



The Baltic Sea region 2014:

Ten policy-oriented articles from scholars
of the University of Turku

Edited by Kari Liuhto

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Foreword

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Aleksi Randell, Mayor of the City of Turku, proposed to Centrum Balticum – Finland’s think-tank on the Baltic Sea region (BSR) – compiling a policy-oriented report on the BSR for the Baltic Sea Days to be hosted by the City of Turku in June 2014. In response to this call, I invited a selection of scholars from the University of Turku to write short policy-oriented articles on their fields of expertise.

The Baltic Sea region has long played a prominent role in the strategies and activities of the University of Turku, which over the past decades has developed and launched a range of special courses, a Master’s programme, numerous forums, internationally funded projects, databanks, an electronic discussion platform and research reports all dedicated to deepening our understanding of the Baltic Sea region.

This report bears strong testimony to the fact that scholars are ready to dedicate their time and expertise to keeping the Baltic Sea region competitive, clean and peaceful. We will continue this work in the National Baltic Sea Forum on 2 June 2014 and the Baltic Sea Arena on 25 November 2014. In addition, the Pan-European Institute of the University of Turku will continue to publish its Baltic Rim Economies (BRE) review, which is one of the world’s leading electronic discussion forums on the Baltic Sea region.

All of the articles in this publication have been contributed on a pro bono basis, and I warmly thank the authors for their invaluable work. My thanks also go to Centrum Balticum for proof-reading and publication funding. I would also like to express my gratitude to the City of Turku, who has financed Centrum Balticum over many years, significantly assisting us in our work on behalf of the Baltic Sea region.

Europe Day, 9 May 2014

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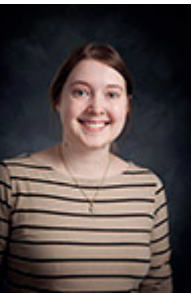
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Future economic challenges facing the Baltic Sea region

Urpo Kivikari

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Executive summary

At the beginning of the 1990's, the Baltic Sea region (BSR) "woke up" to a completely new reality. The Baltic coast was no longer home to East-West adversaries, but simply neighbours pursuing common interests and tackling common problems concerning this area. On this basis, the BSR has become an exemplary European region, referred to as a meso- or macro-region, depending on the context. States, other public entities, enterprises, other organisations as well as individuals have successfully developed the functional nature of the BSR, what is clearly a never-ending task. This article presents some of the current and future economic challenges facing the BSR.

Environmental and economic questions have taken priority over other issues on the BSR's agenda. For the sake of the environment and human welfare within the BSR, closer alignment is needed between ecological and economic interests. The BSR also needs to become more economically competitive, under the pressure of globalisation.

Within national governments and parliaments, common BSR projects have to compete with numerous other ways of spending public money. BSR endeavours and co-operation therefore need to be made attractive and convincing to possible participants. BSR states, enterprises and other organisations have created strategies and visions for their possible integration within the Baltic area. The EU "has rewarded" such activity by adopting the EU Strategy for the BSR, within which the EU refers to the BSR as a "macro-region".

Together with Belarus and Kazakhstan, Russia has founded a Customs Union. In spite of Russia's belonging to a new, "competing", union, it would be important to develop integration and co-operation among all BSR countries. In particular, all countries in the region should understand that without good Russo-German relations, a functional BSR cannot be maintained.

Unless the BSR's identity is well-known and generally recognised within the region, it will be difficult to present the region under a brand that is attractive to outsiders. Maintaining the motivation of states, enterprises and other organisations in the region to continuously develop the functional nature of the BSR would be in the common interests of all regional players.

1. The rebirth of a functional Baltic Sea region

The Baltic Sea links the countries around its rim and brings them closer together, thereby creating a natural region. In the late 1980's, reforms such as Perestroika and Glasnost in the Soviet Union, and the remarkable changes in other socialist countries around the Baltic Sea, led to anticipation of the possible rebirth of a functional Baltic Sea region. In the early 1990's, the BSR entered an entirely new phase, when all its countries identified themselves as market economies and democracies, or at least defined these as their goals. Another dramatic change was the later accession of all Baltic Sea states – except Russia – to the European Union. Within the Baltic Sea region, two worlds suddenly merged into a single meso-region, which became a pioneer and example to other parts of Europe. A meso-region can encompass both entire countries and one or more regions within individual countries. The evolution of the Baltic Sea area in Europe following the dissolution of the Eastern and Western blocs can be described in terms of such a process.

Meso-regions come about as a result of mutual interests and networking among states, corporations, enterprises and other players. In literature on cultural geography, the BSR is termed a meso-region more regularly than any other European area. Explanations for the BSR's development as a meso-region are not hard to find. Various problems and phenomena can by no means be contained within national borders; environmental issues are examples of present-day concerns that

are simultaneously national and international. Pollutants spread by air and water irrespective of administrative boundaries. Furthermore, the development of transport systems becomes more functional when national projects are harmonised in one or more meso-regions. In many cases, energy generation and distribution are best handled internationally. At the same time, internationalisation of business networking is crucial to maintaining and improving the competitiveness of national economies and companies.

The functional nature of the BSR renders it impossible to characterise the region using a single description. This clearly creates difficulties in terms of brand and identity building. However, highlighting the fact that functionality lies at the core of regional identity is more important than achieving a straightforward geographic definition, which would not suit all purposes. Interests defining the region and pertaining to economic relations, transport, environmental protection, and social and cultural platforms are fundamental to achieving a properly functional BSR. With a high number of administrative bodies now serving a plethora of organisations, it is clear that the Baltic Sea region will never have a king, president, parliament, its own legislation or “sacred” frontiers strengthening its identity and refining its brand.

I have been monitoring the development of the BSR since the 1980’s. Through the years, certain persistent issues have emerged. In this article, I present a few such issues that may represent noteworthy future challenges.

2. Ecology and economy – preferential spheres in the Baltic Sea region

In the last two decades, environmental and economic questions have taken priority over other issues on the BSR agenda. While substantial progress has been made in solving environmental problems and creating a common market around the Baltic Sea area, much remains to be done, particularly in the alignment of ecological and economic aspects and activities.

We know that, aside from economic benefits, the ecological situation is increasingly important to the well-being of the population living in the BSR. A fairly one-sided approach, based on the perspective of the natural sciences, has been taken to studying and managing the environmental

problems faced by the Baltic Sea. Although this perspective is undoubtedly helpful in detecting and eliminating existing pollution, it should be borne in mind that practically all environmental problems are caused by a range of economic activities and all economic activities cause environmental problems. The sources of pollution are agriculture, industry, transport, housing and other activities related to either production or consumption.

For advance prevention, it would be important to step up the investigation of environmental problems from the economic perspective, i.e. to study how the activities of companies, other organisations and individuals might be effectively redirected to render them more environmentally friendly.

The challenge: wedding the ecology and economy into a happy alignment of interests for the sake of the BSR’s environment and welfare.

3. Deepening economic integration

The BSR is operating under the impact of diminishing barriers to trade, increasing integration and advancing globalisation. Although some friction points still hinder trade in goods and services, the Baltic Sea region has already come fairly close to realising the ideal of free trade. Germany is the largest trading partner of most countries in the region. Except in the case of Russia’s trade flows, the share of intra-industry trade is fairly high in mutual trade.

National domestic markets have given way to the BSR as a new domestic market, which is under intensifying competitive pressures from outside. More companies have published strategies in which the BSR is defined as their domestic market. National borders no longer constitute a barrier to internationalisation or impose unreasonable costs on such a process. This means that supply and demand within adjacent market economies tend to be merged when profit-seeking companies aim to sell high or buy low, or are seeking advantageous locations for their various operations.

All countries favour capital inflows in the form of foreign direct investment. A considerable percentage of these investments consists of movements of capital between the Baltic Sea

states. Direct investments from abroad have been particularly significant to the internationalisation and competitiveness of former socialist countries since, in addition to capital, such investments have brought new technology, management skills, corporate cultures, readiness for risk-taking and marketing channels abroad almost free of charge to the host countries. Investments have also had important spin-offs within the target countries. While foreign direct investments can replace trade in goods, in many cases it can also create such trade.

There has been a steady increase in the migration of labour from other BSR countries. In fortunate cases, labour movement benefits all of the parties concerned: both immigrants and the two countries involved. But the outcome is not always as expected. For example, free movement of labour does not necessarily lead to narrowing wage gaps between two countries. Emigration may cause a labour shortage and economic losses in the country of departure.

The temporary or permanent acquisition of foreign labour is seldom a question of merely purchasing work input. In general, for geographic and other reasons, workers do not commute back and forth between countries on a daily basis. Migrants tend to enter countries in order to live there, often accompanied by their families and relatives. There is therefore a need for both the permanent and temporary integration of migrants and their families. Failure to do so will lead to frustration in terms of the aspirations of foreign workers and their families and children.

The challenge: the Baltic Sea region needs to be capable of enhancing the region's economic competitiveness and the welfare of its population during a period of deepening integration and under the pressure of globalisation.

4. Common versus national interests

In the photograph taken at the end of Baltic Sea Summits, high-level decision-makers look satisfied with the resolution of their meeting. However, even the journey home, accompanied by the prospect of dealing with a domestic political agenda, may be sufficient to put them into a more sombre mood.

Within national governments and parliaments, common BSR projects must compete with

numerous other ways of spending public money. Governments clearly find less political resistance to putting money to purely domestic use than spending additional money on international activities. The funding of BSR projects is only guaranteed if every country involved considers the activity sufficiently profitable compared to domestic alternatives. The above-mentioned (Chapter 2) closer alignment of economic aspects and environmental issues might serve the important goal of encouraging the coastal states to regard the BSR as useful and important.

Of course, the BSR cannot be treated as a colony or other type of dependency from which riches are sent to a mother country. It is perhaps best compared to a garden that will not thrive unless all parties tend their own plots – the welfare of the institutional, technical and ecological environment within each country – and invest in co-operation.

The challenge: to make BSR endeavours and co-operation attractive and convincing from the national point of view of potential participants.

5. The Baltic Sea region – a pioneer as a meso-/macro-region

Unlike any other European meso-region – excluding the Black Sea region – the Baltic Sea region has an inland sea as its core. While it also has other unique features, this natural geographic characteristic explains the fact that only the BSR, albeit with varying borders, has established itself on all European meso-region maps.

Since the beginning of the 1990's, the Baltic Sea countries, and enterprises and several other organisations, have created strategies and visions for their integration within this area. The EU has noted this systematic development trend: in 2011 the EU “rewarded” the BSR for its exertions and achievements by adopting the European Union Strategy for the Baltic Sea Region. This is the EU's first macro-strategy, followed by the EU strategy for the Danube region. The goal is to develop the entire region surrounding the Baltic Sea into a globally leading region in a number of aspects. The strategy began by identifying four main pillars of action. These are related to environmental issues, prosperity and attractiveness, accessibility, and safety and security. On occasions, when drafting an evaluation

of the macro-regional approach as requested by the European Council, the Commission draws on its experiences in implementing the EU strategy for the BSR. Within this strategy, the EU refers to the BSR as a “macro-region”, thereby emphasising its importance in comparison to the common use in the literature of the term “meso-region”.

Due to its cohesion and identity, the BSR could serve as an example to other European meso-/macro-regions which remain at the potential phase. In the Black Sea region, two EU member states and other countries, including Russia, now face severe problems and share common benefits within their mutual relations. The EU could use the experiences gathered from the BSR in promoting the creation of a functional region in South-East Europe. Of course, the BSR will need to compete more vigorously in Brussels for attention and financing as regionalisation proceeds within Europe.

The challenge: to maintain and develop the BSR’s peculiar position as a pioneer European meso-/macro-region.

6. The coexistence of two unions

The Baltic Sea region is made up of eight EU countries and Russia. Because the BSR is not among Russia’s highest foreign policy priorities, Russia lacks a special BSR strategy. Nevertheless, environmental issues and energy generation and distribution in particular, as well as commodity trading, closely connect Russia with other countries in the region.

Russia’s presence in the BSR has entailed the appearance of another union in the area in addition to the EU. A few years ago, together with Belarus and Kazakhstan, Russia founded a Customs Union. This Customs Union intends to extend and deepen its integration in the coming years, thereby developing into a union more or less comparable with the EU. There is little likelihood that current EU member states will move from one union to the other and the EU has neither the need nor the possibility to continue expanding along the Baltic Sea coast. In contrast, each step forward in warm neighbourly and other relations between the EU and Russia serves co-operation and unity within the region. Of course, each country also has the right and duty

to maintain its own bilateral relations with Russia, thus supplementing the EU’s common policy on Russia.

Although Russia’s development and policies naturally fall under its own jurisdiction, through their own policies the EU and its member states can influence Russia’s readiness to contribute to the BSR’s stronger integration and identity. It is to be hoped that Russia’s membership of the World Trade Organisation will also be beneficial to the BSR. As the most important producer and supplier of energy in the region, Russia plays a special role in the production of light, heat and motion.

All of Russia’s EU neighbours are Baltic Sea states. Finland-Russia relations are characterised as normal and even good – while politicians like to define them as “problem-free”, many others would not go so far. After the revolutionary changes in the 1990’s, the question still arises of whether relations between Russia and its neighbours, Estonia, Latvia and Lithuania, can be defined as normal. These countries have harsh experiences of their years as part of the Soviet Union. Unfortunately, not all of their more recent experiences of Russia have been positive either. Relations between Russia and Germany deserve a separate discussion.

The challenge: to develop integration and co-operation among Baltic Sea states in all of the relevant spheres, despite Russia’s belonging to a new, “competing” union.

7. Germany and Russia – two principal players in the region

The BSR is only of moderate or marginal importance to Russian and German politics. However, these major powers and their mutual relations have a great influence over other Baltic Sea countries and on the region as a whole. Although every country and link in the region is important, the decisive factors are Russia and Germany and their mutual relations.

The First World War marked the end of a century and a half of Russo-German co-operation. In the Second World War, hostilities between the Soviet Union and Germany resulted in unprecedented destruction and suffering, in the BSR as elsewhere. In light of these 20th century experiences, it is the

lack of genuine partnership between Germany and Russia that divides the Baltic Sea region. We may therefore conclude that BSR unity will depend on good relations and democratic government in these two countries. Fortunately, in the 1990's preparations for a new period of true partnership became possible. Germany and Russia have sought to emerge from the shadow cast by history.

No one can deny that there are sound reasons for economic co-operation between Russia and Germany. Germany possesses technology and strong companies; Russia has natural resources and an attractive market. Germany is one of Russia's largest trading partners. The most impressive manifestation of Russo-German relations in the BSR has been the Nord Stream project, a natural gas pipe between Russia and Germany laid along the bottom of the Baltic Sea. From the energy policy perspective, there are good grounds for building a link between Russia and Germany: Russia has natural gas to sell, and Germany – like many other countries – needs to import it.

Nord Stream also provides an excellent illustration of the political relations between Russia and EU member states within the region. All coastal states, particularly those that view themselves as having been bypassed in this project between Russia and Germany, have stressed the environmental risks involved in the construction and use of the pipe. The gas pipe is also attended by security policy considerations. Some EU member states view dependence on Russian energy as a risk to their national security. Another aspect of this lies in the fact that Russian enterprises have acquired holdings in the energy markets of various countries. If Russia considers that the gas pipeline requires special military preparedness against new risks, the entire Baltic Sea region might be affected.

A prosperous BSR would be built on the natural prerequisites for economic co-operation and friendly political relations between Russia and Germany. If these prerequisites do not arise, a functional BSR will not be possible, a fact which all countries in the region need to understand.

The challenge: to further develop Russo-German relations for the benefit of the BSR, without imposing costs on or offending third countries.

8. Identity and brand of the Baltic Sea region

The BSR has experienced revolutionary changes and its integration has progressed on the basis of numerous initiatives and organisations, thanks to the efforts of politicians, enterprises and other players. Due to this development, the BSR is fairly well known both within and outside the region. As stated above, in some respects it is considered to be a region that has developed in an exemplary manner. Although such assessments can sometimes be a question of politeness, there are also realistic grounds for adopting such a view.

Despite the headway made, much remains to be done in strengthening the identity of the region and polishing its brand. The coastal states and their areas do not always see themselves as belonging to the BSR – at least not primarily. This dilemma is particularly relevant in the case of Russia, Germany and Poland. While the coastal provinces of these three countries understand the importance of the BSR's identity and co-operation, the regional identity of other areas, including the capitals, is mainly focused elsewhere. Naturally, the BSR aspect is only one element in the national geographical identity of countries that also have strong interests in other meso-regions. None of the large coastal states is primarily part of the BSR. At present, Russia controls coastal areas that, in the light of its history, are rather modest. Undoubtedly, these areas still mean much more to Russia than their share of the surface or population of the entire country would indicate. The main hubs of the Polish and German economies are not located in the coastal area, which are rather peripheral in terms of these countries' economic geographies.

Although the way in which the BSR identity has been experienced leaves much to be desired, it is probable that no one has ever claimed they are against the BSR or their country's participation in co-operation within the region. In quarters that usually take a critical stand towards integration and globalisation, and oppose the EU, it is perhaps thought that Baltic Sea co-operation neither takes nor gives anything worth protesting about.

The challenge: general awareness of the BSR's identity should be increased within the region, otherwise it will be difficult to present the region as an attractive brand to outsiders.

9. The vitality of the Baltic Sea region

The BSR's identity and image are based on co-operation between and other functions of countries and societies on the coast of the Baltic Sea, and on the integrated (home) market formed by at least the EU member states. It is difficult to imagine that environmental, energy or transport issues in the BSR can be solved without close mutual co-operation. Regional co-operation creates value added of a kind which cannot be achieved merely through national, or more extensive, international measures.

While the existence of an independent state can only be brought into question in a revolutionary situation, mundane everyday life can be fatal to the existence of a functional region. After the initial enthusiasm for the Baltic Sea region in the 1990's and 2000's, its usefulness and attraction are now being questioned from time to time by its various participating organisations. Despite the above-mentioned and many other grounds for co-operation within this entity, the BSR is not a self-evident issue to every participant. As mentioned earlier, in at least three large countries, Russia, Germany and Poland, the overall regional emphasis is mainly located outside the BSR. Another problem may arise in the restriction of these countries' presence in this region to the southern (in the case of Germany and Poland) and eastern (in the case of Russia) coasts.

Unlike any other country in the region, Sweden has Baltic Sea coastal areas running from the south to the north and is involved in the integration of northern, central and southern parts of the region. Thanks to its geography, economic resources and attitudes, Sweden occupies a unique position in the Baltic Sea region. Sweden tops the list of direct investments by enterprises, while the state and many organisations put considerable amounts of capital to work for the benefit of the BSR. Sweden participates in regional integration by moving capital and information more extensively than goods.

Although the prerequisites for Baltic participation in other coastal countries do not compare with those of Sweden, every coastal state has much more to win than lose by participating in common activities. The EU's BSR strategy, which makes a significant contribution to the BSR as a whole, is also conducive to achieving a positive outcome in terms of co-operation within the BSR. On the other hand, only the states, other organisations and people inhabiting the BSR can ultimately be considered responsible for the future of the BSR.

The challenge: to maintain the motivation of states, enterprises and other organisations within the region to continuously develop the functional nature of the Baltic Sea region.

The “Seven Cs” of logistics and transport in the Baltic Sea region

Lauri Ojala and Harri Lorentz

13

Executive summary

The aim of this article is to provide an outline of some of the key prerequisites and drivers affecting the transport and logistics sector in the Baltic Sea region (BSR) from the policy-making point-of-view. The time horizon is from the current state in spring 2014 to approximately year 2025. The analysis comprises seven dimensions of relevance for BSR logistics, or “Seven Cs”, with key findings summarised as follows:

- **Competitiveness** is good, but mixed, as Russia and Belarus have a sizeable gap with the others.
- **Complexity** of global supply chains and those in the BSR is increasing, with multiple actors requiring co-ordination.
- **Connectivity** ranges from extremely good to good/medium, however, Russia and Belarus are lagging behind.
- **Costs (logistics)** range from medium to high and are increasing due to cost pressure especially from regulatory compliance. Policy-making focus should be more on “other” logistics costs, often related to uncertainty, than on transport costs.
- **Competence** ranges from high to medium in the EU, and from medium to low in Russia and Belarus in the private and public sectors.
- **Capacity** in terms of transport infrastructure exists, however, its condition and maintenance is more problematic.
- **Consistency of policies** ranges from good to medium in the EU and Norway, and from medium to poor in Russia and Belarus.

The analysis of these “seven Cs” is based on existing empirical evidence, including a BSR

wide Delphi study to assess the potential futures in 2025 among 109 logistics experts conducted by the authors in 2013 (Ojala et al. 2013)¹. The political and economic events related to Ukraine during spring 2014 have rendered this follow-up analysis particularly difficult.

Drawing on the Delphi study and recent observations, we offer the following policy recommendations: (1) put logistics prominently on the political agenda, (2) carefully observe infrastructural capacity needs and prepare for necessary investments based on user demand, (3) invest in blue collar training/education, (4) found environmentally-motivated regulation on sound analyses and offer support for compliance, and (5) collaboration in the region in terms of logistics remains important also in the future.

1. Competitiveness of the BSR transport and logistics sector

Similarly to the more general results of World Economic Forum’s Global Competitiveness and Enabling Trade indices, and The World Bank Group’s Doing Business index, there exists a wide gap between the level of logistics competitiveness of EU countries & Norway and Russia & Belarus. This is vividly illustrated in the World Bank’s latest Logistics Performance Index released in March 2014. The gap is at the widest with the ease of working with customs and border agencies, and in the availability of affordable international transport services (Table 1).

¹ 60% of the experts were from Finland, Denmark, Germany, Norway and Sweden (geographically, not politically grouped as “West”); and 40% from Estonia, Latvia, Lithuania, Poland and Russia (“East”).

Table 1. Country scores and ranks according to the World Bank's Logistics Performance Index, LPI (aggregated values from LPI 2007-2014; score range: 1-5)

country	Overall LPI		CUSTOMS		INFRASTRUCTURE		INTERNATIONAL SHIPMENT		TRACKING AND TRACING		TIMELINESS		LOGISTICS COMPETENCE	
	Mean score	Rank	Mean score	Rank	Mean score	Rank	Mean score	Rank	Mean score	Rank	Mean score	Rank	Mean score	Rank
Germany	4,10	1	4,02	2	4,26	1	3,73	3	4,10	3	4,38	2	4,06	3
Sweden	3,95	6	3,77	12	4,14	5	3,65	8	3,97	9	4,30	5	3,99	5
Norway	3,87	11	3,92	4	4,08	8	3,47	21	3,64	22	4,26	8	3,97	7
Denmark	3,86	14	3,82	8	3,85	16	3,63	11	3,62	25	4,29	7	3,83	14
Finland	3,78	17	3,88	6	3,79	18	3,56	13	3,72	19	3,96	25	3,92	10
Poland	3,44	31	3,24	28	3,09	43	3,38	30	3,40	35	3,96	26	3,35	33
Latvia	3,19	40	3,02	40	2,91	53	3,15	39	3,35	37	3,74	37	3,06	44
Estonia	3,16	42	3,05	39	3,15	38	3,09	48	3,14	51	3,48	52	3,14	39
Lithuania	3,08	47	2,90	43	2,95	49	3,02	54	2,98	63	3,60	43	2,93	55
Russia	2,63	94	2,15	142	2,45	94	2,57	110	2,72	83	3,08	92	2,62	84
Belarus	2,61	98	2,46	83	2,63	67	2,58	109	2,57	102	2,99	103	2,44	115

Source: The World Bank 2014.

NOTE: Tracking and tracing refers to the visibility on location of work (such as consignments) and its disposition (van Dorp, 2002).

The importance of the transport and logistics sector in terms of economic prosperity, and its role in attracting FDI and maintaining competitiveness in manufacturing and trading industries is significant, and is expected to increase till 2025. Russian WTO membership might have a positive effect on BSR transport flows, but ultimately the demand for logistics services is derived from trade volume, development of which has become more difficult to predict, due to for example the recent events in Ukraine. In the same time, the regulatory impact on the sector will increase costs, especially due to compliance with environmental regulations. The main finding here is that the logistics sector is expected to play a larger role in the economy of the region, while this is threatened by costs due to increasing extent of regulation.

2. Complexity of aligning policies to support supply chains in the BSR

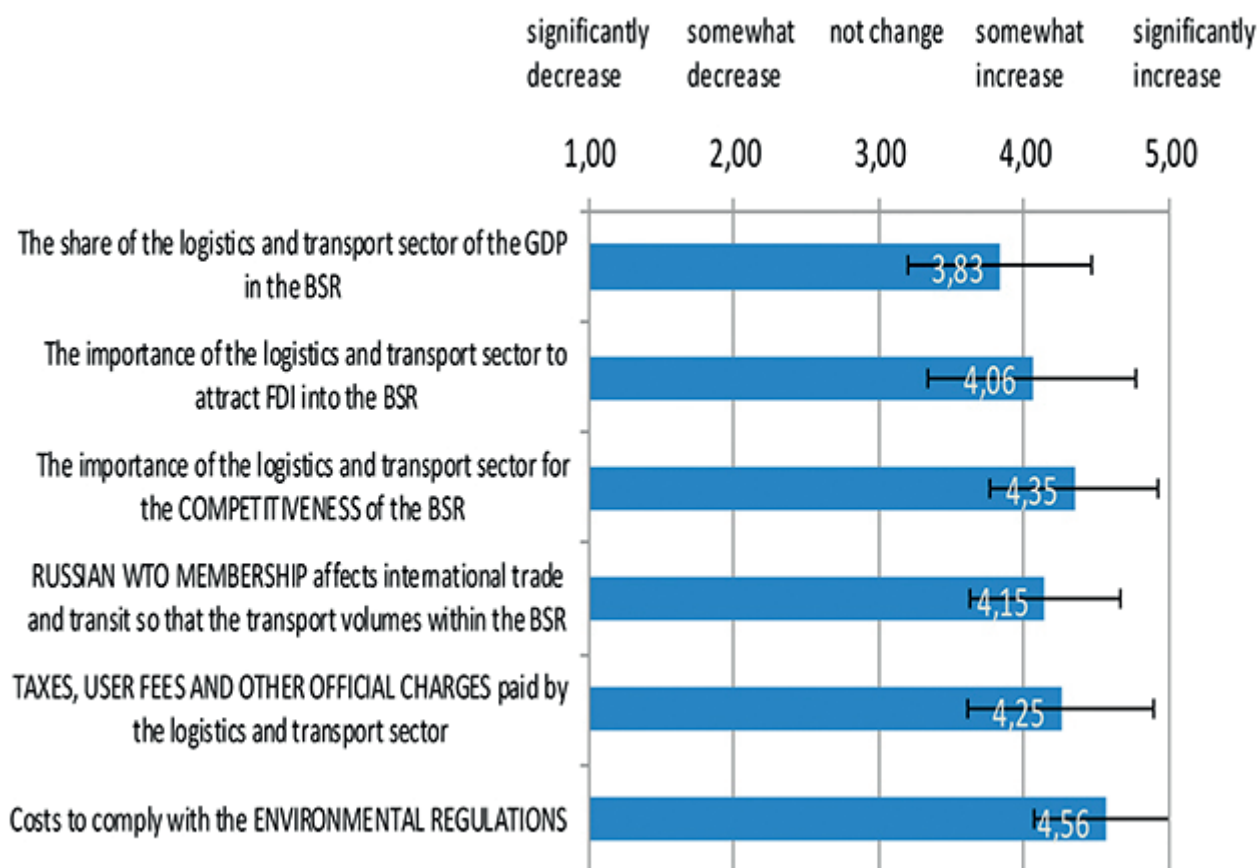
The operational environment in international trade as well as that in domestic business

across all industries is getting increasingly more complex to manage because the increasing length of supply chains and the proliferation of product variants.

Hence, there is a growing need for consistent and aligned policies in countries where complexity is high. This is the case in the BSR, too. There are fewer “low hanging fruits” that countries can pick off-the-shelf. Reforms involving many stakeholders are slow to implement, and they are easily reversed by inconsistent and ad hoc governance.

More detailed, accurate data for policy-making and information sharing is needed. For instance, the trade facilitation concept of “trade single windows” requires alignment of several government control agencies, which takes time. Ultimately, successful countries in introducing far-reaching changes have combined regulatory reform with investment planning, inter-agency co-ordination, and incentives for operators. The aggregated LPI index results from 2007-2014, and especially the dimensions “Customs”,

Figure 1. Importance of logistics and transport sector in the Baltic Sea region and the impact of the regulatory environment by 2025 (range indicates plus/minus one standard deviation around the mean)



Source: Delphi study responses, Ojala et al. 2013.

“Timeliness” and “International Shipment”, in Table 1 provide insights for this in the BSR.

3. Connectivity of the BSR from a transport and logistics point-of-view

Connectivity of a country, or eventually a port or airport, is consistently defined as how central this country is on those networks. A crucial aspect is the frequency of services that can be maintained by air, sea and land. Connectivity also reflects geography and the global structure of transportation and logistics networks. Country-specific trade transaction costs coming from supply chain inefficiencies increase economic distance and reduce connectivity. Hence policies that increase logistics performance also improve connectivity, notwithstanding geography.

Some of the few connectivity indicators available are the UNCTAD [Container] liner shipping connectivity index (LSCI), and the Air Connectivity Index proposed by World Bank

experts (Arvis and Shepherd 2011). This data confirms that there is a strong correlation between connectivity and economic outcomes, such as participation in global value chains, as measured by trade in manufactured components. This phenomenon is reflected in Table 1 (especially “International Shipments”) where EU member states in the BSR are generally ranked very high, and all of them are in the top 1/3 of the 166 countries assessed.

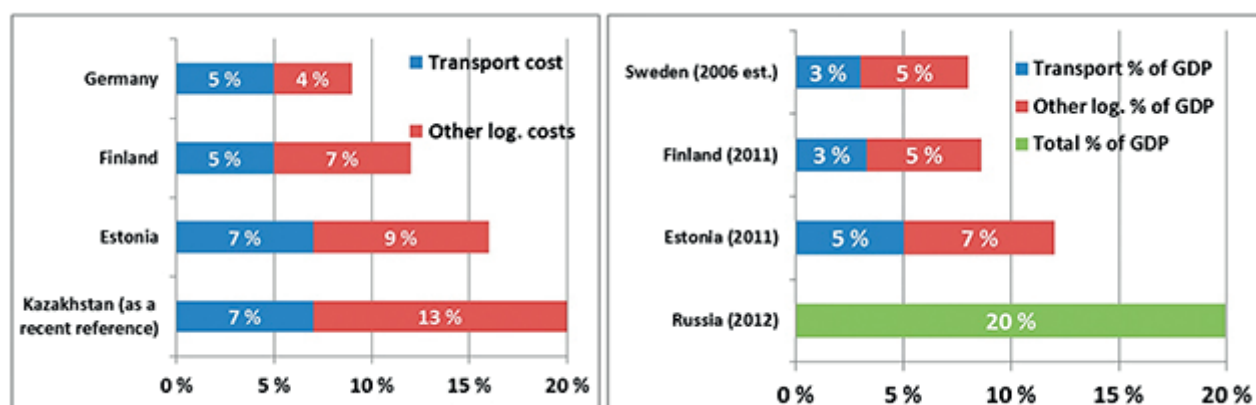
However, more specificity is needed to assess the impact of decisions on ports, corridors, border crossing, trucking reforms, etc. These needs fall into two categories:

1) Measures of performance outcomes in terms of costs, time, and reliability of specific chains – corridors or ports, for instance.

2) Impact of logistics costs on the economy.

Even in the more developed BSR countries, substantial knowledge gaps exist in this respect,

Figure 2. Logistics costs in companies in 2012-2013 (as % of sales, left hand side) and in comparison to GDP in 2006/2011-12 (% , right hand side)



Sources: TU Berlin (DEU); TSE (FIN & EST); The World Bank (KAZ); Sweden: own estimate based on Vinnova 2008; Finland: State of Logistics Finland; Estonia: TSE; and Russia: Lukinskiy et al. (2012).

which calls for more systematic studies in the subject (Solakivi et al. 2012).

4. Cost of logistics in the BSR

Logistics costs have no uniform definition either as an accounting or a statistical term and the research methodologies applied in various studies is not unified, either. These make their comparability across studies and countries difficult. For firms, logistics costs have a trade-off with the desired service quality; thus they are relative to a given market situation (Rantasila 2013). Therefore, the business goal is not always to seek the lowest possible logistics cost, but one that optimises the business situation at hand while eliminating all avoidable or unnecessary costs.

Comparing logistics costs to GDP is difficult due to differences in factor endowments, production and trade patterns. A significant part of logistics costs are typically generated outside the country under study, which further complicates comparing these costs with the GDP. Therefore, it is not possible to say that logistics costs comprise X % of the GDP, but rather that logistics costs are X % compared to the GDP.

In logistics, reliability and predictability is generally more important than freight costs. As shown in Figure 2, logistics costs tend to increase with decreasing logistics performance. Most of the cost increase comes from poorly functioning logistics markets and lower reliability, which make trades keep unnecessarily high inventories

(i.e. high “other costs” rather than “transport costs”). The available data provides some general observations also for the BSR.

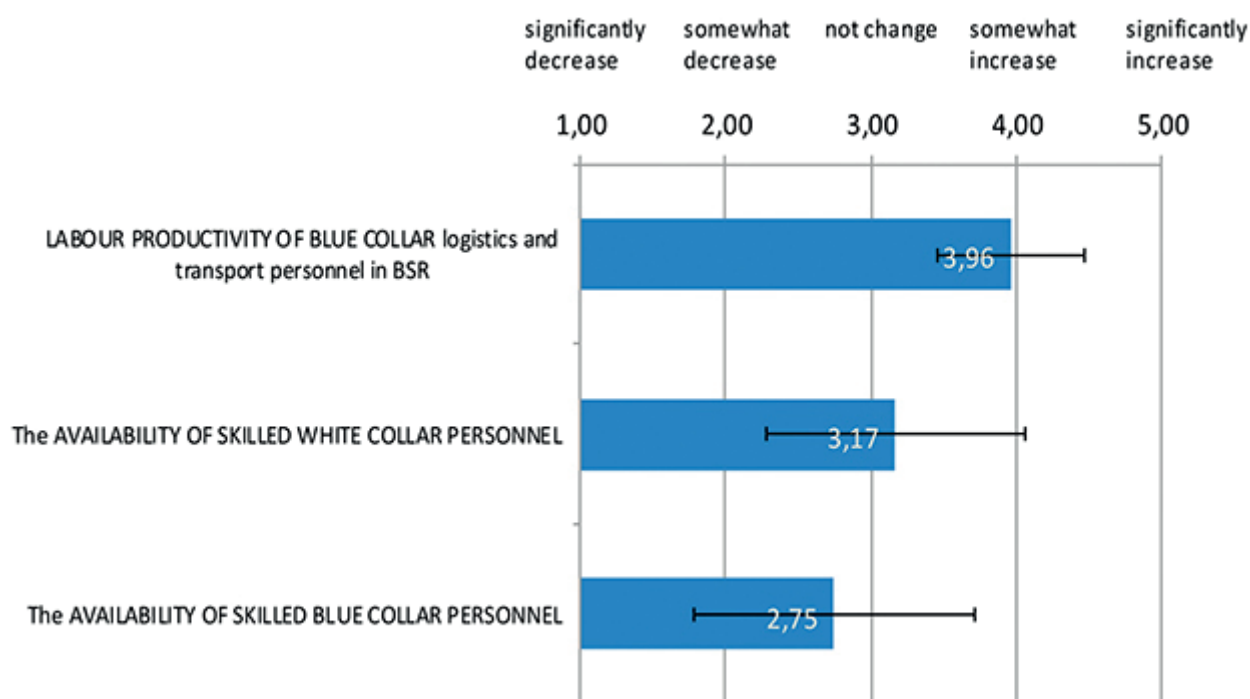
The available data in the BSR enables some general observations:

- Transport costs are typically only 30-50% of total logistics costs for manufacturing and trading firms;
- “Other logistics costs”, such as warehousing, inventory carrying and administration are 50-70% of total costs;
- The share of “other logistics costs” increases, the less developed the logistics market, due to uncertainty and low service quality;
- Compared to GDP, logistics costs tend to be below 10% in developed countries, but 15-20% or more elsewhere;
- The main savings through aligned policies are reached with the “other logistics costs” rather than transport costs; and
- The benefits help keeping manufacturing competitiveness up and consumer prices low.

5. Competence of the BSR transport and logistics sector

The level of logistics competence in Germany, Sweden, Norway, Finland and Denmark is rated in the top 10% of the 166 countries surveyed in the World Bank’s LPI. Poland, Estonia, Latvia and Lithuania are rated within the top 1/3, while Russia is just below

Figure 3. Logistics labour productivity and skills in the Baltic Sea region by 2025 (range indicates plus/minus one standard deviation around the mean)



Sources: Source: Delphi study responses, Ojala et al. 2013.

1/2 and Belarus in the bottom 1/3 as shown in Table 1.

Figure 3 depicts results for statements on logistics labour productivity and availability of logistics skills in the Baltic Sea region by 2025. Predictions of availability of white and blue collar personnel are rather uncertain. However, the results suggest that blue collar labour productivity will increase and will therefore offset the anticipated cost increases in the BSR by 2025. On the negative side, the region is likely to experience shortages in skilled labour for logistics professions, especially in the case of blue collar workers. While there may be country differences, the varying economic conditions are likely to increase short-term job-seeking or migration from low-cost countries, resulting in shortages in these countries. This is already happening with e.g. truck drivers in the BSR.

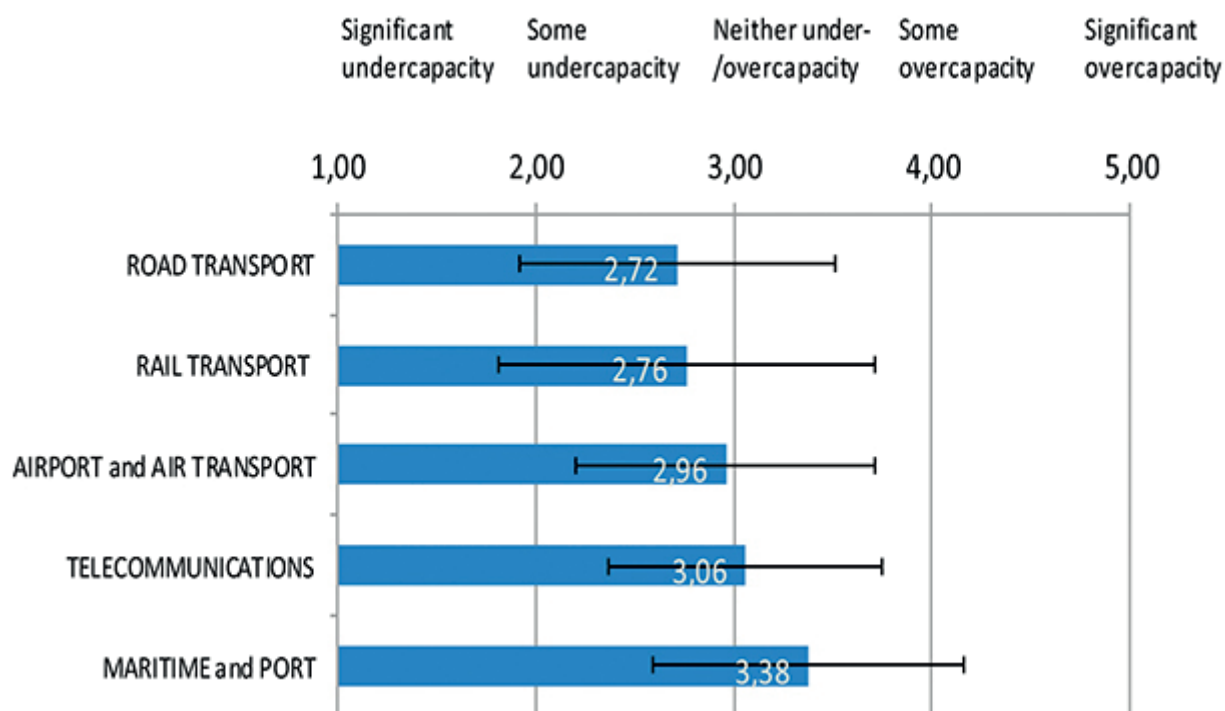
6. Capacity of transport infrastructure in the BSR

Figure 4 depicts Delphi statements on transport infrastructure capacity in the BSR by 2025. It appears that most types of infrastructure seem to have neither over-capacity nor under-capacity.

However, the uncertainty is quite large, indicating disagreement especially for road and rail transport infrastructure, which could have some under-capacity by 2025. However, the assessments on rail transport infrastructure show a statistically significant difference between the geographically rather than politically grouped countries in “East” and “West”. Response from “West” seems to be more prone to “some under-capacity” (mean 2.5) in comparison to the response from “East” (mean 3.1), underscoring the need to consider possible infrastructure deficit. There seems to be a consensus on maritime transport and ports will have some overcapacity by 2025.

The Baltic Sea region has numerous on-going large-scale transport infrastructure projects but many of these projects are domestic or bilateral. According to the BTO 2030, infrastructure should act as an enabler of market dynamics guiding the region towards efficient and sustainable co-modal logistics services. However, there is a common concern in the BSR that the gap between the level of transport infrastructure maintenance and funds available for that is widening, thus deteriorating the maintenance deficit.

Figure 4. Anticipated transport infrastructure capacity in the Baltic Sea region in 2025 (range indicates plus/minus one standard deviation around the mean)



Source: Delphi study responses, Ojala et al. 2013.

7. Consistency of transport and logistics related policies in the BSR

When looking at the operational environment for logistics users – manufacturing and wholesale/retail firms – as well as for logistics providers, one cannot overstate the importance of consistent and predictable policies and implementation of the adopted policy actions. The additional challenge with policy work on logistics issues is that they need cross-cutting actions. Compared to e.g. transport issues, they span across multiple national ministries, or Directorate Generals within the EU, for example.

However, cross-agency alignment is very important so that changes in certain parts of the government do not impede improvements in other sectors. Key agencies here are e.g. customs and other border agencies, transport safety (security) agencies, and public or private entities managing transport infrastructure.

Transport regulation is already dominated by multilateral decision-making: the UN structure on e.g. safety and technical standards in maritime and air transport (IMO and ICAO); e.g. road and rail transport, air traffic control within the EU;

or other multilateral and bilateral arrangements (e.g. road haulage quotas under the ITF [ECMT/CEMT]). Consequently, in the EU less than 5% of the issues at stake in aviation, and less than 10% in maritime and road transport are within the national decision-making authority. That share is higher in non-EU countries, which complicates synchronising the regulatory frameworks in the BSR.

Environmentally-motivated multilateral regulation is increasingly setting the tone in freight transport. These include various emission-related regulations on engine exhausts, technical standards of vehicles/vessels and ultimately also emission trading schemes. These have combined aim at internalising a larger share of external costs of transport. While the desired environmental impact may be significant, the actual market response may be more significant still – and sometimes to the opposite direction.

This is probably going to be the case with the IMO's convention regulating the sulphur emission from ships. This change, also adopted as an EU directive and subsequently also by the Russian Federation, affects the entire Baltic Sea and parts of the North Sea and the English Channel as from 2015.

Apparently no or only rudimentary cost impact analyses were made when the amendment to the IMO convention was passed. The cost to comply with the regulation within shipping is so high that due to freight increases a significant share of unitised cargo is likely to shift to land-based transport away from much more environmentally-friendly shipping. This is likely to happen especially in Denmark, Finland and Sweden. The costly lesson is that even environmentally-motivated regulation must be accompanied with sensible cost-benefit analyses.

Socially-motivated regulation aims at safeguarding the working conditions in transport and logistics related work, which is affecting especially road haulage. All these changes are well intentioned be they motivated by social, environmental, safety and security or competition issues. However, the problem is that countries falling under different regimes implement such changes at different pace, if at all. This is the case also in the Baltic Sea region, and remains a challenge for future policy-making in this respect.

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Future oil transportation volumes in the Gulf of Finland: Policies needed to prevent the risks of oil transportation

Olli-Pekka Brunila, Jani Häkkinen and Vappu Kunnaala

Executive summary

Oil transportation volumes in the Gulf of Finland have multiplied during the last thirteen years. However, based on future forecasts of oil transportation volumes in the year 2020 and 2030, the volumes will increase only modestly. The main fear or the worst scenario in the Gulf of Finland is the occurrence of a large oil spill. The risk and the consequences of such an oil spill are shared with the surrounding countries. It has been estimated that the clean-up costs of a 30,000 tonnes shored oil spill could rise up to € 1 billion. Damages to the vulnerable Baltic Sea region and its unique fauna and flora could be irreplaceable. Plenty of oil recovery co-operation exists between Finland, Estonia and Russia, but there are not enough resources to respond to a large oil spill. In Russia, oil recovery is in its infancy, especially in the open waters. Lot of co-operative efforts has been made to prevent the risk of oil spills. Universities and authorities in the Baltic Sea area have carried out successful projects and developed many tools to prevent the risk of oil spills in the Baltic Sea and the Gulf of Finland. These tools can aid authorities in their decision-making processes and help ships avoid collisions and groundings. Still, on the ships there are humans behind the “wheel” and human errors are the most common reason for maritime accidents.

1. Introduction

There has been a remarkable increase in maritime transportation volumes and the transportation of oil in particular, in the Baltic Sea in the 2000’s. Between the years 2000–2012 the volume of oil and oil product transportation has tripled in the Baltic Sea area. The economic recession had a

negative effect on transportation and on the demand for goods in the Baltic Sea region in the final years of the 2000’s. The volume of transported oil, however, did not decrease during the recession. The main reason for the increase of maritime oil transportation volumes in the Baltic Sea is Russia’s new oil terminals in the eastern part of the Gulf of Finland (GoF). The Port of Primorsk started operating in the year 2002 and other ports have increased their capacity as well. Oil terminals in the Port of Ust-Luga started operating in March 2012. This will increase the transportation of oil in the Gulf of Finland in the future.

In the year 2012, the total transported cargo volumes in the Baltic Sea area were a little over 839 million tonnes, from which the share of Russia was 208 million tonnes, Finland’s share was 106 million tonnes and Estonia’s 43 million tonnes, which comprise 43% of the total Baltic Sea cargo volumes and these volumes were transported via the GoF. In the year 2012, almost 342 million tonnes of oil and oil products were transported via the Baltic Sea, of which more than 50% via the GoF. The shallow and rocky waters, narrow channels and severe ice conditions add to the risks of navigation in the Baltic Sea and, more particularly, in the Gulf of Finland. Every year, more than 40,000 ships sail in the Gulf of Finland, and 7,000 of these are oil tankers. Nearly 15% of the world’s maritime transportation takes place in the Baltic Sea (HELCOM 2009). The relatively small sea areas, crossing traffic between Helsinki and Tallinn and oil tankers going west from the eastern part of the Gulf of Finland are a combination which can cause a huge environmental disaster. Maritime oil transportation is also vulnerable to security threats, an issue, that has attracted less attention in the Baltic Sea.

2. Shared risks

2.1 Environmental consequences

The Gulf of Finland and the archipelago are very sensitive and vulnerable to pollution, for example, due to the low volumes and slow turnover of water, low temperatures and ice cover during winter, and the stratification of water into layers with different temperatures. The largest shared risk might be a tanker accident and large oil spill either in the GoF or in the Baltic Sea. Depending on the weather conditions or the time of the year, the consequences could be catastrophic and very expensive. Oil spills have both acute and chronic effects on ecosystems. The most vulnerable are flora and fauna when in direct contact with spilled oil. Many of the chemicals in oil spills are toxic and can thus have devastating effects on plankton, fish, and animals living on the seabed (Rogowska and Namieśnik 2010). The fate of spilled oil in the marine environment depends on the physical and chemical properties of the oil, the characteristics of the environment affected as well as the physical, chemical, and biological processes occurring at the location, such as evaporation, dispersion, microbial degradation, photo-oxidation, and interactions between oil and sediments (Wang et al. 1999).

The best known oil-related negative effect for sea birds is the loss of body insulation, which causes hypothermia and mortality. In addition, large amounts of oil cause the feathers to stick together, impairing flight and buoyancy. Birds may ingest and/or inhale oil while trying to preen or eat contaminated food. Consequently, they suffer rapid, short-term or long-term effects, such as damage to the lungs, kidneys and liver and gastro-intestinal disorders (Camphuysen et al. 2009). In some studies it has been found that oil spills can cause sublethal effects (e.g. genotoxic DNA damages, alterations in immune functions and changes in the activity of hepatic enzymes have been measured), but these parameters have not been used systematically in long-term spill monitoring. However, there are cases where sublethal effects are still detectable 40 years after the original spill (Kirby and Law 2010).

So far there have not been very serious oil spill accidents in Finland's territorial waters, and hopefully there never will be. Nevertheless, there have been several near miss cases in the GoF. From the perspective of animals, the most significant factor is the time of the year. If the oil

spill accident happens in the spring, during the breeding and migration of animals, the damage caused could be significant. Even a large quantity of oil might not cause harm to animals if the time of the year and weather conditions are right.

Possibly the most famous oil accident is the Exxon Valdez oil spill. Approximately 38,000 tonnes of Alaskan North Slope crude oil polluted over 2,000 km of rocky intertidal shoreline. In total, over 250,000 sea animals were killed. In the Baltic Sea in 1979, after the Mt Antonia Cramsci accident, approximately 5,500 tonnes of oil was spilled into the sea. In total, over 1,000 dead animals were collected on the coastlines of Finland and Sweden. On the coastline of Estonia in 2006, approximately 20 tonnes of oil was spilled from an unknown vessel. During the investigation, there were fifteen different suspects and even today the source of pollution has not been discovered. Despite the fact that it was January, there were a lot of birds at the coastline and it was estimated that 35,000 birds died during that winter and spring.

2.2 Economic risks

An oil spill accident is also a huge economic risk. In various studies and analyses, the costs of an oil spill accident have been estimated. Because there has not been a large oil spill accident in the Baltic Sea the costs are only estimations. The costs depend on whether the oil is collected from the sea or whether the oil has come ashore. Tegeback and Hasselström (2012) estimated that if 10,000 tonnes of oil contaminated a coastline of the Baltic Sea, the costs would be € 100–400 million, including direct (e.g. clean-up), market (e.g. tourism and fisheries industry) and non-market costs (i.e. environmental and other impacts that are not easily measured in a market). Similarly, Halonen (2007) stated that in a case of a spill of 30,000 tonnes of oil in the GoF, the estimated costs of clean-up could reach up to € 1–1.5 billion. The costs depend on the shape and material (sand, rocks and vegetation) of coastline and whether the oil has become mixed with water.

Before the BP oil disaster in the Gulf of Mexico, the most expensive cleanup costs in oil spill history occurred during the Exxon Valdez accident. The clean-up costs were approximately \$ 2.5 billion and total costs (including fines, penalties and claims settlements) as much as \$ 7 billion. The

estimated costs of the Gulf of Mexico disaster are set to rise well above \$ 42 billion. The accident of Prestige in the year 2002 was also very large and in total 76,000 cubic meters of fuel oil was spilled. The cleanup costs on the Galician coast alone were € 2.5 billion. However, extra costs of disaster (almost € 600 million) were set for Spain and France in the year 2013.

3. Accidents in the Baltic Sea

The Helsinki Commission (HELCOM) has reported that during the years 1989–2010, approximately

1,400 ship accidents happened in the Baltic Sea. Most of the accidents were groundings and collisions, followed by pollutions, fires, machinery damages and technical failures (Figure 1).

According to HELCOM (2012), 1,520 vessels in total have been involved in the accidents that occurred in the Baltic Sea during the years 1989–2010. Almost half of the vessels were different types of cargo vessels, excluding tankers (Figure 2). A large number of other vessel types (e.g. pilot vessels, tugs, dredgers) were also involved in the accidents. One in seven of the accidents involved a tanker and a passenger vessel.

Figure 1. Vessel accidents in the Baltic Sea in 1989–2010 by accident types

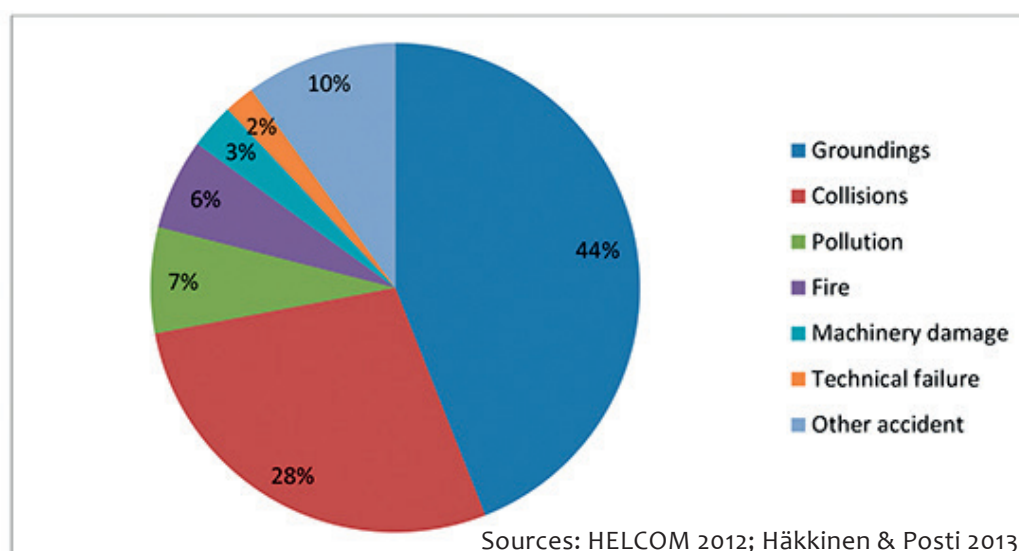
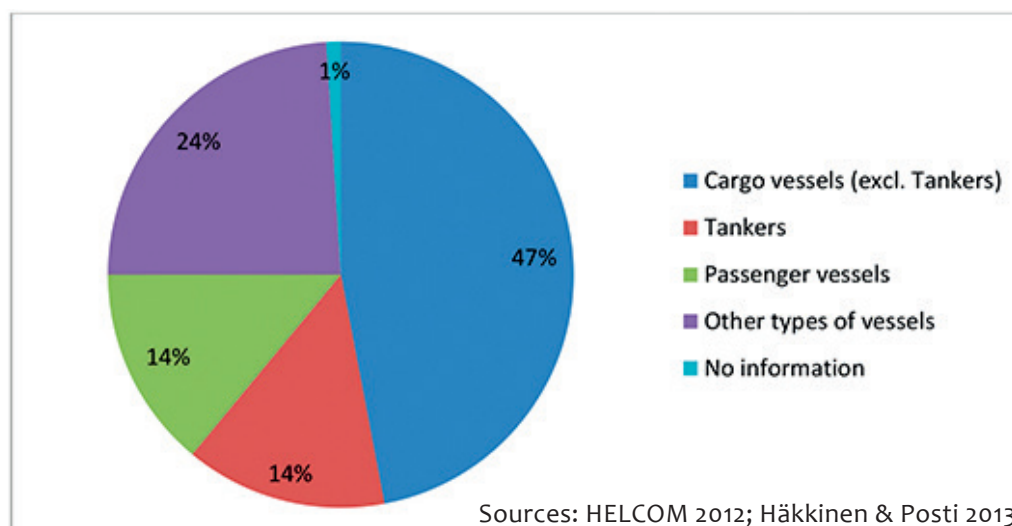


Figure 2. Vessel accidents in the Baltic Sea in 1989–2010 by vessel types



Based on the HELCOM's accident statistics, 210 tankers (including crude oil tankers, chemical tankers, oil/chemical product tankers, gas carriers and other types of vessels carrying liquid bulk cargoes) were involved in the accidents that occurred in the Baltic Sea during the years 1989–2010. During this period, 28 of all tanker accidents in the Baltic Sea led to some sort of pollution. Due to these 28 pollution cases, approximately 3,100 m³ of harmful substances in total spilled into the sea. In almost all of the pollution cases, the spilled substance was conventional oil or an oil product (Figure 3). The largest pollution case involving a tanker in the Baltic Sea during the period of 1989–2010 happened in the Danish waters on 29 March 2001 when approximately 2,500 m³ of oil spilled into the sea as a result of a collision between a tanker and a bulk carrier (HELCOM 2012; Häkkinen & Posti 2013).

4. Oil transportation development in this millennium

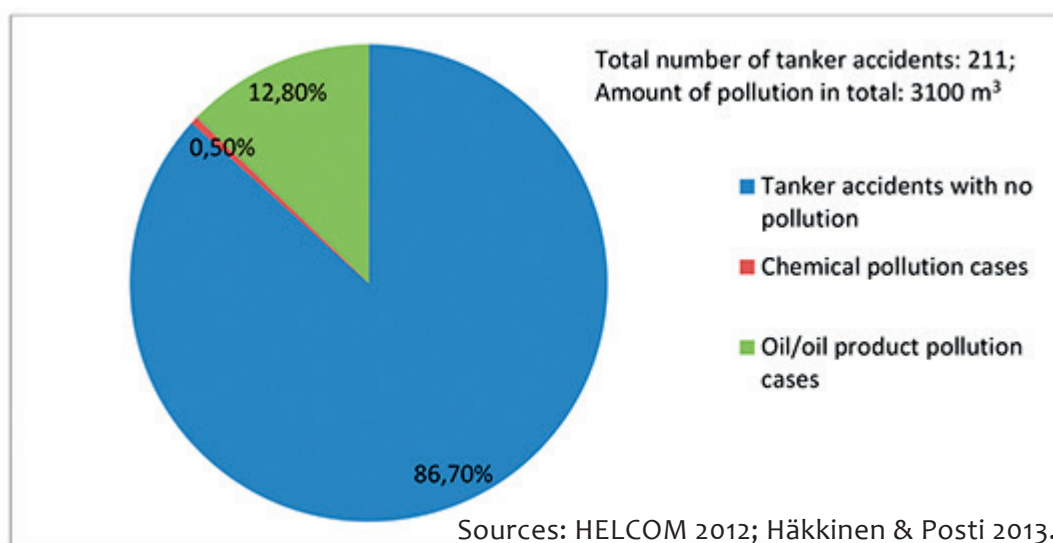
Oil transportation in the Gulf of Finland has nearly quadrupled in the past ten years. In the year 2000, a little over 43 million tonnes of oil and oil products were transported and handled in the Gulf of Finland. In 2012, transported oil and products volume was little over 171 million tonnes. The economic recession which started in the late 2008 has not had much effect on the volume of maritime oil transportation.

The increase in oil volumes is due to the increasing oil production and exports in Russia. Russia's

oil volumes are the largest in the Baltic Sea. They have increased exponentially from the year 2000. In the year 2000, the volume handled was only 7 million tonnes, while in 2012, the volume was almost 127 million tonnes in the GoF. Russia opened the oil port of Primorsk in 2002. Since that time, the volumes in Primorsk have increased six-fold from 12 million tonnes to 75 million tonnes. There has been variation in oil transportation volumes in Primorsk. A few years ago, the annual volume was almost 80 million tonnes. The Port of Vysotsk started to handle oil in 2007, and currently its oil volumes are about 10–14 million tonnes. In the Port of St. Petersburg, the annual oil volumes have increased from 7 million tonnes to 16 million tonnes. In addition to these ports, the Port of Ust-Luga started operating in 2012. The Baltic Pipeline System 2 is connected to the Port of Ust-Luga. In the initial stage, the planned oil volume will be about 10–30 million tonnes, and in the second stage it will increase to 30–50 million tonnes annually. It will take 5–10 years until the second stage is ready. In the year 2012, the annual handled oil volume was almost 28 million tonnes.

The oil volumes handled in Estonia mainly consist of transit transportation from Russia via Estonian ports. The oil volumes in Estonia have been relatively stable and the economic recession did not affect the oil transportation volumes much. The volumes vary from the peak year of 2004 with 29 million tonnes to 22 million tonnes in the year 2008. In the year 2012, the volume increased to near 26 million tonnes. The Port of Tallinn handles more than 91% of the total oil volume via

Figure 3. Tanker accidents and the share of pollution cases in the Baltic Sea in 1989–2010



the Muuga and Paldiski South port areas. In the port of Sillamäe, the volume has varied between 1–2 million tonnes. Miiduranna, Paljassaare and Vene-Balti handle smaller volumes of oil annually.

In Finland, there are 12 sea ports in the Gulf of Finland, of which six ports handle oil and oil products. The largest oil port in Finland is Sköldvik, which mainly serves the Neste Oil Ltd. oil refinery and other petrochemical industry in the vicinity of the port. The oil volume handled increased slightly in the last decade. In the year 2000, the amount of oil and oil products handled was a little over 12 million tonnes and in 2012, it was 18 million tonnes. The Port of HaminaKotka currently handles just under 0.5 million tonnes of oil products annually. The volume of oil products handled in the Port of Helsinki has varied greatly in the recent years: from 0.04 million tonnes (2012) to 0.4 million tonnes (2003). In the Port of Inkoo, oil transportation volumes decreased over the last ten years from 0.4 million tonnes to very small annual amounts. The Port of Hanko also only handles small volumes of oil, amounting 0.003 million tonnes in 2012.

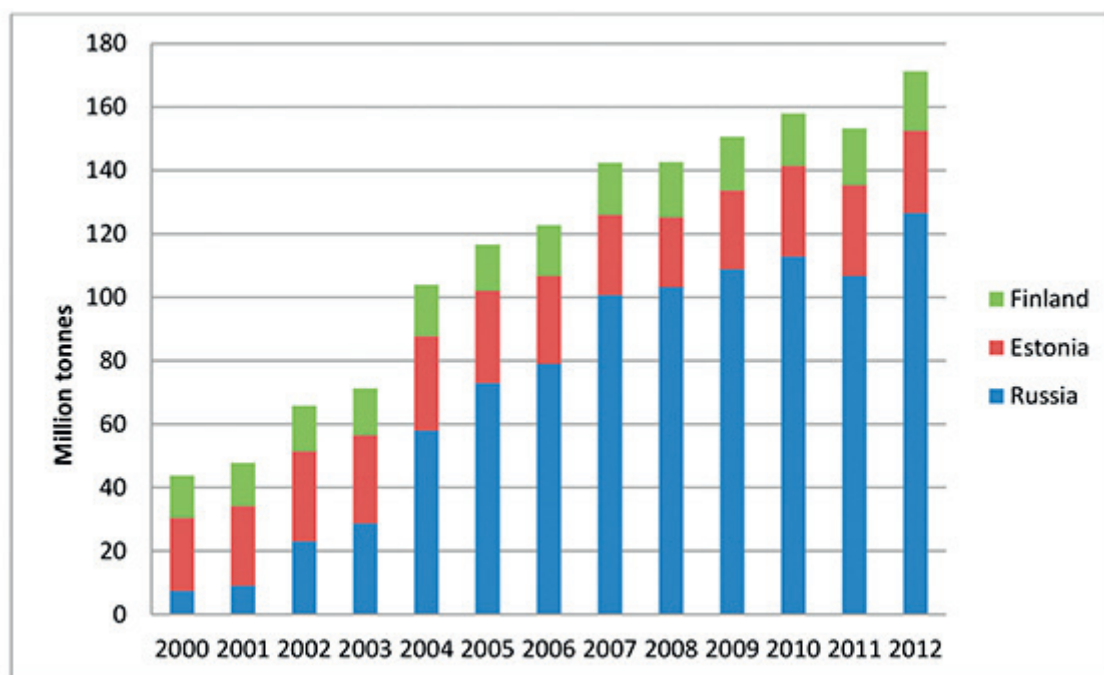
5. Different oil transportation scenarios in the Gulf of Finland

5.1 Safgof -scenarios

In the Safgof or “Evaluation of the traffic increase in the Gulf of Finland during the years 2007–2015 and the effect of the increase on the environment and traffic chain activities” project, three different scenarios for maritime traffic and cargo volumes in the Gulf of Finland were produced. The basic year was 2007 and scenarios were produced for the year 2015. In this article, the Safgof scenarios focus on petroleum products. The prevailing energy consumption worldwide in the year 2007 was, as it is today, based on fossil fuels and especially on petroleum products. The global petroleum demand is expected to increase, mainly due to the growing energy needs of developing economies, such as China.

In the Safgof project, three different future maritime transportation scenarios for the year 2015 were formulated. “Slow growth”, “Average growth” and “Strong growth” scenarios were built on the basis of the existing maritime transportation scenarios and by analysing the economic development, production and transportation infrastructure in the countries surrounding the Gulf of Finland: Finland, Russia and Estonia. The

Figure 4. Development of oil transportation in the Gulf of Finland



Source: Wahlström et al. 2013.

probability of the three scenarios was studied in the context of a probability distribution simulation. In the Safgof scenarios, the most accurate scenario for the year 2015 is somewhere between slow and average growth. The estimated volumes in the Safgof “Slow growth” scenario were 158 million tonnes of oil and oil products, and already in the year 2012 the volumes exceeded this number by 13 million tonnes. Also the shares in the scenario are not fulfilled. The shares in Estonia and Finland have not changed that much in the past ten years, but the Russian volumes have increased every year. The most accurate scenario might be the average growth scenario. The volumes in Finland and Estonia are quite close, but Russian volumes are 55 million tonnes too high compared to the volumes in 2012.

In the year 2007, it was estimated by Finland’s environmental administration and VTT Technical Research Centre of Finland that oil transports in the Gulf of Finland would total 240 million tonnes by the year 2015 (Hietala 2006). The main reason for the huge increase was that the Port of Ust-Luga was expected to start its operation earlier than it actually did. The first oil load was shipped in the spring of 2012. In the year 2013, the Finnish Environmental Institute changed and decreased the estimated oil transportation volumes for the year 2015. In the year 2012, Finnish Environment Institute updated the estimated oil transportation volumes. The new estimate for the year 2015 is that the total amount of oil transportation in the GoF will reach approximately 170 tonnes per year and will stay at that level.

5.2 MIMIC –scenarios

The scenarios of the MIMIC or “*Minimizing risks of maritime oil transport by holistic safety strategies*” project concentrate only on oil transportation in the Gulf of Finland for the years 2020 and 2030. In the year 2011, the total volume of oil transportation in the GoF was 153.3 million tonnes (Russia 106.7 million tonnes, Estonia 28.6 million tonnes and Finland 18.0 million tonnes). The newest data is from the year 2012. The volumes have increased by 20 million tonnes in a year. The reason is that the Port of Ust-Luga started to operate in the spring of 2012. Oil transportation volumes in 2012 were 171.2 million tonnes (Russia 126.5 million tonnes, Estonia 25.9 million tonnes and Finland 18.8 million tonnes). The largest ports were Primorsk, whose share was 44% of

the total volume in the GoF and the second largest was Ust-Luga, with a share of 16%.

In the MIMIC project, three different scenarios for the year 2020 and 2030 were created. The scenarios were formulated on the basis of national energy strategies, the EU’s climate and energy strategies as well as other energy and transportation forecasts for the years 2020 and 2030. Energy strategies are crucial for oil transportation, as Russia is one of the world’s largest energy producers, and many countries in Europe and other parts of the world are dependent on Russia’s energy resources. Russia’s primary interest is to utilise its energy resources for the benefit of the Russian economy. In the EU, political goals have been set for reducing the use of oil and other fossil fuels and for increasing the share of renewable energy sources. The oil volumes transported will also depend to some extent on oil prices.

Scenarios for the year 2020

The “*Slow development 2020*” scenario is based on the assumption that the EU countries and Russia will suffer from a long-term economic slowdown due to e.g. the economic crisis in Greece, Portugal, Spain and Italy. The demand for consumer goods will decrease or remain at the current level. In this scenario, it is assumed that heavy industries, such as the metal and forest industries, will continue to move to Asia, South America or other continents in order to cut production costs and because of the growing demand in developing countries.

The demand for oil and oil products will decrease because of high oil prices. Transportation of goods will be more expensive because of the expensive fuel. In this scenario, Russia has no interest in investing in new technology in oil production as the demand for oil is decreasing.

The scenario “*Average development 2020*” depicts a “*business as usual*” situation. The population, economy, technology and society continue to develop in a similar manner to the past decades in Europe. It is assumed that if there is economic growth, the demand for oil will also increase. Economic growth will be more rapid in Russia than in the rest of Europe, because oil and gas pipelines connect Russian ports and gas lines to Europe. Investments for possible new gas and oil pipelines will be made as planned. A growing demand for oil will lead to investments in new and more efficient

technologies. In this scenario, heavy industries will continue their operations in Europe and new green products and innovations will be made.

In Finland and Estonia, the demand for oil products will only increase a little, because the share of bio fuels and other alternative energy sources will increase. Oil transportation in Estonia will decrease, because Russia will concentrate its oil transportation to its own ports and only half or less compared to current situation of Russian oil will be transported via Estonian ports.

The “*Strong development 2020*” scenario is the most optimistic vision of economic development and transport in Europe and Russia. The overall economic situation and trends are very positive at the global level. The demand for oil will remain high all over the world, regardless of its high price. Russia will invest in oil production and refinement technologies for the current oil production areas and expand oil drilling in the Arctic areas, but the production will not have started yet at full scale. Some estimates have expected that production would reach approximately 6 million tonnes of crude oil per year in the year 2021. Oil production in the Arctic areas is more expensive, but the high price of oil products will make drilling economically viable.

The EU will invest more in green technologies and renewable energy resources. The targets of the climate and energy package for 2020 will be achieved as planned in the strategies. Port areas will be modernised and smaller ports will merge because of the harsh competition. Ports will also specialise in certain products, such as oil and oil products, containers, dry or liquid bulk. This scenario assumes that the physical size of ports will not grow much, meaning that there will be no new pier areas for larger tankers.

Scenarios for the year 2030

The forecast for the year 2030 is more difficult to make than for 2020 due to the longer time span. 15–16 years is a long time period and anything can happen. More radical changes may take place, for example in the economy, politics and the climate. The “*Stagnating development 2030*” scenario assumes that the implementation of the EU’s climate and energy package has failed and there is no interest in greener technology. It is believed that despite of the recession, some development must have happened over the next two decades.

The main energy resource for especially in transportation sector will be oil. The demand for oil will increase the price of oil and transportation costs. Because of the poor economic situation in the EU and Russia, there are no investments in new energy saving transportation technology.

Heavy industries have relocated from Europe to Asia, South America or other continents because of lower labour and production costs. Russia has not been able to increase its oil or gas supply. Oil production in the Arctic area is so expensive that only test drillings have been made, but production has not started. No new investments are being made in ports or vessels, except for the compulsory investments if the tanker fleets get too old. The experts who estimated transported oil volumes in the MIMIC scenarios believed that the Northern Sea Route would be opened by the year 2030 and would change transportation chains to some extent by 2030.

In the “*Towards a greener society scenario 2030*”, growth continues in a similar way as in the *Average development* scenario for 2020. The economic situation will be mainly positive. In 2030, the EU’s climate and energy package objectives will have been achieved and new, more ambitious strategies will have been formulated for the following decades. The EU is becoming a more carbon neutral society. Renewable energy is increasingly replacing fossil fuel energy resources.

Despite of economic growth, it is believed that the demand for oil will decrease. The reason for the decreasing oil demand is the increasing amount of renewable energy sources and bio fuels. In the transportation sector, there will also be a shift towards railways and multimodal transportation modes. Heavy industries have relocated their production to countries in what are now called developing countries, but the green wave will have brought new innovative industries to Europe.

Russia will have been building up its oil production capacity especially in the Arctic. The growing demand for oil will be in Asia, so the majority of the oil from new oil production areas will go to China and India, where private and public transportation will have increased strongly.

In the “*Decarbonised society 2030*” scenario, the EU will have implemented very strict environmental policies that all EU member states follow. This trend will also be apparent in other western countries.

Green technology will be one of the major export products in Europe, and less rich countries in particular are attempting to solve their energy problems with green technology. It is believed that oil and fossil fuels will remain the main energy resource in poorer countries and also in Russia. Russia will still use oil and fossil fuels because of its national production capacity. New battery technologies will have enabled the use of electricity as a power supply in cars. The remainder of the world will still be mainly using combustion engines in cars.

Russia's oil production will have expanded to the Arctic areas, and the country will produce increasing amounts of oil. As in the "*Towards a greener society*" scenario, in this scenario, too, large amount of Arctic oil will travel through pipelines to Asian developing markets. This option might be too optimistic by the year 2030, but might be implemented in the future. Russia's domestic demand for oil will have decreased and Russia will have begun using greener technologies in transportation and energy production. New gas pipelines will have been built to Europe via the Baltic Sea. Gas consumption in the EU will increase only modestly, but the main reason for pipelines via the Baltic Sea is that natural gas would not come anymore via the former Soviet Union countries. Europe will also prefer using gas because the carbon capture is one of the EU's key tools in the fight against global warming and climate change.

5.3 Other forecasts

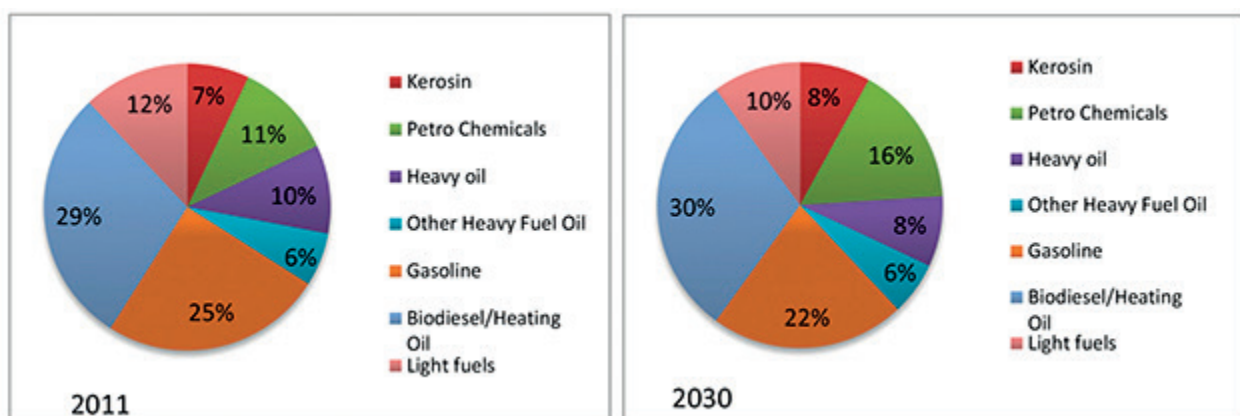
Other future forecasts of maritime transport in the Baltic Sea have also been made. The Baltic

Transport Outlook 2030 study forecasts a growth in cargo volumes in the Baltic Sea. Maritime freight traffic is estimated to increase by 20% between the years 2010 and 2030 and the freight volumes will increase by almost 150 million tonnes by the year 2030, which is 17% compared the total cargo volumes of the year 2012. The largest growth is expected in the field of container, RoRo and dry bulk traffic. However, it is forecasted that transport volumes of liquid bulk (mainly consisting of oil) will decrease by 7%. Liquid bulk will still remain the largest freight segment in the year 2030.

Another interesting forecast can be found in a Swedish study: Risk picture for oil spill to sea in Sweden before 2025. What is interesting in the study is how the share of oil types in the future is forecasted. According to the study there will be no changes in the next twenty years. Only modest movement to one direction or another will be happen. Only the share of petrochemical products will increase by 5% in the next twenty years. In Figure 5, the share of different oil products is described.

In Russia's energy strategy for the period up to 2030, one goal is to increase the oil production up to 30% by the year 2020 and 65–80% by the year 2030. To cope with the production and export growth, large investments are required. The exported crude oil volumes over the Baltic Sea are estimated to increase slightly, while it is believed that growth eastward toward China, India or other developed markets will increase rapidly. Russia needs a large part of their oil reserve to produce kerosene / JET fuel and gasoline for domestic consumption and both

Figure 5. Share of oil and oil product types in 2011 and 2030 transported in the Baltic Sea



Source: MSB 2013.

naphtha and Vacuum Gas Oil production will be needed as raw materials for the domestic refineries. The Baltic Pipeline System 2 was connected to the Port of Ust-Luga in the year 2012 and that year the capacity reached almost to the estimated 30 million tonnes / year. In next several years, Russian oil transportation volumes via GoF might increase up to 130–150 million tonnes annually.

In Figure 6 the oil transportation development from the year 1987 to 2012 is presented in blue dots. As it can be seen from the figure, the development has been relatively linear from the year 2000–2012. The volumes of transported oil in the GoF cannot increase in a linear manner because of production capacity. Red dots are scenarios, which have been created in the Safgof and MIMIC projects. S2015 is the average growth in Safgof scenario and at that time the expert estimated that the oil transportation volumes would be 220 million tonnes. In the MIMIC scenarios for the years 2020 and 2030, the average growth scenario estimated that the oil transportation volumes are 187 million tonnes in the year 2020 and 178 million tonnes in 2030 (towards a greener society scenario). The estimates presented in the aforementioned scenarios were based on expert interviews.

6. Policies and co-operation

In the Baltic Sea, the co-operation on pollution preparedness and response under HELCOM

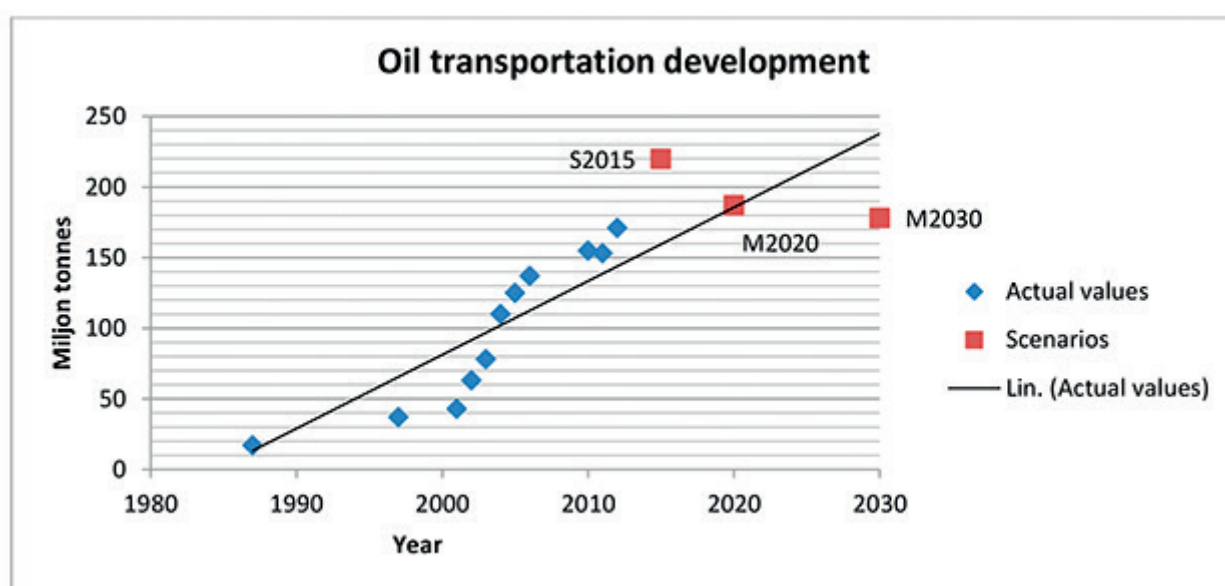
started in the year 1977. The HELCOM Response Group consists of the competent pollution response authorities of all the Baltic Sea countries, usually national coastguard or navy. Today there are around 70 dedicated oil response vessels in the region, with equipment that can be used for international assistance. Many of these vessels have also substantial towing capacity. Additional, usually smaller, vessels are available for accidents in ports and coastal waters.

At the national level in Finland there are policies and different tools to prevent the risk of oil spill accidents. Guidelines for oil spills and exercises for oil spill response in the Baltic Sea and the GoF have been arranged. These activities increase the level of oil spill preparedness. The common goal is to prevent oil spills and facilitate the recovery of oil spills and improve the condition of the Baltic Sea.

6.1 Compulsory pilotage

Using a pilot on board decreases the risks of collisions and groundings and can prevent vessel damage, cargo damage and damage to passengers and crew members. The main goal is to ensure the overall maritime safety. The use of pilotage is compulsory in Finland according to the Pilotage Act (940/2003). Vessels shall use a pilot in the public fairways and on other areas defined as compulsory pilotage areas. Some vessels are exempt from compulsory pilotage based on the size of the

Figure 6. Development of oil transportation in Gulf of Finland



Note: Comparisons of actual values and Safgof and MIMIC scenarios - marked as S or M together with the year forecasted

vessel; because the masters of the vessels hold a pilotage exemption certificate or because the vessel is in domestic service sailing in the Saimaa waterways.

Also Ice Advisor service is a sort of voluntary service where advisors assist shipmasters on vessels navigating in the icy conditions, or in summertime if needed, in the Baltic Sea. The aim is to ensure the safest and most efficient route to the port of destination. It has been estimated that compulsory pilotage decreases the accident risk approximately 7–11%.

6.2 ENSI –system

The Enhanced Navigation Support Information (ENSI) service facilitates information exchange between ships and shore. A key feature of the service is that before departing from the port the ships send their route plans via ENSI to the Vessel Traffic System (VTS) centre. The route is then automatically checked by the VTS centre equipment, after which the plan becomes available for the VTS operator, who can then visually check it or examine the results of the automatic ENSI check on the screen. In exchange for sending the route plan, the ENSI service provides the ship with real-time and route-specific information on the meteorological conditions via the ENSI portal. The ENSI service improves the level of the flow of information and decreases the level of misunderstanding between the ships and vessel traffic instructors. Before the ENSI system, information was managed through VHF phones. The most significant impact is that ENSI affects the number of collisions and groundings. The ENSI financier has estimated that the ENSI system decreases the risk of accident by 20%. Establishing costs are around € 1 million, but actual exact operating costs are not available (Hänninen et al. 2013; Finnish Transport Agency 2014).

6.3 Oil recovery co-operation

Finland has invested a lot in oil spill recovery if compared to Estonia or Russia. Especially in Russia, the oil spill response is in its infancy. According to the Finnish Environment Institute, Finland has 16 ships, 2 airplanes, 140 boats, hundreds of small boats, 19 km of boom for open seas and 90 km of other booms for coastal waters for oil

recovery. In Sweden, the situation is the same or even slightly better than in Finland when ships and other equipment are compared. According to European Maritime Safety Agency (EMSA), Estonia's ship fleet is approximately one fourth of the ship fleets of Finland and Sweden. Also in Estonia there are less than 3 km of booms for open seas and 5 km for coastal waters. In Russia, one modern vessel and new multipurpose ships are under development for salvage and rescue operations.

The main goals in oil spill preparedness by the year 2015 are that together with neighbouring countries, in three days during the open water season and during ten days in ice conditions, 30,000 tonnes of oil can be collected in the GoF, 20,000 tonnes in the Archipelago Sea and in the Gulf of Bothnia and 5,000 tonnes in the Gulf of Finland. To achieve these goals, more new vessels, booms, equipment, training and money is needed. A lot has been done so far, but the fight against the oil threat must be strengthened with co-operation between all of the countries surrounding the Baltic Sea. Efforts for co-operation are being made in for example the WINOIL (winter navigation risks and oil contingency plan) project. The overall objective of the project is to increase understanding of oil pollution prevention measures, improve the joint emergency cross-border procedures in oil accident, and to mitigate the risks related to ship navigation in ice conditions prevailing in the Gulf of Finland.

Besides oil, a variety of chemicals are transported in the Baltic Sea annually. In some cases, chemical releases are thought to be potentially more hazardous than oil. As to marine spills, chemicals may have both acute and long-term environmental effects, and may not be as easily recoverable as oil spills. In the future, decision makers should also put effort in preventing chemical spills.

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The EU's isolated gas islands and LNG receiving terminals in the Baltic Sea region

Kari Liuhto

33

Executive summary

Three out of 10 littoral states of the Baltic Sea region, namely Denmark, Norway and Russia, are net exporters of natural gas, while the remaining seven countries are dependent on gas imports. These seven countries consume over 100 billion cubic metres (bcm) of gas annually, 85% of which is imported. Russia is the main supplier of gas to the region. Nearly half of these seven net importers' demand for gas is met by Russian gas. The corresponding share for the entire EU is less than 25%. Around 40% of Germany's gas needs are satisfied from Russian supplies. The corresponding share for Poland is around 60%. Estonia, Finland, Latvia and Lithuania are fully dependent on Russian deliveries, whereas Sweden does not consume Russian gas. Since three Baltic States and Finland are not connected to the West-European gas grid, they can be regarded as the EU's isolated gas islands.

In order to reduce their gas dependence on Russia, the Baltic Sea countries have begun building liquefied natural gas (LNG) terminals. The first LNG receiving port in the region was completed in Sweden in May 2011. This small-scale unit (annual capacity 0.4 bcm) will probably be accompanied by large-scale LNG terminals, one in Lithuania (capacity 3 bcm) and the other in Poland (capacity 5 bcm). These ports are scheduled for completion by the end of 2014. Estonia and Finland are next in line, although it remains to be seen whether, based on EU co-funding, they will jointly build a regional LNG outlet (estimated capacity 4 bcm), which would be divided into two parts i.e. one unit to be located on Estonian territory, with another situated in Finland. A possible resolution to divide up the regional LNG terminal will only be economically rational if the units are under common ownership. Otherwise, the divided units will be too small to lower the price of LNG. In the worst-case scenario, these LNG terminals would begin competing over LNG deliveries and actually raise prices.

Since Germany, which represents three quarters of net importers' gas consumption, continues to rely on pipeline deliveries, LNG terminals will continue to account for a modest share of the total gas supply in the region. Even if LNG terminals do not change the geography of the region's gas supply as a whole, they will be of strategic significance to individual Baltic Sea countries. The Crimean conflict stresses the importance of finalising these projects quickly and highlights the need to reduce the EU's hydrocarbon dependence on Russia, as proposed by the EU's energy commissioner Günther Oettinger on 3 March 2014 (YLE 2014).

Depending on the final capacity and utilisation rate of the LNG terminal in Klaipėda, Lithuania may be able to meet 30-90% of its gas needs via its LNG terminal. Since over a third of Lithuania's primary energy consumption is met from natural gas, in principle this LNG port could secure 10-30% of the country's total primary energy consumption. Although the corresponding share in other Baltic Sea countries will remain more modest, LNG terminals will play a strategic role in diversifying these countries' energy imports. In addition to LNG terminals, to end the Baltic States' and Finland's isolation from the West-European gas grid, a gas pipeline must be constructed soon between Lithuania and Poland (GIPL) and an underwater pipe (the Balticconnector) will need to be laid between Estonia and Finland. Together, these LNG terminals and new gas pipes will improve the energy and overall security of the EU's north-eastern corner.

1. The growing role of natural gas in the world, the EU and the Baltic Sea region

Whereas 50 years ago global natural gas consumption totalled around 650 billion cubic metres, consumption was already five times higher, at 3,300 bcm, by 2012. Nowadays, natural gas accounts for over 20% of global primary energy

consumption¹ (BP 2013) and its share is expected to increase (GREO 2013). Almost one third of global gas production, totalling over 1,000 bcm, is sold internationally. Liquefied natural gas, LNG,² accounts for one third of the international gas trade (BP 2013). In 2012, international trade in LNG amounted to almost 240 million tonnes, roughly equivalent to 325 bcm. The role of LNG in the gas business has grown rapidly. Only 30 years ago, LNG trade volumes were just one tenth of their current level (IGU 2011; IGU 2013).

Natural gas has also become an increasingly important energy source in the EU. Some 50 years ago, less than 5% of energy consumption by current EU member states was based on natural gas (Noel 2008). This share now amounts to almost 25%. The EU meets a third of its gas consumption through indigenous production, while two thirds of gas is imported. In 2012, two most important external suppliers of natural gas to the EU were Russia (accounting for 23% of the EU's total gas supply) and Norway

(22%). Over 80% of gas imported to the EU was delivered via pipelines, whereas LNG amounted to a fifth of the Union's gas imports (Eurogas 2013).

The Baltic Sea region is unique in terms of its natural gas supply. The region is home to the globe's largest gas exporter, Russia, a major European gas supplier, Norway, and a significant regional gas provider, Denmark. As the aforementioned three countries are net exporters of natural gas, they have been excluded from Table 1, which describes the gas supply of net importers in the region.

Natural gas is a particularly important source of energy to Lithuania, where it accounts for almost 40% of the country's primary energy consumption (PEC). In Germany and Latvia, roughly 20-25% of PEC is based on gas. In Estonia, Finland and Poland gas accounts for approximately 10-15% of PEC. In Sweden, gas represents only 2% of the country's PEC³.

Table 1. Net importers of gas in the Baltic Sea region in 2012 (billion cubic meters)

	Indigenous production	Russia	Norway	Other, including re-exports	Total gas supply	Share of gas in primary energy consumption
Estonia	0.0	0.6	0.0	0.0	0.6	9%
Finland	0.0	3.6	0.0	0.0	3.6	9%
Germany	11.1	31.3	24.5	17.0*	83.9	21%
Latvia	0.0	1.4	0.0	0.0	1.4	27%
Lithuania	0.0	5.3	0.0	- 2.1**	3.2	36%
Poland	4.6	9.6	0.0	2.2	16.3	14%
Sweden	0.0	0.0	0.0	1.2***	1.2	2%

* Most of Germany's remaining gas supply is imported from the Netherlands (IEA 2012a).

** Lithuania re-exports some 2 bcm of gas to the Kaliningrad region, the Russian enclave located between Lithuania and Poland.

*** Sweden mainly imports its gas from Denmark via a pipeline, despite the fact that the country completed an LNG terminal with an annual capacity of 0.4 bcm in May 2011.

Source: Eurogas 2013.

¹ According to the OECD (2014), "primary energy consumption refers to the direct use at the source, or supply to users without transformation, of crude energy, that is, energy that has not been subjected to any conversion or transformation process".

² LNG is conditioned natural gas that has been cooled into its liquid state at approximately minus 162 degrees Celsius. LNG is compressed into liquid form so it can be shipped in pressurised containers. In its liquefied form, natural gas takes up to 1/600th of the gasified space. One million tonnes of LNG are equivalent to 1.36 bcm of natural gas (BP 2013).

³ Gas consumption in Sweden is highly concentrated; around 30 consumers use 80% of the gas consumed in Sweden (SEMI 2013).

Nuclear energy, which accounts for approximately 30% of Sweden's PEC, has kept the share of natural gas low in the Swedish energy mix (IEA 2012b; BP 2013).

Denmark, Norway and Russia are not the only gas producers in the Baltic Sea region. Germany and Poland meet part of their gas consumption requirements through indigenous production. Poland may become independent of gas imports, if it succeeds in increasing its gas output based on shale gas production. In 2011, Poland's Prime Minister Donald Tusk optimistically indicated that Poland would begin shale gas production in 2014 and aims to meet all of the country's own gas needs through indigenous production by 2035 (Reuters 2011).

The remaining countries of the Baltic Sea region do not currently produce gas. However, the prospect of shale gas production elsewhere in the Baltic Sea region cannot be excluded, although shale gas drilling has been hampered in Lithuania, Poland and Sweden (Gismatullin 2011; Reuters 2013; Sytas 2013; Cienski 2014).

Russia is clearly the region's key supplier of natural gas, accounting for almost half of the gas consumption of the region's net gas importers. Even more importantly, Russia is the sole supplier of gas to Estonia, Finland, Latvia and Lithuania. Some 60% of Polish gas supplies and 40% of Germany's arrive from Russia. All Russian gas supplied to the Baltic Sea region is piped. Norway's role becomes emphasised in supplies to Germany, while Denmark is the major supplier of gas to Sweden. An overwhelming share of Norwegian gas supplied to Germany is transported via an underwater pipe (see Energy Delta Institute 2013). Despite the LNG receiving terminal built in May 2011, Sweden chiefly receives its gas via an underwater pipe from Denmark (SEMI 2013).

In 2009, the EU commissioner Andris Piebalgs

termed the Baltic States "*an energy island*", since then they were not connected to the EU's electrical energy grid (EU 2009). In a similar manner, the Baltic States and Finland could be labelled the EU's isolated gas islands, since their national gas pipeline networks are unconnected to the West-European gas grid. This deficiency has served to emphasise the importance of building a gas pipeline between Lithuania and Poland (GIPL⁴ with an initial annual capacity of 2.3-2.4 bcm) and an underwater pipe between Estonia and Finland (the Balticconnector⁵ with an annual capacity of 2.0-2.4 bcm). In addition, gas pipes between the Baltic States should be upgraded and LNG receiving terminals constructed, in order to diversify gas flows in the eastern Baltic Sea region (Booz&co 2012).

The objective of this article is to describe the condition of LNG receiving terminals in the Baltic Sea region at the beginning of 2014 and to discuss the possible role these LNG ports will play in energy supply security within the region. Because I approach the theme from the point of view of net gas importing countries, I do not discuss the gas supply of Denmark, Norway and Russia in this article. The article is based on freely available published reports, analysis and articles.

2. LNG receiving terminals in the Baltic Sea region

The first LNG receiving terminal in the Baltic Sea region was built in May 2011 in Nynäshamn, some 60 km south of the Swedish capitol, Stockholm. The Nynäshamn LNG is a small-scale unit with an annual capacity of 0.4 bcm. This terminal mainly meets industrial demand and serves the bunkering of LNG ships. The latter will become emphasised in the future, when the sulphur directive enters into force⁶. According to this directive, the sulphur content of fuel used in the shipping industry must be lowered from its present 1.0% to 0.1% in the Baltic Sea, the North Sea, and the English Channel by January 2015.

⁴ A final investment decision concerning GIPL is expected in 2014. Over 500 km of new pipeline is needed to connect the Lithuanian gas grid with the Polish one. This pipe requires an investment of over € 550 million and the EU may provide up to 75% of the financing for it. The pipeline may be operational as early as 2018. Later on, the capacity of this pipe could be increased to 4.1-4.5 bcm (Booz&co 2012; BB 2013; ICIS 2013; NGE 2013a).

⁵ The final investment decision on the Balticconnector may be made during 2014. It is estimated that this 80-110 km underwater pipe will cost approximately € 150 million. Should the investment decision be made in 2014, this pipeline may begin delivering gas as early as the autumn of 2017 (Booz&co 2012; ERR 2013b; NGE 2013b).

⁶ Serious reservations should be expressed here on the subject of a fast LNG fuel revolution, since the transformation from conventional fuels to LNG may take decades rather than years; it may be more viable in economic terms for shipping companies to use their current fleets until the end of their lifecycles before switching to LNG powered ships. It has been estimated that only 15% of ships travelling in the Baltic Sea will be using LNG by 2020 (Talouselämä 2014).

The first LNG terminal in the Baltic Sea region to pursue the goal of meeting strategic energy demand is scheduled for completion in Swinoujscie, Poland, by the end of 2014, although the possibility of delay cannot be excluded. The terminal's initial capacity will be 5 bcm, with the possibility of upgrading the unit to 7.5 bcm. Qatargas will be the main supplier of gas to the terminal. Qatar has agreed to provide around 1.5 bcm of gas annually (Ciesnowski 2013). Here, it should be borne in mind that nameplate capacity rarely corresponds to realised LNG inflows. For example, the nominal regasification capacity of LNG terminals in the EU was some 190 bcm in 2012, but the terminals managed to utilise only 30% of their nameplate capacity (Eurogas 2013). Despite the aforementioned reservation, the Swinoujscie LNG terminal will undoubtedly become a strategic unit for Poland, since in theory it can meet almost one third of Polish gas demand (Table 2). As natural gas accounts for almost 15% of Poland's PEC, the Swinoujscie terminal could satisfy up to 5% of Poland's PEC.

The construction of the first floating LNG terminal in the Baltic Sea region was begun in Klaipeda by Klaipedos Nafta, a company 70% owned by the State of Lithuania, in January 2014. Construction is scheduled for completion by the end of 2014. In principle, the floating unit could serve Lithuanian needs during the coldest months of the year. During the summer months, it may be moved onto the shore of Latvia, where it may be used to fill Latvia's large underground gas storage facility, Incukalna (2.3 bcm)⁷. To fulfil this mobile supply

function, Latvia's legislation will have to be liberalised to provide the floating unit with access to the country's gas pipeline grid and to enable its use of the gas storage facility. Alternatively, LNG could be regasified in the Klaipeda LNG terminal and gas delivered via a pipeline from Klaipeda to Latvia.

The Klaipeda LNG terminal is expected to regasify around one billion cubic metres of gas in 2015, while the terminal's throughput is later expected to increase to 2 to 3 bcm (MERL 2013). Even if its capacity is not increased, the Klaipeda LNG terminal will become a highly strategic outlet for Lithuania. If capacity were to reach even one billion cubic meters, the terminal would satisfy over 30% of Lithuania's gas demand, or over a tenth of the country's PEC. Due to the terminal's strategic significance, the EU may provide over €400 million in support for the LNG terminal (Port Technology 2013). The Lithuanians are expected to sign a deal with a gas supplier by mid-2014 (Lithuanian Tribune 2013).

In February 2014, the Latvian Parliament approved amendments to the country's energy legislation at the second reading of the proposed changes. These amendments envisage the gradual opening up of the country's gas market by April 2017. Before criticising Latvia's slow unbundling of its gas sector, it should be borne in mind that Latvijas Gaze, a company in which Gazprom is the major stakeholder (Latvijas Gaze 2013), has a gas deal with Gazprom which will remain valid until

Table 2. LNG receiving terminals of net gas importing countries in the Baltic Sea region

Country	Name	Year in operation	Owner	Concept	Nominal receiving capacity per annum (bcm)	Nominal receiving capacity / country's gas consumption in 2012
Sweden	Nynäshamn LNG	2011	AGA Gas AB	Onshore	0.4	33%
Terminals in construction						
Poland	Swinoujscie LNG	2014	GAZ-SYSTEM SA	Onshore	5.0	30%
Lithuania	Klaipeda LNG	2014	Klaipedos Nafta	Floating	3.0	94%

Source: IGU 2013.

⁷ Lithuania is considering the construction of the Baltic States' second underground gas storage facility in Syderiai. This facility's initial capacity would be around 0.5 bcm (Jievaltas 2012; RS 2013).

2017 and Latvijas Gaze has an exclusive right to use the gas storage facility at Incukalns until 2017. This may slow down the construction of a national LNG terminal in Latvia. Should Latvia proceed with its own LNG terminal, this will mainly serve the needs of Latvia and its capacity will be much lower than declared in earlier plans (Liuhto 2012). If Latvia proceeds with its small-scale LNG port, we can assume that this will be located in Riga rather than Ventspils, since the current pipeline grid supports the port's location close to the capital.

Estonia has decided to unbundle its gas sector by 2015. This would allow LNG terminals to access the existing gas grid. Three LNG terminal plans have so far been proposed; a terminal in Paldiski, a unit in Tallinn or a port in Sillamäe (Booz&co 2012; Bryza and Tuohy 2013; EMFA 2013; ERR 2013a). At the time of writing this article, the joint LNG terminal with Finland seemed a more likely alternative than any of the aforementioned national LNG terminal plans (TS 2014b).

Finland is gradually unbundling its gas market. Gasum, a company with a minority stake of Gazprom, is the main player in the Finnish gas market. Gasum plans to construct a national LNG terminal, called the Finngulf LNG, in Inkoo, which is located some 60 km west of Helsinki. The Finngulf LNG is scheduled to become operational in 2016 and the initial capacity of this national terminal will be one billion cubic metres, although this capacity could be expanded to 2 bcm in 2018. This national unit could therefore meet around 25-50% of Finland's gas consumption needs (Jännes 2013). The LNG terminal will also be strategic for Finland, since it could satisfy some 2-5% of the country's PEC. If the joint terminal with Estonia proceeds, this national LNG terminal plan will be set aside. Should the joint LNG terminal be divided into two units, one is highly likely to be situated in Paldiski (Estonia) and the other in Inkoo (Finland).

Every now and then, the media runs articles on plans for LNG terminals on German soil, including projects in Bremerhaven, Hamburg, Lübeck or Rostock. At the moment, it looks as though an LNG bunkering terminal will be completed in at least Bremerhaven and Hamburg (Liuhto 2012; NDR 2013; WMN 2013). Despite the numerous LNG port plans, we can assume that Germany will rely on pipeline imports for its strategic gas supplies and will build small- and mid-scale LNG terminals for bunkering purposes. Prior to the Crimean crisis, it seemed logical that Nord Stream would build two new gas pipes, in addition to the two existing ones running from Vyborg in Russia to Greifswald in Germany which have a current capacity of 55 bcm. However, the Crimean conflict may lead to the freezing or entire cancellation of the plan to build additional underwater pipes.

In addition to the aforementioned LNG terminals, several small- and mid-scale LNG terminal projects in the Baltic Sea region are either at the construction or planning stage, such as the LNG terminals in Lysekil, Gothenburg and Gävle in Sweden,⁸ and in Pori, Tornio and Hamina in Finland (Tekniikka & Talous 2014)⁹. Since these terminals will mainly serve industrial needs and the bunkering of LNG ships, this article will not consider them in further detail (see Map 1).

Leaving aside the perspective of net gas exporters in the Baltic Sea region, i.e. Denmark, Norway and Russia, mention should be made of the special case of the Kaliningrad region, since gas imports are of strategic importance to energy consumption in the region, which is highly dependent on gas deliveries from the Russian mainland through Belarus and Lithuania. Statistics provided by Eurogas (2013) suggest that, with its less than one million citizens (less than one third of the combined population of Estonia and Latvia), the Kaliningrad region consumes more natural gas than Estonia and

⁸ The construction of the Lysekil LNG terminal has already begun and this terminal could offer slightly larger storage capacity than the Nynäshamn LNG (LWN 2013). The LNG terminal in Gothenburg will be somewhat smaller than the Lysekil LNG. The Gothenburg LNG port is set to be finalised by December 2015. Part of this project will be funded by the EU. The Gävle LNG will be of the same size as the aforementioned units and its completion is scheduled for early 2016. All of the aforementioned Swedish LNG terminals are intended to fuel LNG ships or serve the needs of local industry (liG 2013; PoG 2013; PS 2013).

⁹ Gasum has decided to build an LNG terminal in Pori instead of Turku (TS 2014a). However, it is possible that progress will be made in the case of the Turku unit under another company, such as AGA (Turku 2014c). The LNG terminal in Tornio may be completed in 2017 (HS 2013; Manga 2013), with Outokumpu Steel as the main client of the terminal (YLE 2013; Kauppalehti 2014).

Map 1. LNG terminals and the related plans in the Baltic Sea region, July 2013



Source: GIE 2013.

Latvia together. This gives a clear indication of the strategic significance of natural gas to the Kaliningrad region¹⁰. Since the nuclear power project in the Kaliningrad region was suspended in May 2013 (Menkiszak 2013), speculation has intensified about the construction of an LNG receiving terminal in Kaliningrad. If the aforementioned plan is executed, this terminal may meet the entire consumption need of the Kaliningrad region while making some gas available for re-export. A final investment decision will be taken by the end of 2014 (Gazprom 2013; OGJ 2013). In addition, the construction, close to St. Petersburg (BTJ 2013), of an LNG sending terminal with an annual capacity of over 10 bcm has been a subject of public discussion. Since a final investment decision has not yet been taken on the two aforementioned ports, some doubts remain about whether these projects will be realised.

3. The importance of LNG to security of energy supply in the Baltic Sea region

Natural gas accounts for 23% of primary energy consumption by the EU's 28 member states. Among the littoral states of the Baltic Sea, this share is higher in only Latvia, Lithuania and Russia (BP 2013; Eurogas 2013). Five out of 10 littoral states in the Baltic Sea, namely Denmark, Germany, Norway, Poland and Russia, produce gas in the Baltic Sea region, but only Denmark, Norway and Russia are net exporters of gas. In practice, this means that seven countries in the region, namely Estonia, Finland, Germany, Latvia, Lithuania, Poland and Sweden, are net importers of gas.

These seven countries consume over 100 bcm of natural gas, 85% of which is imported. Despite major gas imports, only one LNG receiving terminal currently operates in the region. This terminal is located 60 km south of the Swedish capital and is of strategic significance to Sweden's gas supply, since it can cater for up to one third of Sweden's total gas requirement. On the other hand, natural gas is of such marginal significance to Swedish primary energy consumption (2%) that the strategic importance of this terminal should not be over-emphasised. However, this Nynäshamn LNG terminal may be followed by 2-3 other small-scale LNG terminals in southwest Sweden and

north of Stockholm. It seems that these new LNG terminals will be constructed for industrial and transportation purposes, i.e. for the bunkering of LNG ships, rather than meeting Sweden's strategic energy requirements.

The Baltic Sea region's second LNG receiving terminal will be completed in Poland by the end of 2014, if there are no more changes in the project schedule. During the first phase, this Swinoujscie LNG terminal could handle a third of the natural gas consumed in the country, i.e. this unit may meet up to 5% of Poland's total primary energy consumption.

Lithuania will build the region's third LNG receiving terminal. The Klaipeda LNG terminal will play a highly strategic role in Lithuania, since it will be able to meet most of Lithuania's demand for gas. In theory, the terminal could satisfy up to one third of the country's total PEC.

Probably after the construction of this Lithuanian LNG port, smaller LNG terminals will be constructed in Finland (Tornio, Pori and possibly in Hamina), in Germany (in the vicinity of Hamburg) and in Sweden (Gothenburg, Gävle and Lysekil).

While both Estonia and Finland have planned the construction of large national LNG terminals on their soil, a joint terminal between Estonia and Finland now looks like a more likely alternative.

Latvia has advanced slowly with its LNG terminal project, possibly due to Latvia's Gaze's existing deal with Gazprom, which will remain valid until 2017. It would be no surprise if Latvia were to erect a small-scale unit for bunkering purposes in Riga while continuing strategic imports of gas via a pipeline.

Around 7% of Germany's total energy consumption is currently based on nuclear power. The country has decided to phase out its nuclear power stations by 2022, i.e. within around 3,000 days. Should the related closures follow the initial schedule, Germany must proceed rapidly with its energy transformation, the *Energiewende*. The *Energiewende* may slightly increase the share of gas in the German energy mix, which explains why the Gazprom-controlled North Stream plans to construct a third and fourth pipeline on the

¹⁰ Russia currently exports LNG solely from the Sakhalin Islands to Asian countries. This operation had a capacity of 15 bcm in 2012 (IGU 2013). Russia may open a major LNG terminal with an annual capacity of over 20 bcm in the Yamal Peninsula sometime in the next 10 years.

bottom of the Baltic Sea, despite the fact that the two earlier pipes have so far run below their maximum capacity of 55 bcm (Luukka 2013). On the other hand, the Crimean crisis may lead to the freezing of these plans. However, even if no new gas pipes are constructed, Germany has decided to rely more on gas pipelines than LNG terminals, although it will build some small-scale LNG terminals for fuelling LNG ships.

To sum up, 1) there will be no dramatic increase in gas consumption in the Baltic Sea region due to new LNG terminals or LNG powered ships; 2)

the majority of LNG terminals to be constructed in the region will be small-scale units and they will mainly serve increased bunkering; 3) LNG terminals will not shake up the geography of gas supply in the Baltic Sea region and Russia will remain an important supplier of natural gas in the region as a whole. On the other hand, LNG terminals will be of high strategic value to the Baltic States and Finland. Even if Russia remains the key supplier of gas in the Baltic Sea region, the Crimean conflict will indisputably motivate governments in the region to reduce their energy dependence on Russia.

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The Baltic Sea region: The future hub of clean maritime technology?

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45

Executive summary

While new environmental regulations in the Baltic Sea region (BSR) impose considerable investment pressures on the maritime sector, they are simultaneously forcing the region's maritime clusters to put great effort into the development of cleantech (or clean technology). In addition to direct environmental benefits, such advances may eventually result in first-mover advantages in global competition. Through determined actions and well-targeted investments, the Baltic Sea region may in fact become the world's key source of and forerunner in clean maritime technology. In order to realise this opportunity, initiatives and investments are required in key areas, such as infrastructure and technologies, R&D and education, international networking and national strategies. This article summarises recommendations applicable to all of these development areas. For example, international co-operation would be highly beneficial in the development of a harmonised monitoring system for shipping emissions, creating targeted events for networking and the solving of shared problems, developing joint R&D programmes and consortia, and increasing joint marketing and benchmarking activities on a global scale. The article concludes that policy-makers have a responsibility – through co-operation first at national and then at international level – to create a well-functioning, international and forward-looking business and innovation environment, after which state-of-the-art cleantech know-how can emerge in the private sector.

1. Increasing need for maritime cleantech¹

The global maritime sector faces major challenges. The maritime industry worldwide is suffering from significant excess shipbuilding capacity since the forceful expansion of such capacity in several Asian countries prior to the economic crisis of 2008. For instance, in only a decade, China emerged as the largest shipbuilding nation in the world, multiplying its shipbuilding capacity. Simultaneously, European shipyards have lost market share to the booming maritime industries in Far Eastern countries, which produce series of standardised vessels at considerably lower cost. However, since the competitive advantage of the European maritime industry lies in high quality and specialisation, European clusters have so far been able to maintain their market share in constructing some special types of vessels, such as cruise ships. The imbalance between supply and demand in shipbuilding has also affected the shipping sector, since there is plenty of excess tonnage in the market. Although demand for shipping services as well as new vessels has been growing since the economic downturn, the fleet over-supply is still largely in excess of cargo growth (CESA 2011; SmartComp 2013). However, seaborne transportation and thereby shipping and shipbuilding activities are only expected to increase in the future. Consequently, traditional European maritime clusters need to invest in innovation and marketing activities, particularly during hard times, in order to keep pace with global competition, maintain their forerunner position, and continue producing superior technological solutions.

Besides changes in the shipbuilding industry worldwide, other trends are shaping the development of the global maritime sector. Environmental-

¹ This chapter is largely based on the SmartComp (Smart competitiveness for the Central Baltic region) project, funded by the EU Interreg IV A Programme in 2012–2013. For more information about the project and its outputs, please visit www.cb-smartcomp.eu.

friendly solutions, such as cleantech, are of increasing importance as there is a growing need to prevent environmental pollution and mitigate climate change, amidst growing awareness of the importance of these issues. New cleantech solutions are needed for traditional shipping as well as new environments. For instance, energy production is slowly shifting to the Arctic region and northern shipping routes are increasingly accessible. This is creating growing demand for specialised maritime and offshore solutions that will mitigate the harmful effects of stepping up operations in this fragile environment (Smart-Comp 2013).

Cleantech refers to new technology and the related business models, which provide superior performance at lower costs while reducing or eliminating negative ecological impacts and improving the productive and responsible use of natural resources (Cleantech Group 2014). Cleantech thereby concerns the production of environmentally friendly energy, such as biofuels, hydro-power, solar power and wind power, as well as advances such as green transportation methods, motor solutions, waste treatment and recycling. While eliminating environmental damage, these technologies may also be more energy efficient and hence superior to their conventional counterparts. Investments in clean technology have increased considerably during the past decade. According to the estimates of Clean Edge (2013), global markets in key sectors – biofuels, wind power and solar photovoltaics – are expected to almost double in value from \$ 249 billion in 2012 to \$ 426 billion in 2022. In comparison with other parts of the world, the transition to renewable energy generation is proceeding fastest in the European Union, led by growing capacity in solar and wind power generation, particularly in Denmark and Germany.

In the maritime sector, cleantech focuses on reducing shipping emissions by adopting cleaner fuels and building a more effective infrastructure. In addition to sea transportation, maritime cleantech is increasingly connected to the offshore production of solar, wave and wind power, which are providing new market opportunities for the traditional maritime industry. Shipping is the most important transportation method in global terms, since around 90% of goods are transported by sea and this trend is increasing (UN Review of Maritime Transport 2008). However, while other modes of transport have continuously improved

their environmental performance, shipping clearly lags behind. For example, maritime transportation releases a multitude of emissions, causes noise pollution and wave erosion, produces unwanted nutrient load, and facilitates the spread of alien species (Wetterstein 2004; HELCOM 2006). These outcomes affect not only the natural environment but also human well-being – it has been argued that in 2000 as many as 50,000 deaths in Europe were related to shipping exhaust emissions, with increasing numbers forecast for the coming years (Brandt et al. 2011).

To head off this hazardous development and promote the creation of cleantech solutions in the maritime industry, various regulations are being implemented in the Baltic Sea region. In 2012, the European Parliament approved the sulphur directive, which will limit the maximum sulphur content of fuels used by ships operating in the Baltic Sea, the North Sea and the English Channel to 0.1% from the beginning of 2015. A decision on sulphur limitation was originally taken by the International Maritime Organisation (IMO) in 2008 (IMO 2008). Sulphur emissions are among the main pollutants originating from fossil fuels, causing problems such as acid rain and having a negative effect on human health. Compliance with the sulphur limitation will require changes from ships. The most likely options in the case of old ships are either using low sulphur fuel, i.e. diesel, which is expected to be significantly more expensive than the currently used heavy fuel oil, or to continue using heavy fuel oil and use scrubbers to reduce sulphur emissions. In the case of new ships, liquefied natural gas (LNG) is the most feasible fuel solution, as it produces practically zero sulphur emissions. However, large-scale use of LNG as shipping fuel is likely to take time and will require investment from all stakeholders, including ports, shipping companies and shipyards, as well as LNG providers. For instance, many ports in the BSR lack an LNG bunkering infrastructure and the supply of LNG remains a problem. Furthermore, the price of LNG for large-scale use remains a question mark. Biofuels are another interesting future fuel option for ships, but the processes associated with their production and use require further development before their large-scale adoption will be possible (Laaksonen et al. 2013).

With respect to other regulations, the upcoming Energy Efficiency Design Index (EEDI) includes directives applying to newbuildings on fuel usage,

meaning that current vessels constructed for heavy ice conditions are too powerful. In addition, governments, regulatory bodies and consumers alike are increasingly focused on environmental friendliness. Hence, the sulphur oxide (SOx) and nitrogen oxide (NOx) regulations will only become stricter, meaning that new fuel types are needed in place of heavy fuel oil, particularly in the ECA areas (Emission Control Areas). In the near future, BSR maritime clusters will have to make significant investments in identifying and implementing new solutions to meeting these regulations. In many BSR countries, seaborne trade plays an important role and the sulphur directive in particular is likely to increase freight costs and pose challenges for shipping companies as well as export industries. For instance, in Finland, where foreign trade is 85% seaborne, it has been estimated that the sulphur directive will increase freight costs by up to 30–50%, which may threaten the competitiveness of the country's exports and thereby affect a range of industries in addition to the maritime sector.

However, while these regulations will impose considerable investment pressures on the maritime transportation sector, they will simultaneously force the BSR's maritime clusters to invest in cleantech development, which may, in addition to direct environmental benefits, eventually result in considerable competitive advantages with regard to global competition in shipbuilding and maritime transportation. Combined with increasingly green customer preferences and public interest, these regulatory pressures may turn BSR maritime companies into forerunners in the global cleantech development (SmartComp 2012; Laaksonen et al. 2013).

2. The Baltic Sea region's maritime clusters

The maritime clusters of the BSR are gathered around a common sea. This creates a special business environment currently shaped by issues such as tightening environmental regulations and rising cost levels. Production costs have risen throughout the region and maintaining profitability is a genuine challenge for the maritime industry, particularly with the Asian clusters competing through lower production costs. Traditional shipbuilding has decreased in many of the BSR maritime clusters. At the same time, the risk of accidents, such as oil catastrophes, concerns all coastal states and is leading to greater investment in technologies and processes

aimed at increasing the safety of navigation. However, the starting point for engaging in cleantech developments is somewhat different in each of the BSR countries.

In Denmark, most shipyards have been run down and those that remain have been converted into repair yards. The shipping industry forms the core of the Danish maritime cluster and, due to a favourable taxation system, the Danish fleet has grown steadily in recent years. The country has invested in the development of quality shipping, meaning high safety standards, energy efficiency and environmental sustainability, among other factors (SmartComp 2013). An example of quality shipping lies in the Maersk Group's Triple E-class (economy of scale, energy efficiency and environmentally improved) container vessels, which the company argues emit 50% less CO₂ per container moved than the current average on the Asia-Europe route (Maersk 2013). Recently, Denmark has also made heavy investments in developing its offshore maritime sector, particularly in sea wind and wave power production. Wind power, in particular, has long been utilised in Denmark and the country can be considered a forerunner in the field (Laaksonen et al. 2013).

In Sweden, shipbuilding was regarded as one of the nation's key industries until it entered an extensive crisis in the late 1970's. Following this crisis, the Swedish shipbuilding industry underwent structural change and practically the whole industry was run down in the 1980's. Rather than newbuilding activities, Swedish shipyards therefore now focus on repair, maintenance and conversion. In addition, there is a competitive network of various maritime industry suppliers, for instance engineering and design companies, equipment suppliers and steel industry companies, as well as companies specialising in the offshore industry (SmartComp 2012). In Sweden, green technologies are used across all sectors, such as in energy production and waste treatment. For instance, in the Port of Gothenburg, an onshore power supply (OPS) system has yielded significant environmental benefits, particularly when renewable energy sources are used for power generation. In ports using OPS, power for vessels at berth is delivered from the shore side, reducing pollution from ship engines and lowering noise levels in ports (Port of Gothenburg 2013).

Poland has also experienced a structural change in its shipbuilding industry, but repair yards have

maintained their importance. Poland has invested heavily in the development of harbours, for instance in Gdansk, which has become an important hub for container traffic. The Polish maritime industry is also seeking new business opportunities in the offshore wind power sector. Gdansk Shipyard, for instance, is producing wind towers in addition to its more traditional shipbuilding and steel construction activities. In Estonia, Latvia and Lithuania, maritime clusters include repair and maintenance yards, harbours and logistics centres. The shipyards in Latvia and Lithuania also operate as suppliers for the maritime industry in other countries, providing ship hulls, for instance. Estonia, in turn, has a lively sub-cluster in Saaremaa building small boats. Furthermore, the cleantech sector is also attracting increasing attention in the Baltic States. For example, renewable energy and energy efficient technologies are under intensive development.

Large shipyards building new vessels still operate in Finland and Germany. In particular, together with other European shipyards, Meyer Werft in Germany and STX in Finland have engaged in fierce competition for cruise ship orders. The Finnish shipbuilding industry has experienced serious difficulties despite its high competence levels. Finnish shipyards have suffered from poor profitability and gaps in their order books, and their subcontractors have been forced to seek business opportunities elsewhere, even outside the maritime sector (Laaksonen et al. 2013). Finnish maritime companies have therefore sought new areas of specialisation, for instance in the Arctic and offshore sectors, as well as in environmentally friendly technologies. In fact, the cleantech sector is developing into a key sector in the Finnish economy – in 2012, the Finnish cleantech business had a combined turnover of € 25 billion. The Finnish cleantech sector has significant growth potential and demand, particularly in the large export markets of Brazil, China, India, Russia and the USA. A harsh climate and lack of indigenous fossil fuel resources have pushed Finnish companies into developing energy and resource efficient solutions which could be increasingly marketed abroad (Cleantech Finland 2014). In the maritime sector, large international companies, such as Wärtsilä and Cargotec, are known for their cleantech solutions. For example, Wärtsilä produces gas-fuelled engines, scrubbers and ballast water treatment systems, while Cargotec supplies energy efficient and automated cargo handling solutions.

Despite being the largest in the BSR, the German shipbuilding industry has also undergone changes. German shipbuilding capacity has been reduced and production in shipyards has shifted from container ships towards vessels requiring a higher degree of specialisation, such as cruise and passenger vessels. The shipping industry, particularly the container vessel segment, is also significant in Germany (SmartComp 2013). Although German shipyards are still doing rather well, the maritime industry is already looking ahead. Following Germany's decision to abandon nuclear power, significant resources have been dedicated to developing the renewable energy sector, such as wind power. German shipyards are investing heavily in developing offshore wind farms and the customers of their shipbuilding network increasingly consist of large energy utilities and technology companies rather than traditional shipping companies (Laaksonen et al. 2013).

Russia is also emerging as a new large player in the BSR maritime sector. The Russian maritime industry has deteriorated since the Soviet era, but is now under intensive development. An ambitious programme approved by the Russian Government states that Russia must quintuple its shipbuilding output by 2030, through substantial state funding (BOFIT 2012). Even if not all of these goals are achieved, the Russian shipbuilding industry is expected to grow and provide increasing business opportunities for foreign maritime companies. Russia is showing particular interest in and demand for Arctic expertise and offshore solutions, which is also likely to provide subcontracting opportunities for other clusters in the BSR. An example of successful co-operation lies in the Arctech Helsinki Shipyard, which operates under the joint ownership of the Russian United Shipbuilding Corporation (USC) and STX Finland in the production of multipurpose icebreakers. According to recent information presented in the media, USC will take full ownership of Arctech but the acquisition timetable has not yet been confirmed.

Norway can be viewed as both as a tough competitor and a country of great business opportunities. Both the maritime and shipping industries have remained strong and viable in Norway, and the maritime cluster's future prospects are promising due to emerging opportunities concerning Arctic shipping routes and offshore energy production. In particular, the

offshore industry is under extensive development in Norway. Norway is also investing heavily in environmental technologies in the maritime sector, for instance green shipping and the use of renewable energies (SmartComp 2013).

Thus, despite the structural differences between BSR maritime clusters, they share several common features. Traditional shipbuilding has decreased throughout the region and new business opportunities are being sought in areas, such as the offshore sector and environmental technologies, for which there is growing demand worldwide. Clearly, the region's maritime clusters cannot compete with the mass production of Asian shipyards. They must seek new business opportunities and compete on the basis of quality and specialisation rather than price. These clusters should rapidly join forces in the cleantech sector, which is under strong development throughout the BSR and has rapidly growing markets worldwide. The Baltic Sea provides a special business environment for the region's countries and tightening environmental regulations can be viewed as an opportunity to develop into a forerunner region in green shipping. By combining the countries' expertise in the cleantech, Arctic and offshore sectors, environmentally sustainable solutions could be developed for applications, such as Arctic icebreaking and shipping.

3. How to support maritime cleantech development in the Baltic Sea region?

However, considerable political effort and investment will be required to realise the vast opportunities represented by demand for cleantech and the creation of an international BSR cleantech hub. Rather than competing fiercely with each other, national clusters must bring their mutual networks closer together and make considerable investments in marketing their expertise worldwide. This will require joint action involving business and political decision-makers. The following policy recommendations are presented bearing this in mind.

3.1 Infrastructure and technologies

- BSR ports should increase their co-operation, particularly in the bunkering of new fuels, the reception and treatment of waste (sulphur,

nitrogen) and sewage, and recycling operations. Large infrastructure investments will be required in order to make new fuels (e.g. LNG) available for shipping companies operating within as well as visiting the BSR. Development of standardised IT platforms has also been considered an important development objective by shipping companies. Such developments should be assigned political and financial support, since considerable investments are required.

- The development of a harmonised, electronic monitoring system for ship-related emissions would increase awareness of ship pollution, enabling a comparison of emission levels between different vessels and ports, as well as providing a tool for monitoring ships' compliance with the new regulations and thereby encouraging the development of maritime cleantech solutions.

- While cost-increasing directives may influence the modal split of transportation within the BSR, the advantages of seaborne trade should be actively promoted, particularly by strengthening port connections to other modes of transport. For instance, in the Eastern part of the BSR, countries tend to compete over East-West transportation, but there is great potential for increased international co-operation, particularly on the North-South axis. Based on the possible Arctic corridor initiatives and their connection possibilities with Rail Baltica, for instance, the BSR's well-connected national logistics and transportation clusters could emerge as a global freight hub and as a provider of comprehensive, energy efficient and environmentally friendly maritime services and technologies.

3.2 R&D and education

- Business-university co-operation must be enhanced in order to support the purposeful co-creation and use of scientific inventions in the maritime sector. Universities must build stronger contact points in order to make it easier for companies to approach them with their problems, and should actively promote their business development and incubation services for industry.
- Wider co-operation between higher educational institutions in the BSR will be necessary, for

instance through increased student exchange and joint double diploma programmes, as well as harmonised and joint training programmes. This would contribute to flexible labour mobility in the BSR, and thereby to the exchange of new ideas and best practices between maritime clusters.

- While the maritime sector in Europe currently faces cost-challenges, the image of the maritime sector, both in shipping and shipbuilding operations, should be promoted among young people, to guarantee the availability of a new generation of experts and innovators in the sector.

3.3 International networking

- The formulation of joint forums for the discussion of issues critical to the BSR's competitiveness should be promoted through closer co-operation between states and different stakeholders in the BSR maritime sector. This would improve these countries' ability to have a joint influence over issues, such as the design and implementation of regulatory frameworks.

- Instead of very generally profiled seminars, it would be highly important to organise international but targeted problem solving events among representatives of maritime companies, associations and research institutions. This would also provide stakeholders with opportunities for match-making, pooling resources, and the sharing of best practices.

- State delegations and embassies should increasingly promote domestic expertise abroad and build connections with policy-makers and business circles in foreign countries. While Cleantech is highly beneficial to actors in the BSR, it would be much more beneficial if it were also actively sold on the global markets. Furthermore, promotional delegations should not always be national – groups of countries could also seek ways of promoting their shared expertise, for instance through joint marketing organisations.

- Incentives should be created encouraging large companies to share their international connections and experience with smaller companies. While large companies are operating

actively in international markets and have often progressed in terms of environmental considerations, smaller firms would benefit greatly from increased business-to-business co-operation. There is a great need for such pioneers, both in international marketing and in cleantech adoption and innovation activities.

- Benchmarking, both within and outside the BSR, would also be highly useful in promoting the region's competitiveness. Innovation systems, funding structures and business network dynamics are particularly worth looking into. For instance, the maritime sector is developing at a surprisingly rapid rate in several Asian countries. For example, national governments are playing a key role in the development of successful clusters, most importantly through clearly defined visions of the clusters' future, which are then implemented in co-operation with strongly committed stakeholder efforts and supported by the relevant infrastructural developments. Simultaneously, local associations are not only supporting the interests of their members within the national cluster, but are also involved in international discourse and active marketing of domestic expertise. New research centres are being established through a mix of public and private funding, which in some cases even originates in foreign companies. While making the most of progress already accomplished in other regions, BSR maritime companies should establish a strong presence in these global maritime hubs and embed themselves in their existing networks, and that way sell the clean technologies developed here to the global markets.

3.4 National strategies

- Policy-makers in each country should agree on a clear and shared future vision of the maritime sector's future development, supported by a strong triple helix commitment. Only after that can the BSR countries jointly formulate concrete development policies.

- Political decision-making should be far-sighted – for instance, in the public procurement of new vessels, instead of selecting the lowest-cost option in every case, room should be left for financing innovative solutions and account

should be taken of the positive multiplier effects of purchasing vessels from the home region.

- Since vessel construction orders are again beginning to increase, it would be crucial for the maritime industry, particularly in Finland, to have the related financial arrangements settled. If international customers find shipyards in the Baltic Sea region competitive, inability to take on new vessel orders due to financing issues would be extremely harmful to the industry's future development. Traditional shipbuilding operations in yards are the feeding and testing grounds for the development of new maritime-related high-tech solutions.

- Programmes supporting R&D and internationalisation continue to be highly important to the maritime sector and higher levels of funding are needed to enable the rapid development required to meet new environmental regulations. At the same time, the business field calls for developing the related procedures, for instance by reducing bureaucracy in the application and reporting processes. R&D funding should also be

reorganised to be made more accessible for SMEs and international consortia.

- The creation and development of clusters and competence centres is important, particularly to SMEs, and provides synergies through factors, such as joint product development and marketing activities. Wherever possible, the creation of such innovation clusters should be supported, with the involvement of companies from other industry fields, which might encourage the production of unforeseen cleantech solutions.

All in all, the governments of BSR countries should bear in mind the economic importance of the maritime sector and must bolster its healthy development through cleantech investments. It is the responsibility of policy-makers to create a well-functioning, international and forward-looking business and innovation environment. Thereafter, state-of-the-art-know-how – the core of competitiveness – will arise in the private sector and the BSR may become the global hub of clean maritime technology, as well as a clear forerunner amongst the global competition within the sector.

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Why me?: Unexplored territory in linking people with the environment

Anne Paavolainen and Tuomas Valtonen

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Executive summary

Encircled by a mix of Nordic, Central and Eastern European countries, the Baltic Sea is subject to a diverse range of national practices and policies. The potential of public participation in research, environmental decision-making and conservation to protect the Baltic Sea area has not yet been fully explored. By including citizens in the entire cycle of decision-making, a continuous and desirable two-way exchange of knowledge between them and the authorities becomes possible. Involvement of members of the public in research increases both the general awareness of research and the significance of research and its objectives. All stakeholders will need to combine their forces and knowledge in order to enhance the living environment for citizens, maintain the ecological balance and facilitate economic activity in the Baltic Sea area. Now is the time for authorities to answer the call for public participation of a kind that is more open and empowering. By opening up the full decision-making cycle to citizens, it would be possible to create more sophisticated solutions to environmental problems and to provide positive possibilities for active citizenship.

1. Linking people with the environment

The Baltic Sea is being damaged by the cities, farms and industry situated along its shores. External nutrient loads have been strongly linked to economic activity in Baltic Rim countries. Damage caused to the Baltic Sea leads to economic losses as recreational values diminish (Markowska and Zylicz 1999; Toivonen et al. 2004; Soutukorva 2005; Egan et al. 2009), fisheries struggle (Lappalainen 2002) and the value people place on the sea decreases (Turner et al. 1999).

The current environmental situation serves as an example of a classic market failure: even if the economic benefits of enhancing water quality

outweigh the costs, markets have failed to provide the correct incentives to do so. The Baltic Sea remains highly polluted.

Many people hold the Baltic Sea dear and use it for recreational purposes. People live on the shores of the sea and alongside rivers flowing into it. In general, people take an interest in the fate of the Baltic Sea, but lack effective means of participating in its preservation. An individual may have difficulty in identifying the possibilities for and the impact of conservation activities. Additionally, although the poor state of the Baltic Sea is generally recognised, identifying the required actions and their impacts can be challenging.

Neither authorities nor universities have been able to aid people and offer them pragmatic tools linking them with the environment. The academic community has yet to fully understand the need and potential for co-operation and public participation on this issue. While the condition and potential of the Baltic Sea has intrigued researchers and scientists around the Baltic Sea region, academics have traditionally seen their responsibilities and roles as lying in research, education and the dissemination of research-based information, rather than activating, influencing and interacting with the wider public.

2. Environmental situation in the Baltic Sea

The environmental situation in the Baltic Sea has changed drastically over recent years. Human activities on the sea and throughout its catchment areas are placing increasing pressure on marine ecosystems. Continuing eutrophication of the Baltic Sea is one of the most serious and complex environmental problems facing the region. The potential for sustainable use of the Baltic Sea is also hampered by the hazardous substances affecting its biodiversity.

Although much effort has been invested in the protection of Europe's waters, much remains to be done and further efforts are required in order to clean up our sea areas and keep them pollutionfree. After 30 years of European water legislation, not only the scientific community and other experts, but also citizens and environmental organisations are demanding action in this regard.

European water legislation began with standards for rivers and lakes applied to drinking water abstraction in 1975. In 1980, binding quality targets were defined for drinking water, fish-inhabited waters, shellfish-inhabited waters, bathing waters and groundwater, primarily via amendments to the Dangerous Substances Directive (1967). This was followed in 1991 by the Urban Waste Water Treatment Directive addressing biological wastewater treatment, and the Nitrates Directive addressing water pollution from agriculture. In 1996, the Directive for Integrated Pollution and Prevention Control was adopted to address pollution from major industrial installations, and a more stringent Drinking Water Directive was adopted in 1998.

In 2000, the Water Framework Directive (WFD) was adopted to establish a framework for Community action in the field of water policy, in order to address water policy and water management issues in a coherent manner. WFD, among other issues, emphasises a river basin level approach, in contrast with administrative or political boundaries. Under WFD, a number of River Basin Management Plans have been adopted in major European river basins, most recently for the period 2009–2015.

The European Roadmap towards a Resource Efficient Europe outlines how we can transform Europe's economy into a sustainable one by 2050. The water "milestone" for this roadmap is entitled "A Blueprint to Safeguard Europe's Water Resources", which aims to tackle obstacles hampering the action required to protect such resources. For the blueprint, much fundamental research has been conducted on the state of European water, including the EEA State of Water report, the EC's report "Implementation of the Water Framework Directive (2000/60/EC)", River Basin Management Plans, the Review of the Policy on Water Scarcity and Droughts, and the Fitness Check of EU Freshwater Policy.

The European Innovation Partnerships (EIPs) aim to expedite innovation that contributes to resolving societal challenges, to enhance Europe's competitiveness and to contribute to job creation and economic growth. EIP Water aims at developing tools in support of water related innovation, available to any actor dealing with water and innovation. The Annual EIP Water meeting, open to a wide audience, presents the activities of the Action Groups and progress made in implementing the EIP Water tools and activities, as well as hosting brokerage events between supply and demand for water innovation. The Web-Based Market Place aims at the creation and establishment of a community and location for matchmaking with respect to innovation topics in the field of water, in Europe and worldwide. The idea is to connect problem owners to owners of solutions, regardless of their geographical location.

Europe has shown interest in and offered tools, strategies and resources for tackling the issues affecting the Baltic Sea. As well as the granting of various powers and the enactment of legislation, the sustainability and protection of the Baltic Sea requires that the citizens living on its shores demonstrate their commitment to protecting it. Through communication and open discussion, more possibilities can be presented for engaging the public in the protection and conservation of the Baltic Sea.

The Baltic Sea is surrounded by a complex array of national policies and institutions with varying development paths; indeed, the Baltic Sea itself represents, so to speak, a hidden history of the water quality of its contributory streams, rivers and urban runoff from catchment areas.

To see the entire picture, we need to identify and unify the practices underlying national policies and institutions, and for this we need information – plenty of information. One way of activating more citizens and accessing a wide range of data on the rivers and streams around the Baltic Sea would be to supply citizens or groups with miniaturised, autonomous water monitoring equipment. But how can we equip citizens in order to make them credible data producers? Would data produced by volunteers be reliable? What other benefits would such activities have?

3. Transparent and publicly owned water management

In a 2010 publication, the European Environmental Bureau presented the areas in need of urgent attention. Number one on their list is transparent and publicly owned water management. Transparency is essential to the public understanding and perception of the logic behind decisions on the living environment. Better access to information and greater transparency in decision-making has long been a goal of societies seeking to improve and encourage public participation.

Uncertainty over emerging technologies and their potential effect on society and the environment often lead to controversy between scientists, policy-makers and the public. Opening up the debate and involving citizens and social scientists at an early stage in the development of new technology would be one way of responding to this governance issue (Robinson et al. 2014).

Since the late 1970's, public opinion has slowly shifted towards allowing and even encouraging the public to participate in science and technology debates (OECD 1979). Keeping such debates exclusively within the scientific domain, in splendid isolation from policy and politics, is increasingly viewed as objectionable (Pielke 2007).

The sea, lakes and streams belong to all of us. In order to protect them, we need legislation, common rules and guidance, as well as co-operation and the willingness to work together and participate. Eagerness to take part in the everyday life of one's own environment seems very natural. The very existence of volunteer, wildlife protection and environmental protection organisations sends a clear message to all of us: people do care. They care about their environment. The WWF has declared that its mission is to build a future in which people live in harmony with nature. The wellbeing of people, wildlife and the environment are seen as closely linked. Communities, politicians and businesses can join forces to find solutions which enable both people and nature to thrive.

When working together towards a common goal, a top-down process does not suffice: a shift towards participation and citizenship interaction is on its way.

4. Public participation

Environmental decision-making should include public participation. The importance of opportunities for citizen participation in environmental decision-making is widely emphasised by several international agreements, such as the 2002 World Summit on Sustainable Development Implementation (Paragraph 119), the 1998 Aarhus Convention, and the 1992 Rio Declaration on Environment and Development (Principle 10). These documents make the major observation that environmental and livelihood concerns are closely linked (Hunsberger et al. 2003). Petkova et al. (2002) note that public participation and citizen input tend to drive environmental decisions towards better outcomes and greater public acceptability.

When public participation is involved in scientific research, it can be referred to as citizen science. Such activity is proving to be an effective tool in tracking the rapid pace at which our environment is changing over large geographic areas. Members of the general public and school pupils are becoming more commonly engaged in the collection of scientific data in support of long-term environmental monitoring. Public participation of this kind provides an excellent way of gathering large amounts of data. Unfortunately, in terms of environmental monitoring and the regulation of such monitoring, not all nations are providing the information required by their own legislation or share it with their citizens. Environmental information-gathering is costly, labour intensive and time consuming. In order to make good decisions about the environment, citizens and businesses, we need the right information. Through wide-scaled data gathering, information could be provided to all parties interested in gaining from such knowledge.

Environmental monitoring is one of the most suitable and commonly used forms of citizen science. Monitoring the environment offers the wider public a means and the possibility of becoming involved in scientific research (Kruger and Shannon 2000) and data collection in a meaningful way. When large numbers of the general public are involved in data collection of this type, integrated and structured methods of public engagement are needed. Whereas scientific environmental programmes gain access to a larger workforce, citizen scientists

gain knowledge and expertise in their field of interest (Bonney et al. 2009; Silvertown 2009; Miller-Rushing et al. 2012). Citizens who participate in citizen monitoring initiatives may also come to feel empowered by their knowledge of environmental conditions and their ability to assist and make a difference (Hunsberger et al. 2003).

One of the oldest and longest running citizen science projects in the world is the Christmas bird count in the United States. Through this project, volunteers have been collecting data on birds since the year 1900, providing scientists with unique and invaluable data in a range of fields highlighting previously unforeseen issues, such as global warming and its effects. Of course, the project also activates ordinary citizens interested in birds and ornithology. These activities exist for a simple reason – they would never have been sustained for so long by complex factors – people care about and have an interest in the issues and the data gathered.

Today, most projects and public databases gather information in a defined location, website or organisation, mainly for those sufficiently well-informed to request such information. Collected data of this kind could, for example, be used to fulfil statutory obligations in nature conservation. While some networks may serve educational rather than scientific purposes, some are more relevant to recreational rather than active citizenship. However, regardless of the reason, data is being gathered and we should be intelligent enough to make this activity as easy as possible, seek ways of using such data in a range of contexts, and whenever possible, make it serve the whole of society.

Involving members of the public in research increases not only general awareness of research, but also the significance of research and its objectives. A dialogue between scientists and members of the public could add momentum to the debate on environmental research and the state of the Baltic Sea. Recent changes in university funding have inspired a discussion of their role in society. Universities cannot remain in glorious isolation within their ivory towers; research and education will need to take a step closer to the wider public and society as a whole. The growing emphasis on external funding will be a double-edged sword; while it will force universities to interact more closely with the outside world, it may also limit the scope for excellent research and science. It should be borne in mind that, due to market failure and the lack of incentives in

areas such as environmental research, the language of economics may not provide us with the most effective way of understanding how best to serve all fields of research. All stakeholders will need to combine their forces and knowledge in improving the living environment of citizens, maintaining the ecological balance and enabling economic activities around the Baltic Sea.

5. Applicability of data

How can the data gathered by non-experts, rather than scientifically trained volunteers, be used in decision-making? Environmental monitoring projects in which data is gathered by citizen scientists have not been free of controversy. The applicability of the data concerned has been a hot topic for both scientists and authorities. On the other hand, citizen scientists provide a valuable resource which is not available to traditional monitoring practices (Dickinson et al. 2010; Donnelly et al. 2013).

Environmental monitoring and citizen science projects are raising new questions as the popularity of such activities grows. One example would be the increase in the number of participants and the free time available to make observations. Both Sparks et al. (2008) and Courter et al. (2012) remind us of the phenomenon of weekend bias in traditional observation-recording projects; records can be affected by the greater availability of volunteers during weekends and consideration must be given to this when analysing data (Donnelly et al. 2013). However, both of the studies mention that weekend bias seems to be declining, due to recent changes in the traditional working week.

Naturally, data collected by non-expert volunteers is subject to some reliability issues, but we must bear in mind that modern technology can help us to overcome some or even most of the limitations of human sensory data. Most projects and studies still gather data provided by volunteers who rely on the human senses.

Modern technology offers an ideal means of training and communicating with network participants, as well as an easy and effective means of transferring data. The level of training required will depend on a wide range of factors based on the level of expertise of volunteers and technical issues related to the set up of the data collection. Shmeller et al. (2008) suggest that a large sample

size and geographic area would help reduce possible errors caused by non-expert volunteer data collectors. Reliable scientific results are possible using well-designed protocols and appropriate data analysis methods. To ensure high-quality data collection in citizen science programmes, Bonney et al. (2009) suggest the use of (a) clear data collection protocols, (b) simple and logical data forms, and (c) support for participants (Donnelly et al. 2013).

In a traditional environmental monitoring project engaging the wider public, the volunteer is first trained, activated, and then performs monitoring when suitable and reports his/her observations through a form into which data needs to be typed. But what if the data were collected through technological sensors instead of the human senses? In the field of water quality monitoring in particular, it is difficult to know precisely what the water sample collected from the river running past the bottom of your garden actually contains – unless the sample is sent to a laboratory for detailed analysis. Most volunteer-based projects involve the collection of other, more accessible data for reporting by volunteers. For example, the colour of water or visible algae blooming on the water's surface is relatively easy to report. Based on the opportunities provided by modern technology, in the future volunteers may be able to conduct research and data gathering via automated sensors that analyse the data on-site, with no need for long journeys to the laboratory and into the hands of an expert.

According to Silvertown (2009), the best way for the public to understand science is to participate in it. This means that the growing number of participants involved in citizen science (Silvertown 2009; Beaubien and Hamann 2011) indicates an increase in the level of scientific knowledge and environmental awareness among members of the general population (Donnelly et al. 2013).

Citizens' participation requires meaningful channels for dialogue and influence, in which citizens are interested in participating. Most Baltic Sea communication projects focus on sharing information, with no clear element of active involvement (Kiviluoto et al. 2014).

While most stakeholders acknowledge the need to protect the Baltic Sea, in the broader sense there is still no role through which the general public can take responsibility. Conventions and strategies make clear recommendations that

regional and local government and organisations should engage the public and stakeholders in activities promoting a healthy Baltic Sea and actively promote public participation in decision-making (Kiviluoto et al. 2014). Raising public awareness and promoting the active role of citizens could lead to greater public participation in the protection of the Baltic Sea. General awareness of research and its objectives could be enhanced with the help of tangible means of participation, well-planned monitoring systems and the possibility to stimulate active dialogue between actors at national and international level, as well as between private citizens and officials. Greater awareness, information sharing and involvement in the public arena are necessary to protecting the Baltic Sea. Many individual actors have the required willingness and awareness, but lack the means and channels for participation (Kiviluoto et al. 2014).

By offering citizens the means to participate in environmental monitoring, at the same time we offer them tools for participation in the conservation of the Baltic Sea, becoming active citizens and sharing their knowledge. Participation and discussion can be activated, if people are provided with tools making it relatively easy to contribute to the management of an interesting issue. On the other hand, activity and participation can hardly be expected if a person does not believe that his/her actions genuinely make a difference. This is why an active and lively public discussion is needed. Visible support for and communication on all steps taken towards the conservation and protection of the Baltic Sea could provide citizens with greater confidence in actions taken and enhance the possibilities of broader public participation.

Turku University of Applied Sciences has been active in including the wider public in research and conservation activities. Its recent BalticSea Info.Now project included a survey aimed at those working in the protection of the Baltic Sea. The aim of this survey was to clarify Baltic Sea experts' thoughts on the need to involve the public and on the opportunities provided by such inclusion. Ideas on the role of citizens in the protection of the Baltic Sea were explored by means of open-ended questions. These questions also covered the concept of a Baltic Sea identity as a means of raising interest and increasing participation. However, this was considered a difficult issue, since the Baltic Sea's runoff area is extensive and not all residents live near the coast. According

to the project, a common identity might also prove difficult to establish as the cultural backgrounds of states in the Baltic Sea region differ from one another. New ideas and approaches are needed in order to promote and encourage public participation in environmental research and public discussions. A Baltic Sea identity was considered an important channel for fostering participation, since people are prone to acting in favour of issues over which they feel they have ownership. Improving people's relationship with and appreciation of nature may prove to be a practical means of boosting the development of a mindset enabling and encouraging public participation, as well as furthering the development of a Baltic Sea identity.

6. Could it be?

Environmental problems do not respect national borders. This is particularly true of environmental problems in the Baltic Sea, which either directly or indirectly affect the citizens of several countries. Today, citizens have the possibility to become involved in environmental decision-making by commenting on proposals currently subject to environmental assessment. However, citizens could play more direct roles in the full decision-making cycle, all the way from objective setting and the planning of new initiatives, through the monitoring of existing conditions and the provision of monitoring results (Hunsberger et al. 2003). Where possible, replacing human senses with technology could further minimise problems in volunteer data collection.

A strong mindset is needed which encourages citizens to assume an active role in knowledge creation and environmental decision-making. Using information gathered by citizens to inform policy and management decisions would challenge the traditional top-down flow of information that characterises expert-led decision-making structures. By including citizens in the entire cycle of decision-making, a continuous and desirable two-way exchange of knowledge between citizens and authorities would become possible (de Neufville 1985).

Public involvement in environmental undertakings would provide many further benefits in addition

to the local acceptance and strong grounding of decisions. The main benefits would include enhanced public education and heightened awareness of local issues (O'Rourke and Macey 2003); capacity building, which could in turn lead to stewardship programmes, and enhanced partnerships or greater political participation in other areas (Bliss et al. 2001). In the case of monitoring activities, more data can be collected at a lower cost than through conventional research methods (Au et al. 2000; Hunsberger et al. 2003).

Before a citizen monitoring programme begins, several steps must be taken: training volunteers, gathering information, interpreting results, storing data and communicating results to decision-makers and the public. Naturally, communication between academics, the public and authorities must be active before, during and after such a project (Hunsberger et al. 2003).

Now is the time for regional authorities to answer the call for more open and empowering public participation. By opening the full cycle of decision-making to citizens, more sophisticated solutions to environmental problems could be identified and positive possibilities for active citizenship could be created.

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Baltic Sea region innovation systems: Challenges and opportunities

Jussi S. Jauhiainen

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Executive summary

This article discusses the development opportunities and challenges of the Baltic Sea region (BSR) through the innovation systems approach. The BSR – the areas of countries adjacent to the Baltic Sea – with over 100 million inhabitants has a potential size in the global economy. Since the early 1990's, there have been collaboration visions and strategies throughout the region from the early VASAB 2010 to the recent European Union Strategy for the Baltic Sea Region. Furthermore, many global innovations have emerged in the area, such as mobile phones of Nokia in the 1990's and Skype Internet calling software in the 2000's.

Nevertheless, crossing national and regional borders for collective innovation potential is not exploited enough in the BSR. Transnational innovation policies are mentioned in political documents but they do not exist in practice in the BSR. Each country focuses on its territory with national innovation systems and regional innovation systems mostly consist of sub-regions of countries. Instead of fostering similarities and simple complementarities that has been on the policy agenda for the past two decades, the differences, diversity and variety in the BSR should be converted with clever policy-making into a strength. New knowledge emerges from enough but not too much difference. Different knowledge bases are the source for innovations for successful and sustainable economic development.

The policies should consider more properly cross-border innovation systems and trans-frontier knowledge creation processes. The tight links between real grass-root innovation actors, public policy authorities, incubators, science and technology parks and venture capitalist at the BSR level should be supported to integrate better the market-oriented research and development. As suggested also by Technopolis (2011), diversity in innovation priority fields is supported with

educational mobility and lifelong learning programmes, pooling expertise of science and technology centres and incubators, and sourcing novel solutions from young innovative firms. Innovation co-operation in the BSR is better clustered and leads into long-term innovation capabilities when the EU, Nordic and national innovation funding is structured into few strategic BSR research and innovation funding priorities and principles. The transnational BSR innovation system should remain actively open, transforming, global and connected to other transnational innovation systems.

1. Introduction

In this article three issues are discussed. First, the idea of knowledge creation is introduced. Second, the issue of knowledge creation is connected to innovation systems. Third, the knowledge creation and innovation systems are then placed in the context of the Baltic Sea region. The idea here is not to conduct an exhaustive analysis of different national innovation systems in the BSR, nor to illustrate all good cases of successful and innovative economic development (see Technopolis 2011). Throughout the article, the main focus is on policy suggestions to reach an innovative economically successful and sustainable BSR.

Traditionally, most discussion on innovation systems concerns countries, i.e. national innovation systems. Less often, but still frequently, the issue is about regional innovation systems, i.e. the promotion of innovation in sub-national areas, often directed by national policies. Only scarce attention is paid on cross-border innovation systems that extend over regional and national borders. However, cross-border innovation systems and trans-frontier knowledge creation utilising the strength of difference, diversity and related variety are important if not necessary for the BSR, as it aims to be a globally important innovation platform and economic area in the future.

The key message of this article is that now it is time to focus more on differences, diversity and variety in the BSR. The careful and clever policy making turns them into a strength of the BSR. As mentioned, the focus on trans-frontier knowledge creation processes and cross-border innovation systems are useful to achieve this. Enough diversity is needed for creation of novel knowledge and novel knowledge is needed for innovations. Innovations are necessary for successful and sustainable economic development. New viewpoints, novel knowledge and successful innovations emerge from differences that are enough but not too large. This is valid between individuals, economic sectors and regions. Instead of general policies making cross-border areas internally similar in the BSR, the policies should facilitate cross-border innovation systems with trans-frontier knowledge creation based on positive difference.

The BSR is a geographical area with commonalities and diversities in environmental, economic, political and cultural aspects. After the dividing Cold War period, much attention has been paid to the past two decades' policy making to create a collective BSR. The key idea has been to support similarities and simple complementarities that would form the base of the BSR. This integration is challenging because in the BSR, there are tens of borders and cross-border areas. According to Lundquist and Tripp (2013), cross-border areas have very different economic histories, technological trajectories, institutional set-ups as well as different social dynamics, political visions, governance structures, modes of regulation and cultural identities. These differences are perceived as barriers for interaction and knowledge exchange. However, they can also be a key source of innovation, as discussed later in this article.

At the same time with the BSR integration processes, each country around the Baltic Sea has launched national development strategies that have been up-dated frequently. They have mostly focused on developing national innovation systems to foster economic development and internal cohesion of the country in question. It is a systematic approach to cover the whole society from business, governmental and societal aspects to innovative realms. It pays attention to a selection environment and a milieu for variety creation. National innovation systems have also been regionalised to cover the whole territory and all economic sectors of the country.

Furthermore, open and user-centric innovation environments, living labs, have been developed as collaborative platforms for research, development, and experimentation with product and service innovations (Schaffers and Turkama 2012).

In addition to the national schemes, considerable effort and funding have been made on transnational innovation policies in the BSR. The BSR have over 500 main organisations active in the field of innovations. There are hundreds of publicly funded projects to enhance innovation. For example, over 50 INTERREG IV C projects were within the innovation and the knowledge economy sub-theme, the fostering innovation sub-theme of the Baltic Sea Region Programme 2007-2013 had 22 projects and there are innovation flagship projects in the European Union Strategy for the Baltic Sea region. Together they link hundreds of actors in innovation-related fields. In total, the Structural Funds invested in 2007-2013 € 5.5 billion in research and innovation in the BSR. Two thirds of the finance concentrated on the Baltic States and three Polish regions (Technopolis 2011). Without the EU funding, the co-operation amongst the BSR would be much more limited. This is a particular challenge in the BSR for the 2014-2020 programming period and after.

According to the systematic overview by Technopolis (2011), despite numerous projects and substantial funding, the innovation stakeholders in the BSR find more effective to develop innovations through bilateral cross-border links or focused co-operation between few organisations than platforms that cover the entire BSR. There is little or no integration of a transnational Baltic Sea dimension in national and regional innovation programmes. In addition, the strategies do not recognise how heterogeneous the innovation performance in the BSR is. Furthermore, as regards the innovation potential of the BSR, the organisations and projects are fragmented and duplicate their efforts. Most innovation-related co-operation is driven by bidders' perception of how to align their interests with funding priorities. The co-operation is short-term project-based without capacity of structuring or permanency.

As the result of the review, Technopolis (2011) made numerous recommendations for transnational innovation policies in the BSR. An increased, more structured and joint strategic programming is needed to cluster innovation co-operation in the BSR, however, not pulling

resources exclusively towards the strongest clusters. The policy focus should be on funding and operational practices. Examples mentioned were strong long-term structured co-operation between regional Triple Helix competence centres supported by co-operation between enterprises, universities and research institutes, and public authorities in innovation development, greater integration of market-led research and development, fostering tight links between incubators, science and technology parks and investors at the BSR level, and allocating more capacity to groups of local and regional authorities to source innovation solutions from young innovative firms. Hence, it was recommended a shift away from a bottom-up project-based funding. The EU, Nordic and national funds should be structured into three to four strategic BSR research and innovation funding programmes.

In addition, it was suggested to exploit synergies and complementarities. Examples mentioned were enhancing access to expertise in emerging or advanced technologies, developing Baltic educational (doctoral schools, etc.) mobility programmes and lifelong learning programmes in innovation priority fields, and pooling expertise available to science and technology centres and incubators. The investment should focus on few specialised business innovation fields and academic research (Technopolis 2011). However, the comprehensive overview did not properly consider two major issues: the innovation systems and the role of diversity in the knowledge creation.

Asheim et al. (2011) argue that an innovation system becomes dynamic if the strategic policy-making facilitates long-term and systemic relationships between industry and knowledge creation organisations, such as universities. However, national and transnational policies in the BSR have only seldom considered the potential of cross-border innovation systems. Furthermore, innovation policies have been poorly linked to entrepreneurship processes. Whereas national innovation systems pay most attention to institutions, national entrepreneurship systems take better into account also individuals. The national entrepreneurship systems are fundamentally resource allocation systems driven by individuals and individual level opportunity pursuit through the creation of new ventures regulated by national institutions (Ács et al. 2014). Entrepreneurship processes in the BSR are embedded in each country's institutional framework.

In general, the post-Cold War development policies have supported similarities in the BSR and its countries. The perception is that differences hinder economic development and the creation of a shared BSR. The initial focus on similarities, simple complementarities and cohesion had positive results. The main positive outcome is the establishment of BSR as a politically stable platform. As it is known, most countries around the Baltic Sea now belong to the EU. Many are also NATO member countries. Furthermore, there is a continuous exchange of information and sharing of policy viewpoints between the countries around the Baltic Sea. Many formal organisations have been developed to get together politicians and policy-makers from lower to the highest political levels. Cross-border co-operation and economic flows across the borders, also with the help of EU programmes, have diminished the huge economic differences between northwestern and southeastern BSR countries since the 1990's. However, one can also notice the growth of economic differences between capital regions and poorer rural regions. Agglomerations are nowadays the key areas of economic development, especially due to institutions and networks supporting innovation.

Contrary to a common belief among many policy makers, neither diversification of economy nor narrow specialisation in specific economic fields is effective tool to increase innovation. More effective is to support the networking between different but related economic fields, as Boschma and Frenken (2011) argue. This innovation generating networking between related economic fields is supported by mobile labour, the setting up of spin-offs and new enterprises, and knowledge links between enterprises and knowledge suppliers. However, in the BSR it is not enough to link related economic fields but the economic fields must become innovative. The BSR is a macro-region with huge potential for knowledge creation supportive for innovations if policies successfully integrate diversity in the knowledge creation processes and innovation development. Cross-border innovation systems and trans-frontier knowledge creation are useful tools for that. Policy-makers are the key actors in creating relevant instruments. Obviously, the real development actors in the everyday business in enterprises transform knowledge into innovations in practice.

This new focus on difference does not mean that one should forget the idea of commonly shared

BSR. The focus on differences does not signify destructing the path of the past two decades. A region can be called a region when it is internally enough similar and differs from the outside area. However, the development path aiming at similarity brings development routines and lock-in. An economically successful and sustainable region cannot base its development processes in similar routines but in novelty supported by constructive differences. In the end, the BSR economy cannot become an economy of scale in which the competitive edge can be found in the price competition. The edge must be at the upper level of the value-added chain, therefore the BSR needs to be a continuously changing distinguished innovation platform.

2. Background for the Baltic Sea region

Before entering the discussion about knowledge creation, innovation systems and potential policies supporting them, it is useful to discuss shortly how the BSR emerged in the 1990's and 2000's and why globalisation, innovations and digitalisation require different future trajectories for the BSR policies.

The idea of once again shared BSR emerged after generations lost in the Cold War period. It was crucial in the early 1990's to immediately react to the changing political climate and to foster the rise of a collective entity called the BSR (for the general development of the BSR, see Lehti 2009). The BSR, as regions always, is socially constructed by institutions and people. Therefore the BSR is an invented region, the future of which depends on the people involved in its development.

The strong short-term emphasis and action towards shared visions led into major long-term outcomes. The countries around the Baltic Sea came together and were able to formulate together a strategic vision for the future. The document VASAB 2010 was a non-binding collectively agreed strategic document that resulted from meetings and non-formal lower and higher level political gatherings. It promoted specific visions and strategies around the Baltic Sea for the year 2010, for almost two decades ahead from the moment it was created (VASAB 1994).

The co-operation was important as practice to bring different strategic actors together, but also

important was to visualise the strategy. In fact, one picture became fundamental for the coming two decades. A picture, in this case a visionary map, was worth more than a thousand words. This map indicated how by the year 2010 dense road, sea and air transport connects all parts of the Baltic Sea. The protection areas crossing the national boundaries create a collective environment. It was a clearly visible and easily explainable roadmap to the future, increased faith in this common future and, important, showed to insiders and outsiders that there is an area called the Baltic Sea region. In fact, the role and importance of images and visualisation have grown in spatial development strategies. Images are not only informative tools about strategies but also instruments to market and brand the development projects and their goals (Dühr et al. 2010)

The role of borders in the vision was two-fold. The internal borders of the BSR must be crossed to increase the communication and economic flows in the region. On the other, it was important to stress that the BSR has clearly demarked external borders – not all areas and countries belong to it. At the same time, the notion of region was traditional. All areas within the external borders of the BSR would be part of it, thus the geographical outer ring illustrated what is inside and what is outside. The external borders could change but initially they were fixed in the VASAB map.

There is a connection between this rising consciousness of the BSR from the early 1990's to the emergence of the BSR as the first macro-regional strategy for the EU in the 2000's, namely the European Union Strategy for the Baltic Sea Region (EUSBSR). The EUSBSR, adopted in 2009, is a framework for many jointly agreed initiatives to strengthen transnational territorial co-operation around the Baltic Sea and its regions. The initiatives deal with a broad range of issues from small-scale cultural co-operation actions to large-scale investment trajectories for structural change in physical infrastructure and economy (Commission for the European Communities 2009a; 2009b). Projects supporting the emergence of innovations are part of the latter – however, not playing a major role.

Furthermore, EUSBSR is also an example of transformation of a voluntary soft space, i.e. VASAB 2010-type visionary spatial development goals into more formalised and institutionalised activities. Metzger and Schmitt (2012) argue that

with the EUSBSR, the European Commission has taken a role of a spokesperson for the interests of the BSR. Therefore, despite that most countries and thus also regions around the BSR belong to the EU, it is important that the initiatives how to develop the BSR remain in the hands of those who actually live there and have the concrete duty and possibility to develop it. Otherwise, the BSR becomes an example of region-binding in which the emergence, characteristics and durability of the region is designed by the actors outside the region, thus often using the imagined and created region for their short-term interests (Jauhiainen 2014). The current regional intergovernmental co-operation body, the Council of the Baltic Sea States (CBSS), remains as an overall political forum whereas the EUSBSR may become an increasingly influential in transnational operational practices in the BSR.

Another issue resulting from the early project towards a collective BSR was the focus on similarities. During the Cold War, from the 1940's to the early 1990's, the economic and cultural differences grew around the Baltic Sea. Countries, regions and people were forced into separating blocks, information flow between them was restricted, and different realms came into force. The situation did not obviously change overnight when the Soviet regime collapsed and the eastern BSR countries regained their political and economic independence from the late 1980's onwards.

The differences in the areas around the Baltic Sea had grown so large that it was a feasible strategy to pay the most attention to similarities. For this purpose, for example, the common past with joint historical and cultural traits and the environment was emphasised. The Hanseatic League became the frequently mentioned reference point for the shared economic development past. In reality, the Hanseatic League did not really connect so much ordinary people than specific limited economic and political interests (Klinge 1996). In economy, it was often seen that the way forwards is to make the eastern part more similar with the western part. For many, instead of mutual learning the quickest transformation was to copy the practices of the Northwest. The concern about the state of the environment was an issue to explain to all ordinary people away from the upper political and economic elites how our future depends on the collective action in the BSR.

Also here one recognises attention towards borders. Most commonly, borders were perceived

negatively. They divided artificially, due to political exception of the Cold War, the BSR that had co-operation in the past and should become more integrated in the future. Borders should not create a friction to the economic flows and separate people. Instead, borders should join people and foster the similarities between the economies across national and regional borders. The influence of borders should be limited by getting rid of them to the extent feasible.

Now, while it is useful to trace back the roots of the collective BSR programme focused on similarities, the future demands other trajectories. Here we briefly mention three fundamental reasons for that: globalisation, innovation and digitalisation. The fixed vision into material reality for the coming two decades becomes obsolete and expensive since it follows the development paths already passed by a country, region or enterprise. The paths become narrower and lead into lock-in. The future roadmap needs to be a different than the one of the 1990's. The continuous, adaptive and resilient change is a necessity. The strategies must be flexible and the visions novel and distinguishing but at the same time reachable. Therefore, both one-and-only solution and a stubborn emphasis on the traditional material production are risky. However, as in the 1990's, it is important to keep the main message clear, and visualise and brand the new roadmap of difference, diversity and related variety of the BSR.

By globalisation is meant here that the economies have become increasingly open. There are less means to force the economic activities to stay as and where they have been in the past. The production value chains nowadays reach many parts of the world. The structural changes have already moved most production sites outside the BSR and the EU. What the BSR was known until today does not guarantee of what it will be tomorrow. Globalisation is strongly connected to innovation and digitalisation, as discussed below. Another issue directly related to globalisation is population growth and urbanisation. The amount of population in the world has doubled since the late 1960's. The global urban population grows by two billion people in a couple of decades. All this takes places at distance from the BSR. Connections to the rest of the world from the BSR are necessary, if the region wishes to take part in and gain from globalisation and urbanisation that are also huge economic undertakes.

By innovation is meant here that the competitiveness of countries, regions and enterprises is based on their capacity for successful transformation, i.e. on their continuous capacity to innovate. Innovations regard material products and services, immaterial issues and processes leading to these changes. The strategy is the sustainable alternative for developed, high-cost regional and national economies such as in the BSR. Innovation is the key factor in promoting competitiveness in a globalising knowledge economy (Asheim et al. 2011).

The importance of innovations in the contemporary economy has led national governments to design national and regional innovation systems to foster innovative development in their territory. National innovation systems have contributed positively to many innovations in the BSR countries. For example, important behind the success of mobile technology development in Finland in the 1990's, the case of Nokia in particular, was industry/university co-operation supported by public policies. However, it is not only about the government and the public sector but the real change takes place in the private sector with its trans- and multinational enterprises. The earlier shift since the 1970's was to global production networks driven by the search for markets and lower cost production sites. In the recent years, the turn has been towards global innovation networks. These are driven by the search for knowledge needed for the innovation processes. Knowledge is search and found anywhere in the world and then integrated in the value-adding chain. According to Herstad et al. (2014), the probability that an enterprise involves in international innovation collaboration, and establishes and maintains a truly global network configuration is influenced by behavioural differentiation and technological regimes. The nature of knowledge and the cumulateness of knowledge development, the active use of measures to protect intellectual property, the inherent need to innovate, and the opportunity to generate sales from this activity influence this process as well.

By digitalisation is meant a huge material/immaterial transformation in all sectors of business and society. Production, consumption and communication are increasingly digital, mobile and potentially ubiquitous. This process was in early stages in the 1990's when the BSR started to emerge. After that, the Internet and the mobile communication have conquered the

world, production and provision of goods and services have become more digital, and the material realms are transformed with digital bits and pieces. There are also successful examples in the BSR. For example, Skype became in the early 2000's a globally relevant and virally expanding case of digitalisation. Skype is also an example of the novel cross-border co-operation in the BSR. The two visionary leaders were from Sweden and Denmark and the key programmers were from Estonia. Skype did not wait for the emergence of transnational BSR innovation policies nor sought for the EU funding. It utilised successfully the advantage of knowledge difference in the BSR and was able to convince private venture capital into the project. Important was also not to consider only near-by areas or the BSR as the potential market but to target to the whole world.

In the digital era, the logic of location changes but accessibility is still a key. The locations are rather sticky, i.e. the major agglomerations of the 20th century stay where they are also in the 21st century. However, the new sites can overrule the old locations as the economic growth sites in very short time. These new agglomerations emerge mostly far away from the BSR in Africa and Asia, in which the general population growth and urbanisation are the fastest in the world. Therefore, the past and the present of the BSR obviously count but more important is how the key customers anticipate the future. It influences how the BSR is developed today and how successful future development paths there may emerge.

3. Knowledge creation processes and innovation systems

Knowledge creation is a human activity in which people interpret the existing knowledge differently and push it forwards into novel knowledge, applications and innovations. Knowledge creation is a process of interpretation, knowing and making a difference, a particular transformation of information into meaningful knowledge. Data or information can be transferred without changes but knowledge is always interpreted and it changes in this process. New knowledge becomes justified by the users of this knowledge and it replaces the older one. Enough but not too much difference among the key actors is needed for knowledge creation. Policies can support the difference and the emergence of innovations.

Innovation results from a complex set of relationships among actors. These include enterprises, universities and research institutes, and often public authorities at local and national levels directing the policies and public funding supportive for innovation development. This co-operation has also been called the Triple Helix (Etzkowitz 2006). More recently it has been recognised that also non-governmental organisations and people play a substantial in innovation development. Therefore, this extended co-operation has been named as the Quadruple Helix.

There are spatial differences in innovations. Innovations emerge in areas supported by the flow of information between research institutions and enterprises and regional networks of innovators, often inside collaborative clusters taking advantage of geographical proximity but not relying only on them. Urban agglomerations, such as metropolitan regions, are often centres of innovation. This is also the case in the BSR. There the innovation leader regions are the key metropolitan areas around Stockholm, Malmö-Copenhagen, Helsinki and Hamburg and the smaller urban regions with a high tech advanced business or research poles, such as Gothenburg, Aarhus, Tampere, Turku and Oulu (Commission of the European Communities 2013). They possess necessary institutions for innovation development such as high density and diversity of knowledge organisations, support institutions, enterprises and clusters. Some metropolitan areas perform worse because the innovation subsystems and networks are fragmented and the interactive learning is poor (Asheim et al. 2011).

Less urbanised and peripheral regions have usually weakly developed knowledge provision and industrial activities. They have fewer dynamic enterprises and knowledge-generating organisations, less specialised structure of knowledge suppliers and educational institutions, and weakly developed networks to universities, research institutes and other specialised knowledge suppliers. Therefore their innovation potential is also weaker. Agglomerations can use the advantages from the economy of scale and highly specialised knowledge whereas peripheral areas need strengthening of knowledge generation and exploitation subsystems. There is a risk of policy mismatch if innovation policy is the same for metropolitan and peripheral areas (Jauhiainen 2008).

Industrial regions have a high density of enterprises and knowledge organisations. Differently from metropolitan regions, they are specialised in particular industries or clusters networked to and supported by knowledge organisations and educational institutions related to these industries (Asheim et al. 2011). The policy support for traditional industries may turn into negative development trajectory and lock-in in economic sectors with diminishing added-value if cluster policies do not support diversification. However, as noted by Boschma and Frenken (2011), diversification of economic activities does not automatically lead to innovations.

Nevertheless, the knowledge creation processes need to be supported with systematic innovation policies. Despite economic globalisation and the emergence of macro-regional entities such as the EU, national governments are still very important influencing the development in their territory. In the innovation policy the governments emphasise the nation-oriented innovation system. According to Lundvall (2008), a national innovation system (NIS) contains the elements and relationships which interact in the production, diffusion and use of new and economically useful knowledge. There are country-specific realms since a NIS is located within or rooted inside the borders of a state. Despite the fact that the principle and often also the goals of NISs are the same across the countries, the cultural differences between countries matter how NIS is organised and works in practice. Furthermore, as the globalisation continues, it is difficult to halt innovation development within the realm of one country, whether it is large or small. Lundvall and Borrás (1997) recognised that the national level is too large for a comprehensive innovation system. NIS is often too abstract and politically defined. In practice, NIS contains local and regional specialisations in the economy, regional innovation systems.

A regional innovation system (RIS) consists of the knowledge generation and diffusion subsystem (public and private research laboratories, universities and colleges, technology transfer agencies, vocational training organisations, etc.), of the knowledge application and exploitation subsystem (regional production and service structure), of policy organisations and of economic and political actors in a regional socio-economic territory (Tödtling and Trippel 2005). For a successful RIS resulting in commercially viable innovations, the two subsystems and the actors need to learn

interactively and be linked to global, national and other regional systems. Therefore, crucial are the relevant sectoral knowledge bases, institutional setting, networking characteristics, degree of institutional thickness and quality of networking within the RIS and beyond (Asheim et al. 2011).

Asheim and Isaksen (2002) and Asheim and Gertler (2005) have identified three types of regional level innovation systems. The regionalised national innovation system is functionally integrated in a NIS. It clusters large enterprises' or governmental research institutes' R&D laboratories in purposefully designed science parks that are located often near traditional universities and universities of applied sciences. The co-operative Triple Helix approach prevails. The territorially embedded innovation system bases on interaction within a particular region of a country. Enterprises rely their innovation activity on localised learning processes. The proximity in geographical, social and cultural aspects stimulates this local learning in development. Enterprises, however, do not interact much with formal knowledge organisations. The regionally networked innovation system bases its development in interactively learning enterprises and organisations that are embedded in a specific region. The networking is often planned and systemic.

In the BSR, regional innovation strategies are specialised with considerable variation between the northwest and southeast areas. Common themes are environment and sustainable development, ICT and life sciences but the focus within these differ between regions. However, the policies have been prioritised more in strategies than operations. More structured transnational co-operation and institutions are needed to reach a common BSR research and innovation area (Technopolis 2011).

However, business and economy do not develop in an isolated state or region, the states and regions are not homogeneous but internally different and interdependent. Therefore, an innovation system reaches each and every territorial border, inside and outside national borders. To think how innovations could develop in areas across the borders is of particular importance for the BSR because it is consisted of many countries and regions and their borders, thus also of many cross-border areas. The borders are challenging for development. They create a historically rooted embeddedness that separate

business, academic and other societal spheres on both sides of the borders and influence the actors' decisions in general and their cross-border behaviour in particular (Lundquist and Trippl 2013). Furthermore, the heterogeneity between and inside different cross-border areas is considerable in the BSR.

Lundquist and Trippl (2013) present three ideal types of cross-border regional innovation system (CBRIS) that can be contextualised to the BSR. The weakly integrated CBRIS (Stage I) lacks synergies or synergies are substantially under-exploited. This was the most common situation in the BSR in the 1990's and is still prevailing in many border areas.

The semi-integrated CBRIS (Stage II) is an emerging knowledge-driven system. It has few networked cross-border clusters in which innovative networking occurs. However, there is not a coherent innovation system across the borders. In the BSR, this development has been facilitated by hundreds of cross-border co-operation projects, including those supported by EU policies, such as Interreg. The removal of internal barriers in a cross-border region can have a substantial and long-term positive effect on knowledge flows if a targeted policy effort is conducted (Hansen 2013). Also tourism and its mobilities across borders facilitate innovative processes in cross-border areas (Weidenfeld 2013).

The strongly integrated CBRIS (Stage III) is characterised by a considerable trans-frontier flow of knowledge, expertise and skills. It is supported by a highly intensive mobility of students and labour force, innovation networking among enterprises, academic collaborations, university-industry partnerships, etc. In these areas cross-border innovation linkages have grown in strategic importance and are no longer subordinate when compared to other innovation linkages (Lundquist and Trippl 2013). In the BSR, there are many important areas in which policies support more intensive co-operation, such as Öresund between Sweden and Denmark, Haparanda and Tornio between Sweden and Finland and Talsinki between Estonia and Finland consisted of the urban areas of Tallinn and Helsinki (see Hansen 2013; Nauwelaers et al. 2013a; 2013b). Nevertheless, at the current stage, it is still difficult to identify a cross-border region with the strongly integrated CBRIS in the BSR. Furthermore, also in these more advanced cross-border

co-operation projects the focus has often been on similarities in integration or in finding perfect matching with functional complementarities in economic activities. The difference across the borders has not been used as a trigger to knowledge creation and further to commercial innovations.

4. Conclusions

Innovations are needed for successful and sustainable economic development in the BSR. Cross-border regions and trans-frontier knowledge creation offer a huge potential for the BSR, if policies support them as one important trigger for innovations. The careful and clever policy making turns differences, diversity and variety into a strength of the BSR. However, a simple one policy for all is not possible. Following the observations of Lundquist and Tripp (2013), the policies to promote innovations across the borders should differ strongly, depending on the evolution phase of CBRIS. The physical distance and institutional distance, particularly laws and regulations, can be dismantled rather easily. However, new viewpoints, novel knowledge and successful innovations emerge from differences that are enough but not too large. Therefore it would be a policy mistake to make cognitive distance disappear since it is a key trigger behind knowledge creation and innovation development, even if still underused in the BSR.

There have been many positive aspects in the policies promoting the common collective BSR from the early 1990's VASAB 2010 strategy to the recent EUSBSR. However, the track of integration has focused perhaps too much on similarities and simple complementarities in creating an innovative BSR. Furthermore, in national and region innovation systems, the transnational perspective and the role of borders have not received enough attention. As argued by Technopolis (2011), the BSR needs stronger consideration of trans-

national innovation policies. This article states that cross-border innovation systems and trans-frontier knowledge creation are useful for this.

For policy-makers, it is commonly attractive to believe that innovations can be made anywhere just by investing in basic premises, hiring competent experts and teaching the staff to innovate. In the creation of the transnational innovation policies for the BSR such copy-and-paste method of knowledge creation processes and innovation development may be enough to transfer the structures and basic tools of knowledge development, but not the necessary subtle issues that are fundamental for successful discoveries and innovations. Instead of general policies making cross-border areas internally similar, the policies in the BSR should facilitate cross-border innovation systems with trans-frontier knowledge creation based on positive difference. Difference and diversity are needed for creation of novel knowledge. Novel knowledge is fundamental for innovations. Innovations are crucial for successful and sustainable economic development.

The perspective of knowledge as an interpretation hints to uniqueness in each knowledge creation process. Therefore, it is difficult, actually impossible, instrumentally to repeat success in knowledge development. This also explains why policies for direct knowledge transfers so often fail. The policies bringing more similarity between the key innovation actors may initially make the process smoother, however, the lack of necessary difference, different viewpoints and perspectives for innovations will hinder the innovation potential of the policies supporting similarity. The policies in the BSR innovation realms should consider more properly cross-border innovation systems and trans-frontier knowledge creation processes, and support with clever policy-making the turn of differences, diversity and variety into a strength in the BSR.

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Migration and labour market integration in the Baltic Sea region: An emphasis on Finland

Elli Heikkilä

Executive summary

General demographic trends that are causing concern in many countries around the world, i.e. decreasing population and increasing emigration flows, can be also observed in the Baltic Sea region (BSR). Estonia, Latvia, Lithuania and Russia are a prime example of countries where recent emigration has drawn the attention of policy makers looking to mitigate potential negative impacts of the departure of the young and skilled emigrants as well as to support economic development. For example, over the period of 1992-2010, more than 3.6 million people left Russia. Further, according to the Statistics Lithuania, 0.7 million people have left the country during 1990-2011. This article focuses on migration processes and labour market integration in the BSR covering Estonia, Latvia, Lithuania and Russia and their connections to Finland.

Finland has been the main destination for Estonian migrants. The migration flows from Estonia to Finland have increased in size, 600% during 1991-2012. The most remarkable flows of immigration were from Russia to Finland in the 1990's, when Ingrian Finns received returnee-status. In spite of the geographically close location, Finland has not been the most important destination for Latvians and Lithuanians.

The age structure of the immigrants is favourable from the labour market perspective being younger than that of the Finns. What is problematic is that immigrants have many times higher unemployment rate compared to the native population. There are, however, differences according to citizenship in the labour market participation. Immigrants are sometimes ready to take a job not matching to their education, i.e. facing brain waste, over-qualified or over-

education. It is important to empower immigrants with language education. Complementary training is required but it has to be organised in close co-operation with both public and private sector actors.

If the differences in standard of living between Finland and the BSR will decrease, the immigration pressure will decrease. Return migration to the origin country is one important pull effect and option for the BSR immigrants while so-called soft values get more meaning in migration decisions, i.e. roots to origin country.

The recommendation is that there should be organised more language education for immigrants, and also specialised courses according to the language skill levels. There should be more easy-connections to the working life and one good practice is to have training and mentoring in different branches of economical life. It is very important to recognise human and cultural capital which all immigrants bring into the destination country.

1. Introduction

Population ageing is the reason for the diminishing supply of labour in developed countries. For example in Finland, there is a remarkable change in population structure when the baby-boom generation after the World War II retires during the current decade. The share of elderly is growing in the dependency ratio. The dependency ratio is an age-population ratio of those typically not in the labour force and those typically in the labour force. Finland is not the only country to struggle with this development trend since quite generally it is said that Europe is ageing and for example Germany, well-known as an attractive country for immigrants, needs more immigrants

for its labour markets (Elliott and Kollewe 2011). It is also said that there is a competition of skilled labour between different countries. With current demographic trends many countries will come to rely increasingly on the immigration of foreign labour. Discussions focus mainly on need for skilled workers; however, the future demand for labour will most likely relate to all skill categories (Heikkilä and Pikkarainen 2008; see El-Cherkeh 2009).

This article focuses on migration processes and labour market integration in the BSR (Estonia, Latvia, Lithuania and Russia) and more closely their connections to Finland. First, an overview of the BSR's population change and migration on the European level is given. This is showing how diverse regions there are when looking population processes. Secondly, a more detailed analysis of the main international migration flows in the BSR is made. Analysis gives the view where people from the BSR are emigrating and from where

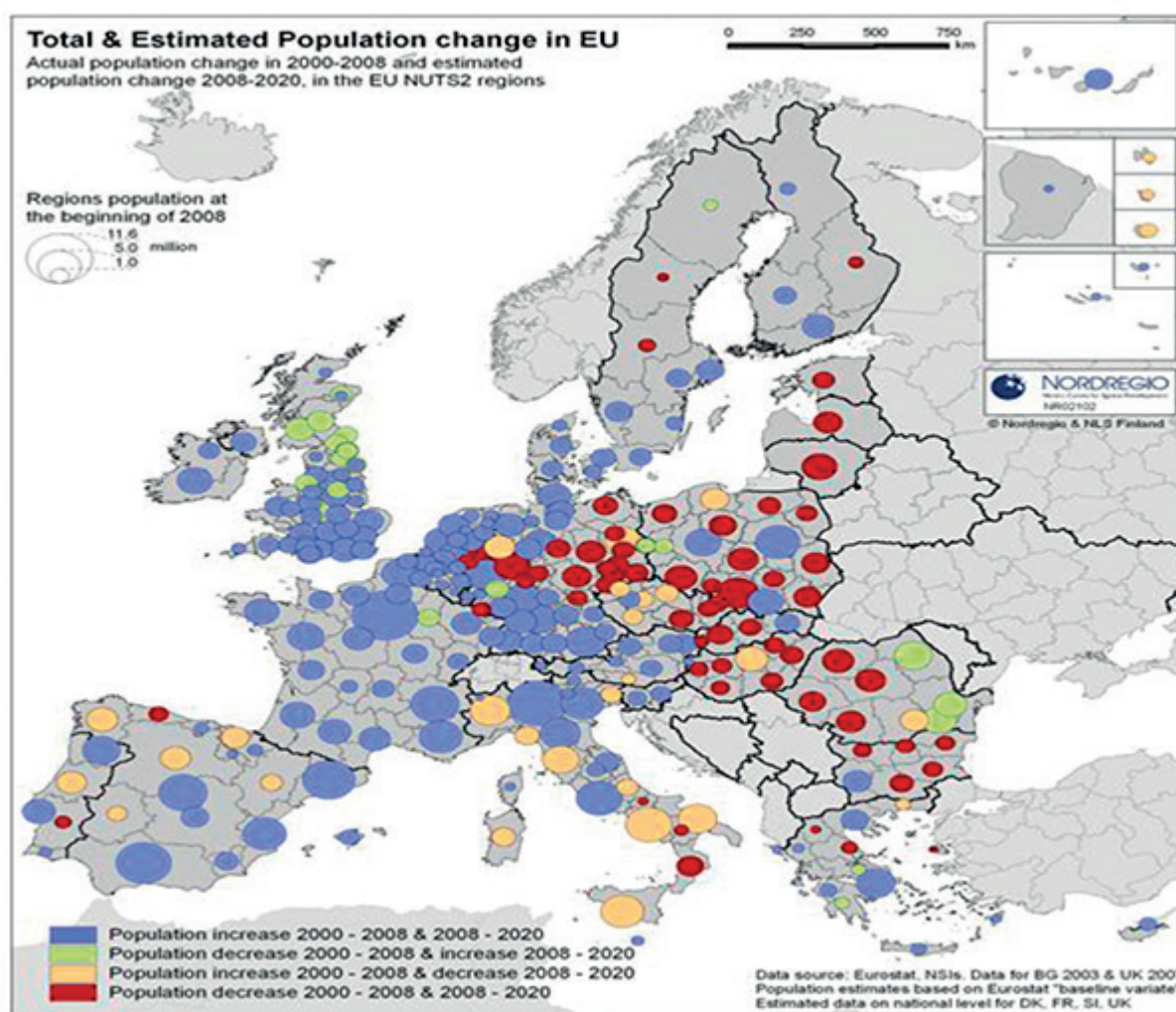
people are immigrating to the BSR. After that we look at the BSR countries' immigration to Finland and also emigration from Finland to the BSR. Immigrants' integration in the labour market is discussed with an emphasis on Finland. After these analyses, the challenges to future developments are discussed in a wider perspective.

The data consist of published data from Statistics Finland and the BSR official statistics. Also special maps of Nordregio (www.nordregio.se) have been used as graphics.

2. The Baltic Sea region in the European demographic context

According to the EU statistics over 100 million people live in the Baltic Sea region. They constitute some 23% of the EU's population (Iglebaek 2009). The BSR is in different position in population change compared, on the European level, for

Figure 1. Population change in the EU



Source: Nordregio, Roto 2011.

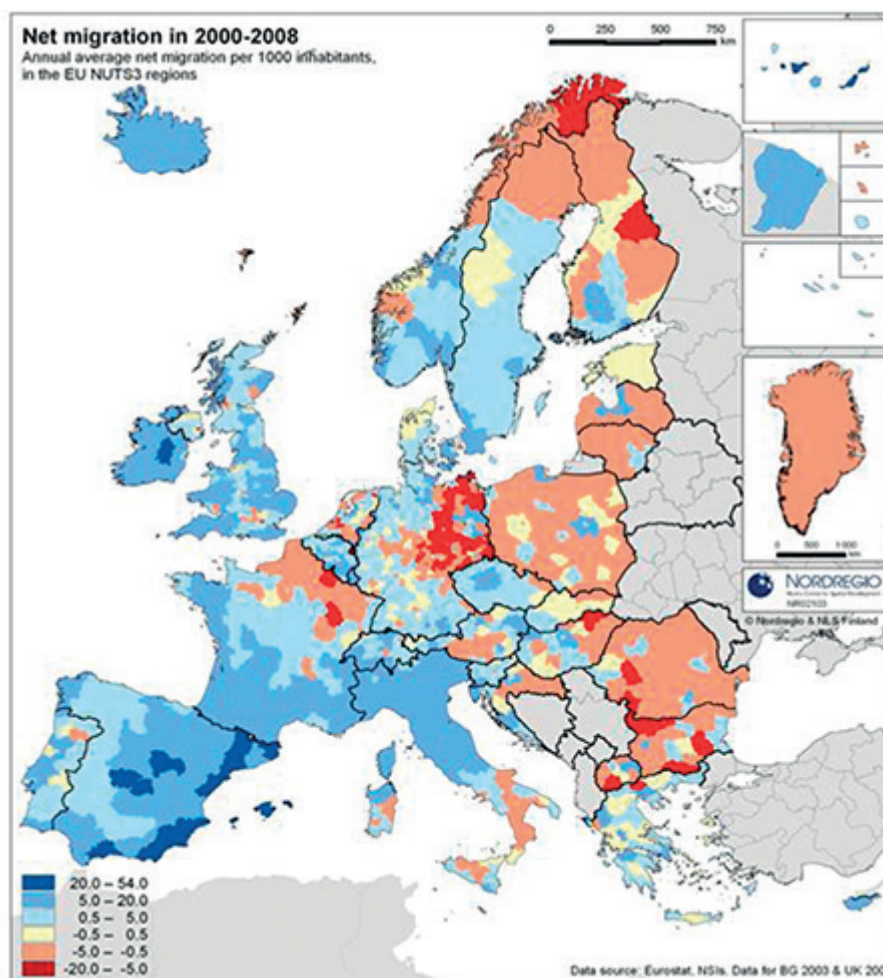
example to Central and Southern Europe: the BSR is facing population decrease, not only in the beginning of the 2000's but also in the future up to 2020. Figure 1 combines population changes in 2000-2008 and 2008-2020 showing more closely those regions with the decrease in population in both periods. These are mainly found in Central East European countries, including Estonia, Latvia and Lithuania, and as well as regions in central Germany. There are also classified those regions which indicate an increase of population both in 2000-2008 and also up to 2020. These are mostly areas in the core of Europe as well as areas close to metropolitan areas. There are separately found areas that have experienced an increase of population in the first period but are expected to lose population up to 2020 and separately regions on the contrary which might expect an increase (Nordregio, Roto 2011).

Indeed the entire BSR shows a slight decline in total population, but on closer inspection it can

be seen that continuing overall urban growth goes hand in hand with rural decline, although with contrasting tendencies between the various countries involved. The majority of small and medium-sized cities and towns, and specifically those that are to be found in relatively peripheral situations, are, however, increasingly hampered by population decrease. The key drivers of population change remain in place: strong migration surpluses in the Western part of the BSR and extensive natural losses in the Eastern BSR, with, however, distinctive national and regional variations pertaining (Neubauer and Schmitt 2009).

According to Roll (2009), the peripheral border regions are usually located on the EU's fringes, bordering economically less developed countries. She uses the concept "*double peripheries*" within a greater European context – distant not only from the dynamic centres of "*Core Europe*" – but also from prosperous national centres as well.

Figure 2. Net migration in Europe 2000-2008 (annual average net migration per 1000 inhabitants, in the EU NUTS3 regions)



Source: Nordregio, Roto 2011.

Further she is stating that as new EU Member States have to compete economically with the “old” Member States, this is done at the expense of underdeveloped peripheral, and especially rural areas in the “new states”, entering into the EU in the 2000’s, which do not have for example the skilled personnel and infrastructure that the highly developed centres, usually national capitals, have.

The main reasons for population change are natural population development and migration. In the EU two thirds of the regions had a migration surplus and 40% a natural population increase in the period 2000-2008. In approximately 30% of European regions both of these components were positive. Almost 80% of the regions with positive in-migration also had a total population increase. In 200 EU regions the total population was decreasing even though net migration was positive. These regions are mainly located in Eastern Germany, Greece and Portugal, i.e. in regions with very low birth rates. At a general level a spatial polarisation is visible in relation to net migration, both between Eastern and Western Europe and between the metropolitan and the more rural and peripheral regions. In-migration was highest in some Spanish coastal regions and around Madrid, in 8 of these regions annual in-migration was over 3%. The highest out-migration regions were in Eastern Germany. In Figure 2 it can be seen that the BSR has had remarkable regional differences in net migration with vast regions of negative net migration and some regions, mostly urban areas, getting migration gain in 2000-2008 (Nordregio, Roto 2011).

3. International migration in the Baltic Sea region

The international migrant stock in the world was approximately 232 million people in 2013. This means that the percentage of international migrants among the world population was 3.1 in 2013. There were 195 million international migrants in 2005, which shows that the migration flows are increasing on the global level. In the total volume of the world’s immigration Russia takes the second place after the USA (Heikkilä 2010; Beloborodov 2011; OECD 2013a). The principle of free movement is one of the core principles of the European Union. Migration and labour mobility is viewed as an important way of matching labour demand and supply, and thus increasing employment and competitiveness.

While the flows, for example of Nordic-Baltic migration, might be small compared to the rest of the movements within Europe, they have an important role to play in the development of the region and relationships between countries. Next international migration in Estonia, Latvia, Lithuania and Russia is analysed. The last three countries entered the EU in May 2004. The migration streams between Estonia, Latvia and Lithuania are very small in numbers: for example emigration from Lithuania to Latvia was only 202 persons and emigration from Estonia to Latvia only 52 persons and to Lithuania 33 persons in 2012.

3.1. Russia

The Russian population has been steadily declining for almost two decades now. When the Soviet Union collapsed in 1991, the population of Russia was recorded at 148.5 million. The 2010 census, the results of which were released in late 2011 and early 2012, reports that the official population of Russia was 142.9 million. In 2009 Russia recorded population growth for the first time in 15 years, with a growth rate of 23,300. Key reasons for the slow current population growth are improving health care, changing fertility patterns among younger women, and nowadays Russia pays child benefits according to the number of children, falling emigration and steady influx of immigrants from the ex-USSR countries. In the 1990’s-2000’s, migrants into Russia were mostly Russian expatriates and their descendants. For example in 2005, 95% of the documented migrants came from the other Commonwealth of Independent States (CIS). They were mainly Russians or Russian speakers repatriating from Kazakhstan (29%), Ukraine (17%), Uzbekistan (17%), and Kyrgyzstan (9%). In recent years, most immigrants have come from Armenia, Kyrgyzstan, Tajikistan and Uzbekistan. Every year, 300,000 immigrants arrive in Russia, of which almost half are ethnic Russians. Most international migration in the Russian Federation is temporary. Temporary labour migration flows are normally at least three times higher than permanent-type flows (see Banjanovic 2007; OECD 2013b; Vishnevsky 2013; World Population Review 2014).

The census, conducted in 2010, counted 11.2 million foreign-born persons, nearly 0.8 million (or 7%) fewer than in the 2002 census. Most of the foreign-born population comes from the former Soviet Union (FSU), led by Ukraine (26%)

and Kazakhstan (22%). Between 2002 and 2010, the number of migrants born in countries in Central Asia rose, while the number of those born in Ukraine and Belarus fell. Nationals from the Central Asian countries made up 42% of the foreign population, led by Uzbekistan (19%). Among nationalities from outside the FSU, China (4%) was the main origin country (OECD 2013b).

Over the period of 1992-2010, more than 3.6 million people left Russia. The largest Russian emigration stocks are found in the European Union, with Germany having the largest number, followed by Estonia and Latvia. Other countries which have remarkable Russian emigration stocks are Ukraine, Israel, and the USA. Mostly, emigrants from Russia have been qualified specialists, who reinforced the economically active population as well as the intellectual and reproductive potential of other countries. For example in the early 2000's, 43% of Russian migrants in OECD countries aged 15 years and over had higher education. Most Russian migrants are women. In Italy they account for more than 80% of Russian citizens living there; in Spain, Germany, Norway, Australia, and France their share varies from 60% to 70%. This phenomenon can be explained by the fact that they marry foreigners more often than men do. For example in 2006, marriage accounted for 30% of female immigration from Russia to France, while the corresponding figure for men was just 3.5%. The reproductive losses caused by female emigration from Russia are indirectly estimated at 0.8 million children that will not be born in the nearest 5 years (Beloborodov 2011; Denisenko 2013).

3.2. Estonia

The Estonian population on January 1st 2013 was estimated at 1.29 million, a decline of 5.5% since 2000. About 16% of the resident population were foreigners, the vast majority of whom are long-standing internal migrants who came from other parts of the Soviet Union prior to 1991. The natural increase was negative (-1,378 persons) in 2012. The net migration was also negative, i.e. 6,629 more persons emigrated than immigrated. There were 4,244 immigrants and 10,873 emigrants, which is 4,659 persons more than a year earlier. In immigration, the main origin countries have been Finland (35%) and Russia (24%). EU-27 countries have covered over a half (55%) of the immigration flows in 2012. EU-15 countries have been origin

countries among 53% of immigrants which shows that over a half of the immigrants are moving, more closely, from EU-15 to Estonia. Since Estonia's accession to the European Union in 2004, returning Estonian citizens have accounted for a large proportion of inflows to Estonia. In 2011, this percentage was 55 of all immigrants. Most immigrants come to Estonia to join their spouses and close relatives. In 2011 majority of residence permits have been issued on the grounds of labour and family ties (OECD 2013b; Statistics Estonia 2014).

When looking at emigration from Estonia, the main destination countries have been Finland (59%) and the United Kingdom (13%) in 2012. EU-27 countries have been target countries in 90% of Estonian emigration flows. When looking specifically at EU-15 countries, their proportion was 87% of the emigration flows from Estonia. Emigration flow from Estonia to Russia has been small, 382 persons in 2012. According to the Estonian population census, in early 2012, there were 24,900 Estonians working abroad. 61% of all Estonians working abroad was working in Finland (OECD 2013b; Statistics Estonia 2014).

3.3. Latvia

At the beginning of 2013, Latvia's population was 2.02 million. Between the 2000 and the 2011 censuses, Latvia's population had fallen by almost 13%. 63% of this decline was due to net migration, which has been negative throughout the past decade. Latvia's population has faced also a remarkable natural population loss in 2013 (-8,475). The international long-term immigration flow was 13,303 persons in 2012. Over a half (55%) of the immigrants to Latvia have moved from the EU-28 countries. More specifically EU-15 has been the origin area for 47% of the immigrants to Latvia in 2012 (Central Statistical Bureau of Latvia 2014; OECD 2013b).

The international long-term emigration flow numbered 25,163 persons in 2012. Almost 82% of the emigration was targeted towards the EU-28 countries, and 80% was towards EU-15 countries. After joining the European Union in 2004, Latvia has experienced a considerable wave of labour migration to more prosperous countries, especially to the United Kingdom and Ireland. It has been estimated that approximately 200,000 Latvians have emigrated in search for

work after joining the EU. Unemployment climbed from 5% to more than 20%, and remains about 14% in 2012. Migration has also picked up to Germany. In 2010, the second largest emigration flow from Latvia was towards Russia while the United Kingdom was number one and Ireland the third destination country (Latvijas statistika 2014). Recent emigrants have been disproportionately young – 70% between the ages of 18 and 34 – and more educated than those who have remained (OECD 2013b; Central Statistical Bureau of Latvia 2014).

3.4. Lithuania

Lithuania's population was 2.97 million in 2013. The country has faced a remarkable natural population loss in 2013 (-10,698). Lithuania is a country of emigration and one of the few EU "sending countries". According to the Statistics Lithuania, over 700,000 people have left the country during 1990-2011. In 2013, the number of immigrants to Lithuania was 23,643 persons but number of emigrants from Lithuania to foreign countries was much higher, 40,391 persons. This means a remarkable population loss in international migration (-16,748 persons) in 2013. Return migration has accounted for nearly 90% of all entries in 2011, mainly from the United Kingdom (41%), Ireland (12%), Norway (8%), Spain (5%), and Germany (5%). Labour emigration to those countries was substantial during their economic boom, and return has occurred with decreased labour demand (OECD 2013a, 2013b; Statistics Lithuania 2014).

The main destination countries in 2011 remained the United Kingdom and Ireland although they drew a smaller share than before the crisis, while Scandinavian countries grew in importance. Prior to the accession to the EU it was the Russian Federation, the Commonwealth of Independent States, and the USA that attracted highest numbers of migrants from Lithuania (International Organization for Migration Mission in Lithuania 2011). Lithuanian emigration predominantly consists of young, single and educated individuals. The 2010 data show that 55% of the emigrants were 20 to 35 years old, 50% had special upper secondary education and 25% completed higher and professional education. Family emigration is also on the rise. Until recently, migrant parents preferred to leave their children with extended family members, a so-called split family phenomenon, or disinte-

gration of families and households (Schmitt et al. 2008), while they were abroad but this trend is changing and now more parents take their children along with them as they leave (International Organization for Migration Mission in Lithuania 2011; OECD 2013b).

4. Immigration to Finland

Immigrants or foreign citizens in Finland numbered 195,511 persons in 2012, representing 3.6% of the total population. Totally, there were 285,471 persons living in Finland who were born abroad in 2012. This represents 5.3% of total population. The largest groups of those born abroad were persons born in Russia or former USSR (62,359; not including Estonia etc.), born in Estonia (34,984), born in Sweden (31,601), and born in Somalia (9,079) in 2012 (Statistics Finland 2014).

Next international migration flows from Estonia, Latvia, Lithuania and Russia to Finland and vice versa is analysed (Figures 3 and 4). The most noticeable waves of immigration were from Russia to Finland in the 1990's, when Ingrian Finns received returnee-status. Persons who have Finnish ancestry or otherwise a close connection with Finland can obtain a residence permit in Finland on certain conditions. No other reason, such as employment or study, is required to obtain the permit. Receiving the residence permit depends on the strength and closeness of Finnish ancestry. If ancestry dates back several generations, a residence permit cannot be obtained on this basis (The Finnish Immigration Services 2014). The immigration flow from Russia to Finland was highest in 1991, reaching 5,515 persons. The migration flow has diminished in the long run: there were 3,096 persons moving from Russia to Finland in 2012. Very few people moved from Finland to Russia (333 persons) in 2012. Of this flow, almost 75% were citizens of European countries excluding EU-countries, i.e. this means that many of emigrants might have been return migrants to Russia. 83 persons of emigration flow to Russia were citizens of Finland in 2012.

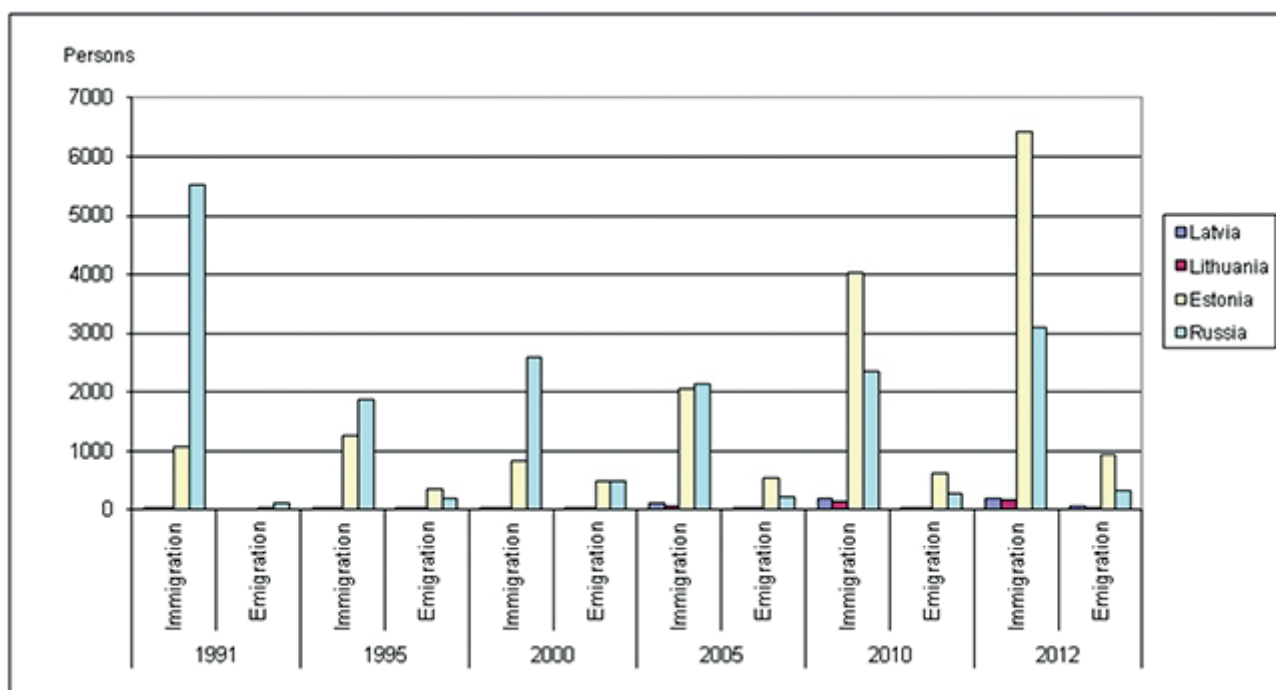
Estonia has been the most important BSR country from where there has been immigration to Finland during 1991-2012. The immigration flows from Estonia have been increasing: in 1991 1,073 immigrants and in 2012 already 6,422 immigrants.

This growth was 600%. Since 1991, a total of around 43,000 individuals have emigrated from Estonia to Finland; and about 8,000 individuals, or 19%, have returned to Estonia. Many Estonians also live and work in Finland on a temporary basis since it is easy and relatively cheap to commute between the countries (Anniste and Tammaru 2014).

Finland has not been the most important destination for Latvians and Lithuanians, in spite of the geographically close location, as can be seen from the size of the immigration flows from these two countries. The largest flows have been in 2012 when Finland received 208 migrants from Latvia and 172 migrants from Lithuania. Emigration from Finland to the BSR has been highest to Estonia but very much smaller in size compared to immigration figures. In 2012, Finland had very positive migration

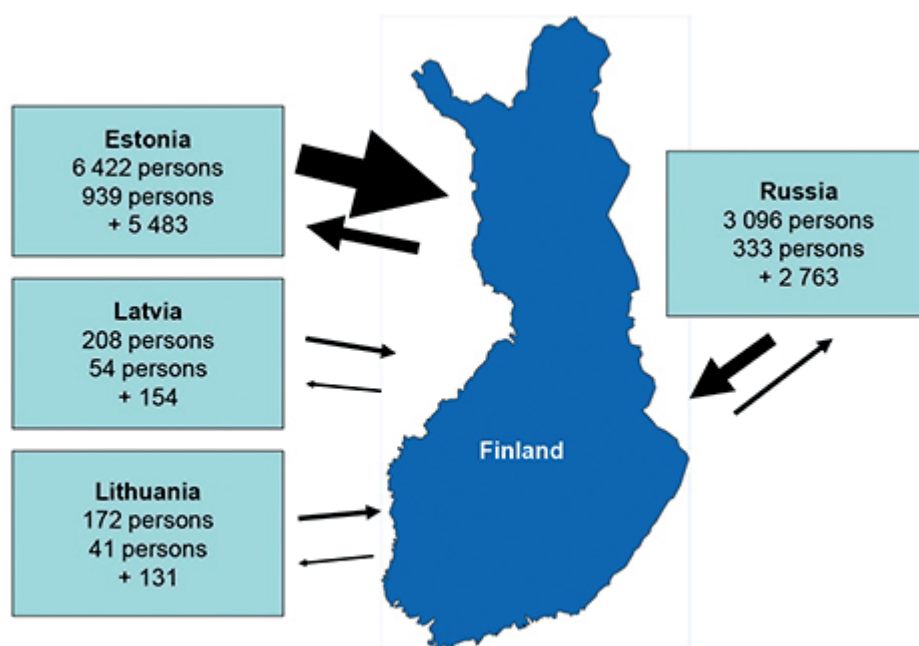
balance with Estonia (Figure 4), gaining almost 5,500 persons, and with Russia (+2,763 persons). In general, motives for moving to Finland have been very much connected to family relations (60-65%) and there are nowadays over 3,700 multicultural marriages in a year in which one of the spouses is a Finnish person and the partner a foreign citizen. According to the Ministry of Labour, work related motives have represented only 5-10% of all motives during the 1990's and the 2000's. Other reasons have been for example seeking asylum and return migration (Kyhä 2007, 29). The basis of first residence permits that the Finnish Immigration Service issued to immigrants coming from outside the EU, the European Economic Area, EEA and Switzerland was most common family ties (34%), study (32%) and employment (29%) in 2012 (Ministry of the Interior 2013).

Figure 3. International migration between Finland and the Baltic States and Russia in 1991–2012



Source: Statistics Finland 2014.

Figure 4. International migration between Estonia, Latvia, Lithuania and Russia and Finland in 2012



Source: Statistics Finland 2014.

5. Immigrants on the Finnish labour markets

Immigrants' age structure is favourable from the labour market perspective: there are more 20-44-year-old among Finland's foreign-born people in relation to the share amongst those who were born in Finland (Figure 5). The percentage of people older than that and especially of pensioners is noticeable lower among the foreign-born population compared to those born in Finland. Russia in this case resembles Finland, since there are more elderly people in its population structure than in other BSR countries. As much as two thirds of those born in Lithuania and Latvia were in the age group 20-44.

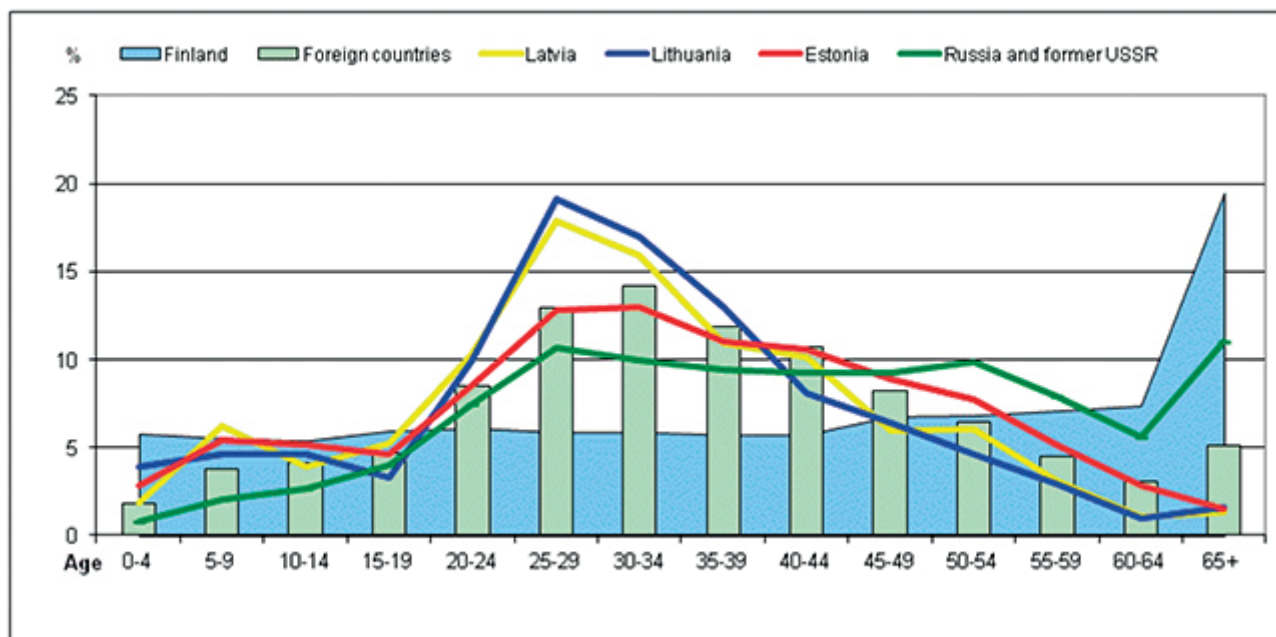
The position in the labour market is a central indicator of the social status of immigrants and ethnic groups and employment constitute the foundation for successful integration for immigrants. Both in Finland and in other industrialised countries, it is more difficult for immigrants to find work than for the native population and the result is that the former often have many times higher unemployment rates than the latter (Heikkilä 2005). On the EU level, the unemployment rate is generally higher for foreign citizens than for nationals. In 2012, the EU unemployment rate for foreign citizens with a citizenship from

another EU country was 12.5% whereas for foreign citizens with a citizenship from outside the EU the rate was almost twice as high, 21.3% (Teichgraber 2013).

The employment rate for immigrants has improved with the economic cycles in Finland. For example, during the deep economic downturn in 1994 the unemployment rate for foreigners was 53% and for the total population 17% in Finland, i.e. a three times higher rate for the former. The unemployment rates of labour force in 2011 were for foreign citizens 22% and for Finnish citizens 9%. There are huge differences in unemployment rates by citizenship in Finland: the unemployment rate for Estonians has been 11%, for Lithuanians and Latvians both 13%, for Russians 33% and for Somalis even 66% in 2011. One explanation for the better integration of Estonians is that the Estonian and Finnish languages are very similar (see Anniste and Tammaru 2014).

In general, immigrants tend to be concentrated in certain branches of activity and immigrant employment sectors show some gender differences in the 2000's. Trade has been the most important sector to employ both immigrant men and women. Finance, insurance, real estate and business activities -sector has especially employed men. For women, education and research have

Figure 5. Age structures of population living in Finland by country of birth: born in Finland, all foreign countries, Estonia, Latvia, Lithuania and Russia and the former USSR (excluding the Baltic States) in 2012



Source: Statistics Finland 2014.

been important, and also employment in health and social work. For example, nowadays there are around 300 Estonian medical doctors working in Finland. Although there are more and more Estonians in different economical sectors, the construction sector is employing the greatest share of Estonians (Tuohinen 2014). Transport and communication and construction sectors have, thus, been important for immigrant men in general. Industry has employed many men, and manufacture of electrical machinery has been especially important. It is clearly seen that the proportion of the employed has grown with better education among both males and females (Heikkilä and Pikkarainen 2008).

When looking at entrepreneurship, 11% of the employed Finns have been entrepreneurs in 2011 but among Turks it is far more common: 38% of the employed Turks have been entrepreneurs. When looking at the BSR countries in 2011, 7% of the employed Estonians were entrepreneurs, totally in numbers 1,330 entrepreneurs. The numbers of Russian entrepreneurs (929), Latvian entrepreneurs (44) and Lithuanian entrepreneurs (21) are much smaller compared to Estonians in 2011 (Statistics Finland 2014).

6. Future aspects

General demographic trends that are causing concern in many countries around the world – decreasing population and increasing emigration flows – can be also observed in the BSR. Estonia, Latvia, Lithuania and Russia are a prime example of countries where recent emigration has drawn the attention of policy makers looking to mitigate potential negative impacts of the departure of the young and skilled emigrants as well as to support economic development. The latter two countries in particular saw outflows' rise after accession to the European Union. For example in Lithuania emigration accounted for approximately 90% of total population decline. These outflows exacerbate a demographic situation in which the Baltic States face a rapidly ageing population and receive few immigrants themselves (OECD 2013a). The shrinking labour force and the safeguarding of public infrastructures, combined with the retention of an acceptable level of public service provision "greying societies" will remain among the most persistent challenges up to the year 2030 and most likely even beyond (Neubauer and Schmitt 2009; OECD 2013a). Also for example, Russia's population shrinks by 700,000 people each year due to high mortality and low birth rates. Migration could help compensate Russia's population decli-

ne and labour shortage. When looking future scenarios, migration alone cannot make up for the population loss. Russia is trying to attract qualified workers and compatriots (Banjanovic 2007).

It is more difficult for immigrants to find work than for the native population and the result is that the former often have many times higher unemployment rates than the latter. It is generally acknowledged that it is difficult for employers to evaluate a person's qualifications when accredited certification is available. This is because the content of education and degrees differ to such an extent between countries (Kahila et al. 2013). Immigrants are in many cases ready to take a job not corresponding to their education, i.e. facing brain waste and over-education, just to get the first step to labour markets and through it to integrate into the society. These types of jobs are so-called incoming jobs which include for example jobs in cleaning and restaurant work -sectors. According to Anniste and Tammaru (2014), found their survey data from 2009, around a third of the migrants from Estonia stated that upon arrival in Finland they had to accept a job that was beneath their qualifications.

In Kyhä's (2011) dissertation, a positive finding was that if higher educated immigrants succeeded in finding employment in Finland, the work was usually completely or partially relevant to their degrees. Further, higher educated immigrants' career starts in Finland can be categorised into three groups, each of which is further divided into two subgroups so that there are altogether six different types of career starts: 1) stable career and 2) stabilising career corresponding to education, 3) mixed career and 4) declining career partially corresponding to education, as well as 5) entry career, not corresponding to education, and 6) unemployment.

Education is a very important tool and it empowers immigrants. Language education and language learning through for example so-called non-stop language education and through hobbies like sports, sewing groups, preparing food groups etc. are some of those tools. Further education to get qualifications updated for host country standards is important. According to Kahila et al. (2013), complementary training is required in many circumstances but it has to be organised in close co-operation with both public and private sector actors.

Most of the immigrants in the BSR and Finland come from other EU countries: for example over half (52%) of the immigrants moving to Finland were from EU countries in 2012. The competition with other European countries for well-educated migrants and migrants for different types of jobs is severe. If the differences in standard of living between for example Finland and the neighbouring countries will decrease, the immigration pressure will decrease. Temporary migration, circulation and short term employment is expected to increase (see Commission of the European Communities 2006; Heikkilä 2007; Kahila et al. 2013).

The BSR and Finland will need work-based immigrants to compensate for the labour deficit due to the baby-boom generation having left the workforce during this decade. These countries thus need immigrants for a variety of sectors, and compete for them with other ageing societies. According to Kahila et al. (2013), the Central Baltic region faces a labour shortage for example in the health care sector particularly medical doctors, nurses with different specialisations and assistant nurses as well as in the social services. For example Finland has immigrant labour reserves, i.e. unemployed and those outside the labour force, living already in the country which is potential labour force. These numbers alone are, however, too small for compensating the labour deficit in the near future (see Työministeriö 2007).

According to Schmitt et al. (2008), one of the policy implications at the macro-scale is that international companies will analyse where they have access to highly qualified labour force before they consider setting up new facilities. At the national and regional level (micro-scale) the reality of a shrinking labour force demands that new strategies on how to attract qualified migrants from other countries to compensate for this will be put in place.

There has always been a demand for certain qualification professionals in different industries, especially when business cycles are going up. For this reason, the main task of so-called Central Baltic Job Ferry (www.cbjobferry.eu) has been to promote the mobility of professional and well educated people to ensure that there are enough qualified specialists in those regions and industries which are the most important for the future development of the whole Central Baltic region. This joint project of Finland,

Sweden, Latvia and Estonia was completed in summer 2013.

Targeted return policies providing information to emigrants about changing economic and social conditions in the origin country, and allowing employers to reach out to diaspora, may help to promote some returns. There is need to provide general information about the labour market situation in the home country. The average emigrant is young, but there is a wide heterogeneity, and students, professionals and circular migrants all have different needs. For those who return, initiatives for labour market reintegration need to reflect these needs. Diaspora ponds can attract also lower cost capital from emigrants and give them a means to contribute to economic development when they no longer have family to which send remittances (OECD 2013a).

The main elements for example for affecting Estonians to return back to home country are: pay which would guarantee a good standard of living, challenge, work environment, a job with an

international dimension, closeness of family and friends, etc. (OECD 2013a). Return migration back to Estonia is widespread. According to the European Social Survey in 2008, eight percent of the adult population of Estonia has worked for at least six months abroad, which is one of the highest rates in Europe (Pungas et al. 2012).

When looking at Estonian immigrants in Finland, the evidence for lifetime strategy explanation stems from the fact that income-migrants have substantially stronger plans to return. These migrants are mostly attracted by the prospects of better earnings and they express elevated intentions to return. Their low attachment to Finland may be enhanced by the possibility of easy commuting between the two countries, as frequent visits help to maintain contacts with relatives and friends living in Estonia (Pungas et al. 2012). The elements, which are affecting to the process of rooting oneself in the new homeland, as Estonians to Finland, are structural integration variables, i.e. Finnish citizenship and homeownership (Anniste and Tammaru 2014).

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East or West – or both at the same time?: Higher education as a battleground for the Russian soul

Markku Jokisipilä

Executive summary

Located in both Europe and Asia, Russia has been searching for its identity and true place in the world for centuries. The classical debate between the Slavophiles and Westernisers is still continuing and has in fact intensified after the dissolution of the Soviet Union. This article aims to look at the recent developments in Russian higher education both against this wider historical background and in relation to the foreign political decision-making under the leadership of Vladimir Putin. Same twin strategies of pragmatic European co-operation and aspirations of Eurasian dominance that underlie the current Russian foreign political doctrine can be observed also in its higher education policies. At the same time as Russia has committed to adapt to the requirements of the European Bologna Process, it is building a competing common educational space in Eurasia, similar to the European Higher Education Area but under the Russian leadership and with the Russian language as the lingua franca. The latter initiative is inextricably linked to Russia's plans of creating the Eurasian Union as a countermove to the growing influence of the EU in the former Soviet countries in Eastern Europe, Caucasus and Central Asia.

Both the Bologna Process and Russian analogous regional plans in Eurasia stem from the realisation of the growing transformative potential of higher education as a form of soft power. In the ever more interdependent and competitive knowledge-driven global economy national higher education systems need growing amounts of academic mobility and internationalisation to be successful. As internationally mobile students are the future leaders of their countries, their choices of where

to study can be very consequential. It will be very significant for the future of Russia, will the dominant strategy of higher education be the European or the Eurasian one. However, if Russia complicates its international co-operation by conducting aggressive foreign policy, its ambitious dual strategies for making its higher education globally competitive have little chance of success. Russia cannot realise its highly publicised and vitally necessary plans of modernisation without partners from Western Europe and Northern America. This is why the EU should not underestimate the political leverage vis-à-vis Russia it gains from the fact that so many Russian universities, academics and students are attracted by the globally acknowledged status of European higher education.

1. Introduction

One of the most important ideological and philosophical fault lines of Russian history lies between the Slavophiles and the Westernisers. This debate has had many different expressions and sub-phases during its course, but it has been a permanent fixture in Russian intellectual debates for several hundred years. Both sides have felt that Russia is located at a political, ideological and spiritual crossroads between Europe and Asia, with economically and socially more developed and prosperous Western Europe on one side and vastness of Russian steppes, tundra and Dal'niy Vostok (Far East) on the other. These contradicting elements of Russianness have led to differing interpretations of Russia's place in the world and the path it should follow.¹

The Slavophiles and their modern-day counterparts have seen Russia as a self-sufficient and

¹ Neumann I. B. (2013) Russia in international society over the longue durée: lesson from early Rus' and early post-Soviet state formation, In *Russia's Identity in International Relations: images, perceptions, misperceptions*, Ed. by R. Taras, Routledge, New York.

independent continental power on its own right and with a unique national and geographical composition. They saw that Russia is historically destined to be the leader of the Slavic world and function as a moral and political counterforce to the Western Europe. They wanted to safeguard Russia against Western (European) influences, because they felt that adopting Western values would compromise and endanger the unique Russian culture and national soul. Westernisers on their part felt that Russia had turned inward and isolated itself from the most important intellectual and political currents, and was therefore lagging behind Western Europe in terms of development. According to them Russia should have enacted political and economic reforms, moved towards Western Europe and embrace the Western values in order to secure its rightful place in the world.²

After the collapse of the Soviet Union this debate has gathered new force, as Russia once again is searching for its identity. Although the times are different and Russia is a hugely different country what it used to be 200 years ago, the traces of this historical divide can still be seen in contemporary Russian political developments. Many experts have for example referred to the similarities between the concept of sovereign democracy and reasoning of 19th century Slavophiles. Putin and other conservative Russian politicians have repeatedly warned Russia against embracing the cosmopolitan culture of globalisation and believing in the alleged universality of European-style democracy and humanitarianism, seeing them as threats for national uniqueness of Russia.³

2. Russian higher education between Bologna and Eurasia

Although higher education is only rarely discussed in the context of political power, it is indisputable that the ability to attract foreign students is an important soft power instrument for any state or a union of states. Both incoming and outgoing student mobility can be used as an instrument of foreign policy.

University students are usually people in their twenties and the years spent in the lecture hall are formative for the consolidation of their values and opinions. When studying abroad, students become acquainted with the culture of the host country, its social realities, political system as well as the national habits, often learning at least some of its language as well. Spending time in foreign higher education system gives them both intellectual and social capital, broadening their worldviews and giving them fresh perspective to their home country as well. For many outgoing students the decision to go abroad is a serious one with potentially life-long consequences. In addition to the academic factors, many of them consider already at this point also the possibilities of integrating into the society of the host country and eventually gaining its citizenship.⁴

In the last years of the Soviet Union and throughout the 1990's, the country experienced tremendous difficulties in sustaining the level and quality of its higher education. In the midst of political and economic turmoil government's education expenditure plummeted from 9.6% of the GDP in 1986 to 3.5% in 1990 and then to 2.9% in 2000. As the Russian economy contracted with nearly 50% during the 1990's, in absolute terms the drop in education spending was even more alarming. In its search for ways to save Russian higher education, President Boris Yeltsin's administration was forced to look for outside assistance. Already in the Partnership and Co-operation Agreement that was negotiated between the EU and Russia in 1994-1996, higher education was mentioned as an important part of the EU-Russia relations. During the EU-Russia summit in St. Petersburg in May 2003, the parties agreed on the creation of the Common Space of Research and Education, including Cultural Aspects, and this agreement was signed two years later in Moscow. Russia signed the Bologna Declaration already in September 2003 and in March 2010 it became a part of European Higher Education Area that was created with the Budapest-Vienna Declaration. As a result of this the country has been moving towards

² Tsygankov A. P. (2007) Finding a Civilizational Idea: 'West', 'Eurasia', and 'Euro-East' in Russia's Foreign Policy, *Geopolitics* 12, 375-399.

³ Morozov V. (2008) Sovereignty and democracy in contemporary Russia: a modern subject faces the post-modern world, *Journal of International Relations and Development* 11, 152-180.

⁴ de Lima A. F. Jr. (2007) The role of international educational exchanges in public diplomacy, *Place Branding and Public Diplomacy* 3, 237-241.

the European two-tier system consisting of three or four years Bachelor's degree and one or two years Master's degree.⁵

Russia's joining of Bologna Process did not happen without protests from the opposition, however. For example, the extremely influential Viktor Sadovnichii, Rector of Moscow State University, a leading figure among conservative academics, likened the joining to a *"brain surgery where Russia has been given the role of organ donor"*. Generally the opponents of Bologna felt that Russian higher education was of such high quality that it did not really need European co-operation and that harmonisation with European standards would in fact jeopardise this quality. The credibility of their arguments, however, was undermined by the fact that during the fifteen years that followed the disintegration of the Soviet Union, the Russian higher education system lost at least 70,000 academics through emigration to the West.

The proponents of Bologna in Russian academic circles expect the educational integration with Western Europe to solve or at least ameliorate many of the current problems of Russian universities: making them more competitive and attractive for both domestic and foreign students, improving the funding through tuition fees and exposition to Western salary levels, making the Russian culture and language more known to Western Europeans through incoming student and staff mobility, increasing the international reputation and appreciation of Russian higher education. The significance of embracing the Bologna Process in its entirety goes well beyond education, all the way up to international reputation and prestige of the country. According to Andrei Melville, Dean of the Faculty of Politics at the Moscow Higher School of Economics, integration to European Higher Education Area has the potential of producing *"a positive impact on the perception of Russia among the Europeans"*.⁶

Also the Bologna Process is based on an agenda that reaches beyond purely educational goals. It is simultaneously a cultural, economic and political project, aimed at fostering understanding between different nations, boosting European economy and serving the particular interests of ruling European political elites. In a 2003 communiqué of ministers of education the *"promotion of European dimension in higher education"* was singled out as one of the most important goals of the process. The ministers declared that *"substantial period of study abroad"* and *"linguistic diversity"* especially in the form of language studies were central in ensuring that the students achieve *"their full potential for European identity"*.⁷ Higher education developments are of course inextricably linked also to the Europe 2020-strategy, which aims at making Europe the world's leading knowledge economy. More than anything else, promoting student mobility and academic exchange are instruments for increasing European competitiveness on the global market.⁸

Similarly as in its foreign political doctrine, also in higher education Russia has developed a dual strategy to strike a balance between its Western European and Eurasian operational environments. The decision to embrace the Bologna Process and to encourage student and staff mobility between Russia and the EU stemmed from the European section of this strategy. The other tip of the strategy points to the East and strives to make Russia the leader in Eurasian higher education market, making the country an attractive destination for tuition fee paying students from the former Soviet republics and Asia. The objectives in these two directions are very different and at least partially contradictory. In its European co-operation Russia has committed to an unprecedentedly comprehensive harmonisation of its higher education with European standards, for example in degree structures, credit system and recognition

⁵ Gänzle S., Meister S. and King C. (2009) The Bologna process and its impact on higher education at Russia's margins: the case of Kaliningrad, Higher Education, Vol. 57, 533-547.

⁶ Tomusk V. (2007) Pizza Bolognese à la Russe: The Promise and Peril of the Bologna Process in Russia, In Creating the European Area of Higher Education: Voices from the Periphery, Ed. by V. Tomusk, Springer, Dordrecht, 227-250.

⁷ Corbett A. (2005) Universities and the Europe of knowledge: ideas, institutions and policy entrepreneurship in European Community higher education policy, 1955-2005, Palgrave Macmillan, Basingstoke, 192-200.

⁸ Garben S. (2012) The Future of Higher Education in Europe: The Case for a Stronger Base in EU Law, LSE 'Europe in Question' Discussion Paper Series 50, 20-24, <http://www.lse.ac.uk/europeanInstitute/LEQS/LEQSPaper50.pdf> [accessed 15 February 2014].

of qualifications. The European part of the Russian higher education strategy is based on the acknowledgment of the fact that as a combined result of historical burdens from the Soviet era and economic crisis of the 1990's Russian higher education seriously lags behind its Western European counterparts and needs to adapt if it ever wants to catch up on them.

In Eurasia, however, a completely different picture of Russian aspirations arises. Here Russia wants to present itself as the continental leader and trail-blazer in higher education. As in their Western contacts Russians have signalled readiness to accept English as the academic lingua franca, in the East they want to promote the Russian language, capitalising on the historical reputation that Russian education and culture enjoy in the countries of the Commonwealth of Independent States (CIS). Although the number of Russian-speakers in these countries has diminished since the Soviet times, there are still close to 65 million active users of the language in the region, including 26 million native speakers (see Table 1). Eventually the goal is to merge the European and Eurasian elements of the higher education strategy and to make Russia a desirable mobility direction also for students and staff from the EU countries,

thereby promoting the image of Russia in Europe and increasing the popularity of the Russian language also outside the former Soviet Union.

In current situation it is highly improbable that the goals set in Russia higher education strategy will be reached even partially in any near future. Although joining the Bologna Process has facilitated co-operation, integration and mobility between Western European and Russian higher education systems, there is still a long way to go. The regional quality variance between Russian universities is huge, and only a handful of them have been able to cast themselves as attractive partners to their Western European counterparts. Similarly there is still a considerable language barrier holding back both staff and student mobility. Especially the incoming mobility from the Western European countries is heavily discouraged by the virtually non-existent supply of English-languages course and academic services. The best chances of success Russia has in becoming the Eurasian leader of higher education, but so far as this happens in Russian language, it has very little potential of producing any significant improvements either in the quality or the level of internationalisation of Russian higher education.

Table 1. Number of native and active Russian speakers in the CIS and the Baltic States (million)

Country	Population	Native Russian speakers	Active Russian speakers	Non-speakers
Armenia	3.2	0.0	1.0	1.0
Azerbaijan	8.2	0.3	2.0	2.7
Belarus	10.2	3.2	8.0	0.2
Estonia	1.3	0.5	0.5	0.3
Georgia	4.5	0.1	1.7	1.8
Kazakhstan	15.1	4.2	10.0	2.8
Kyrgyzstan	5.0	0.6	1.5	1.5
Latvia	2.3	1.0	1.3	0.3
Lithuania	3.4	0.3	0.5	0.5
Moldova	3.4	0.5	1.9	0.5
Tajikistan	6.3	0.1	1.0	3.3
Turkmenistan	4.8	0.2	0.1	3.8
Ukraine	48.0	14.4	29.0	8.0
Uzbekistan	25.0	1.2	5.0	10.0
Total	140.7	26.4	63.6	37.7

Source: Tishkov 2008.

3. Russia as global player in the education market

The Eurasian pillar of the internationalisation drive of the Russian higher education is in perfect concordance with the grand foreign political scheme of Putin's Russia – that of political, economic, cultural and military reintegration of the former Soviet territory under Russian regional hegemony. The Eurasian Economic Community (EurAsEC) was established in 2000 to facilitate economic and trade contacts between Russia, Belarus, Kazakhstan, Kyrgyzstan and Tajikistan. In 2002 Russia formed a military alliance together with Armenia, Belarus, Kazakhstan, Kyrgyzstan and Tajikistan by creating the Collective Security Treaty Organisation (CSTO). The Customs Union of Belarus, Kazakhstan and Russia was launched in the beginning of 2010 and in November 2011 the countries agreed on the establishment of the Eurasian Union by 2015. As much as promoting regional integration the recent steps can be seen as a countermove to the EU's Eastern Partnership initiative, which Russia has interpreted to be a mere front of the EU's ambition of extending its sphere of influence.⁹

Dual internationalisation strategy of Russia is in fact a very logical one when one looks at the current patterns of outgoing and incoming student mobility in the country. According to the Federal State Statistics Service of Russia, in the academic year 2011-2012 there were over 125,000 foreign students in Russian higher education institutions. 58% of these came from CIS countries, with Kazakhstan, Belarus and Uzbekistan topping the list. According to the OECD, the share of CIS students was actually much higher, around three in four. During the same time period there were over 70,000 Russian students abroad, most popular destinations being Germany (13,000), the United Kingdom (4,500), the United States (4,500) and France (4,000). The uneven geographical distribution of incoming and outgoing students is completely compatible with the global patterns

of student mobility, where one of the largest flows goes from East to West.¹⁰

President Putin has expressed in unmistakable terms that making Russia a global player in higher education competition has now been given the highest priority. In his State of the Nation speech in December 2013 he demanded “*much greater effort*” to export education services and to have foreign students especially from the CIS countries to study in Russian universities. As ways to achieve this he presented the mutual recognition of school diplomas within the CIS and making it possible to take the Russian National Final School Exam in other CIS countries simultaneously with Russia. These plans, if realised would in fact move the harmonisation of education systems in CIS well beyond what the Bologna Process has achieved in Western Europe. According to Putin, the establishment of common higher education within the CIS “*can play a very big part in strengthening Russia's cultural and intellectual influence in the world*”.¹¹ It was striking that he did not say a word about the educational integration with Western Europe or the Russian student and staff mobility to the EU countries.

The increased Russian activities in the internationalisation of its higher education seem to aim at producing a replica and an eventual competitor for the Bologna Process, a multinational common higher education space similar to the European Higher Education Area, binding together the university systems in the former Soviet Union and using the Russian language as the glue that holds the constellation together. The most concrete and advanced step in this direction is the establishment of the CIS Network University, a consortium of 16 leading universities from Armenia, Belarus, Kazakhstan, Kyrgyzstan, Moldova, Russia, Tajikistan and Ukraine. This co-operation strives to establish a single common education space, to increase mobility of students and faculty, and to promote intercultural dialogue within the CIS.¹²

⁹ Tsygankov A.P. (2010) *Russia's Foreign Policy: Change and Continuity in National Identity*, Rowman & Littlefield Publishers, Lanham, 171-196.

¹⁰ Federal State Statistics Service of Russian Federation, http://www.gks.ru/bgd/regl/b13_12/lssWWW.exe/stg/d01/8-12.htm [accessed 22 February 2014]; OECD Directorate for Education and Skills, *Education at Glance 2013* <http://www.oecd.org/edu/eag.htm> [accessed 22 February 2014].

¹¹ Presidential Address to the Federal Assembly, 12 December 2013, Website of President of Russia. <http://eng.kremlin.ru/news/6402> [accessed 1 March 2014].

¹² Torkunov A. (2013) *Education as a Soft Power Instrument of Russia's Foreign Policy*, Russian International Affairs Council, http://russiancouncil.ru/en/inner/?id_4=1495#top [accessed 28 February 2014].

These plans are part of the larger process of strengthening the CIS as a framework for regional economic and political co-operation in the area former Soviet Union. The Russian Ministry of Education has announced plans of investing hugely in exporting Russian higher education through a network of branch campuses of Russian universities in foreign countries. Simultaneously the Ministry declared that it is going to make a billion-dollar investment to promote Russia as a destination of international student mobility. First results can already be seen. In the past ten years, Russia has increased its share of the international higher education market from 2.0 % in 2000 to 4.0 % in 2011, putting it between Japan (3.5%) and Canada (4.7%). The most popular destinations for mobile students are the United States (16.5%) and the United Kingdom (13.0%). The Russian share is impressive taking into account the fact the availability of English-language programmes is close to non-existent.¹³ In internationalisation of its higher education Russia has traditions to lean on. During the Cold War, the Soviet Union routinely utilised its university system also as a political and ideological instrument through the enrolment of foreign students especially from the other communist countries and the Third world. Still in the 1980's the Soviet Union was the second most popular destination for international student mobility, surpassed only by the United States.

In its emphasis on the necessity of internationalisation new Russian strategy for higher education, launched in 2012, is no different from other countries. However while the European understanding of the internationalisation refers to the promotion of European identity according to the unity in diversity-principle, Russians plans of creating a regional higher education area in Eurasia are not geared towards establishment of any Eurasian identity with underlying national identities and languages as equal constituent elements. More than creating a new overarching regional identity and awareness through exposure to different cultures, languages and societies Russian plans aim at strengthening the role of Russia as a regional hegemon, the status of the Russian language as the lingua franca of regional interaction and the familiarity of Russian culture

as a historical force binding together different nations and peoples in the area.

4. Education as a form of soft power with transformative potential

In a country where the population decrease has been one of the most serious strategic concerns for 20 years and which has witnessed large numbers of outward emigration especially of young and highly-educated people, student mobility from Russia to EU countries poses a potential demographic and educational threat. One of the most important goals of international student exchange programmes of the European Union is to instil and enhance the European consciousness among those people, students especially but also the faculty members, who participate in this mobility. The surveys have demonstrated that by gaining the civic experience of studying in these kinds of Europeanised networks, people become more supportive of the EU and will more likely identify themselves as Europeans instead of an exclusive nation-state affiliation. Therefore, student mobility is very much a tool of legitimacy-building and civic education. In Europe the political rationale of the Bologna Process rests on the assumption that the integration and harmonisation of higher education systems together with increased mobility of students and staff members of different nationalities will promote a strengthening European consciousness, a sense of European identity and a growing support of European integration among future elites.¹⁴

Whether the development of Russian higher education will happen on European or Eurasian lines is of utmost significance to the future of Russia, the CIS and even Europe as a whole. Increasing interaction with and mobility to and from Western Europe will mean that Russian students will have more exposure to the European conceptions of democracy, human rights, rule of law, civic society and transparency. As observed in surveys among Erasmus students, European mobility provides students with a civic experience that makes them view themselves as more European and leads, at least to some degree, to a Europeanisation of their value world, making them less prone to accept

¹³ Pimenova N. Y. (2006) Promotion of Russian Education on the International Market, *Universitetskoye upravlenie: praktika i analiz* 41/1, 15-26.

¹⁴ Mitchell K. (2012) Student mobility and European Identity: Erasmus Study as a civic experience?, *Journal of Contemporary European Research* Vol. 8 (4), 490-518.

e.g. authoritarian forms of government and curbing of the freedom of expression. If, however, the development of the common Eurasian higher education area becomes the dominant form of developing the Russian universities, the results might look very different. As we are talking about educating the future decision-makers and voters, the question which direction Russian higher education will take is important indeed.

At the time of writing this article, Russia was flexing its great power political muscles in the Crimean Peninsula and seemed to be on the verge of a large-scale military confrontation with Ukraine. As one of the largest countries in Europe with 45 million inhabitants Ukraine is central for the success of Russian plans of re-integrating the post-Soviet countries under the Russian leadership. If Ukraine decides to take the European path, it will deal a major blow to Russian plans of launching the Eurasian Union as a credible challenger to the EU. If Russia decides to forcefully intervene in Ukraine to help its compatriots in its near abroad, it will confirm the notion that Russia still regards the areas of the former Soviet Union as its legitimate sphere of influence. However at the same time it will seriously harm the relations of Russia to the EU, the United States and the NATO. It would be difficult not to regard a military confrontation between Russia and Ukraine as a complete failure of the European pillar of the Russian foreign policy.

Most importantly, a military intervention to stop Ukraine from entering a closer relationship with the EU might seriously damage the popularity of the Putin administration in Russia, as it would trigger severe economic sanctions against it and run the risk of international isolation. According to a recent survey commissioned by the German television broadcaster Deutsche Welle 60% of the Russians see the EU as an important political and economic partner of Russia and no less than 41% feel that the country should become a member of the union in the future.¹⁵ In the eyes of ordinary Russians Putin's greatest achievement is that he steered the country back from the instability and economic chaos of the 1990's. As the EU member states combined are the first trading partner of Russia and its most important foreign investor,

a freezing of the EU-Russia relations would be nothing short of disastrous to it. In the interdependent and globalised world that we live in, defiant clinging to the traditional methods of power politics carries potentially detrimental consequences even for the largest countries.

All of this is very much linked to Russian plans in higher education as well. A tough line in Ukraine would most probably mean major difficulties for the European co-operation in the field and make it very hard if not impossible for Russian universities to succeed in the desperately needed project of modernisation. Although temporarily Russia might be able to project itself as a strong regional power to its Eurasian clientele, it is highly debatable whether the use of force as a foreign political tool would make it more attractive destination for students and staff even there, not to say anything about the prospects of attracting mobility from the West. As international co-operation of Russian universities would most certainly become much more difficult, an inevitable long-term consequence would be degradation of the quality, competitiveness and attractiveness of Russian higher education in the eyes of not only the potential foreign students but also Russians themselves. This course of events would bring back the realities of the 1990's, when huge numbers of qualified academics and talented students saw moving away from Russia as their only viable option.

In their efforts of trying to persuade Russia from taking steps that effectively would bring Cold War back to the international relations the EU and the governments of its member states should not underestimate the transformative power of higher education. Country's international education exchanges can be seen as a complementing dimension of its foreign policy, as they can greatly contribute to the international image of the country and its policies. Exchange programmes and scholarship schemes are a diplomatic investment in the future relations, as they attract potential future members of the leading political and economic elites of the targeted countries, bestowing them with knowledge about the hosting country and in most cases also a favourable attitude towards it.¹⁶

¹⁵ Deutsche Welle, 'Russians esteem European partners', <http://www.dw.de/russians-estimate-european-partners/a-16931584> [accessed 27 February 2014].

¹⁶ Knight J. (1997) Internationalization of Higher Education: a conceptual framework, In Internationalization of Higher Education in Asia Pacific Countries, Ed. by J. Knight and H. De Wit, European Association for International Education, Amsterdam, 5-19.

Higher education exchanges offer possibilities for both high-level and grassroots influencing. The Russian leadership understands very clearly that a thorough modernisation of higher education is an absolute necessity if the country wants to stimulate innovation and eventually become a competitive knowledge economy. As evident from Putin's comments quoted earlier, the leadership has invested a lot of political capital and money to achieve this. If its hawkish foreign policy leads to an international isolation, it would mean a complete failure among other things of its ambitious plans of modernisation and making Russia a competitive player in the global knowledge economy. Isolation would seriously put into risk such high-profile projects dependent on international support and co-operation as Skolkovo Institute of Science and Technology.

On the level of academic trenches the best way to influence Russia is to encourage outgoing student and staff mobility from the country. This way of influencing does not have the spectacularity and visibility of high politics, but in the long term it can be even more influential. *"I can think of no more valuable asset to our country than the friendship of future world leaders who have been educated here"*, said the US Secretary of State Colin Powell about the political significance of the American higher education in 2001. In his article about the soft power dimension of the higher education Joseph Nye cites the example of Aleksandr Yakovlev, who in 1958 studied a year as a Soviet exchange student at the Columbia University with the political scientist David Truman. 30 years later he became the senior advisor of Mikhail Gorbachev and a key figure behind his policies of liberalisation.¹⁷

The EU has a host of higher education exchange programmes and projects suitable for the task of foreign political influencing in Russia, most importantly Erasmus Mundus and TEMPUS (The Trans-European Mobility Programme for University Studies, renamed to Erasmus+ in 2014). Erasmus Mundus aims at improving the quality of higher education and promoting the understanding between people and cultures through fostering academic mobility and co-operation, while Tempus supports the modernisation of higher education in 27 Eastern European, Central Asian, Western Balkan and Mediterranean partner countries by funding

university co-operation. With their combined annual budgets of € 300 million they are significant boosters of academic co-operation and mobility between the EU and the rest of the world. The goal of these programmes is to enhance the profile and visibility of European higher education in accordance in the external policy objectives of the EU.

The Erasmus Mundus programme offers students and academics from the rest of the world opportunities to spend time in the EU, study and work in an intercultural environment, get acquainted with European higher education and improve their language skills. The programme has been a significant stimulus for mobility between the countries of the former Soviet Union and the EU. Between years 2004 and 2013 over 1,200 students from the former Soviet countries, excluding the Baltic States, were selected to the Erasmus Mundus Master's courses, the largest groups being Russians (over 500) and Ukrainians (over 300). From 2010 to 2013 the programme offered 58 joint doctoral scholarships to the candidates from this region, including 34 Russians and 14 Ukrainians. The numbers of staff mobility were considerable as well: between 2004 and 2010 total of 160 scholars from the former Soviet Union received Erasmus Mundus fellowships, with 106 Russian and 30 Ukrainian awardees. In 2013, Tempus on its part funded a total of 95 co-operation projects in 12 former Soviet countries in Eastern Europe, Caucasus and Central Asia, including 33 in Ukraine, 28 in Russia, 19 in Georgia and 18 in Armenia. Typically the funding for a single project was between € 0.5-1.5 million.¹⁸

Although these sums are very small in comparison with for example national military budgets or other forms of hard power spending, the amount of mobility and exposure to European values they create has a soft power potential that is easily ten times worth the euros spent in e.g. military modernisation. The more students and scholars from Russia (and other CIS countries as well) gain experience of studying and teaching in the European higher education institutions, the more probable it becomes that future Yakovlevs will arise as a result of this mobility. When that happens, the soft power of higher education truly has unleashed its transformative potential.

¹⁷ Nye Joseph (2004) Soft Power and Higher Education, in The Internet and the University, Forum 2004, <http://net.educause.edu/ir/library/pdf/ffpiu043.pdf> [accessed 25 February 2014].

¹⁸ Erasmus Mundus and Tempus statistics can be accessed on the website of Education, Audiovisual and Culture Executive Agency of the European Commission, http://eacea.ec.europa.eu/erasmus_mundus/results_compendia/statistics_en.php [accessed 26 February 2014].

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Germany's priorities and interests in the Baltic Sea region

Kimmo Elo

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Executive summary

Germany has always been an important player in the Baltic Sea region (BSR). During its presidency in the Council of the Baltic Sea States (2011-2012) Germany sought to strengthen existing structures and programmes for regional co-operation and stressed the importance of functioning dialogue in the BSR as the most important prerequisite for regional development. Russia's integration in the BSR co-operation was one of Germany's most important political interests and priorities in the BSR. This assessment accounts also to the current situation and is also unlikely to change in the future.

Germany's most important priorities in the BSR are related to modernisation, economic development, environment and energy security. However, these are by far not solely BSR-related issues, but merely questions and challenges the EU is facing in its entire neighbourhood, including both the Mediterranean region and the eastern neighbours.

The times are over, when regional problems and challenges were truly regional. Today, opportunities, challenges and problems the BSR is facing overlap with those in other regions in and around the EU. What is needed, is a renewed European Neighbourhood Policy (ENP) providing a coherent policy framework for all regional activities. Such a revised ENP should represent the EU's external interests and, thus, be part of the Common Foreign and Security Policy. In this respect, Germany as the largest EU economy, the largest EU member state and the connecting power between different European spaces will remain the key player for any kind of reforms in the EU's regional policies. But Germany cannot substitute the EU and its institutions in the BSR, but just act as a mediator between the EU and Russia. A strong political bridge from the Commission over EU states in the BSR to Russia must be built, linking the internal and external interests in the BSR within a coherent framework of a renewed ENP.

1. Introduction:

The Baltic Sea region as co-operation framework

For centuries, the Baltic Sea region has been a place of geopolitical, political, economic and cultural clashes between western Europe and Russia. During the Cold War, the BSR provided a demarcation between Western and Eastern Europe, between the Soviet empire and the Western Community (Bengtsson 2000), conceptualising the European north as a balancing region in international relations on the one hand, as firmly anchored in between the superpowers on the other (Musiał 2009).

The end of the Cold War and the developments thereafter have step by step widened the definition of the European north to revolve both geopolitically, economically and culturally around the Baltic Sea. Especially the EU enlargements in 1995 (Finland and Sweden) and 2004 (Estonia, Latvia, Lithuania and Poland) have supported and boosted political, cultural and economic integration of the BSR toward a European inland sea. Today, all Baltic Sea rim states except for Russia and Norway are also members in the EU and the BSR itself is conceptualised as a region covering an area from Northern Germany to Northwest Russia.

A variety of established co-operation frameworks and political agreements have supported and strengthened these developments, but also sought to reduce the risk of hegemony conflicts with Russia in the BSR. One of the most important frameworks for regional co-operation is the renewed Northern Dimension (ND) policy. Launched in 2006, it established an extended framework for common policies by combining the original Northern Dimension Initiative from 1998 and the "EU-Russian common spaces" from 2003 (Browning and Joenniemi 2004; Haglund-Morrissey 2008).

The second framework tailored to tackle

problems in the Baltic Sea region is the EU Strategy for the Baltic Sea Region (EUSBSR). It was initiated in 2006, adopted in 2009 and has been implemented since 2010. Conceptually, the underlying idea to create a steering framework for a more sustainable, deeper and closer co-operation in the Baltic Sea region links the EUSBSR both with the principles of the European Neighbourhood Policy and the renewed ND (Roggeri 2012). The EUSBSR should be considered as one step on the long path toward sustainable political co-operation and co-ordination in the BSR. One of the most important aims of the EUSBSR is to strengthen the EU's voice in the region by defining objectives for future co-operation. Since the EUSBSR creates no new institutions, the strategy should be carried out by the existing ones and is, consequently, dependent on commitments of the different Baltic Sea actors to the strategy.

In regard to the realisation of the objectives of the EUSBSR and the ND, the Council of the Baltic Sea States (CBSS) deserves special attention. Since its establishment in 1992, the CBSS has supported the stability in the region by contributing to solutions to political, economic and environmental challenges and problems (Etzold 2012). Although the BSR is almost overpopulated by a great number of regional, sub-regional and local organisations and actors, the CBSS as an inter-governmental organisation plays a special role in this networked framework of regional co-operation. The CBSS brings together the Baltic Sea EU member states and Russia, thus offering a forum for cross-border political co-operation at a high political level.

Germany has always been an important player in the BSR. Geographically, Germany's northern Länder Mecklenburg-Western Pomerania and Schleswig-Holstein have a long coastline to the Baltic Sea. One of the largest harbours in Europe, Hamburg, is the reloading hub for goods transported between the North Sea and the Baltic Sea. Historically and culturally, German influence in the BSR dates back to the early days of the Hanseatic League in the 13th century. Despite these direct geographical and historical linkages, the special meaning of Germany for the BSR is linked with its political and economic weight within the EU. Germany is indispensable for the successful implementation of BSR policies, not just in regard to Russia, but also to the BSR in general. Further, the small Northern and Baltic rim states are both economically and politically dependent on Germany and can implement

their regional policies only together, not against Germany.

Against this background, understanding Germany's contemporary economic and political interest, priorities and challenges is vital for the current and future co-operation in the BSR. The next section will present a short summary of the legacy of the German CBSS presidency in 2011-2012, forming the current framework for Germany's BSR policies. The third section will discuss Germany's contemporary economic interests and challenges in the BSR. The focus of the fourth section will be on Germany's political priorities and challenges in the BSR. The article will be rounded up with a critical outlook over the future of European regional policies.

2. The legacy of the German CBSS presidency

On 1 July 2012, Germany handed over the Presidency of the Council of the Baltic Sea States to Russia. This handing over was not just a practical matter, it also symbolised the status of the Baltic Sea region as a region connecting two major powers in Europe, Germany in the west, Russia in the east, in a common, shared space. Despite the apparent differences between Russia and the EU in regard to BSR policies, the change was also bound with a certain hope for continuity as well: Russia was expected to carry on programmes and policies initiated during the German presidency (e.g. Elo and Kaakkuriniemi 2012).

The beginning of the German CBSS presidency was overshadowed by "*federal tensions*" between less interested federal level politics and the northern Baltic rim Länder. One obvious reason was of geographical nature: only a small part of Germany is directly connected to the Baltic Sea. Economically, and consequently politically, strong Länder Bavaria, Baden-Württemberg, North Rhine Westphalia and Rhineland Palatine have their regional, political and economic focus on the Rhine or the Danube region. Another reason can be found in the traditional skepticism of German governments against institutionalised regionalism located between the national and European level. In other words, Germany has not been interested in supporting regional programmes possibly undermining the powers of both national governments and European institutions (Klein and Gabel 2010).

Another aspect undermining Germany's interest

in its CBSS presidency was the sovereign debt crisis in the eurozone. In 2011-2012, the crisis dominated the EU's political and economic agenda and put everything else in its shadow. As a consequence, Germany's initial agenda revolved around traditional topics of the CBSS: economic development, environment and energy. Additionally, Germany manifested its support for the idea to make the CBSS to the central, pioneering organisation for macro-regional co-operation (Etzold 2012). The idea behind this was to re-gain the status as the model for the EU's regional policy the BSR enjoyed until 2004. Since then, the BSR's status within the EU has been challenged by other regional strategies like the Mediterranean Union launched and the strategy for the Danube region.

During the CBSS presidency, however, Germany succeeded in developing an active BSR policy programme based on selected topics not only being of regional importance, but also tackling the BSR's most important challenges. In this respect, the most important single issue was the question of energy security in the BSR. This question has two important dimensions. First, Germany's coastal region to the Baltic Sea plays an important role in the German energy change (Energiewende). This, because the share of wind energy produced in Baltic Sea wind parks should increase remarkable in the future. In 2012, the share of wind energy was approximately 8% of energy consumption. Until 2025, this share should increase to 25%. Second, Germany's consumption of Russian natural gas flowing through the Nord Stream gas pipeline is also expected to grow in the future. Both factors are expected to affect both the regional and European energy market and policy. By stressing the regional co-operation in energy security, Germany seeks to prevent regional tensions from emerging (see also Etzold 2012).

Another important question was that of modernisation, especially along the southern rim of the Baltic Sea and in Russia, the so-called SEBA (South Eastern Baltic Sea Area). To the most important achievements counts the initiative to establish a joint modernisation fund supporting modernisation of the SEBA. The lack of modern infrastructure and technologies is often seen as the core problem in regard of pollution, environmental care and societal developments. The fund should help the realisation of projects by granting financial support (Etzold 2012). In general, modernisation should foster and strengthen stability in the BSR.

Especially in Russia, modernisation is expected to strengthen democracy, civil society and market economy and, thus, bound with the hope of bringing Russia and the EU closer to each other. But also e.g. in Poland, modernisation in rural regions and heavy industry is expected to temper the environmental load of the Baltic Sea.

As a whole, the German CBSS presidency sought to strengthen existing structures and programmes for regional co-operation. Especially the triangle consisting of the EUSBSR, the Northern Dimension and the CBSS was strengthened. In this respect, Germany's CBSS presidency stressed and underlined the importance of functioning dialogue in the BSR as the most important prerequisite for regional development. However, the common denominator of all these activities seems to be Russia and Russia's integration to the BSR. Thus, the BSR policy of Germany is tightly embedded in the wider framework of the German Eastern policy and, consequently, the German European policy.

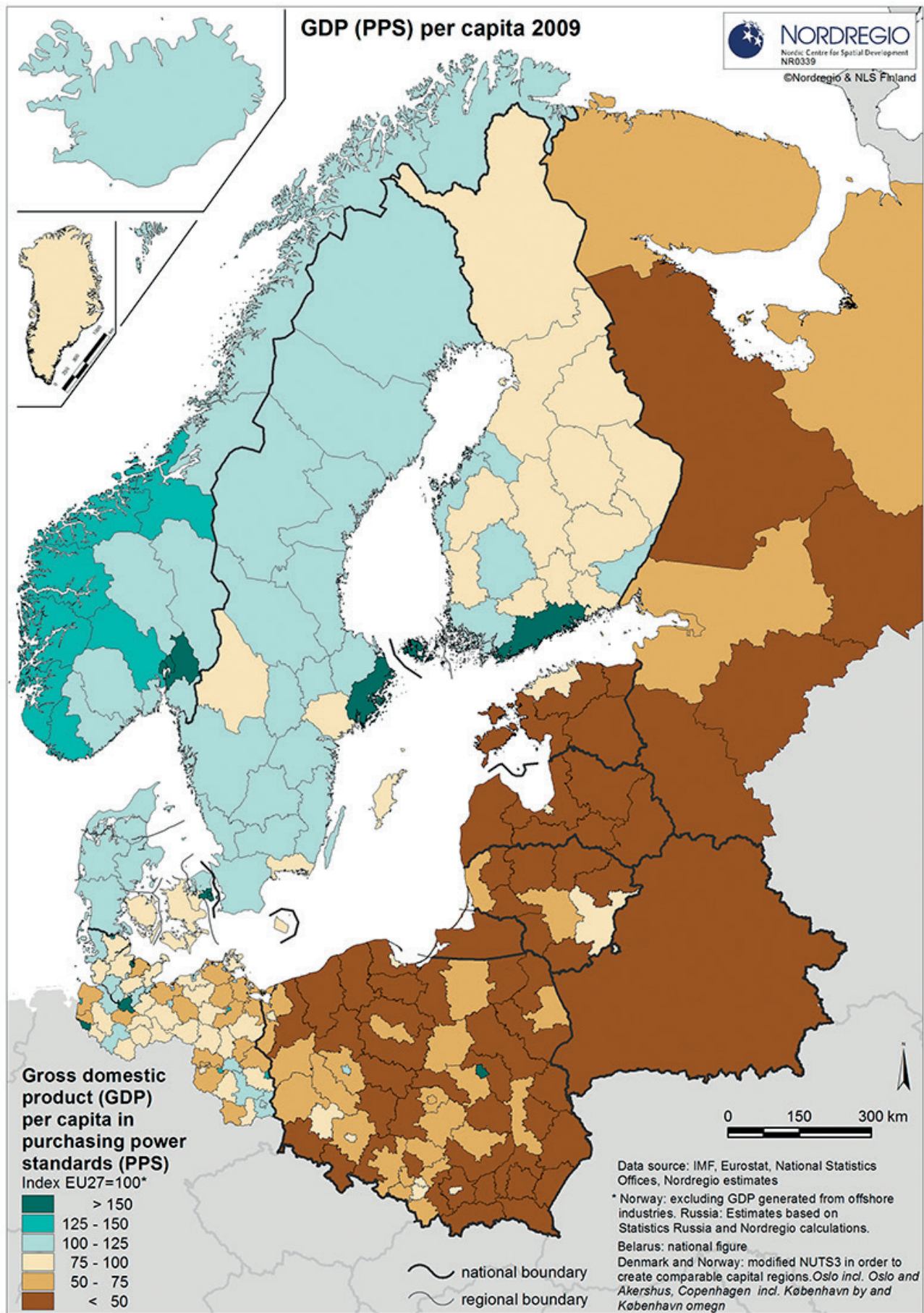
3. Economic dependencies in the Baltic Sea region

The BSR is an economically interdependent region, characterised by strong intra-regional trade flows. In this respect, trade has the function of binding the BSR together and fostering both economic and social co-operation in the BSR. In this network of mutual economic inter-dependencies, Germany as the largest economic power in the EU holds a dominant position.

At the same time, there exist strong asymmetries between the BSR states. Considering, first, the GDP, the southern rim of the BSR is below average, whereas the northern rim is remarkable above average (see Figure 1). It is worth noting, that also many of German northern regions - especially those located in the Mecklenburg-Western Pomerania are economically relatively weak (but still better off than coastal regions in Poland and the Baltic States). These asymmetries explain Germany's interest in fostering modernisation especially along the southern rim of the BSR. Modernisation should equalise economic differences and, thus, reduce the risk of political instability in the region.

The regional asymmetries are even more evident when trade is concerned. For the small and medium-sized economies of the Nordic countries and Baltic States, trade with other BSR countries represents approximately 50-75% of their

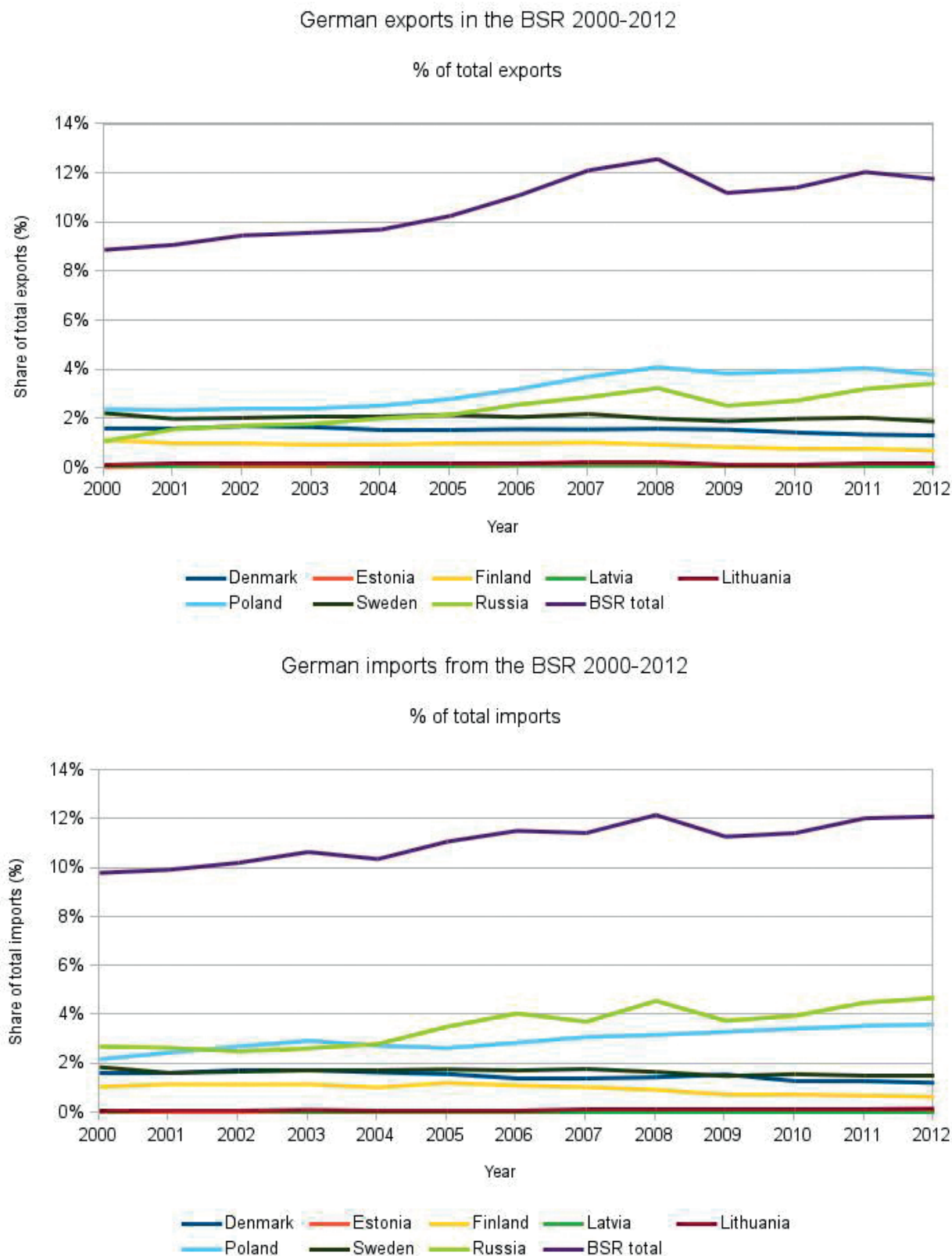
Figure 1. GDP in the Baltic Sea region in 2009



Source: Nordregio 2012.

total trade. For the large-sized economies of Germany and Russia, the share of the trade with other BSR countries lies between 10% and 15% of their total trade (Dubois et al. 2009).

Figure 2. German exports and imports in the Baltic Sea region 2000-2012



Source: Statistisches Bundesamt 2013.

Germany as the largest economy both in the EU and the BSR is the most important trade partner for almost all other BSR countries. This trade relationship is quite asymmetric. Germany is one of the TOP-3 trade partners for almost all BSR countries with a share between 10% and 30%. However, the total share of the BSR is approximately 10% of Germany's total imports and exports. Poland and Russia are the most important trade partners, but also their share of Germany's foreign trade is between 3% and 5% (Figure 2).

In 2008-2009, Germany's imports from and exports to the BSR dropped by approximately a quarter. The recovery, however, has been quite rapid: almost all BSR countries were in 2012 above the 2008 level. The notable exception is Finland. The value of Finnish exports to Germany in 2012 was only some 80% of that in 2008. The annual recovery of the Finnish exports to Germany has also been remarkably slower than in other BSR countries.

The share of the intra-EU trade is approximately 50% of Germany's total trade. Against this background, the BSR with a share of over 10% of Germany's total exports and imports is anything but unimportant. However, the existing economic asymmetries – especially the high dependence of small BSR countries on Germany's economic power – can create tensions in the region. Additionally, the skewness of the trade structure with Russia, especially the high share of raw materials, gas and oil, might increase the risk of political tensions in the future.

4. Germany, Europe and the Baltic Sea region today

As already pointed out, Russia and Russia's integration in the BSR co-operation is one of Germany's most important political interests and priorities in the BSR. This assessment accounts also to the current situation and is also unlikely to change in the future. However, the political interest in establishing a functioning framework for EU-Russia dialogue also in the BSR is more connected to the question of the future of EU-Russia relations. In this respect, Germany's contemporary interest in the BSR are more bound with and embedded in Germany's particular eastern interest and its role as the motor for European Ostpolitik.

The core challenge of the EU-Russia interface in the BSR is its asymmetry. The salience of the EU both in the constructing of the institutional framework and in setting the agenda has resulted in a normative hegemony of the EU in the Baltic Sea region. Although the description of the BSR as an inland sea might be interpreted a metaphoric notion toward a common space, the reality looks quite different. Russia has quite effectively rejected any co-operation requiring commitment to these European norms and values. However, the fact that Russia has not seen any reason to present a competing set of Russian ideas indicates that Russia is quite satisfied with the current state of affairs in the BSR. On the one hand, Russia's sovereignty is not threatened by the EU's policies. On the other, the possibility to withdraw from co-operation offers Russia an easy, but effective way of setting the EU under pressure. The fact that a Russian rejection is enough to freeze projects indicates, that the real expectations-capabilities gap lies on the EU's side, not on Russia's: the EU is not capable of exploiting its normative hegemony outside the EU (see Haukkala 2010; Elo and Kaakkuriniemi 2012).

According to the government platform of the new federal government, Germany's contemporary and future BSR politics is strongly based on the understanding of the BSR as a connecting region. In energy policy, new main grids should connect the wind-rich coastal region with densely populated industrial centres in western and southern Germany. In transport policy, the Hamburg region should be developed to a maritime hub between the North Sea and the BSR. Pan-European modernisation projects are expected to boost regional economic developments also along the Baltic rim, but also to help to protect the environment in the highly polluted Baltic Sea.¹

In regard to Germany's geopolitical interests, the BSR is one of the corridors connecting the EU/ western Europe with Russia. Consequently, Germany's contemporary (and future) interests and priorities in the BSR are derived from its policies toward the EU's eastern neighbourhood. Already during its CBSS presidency Germany sought to foster integration of overlapping frameworks and programmes. The creation of a coherent framework for EU-Russian co-operation remains a central priority for Germany. A crucial question

¹ See further: <http://www.cdu.de/sites/default/files/media/dokumente/regierungsprogramm-2013-2017-langfassung-20130911.pdf> [online, visited on 18th February 2014]

is the future relation between the ND, the EUSBSR and the ENP. This is understandable, since the renewed ND is included in the EUSBSR as its external arm (Rostoks 2010). On the one hand this arrangement seems reasonable, since both frameworks should work for the same goals and, thus, help the EU to achieve better co-ordination of its policies. On the other, making the agenda of the renewed ND dependent on the EUSBSR might increase Russia's unwillingness for future co-operation.

Considering Germany's strategic interests, the BSR and the Danube region are epitomes of the EU's new strategies for regional co-operation.² Such strategies create regional frameworks for implementing the EU's policies, both within the EU and in corridor regions connecting the EU to its non-EU-neighbours. The underlying idea is to create a coherent strategic framework for regional policies based on the EU's general interests, goal-settings and priorities. These regional frameworks should also simplify the transfer of knowledge and/or policies between different regions and, thus, support mutual learning. Regions like the BSR enjoying a high level of stability, prosperity and modernisation and having a functioning, robust framework for regional co-operation should act as model regions capable of providing approved tools, methods and policies of regional co-operation.

In this respect, Germany seems to strive for a revised ENP as a new strategic framework for regional co-operation with the EU's eastern and southern neighbourhood. Such a revised ENP should offer a common framework for all regional programmes and, thus, declare common interests and priorities of the EU vis-à-vis its neighbours (see also Lang and Lippert 2011). Germany, with its traditional historical, political and cultural interest in and connection to the EU's eastern neighbourhood, has already during its CBSS presidency showed interest in strengthening the BSR as the connecting centre of regional strategies and policies. Germany's special interests in fostering modernisation, environment policies, energy security, political stability or economic development are not solely bound with the BSR. These rather manifest the common challenges of the EU vis-à-vis its southern and eastern neighbours. From this perspective, Germany's interests,

challenges and priorities in the BSR rather represent Germany's European policy agenda.

5. Summary and outlook

The BSR is a European macro-region characterised by a dense network of historical, economic, political and cultural connections, dependencies and similarities. After the Cold War the region has experienced a rapid development and is today regarded as one of the EU's most stable regions. Compared e.g. with the Mediterranean region, the BSR undoubtedly enjoys economic wealth, political stability and regional homogeneity.

At the same time, the BSR is one of the connecting regions between the EU and Russia. The two most important players in Europe – Germany and Russia – are also Baltic rim states. The Nord Stream gas pipeline not just connects Russia to western Europe, but also forms the backbone of the common EU-Russia energy space. However, the status as one of the common geopolitical spaces of the EU and Russia, the BSR is also affected by the problems and challenges overshadowing contemporary EU-Russia relations, thus stressing and underlining the need for a better harmonisation between the EU's general political agenda and its regional policies and programmes. In other words, the EU's macro-regional policies should be embedded in a pan-European framework of co-operation, based on the EU's political priorities, interests and goals.

Germany has showed a strong interest in fostering regional co-operation embedded in and based on the EU's general political agenda. During its CBSS presidency, Germany sought to strengthen the CBSS as the motor for regional co-operation. Additionally, Germany also tried to bring the two programmatic frameworks for regional co-operation – the ND on the one hand, the EUSBSR on the other – closer together. Undoubtedly, these two frameworks should be harmonised, since they are widely overlapping and, thus, prone to misunderstandings. A crucial point here is how to surpass the domestic-foreign contradiction between the ND as an external policy framework and the EUSBSR as an EU-internal strategy. In other words, the link between

² See also: <http://www.bundestkanzlerin.de/ContentArchiv/DE/Archiv17/Reden/2012/11/2012-11-28-merkel-donau.html> [online, visited on 18th February 2014]

the EU's domestic and foreign interests, priorities and policies needs to be established.

One possibility is to shift the focus from regions to issues. Currently, the EU has a lot of regional programmes. Most of these programmes share a joint set of issues linking different programmes thematically together. However, the programmes are run and funded separately, thus causing redundancy and ineffectiveness. In the future, the Commission should be responsible for the joint co-ordination of all regional policies including both EU-inter and cross-border co-operation. What should also be abandoned is the naïve thinking that intra-EU policies and activities in the EU's borderlands like the BSR are externally neutral, i.e. they would not have any external impacts.

Germany's most important priorities in the BSR are related to modernisation, economic development, environment and energy security. However, these are by far not solely BSR-related issues, but merely questions and challenges the EU is facing in its entire neighbourhood, including both the Mediterranean region and the eastern neighbours. What is needed, is a renewed ENP providing a coherent policy framework for all regional activities. Such a revised ENP should represent the EU's external interests and, thus, be part of the Common Foreign and Security Policy.

Such a common framework should provide an overall framework for the EU's regional activities. The framework should be capable of doing three things. First, the framework should provide methods for identifying the most important issues in the region and for linking these with the EU's strategic agenda. Second, the framework should provide tools for selecting the appropriate instruments, methods and policies. And third, the framework should help to identify the key players (see also Dubois 2009).

In respect to the BSR, modernisation, environmental issues, economic development and energy security will remain crucial also in the next years. The first three are also interlinked, since modernisation is often seen as a prerequisite for economic development and solving environmental problems. Traditionally, Germany's has supported especially Russia's modernisation by granting economic aid, technical assistance and political support, thus attempting to strengthen market economy and political stability in Russia. But Russia's modernisation is a truly European challenge, not a challenge

limited to the BSR. If Russia fails to modernise its industrial and societal infrastructures, its political and administrative system and its economy, the consequences would affect the whole EU. And this far beyond the simple question of energy security. In global scale, the EU can be strong only together with, not against Russia. But at the same time, only a stable Russia can be a strong, reliable and accountable partner. Therefore, although Germany – due to its traditional close relation with Russia – plays a central role in preventing Russia and the EU from drifting apart, the whole EU should be interested in convincing Russia from the benefits of a closer co-operation with the EU in regard to modernisation.

Also in respect to the second aspect, the selection of methods and instruments, a common, Northern framework could provide a more sustainable and robust framework. The BSR does not need more, but less programmes and framework better linked with overall strategic interests of the EU. Recent developments in the wider region from northern Germany to the Arctic seem to underline the need for a thematically more coherent and geographically wider programmatic framework capable of providing solutions to interlinked cross-regional problems. But re-thinking is also needed in regard to financial instruments. A revised ENP should be backed up with an own structural fund providing long-term financial support for regional activities.

Considering, finally, the actors responsible for carrying out the regional policies within the revised ENP, a mixture of top-down and bottom-up approaches is needed. Additionally, the current central weakness of regional co-operation, the lack of binding decisions at governmental level, should be tackled in the future. Many of the problems and challenges cannot be postponed any longer.

Germany has recognised the problem arising from Russia's weak commitment to binding regional integration and co-operation not only in the BSR, but also in the wider, cross-regional space in the European north. During its CBSS presidency Germany sought to promote the CBSS as the motor for regional co-operation in the BSR. This idea is worth being developed further in the next years. The idea of a cross-regional framework merging the ND, the EUSBSR and the Arctic programme and embedded in a revised ENP should be supported by a strong cross-regional, inter-governmental organisation bringing together the political leaders in the region. However, taking the problems and challenges in the northern region

and their possible impacts on the whole EU into account, this organisation should not just offer a platform for the dialogue between the EU and its non-EU neighbours. It should also be capable of making binding decisions and controlling their implementation. Here e.g. the OSCE guaranteeing also Russia with an equal status could be used as a model.

The times are over, when regional problems and challenges were truly regional. Today, opportunities, challenges and problems the BSR is facing overlap with those in other regions in and around the EU. Hence, the EU would profit from a revised ENP as an umbrella framework for all cross-border

regional policies. In the past, the BSR has often been regarded as a model for macro-regional co-operation. The next step forward could be that toward a model framework for cross-regional and cross-cultural co-operation. The most important challenge remains to be Russia: Russia needs to be convinced from the political, economic and modernisational benefits of a closer co-operation. In this respect, Germany as the largest EU economy, the largest EU member state and the connecting power between different European spaces – regional, political, historical and cultural – will remain the key player for any kind of reforms in the EU's regional policies. This holds true also for the BSR – now and in the future.

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