, n.d.).
- New social consciousness. The combination of the above mentioned mega-trends, as well as the COVID-19 pandemic and its reality shed light on a new way of thinking in the future where humanity will have to re-design its practices. Shifting people's mindset through more sustainable, more long-term practices will be necessary to cope with the new challenges. Such shifts are already supported by policies, such as the New European Bauhaus, which does not only reflect on practical sustainable solutions but also aims at shifting people's way of thinking to that direction. This shift can develop in the long-run a new 'social consciousness', as introduced by Durkheim, i.e. a collective awareness and experience of shared identities and community feeling.

Figure 2 shows an overview of existing exogenous and endogenous trends (Böhme et al., 2019; ESPON, 2019c). Exogenous trends are considered these that cannot be influenced by policy making. Endogenous trends are these trends that can be influenced by policy making. Both exogenous and endogenous trends come from the political, economic, environmental, social and technological spheres and may influence territories and people in different ways. Some of the trends represent mega trends (in dark colouring), while others represent seeds (in light colouring). Climate change, biodiversity loss, population ageing, the 4th industrial revolution, collaborative economies, big data, increased global tensions, neo-nationalism, e-governance are only a few of the trends that may influence global and EU territories.

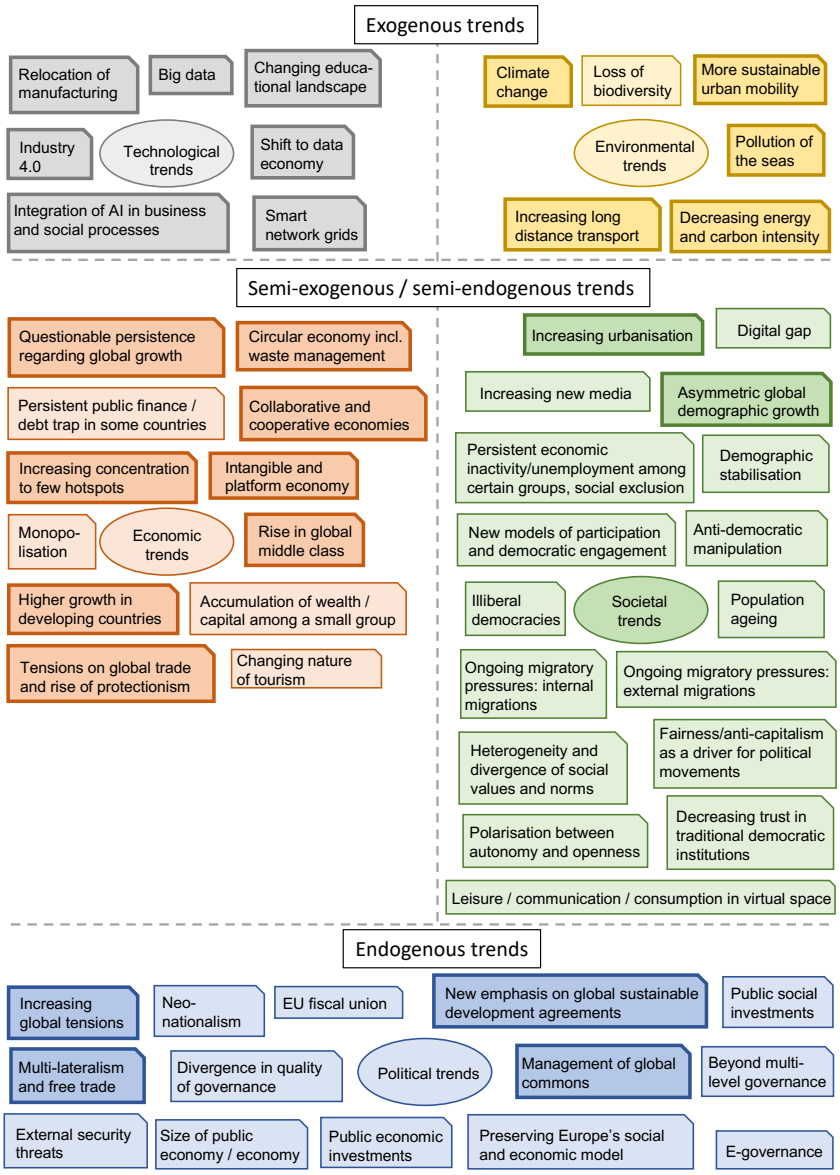


Figure 2 Endogenous and exogenous trends
Source: Böhme, Lüer, & Toptsidou (2019)

Zooming in the Baltic Sea Region, several trends are particularly relevant for the region. The study 'Looking towards the 2030: Preparing the Baltic Sea Region for the future', prepared for the Swedish Agency for Economic and Regional Growth' has looked into numerous trends that may have implications for the Baltic Sea Region and the EUSBSR. Four key categories were identified, namely the 'changing demographic pressure', 'renewing industries and innovation', 'deepening environmental conversations' and 'changing democratic decision making' (Böhme et al., 2016). These categories highlight the variety of trends as well as the high levels of uncertainty that may affect the region. Further to this, the ESPON study on 'Territorial Scenarios for the Baltic Sea Region 2050' identified additional trends under key categories of relevance for the Baltic Sea Region, including its EU and non-EU members (Figure 3). Particularly trends linked to the overarching themes of technology

transforming economy and society, demography and politics shaping society and environment shifting economy may play an important role for the territorial development of the Baltic Sea Region in the future (ESPON, 2019b).

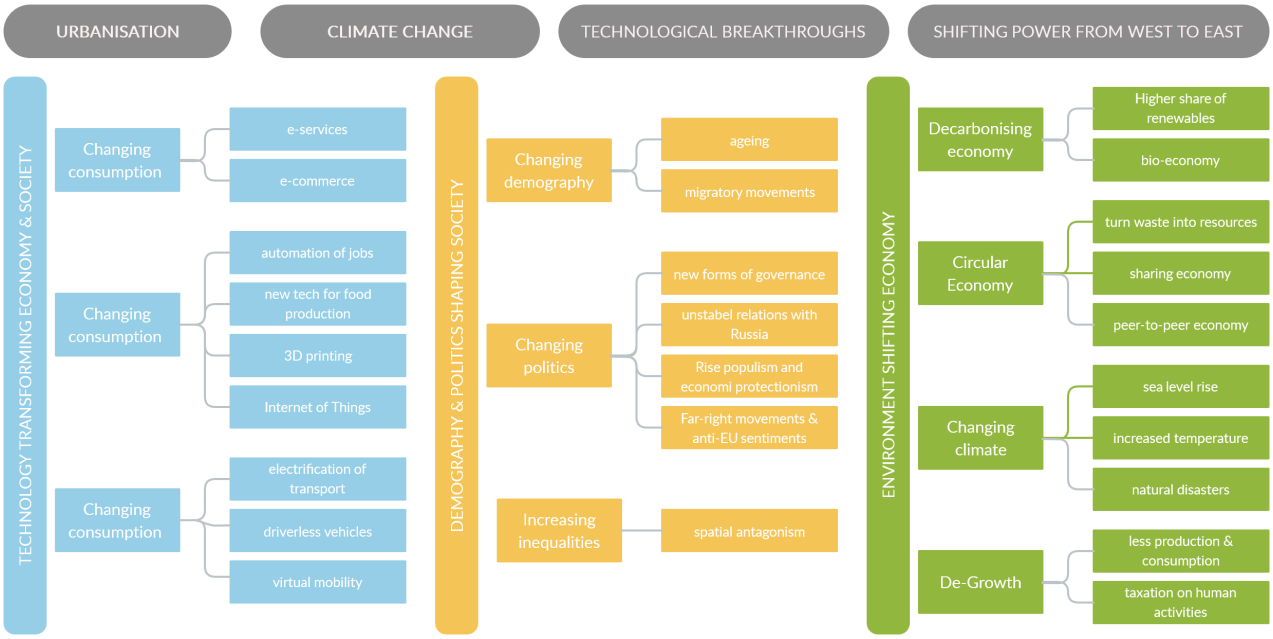


Figure 3 Trends and factors influencing the Baltic Sea Region
Source: Aguiar Borges 2020, ESPON 2019a

The brainstorming of the first internal workshop with the VASAB CSPD/BSR has proved that most of these trends remain important, while new ones emerged and need to be considered for the region's future. From the meeting it became clear that some trends in particular shape our future one way or the other, but also define our future value-base. These reflect a strong sustainability and cohesion concept, with the high presence of technological advancement, as well as some starting points for future new normal and better quality of life.

Figure 4 shows the key trends selected during the meeting.

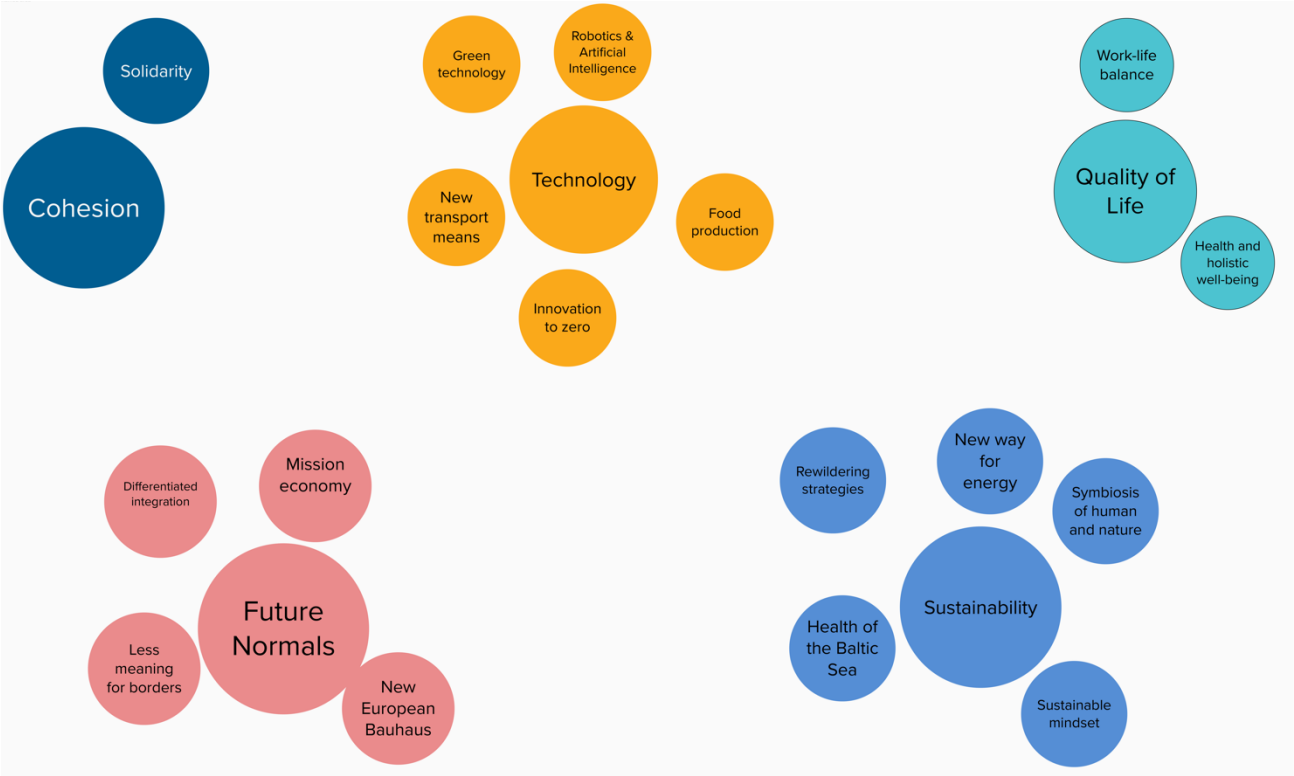


Figure 4 What is the shared value base for the VASAB vision?
Source: Results from the exercise of the 1st Internal Workshop, VASAB Long-Term Perspective Update, 7 May 2021

Following these reflections, five overarching key values emerge to be at the heart of the VASAB Long-Term Perspective for 2040 aiming at a cohesive and green Baltic Sea Region:

Cohesion. Cohesion represents a caring society where solidarity is strong and people have equal opportunities, all governance levels are represented and all territories can share equal rights for their development.

Technology. Technological advancements from robotics and artificial intelligence to new forms for food production will shape citizens' everyday life. A sustainability shift will also characterise this progress, as technology will be in line with green technology, innovating to zero and investing in new energy forms.

Quality of life. The quality of life of people is put on the forefront with focusing on people's well-being and respecting a work-life balance in the future.

Sustainability. Sustainability represents a mindset shift towards more environmentally friendly practices, where development does not deprive future generations. Putting the health of the Baltic Sea first, human and nature are in symbiosis, rewilding practices are in place to restore loss of biodiversity, new ways of producing energy are explored.

Future normals. One of the consequences of the COVID-19 pandemic has been a change in people's thinking. Changing our world view towards a 'mission economy' and a

more moral capitalism, building our lives along integration though decreasing the importance of borders and being involved in the New European Bauhaus as a means to sustainably change our lives in practice and mentally will shape the future vision. The trends presented in this chapter have been used and discussed in the co-creation process and also taken into account for the development of the VASAB vision document.

4. FROM TODAY TO 2040

To design the future, one needs to first understand the present. Taking into account the policies and trends described in the earlier section, section 2.3 links the present with some first indications on the future. Driven by a territorial approach, the section takes as starting point the pearls, the strings, the patches and the system, each representing territorial approach, to show the situation today, their potential for the future and concluding with some future indications on how these metaphors may be understood in 2040, what is their position in the region and what are possible trends that are relevant and may influence them in the future. The current situation offers the basis and background for building up the work on the future. Although the 'pearls', 'strings', 'patches' and 'system' are presented separately, they are highly interrelated. Certainly, developments under e.g., energy production under 'strings' may have an impact on the land take and use, reflecting the 'patches', or similarly changes and plans under 'system' can have an effect on 'patches' and the land and sea relations. The following sections show relevant information for each so as to inform the reader on what needs to be taken into account for the vision update. Another important element is the interlinkages between land and sea, as both are also strongly interrelated and presented as such in this report and particularly in the system section. For instance when it comes to offshore wind farming, important land links regard the cable connections to the land, while e.g. tourism and recreation activities are, among others, also linked to clean bathing water (PanBaltic Scope, 2019).

The discussion of the future vision and its focus is a process under development and progress. The focus will be gradually developed through the co-creation process and internal workshops designed for the update of the VASAB Long-Term Perspective. Therefore, the first indications on the future are based on the discussion that took place so far and desk research. How the different trends will play out and influence each metaphor will be developed in the next step of the process.

All these metaphors shall not be treated as single elements but shall be rather seen in a more functional approach and complementing each other, as in some cases impacts on one may have an implication in the territorial development of others. This approach is also relevant when it comes to the interlinkages between land and sea when throughout the context of this report, those shall not be thought separately. Following a place-based and functional approach, each builds on its unique characteristics, environments, communities and development potential.

4.1 PEARLS OF TODAY

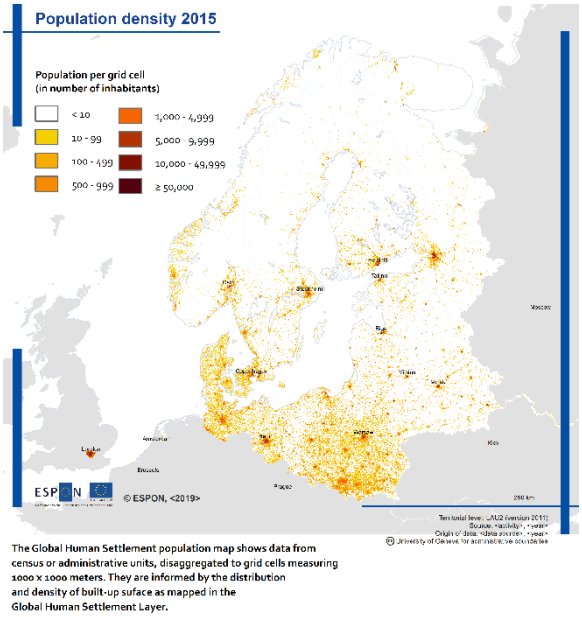
Following the first vision for the spatial development of the Baltic Sea Region (VASAB, 1994), 'pearls' account for the urban network of international importance. This chapter provides an overview of the urban hierarchy and networks, the urban-rural relationships and economy and quality of life in the Baltic Sea Region.

People and their settlements

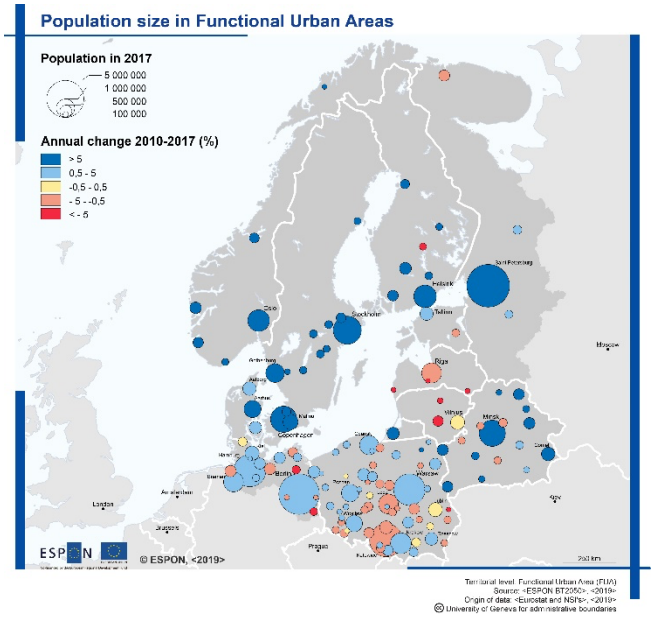
The Baltic Sea Region is home to 106 million people, which corresponded to 24% of the EU27 population in 2020. As can be seen in Map 1, the distribution across the territory is however quite uneven, with more than half of the population (55%) living in the more densely populated Southern part of the region (Denmark, Northern Germany and Poland). Denmark, Northern Germany and Poland are the only three countries with a population density above the EU average and are more than twice as densely populated as the rest of the Baltic Sea Region.

Population density goes hand in hand with urbanisation and a denser network of cities. As can be seen in Map 2, the network of Functional Urban Areas (FUAs) is denser in the southern part of the region. The FUAs were defined by OECD and Eurostat and comprises the urban centre of a city as well as the surrounding commuting zone and is a unit that is meant to capture the labour market area of a city (OECD, 2013)[11]. In 2017 the Baltic Sea Region had 135 FUAs with more than 58,000 inhabitants. These 135 FUAs stand for 63% of the total population in the region.

[11] The FUAs definitions of the FUAs are based on three steps, 1. identification of a local administrative unit (LAU where the majortiy leave in an urban centre of at least 50 000 inhabitants, 2. the commuting zone consists of the surrounging areas (LAU units) where at least 15% of the population travel to the city for work. 3. A FUA consists of the city and the commuting zone. LAU data have been used to fill data gaps in the Eurostat data. For Russa and Belarus the Rayon level has been used to demarcate approximate FUAs.



Map 1: Population density in the Baltic Sea Region
Source: ESPON, 2020a



Map 2: Population size of the Baltic Sea Region' FUAs
Source: ESPON, 2020a

OECD (2013) has classified the FUAs into four categories: Small FUAs with population between 50,000 and 100,000; medium-sized FUAs with population between 100,000 and 250,000; metropolitan FUAs with population between 250,000 and 1.5 million; and Large metropolitan FUAs with a population above 1,5 million. According to this classification, there are eight large metropolitan FUAs in the Baltic Sea Region. Here, St. Petersburg and Berlin stand out with populations of 5.2 million inhabitants, respectively. The other large metropolitan areas are (in order of size) Hamburg, Warsaw, Katowice, Stockholm, Copenhagen and Minsk. The capital cities are hubs for finance, universities and information, as well as gateways to international networks. Hamburg is an important city within its regional context, and the functional area of Katowice comprises a number of urban areas.

There are in total 54 Metropolitan FUAs with a population between 250,000 and 1.5 million in the Baltic Sea Region. In this category, fits the other capital cities, i.e., Helsinki, Oslo, Riga, Vilnius and Tallinn, as well as other regional centres, such as Kraków and Gdansk in Poland, Gothenburg and Malmö in Sweden, Aarhus and Aalborg in Denmark, Bremen and Kiel in Germany, Gomel in Belarus, Bergen in Norway, Kaliningrad in Russia, Tampere in Finland and Kaunas in Lithuania.

Population size numbers and importance do not always match as the importance of a FUA, city or town also depends on its wider territorial context (VASAB, 2016). In particular in the more rural or sparsely populated areas there are also small and medium-sized towns[12] which have less inhabitants than small FUAs (i.e. less than 50,000). This is especially the

[12] Note, what is usually defined as small and medium-sized cities in the Baltic Sea Region are towns with populations below 50,000 inhabitants. This is a different definition to the Functional urban areas as defined by Eurostat

case in the countries with only a few FUAs, such as the Baltic states and the Nordic countries except Denmark.

The urban structure and urban hierarchy vary between the countries. As Figure 5 shows, the concentration of the population to the capital/main city is very high in Western Russia, Latvia and Estonia. In these countries, the capital has a very important role in the country/region. On the other side of the spectra stands Poland, where the capital Warsaw is home for 8.3% of the total population. The urban structure in Poland is characterised by polycentricity, with as many as 59 FUAs, including two large metropolitan and 19 metropolitan FUAs. In total, almost half of all the FUAs in the Baltic Sea Region (43.7%) can be found in Poland.

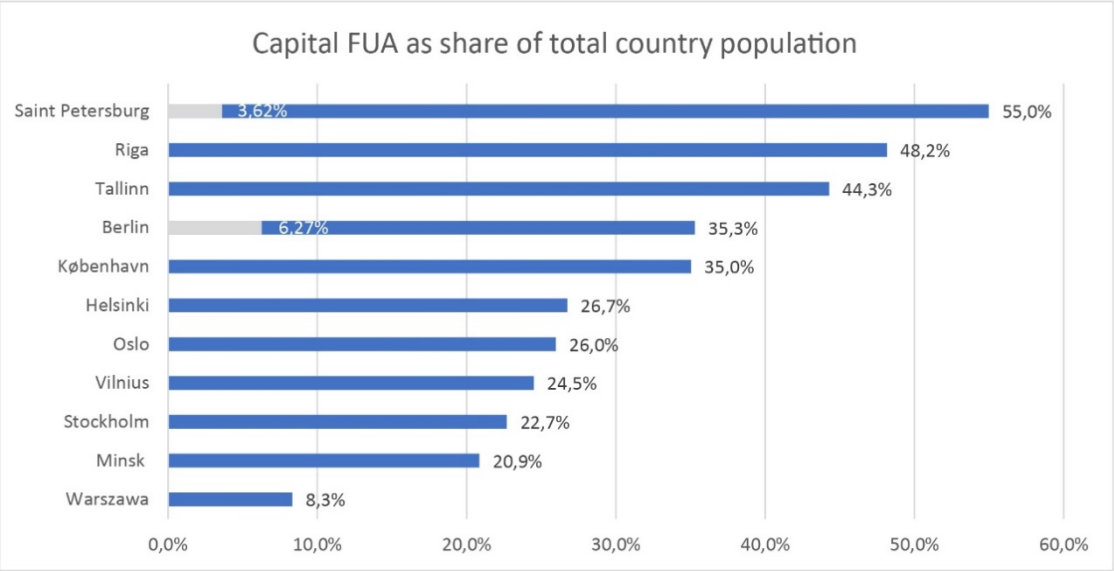


Figure 5: Capital FUA as a share of the total country population in 2017
Data source: Eurostat & NSIs. Note: The blue bar for Saint Petersburg and Berlin shows the share of the FUAs the part of the respective country that belongs to the Baltic Sea Region while the grey bar shows the share for the whole countries.

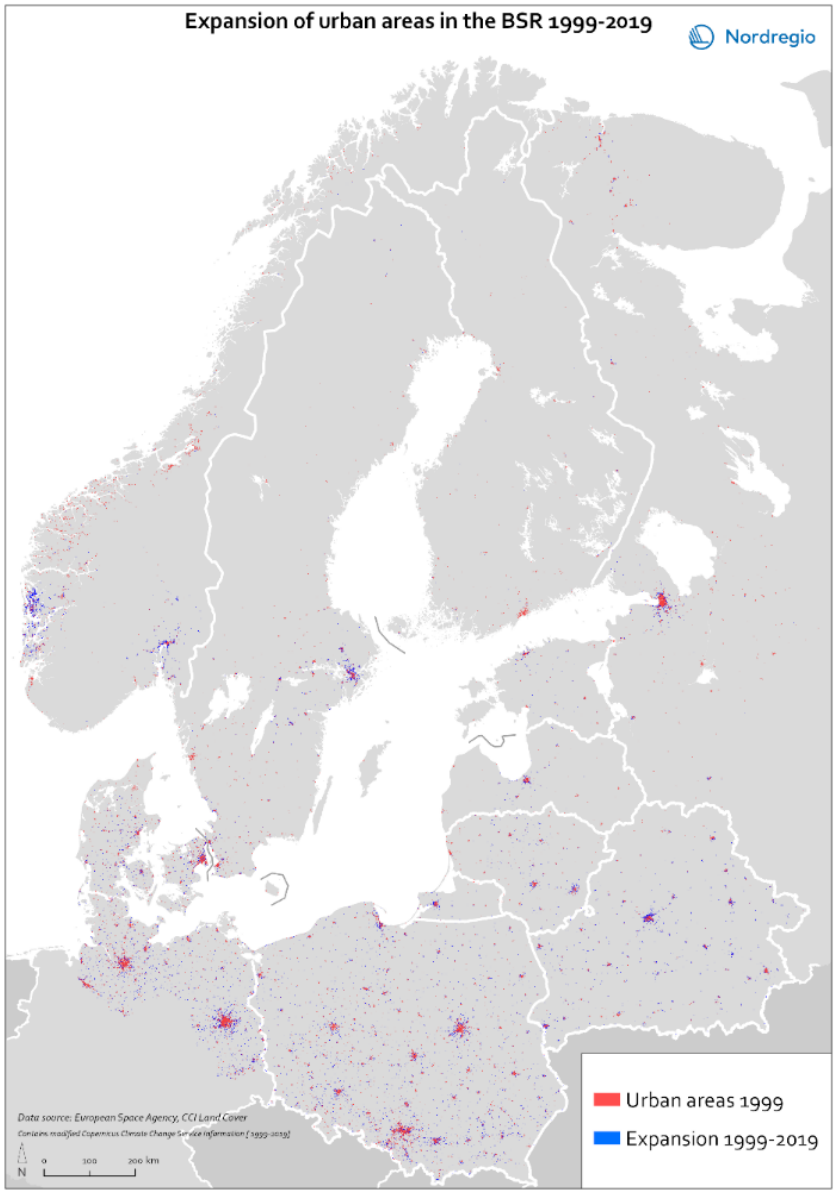
Although most of the population can be found in the southern part of the Baltic Sea Region, as Map 1 shows, most of the FUAs in the Northern part experienced growth of more than 5% between 2010 and 2017 (ESPON, 2020a). Other FUAs with strong population growth include most of the cities in Belarus as well as St Petersburg and Kaliningrad in Russia. Several FUAs in Poland and Germany, such as Warsaw, Berlin, Hamburg and Rostock, also saw moderate growth during this time period. Conversely, cities in Eastern Germany and former industrial centres in Poland are declining as well as most cities in the Baltic states. In the Nordic FUAs, this growth is, in most cases, both an effect of immigration and natural growth.

Small and medium-sized cities play an important role in creating spatial and social cohesion. SMS cities are often regional centres in more peripheral regions and can therefore have a balancing effect on spatial development (Lang et al., 2005). Also smaller towns with population of less than 50,000 inhabitants can have an important role to play within a region.

Towns with population between 5,000 and 50,000 are often referred to as small and medium sized cities, although definitions vary (Wagner and Growe, 2021). The importance of a small and medium-sized city is not only dependent on population size but also on its position in the urban hierarchy and its relation to other cities and the surrounding rural areas. (ibid.). ESPON SMESTO (ESPON, 2006) developed a classification of small and medium-sized cities based on their spatial position (if the town was part of an agglomeration, a network or was isolated), the socio-economic performance (if it was dynamic/growing, declining or restructuring) and the relationship between urban nodes and administrative units. It is worth noting that small and medium-sized cities that are part of an agglomeration might be defined as a single FUA. This is for example the case with the FUAs of Katowice and Krakow in Poland that contains several towns. There are several examples of isolated towns in the Baltic Sea Region and many of them play an important role for the surrounding region. In sparsely populated areas the small and medium-sized cities can play a role in diversifying the economic base and ensuring that services are kept in the region (Smas, 2018). In the Nordic region many of the isolated small and medium-sized cities have seen a population decline during the past decade while more connected small and medium-sized cities have seen a population growth (ibid.). Examples of isolated small and medium-sized cities with a regional importance can be the mining town Kiruna in northern Sweden, coastal cities in Norway and towns in the sparsely populated areas of the Baltic states and Russia. In the more densely populated countries, the small and medium-sized cities are rather part of agglomerations or networks of cities. Smart shrinking can be a solution for shrinking urban and rural areas, losing population and economic activity. By re-using and re-developing non-residential areas and providing alternative ways to their use can result in an increase of the quality of life and wellbeing for their citizens. Estonia, for example, is one of the countries in the Baltic Sea Region heavily challenged by shrinkage and depopulation. A recent study suggests, among others, smart shrinking approaches, such as reducing land consumption and promoting densification of central areas, increase quality of services through municipal cooperation, implementing demolition and renovation projects, as well as supporting municipalities with information systems and administrative support (OECD, 2022).

Another way of approaching urban growth is by looking at land use. Map 3 illustrates the distribution of areas classified as urban in 1999 and areas which became urbanised between 1999 and 2019 (see also Map 14 and Map 15. As shown in Map 3, the built-up areas increased by 57.5% between 1999 and 2019. This is likely reflective of the trends of rural depopulation and population growth in FUAs over this time period. Even though this growth seems quite significant, it corresponds only to 1% of the overall land cover in the Baltic Sea Region. There is a noticeable divide in the spatial extent of urban areas between countries in the north and south of the region. Northern countries such as Sweden, Norway, and Finland are more sparsely populated and contain a lower proportion of urban land. A north-south regional divide can also be seen within these countries - southern regions such as Skåne and Stockholm in Sweden, Oslo and Vestland in Norway and Uusimaa in Finland contain larger urban areas than their northern counterparts and saw a greater degree of spatial expansion

of these areas in the 1999-2019 period. The southern Baltic Sea Region is more densely populated, contains a larger proportion of urban areas, and saw a greater degree of urban expansion. This is particularly noticeable in Poland, Germany and Denmark.



Map 3: Expansion of urban areas in the Baltic Sea Region 1999-2019
Source: Nordregio (Map by Michael Oakden)

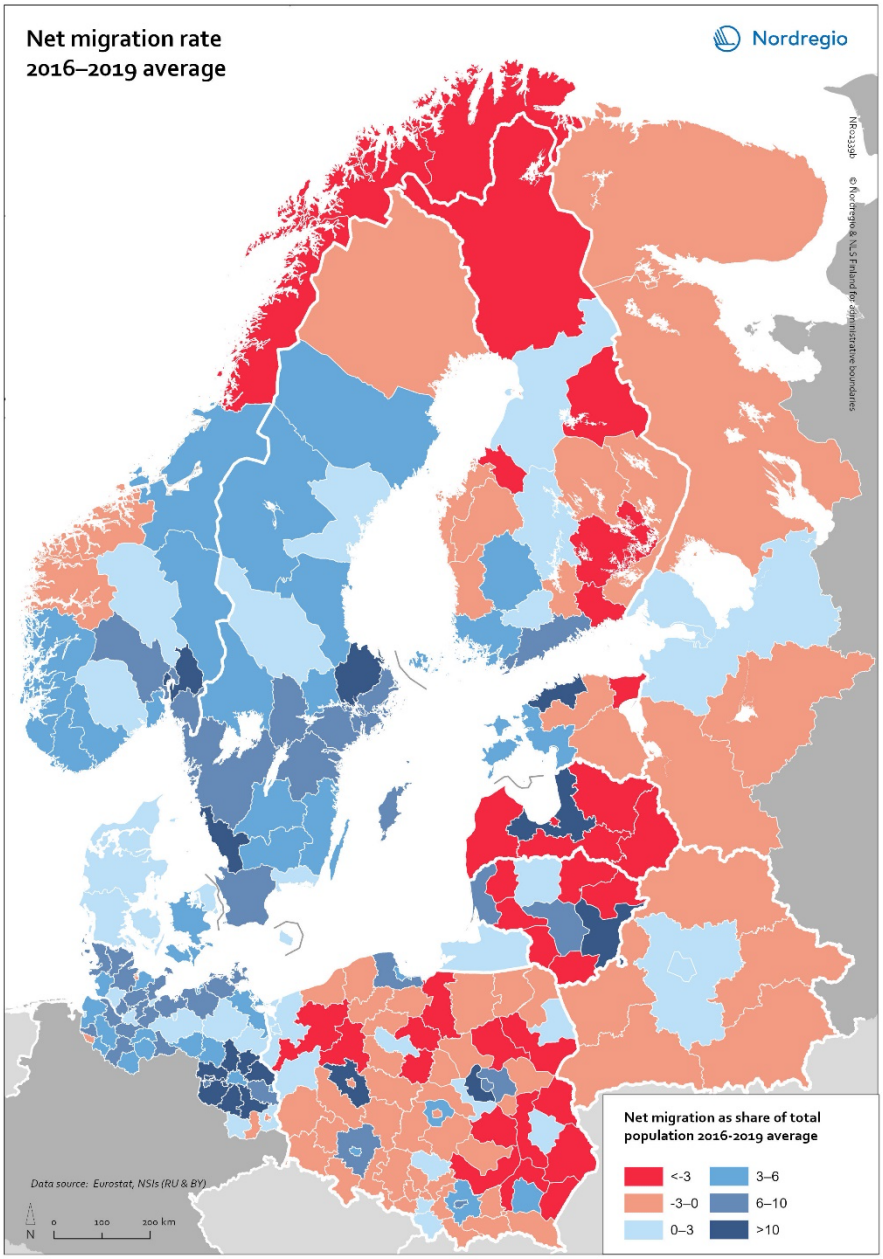
Overall, the urban areas in the Baltic Sea Region are growing while the rural areas are being depopulated. However, as seen in Map 2, there are also medium-sized FUAs that have shrunk in population, especially in the Eastern and some Southern parts of the region. This makes the linkages between urban and rural more important. Urban and rural areas are interlinked in multiple ways (e.g. common labour markets and common provision of services within functional areas or in terms of trade, ecosystem services and tourism in geographical larger interdependencies) and also face common challenges (e.g. demographic development, urban sprawl, migration and climate change). The **urban-rural interlinkages** vary across the

Baltic Sea Region. In the Southern part, the distance between cities and their hinterlands is much smaller in comparison to the Northern part, where the territory is quite specific, with large areas being sparsely populated. From a geographical point of view, the southern part has better conditions for tightening the exchanges between urban and rural areas with stronger connections due to the shorter distances. Nevertheless, in sparsely populated regions the pearls are even more important as they provide essential services and connections to their hinterlands.

Regardless the size of urban-rural hinterlands, the rapid development of bioeconomy in the Baltic Sea Region pledges to add and maintain value within the local rural economy. Exploring new ways of producing and consuming biological resources, the bioeconomy offers prospects for new development of rural areas with new the creation of jobs and business and opportunities to grow primary industries. Several projects promoting bioeconomy have been implemented in the Baltic Sea Region (Nordic Council of Ministers, n.d.).

Still, urbanisation is one of the longest lasting megatrends and the trend of migration from rural to urban areas is enduring, both between and within regions[13]. Two other persistent trends are the outmigration from the eastern parts of the Baltic Sea Region and the immigration to the western part. Map 4 shows the average net migration rate between 2016 and 2019. Migration in the Baltic Sea Region is diverse and the result of complex interplays of social and economic factors which differs from country to country. The map shows that most regions in the eastern part of the Baltic Sea Region had outmigration during this time. The exception being the bigger cities. This is also a sign of a “brain drain” since it is mainly the younger people that migrate. At the same time almost all regions in Sweden, Northern Germany and Norway had immigration during this period. The time frame displayed on the map was just after the inflow of refugees coming in 2015/2016 with the lower numbers of refugees noticeable in Denmark and Finland.

[13] During the COVID-19 pandemic some new trends can be seen. In the Nordic Region there was a domestic out migration from the bigger cities in 2020. The municipalities with the highest in migration were in the outskirts of the major functional urban areas and attractive tourist areas, such as Åre in Sweden. Nevertheless, the pandemic effects to territorial development in the Baltic Sea Region are beyond the scope of this project.

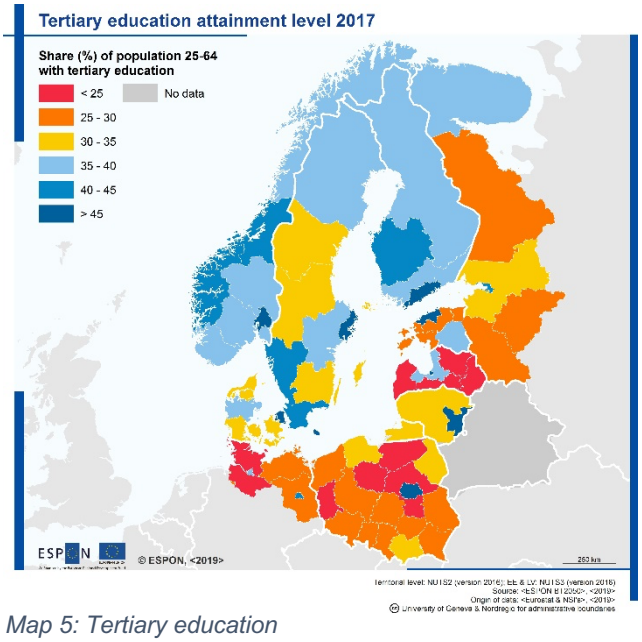


Map 4: Net migration rate 2016-2019
Source: Nordregio (Map by Gustaf Norlén)

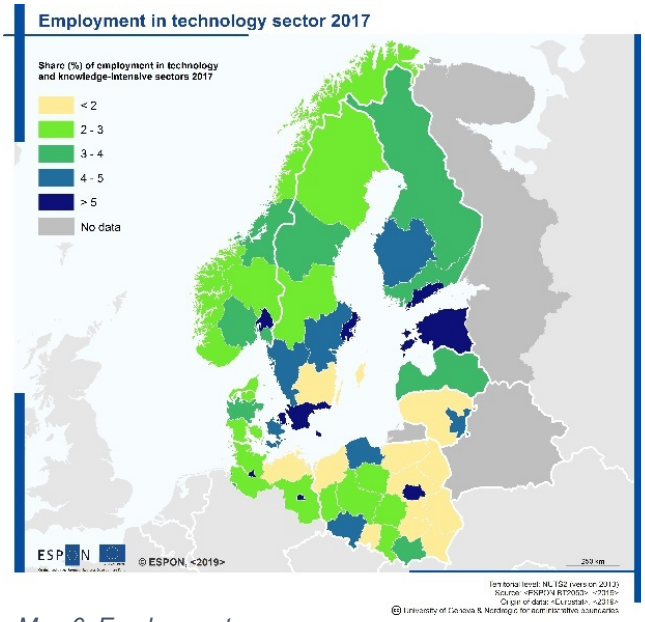
Economy and quality of life

The reason behind the delimitation of the Functional urban areas is to identify the labour markets of a city, indicating where the labour supply of a particular labour market can be found. A well-functioning and productive labour market is characterised by a match between job demand and a skilled labour supply. Map 5 shows the share of the population aged 25-64 years who had tertiary education attainment in 2017. The share of people with tertiary education is highest in the bigger FUAs, where there is a high demand for skilled workers and where tertiary education is usually taking place. The NUTS2 regions with the highest share of people with tertiary education attainment are Warsaw (56.7%), Oslo and Akershus (54.3%), Vilnius in Lithuania (53.3%), Helsinki-Uusimaa (51.4%), Stockholm (51%)

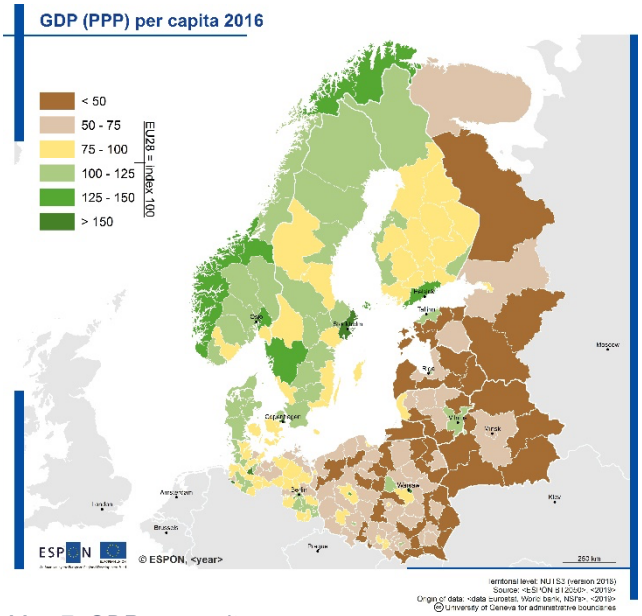
and Hovedstaden in Denmark (50.2%). The regional differences between the regions with the highest and lowest education attainment are highest in Poland, where there is a 34 percentage point difference between the city of Warsaw and the surrounding region (Mazowiecki regionalny).



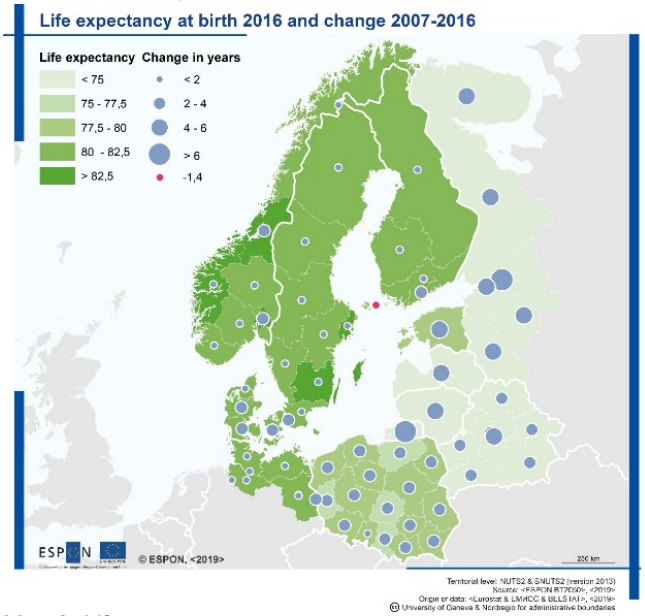
Map 5: Tertiary education
Source: ESPON, 2020a



Map 6: Employment
Source: ESPON, 2020a



Map 7: GDP per capita
Source: ESPON, 2020a



Map 8: Life expectancy
Source: ESPON, 2020a

Regarding the number of people working in technology and knowledge-intensive branches, the average of the entire Baltic Sea Region is slightly lower (3.6%) than the EU average (4%) (see Map 6). Still, there is fast growth in this sector, with an increase of approximately 200,000 people between 2007 and 2017. This corresponds to a 14% increase which is a significantly higher increase than the 4% increase in the total number of jobs in the region. During this period, Estonia had the highest growth in the number of jobs. Together

with Finland, Estonia also had the highest share of employment in the knowledge-intensive sector with 5.5%. Other regions with a high share of jobs in this sector include the capital regions of Warsaw, Copenhagen, Stockholm, Oslo and Berlin. The capitals of the Nordic Countries have more than 45% of the employment in the technology and knowledge sector. (ESPON, 2020a)

Map 7 shows the GDP per capita, adjusted for the power purchase parity (PPP). The average GDP per capita in PPP of the Baltic Sea Region was lower than the EU28 average in 2016 (86% of the EU average). While on a country level, the east-west disparity prevails, the gap has been narrowing during the last decade. Sweden, Denmark, Germany (Baltic Sea Region), Norway and Finland had GDP per capita above the EU28 average, while the other countries have an average below. The GDP per capita is higher in the large metropolitan and metropolitan FUAs. This correlates with a high skilled labour supply and more jobs in high-income sectors.

The human development index, as developed by the United Nations Development Programme (UNDP), was developed to broaden the view of development and to incorporate a quality-of-life aspect. The index consists of three indicators: GDP per capita, education and life expectancy. The last indicator is meant to cover the aspect of health and the possibility of long and healthy life (UNDP, 2020). The life expectancy has been low in the eastern part of the Baltic Sea Region, but as Map 8 shows, it has been increasing fast between 2007 and 2016. In Estonia and Poland, the life expectancy has almost reached the levels of the western part of the region, while Russia, Belarus, Latvia and Lithuania still have a lower life expectancy, especially for males.

Another aspect of quality of life is income inequalities within a country. Studies have shown that income inequality has been associated with negative health, wellbeing as well as loss of trust in institution (Grunfelder, Norlén, Randall, & Gassen, 2020; Lundgren, Randall, & Norlén, 2020, p. 38). Figure 6 shows the spread of income within a country through the Gini coefficient. The Gini coefficient ranges between 0 and 1, where 0 stands for perfect equality and 1 perfect inequality. While the income differences have increased in the Nordic countries during the last decades, they are still low compared to most countries. The highest income inequalities in the Baltic Sea Region can be found in Lithuania and Latvia followed by Estonia and Russia.

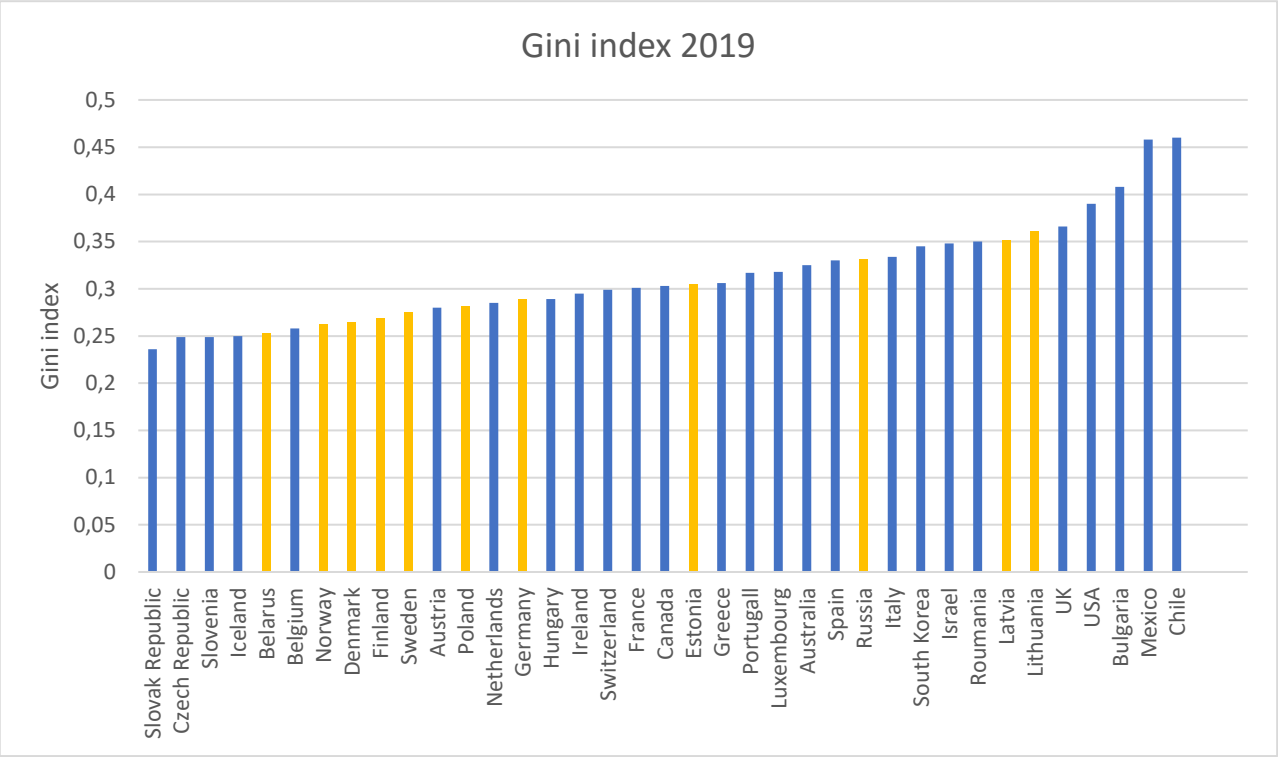


Figure 6: Gini index in 2019 or latest available year.
Data source: OECD & World Bank (Belarus).

4.2 PEARLS TOWARDS TOMORROW

The following sections give a short presentation of possible future developments for pearls and relevant trends that may influence them.

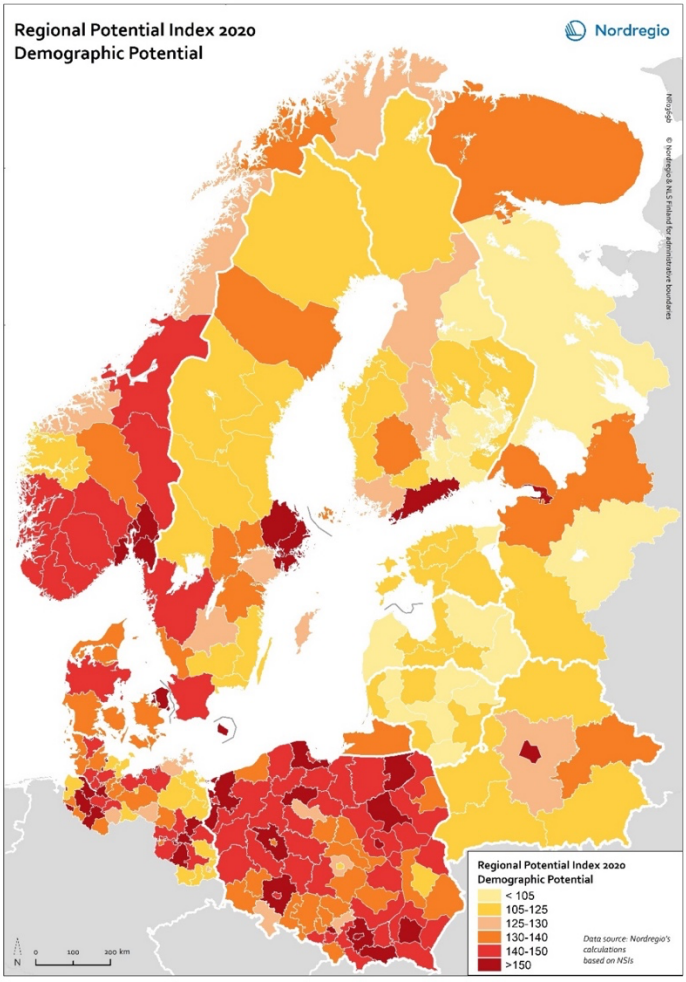
4.2.1 POTENTIAL OF THE REGION: PEARLS

Looking towards the future development of the Baltic Sea Region, one way to discuss the potential of the region is by looking at the Regional Potential Index (RPI) as developed by Nordregio (Grunfelder, Rispling, & Norlén, 2016). The idea behind the RPI is to assess the future development potential of a region. It is based on a series of indicators on demography, labour market and economic performance. The index highlights several potentials of each region, which, if capitalised upon, could contribute to positive development. As such, it can make it possible to identify regions with high potential for future development as well as identifying regions where further support and policy measures are required to strengthen their potential and meet existing challenges [14] (Grunfelder et al., 2016, 2020; Rispling and

[14] We have here chosen to consistently show the NUTS3 regions in the map, it should however be noted that the size of the regions vary and that this will affect the outcome of the index. The NUTS3 region of Oslo is for example significantly smaller than the NUTS3 region of Stockholm affecting the overall ranking. Another way of displaying the index could be to look at it with consideration of which is the administrative level that respond to the challenges that the index highlights. The NUTS3 level in Denmark is for example only a statistical unit.

Grunfelder, 2016). The index was developed for the Nordic regions, but has also been applied on the Baltic Sea Region previously (Rispling and Grunfelder, 2016).

Due to data limitations, we here focus on the demographic part of the index, which consists of four indicators: population density, dependency ratio, gender ratio and net migration. The rationale behind selecting these indicators is that a **densely populated region** offers relatively good access to jobs (especially in the tertiary sector), health care, culture, environmentally friendly transport and other services, thanks to a critical mass of population. **In-migration** highlights the attractiveness of a region as a place to live and work. It contributes to an increase in the workforce, taxes and social contributions. The **demographic dependency ratio** highlights the economic burden on the working population in supporting members of the population who are not working (young people and pensioners). Finally, regarding the **gender ratio** (number of females per 100 males), in a balanced situation, the region offers education and workplaces for both genders. An unbalanced situation often results from out-migration for education or work, which contributes to an intensification of demographic shrinkage (Grunfelder et al., 2020).



Map 9: Demographic potential index
Source: Nordregio (Map by Gustaf Norlén)

As Map 9 shows, the metropolitan FUAs, in general, have a higher demographic potential. The NUTS3 region of Berlin gets the highest point in the index, followed by Oslo, Minsk and Hamburg. Only the smaller German FUAs of Flensburg, Kiel, Bremen and Neumünster break the pattern. Their score can partly be explained by the small geographical area of the NUTS3 unit. The demographic potential is lower in the Baltic states and the more sparsely populated areas of the Nordic Region and Russia.

The pearls and the pandemics

The recently published report 'Cities and Pandemics: Towards a More Just, Green and Healthy Future' (UN Habitat, 2021) pinpoints the need for reconfiguring regions for more sustainable and integrated systems and also highlights the role of small and medium-sized cities in remote working arrangements. Text box 1 summarises the potentials and challenges Baltic Sea Region cities and regions may face addressing these recommendations.

Text box 1 Dealing with pandemic: the role of Baltic Sea Region cities and regions

- The role of Functional Urban Areas becomes even more important to minimise the impacts of pandemics. The FUAs of the macro-region should become more sustainable and productive in the long term. Strengthening City Regions Food Systems with short food supply chains is one of the means to become more resilient and also complying with important EU strategies (European Commission, 2020c).
- The pandemics can be seen as an opportunity for improving the territorial cohesion of Baltic Sea Region as smaller and medium-sized cities can attract new inhabitants if they offer good services to remote workers (e.g. broadband, healthcare).

4.2.2 TRENDS INFLUENCING PEARLS TOWARDS 2040

Several trends of different thematic categories may influence the development of the pearls. Trends are interlinked to each other, driving or hampering the development of pearls. The list of possible relevant trends can be endless. This section aims at giving some first insights on key trends that may relevant in the context of pearls and in the framework of the vision process. The trends will help in discussing the future vision through a more informed background.

Trends can be overarching mega-trends such as demographic changes and ageing, digitalisation and new behavioural changes, or more concrete trends, related to the mega-trends, such as industry 4.0, big data, robotics, artificial intelligence, the green transition and green economy, increase of blue growth, circular and sharing economy, affordable housing, new lifestyles, more direct democratic power to the city, the mission economy and others. Some indicative examples are given in the box below.

Relevant demographic trends. Demographic change and particularly ageing is a mega-trend relevant for metropolitan areas. Population in the Baltic Sea Region is expected to decline slightly more than 3% in the next three decades with urban regions together losing

about 2% of their total population (ESPON, 2019a). Overall, by 2050 the population in rural areas declines much more than in urban areas, with the exception of Norway and Denmark (ESPON, 2019a). It is expected that the population of all rural areas together will decline by about 5% (ESPON, 2019a), with some being more drastically affected than others.

When it comes to ageing, the share of elderly will be increasing in all areas. The European demographic future is greying, with projections of people aged 80 years and over rising up to 60.8 million in EU-27 by 2100[15]. The differences in ageing are not only to be seen between Member States but also between urban centres and areas outside them. Several large cities, as for instance Berlin and Warsaw, are characterised by a higher increase in the share of elderly in the outskirts of the city, compared to the centre. (JRC, 2021) The share of elderly in cities is expected to increase from 15% to 27% (JRC, 2021). Ageing is visible also in small and medium-sized towns, with the share of elderly increasing from 17% to 29% in towns. The ageing trend is also relevant for the rural areas. Studies have shown that the average share of elderly in rural areas is 2% greater than in towns and 3% greater than in cities (JRC, 2021). In particular, maximum values of share of elderly are seen in rural areas, where the share would increase from 19% in 2011 to 30% in 2050. For some Member States like Germany and Denmark, the gap between rural areas and cities would increase, unlike other Member States where the trend may reverse, i.e. cities having higher share of elderly compared to rural areas.

Migration is an important trend in relation to population decline and ageing. Migration inflow which prevents a stronger decline in the Baltic Sea Region and the urban rural in particular. Nevertheless, migration remains an urban matter due to their economic performance urban areas are more attractive (ESPON, 2019a). Further trends that may influence migration are climate change and climate refugees, i.e. refugees who move to other countries due to climate change affecting their current residence, the economic development and better future economic prospects, as well as digitalisation which can be a game changer in the future in altering migration journeys (European Political Strategy Centre, 2017).

Relevant digitalisation trends. Technological trends and particularly digitalisation is another relevant trend for pearls. Although digitalisation is a means to cover gaps between urban and rural areas, digital divides will be challenging. Digitalisation will affect cities, medium-sized towns and rural areas in the Baltic Sea Region, with the Nordics and Estonia having higher possibilities to enjoy its benefits, while digitalisation may have a larger effect on labour markets in cities, increasing polarisation of urban areas in the region. (ESPON, 2019a) Related trends to digitalisation relevant for pearls is industry 4.0 or the 4th industrial revolution, i.e. the fusion of technologies and blurring lines between physical, digital and biological systems, with firms and industry being digitalised by 2030 raising the issue of new business models (ESPON, 2019c).

[15] https://ec.europa.eu/eurostat/statistics-explained/index.php?title=People_in_the_EU_-_population_projections&oldid=497115#Population_projections

Relevant green transition trends. Urban areas are responsible for CO_2 emissions and also largely affected by the effects of climate change. In addition, the expected population growth in urban areas may result in increasing GHG emissions and changes in the urban micro-climate (JRC, 2019). Trends such as sea levels rise, increased temperatures are relevant. In addition, trends around a green transition and more sustainable development may be relevant, in relation to green cities, discussions around private companies exploring more environmental friendly solutions, innovating to zero (i.e. with the lease CO_2 emissions possible), the use of more environmental friendly and low-carbon technologies, smart energy efficient buildings. People-related trends as high consumerism practices, but also practices such as circular and economy.

All these trends have an influence on the social aspect or develop new social trends, such as trends of changing mindset building on the ideas of the New European Bauhaus, the mission economy towards overarching goals and new urban lifestyles. The trends may also result in the rise of the importance of cities by becoming 'diplomacities'.

Text box 2 Indicative examples of further relevant trends for the future development of the pearls

Mission economy. Mission economy calls for the alliance of all efforts towards an overarching goal. Infusing the interest of people and the public good in capitalism and the power of the market gives a new approach to address key challenges. Governments together with the people define those grand challenge and in dialogue design grand missions (inspired by the grand Apollo mission). Such missions need to be inspirational and dynamic to shake the waters and make a change. (Mazzucato, 2021)

Rise of 'diplomacity'. With their size and importance growing, cities gain gradually more and more power and jurisdictions. Cities may be bypassing national governments and become more and more independent when it comes trade agreements or issues of their interest. In particular also networks of cities become powerful at even global level discussion and taking actions on important topics. (Krznaric, 2020)

New urban lifestyles. Future lifestyles will be largely shaped by the millennials (born between 1980-mid 1990s) characteristics. Millennials are digital natives, use largely social networks, with many facing youth unemployment due to for instance economic crises. New urban lifestyles are also characterised by a 'millennial socialism' which aim to fight inequalities and injustices (Leaders, 2019). Sharing platforms and a mindset shift from a linear economic model to a more recycle, reuse, reduce consumption model is also a characteristic of this and the next generations forming new urban lifestyles and shaping the profiles of cities and towns. A seed tendency in that respect, mainly due to the pandemic effects, observes a move to less urban areas, creating stronger urban-rural links, in cases where infrastructure and lifestyle supports this.

4.3 STRINGS OF TODAY

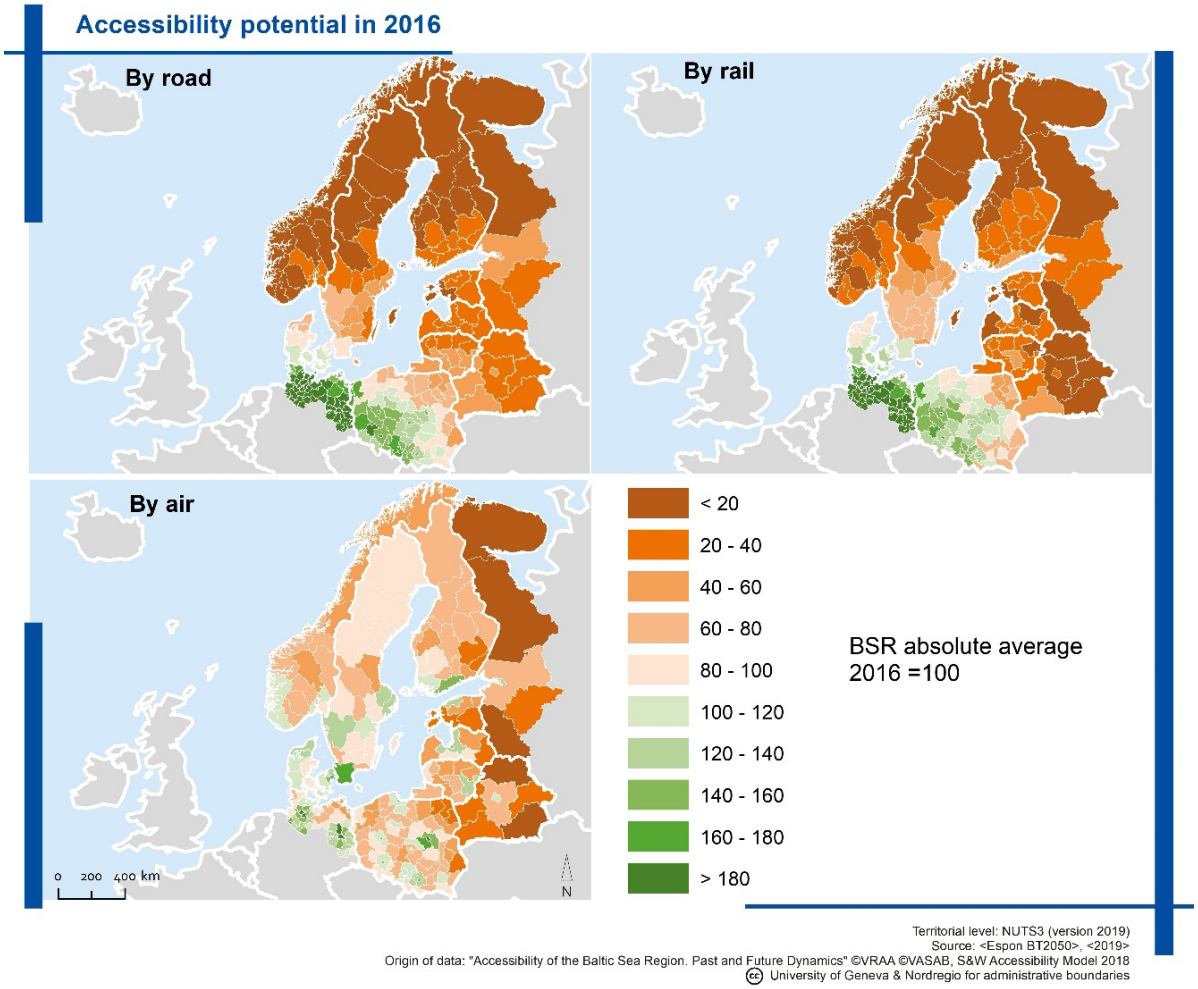
Strings account for the internal and external connectivity of the Baltic Sea Region. This chapter provides an overview of territorial and digital connectivity.

Territorial and digital connectivity in the Baltic Sea Region

The urban areas are not islands but linked to each other, and to their hinterland, through physical and digital connections. Traditionally the main linkage between the countries in terms of transport was through the Baltic Sea (e.g. in Hansa times). While the Baltic Sea is still important, not least for the transportation of goods, it also functions as a barrier. The main modes of transportation today are instead road, rail and air. The goal of any transport system is to produce good accessibility and facilitate the mobility of people and goods. Hence it contributes to the social, cultural and economic exchange between cities and regions. (ESPON, 2007)

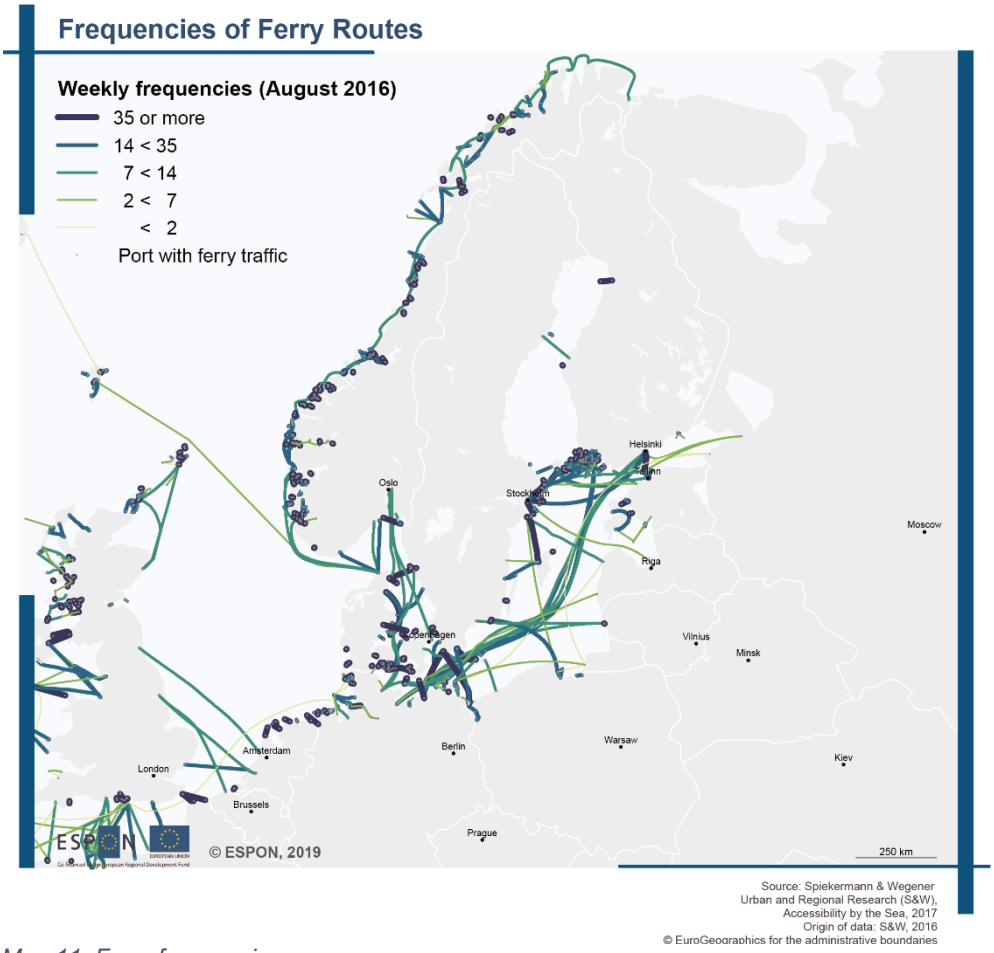
The accessibility of a region is determined by the geographical position and specificities as well as the density and quality of road, rail, airport, shipping and port infrastructure. Map 10 shows the accessibility potential by mode of transport in 2016, where the Baltic Sea Region average is set to 100. As the map shows, and not so surprisingly, the accessibility by road and rail is higher in the southern and more densely populated southern part of the region. This part of the region is well connected to the central and more densely populated parts of Europe. The accessibility by road gets lower in the northern and eastern parts of the region, where the population density, as well as the urban networks, are weaker. The accessibility by rail is particularly low in the eastern part of the region, where the rail infrastructure is weak. Investments in railroads in projects such as the Rail Baltica, Fehrman-Belt tunnel and high-speed trains are likely to improve the connectivity in the coming years and help to steer transportation towards more environmentally friendly modes of transportations.

The accessibility by air shows a different pattern where the bigger FUAs are connected to each other as well as to the rest of Europe and the world. Since the air traffic is not restricted by physical geography, all the Norwegian regions have comparably high accessibility. The accessibility potential by air is mainly lower in the eastern part of the region, where the distance to international airports is greater.



Map 10: Accessibility potential by road, rail and air 2016
Source:

As the sea plays a key role in the development of the Baltic Sea Region, sea connectivity and shipping routes are important to highlight. As Map 11 shows the main shipping routes in the Baltic Sea Region. Sea traffic includes ferries, cargo ships and cruise ships. During the last two decades the ferry traffic has been declining while the cruise ship sector has increased. The cargo ship stands for a big share of the sea traffic in the Baltic Sea Region and as much as 15% of the world's cargo traffic is handled in the Baltic Sea (Baltic LINes, 2016). The shipping lanes follow some main corridors, and the traffic is most intense in the southern part of the Baltic Sea. The most frequent ferry routes are between ports in Sweden and Finland, Finland and Estonia, Denmark and Sweden and Denmark and Northern Germany. In Russia, Saint Petersburg serves as the main port (ESPON, 2019b).



Map 11: Ferry frequencies
Source: VASAB, 2018

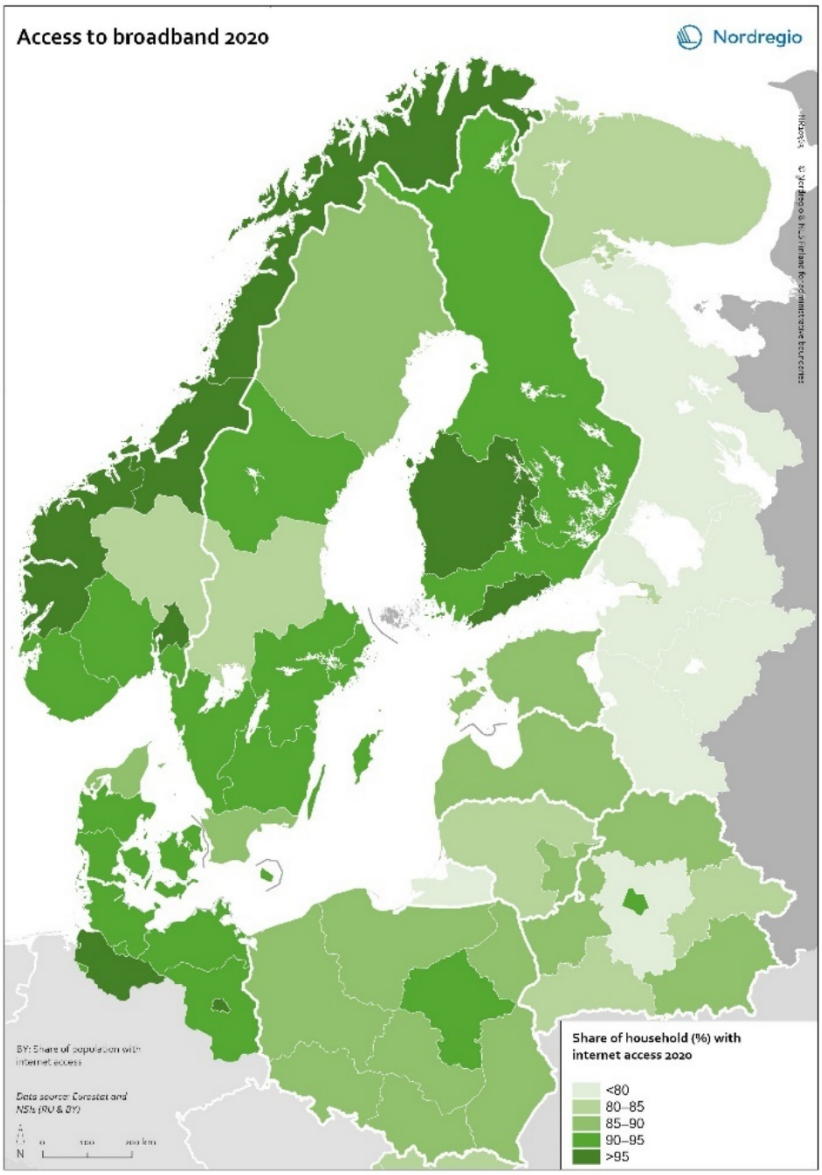
As the COVID-19 pandemic has shown, the digital infrastructure is more and more becoming as important as the physical infrastructure. With an increasing number of jobs in the knowledge and technology sectors as well as increased requirements of possibilities for distance work, broadband connectivity and internet accessibility are more important than ever. A good internet connection facilitates distance work and an opportunity to reach a bigger market for products and services.

According to Eurostat data, the infrastructure for broadband has increased substantially during the last couple of years. In all countries, excepting parts of Russia and Belarus, more than 80% of the households have broadband access (see Map 12). In Norway, as much as 96% of the households had access to broadband, followed by Finland and Germany with 95%. The biggest increase during the last five years have taken place in Poland (increase with 14 percentage points) and Latvia (increase with 13 percentage points). On a regional level, the connection tends to be better in urban areas but lower in rural areas such as Innlandet (82%) in Norway and North Middle Sweden (84%). The access to the internet at home partly correlates with population density, but Norway stands out with a low share of households that didn't have internet at home, while Poland had a higher share compared to their population density.

Digitalisation is important not only for the urban areas but as an instrument for regional growth in rural areas. Here it can be a tool for overcoming geographical isolation and create stronger links with urban hubs and international markets. As more education and work can be done from home, it can be a means of preventing out-migration (Löfving et al., 2021). The COVID-19 pandemic led to a big shift towards working from home and using digital tools for meetings. This has reduced the need for transportation at the same time as it has highlighted the importance of good internet connections. The trend of remote working and increased use of digital meetings is expected to continue also after the pandemic is over.

Initiatives such as the Digital North 2.0[16] aim at speeding up the digitalisation in the Baltic Sea Region so that it can become a frontrunner and use data and technology to tackle societal challenges such as the green transition and pandemics. (NCM, 2020)

[16] https://www.norden.org/en/declaration/ministerial-declaration-digital-north-20



Map 12:Access to broadband 2020
Source: Nordregio (Map by Gustaf Norlén)

Another very important aspect of connectivity is the infrastructure for securing efficient energy flows in terms of electric grids, pipelines, and so forth. With the green transition, an efficient energy system with renewable electricity produced at a low cost; traded and spread through a connected electric grid, will become essential. This cooperation is partly taking place in the Baltic Energy Market Interconnection Plan. This initiative aims at achieving an open and integrated regional electricity and gas market between the EU countries in the Baltic Sea Region (European Commission, 2020a). The importance of improving the electric grid between the Baltic Sea Region countries, is highlighted by other ongoing and recently finished projects: the Baltic LINes[17] the Baltic InterGrid[18] both financed by Interreg Baltic Sea Region.

[17] Baltic LINes | VASAB
[18] Home - Baltic InteGrid (baltic-integrid.eu)

As Figure 7 shows there are not so many electronic cables over the sea connecting the easter and western part of the region.

In addition, offshore wind farms are linked to land and sea interactions issues. As they are mainly located along the coast, their infrastructure links to the land are an important issue. Given their rapidly evolving sector, locations in the sea and storage locations at harbours or onshore storage space becomes crucial. This, in combination with urban regeneration and transformation of urban areas and harbours to other uses, result in further planning challenges. Further challenges also emerge with regards to offshore wind energy putting pressure to other sea activities, such as threatening small-scale fishery, and by extension challenging local cultural heritage and tradition in the region. (PanBaltic Scope, 2019)

When it comes to energy, also the Nord Stream 2 project, a highly political and debated project, which aims to transport natural gas from Russia to the European Union through the Baltic Sea Region has been largely discussed.

Figure 7: Interconnected Network of Northern Europe
Source: ENTSO-E: European association for the cooperation of transmission system operators (TSOs) for electricity

4.4 STRINGS TOWARDS 2040

The following sections go towards the future of the strings, by presenting some future-oriented projects and trends that are relevant for the VASAB vision work.

4.4.1 TOWARDS THE FUTURE: STRINGS

Several visionaries, and possibly upcoming projects, pledge to transform the connections of the macro-region and impact the territorial development in different ways. Text boxes 3-8 briefly describe some of these projects.

Text box 3 Electric Regional Aviation in Kvarken Region

FAIR (Finding innovations to Accelerate the Implementation of electric Regional aviation) is a project financed by the Interreg Botnia-Atlantica programme (60%) with national and regional co-funding (NCM and municipal and private stakeholders). Lead by the Kvarken Council, this project brings together diverse actors from the Kvarken region (the counties of Ostrobothnia, South Ostrobothnia, and Central Ostrobothnia in Finland and the county of Västerbotten and municipality of Örnsköldsvik in Sweden) and aims to pave the way for the implementation of electric aviation in the Kvarken Region, improving east-west regional flight routes while complying with the goal for carbon-neutral transportation. Besides being climate-friendly, the implementation of electric aircraft lessens fuel and maintenance costs significantly, making air transport quite competitive. The flight range of 400 km would suit Kvarken Region enable fast commuting for recreation, cooperation, business, and online demand and will address challenges such as long distances and weak east-west connections, demographic change and urbanisation and also the global need to lessen GHG emissions and environmental impact.

Source: https://www.kvarken.org/en/project/fair

Text box 4 Hyperloop between Stockholm and Helsinki

KPMG and Ramboll have conducted a pre-feasibility study on the plans to link the Finnish and Swedish capitals with a low-air-pressure tube – a hyperloop. The Stockholm-Helsinki hyperloop is much faster and environmentally friendly than any commercial aircraft and promise to solve congestion problems in a sustainable way. Connecting both Nordic capitals in less than half an hour, this project pledges positive economic impacts as it would create a transnational mega-region. This would transform the labour markets and share of services between both countries substantially. The system can be built at 50 to 60% of the cost of high-speed rail between both cities. The tubes would be installed in trenches and along the seafloor of the Baltic, requiring minimal tunnelling contributing to lower costs.

Source: https://ramboll.com/ingenuity/helsinki-stockholm-in-30-minutes

Text box 5 Undersea rail tunnel between Helsinki and Tallinn

A Baltic metropolitan area may soon become a reality with the implementation of the undersea rail tunnel between Helsinki and Tallinn. In April 2021, Finland and Estonia formalised the intention of developing towards a 103 km rail tunnel that will connect the airports of both capitals. The project will also have a huge impact on the Baltic Sea Region as the tunnel, together with the Rail Baltica railway project and the Arctic railway line will connect the Arctic Region to Europe via Finland.

Source: https://emerging-europe.com/intelligence/tunnel-vision/

Text box 6 Nordic Battery Belt

The Kvarken region will become a hotspot for the battery industry and the development of battery cells. Several battery plants will be built in this transnational region with a big production capacity. Through a project funded by Interreg Botnia-Atlantica a strategy will be

developed for the a sustainable and cost-efficient cross-border logistics for this emerging industrial cluster.

Source: https://www.kvarken.org/nordic-battery-belt-logistics-partnership-gathers-in-skelleftea-for-kick-off/

Text box 7 The STRING network

The STRING network connects cities and regions in the Baltic Sea Region, sharing knowledge and implementing integrated policies as regards sustainable transport infrastructure, a hydrogen corridor and other links connecting places in the Baltic Sea Region.

Source: https://stringnetwork.org/initiatives/

Text box 8 The Baltic Pipe

The Baltic Pipe is a project under development, providing gas flows from the Norwegian gas system in the North Sea through Denmark and the Baltic Sea to Poland. It is comprised of five components, developing and expanding gas transmission systems throughout these countries and creating secure, affordable and sustainable energy.

Source: https://www.baltic-pipe.eu/

4.4.2 TRENDS RELATED TO STRINGS TOWARDS 2040

Several trends of different thematic categories may influence the development of the strings. Trends are interlinked to each other, driving or hampering the development of strings. The list of possible relevant trends can be endless. This section gives some first insights on key trends and directions that may be relevant in the context of strings and in the framework of the vision process. The trends will help in discussing the future vision through a more informed background.

Relevant mobility trends. Given the increasing focus of policies and discussions on carbon neutrality, strings regard sustainable physical and digital accessibility, as well as energy networks. Studies suggest that mobility in the future will be a combination of physical and digital presence (ESPAS, 2016). Trends around connectivity are largely characterised by a sustainability shift. This regards shifting to more environmental friendly forms of transport, the minimisation of unnecessary transport and uptake of new or alternative forms of connectivity. For instance, the use of hydrogen and fuels cells for cleaner transport, hyperloop transport connections, solar power planes, but also trends such as the return of night train connections in Europe as a counter means of air travels[19] which account for the highest GHG emissions, as well as green rail corridors may be relevant. Maritime transport is another

[19] https://edition.cnn.com/travel/article/night-trains-europe-sleeper-obb/index.html

alternative to air transport to substitute short distance air travels. A further trend is transport as a service where the traveller is put in focus.

Further trends that may influence mobility and are related to technological progress are self-driving vehicles, with drones and other autonomous vehicles operating logistics functions, the rise of electric cars, as well as the use of intelligent mobility with energy, transport and information systems closely linked (ESPAS, 2016).

Future mobility is also linked to society-related trends. Behavioural changes towards more sustainability resulted in trends such as flygskam, the 'flight shame' which is a push to travel less by plane. Trends like car-sharing as part of the sharing economy trend may also be relevant.

All these trends may have further implications to or influence society, by influencing the tourism sector due to reduced flights, benefit from less congestion and pollution, and faster connections.

Relevant digitalisation trends. When it comes to trends related to digitalisation and various trends may influence also different strings, different technological advancements and breakthroughs may be considered, as digital technologies evolve rapidly. Trends such as the Internet of Things, e.g. in relation to big data and data mining, 5G connections, cloud computing, big data, additive manufacturing (incl. e.g. 3D printers) playing an important role in industrial production and also the localisation of production with the potential to recycle and reuse material. In addition, trends around robotics, using nano-technology and artificial intelligence replacing humans in different services, while synthetic biology may revolutionise biomaterials. Furthermore, the digitalisation of services may change the industrial landscape, as e-services take more and more place, from e-governance to e-health. Cyber-attacks and threats through malware, phishing etc. are further relevant trends. All these technological advancements may also have an influence on social relations, influencing people's relations (ESPAS, 2016), replacing human physical interaction and activities with the digital world, changing labour market and employment and industrial profiles.

Relevant energy related trends. The need for energy will be growing, with the expected energy consumption in the world expected to be 30% higher in 2030 than 2010, with fossil fuels, despite the policies and targets discussed, taking still a large piece of the pie and rise from 56% in 2010 to 70% in 2030. Natural gas is playing a bigger role, replacing coal and oil and growing 50% by 2035. Renewable energies increase in offshore wind energy and floating wind technologies are another trend relevant for the Baltic Sea Region, highlighting the strong links between the land and the sea in the region. Focusing on fossil free energy for some players nuclear energy and nuclear fusion technology are possible paths towards more sustainable energy. In addition, the 'democratisation of energy' where households can produce their own energy and sell their surplus to their neighbours, covering parts of the demand needs. Mining and blockchain technologies are a trend in increasing energy demand with regards to energy storage expected costs for battery (European Parliament, 2018).

Text box 9 Indicative examples of relevant trends for the development of the strings

Flygskam. Flygskam translates to 'flight shame'. With the environmental footprint of air travel being among the highest, the flygskam trend pushes to fly less and use instead other more sustainable use of transport. The trend is particularly relevant when it comes to regional or short distance flights. Overall it relates to society's behavioural changes towards more sustainability and a more responsible relationship with the environment. (Hook, 2019)

Increasing Mobility as a Service. The uptake of Mobility as a Service is gaining importance. It focuses on the transport experience and destination rather than the mode of transport, providing information on demand, transport and payment in one platform. This bespoke service makes transport effortless and tailor-made to travellers. (MaaS Alliance, n.d.)

Increase of e-services. With the increase of broadband connections different services have been digitalised. This applies to e-health, with e.g. more personalised medicine, e-commerce, where shopping is done online, e-education, with the uptake of online courses and classes and others.

Industry 4.0. Industry 4 incorporates a set of different technological advancements that influence manufacturing, services and everyday life of citizens through a fusion of technologies blurring the lines between physical, digital and biological systems (ESPON 2019d). The term encompasses the technological trends of cyber-physical systems, Internet of Things, cloud computing, cognitive computing and artificial intelligence (European Parliament 2016) with robotics, autonomous automobile systems, additive manufacturing are not only well established, but also shape the production and consumption patterns.

Democratisation of energy (Rifkin, 2013). The trend suggests that households can produce their own energy and sell their surplus to their neighbours, covering parts of the demand needs. The trend is related with the increase of energy prosumers where the notions of energy consumer and energy producer blend.

4.5 PATCHES OF TODAY

The patches account for large natural areas that offer ecosystem services in the region, supporting dynamism and quality of life. Patches regard the sustainable management of the commons that describe the natural and cultural heritage of the Baltic Sea Region, encompassing its marine and land ecosystem. This chapter provides an overview of human-environment interactions and protected areas in the Baltic Sea Region.

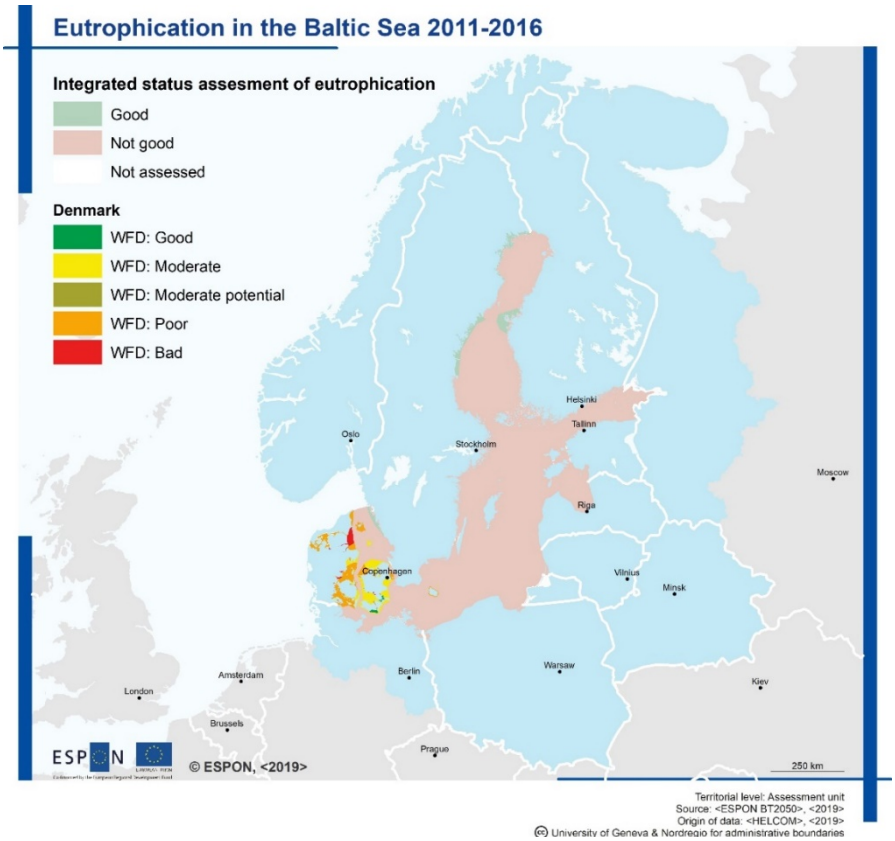
Human-environment interactions in the Baltic Sea Region

The Baltic Sea Region as an environmental-economic unit consists of a complex series of interactions between terrestrial ecosystems, systems of human activity, coastal and marine ecosystems within the Baltic Sea itself (Sweitzer et al., 1996). To successfully implement

sustainable policies within the Baltic Sea Region, a comprehensive understanding of how these systems are distributed, and how they interact, is required. Patches are places that have been developed in line with the EU vision for rural areas.

An important aspect of this perspective is the usage of natural resources and its impact on the environment. In recent years, global development policies such as the UN SDGs and the EU Action Plan for the Circular Economy have increasingly emphasised the environmental impact of increasing resource usage and the importance of transitioning to more sustainable levels of consumption and resource use (EESC, 2019; UN, 2019).

The environmental impacts of human systems in the Baltic Sea Region are well documented. Air pollution from industry and fossil fuel consumption continues to be an issue in parts of the region, particularly urban areas and countries such as Poland, where coal remains a dominant source in energy production. Due to its enclosed nature and relatively low biodiversity, the Baltic Sea is especially vulnerable to environmental pressures. The sea basin has been severely impacted by eutrophication, where excessive loading of nutrients into the sea caused primarily by intensive agriculture and high volumes of shipping have resulted in the degradation of marine ecosystems (ESPON, 2020a; Murray et al., 2019). The coastal zone is no exemption which inhabits high environmental, recreational and landscape values while being subject to strong anthropic pressures. Map 13 illustrates the status of eutrophication of the Baltic Sea Region 2011-2016.



Map 13: Integrated status assessment of eutrophication in the Baltic Sea Area 2011-2016
Source: ESPON, 2020a

Addressing environmental issues in the Baltic Sea Region requires a large-scale, integrated approach. The Baltic Sea spans an area of 377,000 $km^{2,}$ and the terrestrial drainage basin covers an area of circa 1.6 million km^2 of land – the vast majority of the Baltic Sea Region (Sweitzer et al., 1996). This area is home to over 100 million people and contained 24% of the total EU population as of 2020.

The terrestrial landscape of the Baltic Sea Region is primarily dominated by forest cover. As of 2019, 48.6% of all land in the Baltic Sea Region was classified as forest. This represents a slight decrease since 1999 when 49.8% of the Baltic Sea Region was forested, but the figure remains significantly above the EU average of 37.7% (European Parliament, 2021). Other types of natural vegetation such as grassland, shrubs, and wetlands accounted for 23.7% of land cover, and cropland made up 18.5% of the region's total land area. The remainder of the land area consisted of inland water bodies (7.1%), urban areas (0.9%) and other types of land cover such as bare ground and permanent snow and ice (1.2%.)

The distribution of land cover types in the region is relatively uneven, with most forests being in northern areas such as the Nordic countries and Russia, while agricultural and urban land is largely located in the southern part of the region where the population density is much higher. Map 3 (see page 29) Map 14 and Map 15 illustrate the distribution of land cover in the Baltic Sea Region over a 20-year period from 1999 to 2019.

Map 14: Land cover in the Baltic Sea Region 1999
Source: Nordregio (Map by Michael Oakden)

Map 15: Land cover in the Baltic Sea Region 2019
Source: Nordregio (Map by Michael Oakden)

As Map 14 and Map 15 show, no large landscape-scale changes occurred over the 20-year period from 1999 to 2019. Table 1 shows the area of each land cover type in 1999 and 2019 and the relative change in area over the 20-year period[20].

Class	Area 1999 (km^2)	% of Baltic Sea Region 1999	Area 2019 (km^2)	% of Baltic Sea Region 2019	Change (%)
Cropland	2,887,275	18.2%	2,941,628	18.5%	+1,8
Forest	7,919,971	49.8%	7,733,560	48.6%	-2,3
Other vegetation	3,687,953	23.2%	3,767,315	23.7%	+2,1
Urban	88,264	0.5%	139,095	0.9%	**+57,5**
Water bodies	1,120,581	7.1%	1,121,737	7.1%	+0,1
Other	186,052	1.2%	186,761	1.2%	+0,4

Table 1 Land cover change 1999-2019
Source: Nordregio calculations

The most noticeable change in the data is the 57.5% increase in the area of urban land cover, as shown in Map 3. This may reflect the trends of rural depopulation and population growth in FUAs seen over this time period. In this respect, attention should be paid to the EU' objective so-called 'zero land take' by 2050 (European Commission, 2016), which recommends nought the conversion from unsealed land (e.g. agriculture, forests) to

[20] Note that the Baltic Sea is not included in the land use data since definition of land use normally exclude sea area.

infrastructure and urban development. Such changes in land use cover negatively affect ecosystems services which are crucial to human life. It is worth noting that four of the six EU member states with the largest forest areas are partially or entirely within the Baltic Sea Region (Sweden, Finland, Poland, Germany). The role of Białowieża Forest in Poland and Belarus is also worthwhile as this is the largest primaeval forest and an essential part of Europe's ecosystem and biodiversity (WWF, 2020). Sustainable forest management is key for landscape resilience to climate change in the region.

Protected areas on land

The conflicting demand for land for nature preservation and other activities (e.g. renewable energy production, agriculture, industries) accentuate tensions between preservation vs. exploration leading to disputes in many Baltic Sea Region countries. Nevertheless, the aims of biological and cultural conservation are becoming increasingly integrated with social and economic objectives in European spatial planning. The 2017 European Commission action plan for achieving the EU's 2020 biodiversity goals (EU Action Plan for Nature, People, and the Economy) emphasised the importance of "better coherence with broader socio-economic objectives" as a key priority in its approach to biodiversity conservation (ESPON, 2018c).

To facilitate this approach, protected area management has shifted in many cases from a traditional 'islands of nature' approach to a system-based approach where protected areas sharing common goals form a larger network of protected areas which acts as a policy instrument within a sustainable territorial development framework (ESPON, 2018c).

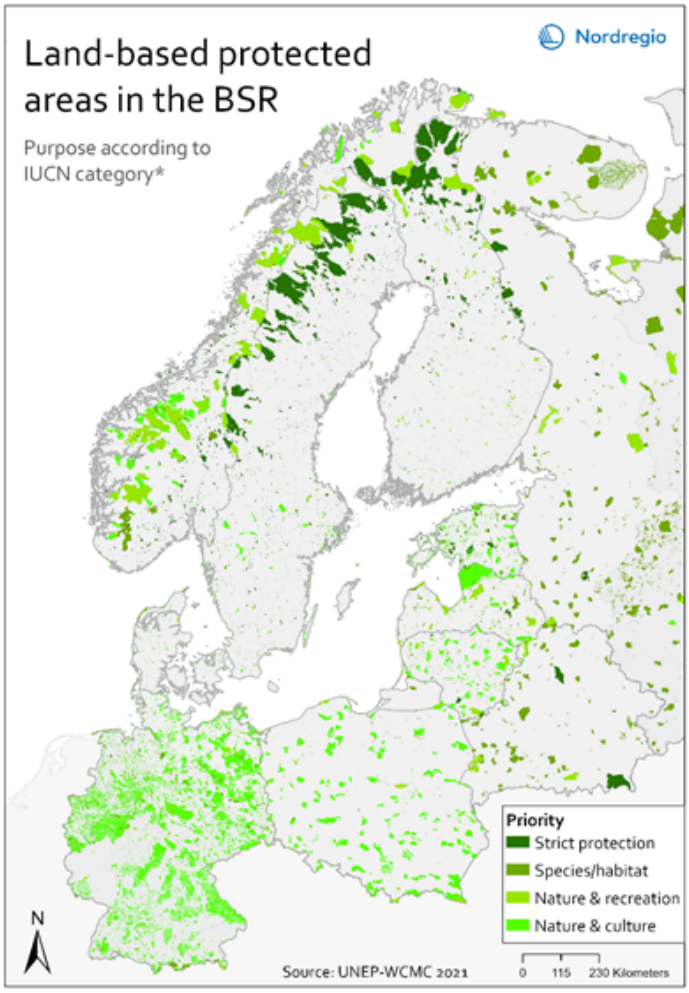
The International Union for the Conservation of Nature (IUCN) classifies protected areas into seven categories based upon the primary objectives and management approach of a site (Dudley et al., 2013). Table 2 contains the different classifications and their definitions.

Category	Name	Description
Ia	Strict Nature Reserve	Protected areas that are strictly set aside to protect biodiversity and also possibly geological/geomorphological features, where human visitation, use and impacts are strictly controlled and limited to ensure protection of the conservation values.
Ib	Wilderness Area	Protected areas that are usually large unmodified or slightly modified areas, retaining their natural character and influence, without permanent or significant human habitation, which are protected and managed so as to preserve their natural condition.
II	National Park	Large natural or near natural areas set aside to protect large-scale ecological processes, along with the complement of species and ecosystems characteristic of the area, which also provide a foundation for environmentally and culturally compatible spiritual, scientific, educational, recreational and visitor opportunities.

III	Natural monument or feature	Protected areas set aside to protect a specific natural monument, which can be a landform, sea mount, submarine cavern, geological features such as a cave or even a living feature such as an ancient grove. They are generally quite small, protected areas and often have high visitor value.
IV	Habitat/species management area	Protected areas aiming to protect particular species or habitats and management reflects this priority. Many category IV protected areas will need regular, active interventions to address the requirements of particular species or to maintain habitats, but this is not a requirement of the category.
V	Protected landscape/seascape	A protected area where the interaction of people and nature over time has produced an area of distinct character with significant ecological, biological, cultural and scenic value: and where safeguarding the integrity of this interaction is vital to protecting and sustaining the area and its associated nature conservation and other values.
VI	Protected area with sustainable use of natural resources	Protected areas that conserve ecosystems and habitats, together with associated cultural values and traditional natural resource management systems. They are generally large, with most of the area in a natural condition, where a proportion is under sustainable natural resource management and where low-level non-industrial use of natural resources compatible with nature conservation is seen as one of the main aims of the area.

Table 2 IUCN Classifications
Source: adapted from Dudley et al., 2013

A primary distinguishing factor between protected area categories is the extent to which socio-economic integration and usage of natural resources are permitted by the management approach. Protected areas can be strictly managed to prevent or limit human activity which may harm biodiversity but a more integrated approach where sustainable use of natural resources and nature-culture interactions are prioritised is also possible. Map 16 shows the distribution of protected areas in the Baltic Sea Region according to the management approach derived from the IUCN classification (see Table 3).



Map 16: Distribution of protected areas in the Baltic Sea Region
Source: Nordregio (Map by Michael Oakden)

Map grouping	IUCN categories
Strict protection	Ia Strict Nature Reserve Ib Wilderness Area
Nature & recreation	II National Park
Species/habitat	III Natural monument or feature IV Habitat/species management area
Nature & culture	V Protected landscape/seascape VI Protected area with sustainable use of natural resources

Table 3 Groups of IUCN categories shown in Map 16

The distribution of protected areas in terms of management priorities in the Baltic Sea Region shows a distinct pattern, with southern and western portions of the region containing a larger proportion of protected areas where integration of nature and cultural/economic activities are prioritised compared to Russia, Belarus, and the far north of Sweden and Finland where areas with 'stricter' management practices are more abundant. This roughly corresponds to patterns of population density within the Baltic Sea Region. The most densely populated parts of the region (Germany, Denmark, Poland) contain the highest proportion of

'nature & culture' focused protected areas, while 'strict protection' and 'species/habitat' focused protected areas are largely concentrated in more sparsely populated areas.

The geographical divide in protected area management practices within the Baltic Sea Region can also be explained in terms of EU policy. As previously stated, biodiversity conservation and protected area management have been increasingly integrated with socio-economic objectives and territorial development policy within the EU countries. Also the Green Deal aim for the efficient use of resources by transitioning to a clean, circular economy, restoring biodiversity and cutting pollution (European Commission, 2019). A part of this integration is the development of networks of protected areas, with two of the most notable examples being the Natura 2000 network (as seen in Figure 8) and the Emerald network (ESPON, 2018c).

Marine and coastal protected areas

Coastal and Marine Protected Areas (HELCOM MPAs) is an important instrument for protecting the Baltic Sea and its ecosystems and to meet the commitments to the Helsinki Convention. The main objective of the coastal and marine protected areas is to protect valuable marine and coastal habitats in the Baltic Sea. Currently, there are more than 176 designated HELCOM MPAs covering a total of 54,266 km2. The HELCOM MPAs form a network which also overlaps with other established nature protection frameworks and designations, such as Natura 2000 (HELCOM, n.d.) (Figure 9).

Furthermore, there are also nine Ecologically or Biologically Significant Marine Areas (EBSAs) in the Baltic Sea, which covers 23 % of the total sea basin surface (see Figure 8). EBSAs is a global database of protected areas support the healthy functioning of oceans and the services they provide.

	Uniqueness	Importance for species	Importance for endangered species/habitats	Vulnerability	Biological productivity	Biological diversity	Naturalness
Northern Bothnian Bay	High	High	High	Low	Medium	Medium	Medium
Kvarken archipelago	High	High	High	Medium	Medium	Low	Medium
Åland Sea, Islands and the Archipelago sea of Finland	High	High	Medium	Medium	High	Medium	Medium
Eastern Gulf of Finland	Medium	High	High	Medium	Medium	Medium	Medium
Inner Sea of West Estonian Archipelago	High	High	Medium	Low	Medium	High	Medium
Southeastern Baltic Sea Shallows	High	High	Medium	Medium	Medium	High	Medium
Southern Gotland Harbour Porpoise Area	High	High	High	High	Medium	Medium	Medium
Fladen and Stora and Lilla Middelgrund	High	High	High	High	Medium	High	Medium
Fehmarn Belt	High	High	High	Medium	Low	High	Medium

Figure 8: List of EBSAs in the Baltic Sea and their classification
Source: HELCOM, n.d.

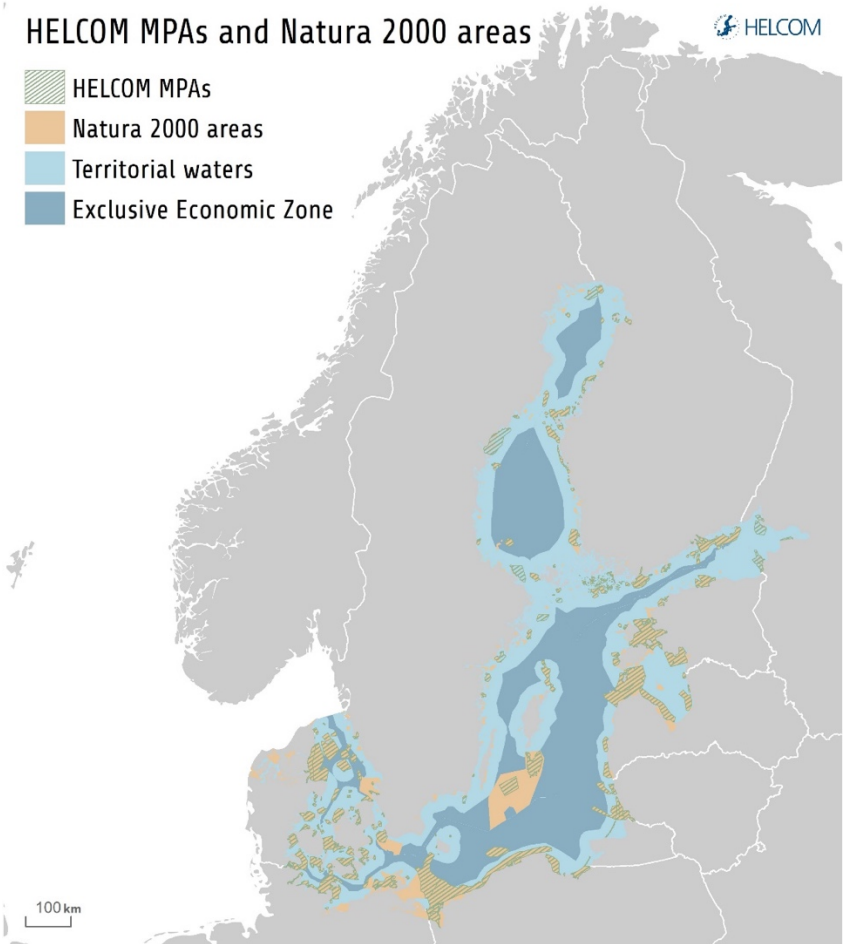


Figure 9: Distribution of Marine Protected Areas and Nature 2000 areas in the Baltic Sea
Source: Borg et al., 2016

The frequency of different protected area management regimes differs across parts of the region, often due to local geographical/social circumstances. In Sweden, for example, most traditional 'strictly' managed sites are in the mountainous northern parts of the country, while most protected areas in the more densely populated south are integrated with socio-economic activity and sustainable resource use (Höjer et al., 2009).

Integration of protected areas through cross-border NPAs and common policy objectives is increasingly common between EU-member states in the Baltic Sea Region. However, an East-West divide remains between the EU member states of the region and Belarus/Russia.

4.6 PATCHES TOWARDS 2040

The following sections look into elements that are relevant for the patches, as well as a number of trends that may influence them.

4.6.1 FUTURE IMPLICATIONS: CLIMATE CHANGE

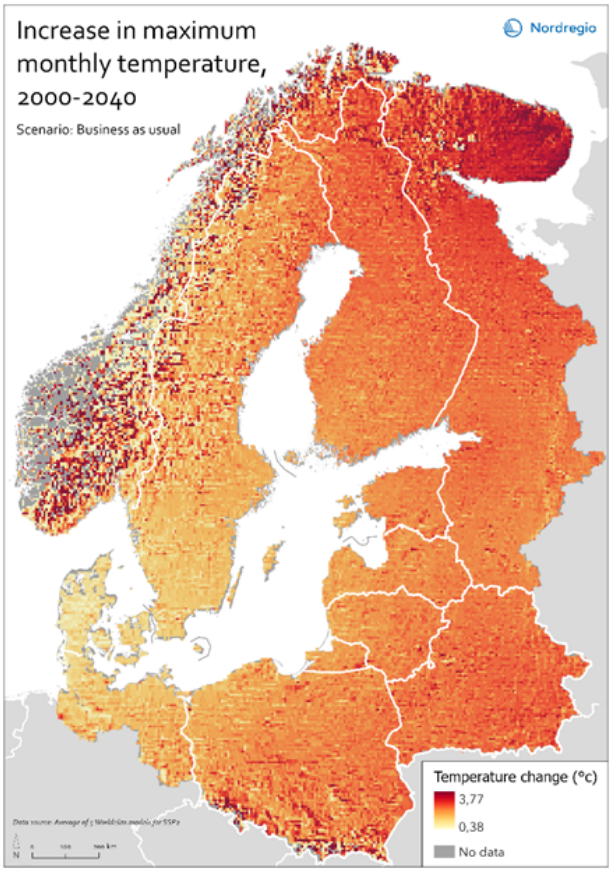
Human activity has caused a dramatic global temperature rise If the current rate of temperature increase is maintained, global warming of 1.5°C and 2°C is likely to occur in the 21st century (Intergovernmental Panel on Climate Change, 2021). Such an increase would dramatically alter ecosystems worldwide and lead to profound regional consequences within the Baltic Sea Region. Long-term risks to the Baltic Sea Region resulting from climate change include rising sea levels, coastal erosion and insufficient oxygenation of the Baltic Sea resulting from cyanobacterial blooms (Meier et al., 2017; Räisänen, 2017). Cooperation on climate change adaptation is necessary, as the possible impacts of climate change on different sectors vary. For instance, impacts on the biodiversity sector, such as the loss of original flora and fauna, the higher survival of invasive species, eutrophication, impacts on food supply and particularly fishery and agriculture, such as the decline in cod populations or the low value freshwater fish, impacts on the coastal infrastructure, such as less damage to buildings due to fungus and sea rise, as well as impacts on economic activities like coastal tourism, such as increased beach erosion, floods, or less winter tourism opportunities which depend on snow or ice (Baltadapt, 2013). Such impacts show the high importance of the sea and its link with land activities, highlighting that action for both land and sea is necessary for climate change adaptation.

The Baltic Sea region has historically seen greater increases in surface air temperature than the corresponding global average, and this is projected to continue into the future (HELCOM, 2013). A recent development in climate modelling is the definition of shared socioeconomic pathways, which provide a scenario framework where different plausible pathways of global socio-economic development can be studied with regards to the impacts, adaptation, and mitigation of climate change. The shared socioeconomic pathways ays provide different visions of global socio-economic development leading up to the year 2100, with a focus on trends in development, growth, and intensity of resource use (O'Neill et al., 2014). Map 17 illustrates projected temperature rises across the Baltic Sea Region between 2000 and 2040 in the event of a global 'Business as Usual' scenario, which corresponds to shared socioeconomic pathway 2 (see Text box 10).

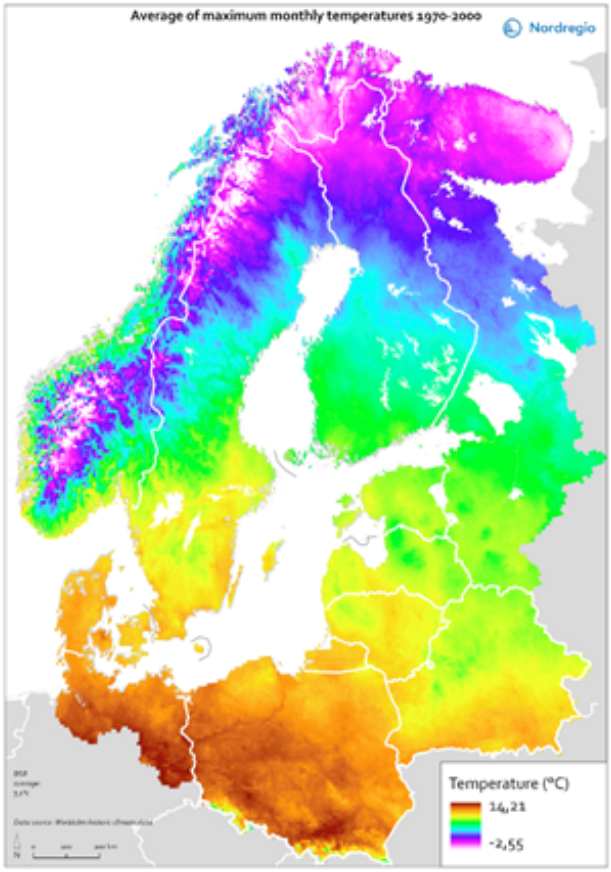
Text box 10 Shared socioeconomic pathway 2 narrative

"The world follows a path in which social, economic, and technological trends **do not shift markedly from historical patterns.** Development and income growth proceeds unevenly, with some countries making relatively good progress while others fall short of expectations. Global and national institutions work toward but make slow progress in achieving sustainable development goals. Environmental systems experience degradation, although there are some improvements and overall, the intensity of resource and energy use declines. Global population growth is moderate and levels off in the second half of the century. Income inequality persists or improves only slowly, and challenges to reducing vulnerability to societal and environmental changes remain." (Riahi et al., 2017).

Map 18 18 shows the baseline against which this scenario is compared, the average temperature for 1970-2000. If historical socio-economic trends persist, the projected temperature increase would intensify the adverse effects of climate change on the Baltic Sea Region. Consequently, the implementation of climate change adaptation and mitigation policies is of vital importance to the region's future. Cooperation between national governments and cross-border organisations is crucial to achieving this. Relevant initiatives may include (but are not limited to) further integration of sustainable resource use and biodiversity preservation strategies within and across borders, cross-border ecological corridors and reforestation efforts, regional cooperation in responding to extreme events (particularly floods, fires, and coastal erosion), common resource management policies, and implementation of tax and/or incentive-based financial initiatives aimed at limiting unsustainable activities and facilitating the transition to more sustainable practices (ESPON, 2020a).



Map 17: Increased in max temperature 2000-2040
Source: Nordregio (Map by Michael Oakden)



Map 18: Average max temperatures 1970-2000
Source: Nordregio (Map by Michael Oakden)

The Norwegian project 'Northern Lights' brings hope to deal with a future that is likely to be severe affected by climate change. Text box 11 provides a short description of this project.

Text box 11 Northern Lights project: Carbon Capture Storage in Norway

The Norwegian parliament has approved the final investment in the Northern Light project that will enable the capture and sequestration of CO_2 in geological strata in the Northern North Sea, around 2,600 metres below the seabed. If implemented on a large scale, this technology could decrease the world CO_2 emissions and, therefore, it is fundamental for meeting the climate neutrality targets by 2050. The Northern Lights will offer third parties the development and operation of CO_2 transport and storage facilities. In this respect, it will be the first cross-border CSS service that will provide European industrial emitters with the chance to store their CO_2 safely and permanently underground. The first phase of the project will be finalised in 2024 with the possibility of storing up to 1.5 million tonnes of CO_2 yearly. There are plans to increase this capacity to 5 million tons per year considering increasing customer base.

Source: *Norway Approves Funding CO2 Transport and Offshore Storage Project (maritime-executive.com)*

4.6.2 TRENDS RELATED TO PATCHES TOWARDS 2040

Several trends of different thematic categories may influence the development of the patches. Trends are interlinked to each other, driving or hampering the development of patches. The list of possible relevant trends can be endless. This section gives some first insights on key trends that may relevant in the context of patches and in the framework of the vision process. The trends will help in discussing the future vision through a more informed background.

Relevant blue-related trends. Blue patches are closely linked and largely affected to climate change effects, such as temperature increase, marine pollution, as well as human activities relating to eutrophication and microplastics. Global warming is a hampering factor as it declines the water quality and introduces non-native species. Sea level rise is another important trend, as the sea level is expected to rise further in the future[21], a trend also particularly for the Southern part of the Baltic Sea[22]. Sea level rise in combination with human activities may result in further coastal erosion, influencing rather strongly harbours and coastal settlements. Aquaculture increase is another trend, as the estimated increase in the share of the total production of aquaculture will overcome captures (Fritsche et al., 2020). Exacerbation of current trends such as further increase in eutrophication, overfishing, unsustainable fishing, the melting of the Arctic and sea level rise are relevant affecting firstly coastal areas and islands. Marine pollution is another relevant trend and particularly the presence of microplastics. Marine plastic litter or any plastic size largely contribute to marine and coastal pollution (Interreg Baltic Sea Region and FanpLESStic-sea Project, 2019). Trends on the marine biodiversity, its status and changes are important for the future. The change in the status of benthic and pelagic habitats, of coastal areas, as well as the changes in the population size grey seal which are increasing are important for the future. Nevertheless, is anticipated that biodiversity will show signs of improvement in the next years

[21] https://www.eea.europa.eu/data-and-maps/indicators/sea-level-rise-7/assessment

[22] https://balticeye.org/en/articles/climate-change-will-increase-the-pressure-on-the-baltic-sea/

(HELCOM, 2018). Furthermore, climate refugia play an important role in the preservation and resilience of biodiversity in the Baltic Sea and changes therein may have severe consequences. The Baltic Sea Region will probably go through drastic ecological regime shifts with implications on economic, cultural and recreational ecosystem services (Törnqvist et al., 2019). This may include reduction in the food production which relies on brackish water, namely fishing, as well as loss of macrophytes which act as foundation species forming habitats for other species (Törnqvist et al., 2019).

Relevant green-related trends. Green patches are also closely linked and largely affected to climate change effects, such as temperature increase, pollution, biodiversity loss. At global level 60% of ecosystems are degraded, 75% of fish stocks are over-exploited or depleted. It is estimated that 13 million hectares of tropical forests are cleared every year and 20% of tropical forests in the world disappeared, with 95% being at risk of extinction by 2050 if climate change continues (European Comission, 2011). The continuation of trends such as biodiversity loss, the tragedy of the commons and loss of wetlands are relevant for the green and blue patches. Further trends regard the increase in land take for re-cultivation and industrial and commercial land use to extent residential areas and construction sites[23]. Discussions to address them have focused on biotope networks to protect and connect natural habitats, as well as on rewilding ecosystems, allowing nature to rebuilt itself.

Relevant agri-trends. The food system contributes up to 50% of GHG emissions, causing also most impacts on the animal welfare, biodiversity, land and water. Studies have shown that if this direction is not mitigated and given the population growth and the changed diets, these impacts may go up to 50-90% (Fritsche et al., 2020). New ways of growing food and trends such as agroecology, which is a trend to counter balance intense agriculture and is related to sustainable agriculture with potential to benefit biodiversity and rural employment. Similarly, more sustainable ways for aquaculture, e.g. by recirculating water, are further related trends relevant for food production[24]. Plant-based diets, more sustainable diets and meat reduction belong to the trends that may influence agriculture production (Fritsche et al., 2020). Trends related to technology, such as the use of Internet of Things, robotics and artificial intelligence contribute to the increase of smart farming (Sciforce, 2019). Food loss is another important issue, to which trends such as redistribution of food surplus and mindful eating play a role. (Fritsche et al., 2020)

Relevant quality of life trends. Trends such as a better work-life balance and a more holistic focus to well-being and health may be relevant. Territorial quality of life encompasses a ‘life-centred’ approach connecting both human and other living beings in harmony with nature (ESPON, 2020b). Focusing more on a symbiosis both of industries with the nature as well as a balance between human activities and nature are also relevant trends for the future.

[23] https://www.eea.europa.eu/data-and-maps/indicators/land-take-3/assessment

[24] https://www.interreg-baltic.eu/news-detail/news/project-spotlight-an-impetus-for-aquaculture-in-the-baltic-sea-region.html

Behavioural changes and trends, such as hyper-consumerism, fast fashion, meat-based diets etc. influence the above-mentioned trends. All these trends influence both the everyday life of people as well as the economy, with effects on e.g. shortage of materials for production, new technologies, circular economy etc.

The trends highlight the need for solutions to mitigate climate change impacts and become more resilient in the future.

Text box 12 Indicative examples of relevant trends for the development of the patches

Biodiversity loss. Loss of biodiversity is a big environmental challenge, with biodiversity being in decline across the world and highly likely to continue in the future (OECD, 2016). The deterioration of biodiversity poses threats to the lives of species and natural environment, posing threats in the long run to humans.

Increasing biotope networks. Biotope networks support the species survival as they connect patchy ecological communities along territories. The approach suggest that when connected, the survival of the species increases. (European Environment Agency, n.d.)

Rewilding practices. Opposed to conservation of ecosystems to a prior state, rewilding proposes to enable ecosystems to restore by introducing plants that can support this process and support the recovery of wilderness (Krznaric, 2020). The approach suggests that 'nature does the work' preventing biodiversity loss.

Changing diets. The shift towards more plant-based diets and artificial production of meat in combination with more sustainable agricultural and aquacultural practices support a more environmental friendly food production and consumption.

4.7 SYSTEM OF TODAY

The system accounts for comprehensive terrestrial/land-based and maritime spatial planning. The comparison and discussion of the planning systems in the Baltic Sea Region has been an important part of the analysis of the region. Throughout the last 29 years, VASAB has played an important role in this respect. VASAB has initiated and promoted knowledge exchange and collaboration between the Baltic countries to establish a comprehensive spatial planning system for the macro-region. Other initiatives include the Interreg-project COMMIN – COMmon MINdscapes (2004-2007), that fostered mutual understanding and cooperation in territorial spatial planning between the 11 Baltic Sea Region countries (Interreg Baltic Sea Region, 2004) and several MSP-related projects (e.g., Baltic Scope (2015-2017)[25], Pan Baltic Scope, Capacity4MSP) which have brought together Maritime Spatial Planning (MSP) authorities to discuss planning solutions to transboundary issues and improve the maritime spatial planning processes in the Baltic Sea. Acknowledging this legacy, this section

[25] http://www.balticscope.eu/events/final-reports/

discusses the territorial and maritime spatial planning of the Baltic Sea Region countries. The section begins with a brief overview of the territorial governance and spatial planning system of the different countries of the region. Following this, the status of the maritime spatial planning is described in regards to the entire region and for each of the Baltic Sea Region countries that borders the Baltic Sea.

Territorial spatial planning and governance in the Baltic Sea Region

There are substantial differences in the spatial planning systems of the Baltic Sea Region countries. The different levels (national, regional and local) play different roles and hold different competencies. For example, except for Germany and Sweden, the Baltic Sea Region countries have strong competencies in planning and territorial governance at the national level. For example, the municipalities in Sweden, follow general national guidelines but they have autonomy to deliberate and allocate resources. The federalism political system in Germany comes with a more complex division of spatial planning responsibilities and powers across multiple levels of government most notably the federal government, the states, regions and local levels cooperating in a form of counter flow principle ('Gegenstromprinzip'). Apart from Belarus, the local level plays an important role in most of the countries. In Sweden, the local level is strongest when it comes to decision making and comprehensive planning, while regions are responsible for managing important issues such as health, public transportation, and regional development. In Norway, Russia and Poland, the regional level plays a strong role. In Finland municipalities and regional councils, which are municipal organisations, have the land use planning mandate. The differences between the spatial planning systems of the Baltic Sea Region countries poses challenges but also opportunities for the legitimation of the macro-regional approaches. For example, the implementation of macro-regional policies might be undermined in countries in which the strongest power lies on the local level. But at the same time, the involvement of local actors in the implementation of macro-regional policies is likely to help the legitimisation of those policies and neutralising weak implementation chains between decision-makers and key implementers (ESPON, 2020a).

Regardless of the differences in the planning systems of the Baltic Sea Region countries, the macro-region has a solid governance structure. A wide range of institutional arrangement with different jurisdictions (e.g. accounting for parts of the region, the entire region and even influencing beyond the borders of the region) have been in place for many decades. Several organisations with different degrees of institutionalisation (e.g. formal and informal), diverse scope of agreements and financed by various sources (e.g. Council of the Baltic Sea States, Swedish Institute, and Interreg Programmes) result in a multitude of transnational, multilateral, cross-border, local and regional cooperation across the macro-region (ESPON, 2020a). In fact, the dense governance structure was the main aspects for the Baltic Sea Region to become the first European macro-region in 2009 (ESPON, 2020a). Text box 13 summarises some organisations and means of international cooperation in the

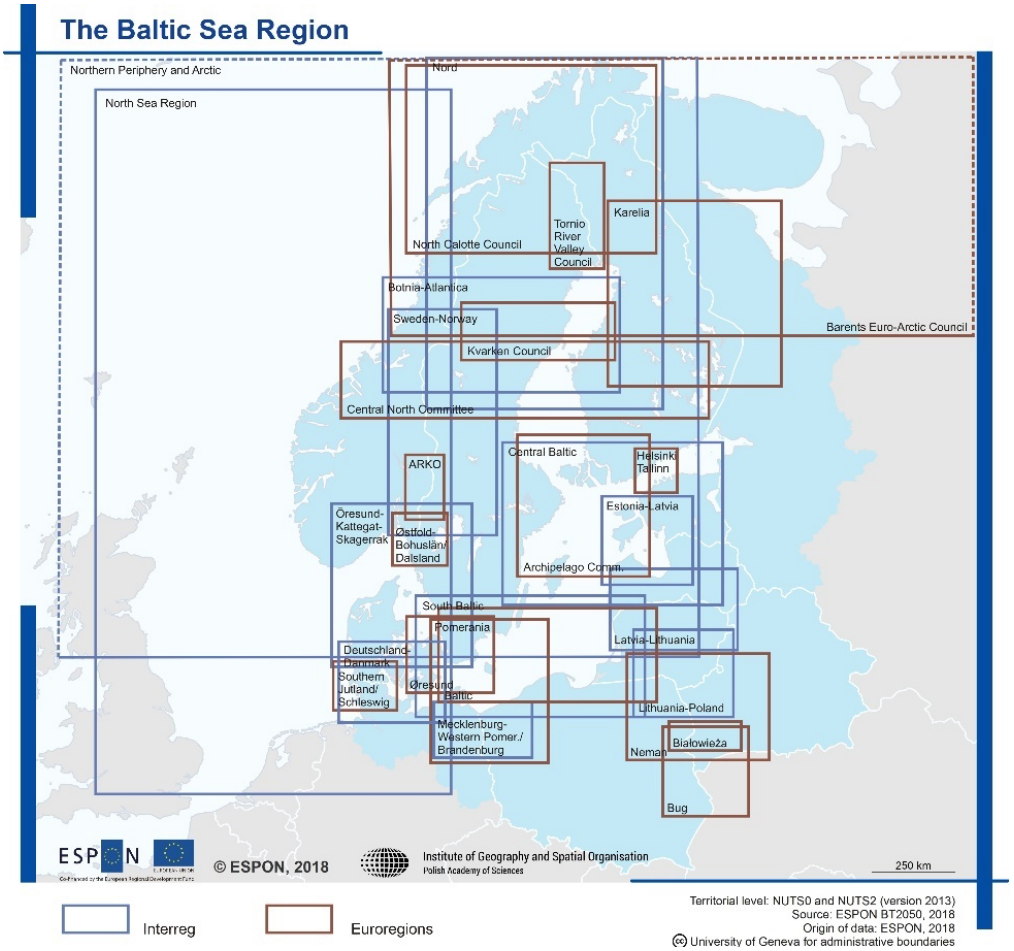
Baltic Sea Region. Map 19 illustrates the geographical coverage of cross-border cooperation in the region in regard to Interreg projects and Euroregions.

Text box 13 Transboundary cooperation in the Baltic Sea Region

- For a long time, different organisations collaborate on different issues for the development of the macro-region. For example, Council of the Baltic Sea States (CBSS) since 1992; VASAB - Vision and Strategies around the Baltic Sea (VASAB) since 1992; Baltic Marine Environment Protection Commission - Helsinki Commission (HELCOM) since 1974; Conference of Peripheral Maritime Regions (CPMR) Baltic Sea Commission since 1996; Union of the Baltic Sea (UBC) since 1991, The Baltic Sea States Subregional Co-operation (BSSSC) since 1993; Baltic Sea Parliamentary Conference (BSPC) since 1991; Nordic Council of Ministers (NCM) since 1952, Baltic Council of Ministers (BCM) since 1994.
- International cooperation in the region also takes the form of informal associations that have actively collaborated in different sectors. To name a few, related to business the Baltic Management Development Association, to culture the Northern Dimension Partnership on Culture; to education, the Nordplus programme and the Baltic University Programme; to labour issues, the Baltic Sea Labour Forum, to sport the Baltic Athletic Association, to tourism the Cruise Baltic, to research the Baltic Research Programme, to youth issues the Baltic Sea Youth Platform[26].
- Since 1990, several projects financed through Interreg Programmes, European Maritime and Fisheries Fund, European Regional Development Fund, Swedish Institute have supported the cross-border cooperation within the region in different thematic areas.
- Since 1971, 17 Euroregions have been established in the Baltic Sea Region.

Source: ESPON, 2020a

[26] https://bsyp.eu/index.html



Map 19: Interreg and Euroregions CBC in the Baltic Sea Region
Source: ESPON, 2020a

Having discussed some aspects of the territorial governance of the Baltic Sea Region, the next section reviews some visionary spatial documents, such as spatial visions, of the Baltic Sea Region countries.

4.8 SYSTEM TOWARDS 2040

The following gives an overview of different territorial perspecitves from different countries in the Baltic Sea Region as regards the system.

4.8.1 TERRITORIAL PERSPECTIVES: AN ACCOUNT FROM BALTIC SEA REGION COUNTRIES

In **Finland**, the most important statutory spatial planning document is the National Land Use Guidelines, which are prepared by the Government, through Ministry of the Environment. The aim of the guidelines is to ensure that matters of national significance are considered in the planning and in actions taken by regional and local Authorities. In accordance with the Land Use and Building Act, these guidelines are a part of the land use

planning system, and thus, have a great influence in the spatial planning at regional and local level. In 2017 the main objectives of this document were revised and structures along five themes: (i) Functioning communities and sustainable traffic; (ii) Efficient transport systems; (iii) Healthy and safe environment; (iv) Viable natural and cultural environment and natural resources and (v) Energy supply capable of renewal (Finnish Government, 2018). Finland has also a vision entitled *'Enabling Finland which has an ability to renew itself: A picture of the regional structure and traffic system 2050'* (Finish Ministry of the Environment, 2015). This document points out globalisation and climate change; digitalisation and bioeconomy as the main factors that are likely to influence Finland's spatial development. It also assumes an increasing polarisation of growth in metropolitan areas and highlights the need to focus on renewable business as a mean to strengthen competitiveness. A polycentric and network based regional structure is the territorial model to strengthen Finland's position in the surrounding areas as well as in Europe and internationally.

Norway does not have a spatial vision. The main planning instrument is the National expectations for regional and municipal planning, which presents guidelines for regions and municipalities on how to interpret important national policies. With the regional reform in January 2020 that merged several regions and municipalities, the regions have greater strategic responsibilities in several sector areas, including cultural heritage management, culture, business development and skills development. Therefore, regional planning becomes an important tool for setting objectives and strategically influence the spatial development of the country. The latest version of this document (Ministry of Local Government and Modernisation, 2019) has a great focus on the implementation of the sustainability goals in Agenda 2030. The Norwegian government has developed indicators for sustainability goals at regional level to monitor regions and municipalities' efforts to achieve the goals (Lidmo et al., 2020).

In **Sweden**, there are no comprehensive national planning directives; the most influential national planning instrument is the national state interest (Riksintressen) which follows the objectives of the Environmental Code. Nevertheless, the national authority for housing and planning has, on behalf of the government, produced a Vision for Sweden 2025 (Boverket, 2014). This document is, however, more an inspirational piece rather than a planning document. Based on approximately 100 national goals that are likely to influence the physical, social planning, the vision presents 12 objectives (conceptions) that are structured around four themes: (i) buildings; (ii) economy; (iii) infrastructure and (iv) nature, landscape and environment. There is, however, a national transport plan developed by the Swedish Transport Administration, which presents the development of the national infrastructure transport system (railways, motorways) for ten years (Trafikverket, 2018). The regions also develop regional development strategies and regional structure pictures (regionala strukturbilder), which set out long term priorities for regional development. In recent years, strengthening the physical planning perspective in the regional development work has been prioritized to further the integration between governance levels (Boverket, 2020)

Like Norway, **Denmark** has no spatial vision. The country has two statutory national planning documents. The National land-use report (Danish Ministry of Trade and Industry, 2019a), which is a strategic document, and the overview of national interests (Danish Ministry of Trade and Industry, 2019b), is a regulative document. The strategic document received a lot of criticism for being “backwards-looking” because it does not address traffic, climate and energy, which are issues that can be challenging or impossible to resolve within the framework of municipal planning. Therefore, it lacks pointing out important issues that influence strategic decisions for land use in the future. Another characteristic of the Danish planning legislation is that it focuses mainly on land use, overlooking social aspects. In addition, even though the coastal zones are included, the perspective on water areas are quite weak (Lidmo et al., 2020).

The **Estonian** vision for territorial development in 2030 is based on the EU policies and global trends such as urbanisation, transition to a knowledge-based, decarbonised and green economy, shifting of economic power to Asia, climate change, ageing population, the rising influence of environmental values (Estonian Ministry of the Interior, 2013). This document emphasises the need to pursue a cohesive spatial structure with a diverse living environment and low-density urbanised space that integrates compact cities, suburbs and traditional villages, valuing different lifestyles equally. Furthermore, good links with the external world are highlighted as essential for the economic competitiveness of the country. The Estonian development strategy ‘Estonia 2035’ also sets out strategic goals for the people and country, emphasising the need to pursue five strategic goals, focusing on the people, the society, the economy, the living environment and governance for a democratic and secure state (Republic of Estonia. Government, 2021). The involvement and contribution of local governments, public, non-governmental and private organisations are highlighted as essential for the implementation of the strategy.

Lithuania has a vision for the spatial development of the country in 2050 and offers concrete actions for the territorial development until 2030 (Lithuanian Ministry of Environment, 2019). This document defines the spatial aims and functional priorities for the use of territories. The new document analyses the social, economic, and complex challenges, with a focus on climate adaptation and mitigation, negative net migration, increasing unemployment and migration from rural to urban areas. The qualities of the different localities are seen as means to boost productivity and quality of life. The collaboration between the main cities (Vilnius and Kaunas) pledge to strengthen the potential of the country internationally. Comprehensive Plan of the Republic of Lithuania is the key spatial territorial planning document that defines spatial development aims and functional priorities for the use of land and maritime space.

Latvian inward characteristics (heritage, cultural and spiritual values) are put at the forefront for the development of the country by 2030 (Latvian Ministry of Regional Development and Local Government, 2010). Relying on active and responsible citizens, the vision builds on national values and characteristics as the primary foundation to deliver a

diverse and unique economy, science and culture that will be appreciated, known, and respected internationally. The document describes this ambition through seven priorities that include the development of the cultural space, the need to invest in human capital and lifelong education, innovative and eco-efficient economy, the importance of nature as a future capital, perspectives on spatial development and innovative government and participation of the society.

The vision of **Poland** 2030 – National Spatial Development Concept 2030 is guided by competitiveness, innovation, internal cohesion, biological richness and diversity, security and spatial order (Polish Ministry, 2010). This document responded to challenges the country faces due to European integration. The economic and societal openness of the country calls for strengthening its competitiveness, ensuring energy, preserving biodiversity, building social capital, changing social behaviour while dealing with challenges such as depopulation, migration, ageing society. Its strategic goal is effectively using the territorial differences of the country as potential to achieve overall development objectives – competitiveness, increased employment, the efficiency of the state and long-term social, economic and territorial cohesion. Currently, a new long-term vision 'The National Development Concept 2050' and medium-term national development strategy with strong territorial/ spatial dimension is being prepared to replace the withdrawn National Spatial Development Concept 2030.

The **German** spatial planning at federal level provides organisational and material guidance for spatial planning (in legal terms), that is then considered and made concrete by the subsequent planning levels. In particular, the spatial planning act exposes the main guideline of spatial planning (in legal terms) in Germany and stipulates so-called 'principles' of spatial planning (general provisions relating to the organization of space, especially the structure of settlements and open space, as well as infrastructure). An important body in this process is the Ministerial Conference on Spatial Planning (MKRO), which consists of ministers with responsibility for spatial planning from the federation and the 16 federal states (Länder) and serves to exchange information on and coordinate spatial planning (in legal terms) and spatial development issues with countrywide significance. Among other things it adopts formulated and cartographically visualises guiding principles (Leitbilder) to provide guidance for joint federal/state action. (ESPON, 2018b; Reimer et al., 2014) (Blotevogel et al., 2014). A particular focus of German federal spatial planning is on the provision of services of general interest (Daseinsvorsorge). This has been the topic of the 2006 guiding principles and reemphasised in 2016 (Baltic Sea Region, 2018). The 2021 guiding principles laid down in the national spatial planning report (Raumbordnungsbericht) focus on strengthening competitiveness (Baltic Sea Region, 2021). The aim is to make all regions in Germany fit for the future and to strengthen the contribution of federal spatial planning, state and regional planning. The options for action of spatial planning are placed in the foreground and highlighted. It stressed the importance of the decentralised urban system and functional areas, demographic change, infrastructure and mobility. Besides a specially chapter on COVID-19, special emphasis is placed on globalisation, digitalisation, labour market

developments metropolitan areas and medium-sized and regional centres and their current and expected future competitiveness. This is closely related to a broader policy agenda in Germany concerning equal living conditions in all places.[27] Another feature of the federal spatial planning concerns cross-border developments. The most prominent example of this is the common future vision for the German-Polish interaction area, which has been elaborated by the Spatial Development Committee of the German-Polish Governmental Commission for Regional and Cross-Border Cooperation.[28] It is a spatial planning vision for the area on both sides of the rivers Oder and Lusatian Neisse demonstrates the potential and development opportunities. The aim is to provide motivation and inspiration to planners and other stakeholders to intensify efforts.

The spatial development in **Russia** appears to be closely intertwined with economic development goals and, hence, elaborated under the Ministry of Economic Development[29] and in cooperation with the other line ministries. The Russian administrative territories next to the Baltic Sea are the city of St. Petersburg, Leningrad and Kaliningrad oblasts (regions). The territories belong to one of the 12 macro-regions of Russia as defined in the Russian Spatial Development Strategy 2025 (Government of Russian Federation, 2019). The North-Western macroregion consists of St. Petersburg and the following seven regions: Karelia Republic, Kaliningrad region, Vologda region, Leningrad region, Murmansk region, Novgorod region and Pskov region. St. Petersburg together with the Leningrad oblast are highlighted as promising centre of economic growth of the country. The Baltic Sea port towns of Viborg, Primorsk, Visock and the port of Ustj-Luga are also mentioned between smaller cities with significant development perspective. The Leningrad oblast is identified as a geostrategic border area with the EU and the cross-border cooperation is encouraged, inter alia, also in the field of 'strategic and territorial planning of border subjects of the Russian Federation and municipalities with border regions of neighbouring countries. The Strategy of Economic and Social Development of St. Petersburg 2030 is based on SDGs. It envisages the city of St. Petersburg as the leader of the Baltic Sea region – a multifunctional city and a centre of culture, science, education, tourism and high-tech industry as well as the outpost of the Arctic exploration. The strategy aims at improving the urban environment and, inter alia, achieving 'air and water environment will be 100% compliant with the regulations of the Baltic region' as well as 'strengthen the importance of small and medium-sized cities' (Kalchenko et al., 2020). The Socio-Economic Development Strategy of the Leningrad Oblast 2030, inter alia, aims at a balanced spatial development in coordination with the city of St. Petersburg (Leningrad Region Legislative Assembly, 2016). As for the Kalinigrad oblast, its strategy of

[27] See https://www.bmi.bund.de/SharedDocs/downloads/DE/veroeffentlichungen/themen/heimat-integration/gleichwertige-lebensverhaeltnisse/unser-plan-fuer-deutschland-langversion-kom-gl.pdf?__blob=publicationFile&v=4

[28] See https://www.kooperation-ohne-grenzen.de/de/

[29] https://economy.gov.ru/material/directions/regionalnoe_razvitie/strategicheskoe_planirovanie_prostranstvennogo_razvitiya/strategiya_prostranstvennogo_razvitiya_rossiyskoy_federacii_na_period_do_2025_goda/

socio-economic development that can be found on the website of the regional authority is outdated, e.g. date up to 2020[30].

The **Belarus** National Strategy of Sustainable Social & Economic Development 2030 (NSSD) approved in 2015 was the starting point for the country to join the UN Agenda 2030. The main task of NSSD is to transform the model of the national economy from administrative to indicative planning, to achieve a balance in the contribution of public and private property to the formation of gross domestic product and the development of the national economy, the introduction of the principles of the "green economy" into production, innovative development and social support for the neediest and creating conditions for realisation of personal potential of each person (Ministry of Economy, 2015). The National Strategy of Sustainable Social & Economic Development is harmonised with the SDGs. In 2021,the National Strategy of Sustainable Social & Economic Development is entering its 2nd stage with a timeframe of 2021-2030 and the main goal to move to 'the strong stability of development, the growth of the spiritual and moral values and the achievement of high quality human development based on the further formation of "green economy", the accelerated development of high-tech industries and services'. In the light of the contested presidential elections in Belarus in August 2020 it is not clear, however, what is the present status of implementation of this policy document.

Text box 14 Future perspectives on the spatial development of the Baltic Sea Region countries – some considerations

- Issues such as climate change and decarbonisation of the economy are highlighted in most of the national documents as challenges that need to be addressed in the future development of most Baltic Sea Region countries.
- Except for Finland, the Nordic Countries do not have well-anchored visions for their national territorial development. This may be due to the strong power the local level has in these countries.
- The territorial development of the Baltic Sea Region (VASAB, 2010) is acknowledged in national planning documents of three countries, such as in Estonia, (Estonian Ministry of the Interior, 2013), Latvia (Latvian Ministry of Regional Development and Local Government, 2010) and Lithuania (Lithuanian Ministry of Environment, 2019). In the other Baltic Sea Region countries, the macro-regional spatial perspective is lacking. Linkages with other countries and regions are mentioned basically as a mean to boost national competitiveness.
- In general, the visions of the Baltic States focus more on inward characteristics such as heritage, culture and local qualities as the strong holders for their future spatial developments.

Maritime Spatial Planning in the Baltic Sea Region

[30] https://gov39.ru/working/ekonomy/strategy/

The EU highlights that the blue economy has a key role in implementing the European Green Deal with, for example, the provision of renewable energy, sustainable food and transportation. In the Baltic Sea Region sectoral areas such as shipping, the proliferation of the blue bioeconomy, coastal and maritime tourism as well as environmental and monitoring technology have been highlighted as particularly with strong potential for sustainable blue growth (European Commission, n.d.). On the other hand, the maritime or coastal sectors will also themselves have to considerably reduce their impacts on the environment and climate.

The Baltic Sea, a semi-enclosed sea basin with brackish water, is characterised by fragile ecosystems, high biological production, climate change processes and diverse socio-economic dependencies on marine resources and space. The proliferation of the blue economy with maritime sectors such as shipping, fisheries, offshore energy, tourism and mineral extraction are increasingly competing for the limited sea space and resources. This has stressed the need for coordination of regulation, governance and policy measures to ensure a healthy and productive sea and to minimise sectoral conflicts. Integration across sectors, policy areas and spatial and administrative boundaries are key considering the highly interconnected and changing socio-ecological systems, sectors and uses in the sea (European Commission, 2020b; Morf et al., 2019).

MSP has globally emerged as an important tool for the management of shared seas to preserve marine ecosystems, enhance cross-border cooperation and promote economic growth (Ehler et al., 2019). A widely used definition of MSP outlines, “MSP is a public process of analysing and allocating the spatial and temporal distribution of human activities in marine areas to achieve ecological, economic, and social objectives that are usually specified through a political process” (Ehler and Douvere, 2006). In the EU, the EU Integrated Maritime Policy was established in 2007, promoting coherent planning approaches across Europe (European Commission et al., 2007). Consequently, the Directive 2014/89/EU on Maritime Spatial Planning (European Parliament, 2014) was established, requiring the EU Member States to develop Maritime Spatial Plans by 2021. The Directive sets out a number of minimum requirements for these plans, such as taking into account land-sea interactions, environmental, economic, social and safety aspects, ensuring coherence between MSP, ensuring the involvement of stakeholders and transboundary cooperation between member states and with third countries (European Parliament, 2014). The countries and autonomous regions in the Baltic Sea are at various stages of MSP development, where some have recently adopted their first Maritime Spatial Plans for the territorial waters and the exclusive economic zones (EEZ).

Transboundary MSP collaboration in the Baltic Sea Region

Transboundary cooperation is a prerequisite for sustainable and long-term planning and management of the sea. The Baltic Sea Region is considered a frontrunner in MSP collaboration and regional promotion of MSP (Moodie et al., 2021), with a long tradition of cooperation. This is materialised in both formal and informal processes, including networks,

joint strategies, cross-border forums and organisations, as well as MSP projects across the sea basin (see Text box 15 for a selection of these).

HELCOM introduced the 2007 Baltic Sea Action Plan with measures and action to achieve good environmental status in the Baltic Sea by 2021, particularly tackling eutrophication, hazardous substances, maritime activities and biodiversity. The Baltic Sea Action Plan is currently being updated, to be adopted in 2021. The coming Baltic Sea Action Plan update shall also further address climate change impacts, pollution and underwater noise as well as increase the integration of cross-cutting issues and facilitate the inclusion of ocean-related SDGs (HELCOM, 2021a). In terms of planning and regional development, the HELCOM - VASAB MSP Working Group is a key transboundary expert body with the aim to establish a long-lasting platform for the exchange of practical knowledge on MSP. The working group has adopted Regional Baltic Maritime Spatial Planning Roadmap (2013-2020), which includes ten 'Baltic Sea broad-scale Maritime Spatial Planning (MSP) Principles and guidelines, to support the implementation of MSP within the Baltic Sea Region, emphasising intergovernmental cooperation, public participation and the ecosystem-based approach (HELCOM and VASAB, 2010, 2013). A new Regional MSP Roadmap (2021-2030) (HELCOM and VASAB, 2021), complementary to the new Baltic Sea Action Plan, focuses on the implementation of national Maritime Spatial Plans and the new cycle of MSP, applying the ecosystem-based approach (HELCOM, 2021).

MSP is also an integral part of the EUSBSR, not least with the core objective 'Save the Sea' and MSP as included in the Policy Area 'Spatial planning' (European Commission, 2021c; Moodie et al., 2021). HELCOM and VASAB are the joint Policy area coordinators on MSP, with the Regional Baltic MSP Roadmap 2013-2020 guiding the efforts. As Maritime Spatial Plans are adopted in the Baltic Sea Region from 2021 and onwards, renewal of the roadmap (for the period 2021-2030) shall facilitate the follow up on the implementation of national maritime spatial plans as well as ensuring an adaptive spatial planning process as plans are to be reviewed by minimum every ten years according to the EU MSP Directive (European Commission, 2021c; European Parliament, 2014). Although the plans formally only must be updated every ten years, there is a continuous participatory process going on where different sectors and activities are integrated along the way. Text box 15 lists the transboundary MSP projects in the macro-region.

Text box 15 Transboundary MSP projects in the Baltic Sea Region

- Capacity4MSP: Strengthening the capacity of MSP stakeholders and decision-makers (2019-2022).
- Pan Baltic Scope: Towards coherent national maritime spatial planning and lasting macro-regional mechanisms cross-border cooperation in the Baltic Sea region (2017-2019)
- Bonus Basmati: Baltic Sea Maritime Spatial Planning for Sustainable Ecosystem Services (2017-2020).
- Land-sea-act: Land-sea interactions advancing Blue Growth in Baltic Sea coastal areas (2019-2021).

Maritime governance and land-sea interactions in the Baltic Sea Region

Many uses and activities taking place in the marine and maritime environment also have implications onshore, and vice versa which requires consideration to the interface between terrestrial and marine environments in maritime and land-based planning. Since the early 1990s, the governance of the land-sea interface promoted by the EU through integrated coastal zone management (ICZM). Furthermore, according to the EU MSP Directive of 2014, the member states are required to taking into account land-sea interactions in their Maritime Spatial Planning. A plethora of maritime, coastal and land-based sectors in the Baltic Sea Region have land-sea implications. These include for example offshore wind energy development, grids and cables, shipping, fisheries and aquaculture, tourism and recreation, coastal housing, agriculture and industries with associated infrastructure, value chains and socio-ecological pressures. Considering climate change processes, land-sea interactions also shed light on climate mitigation and adaptation measures in the coastal zone (Morf et al., 2019).

Land-sea interactions have also been addressed at sea-basin level through transboundary cooperation and policy-making in the Baltic Sea Region. HELCOM and VASAB as well as the EUSBSR are key examples of coordinating bodies in this regard (Kidd et al., 2019). However, the maritime, coastal and terrestrial uses and types of interactions across the land-sea interface also vary across the Baltic Sea Region. There are different types of shores, coastal settlement density and structures as well as different types of governance systems, measures and locus of administrative mandates managing land-sea interactions issues (Morf et al, 2019). While the competence for MSP has largely been placed at national and larger scales of governance, land-sea interactions issues also depend on local and regional government or where the mandate for land-based planning is located (Ibid, 2019). Alas, a key challenge for the Baltic Sea Region countries and autonomous region is linking MSP with and ensuring coherence with land-based planning and other sectoral policy measures.

Status of MSP in the Baltic Sea Region countries and autonomous regions

The MSP Directive and HELCOM-VASAB Guidelines – The Guideline for the implementation of ecosystem-based approach in MSP in the Baltic Sea area (HELCOM and VASAB, 2016a) and the Guidelines on transboundary consultations, public participation and cooperation (HELCOM and VASAB, 2016b) outline the key common features for MSP in the different countries, for example, with the impetus to apply an integrative and ecosystem-based approach, ensuring stakeholder involvement and ensuring a coordinated cross-border cooperation process. However, the marine uses are diverse across and within these countries and autonomous regions. There are also different shore types, different density in terms of coastal settlements and infrastructure, as well as different legal bases, cultures and systems for spatial planning. The associated processes and legal statuses of plans are also different across the Baltic Sea Region (Morf et al., 2019). Several of the countries also have a variety of mechanisms established for coastal or marine governance at the sub-national level, not

least in relation to the promotion of blue growth, integrated coastal management, environmental protection and implementing the EU Water Framework Directive.

Map 20 below illustrates the governance levels and boundaries for MSP in the countries in the Baltic Sea region. As illustrated, there are different locus of responsibilities of MSP in the different sea areas. In some countries and sub-regions, there are overlaps between local and regional planning and the national MSP. In other areas MSP is tasked at regional level, while overseen by national guidelines or policies, while in others there are no overlaps in the sea between the different planning levels. The status of the maritime spatial plans in the respective Baltic Sea Region countries are also briefly be accounted for below.

Map 20: MSP Governance levels
Source: Nordregio (Map by Johanna Jokinen)

The **Finnish** MSP include three non-binding maritime spatial plans for the Finnish territorial waters and the EEZ, with the purpose to promote the sustainable development and growth of different uses of the marine area, the sustainable use of natural resources, and the achievement of a good status of the marine environment. All three institutional tiers are involved in the Finnish MSP process, where the development of plans has been led by a national coordination group consisting of the Regional Councils and the Ministry of the Environment ensuring coherence across maritime planning areas. The result is one maritime spatial plan for Finland drafted in three parts. Finnish MSP applies to territorial waters and EEZ and overlaps with regional and municipal planning in territorial and onshore waters, which is also a key mechanism for integrating land-sea interactions in MSP. The Finnish maritime spatial plan has been approved (HELCOM and VASAB, 2020c; Morf et al., 2019).

MSP on **Åland** can be considered equivalent to national level planning as the Government of Åland, based on the Autonomy Act, has the mandate to plan its territory. The maritime spatial plan for Åland has a guiding status and covers public waters on the territorial sea outwards to the Finnish EEZ and the Swedish territorial sea and EEZ. The purpose is to promote sustainable use, development and growth and to contribute to good water quality and good environmental status. The Government of Åland (GoA) is responsible for planning the sea from the shoreline outwards, while municipalities are responsible for planning onshore. The maritime spatial plan has been approved. (HELCOM and VASAB, 2020c; Morf et al., 2019).

In **Sweden**, three distinctive national Maritime Spatial plans are developed, encompassing the EEZ and territorial waters. The plans have a guiding status and should result in the better usage of marine waters and the identification of which areas are best suited for each activity. The responsibility for MSP is located at the national level, where the Swedish Agency for Marine and Water Management is the competent authority. There is a planning overlap with coastal municipalities in the territorial waters, where municipal comprehensive planning cover both internal waters and territorial sea out to 12 nautical miles. Coordinating between the planning levels and scales is facilitated by the County Administrative Boards. The marine spatial plans have been submitted to the Swedish Government for adoption at the latest by May 2021. (HELCOM and VASAB, 2020g; Morf et al., 2019).

The **Latvian** maritime spatial plan applies to the whole marine territory, including internal waters, territorial waters as well as the EEZ. The aim of the Marine Plan is to achieve efficient and sustainable use of marine space, reconciling the interests of different sectors. The Latvian sea area is under national responsibility, and more specifically, the Ministry of Environmental Protection and Regional Development. However, different national ministries provide sector planning and management in marine areas. There is an overlap between municipal and national planning, where municipalities are responsible for planning their territory through spatial plans and within Latvian territorial waters of 2 km extending from the shoreline. Guidelines for planning marine coastal waters and the adjacent land areas at the

local level has been developed. The Latvian MSP was approved by the Government in May 2019. (HELCOM and VASAB, 2020e; Morf et al., 2019).

In **Estonia**, the Estonian Government is responsible for MSP, which in turn is carried out by the Ministry of Finance's Planning Department. As the Estonian Maritime Spatial plan covers the entire Estonian marine area, including the EEZ, the territorial waters, and up to the coastline, there is no planning overlap with municipalities. The main objective of the plan is to define the long-term uses of the assigned marine area through a public process. As of early 2022 the Estonian MSP has passed public display and public discussion and is moving towards adaptation.. However, two pilot maritime spatial plans were adopted for the Hiiu Island and Pärnu Bay area already in 2016 and 2017, which will remain in effect (HELCOM and VASAB, 2020b; Morf et al., 2019).

MSP in **Lithuania** is based at national level, with the Ministry of Environment coordinating the process. MSP part of the Comprehensive Plan of the Republic of Lithuania, which shall implement consequent planning for land and maritime space in one document. The Comprehensive plan applies to the entire marine area of Lithuania, including territorial waters and the EEZ and is a legally binding document. The plan was adopted by the Seimas of the Republic of Lithuania on 11 June 2015 (HELCOM and VASAB, 2019). The concept of the new plan was approved in 2020, and the new Comprehensive Plan of the Territory of Lithuania is approved in 2021.

In **Germany**, administrative responsibilities for planning in marine areas are divided between different jurisdictions and planning systems for the three coastal federal states and the federal level. The Federal Maritime and Hydrographic Agency (BSH) is responsible for administering MSP in the EEZ. At federal state level, MSP is part of the state development programmes (Landesentwicklungsplan") for each coastal federal state with respective state plans. Plans for the EEZ (one for the North Sea EEZ and one for the Baltic Sea EEZ) have been in force since 2009 and are currently being revised, and new plans are expected to come into force in 2021/22. (HELCOM and VASAB, 2020d; Morf et al., 2019).

In **Denmark**, there are a large number of sectoral plans applied to governing maritime space. The adoption of the Act on Maritime Spatial Planning establishes an integrated Maritime Spatial plan, integrating the sectoral plans. MSP in Denmark shall promote economic growth, the development of marine areas and the use of marine resources on a sustainable basis. The coming spatial plan applies to the internal marine waters, the territorial sea and the EEZ and the process is managed by the Danish Government. Denmark published its first maritime spatial plan in March 2021 as a digital platform (www.havplan.dk/en). The plan is under consultation until September 2021, during which time the plan has legal effect (HELCOM and VASAB, 2020a).

The maritime spatial planning process in **Poland** is divided into the development of several plans for different scales, with one spatial plan covering the internal sea waters, territorial sea and the exclusive economic zone on a scale 1:200 000. Polish MSP regulations

apply to the whole Polish sea area, including the internal waters, the territorial sea and EEZ. Polish sea areas are governed by the Minister responsible for maritime economy affairs. In turn, the marine areas are administered by the regional maritime administration, where the Directors of Maritime Offices are responsible for the preparation of maritime spatial plans. In April 2021, the Council of Ministers adopted the plan for the scale 1:200 000. The plan was published in the Journal of Laws of 2021, item 935, and entered into force on May 22, 2021. The plan was also submitted to the European Commission. (HELCOM and VASAB, 2020f).

Russia is currently developing its MSP Roadmap for establishing MSP framework in the country. The Maritime Spatial Plan shall cover the internal waters, the territorial sea, EEZ and shelf. In the Baltic Sea, this covers the Russian part of the Gulf of Finland.

The systems and the pandemics

The report 'Cities and Pandemics: Towards a More Just, Green and Healthy Future' (UN Habitat, 2021) advises to '*Strengthen coordination between cities, regions and territories through the creation of shared decision-making platforms'* and '*The establishment of regional boards with the mandate and power to cooperate, unify and manage networks of cities or urban agglomerations'*. Considering the Baltic Sea Region governance and territorial & maritime spatial planning presented in this chapter, Text box 16 list some aspects for consideration.

Text box 16 Systems – dealing with the pandemics

- The implementation of regional boards, especially in cross-border regions, would facilitate cross-border planning on issues such as security, health, labour market, which have been strongly affected by the pandemics.
- Cross-border cooperation at regional level, with mandate and power to address pandemic issues, might be challenging between the EU and non-EU countries in the Baltic Sea Region.

4.8.2 TRENDS RELEVANT FOR SYSTEM TOWARDS 2040

Looking at the future, the system describes an integrated picture of land and sea spatial planning. Several trends of different themes may influence the development of the various planning systems, as it encompasses everything in the Baltic Sea Region. Recent scenario works have highlighted possible futures for the Baltic Sea Region and the Baltic Sea.

Although most trends described so far are linked to the system, increased digitalisation for future planning is a relevant trend offering digital solutions. In addition, increasing cooperation across governance levels, sectors, and countries is a relevant trend affecting the system. Also public participation and the involvement of the civil society in planning processes may still become stronger in future. Land and sea spatial planning are influenced by sector policies, such as transport and environmental policy. Studies on spatial planning systems in the EU have shown that changes in the spatial planning system regard the increased

importance of policy integration in spatial planning and territorial governance, the increased engagement with citizens and stakeholders, as well as that spatial instruments have been becoming more robust and able to adjust to changing circumstances(ESPON, 2018a). When it comes to maritime planning, a multi-sectoral and multi-stakeholder approach and dialogue is being followed through projects on maritime spatial planning in the Baltic Sea Region, e.g. through the Capacity4MSP project. Maritime spatial planning has moved towards an integrated approach and it is estimated that in the next years a third of the world's EEZs could be government approved marine spatial plans (UNESCO Paris et al., 2017). Thoughts and discussions on the institutional framework and marine governance may be a game changer and relevant for the future (Casimiro and Guerreiro, 2019).

Text box 17 Scenarios inspiring the future for the system and the maritime system

Two future territorial pathways have been developed for the Baltic Sea Region. The 'well-being in a circular economy – a RE-mind for a good life', describes a future where the Baltic Sea Region has developed into a sharing and circular economy region, where citizens have consciously decided to change the existing linear economic model in favour of a better quality of life. In this scenario decentralised patterns are observed, where second and third tier cities and towns become the main centres, reducing the importance and concentration in metropolitan and large urban areas. The scenario 'Growing into tech giants – the ecological footprint clear-up' describes a future where the Baltic Sea Region is a giant in green technology and the achievements of the 4th industrial evolution are in the epicentre of everyday life. The mix of innovation and green technology have led to a reduction of the ecological footprint of the region. An increasing concentration of economic activity around the present metropolitan areas and growth centres which in most cases are the capital cities is observed. Both show what paths the system can take and how it can be directed for future planning. (ESPON, 2019b)

Three future maritime pathways have been developed for the Baltic Sea, developed from a Finnish perspective, considering the whole Baltic Sea. 'Dancing with big businesses' presents the Baltic Sea as a source for energy and minerals, putting the interests of companies on the forefront. Environmental policies are unaffected, the maritime environment is deteriorating and species are at risk. Large corporations build extensive farms for off shore wind power and maritime logistics increase. The scenario 'Profitability under the environment's terms' presents the Baltic Sea as an oasis of recreation and experiences. Environmental concerns grow, resulting in small transport volume. People's quality of life is important, transforming their work-life balance. Marine nature and species revive and environmental regulations become stricter. In the 'Baltic Sea of restrictions and tensions' the sea is a breadbasket and strategic playing field. Power struggles and tensions increase. The ports in the West gain more importance and cooperation with Russia becomes more challenging. The maritime infrastructure gets weaker and becoming energy self-sufficient is emphasised with the development of a joint energy union of the EU. (Capful and WSP, 2019)

The land and sea meet in the five different scenarios, showing five different pathways of the Baltic Sea Region and the Baltic Sea. The system and the maritime system can play a vital role in addressing challenges, promoting cooperation and driving the territories and the sea to progress for all place and all people. For this, committed players, cooperation and dialogue are the secrets for success.

5. CONCLUSIONS AND NEXT STEPS

Understanding the present is necessary for designing the future. It is a status to compare to and challenge against new developments, challenges and changes. Furthermore, the shared value-base has identified the direction the vision will be shaped of. A mindset shift towards more sustainability, cohesion and justice, a better quality of life, inevitable technological advancements and different future normals will and do shape our lives. Related trends are interconnected to each and influence each other. The pearls, strings, patches and system are co-dependent and influenced by all these trends. At the same time, other vision documents, such as the 'Vision for rural areas for 2040', the 'Maritime vision of 2030' from the BaltSeaPlan project point towards more resilient and more sustainable solutions for the future.

A balanced territorial development requires place-based and people-centred approaches. Looking at challenges with a fresh eye helps to identify the links and plan wisely. And this is necessary, as our lives are changing constantly. Adapting and preparing for these changes is necessary for desirable futures. And this is the aim of the vision, to develop a desirable future for the Baltic Sea Region that gives a direction and scope for people, and for policy makers to design informed policies.

Although the influence of these trends may be different in different territories, the vision shall address them constructively though policy, social security and sustainability measures, educational processes and knowledge exchange, together with players from different levels and involving the business sector, who can support a sustainable transition, as well as citizens who need to carry over the changes. In that respect strong integration and cooperation across the VASAB members is necessary to ensure this smooth process towards getting closer to the desired future of the vision.

With the finalisation of the co-creation process, the next steps of the process are the stakeholder consultations, which VASAB will initiate in the beginning of 2022 until 15 July 2022. An update version of the vision document will be available to be shared for this process. The stakeholders' consultation concept and presentation material provided will support this process. These materials are user-friendly and easily communicative, so that VASAB members can use them in their stakeholder consultations and participants will have easy access to all necessary information. At the end of the consultation process (July 2022), with the support of the VASAB Secretariat, all comments received from this process will be reviewed, rated concerning their relevance and delivered to the service provider in one file

who will then revise the vision document accordingly. The Report on the results of the stakeholder consultations will be delivered on 1 August 2022. The stakeholder consultation increases the ownership, not only of the VASAB stakeholders, but also of relevant Baltic Sea Region stakeholders and also provides additional feedback, checks the possible uptake of the vision and eventually improves and refines the vision.

REFERENCES

Aguiar Borges L (2020) Future Trends. Baltic Sea Region. Turku, Finland.

Baltadapt (2013) BALTADAPT STRATEGY for adaptation to cliamte change in the Baltic Sea Region. A proposal preparing the ground for political endorsement throughout the Baltic Sea Region.

Baltic LINes (2016) *Shipping in the Baltic Seae: past, present and future developments relevant for Maritime Spatial Planning*. Project Report. Hamburg. Available at: https://vasab.org/wp-content/uploads/2018/06/Baltic-LINes-Shipping_Report-20122016.pdf.

BBSR (ed.) (2018) *Raumordnungsbericht 2017: Daseinsvorsorge sichern*. Stand Juni 2017. Bonn: Bundesamt für Bauwesen und Raumordnung.

BBSR (2021) *Raumordnungsbericht 2021. Wettbewerbsfähigkeit stärken*. Bonn: Bundesinstitut für Bau-, Stadt- und Raumforschung. Available at: https://www.bbsr.bund.de/BBSR/DE/veroeffentlichungen/sonderveroeffentlichungen/2021/rob-2021-dl.pdf;jsessionid=F61B72D1F7E1C1F7D5549EFB5CAF2CD5.live11293?__blob=publicationFile&v=4.

Böhme K and Lüer C (2016) Europe's territorial futures between daydreams and nightmares. *Europa XXI. Territorial uncertainty as a challenge for regional policy in Europe* 30: 5–22. DOI: http://dx.doi.org/10.7163/Eu21.2016.30.1.

Böhme K, Antikainen J, Zillmer S, et al. (2016) *Looking towards 2030: Preparing the Baltic Sea Region for the future*. Stockholm: Swedish Agency for Economic and Regional Growth (Tillväxtverket). Available at: http://www.strategyforum2016.eu/media/reports/looking-towards-2030-report-33885447.

Böhme K, Lüer C and Toptsidou M (2019) Towards a European Geography of Future Perspectives: A Story of Urban Concentration. In: Medeiros E (ed.) *Territorial Cohesion: The Urban Dimension*. Cham: Springer International Publishing, pp. 173–191. DOI: 10.1007/978-3-030-03386-6_9.

Borg J, Kääriä P and Zweifel UL (2016) *Ecological coherence assessment of the Marine Protected Area _ network in the Baltic Sea*. Baltic Sea Environment Proceedings 148. Helsinki: HELCOM - Baltic Marine Environment Protection Commission. Available at: https://helcom.fi/wp-content/uploads/2019/08/BSEP148.pdf (accessed 5 July 2021).

Boverket (2014) *Vision for Sweden 2025*. Karlskrona: Swedish National Board of Housing Building and Planning. Available at: https://www.boverket.se/globalassets/publikationer/dokument/2014/vision-for-sweden-2025.pdf (accessed 3 March 2021).

Boverket (2020) Regional planering - för en stärkt samordning. Available at: https://www.boverket.se/sv/samhallsplanering/sa-planeras-sverige/regional-planering/ (accessed 5 July 2021).

Capful and WSP (2019) *Scenarios for maritime areas 2050. Preparation of scenarios for the future of Finnish maritime areas*.

Casimiro D and Guerreiro J (2019) Trends in Maritime Spatial Planning in Europe: An Approach to Governance Models. *Journal of Environmental Protection* 10: 1677–1698.

COM(2020) 380 final (2020) EU Biodiversity Strategy for 2030 Bringing nature back into our lives. COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS. Available at: https://eur-lex.europa.eu/resource.html?uri=cellar:a3c806a6-9ab3-11ea-9d2d-01aa75ed71a1.0001.02/DOC_1&format=PDF.

Danish Ministry of Trade and Industry (2019a) *Oversigt over nationale interesseri kommuneplanlægning*. Copenhagen. Available at: https://planinfo.erhvervsstyrelsen.dk/sites/default/files/media/publikation/oversigt_over_nationale_interesser_i_kommuneplanlaegning.pdf.

Danish Ministry of Trade and Industry (2019b) *Vækst og Udvikling Gennem Fysisk Planlægning _ Bedre rammer for virksomheder, borgere og kommuner i hele landet*. Copenhagen. Available at: https://planinfo.erhvervsstyrelsen.dk/sites/default/files/media/publikation/landsplanredegoerelse_2019.pdf (accessed 24 May 2021).

Dudley N, Shadie P and Stolton, S (2013) *Guidelines for Applying Protected Area Management Categories*. 21, Best Practice Protected Area Guidelines Series. Gland, Switzerland: International Union for Conservation of Nature. Available at: https://portals.iucn.org/library/sites/library/files/documents/PAG-021.pdf (accessed 24 May 2021).

EESC (2019) *Circular economy strategies and roadmaps in Europe: Identifying synergies and the potential for cooperation and alliance building*. QE-01-19-425-EN-N, Study, 15 April. European Economic and Social Committee. Available at: https://www.eesc.europa.eu/en/our-work/publications-other-work/publications/circular-economy-strategies-and-roadmaps-europe-study.

Ehler C and Douvere F (2006) *Visions for a Sea Change. Technical Report of the International Workshop on Marine Spatial Planning*. 46, ICAM Dossier 3, IOC Manual & Guides. Paris: UNESCO - Intergovernmental Oceanographic Commission. Available at: https://repository.oceanbestpractices.org/bitstream/handle/11329/204/48.pdf?sequence=1&isAllowed=y.

Ehler C, Zaucha J and Gee K (2019) Maritime/Marine Spatial Planning at the Interface of Research and Practice. In: *Maritime Spatial Planning*. Cham: Palgrave Macmillan. Available at: https://link.springer.com/chapter/10.1007/978-3-319-98696-8_1#citeas.

ESPAS (2016) *Global Trends to 2030: Can the EU meet the challenges ahead?* European Strategy and Policy Analysis Systems.

ESPON (2006) *ESPON SMESTO: The Role of Small and Medium-Sized Towns*. Final Report. Luxembourg: ESPON EGTC.

ESPON (2007) *Update of Selected Potential Accessibility Indicators*. Final Report. ESPON EGTC. Available at: https://www.espon.eu/sites/default/files/attachments/espon_accessibility_update_2006_fr_070207.pdf.

ESPON (2018a) *COMPASS - Comparative Analysis of Territorial Governance and Spatial Planning Systems in Europe - Final Report*. Luxembourg.

ESPON (2018b) *COMPASS - Comparative Analysis of Territorial Governance and Spatial Planning Systems in Europe - Volume 3 - Phase 1 questionnaires*. Luxembourg.

ESPON (2018c) *LinkPAs - Linking networks of protected areas to territorial development*. Volume 1. Luxembourg: ESPON EGTC. Available at: https://www.espon.eu/protected-areas (accessed 24 May 2021).

ESPON (2018d) *Possible European Territorial Futures*. Luxembourg: ESPON. Available at: https://www.espon.eu/territorial-futures (accessed 18 September 2018).

ESPON (2019a) *BT 2050 - Territorial Scenarios for the Baltic Sea Region 2050. Interim Report.*

ESPON (2019b) *BT2050 - Territorial Scenarios for the Baltic Sea Region 2050. Final Report.*

ESPON (2019c) *European Territorial Reference Framework. Final Report.* Luxembourg: ESPON EGTC. Available at: https://www.espon.eu/etrf (accessed 11 February 2020).

ESPON (2020a) *BT2050 - Territorial Scenarios for the Baltic Sea region 2050*. Final Report. Luxembourg: ESPON CU.

ESPON (2020b) *ESPON QoL - Quality of Life Measurements and Methodology. Final Report.* Luxembourg: ESPON EGTC.

Estonian Ministry of the Interior (2013) *National Spatial Plan Estonia 2030 +*. Tallin: Estonian Ministry of the Interior. Available at: https://eesti2030.files.wordpress.com/2014/02/estonia-2030.pdf (accessed 3 March 2021).

European Comission (2011) Our life insurance, our natural capital: an EU biodiversity strategy to 2020. Available at: http://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX:52011DC0244 (accessed 22 April 2018).

European Commission (2016) *No net land take by 2050?* Science for Environment Policy, Future Brief. European Union. Available at: https://ec.europa.eu/environment/integration/research/newsalert/pdf/no_net_land_take_by_2050_FB14_en.pdf (accessed 1 June 2021).

European Commission (2019) *Communication from The Commission to The European Parliament, The European Council, The Council, The European Economic And Social Committee and The Committee Of The Regions. The European Green Deal*. COM(2019) 640 final, Text, 12

November. Brussels. Available at: https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal_en (accessed 19 December 2019).

European Commission (2020a) Baltic energy market interconnection plan. Available at: https://ec.europa.eu/energy/topics/infrastructure/high-level-groups/baltic-energy-market-interconnection-plan_en (accessed 27 May 2021).

European Commission (2020b) European MSP Platform: Baltic sea. Available at: https://www.msp-platform.eu/sea-basins/baltic-sea-0 (accessed 10 May 2021).

European Commission (2020c) Farm to Fork Strategy: For a fair, healthy and environmentally-friendly food system. Available at: https://ec.europa.eu/food/sites/food/files/safety/docs/f2f_action-plan_2020_strategy-info_en.pdf (accessed 28 April 2021).

European Commission (2020d) *Shaping the future policy of the European Maritime Space - Motorways of the Sea Detailed Implementation Plan of the European Coordinator*. Mobility and Transport. Brussels: European Commission. Available at: https://ec.europa.eu/transport/sites/default/files/2020-mos-dip.pdf (accessed 27 May 2021).

European Commission (2020e) Working with Parliament and Council to make the CAP reform fit for the European Green Deal. Available at: https://ec.europa.eu/info/sites/default/files/food-farming-fisheries/key_policies/documents/factsheet-cap-reform-to-fit-european-green-deal_en.pdf.

European Commission (2021a) Commission welcomes agreement on the Connecting Europe Facility to fund greener, more sustainable transport and energy networks, and digitalisation. Available at: https://ec.europa.eu/commission/presscorner/detail/en/ip_21_1109 (accessed 27 May 2021).

European Commission (2021b) 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.

European Commission (2021c) EU Strategy for the Baltic Sea Region. Available at: https://www.balticsea-region-strategy.eu/ha-spatial-planning.

European Commission (n.d.) Developing an Implementation Strategy for the Sustainable Blue Growth Agenda for the BSR. Available at: http://ec.europa.eu/newsroom/mare/document.cfm?doc_id=17074 (accessed 10 May 2021).

European Commission, European Economic and Social Committee and Committee of the Regions (2007) Integrated Maritime Policy for the European Union. European Commission SEC. Available at: https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2007:0575:FIN:EN:PDF.

European Environment Agency (n.d.) Biotope network. Available at: https://www.eea.europa.eu/help/glossary/gemet-environmental-thesaurus/biotope-network.

European Parliament (2014) Maritime Spatial Planning Directive. Available at: http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32014L0089&from=EN.

European Parliament (2016) *Industry 4.0*. February.

European Parliament (2018) *Global Trends to 2035. Economy and Society.* November.

European Parliament (2021) The European Union and forests. Available at: https://www.europarl.europa.eu/factsheets/en/sheet/105/the-european-union-and-forests (accessed 24 March 2021).

European Political Strategy Centre (2017) *10 Trends shaping migration*.

Finish Ministry of the Environment (2015) *Ett möjliggörande Finland som har en förmåga att förnya sig: En utvecklingsbild av regionstrukturen och trafiksystemet 2050*. Helsinki. Available at: https://julkaisut.valtioneuvosto.fi/bitstream/handle/10138/158242/ALLI_Ett%20m%c3%b6jliggg%c3%b6rande%20Finland%20som%20har%20en%20f%c3%b6rm%c3%a5ga%20att%20f%c3%b6rnya%20sig_En%20utvecklingsbild%20av%20regionstrukturen%20och%20trafifikssystemet%202050.pdf?sequence=2&isAllowed=y (accessed 24 May 2021).

Finnish Government (2018) National land use guidelines. Available at: https://www.ymparisto.fi/en-US/Living_environment_and_planning/Land_use_planning_system/National_land_use_guidelines (accessed 5 July 2021).

Fritsche U, Brunori G, Chiaramonti D, et al. (2020) *Future transitions for the Bioeconomy towards Sustainable Development and a Climate Neutral Economy*.

Government of Russian Federation (2019) Стратегия пространственного развития Российской Федерации на период до 2025 года. Available at: https://economy.gov.ru/material/file/a3d075aa813dc01f981d9e7fcb97265f/130219_207-p.pdf.

Government of Russian Federation (2020) Стратегия развития Арктической зоны Российской Федерации и обеспечения национальной безопасности на период до 2035 года. Available at: http://publication.pravo.gov.ru/Document/View/0001202010260033.

Grunfelder J, Rispling L and Norlén G (2016) *State of Nordic Region*. 16:1, Nordregio Report. Stockholm: Nordregio. Available at: http://norden.diva-portal.org/smash/get/diva2:906913/FULLTEXT01.pdf.

Grunfelder J, Norlén G, Randall L, et al. (2020) *State of the Nordic Region*. Stockholm: Nordic Council of Ministers. Available at: https://pub.norden.org/nord2020-001/# (accessed 15 March 2021).

HELCOM (2013) *Climate change in the Baltic Sea Area: HELCOM thematic assessment in 2013*. 137, Baltic Sea Environment Proceedings. Helsinki: Helsinki Commission: Baltic Marine Environment Protection Commission. Available at: http://www.helcom.fi/Lists/Publications/BSEP137.pdf.

HELCOM (2018) *Thematic assessment of biodiversity 2011-2016. Supplementary report to the HELCOM 'State of the Baltic Sea' report.*

HELCOM (2021) BSAP update 2021. Available at: https://helcom.fi/baltic-sea-action-plan/bsap-update-2021/ (accessed 10 July 2021).

HELCOM (n.d.) EBSAs in the Baltic Sea. Available at: https://maps.helcom.fi/portal/apps/MapJournal/index.html?appid=590aee36bf2c4dcb99c620779ac84bce (accessed 15 July 2021a).

HELCOM (n.d.) Marine Protected Areas. Available at: https://helcom.fi/action-areas/marine-protected-areas/ (accessed 5 July 2021b).

HELCOM and VASAB (2010) *Baltic Sea Broad-Scale Maritime Spatial Planning (MSP) Principles*. Available at: https://helcom.fi/media/documents/HELCOM-VASAB-MSP-Principles.pdf (accessed 10 May 2021).

HELCOM and VASAB (2013) Regional Baltic MSPP Roadmap 2013-2020. . Adopted by the HELCOM Ministerial Meeting on 3 October 2013. Available at: https://helcom.fi/media/documents/Regional-Baltic-MSP-Roadmap-2013-2020.pdf (accessed 10 May 2021).

HELCOM and VASAB (2016a) Guideline for the implementation of ecosystem-based approach in Maritime Spatial Planning (MSP) in the Baltic Sea area. Available at: https://helcom.fi/media/documents/Guideline-for-the-implementation-of-ecosystem-based-approach-in-MSP-in-the-Baltic-Sea-area_June-2016.pdf (accessed 24 September 2021).

HELCOM and VASAB (2016b) Guidelines on transboundary consultations, public participation and co-operation. Available at: https://helcom.fi/media/documents/Guidelines-on-transboundary-consultations-public-participation-and-co-operation-_June-2016.pdf (accessed 24 September 2021).

HELCOM and VASAB (2019) Country Fiche Lithuania. Available at: https://helcom.fi/media/documents/Country-fiche_LT_MSP_March2019.pdf (accessed 10 May 2021).

HELCOM and VASAB (2020a) Country Fiche Denmark. Available at: https://helcom.fi/wp-content/uploads/2020/04/Country-fiche-DK-MSP.pdf (accessed 10 May 2021).

HELCOM and VASAB (2020b) Country Fiche Estonia. Available at: https://helcom.fi/wp-content/uploads/2020/04/Country-fiche_EE_MSP.pdf (accessed 10 May 2021).

HELCOM and VASAB (2020c) Country Fiche Finland and Åland. Available at: https://helcom.fi/wp-content/uploads/2020/04/Country-fiche_FI_AX.pdf (accessed 10 May 2021).

HELCOM and VASAB (2020d) Country Fiche Germany. Available at: https://helcom.fi/wp-content/uploads/2020/04/Country-fiche_DE_MSP.pdf (accessed 10 May 2021).

HELCOM and VASAB (2020e) Country Fiche Latvia. Available at: https://helcom.fi/wp-content/uploads/2020/04/Country-fiche_-LV_MSP.pdf.

HELCOM and VASAB (2020f) Country fiche Poland. Available at: https://helcom.fi/wp-content/uploads/2020/04/Country-fiche_PL_MSP.pdf (accessed 10 May 2021).

HELCOM and VASAB (2020g) Country fiche Sweden. Available at: https://helcom.fi/wp-content/uploads/2020/04/Country-fiche_SE_MSP.pdf.

HELCOM and VASAB (2021) *Regional Maritime Spatial Planning Roadmap 2021-2030*. HELCOM - VASAB. Available at: https://helcom.fi/media/publications/Regional-Maritime-Spatial-Planning-Roadmap-2021-2030.pdf.

Höjer O, Eriksoon D, Hammersland J, et al. (2009) *Svenskt Naturskydd 100 År*. Stockholm: Naturvårdsverket. Available at: https://www.naturvardsverket.se/Documents/publikationer/978-91-620-8385-4.pdf?pid=4068.

Hook L (2019) Year in a word: Flygskam. Available at: https://www.ft.com/content/5c635430-1dbc-11ea-97df-cc63de1d73f4 (accessed 2 June 2021).

Intergovernmental Panel on Climate Change (2021) *Climate Change 2021. The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change.* August.

Interreg Baltic Sea Region (2004) COMMIN- The Baltic Spatial Conceptshare. European Union - Interreg. Available at: http://www.dex.leontief.net/PDF/COMMIN_Flyer.pdf (accessed 1 June 2021).

Interreg Baltic Sea Region and FanpLESStic-sea Project (2019) *Review of existing policies and research related to microplastics*. December.

Interreg Baltic Sea Region, VASAB and NSB CoRe (2019) NSB CoRe Project. Work Package 4 'Spatial Planning for NSB CoRe Networks Development'. Towards Joint transnational spatial vision on regional development, logistics and mobility of the North Sea Baltic corridor 2050.

JRC (2019) *The Future of Cities. Opportunities, challenges and the way forward*.

JRC (2021) *The Demographic Landscape of EU Territories: Challenges and Opportunities in Diversely Ageing Regions.* Luxembourg: Publications Office of the European Union. Available at: https://data.europa.eu/doi/10.2760/658945 (accessed 5 March 2021).

Kalchenko O, Evseeva S, Evseeva O, et al. (2020) Strategy of economic and social development of St. Petersburg until 2030 achievement. *SHS Web of Conferences* Horák J, Vrbka J, and Rowland Z (eds) 73: 01010. DOI: 10.1051/shsconf/20207301010.

Kidd S, Jones H and Jay S (2019) Taking Account of Land-Sea Interactions in Marine Spatial Planning. In: *Maritime Spatial Planning: Past, Present, Future.* Cham Switzerland: Palgrave Macmillan, pp. 245–270.

Kluge J, Paul M and Stiftung Wissenschaft Und Politik (2020) Russia's Arctic strategy through 2035: grand plans and pragmatic constraints. German Institute for International and Security Affairs. DOI: 10.18449/2020C57.

Krznaric R (2020) *The Good Ancestor. How to Think Long Term in a Short-Term World*. WH Allen, Penguin Random House.

Lang T, Sonntag M and Tenz E (2005) *Small and Medium-Sized Cities in the Baltic Sea Region Socio-Economic and Cultural Approaches to Urban Development*. Berlin: Edition Kirchhof & Franke.

Latvian Ministry of Regional Development and Local Government (2010) Sustainable Development Strategy of Latvia until 2030. Available at: https://pkc.gov.lv/sites/default/files/inline-files/LIAS_2030_parluks_en_0.pdf (accessed 4 March 2022).

Leaders (2019) Millennial socialism. Available at: https://www.economist.com/leaders/2019/02/14/millennial-socialism (accessed 2 June 2021).

Leningrad Region Legislative Assembly (2016) Стратегия социально-экономического развития Ленинградской области до 2030 года. Available at: https://storage.strategy24.ru/files/strategy/201703/4e3108c3d240eb0c4fa507a2aa996e6c.pdf (accessed 6 February 2021).

Lidmo J, Huynh D and Stjernberg M (2020) *Nationellt inflytande i den fysiska planeringen: Nordisk utblick till Finland, Norge och Danmark*. Slutrapportframtagen på uppdrag av Boverket. Stockholm: Nordregio. Available at: https://www.boverket.se/contentassets/e337eb6de57c4a50b3a99db04db8b77d/nationellt-inflytande-i-den-fysiska-planeringen.

Lithuanian Ministry of Environment (2019) Summary. The preparation phase of the conceptual framework. The comprehensive Plan of the Territory of the Republic of Lithuania. Available at: http://www.bendrasisplanas.lt/2019/12/13/en/.

Löfving L, Kamuf V, Heleniak T, et al. (2021) Can digitalization be a tool to overcome spatial injustice in sparsely populated regions? The cases of Digital Västerbotten (Sweden) and Smart Country Side (Germany) Linnea , Viktoria, Timothy , Sabine Weck & Gustaf Norlén. *European Planning Studies*. DOI: https://doi.org/10.1080/09654313.2021.1928053.

Lundgren A, Randall L and Norlén G (2020) *State of the Nordic Region 2020: Wellbeing, health and digitalisation edition*. Copenhagen: Nordic Council of Ministers. Available at: http://norden.diva-portal.org/smash/get/diva2:1482486/FULLTEXT01.pdf.

Lutz W, Amran G, Bélanger A, et al. (2019) *Demographic Scenarios for the EU. Migration, population and education*. European Commission.

MaaS Alliance (n.d.) What is MaaS? Available at: https://maas-alliance.eu/homepage/what-is-maas/ (accessed 2 June 2021).

Mazzucato M (2021) *Mission: Economics: A Moonshot Approach to the Economy*. London, UK: Allen Lane.

Meier HEM, Höglund A, Eilola K, et al. (2017) Impact of accelerated future global mean sea level rise on hypoxia in the Baltic Sea. *Climate Dynamics* 49(1–2): 163–172.

METREX (2019) *Nordic-Baltic Space Transnaitonal Development Perspective*. Urban Environment Publications 9.

Ministry of Economy (2015) НАЦИОНАЛЬНАЯ СТРАТЕГИЯ УСТОЙЧИВОГО СОЦИАЛЬНО-ЭКОНОМИЧЕСКОГО РАЗВИТИЯ РЕСПУБЛИКИ БЕЛАРУСЬ НА ПЕРИОД ДО 2030 ГОДА. Available at: https://www.economy.gov.by/uploads/files/NSUR2030/Natsionalnaja-strategija-ustojchivogo-sotsialno-ekonomicheskogo-razvitija-Respubliki-Belarus-na-period-do-2030-goda.pdf.

Ministry of Local Government and and Modernisation (2019) *National expectations regarding regional and municipal planning 2019–2023*. Oslo: Norwegian Government. Available at: https://www.regjeringen.no/contentassets/cc2c53c65af24b8ea560c0156d885703/nasjonale-forventninger-2019-engelsk.pdf.

Moodie J, Kull M, Cedergren E, et al. (2021) Transboundary marine spatial planning in the Baltic Sea Region: towards a territorial governance approach? *Maritime Studies* 20: 27–41. DOI: https://doi.org/10.1007/s40152-020-00211-0.

Morf A, Moodie J, Gee K, et al. (2019) Towards sustainability of marine governance: Challenges and enablers for stakeholder integration in transboundary marine spatial planning in the Baltic Sea. Ocean & Coastal Management. 177: 200–212. DOI: https://doi.org/10.1016/j.ocecoaman.2019.04.009.

Murray C, Müller-Karulis B, Carstensen J, et al. (2019) Past, Present and Future Eutrophication Status of the Baltic Sea. *Frontiers in Marine Science* 6. DOI: https://doi.org/10.3389/fmars.2019.00002.

National Geographic (n.d.) Anthropocene. Available at: https://www.nationalgeographic.org/encyclopedia/anthropocene/ (accessed 31 May 2021).

NCM (2020) Ministerial Declaration Digital North 2.0. Available at: https://www.norden.org/en/declaration/ministerial-declaration-digital-north-20 (accessed 5 April 2021).

New Leipzig Charter (2020) *The new Leipzig charter: The transformative power of cities for the common good*. Leipzig: Ministerial meeting of the EU under the German presidency of the Federal Ministry of the Interior, Building and Community. Available at: https://ec.europa.eu/regional_policy/sources/docgener/brochure/new_leipzig_charter/new_leipzig_charter_en.pdf.

Nordic Council of Ministers (n.d.) Bioeconomy in the Baltic Sea Region. Available at: http://bsrbioeconomy.net/projects.html.

OECD (2013) *Definition of Functional Urban Areas (FUA)for the OECD metropolitan database*. Paris: OECD. Available at: https://www.oecd.org/cfe/regionaldevelopment/Definition-of-Functional-Urban-Areas-for-the-OECD-metropolitan-database.pdf (accessed 5 April 2021).

OECD (2016) *OECD Science, Technology and Innovation Outlook 2016*. September. Paris: OECD Publishing. Available at: http://dx.doi.org/10.1787/sti_in_outlook-2016-en.

OECD (2022) *Shrinking smartly in Estonia: Preparing Regions for Demographic Change*. OECD Rural Studies. Paris: OECD Publishing.

O'Neill BC, Kriegler E, Riahi K, et al. (2014) A new scenario framework for climate change research: the concept of shared socioeconomic pathways. *Climatic Change* 122: 387–400. DOI: https://doi.org/10.1007/s10584-013-0905-2.

PanBaltic Scope (2019) Lessons, stories and ideas on how to integrate Land-Sea Interactions into MSP.

Polish Ministry (2010) *National Spatial Development Concept 2030*. Warsaw. Available at: https://www.kooperation-ohne-grenzen.de/wp-content/uploads/2016/05/NSDC-2030.pdf.

Räisänen J (2017) Future Climate Change in the Baltic Sea Region and Environmental Impacts. In: *Oxford Research Encyclopedias: Climate Science*. Oxford: Oxford University Press.

Randers J (2012) *2052 : A Global Forecast for the next Forty Years*. White River Junction, Vt.: Chelsea Green Pub.

Reimer M, Getimis P and Blotevogel H (2014) *Spatial Planning Systems and Practices in Europe: A Comparative Perspective on Continuity and Changes*. Routledge. London.

Republic of Estonia. Government (2021) *Estonia 2035. Adopted by the Riigikogu on 12 May 2021*. Available at: file:///Users/mariatoptsidou/Downloads/Eesti%202035_PUHTAND%20%C3%9CLDOSA_210512_ENG_0.pdf.

Riahi K, van Vuuren DP, Kriegler E, et al. (2017) The Shared Socioeconomic Pathways and their energy, land use, and greenhouse gas emissions implications: An overview. *Global Environmental Change* 42: 153–168. DOI: https://doi.org/10.1016/j.gloenvcha.2016.05.009.

Rifkin J (2013) *The Third Industrial Revolution: How Lateral Power Is Transforming Energy, the Economy and the World.* Palgrave Macmillan.

Rispling L and Grunfelder J (2016) *Trends, challenges and potentials in the Baltic Sea Region.pdf*. Available at: https://tillvaxtverket.se/download/18.7c3ce8ba157d264d2e9cbf7f/1479389789736/Trends,%20challenges%20and%20potentials%20in%20the%20Baltic%20Sea%20Region.pdf (accessed 14 December 2018).

Sciforce (2019) Smart Farming: The Future of Agriculture. Available at: https://www.iotforall.com/smart-farming-future-of-agriculture/.

Security Council of the Russian Federation (2020) Основы государственной политики Российской Федерации в Арктике на период до 2035 года. Available at: http://www.scrf.gov.ru/security/economic/Arctic2035/ (accessed 1 June 2021).

Skilling D (2018) *The Baltic Sea Region Economies. Progress and priorities - a 20-year perspective.* Baltic Development Forum. Available at: http://www.bdforum.org/wp-content/uploads/2018/04/TBSREReport2018_210x297_webfinal.pdf.

Smas L (2018) Nordic geographies of urbanisation. In: *State of the Nordic Region*. Copenhagen: Nordic Council of Ministers. Available at: http://norden.diva-portal.org/smash/get/diva2:1180241/FULLTEXT01.pdf.

Sweitzer J, Langaas S and Folke C (1996) Land cover and population density in the Baltic Sea drainage basin: A GIS database. *AMBIO A Journal of the Human Environment* 25(3): 191–198.

Territorial Agenda (2020) *Territorial Agenda 2030: A future for all places*. Berlin: Ministerial meeting of the EU under the German presidency of the Federal Ministry of the Interior, Building and Community. Available at: www.territorialagenda.eu.

Törnqvist O, Jonsson P and Hume D (2019) Climate refugia in the Baltic sea. Modelling future important habitats by using climate projections. Pan Baltic Scope.

Trafikverket (2018) *Förslag till nationell plan för transportsystemet 2018–2029 Remissversion 2017-08-31*. 058. Borlänge: Trafikverket. Available at: http://trafikverket.diva-portal.org/smash/get/diva2:1363916/FULLTEXT02.pdf.

UN E (2019) *Special edition: progress towards the Sustainable Development Goals*. Special edition. United Nations, Economic and Social Council. Available at: https://unstats.un.org/sdgs/files/report/2019/secretary-general-sdg-report-2019--EN.pdf (accessed 24 May 2021).

UN Habitat (2021) *Report on Cities and Pandemics: Towards a more just, green and healthy future*. Nairobi, Kenya. Available at: https://unhabitat.org/sites/default/files/2021/03/cities_and_pandemics-towards_a_more_just_green_and_healthy_future_un-habitat_2021.pdf (accessed 15 April 2021).

UNDP (2020) Human Development Index (HDI). Available at: http://hdr.undp.org/en/content/human-development-index-hdi (accessed 24 May 2021).

UNESCO Paris, Intergovernmental Oceanographic Commission and European Commission DGMARE (2017) 2nd International Conference on Marine / Maritime Spatial Planning.

VASAB (1994) *Visions and Strategies around the Baltic Sea 2010 - Towards a Framework for Spatial Development in the Baltic Sea Region*. Adopted at the third Ministerial Conference in Tallinn.

VASAB (2010) *VASAB Long-Term Perspective for the Territorial Development of the Baltic Sea Region: Towards better territorial integration of the Baltic Sea Region and its integration with other areas of Europe*. Latvia: VASAB.

VASAB (2016) *Development of Cities in the Baltic Sea Region*. Latvia: VASAB. Available at: https://vasab.org/wp-content/uploads/2018/06/2016_VASAB_publication_Development_Cities_BSR_web.pdf (accessed 5 November 2018).

VASAB (2018) *Accessibility of the Baltic Sea Region. Past and future dynamics. Research report. Final Report.* November.

Wagner M and Growe A (2021) Research on Small and Medium-Sized Towns: Framing a New Field of Inquiry. *World* 2(1): 105–126. DOI: https://doi.org/10.3390/world2010008.

WWF (2020) Saving Bialowieza, Europe's primeval forest. Available at: https://www.wwf.eu/what_we_do/forests/saving_biaowiea_forest/ (accessed 1 June 2021).