

Exploring the Baltic Sea Region –
On territorial capital and spatial integration

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The Nordic Council of Ministers

is a forum of co-operation between the Nordic governments. The Nordic Council of Ministers implements Nordic co-operation. The prime ministers have the overall responsibility. Its activities are co-ordinated by the Nordic ministers for co-operation, the Nordic Committee for co-operation and portfolio ministers. Founded in 1971.

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Stockholm, Sweden 2008

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Preface and acknowledgement

After the fall of the iron curtain and the subsequent geopolitical changes that followed in its wake at the beginning of the 1990s the Baltic Sea Region (BSR) re-emerged as a transnational macro-region. Freed from these cold war cleavages, the Baltic Sea Region went on to reinvent new tools, ways and methods of collaborating around common challenges. One of the early initiatives taken was the foundation of VASAB (Visions and Strategies around the Baltic Sea) in 1992, laying the groundwork for further cooperation on spatial development issues between its member states. Since then, this voluntary approach to co-operation between the national ministries in charge of spatial development in 11 countries around the Baltic Sea oversaw the challenge of developing a common framework allowing national spatial development policies to promote transnational co-operation between regions and cities, and finally to integrate this territorial dimension into the work of other pan-Baltic organisations.

In this framework, VASAB has elaborated three key strategic documents. The so-called *VASAB 2010 report*, adopted in 1994, laid the basis for transnational co-operation in the field of spatial planning as an integrative need for joint spatial development initiatives on a transnational basis projecting a visionary picture of the BSR. The *VASAB 2010+ report*, adopted in 2001, was much more analytical. By identifying the main socio-economic trends and the underlying spatial challenges it essentially turned the debate towards a greater focus on infrastructural improvements around the Baltic Sea. In the context of the so-called *Gdansk declaration* of 2005 better spatial integration was claimed by incorporating the possibilities offered by EU Cohesion and Neighbourhood policies in a more efficient way. Specifically, the cross-border dimension was emphasised as well as the need for greater interaction both between the BSR and neighbouring regions and within the BSR itself, for which both soft and hard measures are needed.

In comparison with the early stages of the VASAB process, the EU has increasingly become the driving force in the integration of spatial development issues on a transnational basis. Namely, today most of the countries belong to the EU and to the Schengen area thus enhancing the potentials for transnational mobility and interactions. In addition, the EU has obtained increasing responsibility in the framing of sectoral policies (e.g. agriculture, maritime planning, transport in terms of Trans European networks etc.), which have a high impact on spatial development. Beyond this, the BSR is gradually more seen as an

interface between the EU and Russia, thus there is a need to give more coherence to spatial development initiatives between the EU and Russia (particularly north western Russia) and Belarus.

In connection with the *Gdansk declaration* the need for a new visionary strategic document has been expressed. In 2006 the elaboration process for a so-called *Long Term Perspective* (LTP) for the BSR was launched which is seen as less visionary and more action-oriented than its forerunners (VASAB 2010 and VASAB 2010+). The major focus of the LTP shall be to identify the most important challenges currently hampering spatial integration within the region and between the region and its surroundings. In order to elaborate such a political document a specific evidence-base is needed in order to formulate strategic goals, to draft an action plan and finally to identify elements for a spatial vision with a time horizon up to the year 2030. The intention here is to approve the Long Term Perspective (LTP) at the VASAB Ministerial Conference in September 2009.

Running in parallel with the elaboration process of the LTP, the European Commission, with DG Regio in the lead has, in 2008, at the request of the European Council begun to prepare an *EU Strategy for the Baltic Sea Region*. The aim of this strategy, which is the first of its kind in Europe dedicated specifically to transnational areas, will be to coordinate the efforts of various actors in the Baltic Sea Region so that by working together they promote a more balanced development of the region. The Strategy shall be presented to the European Council in June 2009 and will be one of the main priorities of the Swedish EU Presidency during the second half of 2009.

In this respect the findings contained in this report and developed within the *East-West Window* project, financed under the umbrella of the BSR INTERREG IIIB-Neighbourhood programme (TACIS strand); shall provide valuable insights into the search for evidence-based information on the BSR's territorial capital and its potentials for spatial integration, which can be meaningful for the current elaboration of the two above mentioned transnational strategic policy papers for the BSR. Connected to this is the ongoing EU level debate, launched by the Commission's Green Paper (October 2008) on Territorial Cohesion. The goal of this debate is to come to a better and shared understanding of territorial cohesion and its implications for policy-making and territorial cooperation.

The analytical work within the *East-West Window* project has been divided between three working groups, entitled *urban networks*, *accessibility* (transport, energy and

ICT), and *integrated maritime planning*. *Nordregio* was a project partner in the first two. Their specific focus has been on the international nodes in the system (the metropolitan areas) and the potentials of the other small and medium-sized cities and towns to contribute to territorial cohesion throughout the entire BSR (WG 1) on the one hand as well as on the systems and infrastructures enabling spatial integration on the other (WG 2). The objective of the current report is to bring together the main findings of those parts of the work of the two WGs, which have been planned, coordinated and assembled by *Nordregio* between spring 2007 and autumn 2008.

The present *Nordregio* report is based on the work organised by VASAB and financed and carried out within the EU TACIS *East-West Window Project*. It is, as such, a by-product of the VASAB initiative to elaborate a new long term spatial perspective for the BSR up to the year 2030.

The analytical work in the two WGs and the drafting of the report was coordinated and performed by Peter Schmitt and Alexandre Dubois (both *Nordregio*). Johanna Roto and José Sterling (both *Nordregio*) drafted all the maps and figures and collected data from across the Nordic Countries and also for the entire BSR with the support of Carsten Schürmann (RRG Spatial Planning) for the production of maps on transport networks and accessibility potentials. Jörg Neubauer conducted and updated a study on demographic development in BSR cities while Daniel Rauhut provided useful inputs on future demographic trends (both *Nordregio*).

The tasks of data collection and statistical analysis were undertaken by *Nordregio* with the support of several na-

tional experts. The authors would in particular like to thank Marek Dutkowski (University of Szczecin, Poland), Patrycja Jakubowska (Ministry of Regional Development, Poland), Wojciech Bizon (University of Gdansk, Poland), Dimitri Semenkevich and Anna Lutskevich (Institute for Regional and Urban Planning, Belarus), Isabelle Manz and Wilfried Görmar (Federal Office for Building and Regional Planning, Germany), Julia Spirina, Larisa Emelianova, Gennady M. Federov, and Yury Zverev (Immanuel Kant University of Kaliningrad), Nina Oding, Leonid Limonov and Lev Savulkin (Leontief Centre, St. Petersburg), Laila Kule (University of Latvia), Niels Boje Groth (Danish Centre for Forest, Landscape and Planning, Denmark), and finally Aleksandras Gordevicius (Ministry of Environment, Lithuania). Most of their contributions and comments were delivered thanks to the financing of the EU TACIS programme.

Special thanks also go to Helle Fischer (Ministry of the Environment, Denmark), Wilfried Görmar (Federal Office for Building and Regional Planning, Germany), Vladislavs Vesperis (Ministry of Regional Development and Local Government, Latvia), Jussi Rautsi (Ministry of the Environment, Finland) and Sverker Lindblad (Ministry of Enterprise, Energy and Communications, Sweden) for their support and patience in organising and coordinating the two working groups. Additionally, we would also like to thank the Lead Partner, the Latvian Ministry of Regional Development and Local Government, the VASAB Secretariat (Talis Linkaits, Dzintra Upmace and Kristine Feldmane) and finally Jacek Zaucha (Maritime Institute in Gdańsk, Poland), for the management and coordination of the *East-West Window Project*.

1. Objectives and scope of the report

The accelerating process of globalisation sheds increasing light on the advantages accruing to larger geographic zones such as the Baltic Sea Region (BSR). Since the momentous geopolitical shifts at the beginning of the 1990s, the Baltic Sea Region re-emerged as a unified transnational macro-region. Since then, and in line with further political integration, expectations have been that increased economic, social and cultural cooperation would help to further exploit the BSR's underlying potentials. In other words, the intention is that the BSR should be able to mobilise its territorial capital in an integrative manner in order to become a stronger player in the realm of international territorial competition on the one hand while also reducing regional disparities within the BSR on the other.

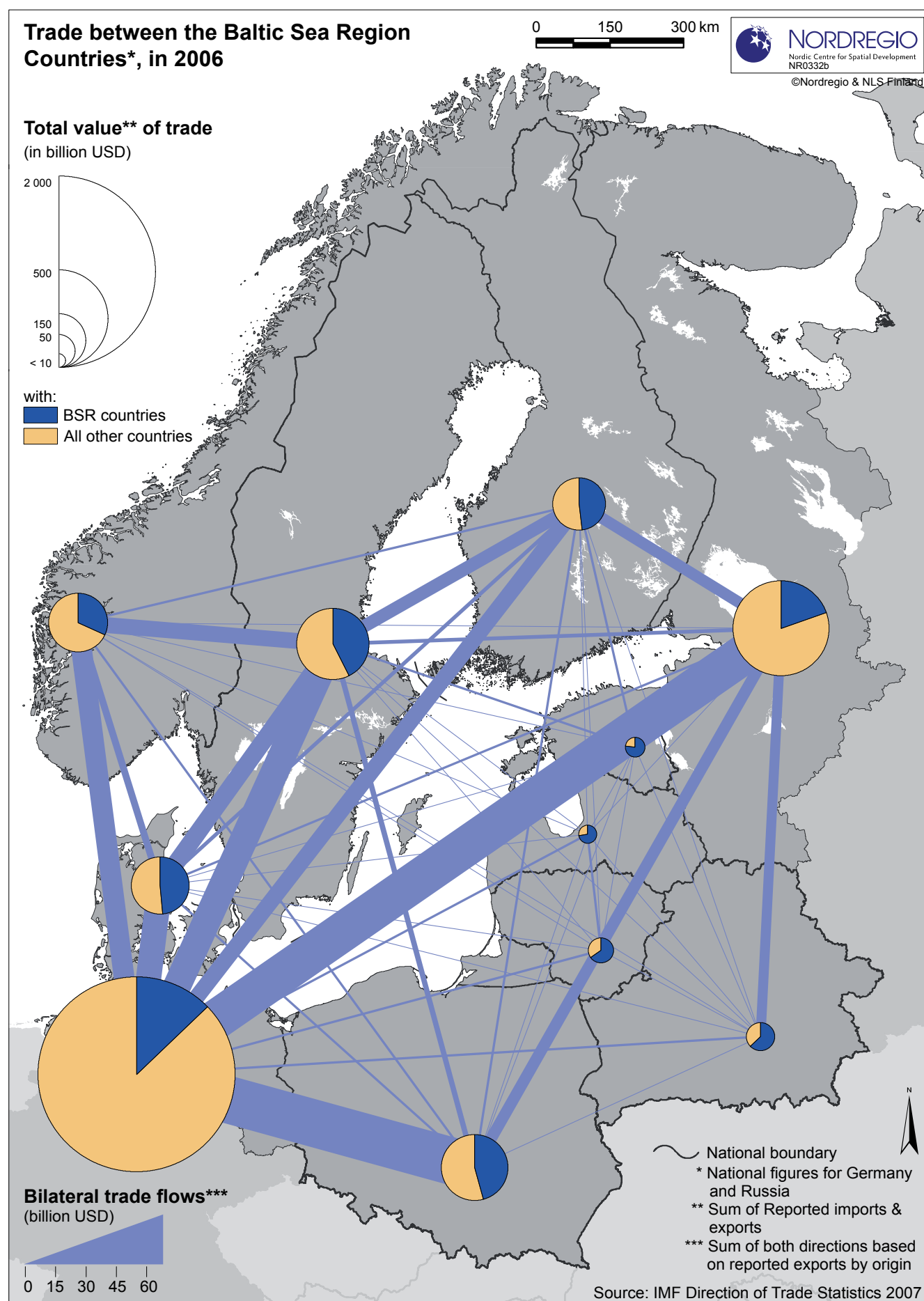
In such a specific 'territorial' perspective cities, and in particular so-called metropolitan areas, can be seen as internationalised nodes of complex transactions in respect of economic activities, information, power, culture, and finally people with their specific knowledge and skills. In this sense they can be viewed as the drivers of spatial integration. At the same time the spectacular overall growth in mobility, rapidly changing transportation networks, logistics services and the spread of communication and information technologies can be seen, in general, as an essential catalyst for the development of spatial integration processes. These dynamics do not necessarily however produce the same effects across the board as from an international comparative perspective the various metropolitan areas in the BSR remain very different given their individual historically driven path dependencies. These path dependencies are first and foremost characterised by the relatively resistant national social, political and economic systems and the ability to overcome organisational and institutional obstacles. In addition to long-lasting prejudices, sometimes even rivalries, and finally a lack of perception over the specific potentials that are to be found around the Baltic Sea can all hamper the process of spatial integration. In respect of the latter, the present report will contribute to the development of commonly shared mindsets on those specific potentials in the BSR.

In the current context the concept of *spatial integration* is linked to the actual (or potential) performance of territorial linkages at a larger geographic scale. Hence spatial integration is supported by specialised networks of e.g. cities as defined by common patterns of either material or

non-material production. Trade and any other kinds of transactions (e.g. knowledge, labour forces, cultural heritages and institutional traditions) are based on complementarity, cooperation and finally, trust. One example here is the world of science, which is essentially based on these forms of networking, be it at the local, national or even the transnational level. As such, freed from the constraints of distance, urban hierarchies, and political boundaries, spatial integration should be understood not only as the sum of interactions among cities in a network, making them the drivers in a dynamic polycentric organisation, but also the potential synergies and add-on effects which may result for an entire transnational macro-region, such as the BSR.

A concrete example of the growing importance of spatial integration in this macro-region is the current trade patterns within the BSR in 2006 (cf. Fig. 1). If we consider the *intra-regional* trade pattern, i.e. trade between countries belonging to the BSR, the three Baltic States and Belarus in particular are shown to substantially trade within the region. The Nordic countries as well as Poland also show a high degree of integration in this respect. Due to the large size of Germany and its central location in continental Europe the share of bilateral trade flows to other BSR countries is rather low. The same can be said for Russia, as we had to use (as in the case of Germany) export-import figures for the entire country. Nevertheless, it enhances the perspective that both Germany and Russia are the most likely global players in the BSR. Looking more closely at the intensity of the flows it becomes clear that the Nordic countries and Germany exhibit relatively strong trade relations with each other. Comparatively strong trade flows are also evidenced between Germany and Poland and between Germany and Russia. Other significant trade partners for Russia in the BSR include Belarus, Poland and Finland. What is striking is of course the comparably small flows that are directed to (or respectively from) the Baltic States. Here one has to bear in mind that these national economies are much smaller as compared to most of the other countries of the region. Moreover, the fact that many Nordic companies (e.g. banks) have established Baltic-based ventures distorts our perception of trade and financial integration along the Nordic-Baltic axis. On closer inspection one can see, however, that their international trade flows are not only very much focussed on other BSR countries, but also that these flows remain

Figure 1: Trade between the Baltic Sea Region countries, in 2006



rather balanced as most of the strokes do show the same gauge.

In a dynamic perspective Groth (2008) concludes that the last 5 to 6 years can be characterised as a period of consolidation as these trade patterns have been relatively stable. He also emphasises that Russia seems to have regained its former position in this respect, which it held before the country had to cope with extreme economic problems around the turn of the millennium. Since then the pattern of trade flows with other BSR countries have begun to grow again, in particular due to the increasing demand for oil-related products in the other BSR countries, at least before the collapse of the financial markets. Considering the nature and the size of the German economy, the importance of the Baltic Rim as a geographical region diminished in the first years after the fall of the Iron Curtain, but has steadily increased again since then. Concerning the three Baltic States, Groth (2008) anticipates a 'trade pattern' which will in future become rather more similar to that of the Nordic countries, which means that the share of trade flows with other BSR countries will decrease further, but will then stabilise around the level of the Nordic countries (i.e. around approximately 40% of their overall international trade).

From an analytical point of view, such interrelations are in general, however, difficult to detect, given that little data is available, in respect of indicating the state of spatial integration. Thus for the most part attribute data on the BSR's territorial capital helps us to anticipate the potentials in respect of spatial integration. This enhanced understanding of these potentials may provide support to policymakers at European, national and regional levels in conceiving and operationalising policies enabling us to more efficiently promote territorial cohesion between BSR cities and regions. This data does not necessarily however fully inform us as to the current state of spatial integration in the BSR.

Aim of the study and structure of the report

Having said all this, the underlying ambition of this report is to attain an in-depth and comprehensible picture of current trends, the state of spatial integration and the developmental potentials related to the BSR's territorial capital. In particular in the subsequent chapters, the following questions will serve as a red thread to help further explore these issues:

- What are the general conditions and challenges for achieving a better degree of territorial cohesion across the BSR? (-> cf. chapter 2)
- To what extent are the cities and regions of the BSR contributing to the processes of transnational, spatial integration within the macro-region, but also with other macro-regions in Europe or even beyond? (-> cf. chapter 3)
- What are the current shortcomings of the transport

networks, and its usage, hampering this integration? What are the key actions necessary to improve accessibility potentials across the BSR? (-> cf. chapter 4)

- To what extent are energy and Information and Communication Technologies (ICT) instrumental in fostering the processes of integration in the BSR? (-> cf. chapter 5)
- What are the lessons that can be derived from these investigations? How can the BSR (i.e. the different stakeholders dealing with the strategic policy and planning agenda for this macro-region) take better advantage of its territorial capital? (-> cf. chapter 6)

Organisational and methodological aspects

Taking into consideration the transnational scope of the study at hand, one of the most challenging questions has been what kinds of indicators can be consulted in view of the availability of harmonised and comparable data in the BSR? In this respect the numerous ESPON¹ studies which have been undertaken thus far do however demonstrate the limits of comparable quantitative analysis within the EU. Here in particular the question of scale is critical because the available and comparable sets of data comprise rather larger regions (for the most part at NUTS 2 or NUTS 3 level at best) or partly even entire countries instead of cities or city-regions, to say nothing of *functional* urban areas. Thus we had to cope with such limitations. Hence the degree of comparability between various territories is somewhat restricted as their spatial structures (in terms of densities and overall sizes) are often extremely different.

Additionally, the intention has been to include territories that belong to non-EU/EEA countries (specifically the North West Russia area and the whole of Belarus) for which, for instance, the European statistical office (Eurostat) does not provide any statistics. In this light we had to compile and use data sets provided by other international institutions such as the OECD (Organisation for Economic Co-operation and Development), the World Bank and the United Nations. Additionally, we had to rely in part on national statistics, enabling the data sets to be harmonised as far as possible. Regarding the latter it was very helpful that our project group contained several national experts to help with the data gathering and some qualitative assessments such as on future demographic trends (cf. chapter 2.2). Nevertheless it should be emphasised that to cope with the limitations in respect of meaningful comparisons we had to leave out a handful of further interesting indicators.

1 ESPON stands for European Spatial Planning Observatory and Network and is financed by the European Commission in accordance with INTERREG (the European community initiative) criteria, and conducted by the European Union (EU) Member States and European non-member states, in which research institutions throughout Europe study topics of relevance to spatial planning in joint, transnational projects.

2. General conditions of, and challenges to, territorial cohesion in the BSR

In the following chapter, the key objective is to gain an overview of the territorial capital of the BSR by analysing the general conditions of, and challenges to, increasing territorial cohesion. To this end we seek to explore a number of basic socio-economic indicators on the overall perform-

ance of the BSR's cities and regions. In other words, we focus on the current and future challenges to the BSR's cities and regions in respect of demographic and economic trends and their implications for the various national labour markets across the BSR.

2.1 The diverse pattern of growing and shrinking cities around the Baltic Sea

Our initial focus here will be on the issue of population, change due to natural development and migration patterns, particularly in respect of BSR cities with at least 10,000 inhabitants as well as other settlements of at least 5,000 people and the so-called rural population, which lives outside cities with at least 10,000 inhabitants. Roughly speaking we can easily detect a slight overall decline at the level of the entire BSR (cf. Fig. 2). This decline is driven by substantial natural losses, i.e. that low nativity and/or high mortality provide the primary engine behind the decline of population in the many cities of the BSR (cf. Fig. 3), which for the most part outweigh migration gains (cf. Fig. 4). Generally speaking, we can recognise that the East-West divide, as analysed in the study by Hanell/Neubauer (2005), has widened further in the period 2002-2006 due to continuing uneven growth (and decline) in population. We can also see that almost all areas marked as 'rural population' have suffered declines, while the winners are to be found in most of the larger cities, although with contrasting tendencies between countries.

More specifically, we can, however, observe a spatial polarisation of population towards capitals, larger agglomerations and higher order urban centres in most parts of the BSR, which is followed by accelerating suburbanisation, notably in and around most of the BSR metropolitan areas (cf. chapter 3). Additionally, numerous small and medium-sized cities and towns on the fringes of these metropolitan areas (and a handful of other urban agglom-

erations) have rapidly expanded their populations on the basis of strong in-migration. Thus, 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 (see below).

Turning to the *Nordic countries*, as a rule we can see that the smaller municipalities ($\leq 20,000$ inhabitants) are shrinking, whereas mid-sized cities between 20,000 and 50,000 are still rather stable in population terms. The winners are primarily to be found in the larger municipalities, i.e. those with 100,000 inhabitants or more. The picture of natural population change and net migration is for the most part the same. Only in mid-sized Swedish cities does strong positive net migration prevail over negative natural population development. In Denmark, the situation is rather different, as the most dynamic places are not necessarily the larger cities but rather the mid-sized cities surrounding the larger units such as e.g. Copenhagen or Aarhus. Such classical examples of sub-urbanisation are also to be found on the edges of the metropolitan areas of Oslo, Stockholm and Helsinki, whereas, in contrast to Copenhagen, these capital cities continue to grow annually at more than 0.5% (cf. for more detailed information on the Nordic Countries: Rauhut *et al.* 2008).

In the *German part of the BSR* we can observe two rather different patterns. A balanced picture in those *Länder* belonging to the former 'Western' part of Germany (Ham-

burg, Bremen and Schleswig-Holstein) with a spread of increasing and declining cities of all sizes. In the eastern part of the German BSR, the picture is rather diverse. In the proximate hinterland around the city of Berlin, we see numerous growing cities, while Berlin as well as Rostock and Stralsund, both located on the Baltic Sea coast, can also be seen as rather stable. All other cities with more than 10,000 inhabitants, as well as the so-called rural population, are however shrinking, most by even more than 0.5% per year. These trends are generated by two overall drivers: a negative natural population development in the whole German BSR area (the only exceptions here are, to some extent, Berlin and Hamburg with at least a stable development in this respect) as well as a very diversified migration pattern, which for the most part outweighs negative natural population change, specifically in the larger rural areas of Schleswig-Holstein. Due to the high rates of out-migration (often more than 0.5%) the overall loss of population in the larger parts of Mecklenburg-Vorpommern and partly also in Brandenburg have accelerated enormously.

An even more diversified pattern of shrinking, but also growing cities can be found in *Poland*. Here it is almost impossible however to draw a more generalised picture. Rather it seems that almost every region (Województwa) displays a different pattern. In many regions cities with less than 20,000 inhabitants can be seen to have grown (and here specifically those that are classified as 'rural population'), while larger cities have shrunk during the period between 2002 and 2006. What is striking in the Polish case is that in many rural, but also in rather more urbanised regions we can witness a positive natural population development, the extent of which is rather unique in the BSR context. Thus, the overall negative national trend can be traced for the most part back to the negative net migration of the many larger Polish cities. Apparently, the out-migration flows are not necessarily directed to other Polish cities, but rather to other countries. The larger Warsaw region, however, seems to be a strong growth-pole as many (not all) mid-sized cities around the Polish capital have gained population in the period 2002-2006, so that the pattern there very much resembles that of Berlin with its proximate hinterland.

With regard to *Belarus* the following three maps illustrate a somewhat distinct national picture. In addition to Minsk, some, but not all other cities with more than 100,000 show a positive, or at least a stable, level of annual performance in terms of overall population development due to the rather stable natural population change and a comparatively positive level of net migration. The rest of the cities, particularly the smaller ones, are shrinking, most very rapidly, which means by more than 0.5% per year. With regard to first order cities then, Belarus is moulding gradually a polycentric structure consisting of around a dozen cities with a more or less stable development pattern (some are growing, some are shrinking) and which can be considered as important backbones for their respec-

tive *oblast*. Looking more closely at an even lower geographic scale, it becomes clear that the regional disparities between Minsk and the rest of the country and in particular between these regional centres and the rest of the *oblasts* become even stronger.

Such an alarming spatial trend, which is worsening gradually the degree of territorial cohesion, is even more distinct in NW Russia. Few cities show a positive or even stable trend. Those belonging to the former type are specifically to be found in somewhat close proximity (about 100 km) to the St. Petersburg agglomeration, which might be interpreted as classical examples of current 'post' suburbanisation processes as commuting distances continue to rise across Europe. Unfortunately, no data could be secured for the other many cities directly surrounding St. Petersburg, such as Kolpino or Pushkin. Nevertheless, according to Savulkin (2008), we can say that the entire St. Petersburg agglomeration (which in addition to the St. Petersburg metropolis includes, all in all, 13 small and medium-sized cities and towns) have, annually, lost between 7.3 and 9.4% of their population between 2000 and 2005. In the same period, the Leningrad *oblast*, which encompasses the St. Petersburg agglomeration, lost between 12.1 and 13.1% of its overall population. Looking at the other two indicators (natural population change and net migration), the reasons become more obvious. The city of St. Petersburg itself, but also a handful of other cities, most located in the Leningrad and Kaliningrad *oblasts*, as well as for instance Petrozavodsk, the capital of the Republic of Karelia, have seen a positive net migration. The same can be said for the settlements that are classified here as 'rural population' in the Leningrad and Kaliningrad *oblasts*. The reason for the negative overall picture lies in the significantly negative natural population change. In brief, the metropolitan areas of Kaliningrad and St. Petersburg, or at least their larger hinterlands, indicate a dynamic performance in terms of attracting migrants. The entire NW Russian territory, however, is marked by a significant natural population decrease. Only in a few aforementioned places have these overall negative trends been compensated by considerable in-migration flows.

Compared to the other BSR countries, the *Baltic States* have the most negative population trends. Roughly speaking, only Vilnius and Tallinn, in addition to some of the smaller cities in the suburban hinterland of Klaipėda (Lithuania), show a stable development here. In spite of the negative net migration trend, the only larger city with a positive development, caused by a positive natural population change, is Tartu in the south-eastern part of Estonia. The fast growing band of cities on the eastern fringe of Riga are perhaps also worth mentioning here. In general however we can clearly see a significant population decline for those cities in the Baltic States with more than 10,000 inhabitants. This is due both to negative natural population change and to negative net migration.

Figure 2: Overall population change in BSR Cities (2002-2006)

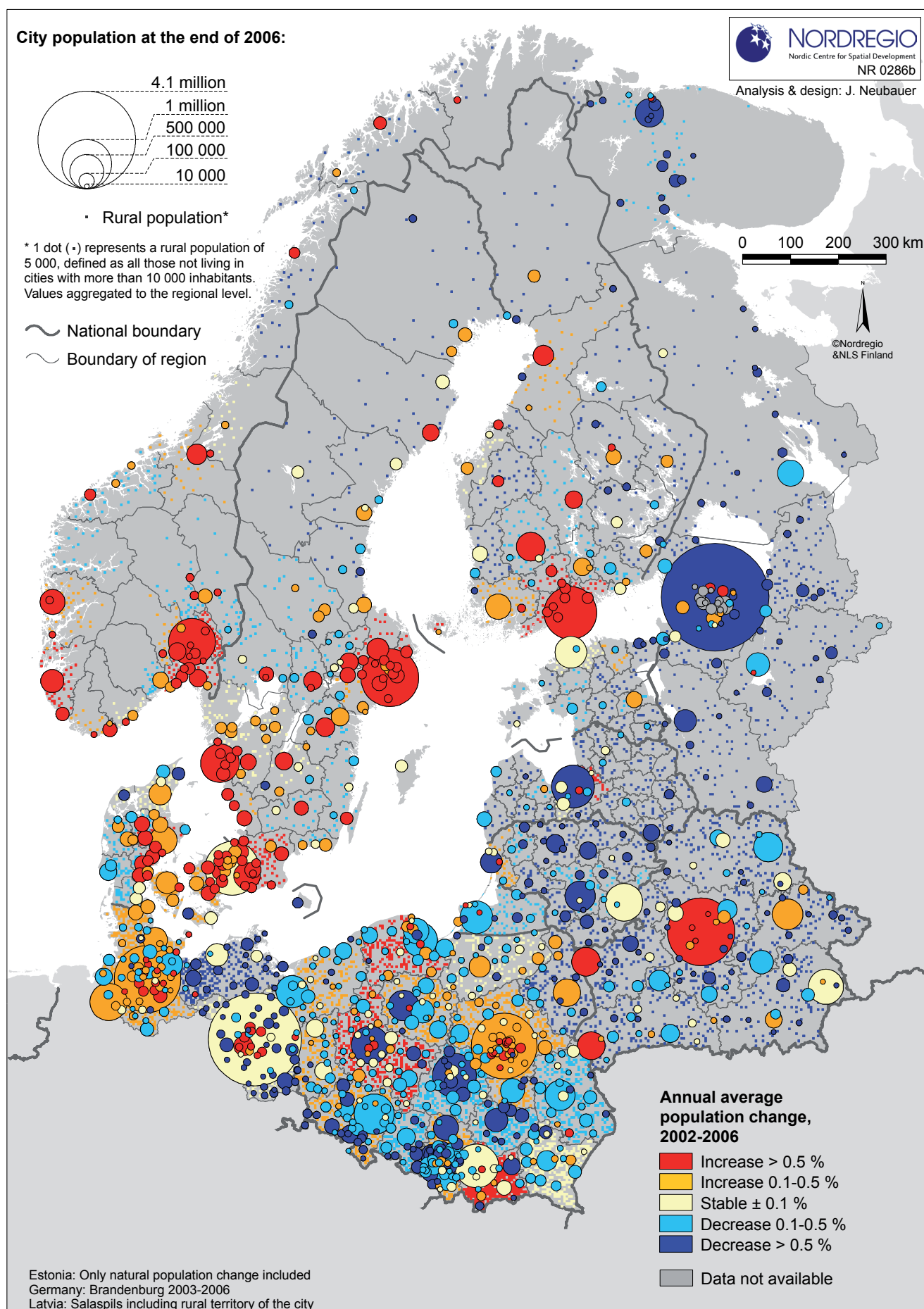


Figure 3: Natural population change in BSR Cities (2002-2006)

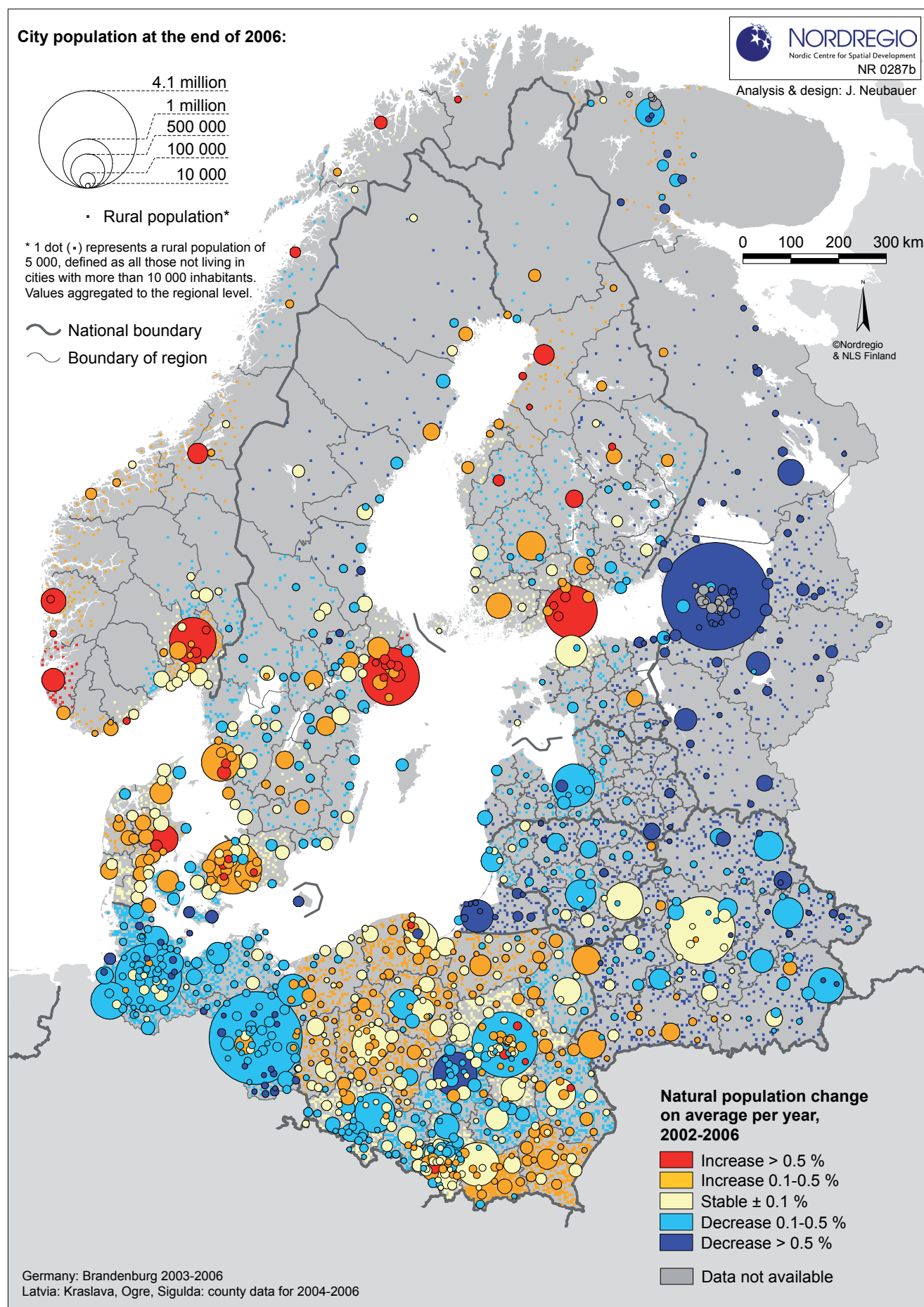
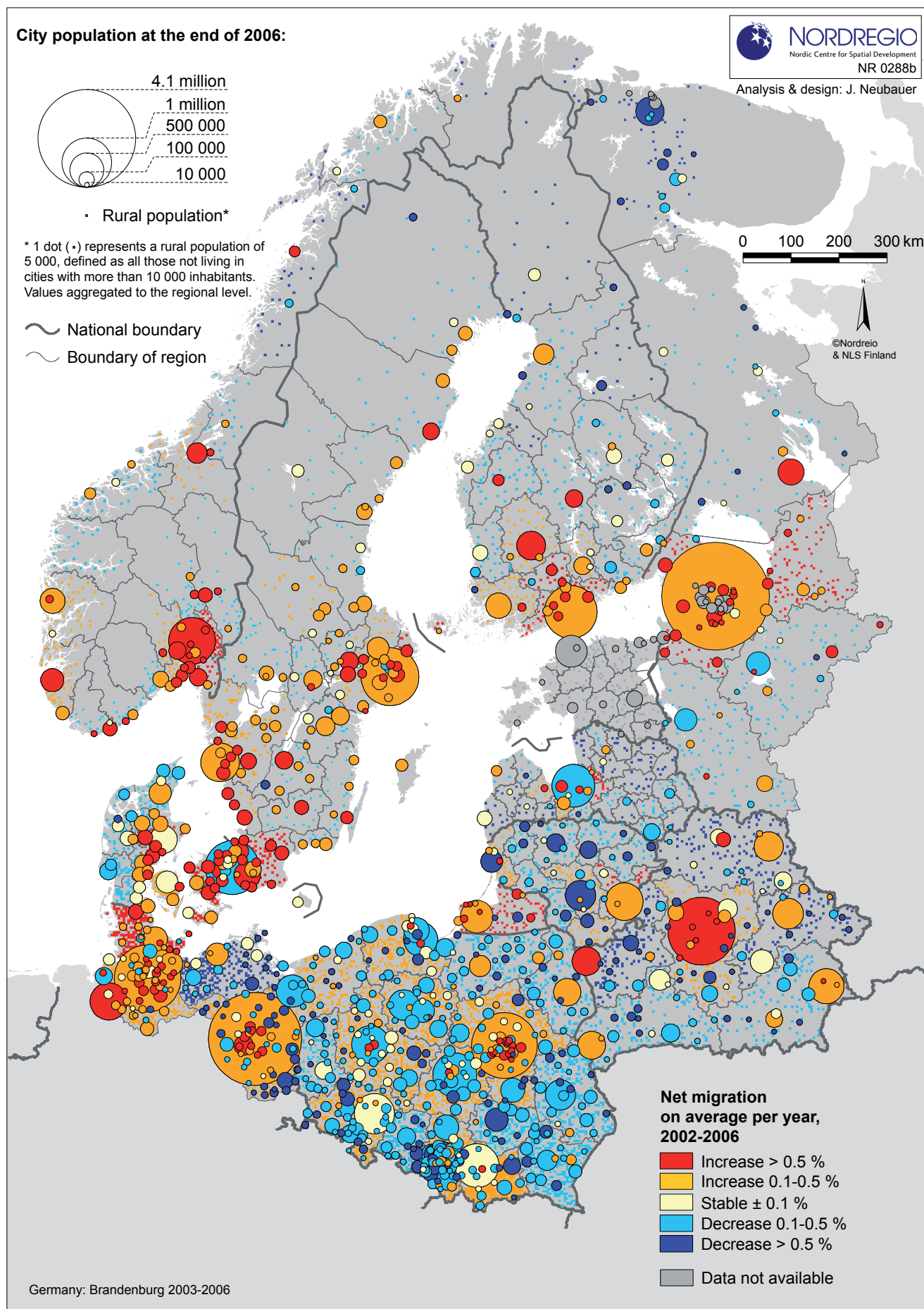


Figure 4: Net migration in BSR Cities (2002-2006)



2.2 Future demographic challenges

In order to gain a better understanding of future demographic challenges and their likely territorial implications we have gathered together some of the findings provided by a number of our BSR 'national experts'. In so doing, it is obvious that the rather negative picture sketched in chapter 2.1 significantly understates the dramatic nature of change as the BSR faces up to a future of enormous demographic challenge. Apart from the Nordic countries – where the demographic challenge can be characterised as rather moderate, one can anticipate a generally strong decrease in overall population levels in the BSR. Most drastically this decrease will hamper rural and peripheral areas as well as those areas characterised by somewhat isolated small and medium-sized cities and towns. Stable developments are to be expected in the larger metropolitan areas – some of which will even increase their populations. One however needs here to discern whether a 'real gain' is to be expected or whether we are more likely to observe a kind of spatial transformation within a country due to strong domestic migration towards the metropolitan areas. Additionally in many cases only in the metropolitan fringes or hinterlands can a positive trend be expected in light of ongoing sub-urbanisation, while at the time we will likely see rather stable or even negative trends in the metropolitan cores.

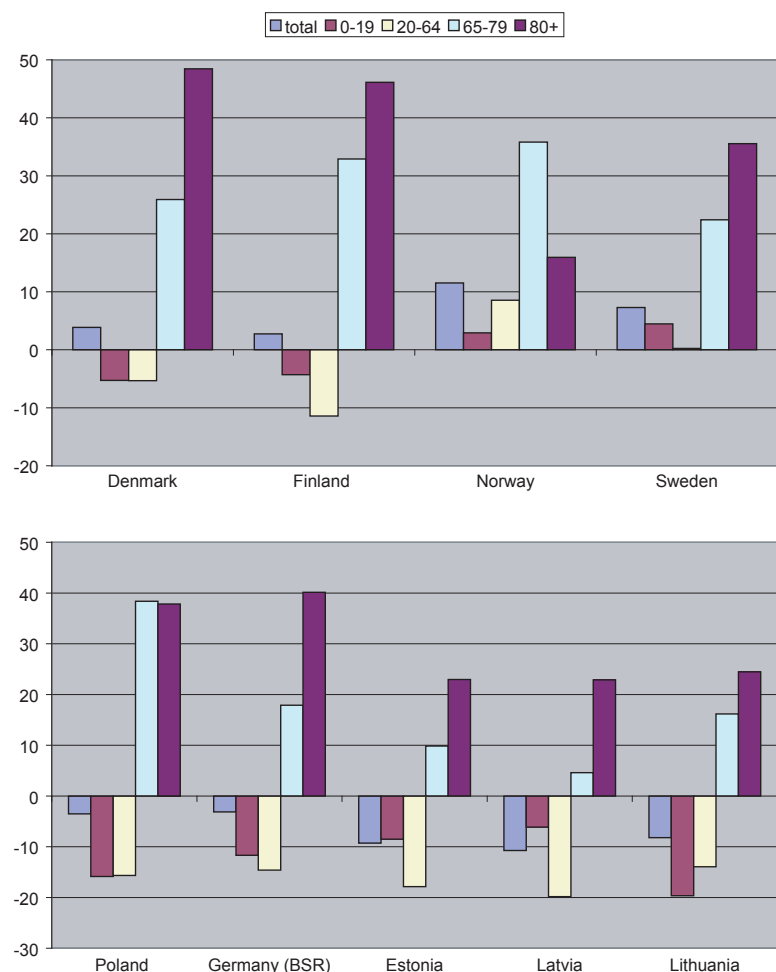
When analysing population development in the Baltic Sea region up to 2030 three universal trends emerge as worthy of note (cf. Fig. 5).

- The Nordic countries (Denmark, Finland, Norway and Sweden) will experience population growth while the other BSR countries and areas will see population decline.
- In all BSR countries and areas the two oldest age cohorts (65-79 and 80+) will significantly increase their share of the overall population in the BSR.
- With the exception of Norway and Sweden, the two youngest age cohorts (0-19 and 20-64) will decrease their share of the overall population in the BSR.

The basic driving force of these overall negative trends and their territorial impacts in the BSR is, in most of the countries, the low birth rate (cf. Table 1), which can only be compensated in some regions by in-migration. It is also worth mentioning here that many countries and regions will be hampered by out-migration not necessarily to other BSR countries, but increasingly to other European coun-

tries. Given this reality most of the cities and regions of the BSR will increasingly suffer from a shrinking labour force (i.e. less people in working age) as well as from a greying population (i.e. more people of pension age). Such a development is not necessarily unique in Europe, as other regions, countries or even transnational areas will likely also face the same challenge in the coming decades. Nevertheless, this tremendous demographic change does (and increasingly will) confront most of the cities and regions of the BSR.

Figure 5: The relative change in total population for 4 age cohorts, in per cent, for the countries and areas in the Baltic Sea Region 2010-2030



Source: Estimations based on Eurostat, calculated by Raubut (2008)¹

¹ The calculations in Fig. 5 are made as follows. Due to the lack of harmonised data, calculations for Belarus and the Russian part of the BSR are not possible.

$$\Delta P_a = \left(\left[\left(\frac{P_a}{P_{tot}} \right)_{t+1} - \left(\frac{P_a}{P_{tot}} \right)_t \right] / \left(\frac{P_a}{P_{tot}} \right)_t \right) \times 100$$

Table 1: Averaged fertility rate in the BSR (2000-2005)

BSR Country	Fertility Rate 2000-2005
Denmark	1,75
Norway	1,72
Finland	1,72
Sweden	1,64
Poland	1,48
Estonia	1,37
Russian Federation	1,33
Germany	1,32
Lithuania	1,28
Latvia	1,26
Belarus	1,24

Source: table based on UNO World Population Prospects: the 2004 Revision

With regard to the numbers presented in Fig. 5 and Table 1 above as well as those which have already been discussed in the context of chapter 2.1 we need to bear in mind that the BSR is, as is Europe more generally, currently experiencing what is referred to as an advanced demographic transformation process. This process is characterised by substantial changes in respect of a number of basic demographic elements, such as birth and mortality rates, complex migration patterns, and both the creation and disintegration of families and households. Indications of this transformation include rearrangements in the behaviour of starting families and relationships, low birth rates, positive changes in the mortality rate and related life expectancy as well as complex domestic and international migration processes, all of which have been highlighted in the one or other report provided by the national experts (see edited excerpts below).

Some additional societal changes should also be mentioned in this context each of which impacts the demographic situation. Rising competition on the labour market, the aspirations of young people to attain a higher professional status, the growing costs of education (both for adults and children), and the overall growing socio-economic stratification of society can all be usefully highlighted here. Other conditions which will increasingly influence demographic development include the high risk of unemployment, a shortage of available housing, the inability to combine family and work/education and reductions in social benefits granted directly or indirectly to families and households, as each negatively impacts matrimonial behaviour patterns and finally the birth of children, first in the cities, but increasingly now also in the countryside. Other issues raised by the national experts

that will have some distinct impacts on future demographic developments in one or other country/region/city in the BSR include the quality of the health care system, the quality of food, environmental threats, health-related effects of housing construction, injuries at work and traffic accidents as well as the effects of alcoholism, smoking and drug abuse. Another set of factors comprises issues such as changes in the hierarchy of values, increasingly widespread individualistic behaviour and ethical relativism. Thus, the prime catalysts behind these changes have been structural causes in the functioning of many areas of political, economic and particularly social life, which, in this context, challenge the competitiveness of most cities and regions in the BSR. Those issues cannot, however, be explored systematically in this report as this would have gone beyond the scope of the EWW-project.

As such, in what follows we will only highlight a handful of findings in a more detailed way by visiting three BSR sub-regions: the Nordic Countries (Norway, Sweden, Finland and Denmark), the Southern Arc (the BSR part of Germany, Poland and Belarus), and finally the Baltic States plus NW Russia (including the Kaliningrad region).

The Nordic Countries²

The estimations made by Eurostat, the national statistics offices in the Nordic countries and by Nordregio show that the total population in the Nordic countries will increase (Eurostat, Rauhut *et al.* 2008). There are, however, age-specific differences in the Nordic regions. The number of persons 0-19 years old will decrease in all regions in Denmark and Finland (except for Åland) between 2010

² Abstract based upon Rauhut (2008)

and 2030. In Norway and Sweden, however, the number of persons 0-19 years old will continue to increase generally in the southern and more urbanised regions though this age cohort will decrease in numbers in the northern and rural/peripheral regions. A similar development can be predicted for the age cohort 20-64. This will decrease in number across all regions in Denmark and Finland. In Norway the age cohort 20-64 will increase in all regions except Nordland; in Sweden this age cohort will increase in the larger metropolitan areas of Stockholm, Gothenburg and Malmö, while decreasing in all other regions. The age cohorts 65-79 and 80+ years will increase in all Nordic regions. The increase is especially marked in the age cohort 80+ years and in some regions where those persons aged 80+ will almost double in number between 2010 and 2030.

In *Denmark* the total population of Sjælland and Midtjylland will increase as a share of the total Danish population between 2010 and 2030. At the same time the population in the greater Copenhagen area, in Syddanmark and Nordjylland, as a share of the total Danish population, will decrease between 2010 and 2030. The population on Bornholm will face an even more significant decline as a share of the total Danish population 2010-2030. The small decrease in the share of population living in the municipality of Copenhagen can be explained by regional enlargement in the Øresund region: while the municipality of Copenhagen is decreasing, Sjælland is increasing its share of the Danish population as is the Skåne region on the Swedish side of the Øresund. Midtjylland, encompassing the metropolitan area of Aarhus, is increasing its share of the Danish population, while rural and peripheral regions – Nordjylland, Syddanmark and Bornholm – will see a decline in their shares of the Danish population by 2030. In general one can say that between 2010 and 2030 the Danish population will be more concentrated around the metropolitan areas of Copenhagen and Aarhus.

In *Finland* the total population in Etelä-Suomi and Åland will increase as a share of the total Finnish population between 2010 and 2030. At the same time, the percentage share of the Finnish population in Itä-Suomi and Pohjois-Suomi will decline between 2010 and 2030. The population in Länsi-Suomi will experience a more or less constant share of the total Finnish population over the period 2010-2030. The ageing population process will be specifically marked in Itä-Suomi and Pohjois-Suomi. In the metropolitan areas of Etelä-Suomi and in Länsi-Suomi this process is however not so marked. Although Åland can only be described as a peripheral and rural region it will not be affected significantly by the process of ageing. Between 2010 and 2030 the Finnish population will be even more concentrated around the metropolitan areas of Helsinki, Tampere and Turku.

In *Norway*, Regions around Oslo – i.e. Østfold, Akershus, Oslo, Vestfold and Buskerud – and around Stavanger

and Bergen – i.e. Rogaland and Hordaland – as well as around Trondheim – Sør-Trøndelag – will increase their share of the Norwegian population between 2010 and 2030. The other relatively rural and peripheral regions (Hedmark, Oppland, Telemark, Sogn og Fjordane, Møre og Romsdal, Nord-Trøndelag, Nordland, and, especially, Troms and Finnmark) will experience a relative population decline during the same period.

In *Sweden*, the total population in Stockholm, Västsverige and Sydsverige will increase as a share of the total Swedish population between 2010 and 2030. At the same time the population in Norra Mellansverige, Mellersta Norrland, Övre Norrland and Småland with its islands, as a share of the total Swedish population, will decrease significantly between 2010 and 2030. The population in Östra Mellansverige will face a small decline as a share of the total Swedish population 2010-2030. While Västsverige and Sydsverige will experience a positive development in terms of their age structure, the rural and peripheral regions of Östra Mellansverige, Norra Mellansverige, Mellersta Norrland, Övre Norrland and Småland with islands will experience the opposite. Between 2010 and 2030 the Swedish population will become increasingly concentrated around the metropolitan areas of Stockholm, Göteborg (Västsverige) and Malmö (Sydsverige).

One can therefore conclude that the increasing population in the Nordic countries is a function of the increasing number of persons aged 65+ years and especially aged 80+ years. The metropolitan areas will retain a population structure that is similar to that of today. This means that the 'ageing society' is strongly correlated to rural and peripheral regions, regions that once were important in the industrial economy (cf. Eðvarðsson *et al* 2007, Rauhut *et al.* 2008). It is also very striking that in all four Nordic countries, the metropolitan areas will be the growth poles in this respect, which will further aggravate the uneven urban geography in each of these countries.

The Southern Arc

In contrast to the Nordic countries, in Germany, Poland and Belarus a much stronger demographic transformation has already begun towards a shrinking population (cf. chapter 2.1), and which is set to become even more pronounced in the years to come. One exception here might to some extent be Belarus that is if one believes the existing national future scenarios, as they are based on a very speculative assumption, namely that very strong in-migration will compensate for the natural decrease of the population. In respect of the BSR part of Germany, and here specifically in the eastern areas, the situation is likely to become even more aggravated. Poland will not only suffer from a very low birth rate (similar to that of the BSR part of Germany), but also, and this is rather unique, it will continue to be hampered by strong out-migration (cf. chapter 2.1). Here one may assume that particularly well educated sec-

tions of the labour force will increasingly opt to leave the country – which shows on the other hand the need to offer attractive jobs and living conditions for those people in their home labour markets as they increasingly compete on international markets. A stable situation is to be expected in the larger metropolitan areas in Germany and Belarus (here often at the fringes than in the cores) due to domestic migration towards those centres at the expense of small and medium-sized cities and towns and the rural areas in-between. In Poland we can expect the same tendency, namely that the ongoing suburbanisation process around the bigger cities will continue and thus will ‘upgrade’ formerly rural areas to urbanised landscapes at the expense of these bigger cities, which themselves will see an ongoing population decline.

Germany³

In Germany we can easily identify a significant difference in terms of population dynamics between the Western and the Eastern areas of the German BSR, with the Western half increasing its population while the Eastern half is experiencing ongoing population decline. On closer inspection these dynamics can increasingly be seen to be an insular phenomena. Here specifically in the Eastern BSR part of Germany mainly rural areas in remote locations are characterised by the most negative development as compared to the rest of the country. By 2020, the differentiation between West- and East Germany tends to soften, but will not disappear completely. Thus some suburban communities in the East will experience population growth whereas in the West, only isolated regions will be performing positively in this respect. Notable examples here are the BSR metropolitan areas of Hamburg and Bremen though with a limited dynamic.

Overall we will see a significant reduction in the population. In 2050, Germany will have between 68.5 million and 75 million inhabitants according to the BBR (*Bundesamt für Bauwesen und Raumordnung*) population projections (today it has 82.5 million), a projected decline which will particularly impact the German BSR area. What is striking here is the decline of the natural population dynamic in the Western part of the German BSR, which will in the long run become increasingly similar to that of the Eastern part (here especially Mecklenburg-Vorpommern and Brandenburg). Thus, except for South-Eastern Germany and some areas in West Germany, the German BSR part is expected to undergo the most significant natural population decline in Germany.

The ‘greying’ process is an all-encompassing phenomenon concerning both Eastern and Western Germany. We need, however, to distinguish once again between suburban and rural areas on the one hand and cities on the other hand. In suburban and rural areas, the average age of people will be older than in the cities. This also related to the fact that people move away from cities at a certain age, be

it because they want to have more space for their families or because they retire. In respect of the regions that are part of the BSR, it is necessary to highlight the future increase in the population age cohort older than 75, especially in Mecklenburg-Vorpommern, Brandenburg, parts of Schleswig-Holstein and Lower Saxony. Compared to them, the metropolitan areas of Berlin, Hamburg and Bremen will be better off than their larger rural hinterlands.

Poland⁴

Due to systemic social and economic transformation the demographic prognosis for Poland up to the year 2030, prepared by experts at the Central Statistical Office (GUS), the Governmental Population Board (RRL) and the Demographic Sciences Committee of the Polish Academy of Sciences (KND PAN), indicates that the decline in the birth rate remains an incomplete process and will increasingly impact consecutive generations of young people. This trend is basically caused by a growing level of education, problems on the labour market, a reduction in social benefits for the family, an absence of pro-family social policies, and stark realisation in respect of the generally difficult socio-economic conditions the generation of reproductive age has found itself.

According to them, the Polish population will decline in numbers from its current total of over 38 million to about 35 million in 2030, becoming a society with considerably more elderly citizens than at present. In the years to come the scale of external migrations will also increase, with a negative overall balance they claim. According to forecasts, the current negative balance estimated at over 10,000 will increase to 24,000 around the year 2010. Internal migrations in the coming years will remain at the current, low level. The expectations are that anticipated economic growth will change this situation, as EU membership may provide a new impulse to this.

The ageing of Polish society will gain momentum in the second decade of the century, resulting in nearly 2 million more people of retirement age in 2020 in comparison with the year 2000. At that time, the post-war boom generation will reach retirement age. The process will also feature process of ‘double ageing’, as the number of the oldest citizens, aged 80 and up, increases from 0.8 million today to 1.8 million in 2030, or by 125 percent. This process largely results from an unfavourable birth rate, a slow but advantageous change in mortality rates, and natural realignments in the age structure.

Belarus⁵

The contemporary demographic situation in Belarus is characterised by the process of natural population decrease, which means an increasing reduction in the fertility rate and, what is striking compared to the other BSR countries, at one and the same time, an increase in mortality. The

3 Abstract based upon Manz (2008)

4 Abstract based upon Dutkowski (2008)

5 Abstract based upon Semenkevich (2008)

peculiarity of that process is a specific high death rate of the male population, due to increased smoking and alcoholism. In 2005 life expectancy reduced by 2.3 years compared to the level of 1990 (for men by 3.4 years, for women only by 0.5 years).

In relation to this the age structure will change. This means that in the coming years the overall labour force will grow at first, but later will decrease substantially. A growth of the older population will cause an increase in the death rate and a decline in economic activity, the labour capacity, and will consequentially lead to an increase in the 'demographic load' on the actual working population, so that the State has to meet higher costs for the social sector. In respect of further future developments, two different forecast models have been developed.

- The 'Inertia model': The low birth rate will continue and does not provide the replacement of the current parental generation. The natural decline of the population will continue and the high death rates will grow further. The migration surpluses will however compensate the natural depopulation process. According to this model, the national population will increase slightly from 8.5 to 9 million inhabitants by the year 2020.
- The 'Stabilisation model': This model is based on the successful implementation of several political measures to improve the conditions for families, the health care sector and the efficient enlightenment of the population in respect of possible health threats as well as an optimisation of inner and external migration. This combines to contribute to a reversal of the negative natural population development, such that by the year 2020, the overall population total reaches 12.5 to 13.0 millions inhabitants.

In both models the population growth is forecasted. The main factor accounting for this growth in each case is migration which is expected to more than compensate for the natural decrease of the population, which is of course, all rather speculative in nature. The share of urban citizens will increase throughout the forecasted period while the rural population will continue to shrink due to high death rates and ongoing migration from rural settlements to the cities.

The Baltic States plus NW Russia⁶

Compared to the countries that constitute the Southern arc of the BSR similar future trends can be predicted for the Baltic States (here only Latvia and Lithuania, no data was received for Estonia) and NW Russia. Significant population shrinkage is thus to be expected. Even the 'optimistic variants' of national forecasts anticipate general

population decline across the entire region, with only a few positively developing areas. These are specifically to be found at the fringes of the larger metropolitan areas, whereas the cores of these metropolitan areas will shrink or (at best) stabilize their number of inhabitants. The losers are, with few exceptions, once again those small and medium-sized cities and towns at a certain distance from the metropolitan areas as well as their rural hinterland in-between.

Latvia⁷

According to Bērziņš (2007) the most reliable version of the demographic prognosis has been produced by the Central Statistical Bureau of Latvia. Regional prospects have been outlined, however, without assessing the impacts of territorial reforms on cities and regions. Up to 2050 depopulation is expected for five out of six statistical regions, the largest decrease is forecasted for the Latgale (24.5%) and Kurzeme region (-17.1%). The total number of population in Latvia will drop from 2.28 (2007) to 1.87 million inhabitants by 2050 according to the 'basic version' of the population forecast by the Central Statistical Bureau of Latvia. A 'high version' projection, which includes a higher fertility and stronger in-migration into the country, has also been calculated. Here the population is calculated to increase up to 2.4 million by 2050 as compared to the 'low version' projection which suggests for the same period a drop to 1.51 million inhabitants. In the latter only in the hinterland of Riga, in the statistical region of Pierīga, a population increase would be expected (+4.0% for the period 2005 to 2030). In the same period the city of Riga is expected to lose population (-11.0%). Both statistical units, i.e. the city of Riga and the Pierīga region will continue to attract both interregional migrants and the majority of international migrants.

With regard to the basic version, which according to Bērziņš (2007) is the most realistic, the following hypothetical presumptions are included: the overall birth rate increases from 1.28 million (now) up to 1.59 million in 2030 stabilizing at 1.60 million in the period from 2030 to 2050. Life expectancy for males is projected to increase from 64.9 to 70.9 million by 2030 and up to 74.3 million by 2050. For females, an increase is calculated from 76.2 million to 80.4 million in 2030 and to 82.5 million by 2050. International migration in the basic version has been forecasted as negative – on average up to 4,700 people per year are expected to leave the country during the period between 2005 and 2013. In the following years a negative net migration will gradually diminish and after 2020 it will be (on average + 3,000 per year) (Zvidriņš, 2005; Bērziņš, 2007). The reason for this ongoing trend towards population decline primarily relates to the continuance of exceptionally low birth rates. This lack of children will continue to be felt thus precipitating various future economic and social problems: the need for an adaption to be made to the child care and

⁶ Due to the absence of an Estonian expert in the East west Window project no detailed information can be provided for Estonia.

⁷ Abstract based upon Kule (2008a)

school system due to its insufficient utilization as well as a labour shortage and a shortage of students to fill the available university places. The sharpest decline in respect of the labour force (persons 15–64 years old) for the period 2005–2030 is expected in Latgale (–31.2%), Kurzeme (–23.1%) and in the city of Riga (–19.9%). Only in the Pieriga region will the number of working age persons stay unchanged or positive with a slight increase (+1.2%) up to 2030 (Bērziņš 2007).

The share of the Latvian population of working age will decrease on average from 68.9% in 2010 to 63.7% in 2030, with the most significant declines observable in Latgale (62.0%) and in the city of Riga (62.8%). On the other hand, due to the ongoing spatial transformation process between Riga and its hinterland, the Pieriga region will gain a larger share of the overall Latvian labour force, from 16.0% (2010) to 19.9% (2030). In total, the Riga and Pieriga regions will constitute 51.8% of the whole Latvian labour force by 2030, thus underlining the growing regional disparities within the country.

After 2010 in all Latvian regions a profound ‘greying process’ will occur as the total number of people older than 65 years increases by +12.7% by 2030 as compared to 2005. In the period 2005–2020 the total number of old aged inhabitants (above the age of 65) will remain unchanged, except in Pieriga where a rise of 11,500 is expected due to a general population increase. After 2020 in all Latvian statistical regions the number of older people will increase, particularly in the city of Riga where in 2030 the number of old people will have risen by 16.6% as compared to 2020, which will then see Riga holding the highest share of that age group in the country.

Lithuania⁸

According to a recent projection by EUROSTAT, Lithuania will see a continuation in its negative population development into the future (i.e. until the year 2030) from 3.43 million (2005) to 3.09 million (2030) according to the ‘basic version’. One fundamental reason for this is, compared to other European countries, a very low birth rate. At the same time it is projected that the number of people of working age population will further decrease from 2.31 million in 2010 to 1.97 million in 2030, whereas, as in many other BSR countries, the numbers of older people (>65 years) will increase. Similar to the situation in Latvia, low birth rates will initially see a significant decline in the number of children and with a slight time shift in the numbers of people of working age also. It is forecasted, however, that the numbers of old people will continue to increase up to 2030, and then even beyond that on up to 2060.

⁸ The short abstract is based upon a table provided by the Lithuanian national expert. Unfortunately, no further information about the territorial consequences was received.

NW Russia and Kaliningrad⁹

The regional pattern within the North-Western Federal Area (NWFA) has its own specific structure and peculiarities. Firstly, it is noteworthy that the northern part, formed by the Murmansk and Arkhangelsk regions, the Republic of Komi and the northern part of Karelia, is a region that is currently suffering from the consequences of a rather dramatic population decline. The Russian population of the Republic of Komi recently passed the stage of demographic transition (transition from a high birth rate to a low one), while national minorities in these territories maintain the traditional reproduction stereotype (high birth rate). That is why the demographic situation remains rather more stable in those territories where the indigenous population of the North lives. In territories where the Russian population lives, a serious reduction in the population level can now be observed. The next significant element of the structure of the settlement system is to be found in the western part of Leningrad region extending up to the eastern end of the Vologda region. In fact, it is the most economically active zone of NW Russia. The demographic potential of the NWFA southern territories (Novgorod and Pskov regions) is much worse than in the central part of the North-West.

The picture provided by migration flows is something of an inverse mirror-image of the natural growth picture. As a rule, people leave the north in order to settle in the south. However, there are territories in the north where there is a migration inflow, and there are territories in the south that are increasingly being abandoned by their populations. In this respect the migration attractiveness of Novgorod and Pskov regions is not very high. Here Kaliningrad and Leningrad region, and especially those territories around St. Petersburg, are in a much better position as they seem to act as a strong attraction pole bringing people to these southern areas of the NWFA (Strategic Developments Centre North-West 2002).

Most of the regions in NW Russia have seen a significant population decline over the period 1990 to 2005. The only exception to this general rule is the Kaliningrad region which will likely struggle in the future with the issue of population decline (see below). The most significant decline can be seen in the northernmost part of the Murmansk region, whereas the degree of decline is rather modest in St. Petersburg and in the neighbouring Leningrad region. Looking at the natural population ratio, it becomes clear that the Murmansk region has primarily lost population due to strong out-migration as the birth and mortality rates are basically balanced. Whereas Leningrad region (partly constituting the suburban hinterland of St. Petersburg), for instance, can compensate for a negative natural population ratio through reliance on a significant migration influx.

The pessimistic variant of the demographic forecast for the NWFA implies the continuation of the conditions re-

⁹ Abstract based upon Savulkin (2008)

lating to current birth and death rates at the level of the year 2000, and migration – at the level of the late 1990s. In this forecast, 1990 is regarded as year zero, the basic level. Under such conditions, compared to 1990, a population decline up to 10% will be observed even in the Kaliningrad region. In St. Petersburg, this figure will be equal to 30%, compared to 1990 (cf. Strategic Developments Centre North-West 2002).

The middle variant of the demographic forecast indicates that birth and death rates in the next 10-15 years (i.e. up to 2015 here) will reach values which were common in the mid-1980s, but the intensity and the direction of migration flows will not change. Calculations show, however, that such an increase in birth rates and a simultaneous decrease in death rates would not change the trend of population decline over the next 25 years (i.e. up to 2025 here), which would be then around 13 % on average in the NWFA (cf. Strategic Developments Centre North-West 2002).

The optimistic variant of the demographic forecast in the NWFA projects a population growth in the Leningrad agglomeration (including St. Petersburg, Leningrad, Novgorod and Pskov regions), precipitated by an inflow of about 2 million migrants over 25 years. The majority of migrants (1.58 million people) are expected to come from outside the NWFA which is (also for Belarus) a rather speculative proposition. Due to this variant a stabilisation

of the entire NWFA would be possible at the level of 14 million people, which is only 3% lower than the figure for the year 2000 (Strategic Developments Centre North-West 2002).

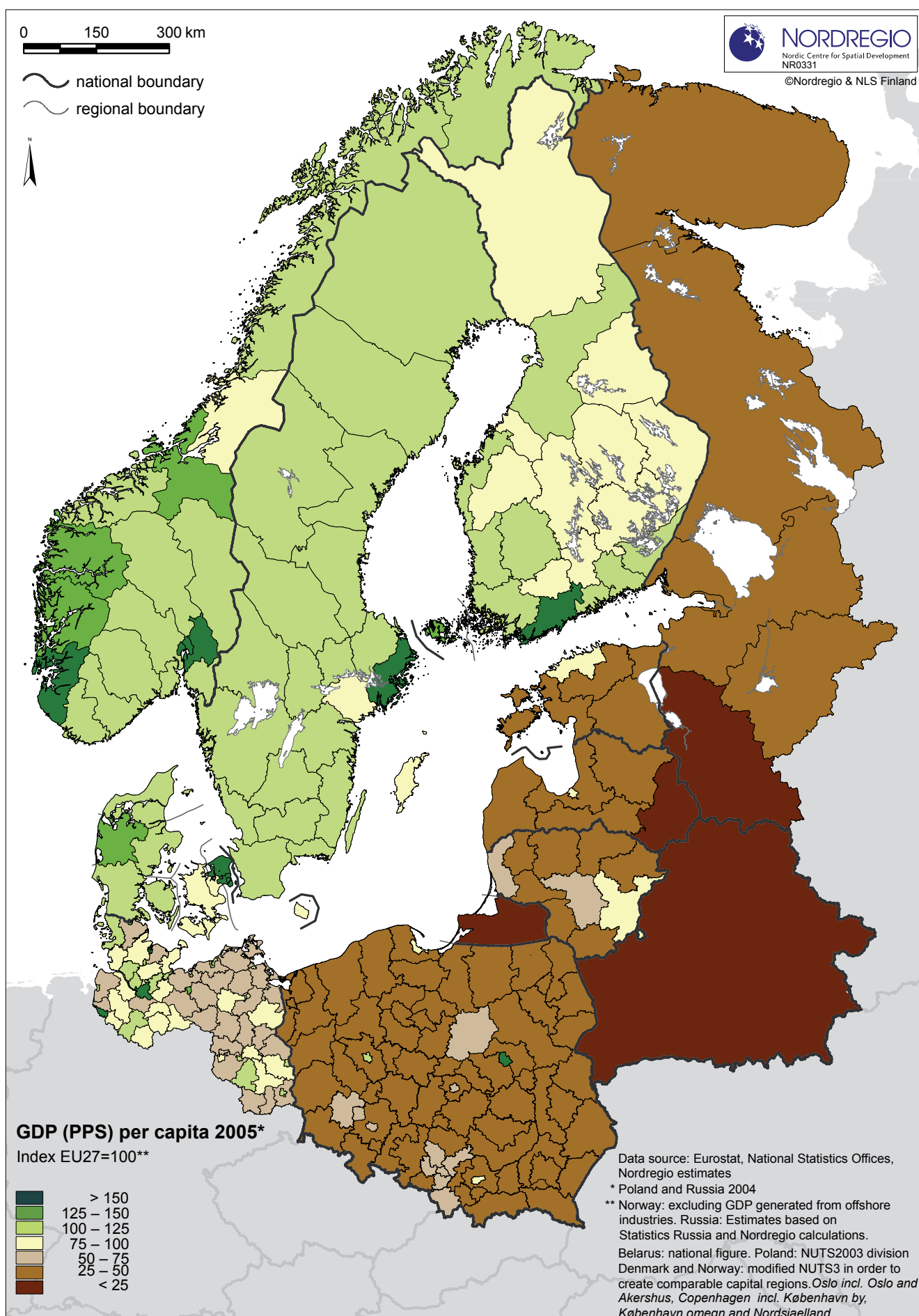
The resulting figures for the assessment of the demographic forecasts show that in 2005, in the NWFA, if the pessimistic variant becomes reality the population of the area would be reduced by more than 25% compared to the year 2000, and will then amount to 10.7 million people. If the middle variant is followed, implying a growth in the birth rate and a decline in the death rate while keeping migration rates at the level of the year 2000, the population of the NWFA would be nevertheless still be reduced to 12.6 million people. In other words the 270,000 migrants, who, according to this forecast, would move to the NWFA, will not be enough to compensate for the overall population reduction. The dynamic development of the larger St. Petersburg agglomeration, as well as of Karelia and Kaliningrad, have to be considered here as the potential backbone of such expected labour force migration flows which once again highlights the importance of these regions for the future of the entire BSR. To maintain the population of the NWFA at the level of 14 million people up to 2025, the number of migrants should amount to 1.5-2.0 million people, which according to the experts, seems feasible.

2.3 Regional economic performance and labour market dynamics

To get some indication of recent regional economic performance levels we have looked at the Growth Domestic Product (GDP) *per capita* in Purchasing Power Standards (PPS) for 2005 at the regional level (cf. Fig 6). Not surprisingly, the highest GDP *per capita*, highlighting the productivity of the labour force, is to be found in the Nordic capital metropolitan areas, in Hamburg, as well as in some of the regions on the Norwegian south-west coast. Apart from the latter, their rather insular position can be qualified as GDP in PPS is measured in relation to the places of work. As such, these numbers do correspond very highly to the locations of companies, and other institutions, and not necessarily to the places 'where' the GDP is being invested (e.g. in housings) or consumed (e.g. in groceries). Rather more eye-catching here is the very distinct west-east divide or rather, the significant differences between the Nordic countries on the one hand, (with an GDP *per*

capita around the EU 27 average and often far above) and the new Eastern EU-member states on the other, with an almost area-wide GDP *per capita* that is between 25-50 percent of the EU 27 average. Regarding the latter, some unsurprising exceptions here are the larger urban agglomerations where, in general, the more productive jobs in the service industries and technology firms are generally located. This west-east divide becomes even more marked when incorporating NW Russia and Belarus, where the respective rates are generally even lower (less than 25% of the EU 27 average). Due to the, geographically speaking, relatively small NUTS 3 regions in the BSR part of Germany, the regional disparities appear extremely strong in those areas. In other words, this means that the factual differences in GDP *per capita* become even more obvious in respect of those countries with larger NUTS 3 regions (e.g. Sweden).

Figure 6: GDP per capita (2005)



The relative expenditures for research and development (as a share of the total regional GDP) in the same year (cf. Table 2) inform us about the general level of willingness to invest in future-oriented activities. Normally such investments do not have a significant impact in the short term, only in the long run. It is thus noteworthy that, specifically, the capital regions as well as the other selected metropolitan areas (MEGAs) receive the lion's share of those national expenditures. This is not surprising as the most important public and private institutions are generally located in such areas. Nevertheless, with regard to any indications of the degree of territorial cohesion at the national level, we can clearly see significant differences across the BSR. Particularly in Norway and Finland, but also in the BSR part of Germany and Latvia the share of expenditures that goes to the rest of the 'other regions' is much higher than in Poland, Denmark or the BSR part of Russia. Again, however, one needs to bear in mind here the urban structure of each country and particularly that in our analysis, relatively large parts of Polish territory are covered by metropolitan areas, which might explain the 11.1% dedicated to the rest of the 'other regions' here. Nevertheless, the numbers for NW Russia are particularly alarming as only 9.3 % goes to regions other than St. Petersburg and Kaliningrad.

Looking more closely at recent labour market dynamics it is clear that the employment rate is quite uneven in the BSR at the regional level (cf. Fig. 7). Not only is it national differences that are striking but specific regional characteristics also emerge. The lowest rates are for the most part to be found in most of the NW Russian and Polish regions. In the Kaliningrad region, however, the rate is slightly higher than the EU-27 average. One reason might be that in this region there is a larger military base and thus there are a lot of young, single, 'employed' males with no dependent families in the calculation. The highest rates (over 75%) are to be found in South Norway, some Swedish and a small number of Polish regions (here for the most part the bigger cities) as well as most of the Danish regions. The Baltic States, Finland, Belarus and the German part of the BSR can be considered as scoring aver-

agely in this respect. In a dynamic perspective it is clear that many larger cities in the BSR increased their numbers of employed persons between 2002 and 2006 even though many lost population. Specifically in Poland, but also in the Baltic States we can observe a very positive development in respect of the creation of jobs in this respect. On the other hand, in numerous small and medium-sized cities and towns (here between 20,000 and 100,000 inhabitants), i.e. not only in the Eastern part of the BSR, but also in the Nordic Countries and in the BSR part of Germany, the number of employed people declined between 2002 and 2006 (cf. Fig. 8).

The unemployment rates, both at the regional and municipal levels, can however help us to qualify these observations. Despite the above-mentioned positive trends, specifically in Poland and in the eastern part of the German BSR area, as well as in some parts of Northern and Eastern Finland we can find comparably high rates of unemployment at the regional level. The rates for the Eastern part of the BSR, both at the regional and at the municipal levels, including NW Russia, the Baltic States and Belarus, are rather moderate (cf. Fig. 9 and 10).

To sum up, it seems that labour markets in the cities and regions of the Eastern part of the Baltic Sea have to some extent caught up with those in the western part. With specific regard to developments in the BSR's cities, one can however detect a north-south divide. Specifically Polish cities, but also in many cities belonging to the German part of the BSR are suffering from high unemployment rates. To turn that into rather more political language we can see that enormous unused potentials remain in terms of the available labour forces. Looking at the negative numbers on net migrations in most of these cities it seems clear that these labour forces are increasingly moving to other regions within the country or even beyond it. As such it is a matter of some urgency to find economic alternatives for those cities in order to halt this downward spiral precipitated for the most part by high unemployment, comparatively low birth rates and significant out-migration.

Table 2: R&D expenditures (GERD) in the BSR, in 2005*

	Division (%) between			Intensity (not comparable) GERD**/GDP***
	regions	performing sector private	public	
Denmark				
Capital region	70,5	71	29	4,5
other MEGA regions	10,1	49	51	1,8
rest of other regions	19,4	68	32	1,0
Finland				
Capital region	42,1	68	32	4,1
other MEGA regions	10,4	75	25	4,3
rest of other regions	47,5	73	27	3,0
Germany (BSR part)				
Capital region	42,4			1,9
other MEGA regions	22,5			0,7
rest of other regions	35,1			0,7
Latvia				
Capital region	39,8			0,3
rest of other regions	60,2			0,6
Lithuania				2,6
Poland				
Capital region	41,7			4,4
other MEGA regions	47,2			2,0
rest of other regions	11,1			1,0
Norway				
Capital region	42,3	45	55	2,6
other MEGA regions	12,1	29	71	2,4
rest of other regions	45,6	52	48	1,6
Russia (BSR part)				
MEGA regions	90,7			0,1
rest of other regions	9,3			0,0
Sweden				
Capital region	32,8	74	26	4,3
other MEGA regions	41,0	81	19	5,5
rest of other regions	26,2	61	39	2,3

* Norway 2003, Russia 2006

** **SE:** Excluding R&D expenditures of municipalities & private non-profit organisations; R&D expenditures of Mittuniversitetet and SLU distributed to Västernorrlands and Uppsala County respectively.

DK: University R&D expenditures on Fyn & Sønderjylland estimated due to geographical widespread research locations of Syddansk University.

*** **Norway:** GDP generated from offshore industries distributed proportionally among mainland counties

R&D intensity calculated as total R&D expenditure (GERD) as a share of GDP is not comparable between the countries

Data source: NSIs & Centre for Studies in Research and Research Policy (DK), NIFU STEP (NOR), German Founder's Association for Economic Statistics.

Figure 7: Employment rate in the BSR at regional level

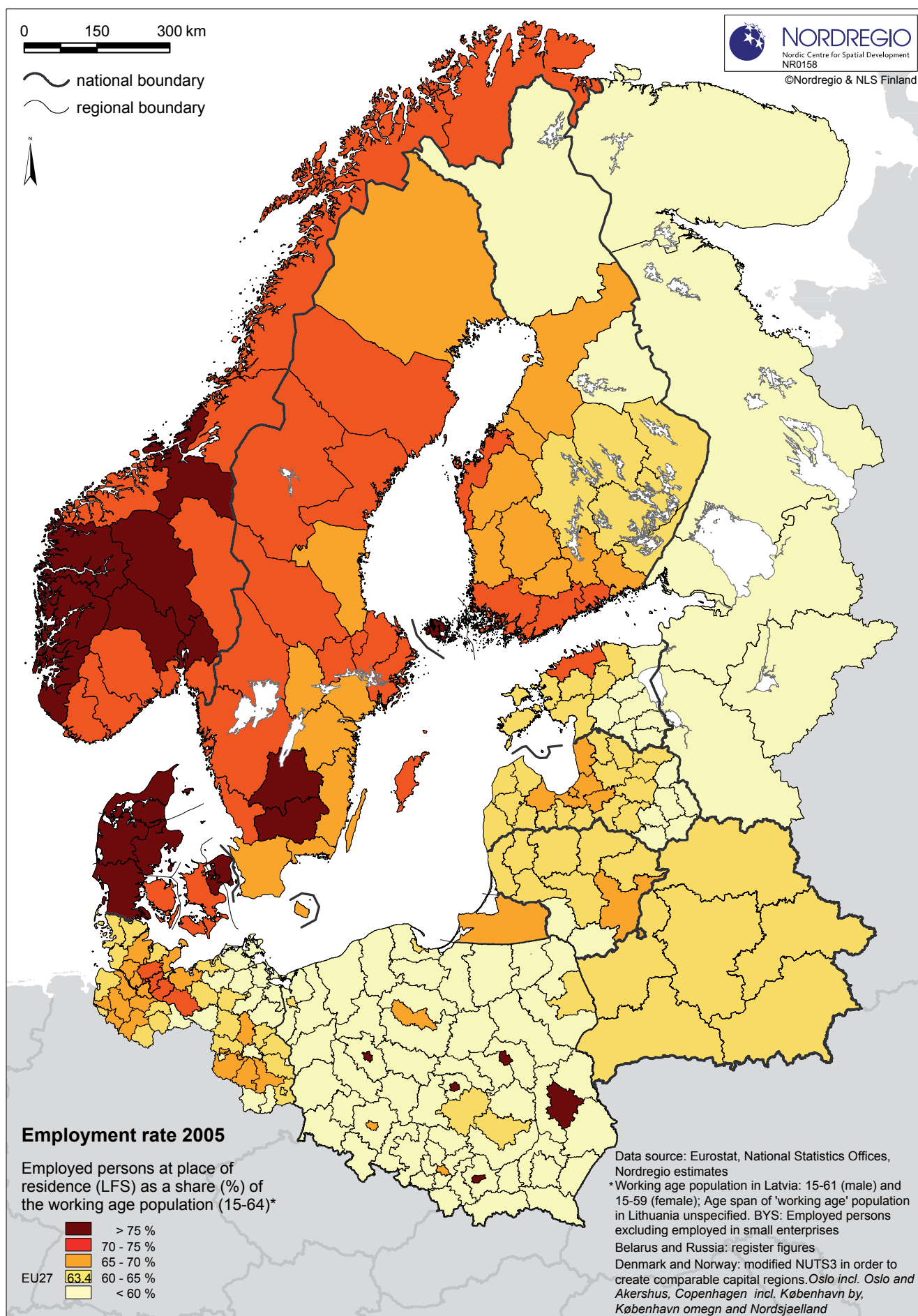


Figure 8: Change in employment rate in the BSR cities (2002-2006)

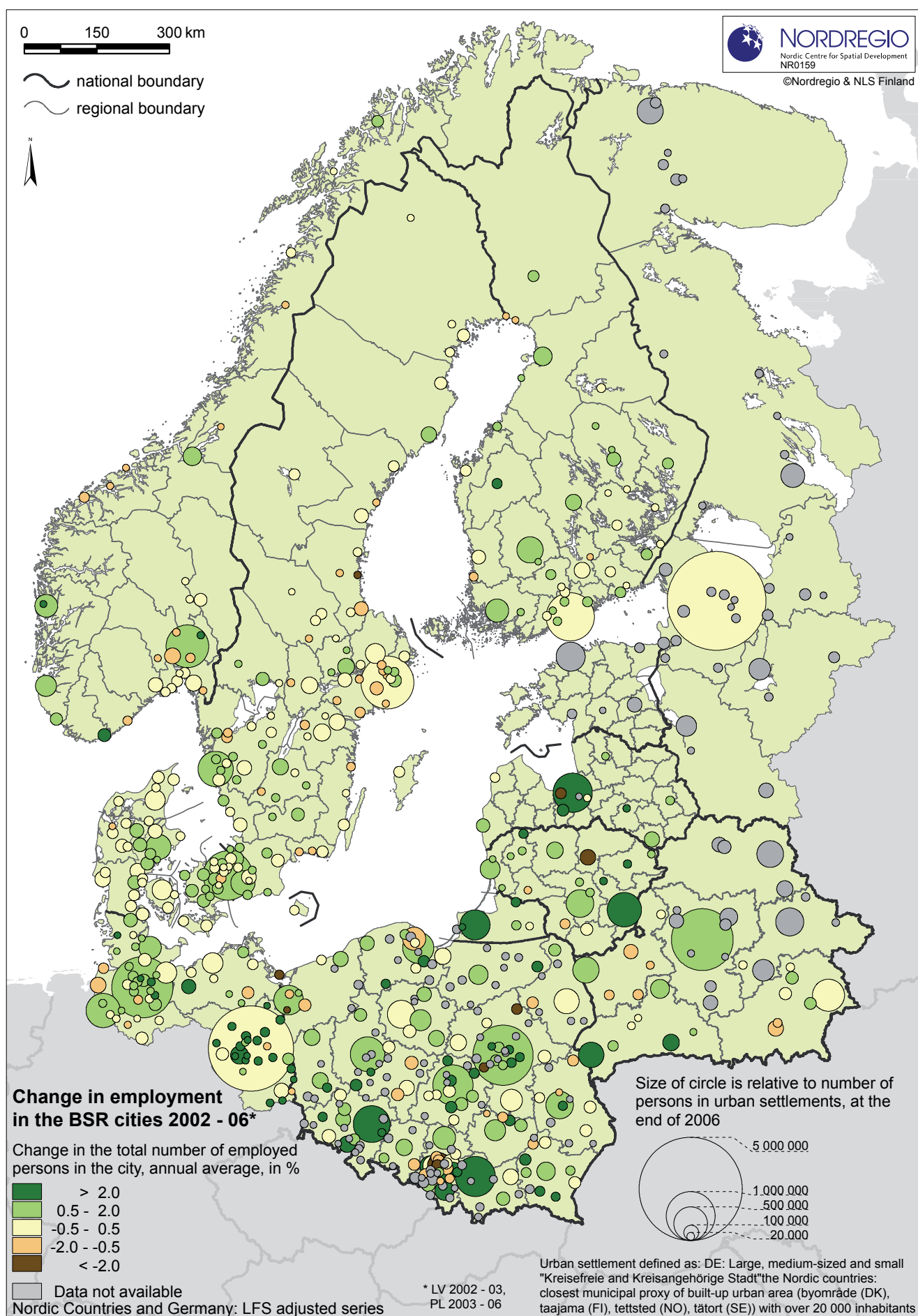


Figure 9: Unemployment rate in the BSR at regional level

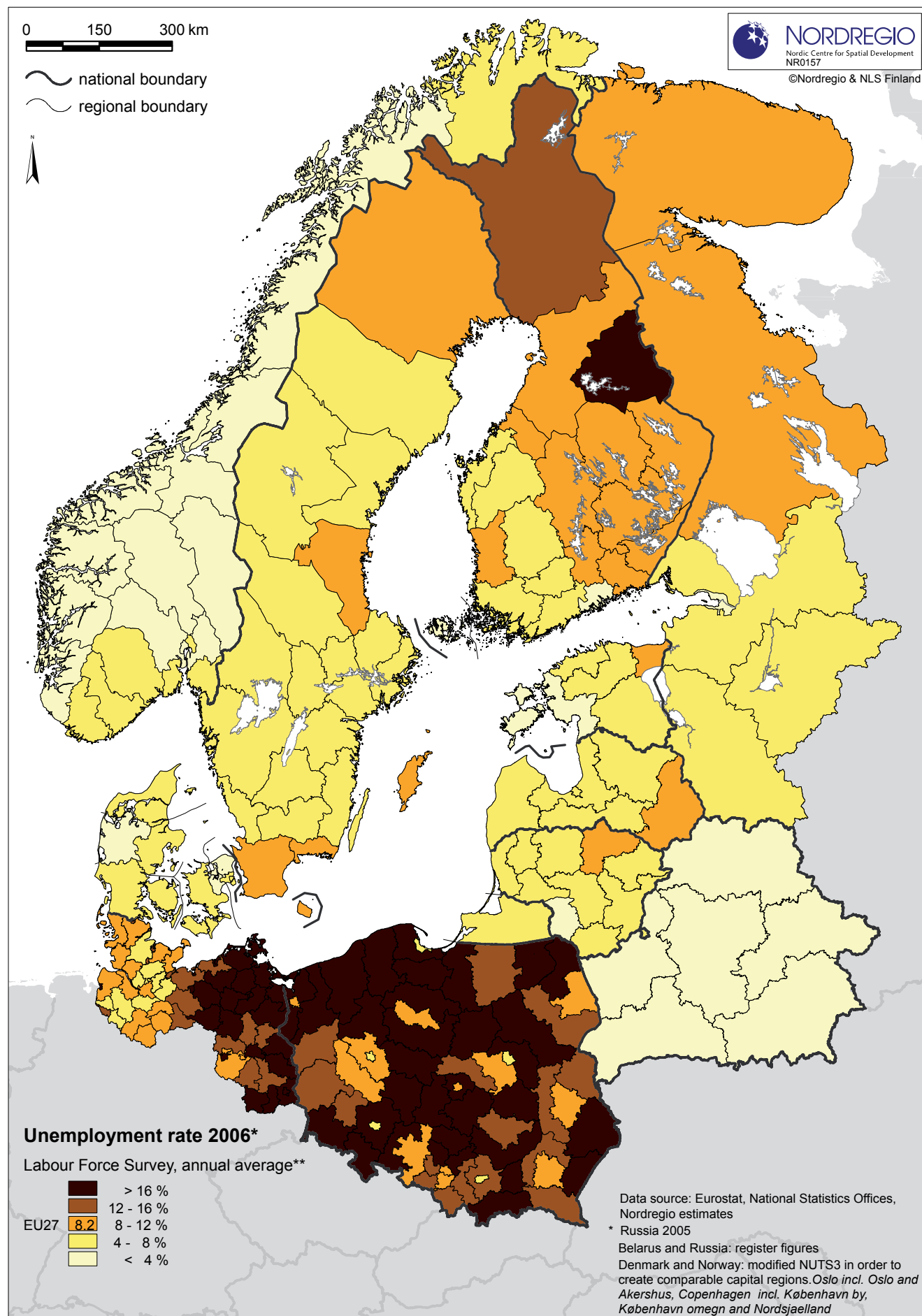
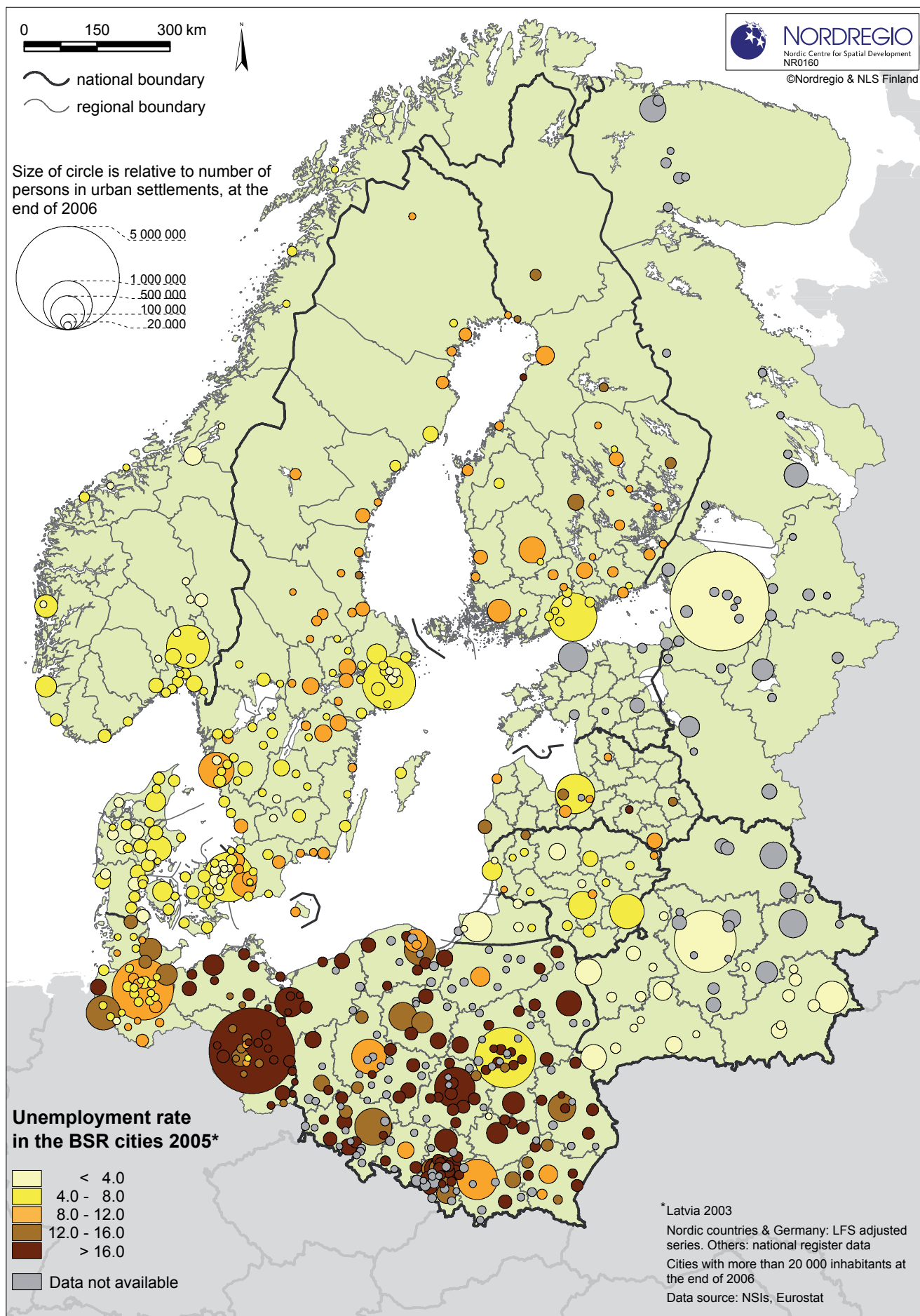


Figure 10: Unemployment rate in the BSR cities

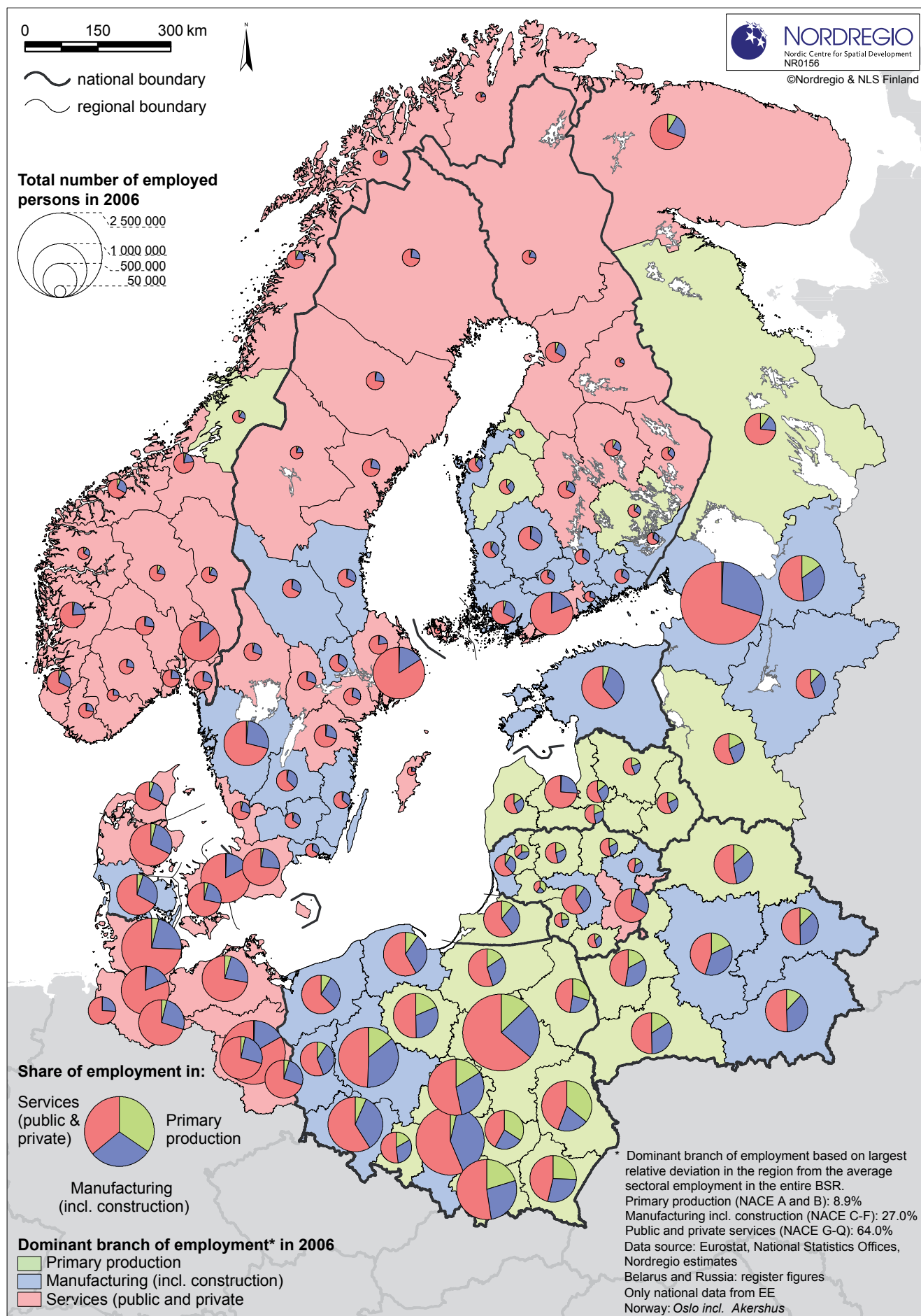


Finally, we looked at the share of the three basic employment branches (primary production, manufacturing and services). Figure 11 depicts the current (2006) employment structure across the entire region. The colours of the regions refer to the branch that has the largest relative deviation from the total BSR average employment structure, whereas (the slices in) the pie-diagrams show the absolute shares per main branch, as well as the total number of employed persons (size of pie). It is immediately very eye-catching that services (public and private) are the largest source of employment in all BSR regions. As is to be expected however there are national and of course regional differences here, which can be partly traced back to the varying degree of urbanisation (in general the higher the urbanisation rate, the higher the share of services), or the different regional development paths adopted in respect of certain agricultural or manufacturing products.

From the relative dominance of employment branches based on the largest regional deviation from the average sectoral employment in the BSR as a whole we can learn something about the relative degree of regional specialisation. Compared to the results obtained by Hanell/Neubauer (2005) utilising the same approach with data for 2001, 2002 and 2003, we can observe some slight differences. In Western Poland some regions are now increasingly dominated by manufacturing rather than by primary production as was the case previously. The same slight shift can be also observed for some regions in Eastern Lithuania and for one region in Eastern Belarus (Mogilev Oblast). The overall percentage for the entire BSR in respect of the share of employment in manufacturing has remained rath-

er stable (27.2% in 2006 compared to 27.0% in 2001, 2002 and 2003), while the percentage in respect of public and private services has increased (now 64.0%, up from 62.9% previously) while that of primary production has declined (from 9.9% to 8.9%). Regions, as identified in the report by Hanell/Neubauer (2005), previously dominated by manufacturing but which are now dominated by services are rarely to be found. Exceptions here include two Finish regions (Pohjois Pohjanmaa and Keski Suomi) located in the central and eastern part of the country and the northernmost region in NW Russia (Murmansk *Oblast*). It should also be noted here that, except for the Riga region, all other regions in Latvia seem now to be dominated by primary production, while previously they were, for the most part, dominated partly by manufacturing and partly by services (cf. Hanell/Neubauer 2005). This change is due to various technical reasons such as what is termed the statistical effect. As such, one needs to bear in mind that the use of different delimitations of regions and other data sources can have a significant distorting effect. The relative dominance of services in the sparsely populated areas in the Nordic Countries can best be explained by the relatively strong economic position of the public service sector which has long provided a significant alternative economic path to the weak development of manufacturing production and the minor standing of agricultural production due to the climatic pre-conditions in these areas. Nevertheless the map below provides a good indication of the state of the economic transformation process of many regions in the Eastern part of the BSR as they remain still, in relative terms, dominated by primary production.

Figure 11: Dominant branch of employment in the BSR at the regional level



3. The BSR's Metropolitan areas as potential drivers of spatial integration

In the academic literature as well as in corresponding policy documents, metropolitan areas are increasingly seen as playing a critical role in the global network economy. They are conceptualised as being central nodes in the space of multifarious flows as they offer the appropriate functional profile to take part in transnational flows of capital, commodities, knowledge, labour, tourists and cultural symbols and are thus key drivers of spatial integration (Castells 1996, Taylor 2004). Each of these processes helps to change our perception of such city-regions, from sub-national, bounded areas to nodes in global networks and to 'regional motors of the international economy' (Scott 1998).

The international competition to attract first-class technological, institutional, social and cultural infrastructures, creative people and transnational firms makes the increasing contrasts between different kinds of city-regions even more obvious. Indeed specifically those termed 'metropolitan areas' promise to be the main geographical centres of international territorial competition in the advanced economies. Their function as important 'hubs' with regard to, for example, the interaction of talents and their tacit knowledge, as control centres for financial assets and as the major points of origin for the generation of different kinds of innovations (i.e. social, cultural organisational, process-related or material innovations) is increasingly part of the political discourse.

Critical in this respect are the so-called metropolitan functions which can be seen as competitive assets in sustaining metropolitan areas' socio-economic performance in a globalising world. A total of at least three groups of metropolitan functions are roughly defined in the literature (cf. Korcelli-Olejniczak 2007, Blotevogel/Danielczyk 2008): (1) Decision and control, (2) innovation and knowledge (3) gateways to markets, people and cultural symbols. These functions are not limited to metropolitan areas alone, however, when they are combined and concentrated in a certain way, they can cross-fertilize and can thus become characteristic features of metropolitan areas (and specifically of their metropolitan cores).

As a consequence of this, the ambition within the EWW-project was to analyse whether, and to what extent, the BSR's metropolitan areas offer a critical mixture of different kinds of institutions, services, infrastructures or urban amenities. This was done in order to understand the extent to which they currently act as transnational nodes in the global network economy. Thus, the intention here has been to analyse BSR metropolitan areas as internationally-oriented centres of decision, control and innovation and as gateways to markets, people and cultural symbols. In this context we have attempted to discern how far the BSR's metropolitan areas are centres of regulative and economic power: i.e. how far flows of finance, goods and information can be controlled by organisations/institutions that are located there. Moreover, specifically metropolitan areas are, in general, competitive centres of innovation, knowledge and growth and as such are characterised by a high density of scientific and research facilities as well as by a high share of people working in knowledge-intensive jobs. With this in mind we have gathered together various datasets on research and development activities as well as on the different profiles and specific competences to be found in the BSR's metropolitan areas.

In order to assess its performance as an international gateway to markets, people and cultural symbols, we need to know more about the BSR's metropolitan areas' relative position in the international and intercontinental network of harbours, airports, high-speed railways and motorways. Those infrastructure assets not only ensure the accessibility of metropolitan areas (in both directions) in general, but also guarantee that knowledge, information and markets in such regions are exploitable. Finally, the (re-)production of collective symbols is also important, but is of course difficult to measure. It can be understood as an expression of the international character of a metropolitan area influencing the mental map of decision-makers, investors and of course tourists. As an initial attempt in this direction we considered the spatial distribution of UNESCO World heritage properties.

Selection of metropolitan areas in the BSR

In the framework of the ESPON 1.1.1 project on 'the role, specific situation and potentials of urban areas as nodes in a polycentric development' so-called Functional Urban Areas (FUAs) were defined and demarcated across Europe (Nordregio *et al* 2004). They can be characterised as travel-to-work areas, which means that they are in principal agglomerations of work places attracting the labour force from surrounding areas. If a certain share of the labour force in a defined fringe area are out-commuters it is attached to the municipality to which the largest portion of commuters goes. Due to statistical problems the concept of FUAs could not be applied with identical thresholds throughout Europe as such they are instead based on national experts' views using the same underlying notions (Antikainen 2005). Their further typology builds on the average scores of five features, namely, population, transport, industry, knowledge and decision-making which are then used to define three categories: Metropolitan European Growth Areas (MEGAs), Transnational/national FUAs and finally Regional/Local FUAs. The total number of functionally significant urban areas in Europe is 1595. 76 of these are MEGAs, 219 are transnational/national FUAs and 1312 are regional/local FUAs. For the following analysis on metropolitan areas we have used this selection of MEGAs for our study of metropolitan areas in the BSR.

Moreover, we have selected Kaliningrad, St. Petersburg and Minsk as further metropolitan areas of the BSR. Unfortunately, we could not use any advanced approaches to delimit Functional Urban Areas (neither provided by ESPON nor elsewhere) at the municipal level due to data shortcomings. Therefore we had to conceptualise those metropolitan areas belonging to the EU as covering one NUTS 3 region (exceptions here include the FUA's of Oslo and Copenhagen which cover two and three, respectively, NUTS 3 regions). We found it necessary also to use NUTS 2 data due to the lack of a better geographic resolution for such data. The metropolitan areas of Kaliningrad, St. Petersburg and Minsk were defined by the corresponding *oblasts* to which they are located.

The following map illustrates this selection for our study providing us with some indication of the critical mass located in the BSR metropolitan areas in terms of the total number of employed people, which unsurprisingly differs significantly due to the above mentioned variations in respect of defining the regional level across the BSR (and of course in the rest of Europe) (cf. Fig. 12). Even though such mass criteria do not necessarily reflect the actual performance of, or potential in, the one or other respect, they can nevertheless be of help here to relate some of the indicators that will be discussed below.

3.1 Metropolitan areas as international centres for decision and control

Viewing the BSR's metropolitan areas as nodes for political decision and control one can distinguish different location patterns in relation to the scope and character of the respective institution (cf. Fig. 13). BSR related political institutions are particularly located in Copenhagen, Stockholm, and Riga and to a lesser extent in Hamburg and Helsinki, whereas EU related institutions are present specifically in the three Nordic capital regions (Copenhagen, Stockholm and Helsinki) and also in Warsaw, while the latter seems to be the most important centre in respect of UN related institutions in the BSR. In this respect the metropolitan areas of Minsk, Hamburg and Copenhagen are also important locations. Unsurprisingly, St. Petersburg and Minsk are important locations for the Commonwealth of Independent States organisation (CIS) of the

former Soviet Republic. Other institutions of international scope are to be found exclusively in Kaliningrad, but also in St. Petersburg and Hamburg, whereas in Berlin none of those international organisations that have been analysed here are present (they are still located in the former capital city of Bonn located outside the BSR). Additionally, institutions belonging to the Nordic Council of Ministers are located in the four Nordic capital regions which belong to the BSR. In conclusion then, it is clear that the metropolitan area of Copenhagen contains the broadest representation of such international organisations while also having the most diversified profile in this respect, while St. Petersburg and Kaliningrad in particular are obviously more oriented towards their eastern hinterland than to the rest of the BSR.

Figure 12: Selected metropolitan areas for the following study

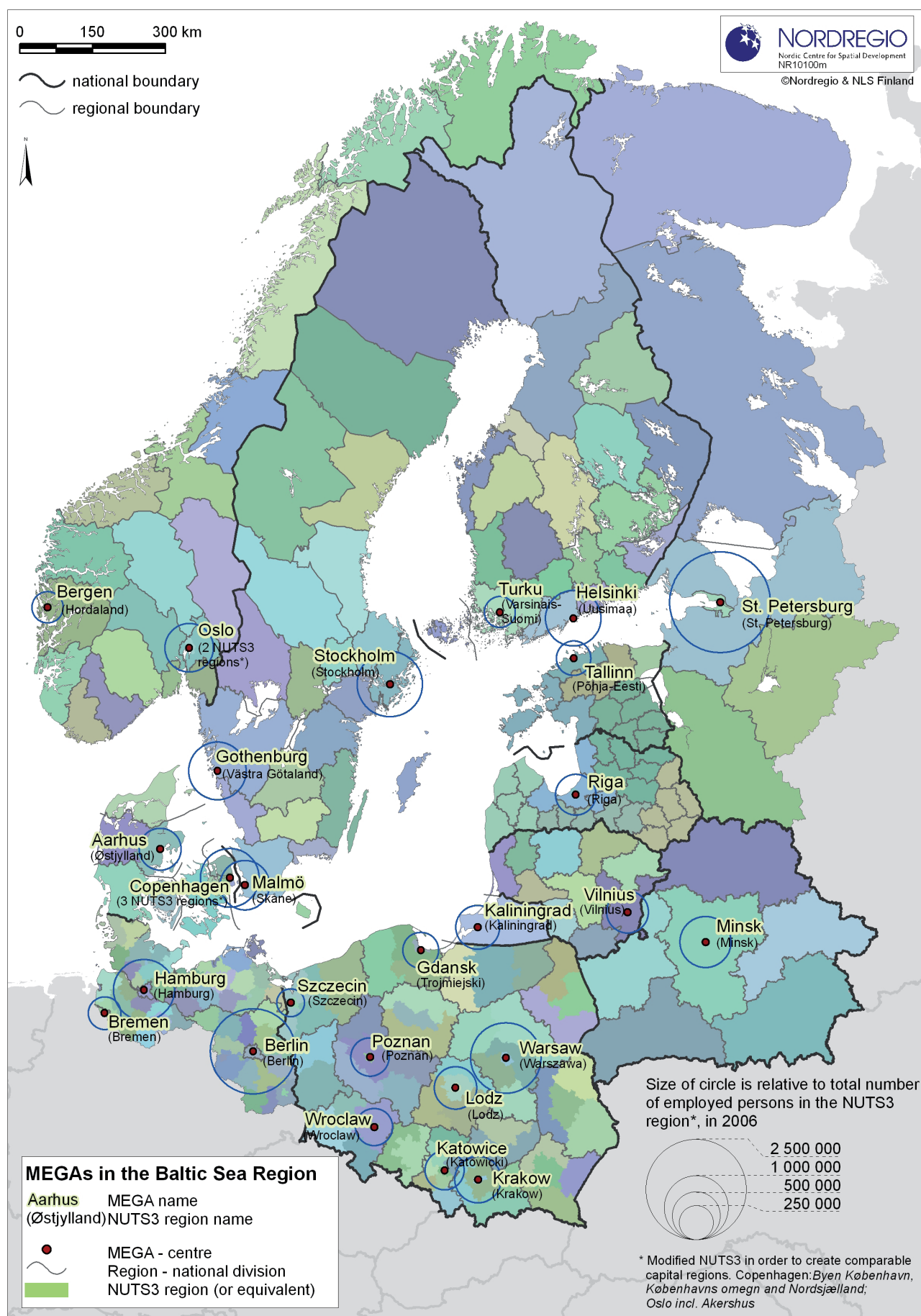
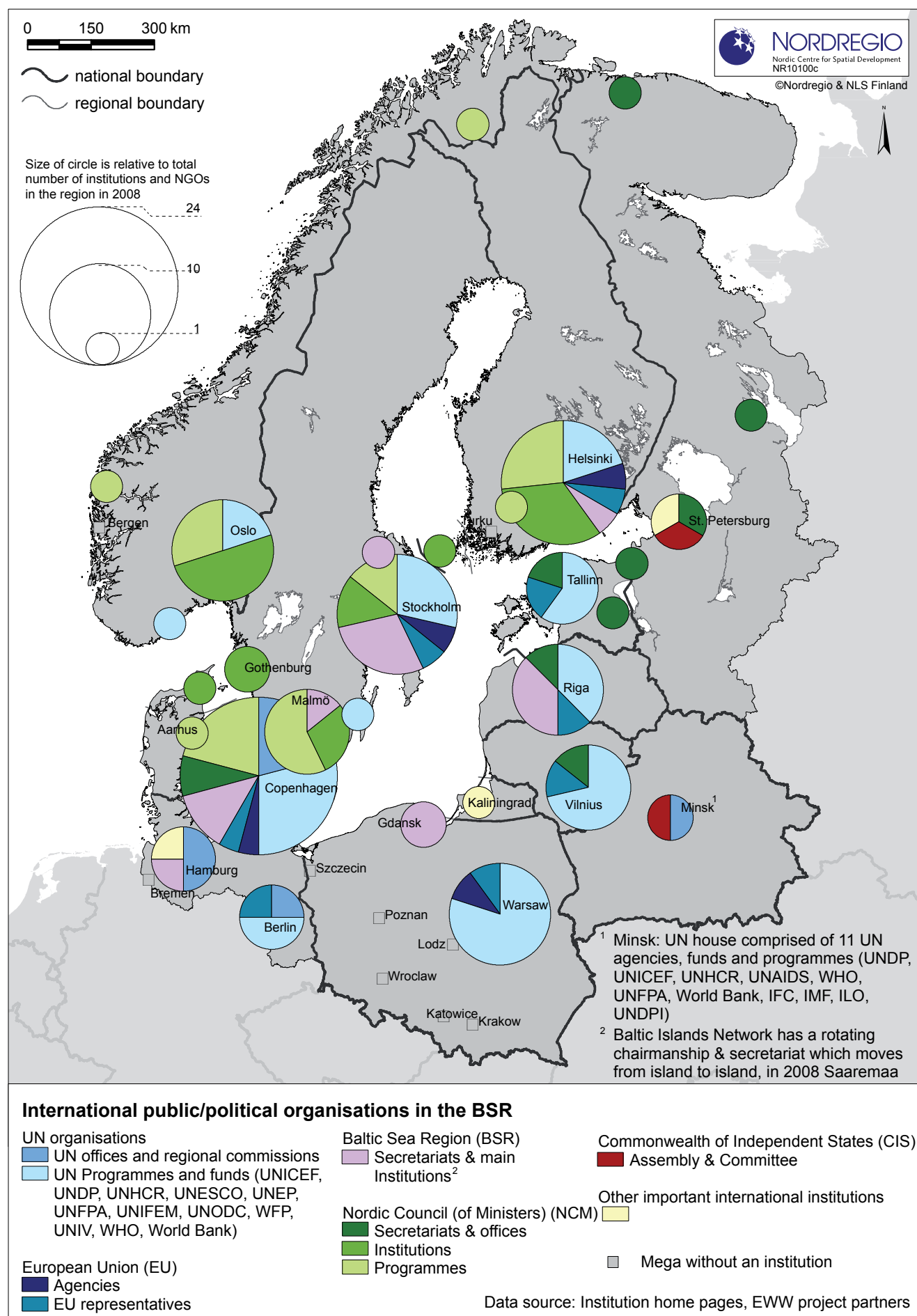


Figure 13: International public and political organisation in the BSR



Looking more closely at the surveys provided by international business magazines focusing on the market values and locations of the largest companies' headquarters enables us to gain a preliminary understanding of the BSR's metropolitan areas as centres of regulative economic power. Almost all, namely 24 out of the 25 largest com-

panies' headquarters in the BSR, by market value, are located in metropolitan areas (primarily the Nordic capitals cf. Table 3 and 4). Due to the enormous market value of the Russian *OAO Gazprom-neft*, St. Petersburg will soon become one of the most important decision centres in this respect.

Table 3: Largest companies in the BSR by market value in 2008

Top 25 companies	Industry	Location	Market value in €b
OAO Gazprom-neft	¹ Oil & Gas Operations	St Petersburg	199,41
Nokia	Technology Hardware & Equipment	Helsinki	94,68
StatoilHydro	Oil & Gas Operations	Stavanger	63,93
H&M Hennes & Mauritz	Retailing	Stockholm	30,43
A.P. Møller - Mærsk A	Transportation	Copenhagen	29,68
Novo Nordisk	Pharmaceuticals & Biotechnology	Copenhagen	27,72
Volvo Group	Capital Goods/ Industrial Engineering	Gothenburg	26,36
Nordea Bank	Banking	Stockholm	25,61
Fortum	Utilities/ electricity	Helsinki	24,24
TeliaSonera Group	Telecommunications Services	Stockholm	23,37
Telenor	Telecommunications Services	Oslo	22,61
LM Ericsson	Technology Hardware & Equip	Stockholm	22,44
Danske Bank Group	Banking	Copenhagen	17,11
VTB Bank	Banking	St Petersburg	16,83
Sandvik	Capital Goods/ Industrial Engineering	Sandviken	13,18
Beiersdorf	Household & Personal Products	Hamburg	13,17
DnB NOR	Diversified Financials	Oslo	12,79
Scania	Capital Goods	Stockholm	12,68
Atlas Copco	Capital Goods/ Industrial Engineering	Stockholm	12,47
Vestas Wind Systems	Capital Goods/ Industrial Engineering	Aarhus	12,39
Vattenfall Europe	Utilities	Berlin	11,82
PKO Bank Polski	Banking	Warsaw	11,78
Svenska Handelsbanken	Banking	Stockholm	11,39
Norsk Hydro	Conglomerates	Oslo	11,26
SEB-Skand Enskilda Bank	Banking	Stockholm	11,20
Top companies in remaining countries			
Eesti Telekom	Integrated Telecommunication Services	Tallinn	1,09
Rytø skirstomieji tinklai	Electric Utilities	Vilnius	0,68
Latvijas Gāze	Oil & Gas Storage & Transportation	Riga	0,41

Exchange rate 1\$ = 0.65 €

Source: Financial Times, Forbes, Omx Nordic exchange

¹ Headquarters currently in Moscow, will be moved to St Petersburg

Table 4: BSR headquarters of large international enterprises in 2007

Headquarters of enterprises on the FORBES "The World's 1000 Largest Public Companies"

Location	Companies in region in numbers	Total sales in bil €
<i>Denmark</i>		
Copenhagen	5	68,48
Aarhus	1	4,61
<i>Finland</i>		
Helsinki	8	103,74
<i>Germany (BSR part)</i>		
Berlin	3	14,51
Hamburg	1	5,23
<i>Norway</i>		
Oslo	6	49,38
Stavanger (not MEGA)	1	57,85
<i>Poland</i>		
Plock	1	11,81
Warszawa	2	5,46
<i>Russia (BSR part)</i>		
St. Petersburg	2	56,03
<i>Sweden</i>		
Gothenburg	2	34,59
Stockholm	12	135,86
Outside MEGAs	2	8,68

Source: FORBES

St. Petersburg including Gazprom

These tables of course simply represent the current location patterns of the largest companies in terms of market values or sales. Also the mere location of the headquarters of a large enterprise does not necessarily imply that the city in which the company is based is actually taking part in the global division of labour. Furthermore the historic industrial structure also biases such information in favour of countries with large enterprises, or large countries as such with large internal markets. Nonetheless on an aggregate level, it can provide rough clues to the urban geography of corporate decision-making. Here we can easily recognise that apart from St. Petersburg, the Nordic countries and the BSR part of Germany represent metropolitan areas where decision making power is much more concentrated as compared to e.g. Poland or the Baltic States.

In view of future potentials the existence of international banks and other financial services is critical in terms of better integrating the BSR into the global network economy and even more specifically in this context, in helping to integrate BSR-based firms in other BSR countries as international banks can ease the market entry of firms into the BSR by providing tailor-made information for cross-border investments. Through minimising e.g.

language and cultural barriers those banks can help to achieve a kind of 'institutional proximity' within the BSR (cf. Fig. 14).

The size of the circles is relative to the total number of banks and other financial services operating in the metropolitan area in 2008. With regard to other international banks, i.e. those which are not based in the BSR (e.g. US banks), it can be seen that their presence is very strong in St. Petersburg, Hamburg as well as in all national capital regions except for the Baltic States. In addition, the smaller BSR metropolitan areas such as Gothenburg, Bremen, Poznan, Katowice, Krakow, Wroclaw, Lodz and Gdansk show a high share of such international financial services. In the current context the blue coloured share of so-called 'non-domestic BSR banks' in each metropolitan area in particular is crucial. The existence of these financial services is fundamental in easing the market entry for e.g. companies based in one BSR country into another (except for those banks based in those parts of Russia and Germany which do not belong to the BSR, see below). Particularly in the capital regions, but also in St. Petersburg, as well as in Turku, Bergen, Aarhus and Lodz, this 'non-domestic BSR financial services' sector makes up a consider-

able share of the overall number of international banks. These types of actors are, however basically absent from Kaliningrad for instance. The third and fourth categories are dedicated to German and Russian financial service providers whose headquarters are based outside the BSR (e.g. in Moscow or in Frankfurt, cf. the orange and red coloured shares). Here it is interesting to note that these financial service providers are relatively strongly represented in Minsk, Oslo, Helsinki, and Warsaw, but not for instance in Kaliningrad and Berlin. The situation in Kaliningrad indicates a rather isolated picture, as only one bank from abroad (Sweden) is currently situated there. St. Petersburg, on the other hand, displays a wholly different profile as the relative share of these different categories is rather similar to the metropolitan areas of Stockholm or Helsinki.

To sum up, one can say that the metropolitan areas of Oslo, Stockholm, Hamburg, Berlin and Warsaw, as well as to some extent St. Petersburg and Minsk represent an overall profile that is basically dominated by 'non-BSR based international financial service providers'. In other words, they can be viewed as the central nodes in the servicing of financial assets originating outside the BSR (including Germany and Russia). At the same time they are, together with those explicitly mentioned above, the main centres of activity through which market entry for cross-border investments within the BSR is facilitated.

A different view of globalisation is presented in Figure 15 below in which the regional offices of four highly globalised accountancy firms have been mapped. These firms (*Deloitte, Ernst & Young, KPMG and PricewaterhouseCoopers*) were selected from various lists of top global service firms in light of their strong regional representation. All enterprises operating in the global arena do not necessarily have need of other international market services (e.g. advertising, banking & finance or law) on a regional basis as these functions are much more concentrated to a few global centres, whereas accounting services are usually de-

manded in physically close proximity to one's own activities. Furthermore, global business strategies in accounting are often based on buy-outs, mergers and partnership agreements between multinationals and small or medium-sized privately owned enterprises. As such, an examination here provides a useful picture of how global business services are now penetrating even the most provincial locations of the Baltic Sea Region.

Most of the BSR's metropolitan areas selected for this study, however, are the obvious hubs in this respect. Stockholm, Oslo and the Öresundregion concentrate most of those offices, while smaller BSR metropolitan areas such as Gdansk, Lodz or Minsk tend to be much more tenuously connected to these networks, while in Kaliningrad none one of these firms are present. The network of offices and/or partners of these four enterprises is at its densest primarily in Sweden and Denmark, but is also present in the other two Nordic countries (Finland and Norway). It is striking that the BSR part of Germany and highly polycentric Poland and Belarus however do not show the existence of a regional network outside the metropolitan areas. The same can be said for the Baltic States and NW-Russia.

The existence of comparable accounting standards is one obvious explanation for the Nordic over-representation here as the demand for such services is widespread. Other explanations include the relatively small size of the Nordic domestic markets, combined with a recent opening up of these markets to external competition, facilitating inward investment and the formation of enterprise networks. In the particular case of Sweden, the country's early economic internationalisation significantly affected the pattern. Germany on the other hand has a large domestic market and international competitors thus have greater difficulty in penetrating German home markets. Domestic competition may be stronger and the rationale for an extensive network of international accountancy firms weaker.

Figure 14: Financial services of international importance

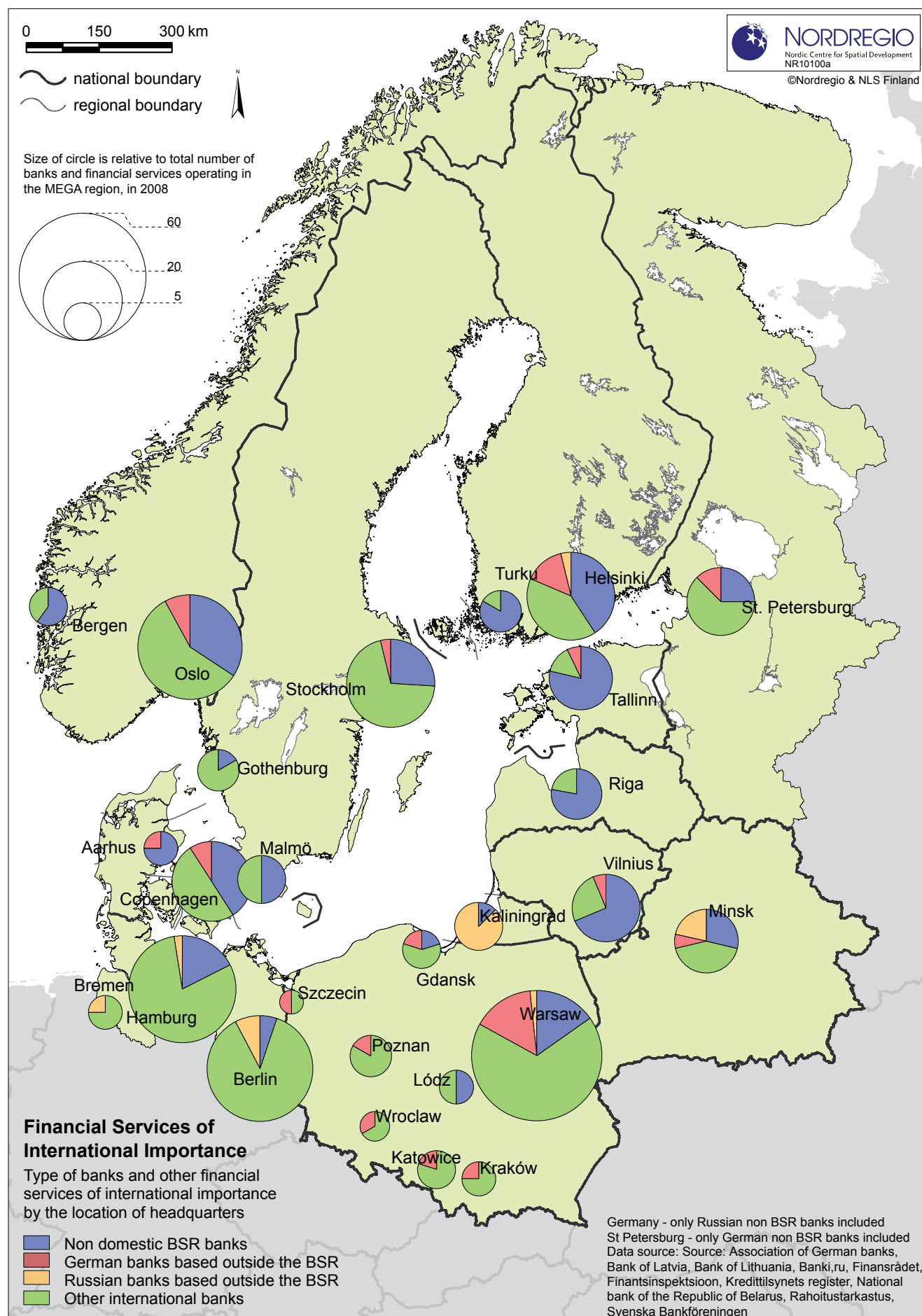


Figure 15: Regional network of global accountancy firms

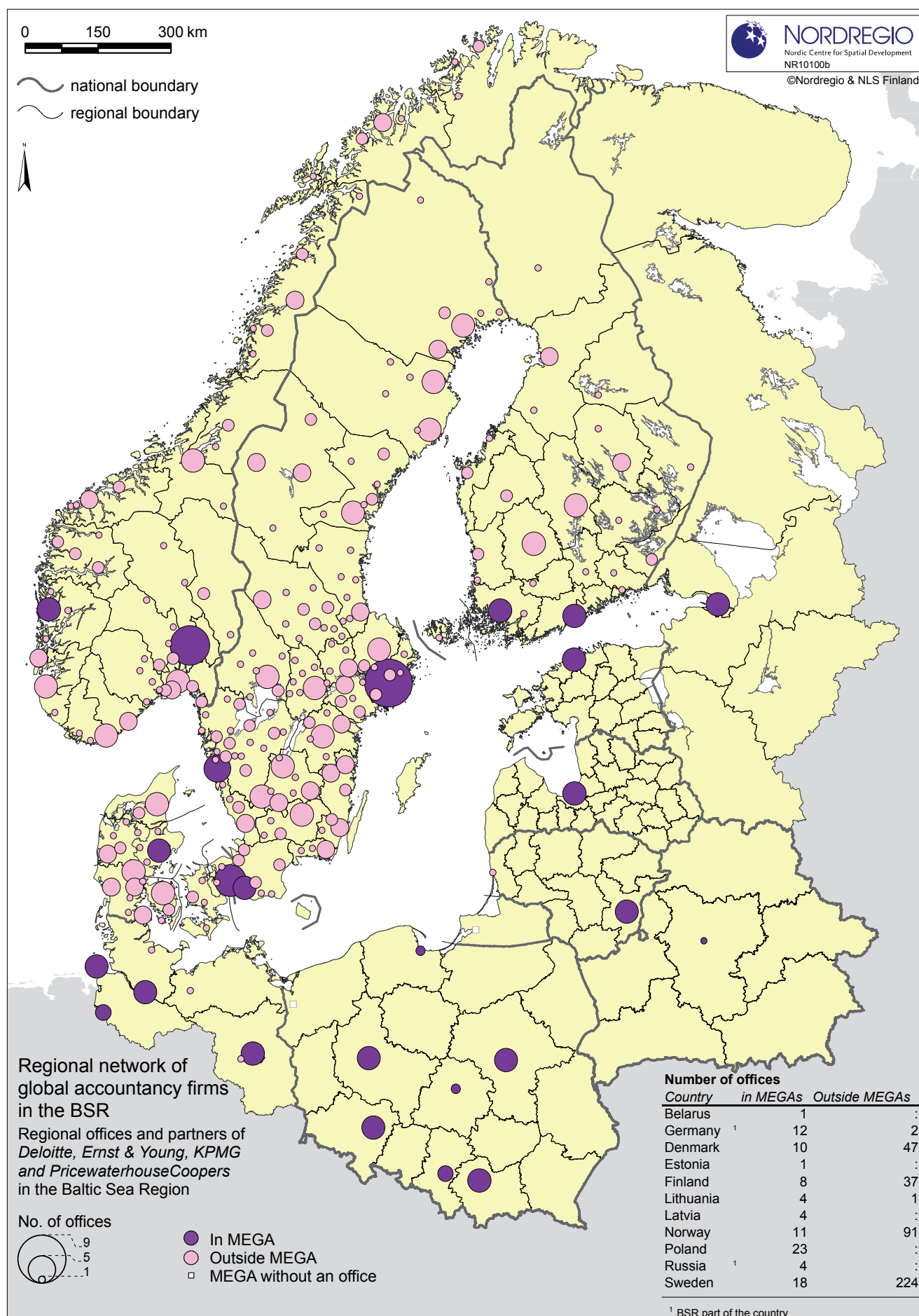


Table 5: Top 35 European Cities for Global Network Connectivities

Global network connectivity (all APS)		Banking/finance connectivity	
London	1.00	London	1.00
Paris	0.70	Paris	0.79
Milan	0.60	Frankfurt	0.70
Madrid	0.59	Madrid	0.69
Amsterdam	0.59	Milan	0.63
Frankfurt	0.57	Brussels	0.59
Brussels	0.56	Istanbul	0.55
Zurich	0.48	Amsterdam	0.54
Stockholm	0.44	Warsaw	0.53
Prague	0.43	Dusseldorf	0.51
Dublin	0.43	Moscow	0.50
Barcelona	0.43	Luxembourg	0.49
Moscow	0.42	Dublin	0.48
Istanbul	0.42	Zurich	0.46
Vienna	0.42	Athens	0.46
Warsaw	0.42	Berlin	0.45
Lisbon	0.41	Prague	0.44
Copenhagen	0.41	Hamburg	0.41
Budapest	0.41	Budapest	0.41
Hamburg	0.39	Munich	0.40
Munich	0.39	Geneva	0.40
Dusseldorf	0.39	Barcelona	0.35
Berlin	0.36	Rome	0.31
Rome	0.36	Lisbon	0.30
Athens	0.36	Stuttgart	0.28
Luxembourg	0.32	Stockholm	0.26
Oslo	0.32	Cologne	0.26
Geneva	0.31	Kiev	0.24
Helsinki	0.29	Bucharest	0.23
Stuttgart	0.27	Vienna	0.23
Rotterdam	0.27	Antwerp	0.20
Bucharest	0.25	St Petersburg	0.19
Cologne	0.24	Bilbao	0.19
Lyon	0.24	Rotterdam	0.19
Antwerp	0.24	Oslo	0.18

Source: Taylor (2003)

Global interconnectivity through intra-firm office networks

In addition to this rather static approach, namely, measuring demand and control functions with attribute data, the Globalization and World Cities Study Group and Network based at Loughborough University in the United Kingdom (GaWC) has moved one step further towards an understanding of global and/or European hierarchies and relations between cities and regions. Based on the information of the internal structure of office locations of larger advanced producer services (APS), expressed by the relationship between head offices and other office locations of the same company (so-called intra-firm networks), GaWC has calculated indices on the global 'inter-connectivity' of cities (cf. Taylor 2004).

The most inter-connected city in global terms - the city that is most embedded in the international office location-strategies of APS-firms - is London, with New York second, Tokyo third and Paris fourth. For further comparisons the calculated connectivity indices for other cities in the world have been related to the value for London. In Table 5 the top 35 European cities are ranked according to their global network connectivities. On the left hand side the values are related to all APS sub-sectors, on the right hand side the banking/finance-sector is picked out separately. Regarding the former, Stockholm, in comparison to the other BSR metropolitan areas is best placed (no. 9 in Europe), followed by Warsaw (no. 16), Copenhagen (no. 18), Hamburg (no. 20), Berlin (no. 23), Oslo (no. 27) and finally Helsinki (no. 29). It is perhaps however, more inter-

esting to focus on single APS sub-sectors such as banking and finance. Here Copenhagen disappears from the European top 35 list. Apparently, those APS-firms that are located in Copenhagen serve the regional and/or national market, but are not of international importance in comparison with those located in Warsaw (no. 9 in Europe), Berlin (no. 16) or St. Petersburg (no. 32). This picture corresponds for the most part to the attribute data as presented in Fig. 14.

Looking at the global connectivity of other sectors or fields of activities concentrated in metropolitan areas the resulting rankings are rather different. Krätke/Taylor (2004) produced a study on global media firms using the same methodology. Due to the locational preferences of those firms European cities show a much higher level of connectivity in this respect in comparison with cities in the United States, which tend to be more strongly interconnected in terms of APS-firms. However, Stockholm, Copenhagen, Oslo and Warsaw seem to be the top locations for those firms as they rank no. 9, 10, 16, and 22 on the 'global' connectivity list (cf. Table 6). With the help of the same methodology Taylor (2003) also analysed the network connectivities of Non-Governmental Organisations (NGOs). Here Copenhagen is the only larger metropolitan area belonging to the Baltic Sea Region to be found among the top 25 in the world. In other terms Copenhagen shows a higher connectivity in this respect than e.g. Stockholm or Warsaw, which corresponds to the attribute data assembled and illustrated in Fig. 13.

Table 6: 'Global' connectivities - European Cities in the World Top 25

APS network connectivity	Bank network connectivity	Media network connectivity	NGO network connectivity
London (1) Paris (4) Milan (8) Madrid (11) Amsterdam (12) Frankfurt (14) Brussels (15) Zurich (19)	London (1) Paris (6) Frankfurt (7) Madrid (8) Milan (11) Brussels (19) Istanbul (21) Amsterdam (24) Warsaw (25)	London (1) Paris (3) Milan (5) Madrid (6) Amsterdam (7) Stockholm (9) Copenhagen (10) Barcelona (13) Zurich (14) Vienna (15) Oslo (16) Prague (17) Brussels (19) Budapest (21) Warsaw (22) Lisbon (23)	Brussels (2) London (4) Geneva (9) Moscow (10) Rome (18) Copenhagen (24)

Source: Taylor (2003), Krätke/Taylor 2004

3.2 Metropolitan areas as international centres for innovation, research and development

In advanced economies the generation of knowledge and its application to various services, products and processes is a critical factor in measuring a city-region's competitiveness. In so doing, however, we nevertheless continue to face a number of methodological problems. Primarily we have to cope with the limited availability of reliable data. Secondly we have to distinguish between input and output variables. Thirdly, we do not know enough about the geographical logic of knowledge, i.e. it is very difficult for instance to distinguish between the places of innovation (products and processes or social and organisational innovations) and the places where they are applied. We need also to differentiate between facilities that can support the production of knowledge (firms and their laboratories, universities etc.) and the spatial mobility of knowledge carriers. The latter is related to the idea that not all knowledge can be codified in books or via the internet. The higher the level of complexity, the higher the importance of the tacit knowledge embodied in the minds of people and which is difficult to transfer in a standardised way. Due to the growing importance of tacit knowledge, face-to-face contacts remain fundamental in rendering this knowledge accessible. In what follows, and with such restrictions in mind, we will now address these issues in relation to the BSR metropolitan areas.

An indicator that is often used to analyse the regional potential to generate knowledge is the number of postgraduate students as a share of all tertiary level students belonging to levels 5 and 6¹ of the International Standard Classification of Education (ISCED) designed by the UNESCO (cf. Fig. 16). What is striking are the high numbers and high share of those students (related to all tertiary levels) in the Polish metropolitan areas. Obviously there are a number of attractive research facilities here which are able to hold or even attract qualified persons. Other eye-catching centres in the BSR are St. Petersburg and Stockholm, whereas the Finnish metropolitan areas of Turku and Helsinki show lower overall numbers, but a high share of postgraduate students compared to all tertiary level students. Compared to their overall size as working places the absolute numbers of Warsaw in particular but also Minsk, Vilnius and to some extent even Riga are relatively high, whereas the overall numbers for Hamburg, Copenhagen and Oslo are rather low in this respect.

It must be noted however, that relatively high overall numbers or a high share of those postgraduate students

can be viewed as a regional competitive asset only insofar as the region manages to hold on to and successfully utilise them, i.e. minimizing the 'brain drain' to other regions after they have completed their studies. In addition, it is also essential in terms of whether a (metropolitan) area (or city in general) manages to attract creative people. This argument can be linked to the work of Florida (2002, 2005) who has criticised mainstream regional policies insofar as they remain overly focussed on input factors (e.g. facilities, infrastructures etc.) thus omitting to properly address the needs and demands of the so-called 'creative class'. He argues that creative people (i.e. those currently working in jobs that demand a certain degree of creativity) prefer cities that are multi-cultural, open-minded and diverse. Such 'locational preferences' challenge mainstream policy-making and planning as other aspects generally gain more attention.

Looking at the numbers of employees in three R&D oriented branches we can verify most of the statements made above. Here again the Polish metropolitan areas show a strong share in the higher education sector, but a rather low one in the other two branches (Business and Government sector) (cf. Fig. 17). It is, in general, interesting that the higher education sector is more strongly represented in the Eastern BSR metropolitan areas than in the western ones where the share of R&D related employees in the Business enterprise sector is much stronger than in Eastern BSR metropolitan areas.

This rather roughly sketched picture for the BSR can be complemented by looking at the profiles of the larger public and private research centres. For this purpose 12 areas of competence were defined following the overall 'themes' of the ongoing 7th European Research Framework Programme. The 'larger' research institutions (more than 50 employees) located in the BSR metropolitan areas have been grouped correspondingly in order to get an idea of the degree of specialisation versus diversification. As a general rule one can say that the larger the metropolitan area is, the more diversified is the aggregated overall profile of the located research centres. The Nordic capital regions of Oslo, Stockholm and Helsinki hold a broad spectrum of such larger research facilities in all 12 selected areas of competence. Other metropolitan areas with a relatively diversified structure (at least 9 areas are covered) are Minsk, Berlin, Vilnius, and Warsaw. Notwithstanding its comparably small size (in terms of overall employees in R&D oriented branches, cf. Fig. 18) the profile of Vilnius, and to some extent also those of Katowice and Poznan can also be viewed as rather diversified.

¹ Level 5: First Stage of Tertiary Education (not leading directly to an advanced research qualification); Level 6: Second Stage of Tertiary Education (leading to an advanced research qualification).

Figure 16: Tertiary level education

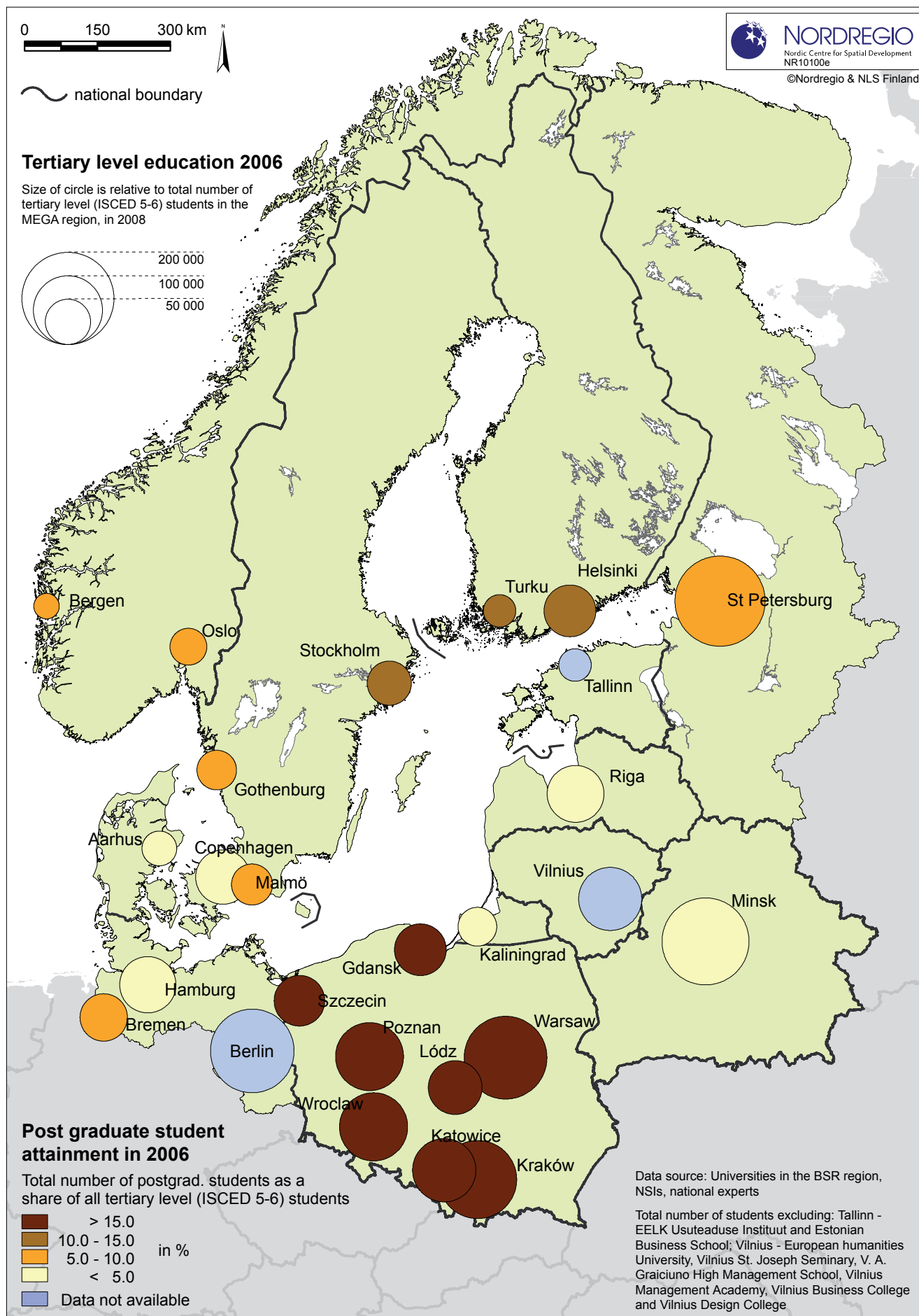
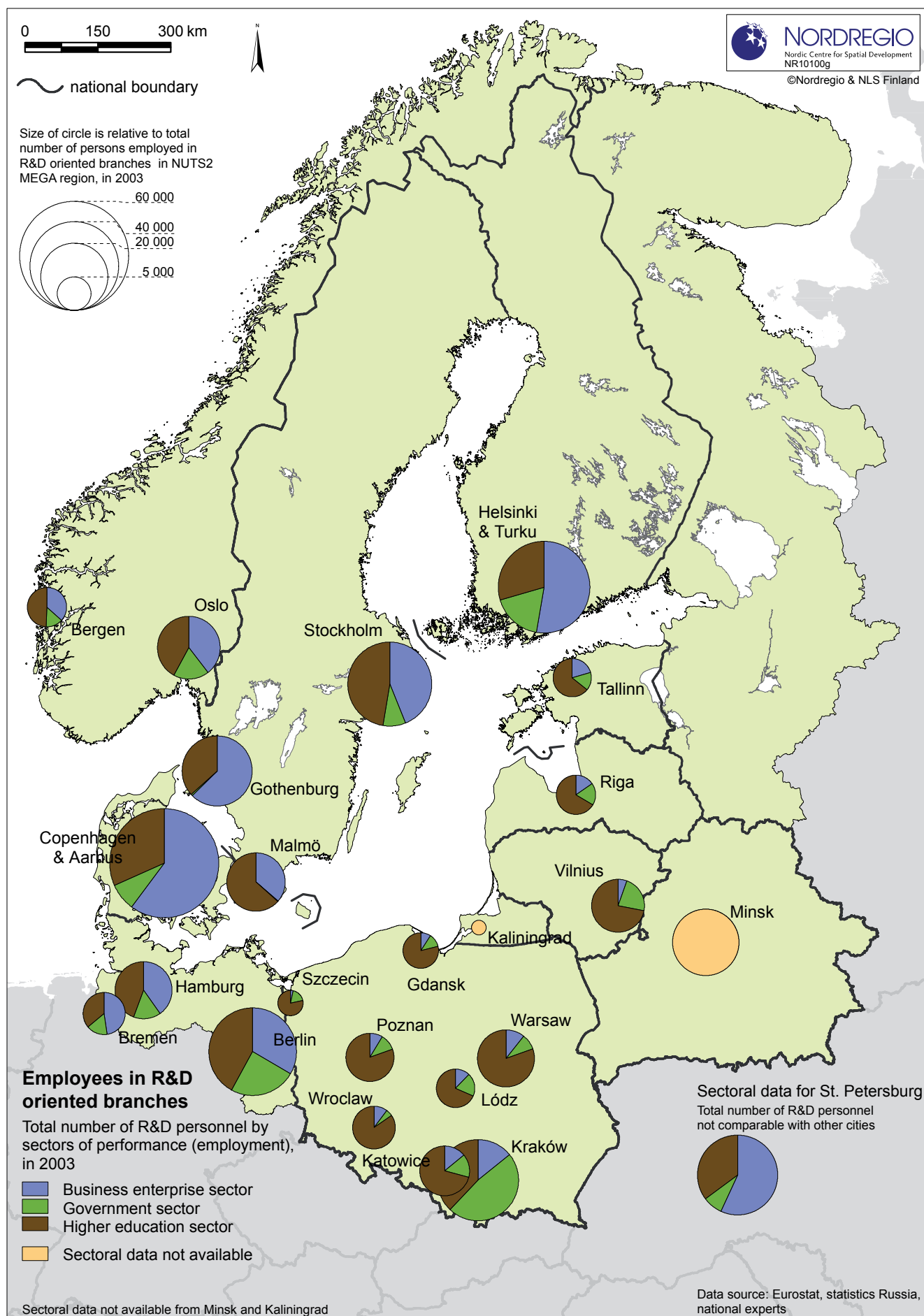


Figure 17: Employees in R&D oriented branches



Less diversified centres such as St. Petersburg, Bergen or Malmö do however show a high critical mass in some specific research fields. This is also worth mentioning as a more or less diversified profile does not say anything about the quality or even performance of the research activities actually taking place. On the contrary it can be interpreted as a sign of high specialisation in the one or other field. Hence the following chart can best be used or understood as a tool informing researchers of how to look for potential co-operation opportunities in other BSR metropolitan areas as much as it is a commentary on the fact that research is increasingly performed in transnational project consortiums. Specifically the following areas of competence are represented in almost every BSR metropolitan area by larger research institutions, implying perhaps that these areas hold the strongest potentials to build up pan-Baltic collaborations: a) Health; b) Natural Sciences; c) Food, Agriculture and Fisheries, and Biotechnology; and finally d) Nanosciences &-technologies, Materials and new Production Technologies (cf. Fig. 18).

The following two maps (cf. Fig 19 and 20) provide further insights into the BSR metropolitan areas' labour markets as centres for highly skilled people, innovation and development. When comparing the numbers of employees in technologically-oriented branches with employees in knowledge intensive services the differences in the overall development paths between eastern and western metropolitan areas can easily be discerned. The latter do show relatively higher overall numbers in knowledge intensive services than in technologically-oriented branches. Regarding the eastern BSR metropolitan areas one can however state the opposite. In most cases there the relative share of people working in 'high' and 'medium high tech'

manufacturing is lower compared to most of the western BSR metropolitan areas. Compared to the other Eastern BSR metropolitan areas the high share of high-technology services in St. Petersburg is remarkable, which might be connected with the relative dominance of research centres in this field there (cf. Fig 18, here: Nanosciences &-technologies, Materials and new Production Technologies). Finally, when interpreting figures 17, 19 and 20, one should bear in mind that we had to use data here at Nuts 2 level, which covers for instance each Baltic country in its entirety as well as comparably large areas in most of the other countries (in particular in Poland and the Nordic countries).

Figure 18: Research centres of excellence (public and private)

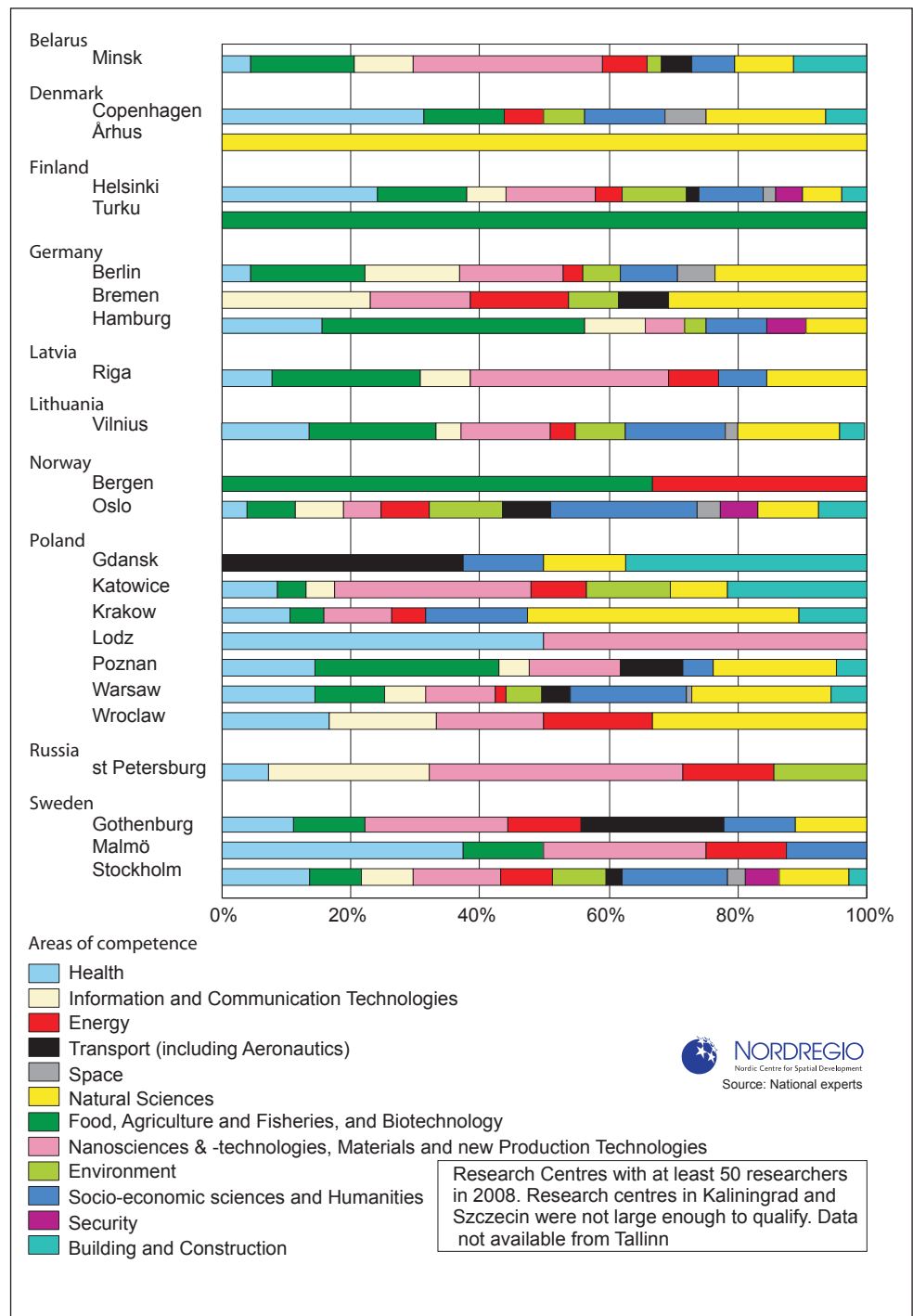


Figure 19: Employees in technologically-oriented branches

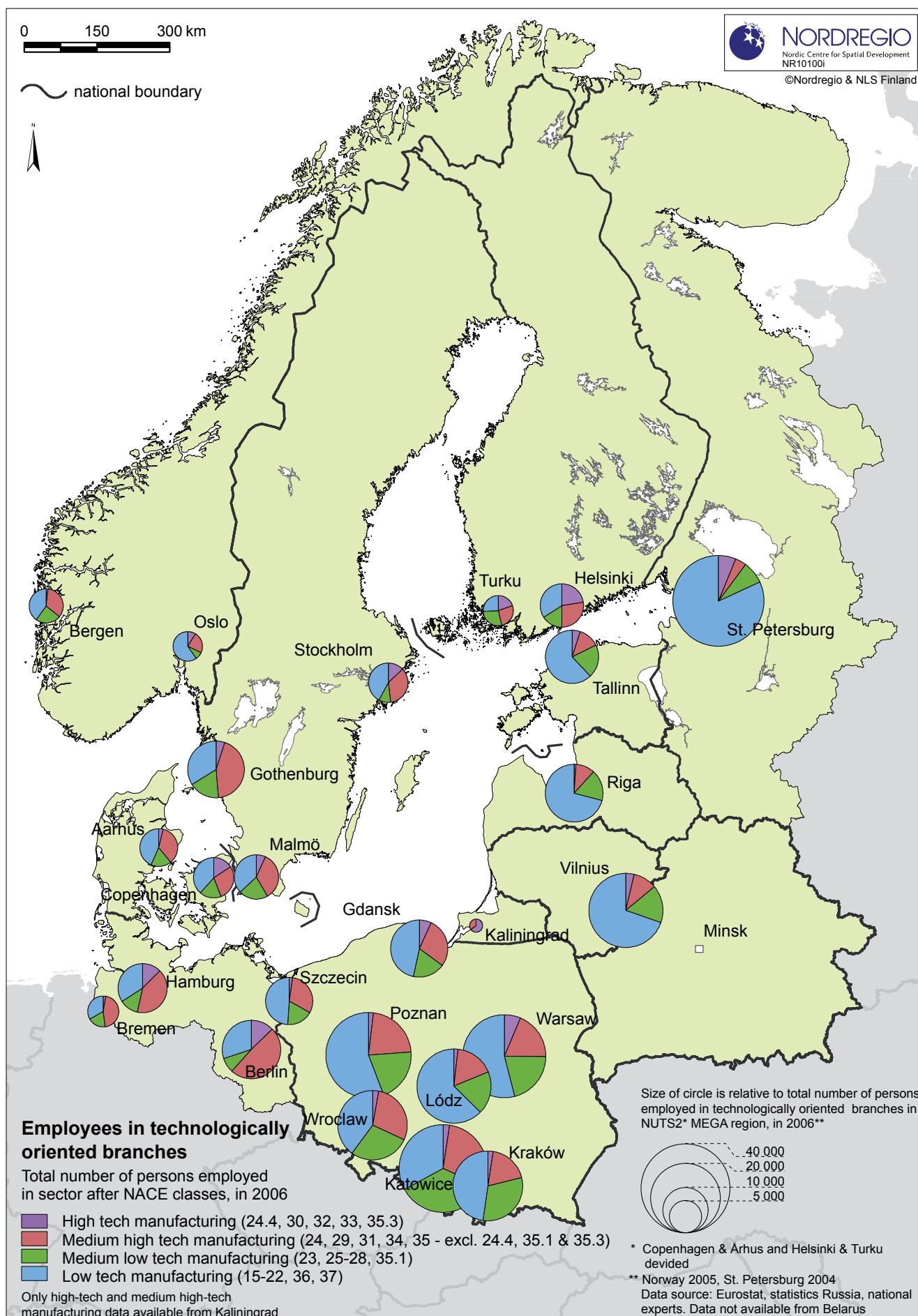
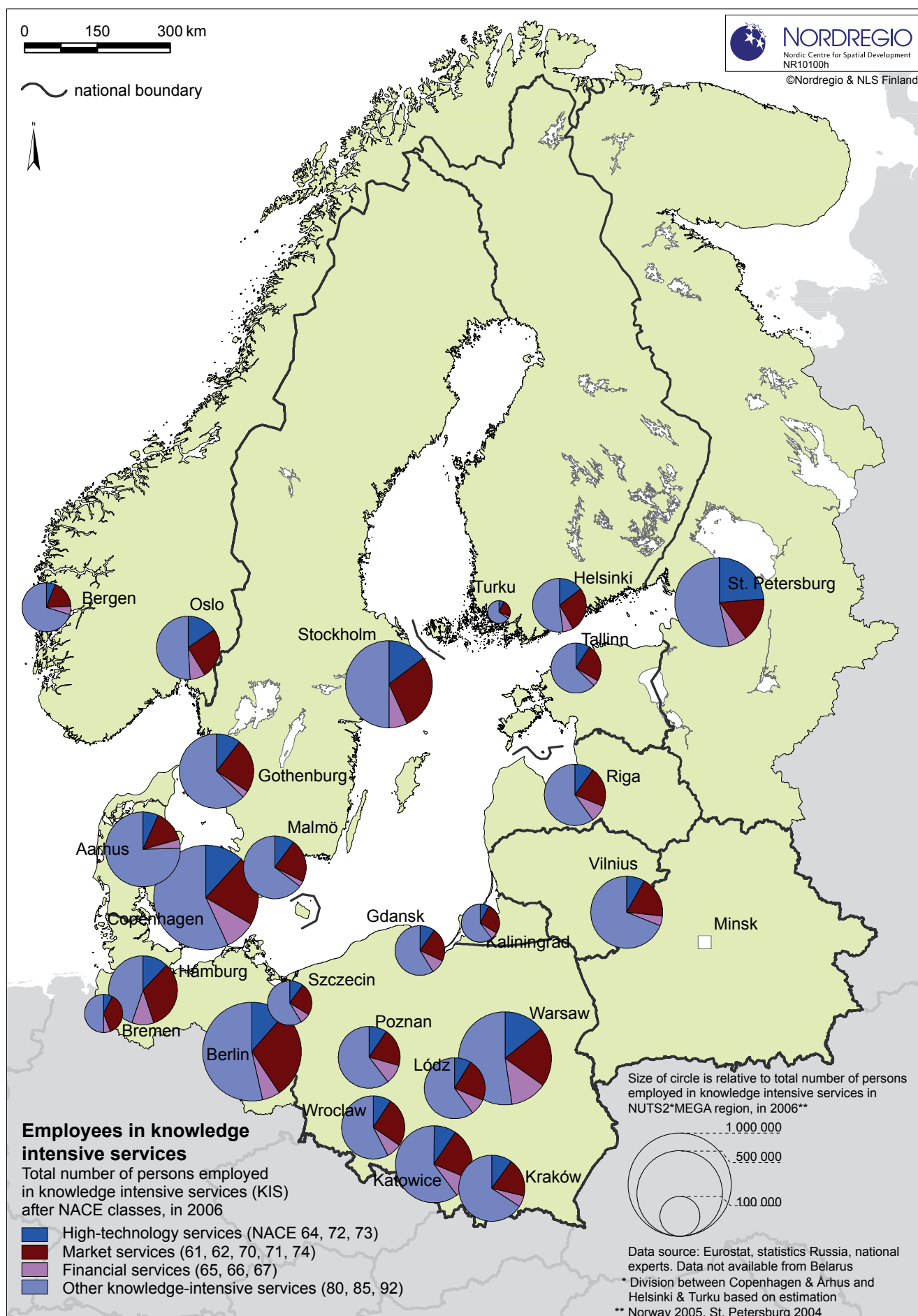


Figure 20: Employees in knowledge intensive services (KIS)



Finally we have consulted data on patent applications. Normally such data is used in this context to measure a region's inventive performance. Here we have collected data provided by the European Patent Office (EPO), by sector, at the NUTS 2 level to reflect the 'region's ambition' to exploit knowledge for the European market as an indicator of the degree of spatial integration at the EU-level (cf. Fig. 21). In so doing, one needs to bear in mind the fact that not every kind of innovation (i.e. social, cultural organisational, process-related or material) is perceived as being required to be registered at national and/or international patent offices. The specific value of registered patents in general is rather to secure intellectual property rights. For this reason, data on patent applications tells us something about the applicant's purpose in seeking to obtain this legal security. This also means that this data does not say anything specific about the applicability of the innovation at hand in e.g. 'new' and 'successful' products, processes or services, nor does it say anything about the level of regional innovative performance as applications to national and/or global patent offices are neglected here.²

Unfortunately corresponding data is not available for NW Russia and Belarus. Nevertheless what we can learn from this data is that significant differences exist between Western and Eastern metropolitan areas, as most of the western BSR metropolitan areas apply for patents in much higher numbers at the European level than do Eastern regions. As no more recent data is currently available, we had to use data from 2003, a period before the entry of the Baltic States and Poland to the EU. This may be one explanation of the sharp differentials alluded to above, which do not correspond at all to the comparatively small differences discussed above in connection with the other indicators in this respect (cf. Figs. 16, 17, 19, and 20). In other words this discrepancy cannot necessarily be traced back to the metropolitan areas' innovative performances³, but is

perhaps due rather more to a difference in attitude or culture (as of 2003) in respect of ensuring the defence of intellectual property rights. Obviously political stability, the degree of domestic market openness and the geographical limitations of the European single market have a significant influence on these numbers. It is also obviously the case that the existence of an embedded legal cultural norm ensuring the protection of intellectual property rights at the international level has a profound impact on the actual numbers of patent applications submitted. In the future then the existence of a robust and reliable system of intellectual property rights will undoubtedly play a crucial role in view of the likely continuing spatial integration within the BSR and beyond.

As noted previously, corresponding data which is at least comparable is not, unfortunately, available for Russia and Belarus. In order then to gain at least a basic idea of the sectoral profiles regarding patents applications in these countries, the following figure illustrates the available data based on national statistics. The overall numbers of sectors are as numerous as in the other BSR metropolitan areas. Much more striking however is the, relatively speaking, strong performance with regard to mechanical engineering in Kaliningrad, and, in comparison with the others (cf. Fig. 22), the total absence of patent applications in the field of 'fixed constructions' in the two Russian metropolitan areas, which can also be observed for the three Baltic metropolitan areas (Tallinn, Riga and Vilnius). In general one can say that the sectoral profiles nevertheless display a very competitive picture in respect of the BSR, showing that most of the metropolitan areas are innovative in the same sectors. Again, as stressed concerning the profiles of larger research centres of excellence, one can best interpret such a map as a valuable guide to future knowledge-intensive transnational co-operations between public institutions and firms.

² Global data as provided by the World Intellectual Property Organisation (WIPO), a specialized agency of the United Nations, refers only to the national level and thus allows for no regional differentiations.

³ Here one needs also to bear in mind that each of the Baltic States covers one single NUTS 2 region as well as for instance that Copenhagen and Aarhus are merged into one extremely large region. The same can be said for Stockholm, which also includes here, for instance, the university city of Uppsala.

Figure 21: Patents applications to the European Patent Office (EPO)

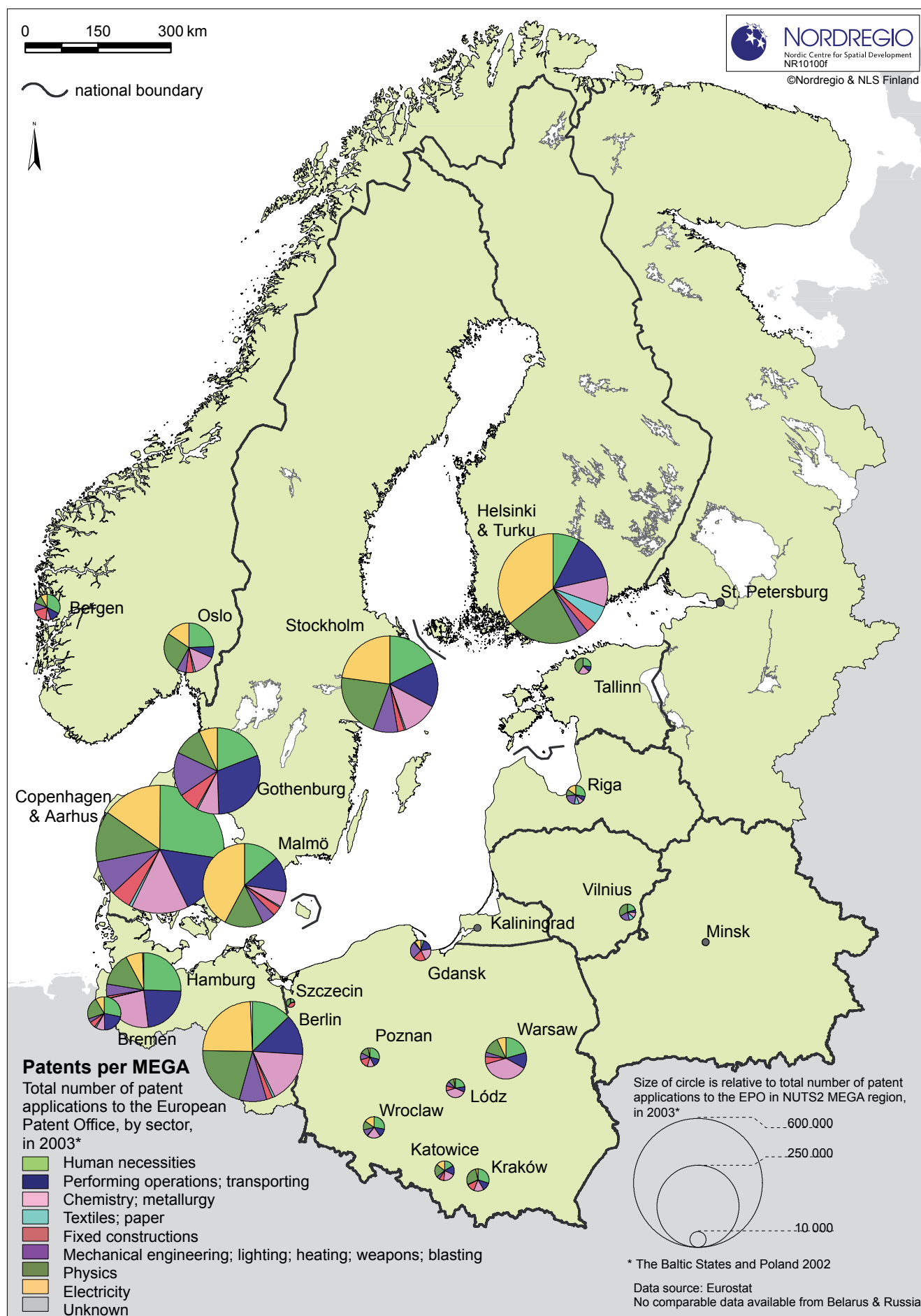
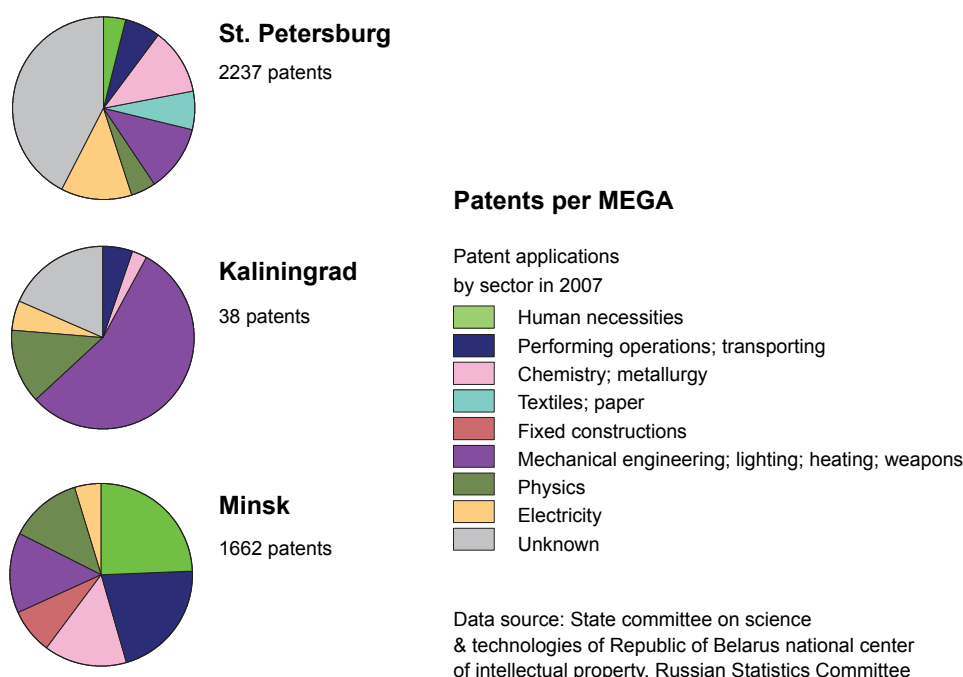


Figure 22: Sectoral profile of patents applications in Kaliningrad, Minsk and St. Petersburg based on national data



3.3 Metropolitan areas as collective symbols and as gateways to markets and people

The functioning of the BSR metropolitan areas as gateways to knowledge, people and as collective symbols is for the most part dependent on the region's relative position in the international network of air- and seaports, high-speed railways, motorways, and telecommunication systems. In the following we only focus on the BSR's external air connections (i.e. with other European and global destinations). Further aspects of the more BSR-related transport networks will be discussed in chapter 4.

From a global perspective it is obvious that none of the BSR metropolitan areas have thus far developed a dense, global air transport network that is comparable to those established, for instance, in London, Paris, Frankfurt or Amsterdam. Not even Copenhagen, which holds the largest passenger and cargo airport in the BSR can be considered a central hub for global connections. The current global hub and spoke system is not only shaped by e.g. the infrastructural endowments and market sizes of regions, but also by the specific strategies and capacities of the various airlines involved. Thus, even if the one or other airport would expand its capacities in order to better connect the BSR with other global markets, it is important to bear in mind that the exploitation of those potentials ultimately remains dependent on individual airlines' strategies. Such strategies are of course driven by the rules of supply-and-demand, which means that it is unlikely, in this era of air

transport liberalisation, that companies pursue the exploitation of unprofitable air links.

As changes to strategic decisions like these are difficult to foresee and given that the current pattern of global air transport has been developed over decades, the main issue at stake here relates to the capacity of BSR airports to develop complementary networks in order to improve their overall connectivity and embeddedness. Indeed the internal integration of the BSR and its integration into international networks are closely related themes.

The following two maps indicate the most important destinations in both Europe and the world that can be reached from BSR airports. As for European connections, there are no surprises: airports situated in north-western Europe are the most popular destinations. London, Paris, Frankfurt, Amsterdam, Brussels, Düsseldorf, Zurich, Milan and Vienna are the main nodes to which many BSR airports are intensively connected, i.e. with more than 125 weekly flights. This highlights the importance of these metropolitan areas as highly internationalised European centres. Destinations in southern Europe are also privileged however though this is in the main due to their attractiveness as tourist destinations.

Another interesting feature revealed in Figure 23 is the strong relationship exhibited between airports on the Eastern shore of the Baltic Sea (St. Petersburg, Kaliningrad,

Figure 23: Air travel connections between BSR metropolitan areas, EU BSR metropolitan areas and neighbouring countries, (spring 2008)

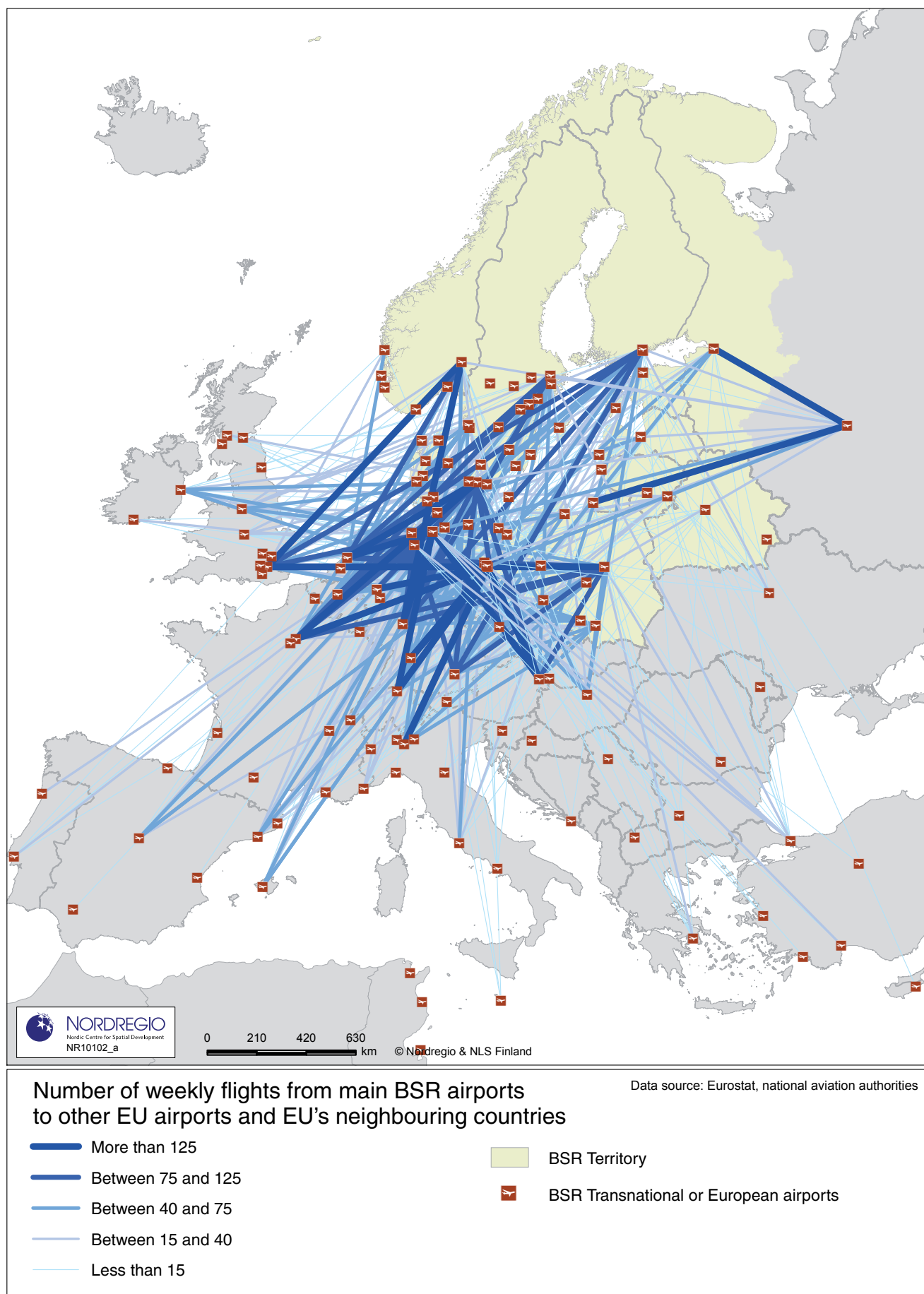


Figure 24: Major flight frequencies between BSR metropolitan areas and international destinations (outside EU and BSR), (spring 2008)



Riga, Tallinn, Warsaw, and Minsk) with major destinations in non-BSR Russia and other Ukrainian locations. Indeed, on average, Kaliningrad and St. Petersburg have more than 125 weekly connections with Moscow. Clearly, it appears that the different parts of the Baltic Sea Region have developed their strong relational networks in line with historical, cultural and geo-political developments. Hence St. Petersburg and partly even Kaliningrad act as main BSR gateways for destinations in the non-BSR part of the Russian Federation as well as in Central Asia and the Caucasus (Kazakhstan, Uzbekistan, Armenia, Georgia, etc.). On the other hand it is obvious that the air travel network originating in the BSR is rather dense in relation to a number of destinations, but practically non-existent for many parts of the world. Indeed, there are very few connections to (relatively) large established markets, such as Canada, Australia and Japan, or emerging markets such as Latin America and India and almost no direct connections to Africa (cf. Fig. 24). Consequently, one can characterise the global networking of air travel from the BSR as specialised. In order to reach other destinations, connecting flights to other larger European airports such as London, Paris, Frankfurt or Amsterdam must generally be used.

The main global destinations accessible from BSR airports can be separated into three main geographical group-

ings. First of all, New York is a privileged destination from airports situated in BSR-Germany (Hamburg), Scandinavia (Stockholm, Copenhagen) and Poland (Warsaw). Other destinations on the Eastern seaboard of North America are also well served. Few connections are however available to destinations on the Western coast of the United States and Canada. This first grouping highlights the strong ties, especially due to trade and commerce patterns but also tourism, between the 'old member states' of the BSR and the United States. The second geographical grouping contains destinations in eastern and south-eastern Asia. The main destinations are Bangkok (mainly as a tourist destination) in Thailand, and to a lesser extent Beijing in China. This destination is particularly accessible from Helsinki and Stockholm. The third main group of destinations consists of regions in the non-BSR parts of the Russian Federation, in Central Asia (Kazakhstan, Uzbekistan etc.) and the Caucasus (Georgia, Armenia etc.). As noted above, St. Petersburg and Kaliningrad act as the main gateways here. A fourth grouping, although less marked, can be said to be constituted by destinations in the Middle East, especially those in Egypt, Israel, Qatar and the United Arab Emirates. For the first two, St. Petersburg acts as the main hub, while Hamburg is strongly connected to the latter two.

Regarding the ongoing globalisation of markets international fairs play a key role in opening up 'domestic' markets. An analysis of such fairs organised in the BSR in 2007 illustrates that almost all of the selected BSR metropolitan areas here play an important role in this respect (cf. Fig. 25). When looking at the total numbers here it is important that we acknowledge the fact that no east-west divide is discernable, i.e. that even those metropolitan areas that display a rather poor level of performance in respect of the various metropolitan functions discussed in this study, such as Kaliningrad, Minsk or Vilnius, are nevertheless to some extent catching up with the other BSR metropolitan areas. In this context it should be noted that St. Petersburg in particular stands out in this respect.

Finally we turn to the BSR's ability to (re-)produce collective symbols. Even though such an indicator is difficult to operationalise (due to the lack of data and the aspect of subjectivity), we argue that metropolitan areas are now very much embedded in the global flow of signs and symbols. They are able to produce certain collective images and thus mental maps which have a great impact on the perception of decision-makers, investors and of course, tourists. In other words they can be interpreted as potentially competitive assets in an international perspective because they enable the earmarking of specific and unique selling points.

To begin with we considered the spatial distribution of UNESCO World heritage sites in the BSR (cf. Fig. 26). Not all are however located in or close to our selected met-

ropolitan areas, nevertheless, we think that particularly in small countries such as the Baltic States their potential international images are closely related to those re-produced in the BSR metropolitan areas, even though the specific national viewpoints on them might be different. The images that are communicated internationally, however, can have a significant impact on producing positive images for the entire BSR in general and its metropolitan areas in particular. Here again we can see a rather balanced distribution of such competitive assets. Looking at the small table in the right-hand corner of the map, it becomes clear that the overall number of such specific heritage sites approved by UNESCO may increase in the future (particularly in Belarus, but also in e.g. Latvia, Poland etc.). In the appendix of this report an up to date list of the UNESCO world heritage sites located in the BSR is attached.

From a general point of view this chapter has revealed that the metropolitan areas in the BSR show some significant differences in terms of quantity but also partly quality with regard to their international functions. Obviously regional transformation as well as integration into the global and European markets is a long-term process, which can nevertheless be impacted in various ways, such that significant differences between the 'Western' and the 'Eastern' metropolitan areas to some extent remain in place. On closer inspection a number of promising potentials seen as critical in supporting the process of spatial integration can be detected (cf. chapter 6).

Figure 25: International fairs in the BSR

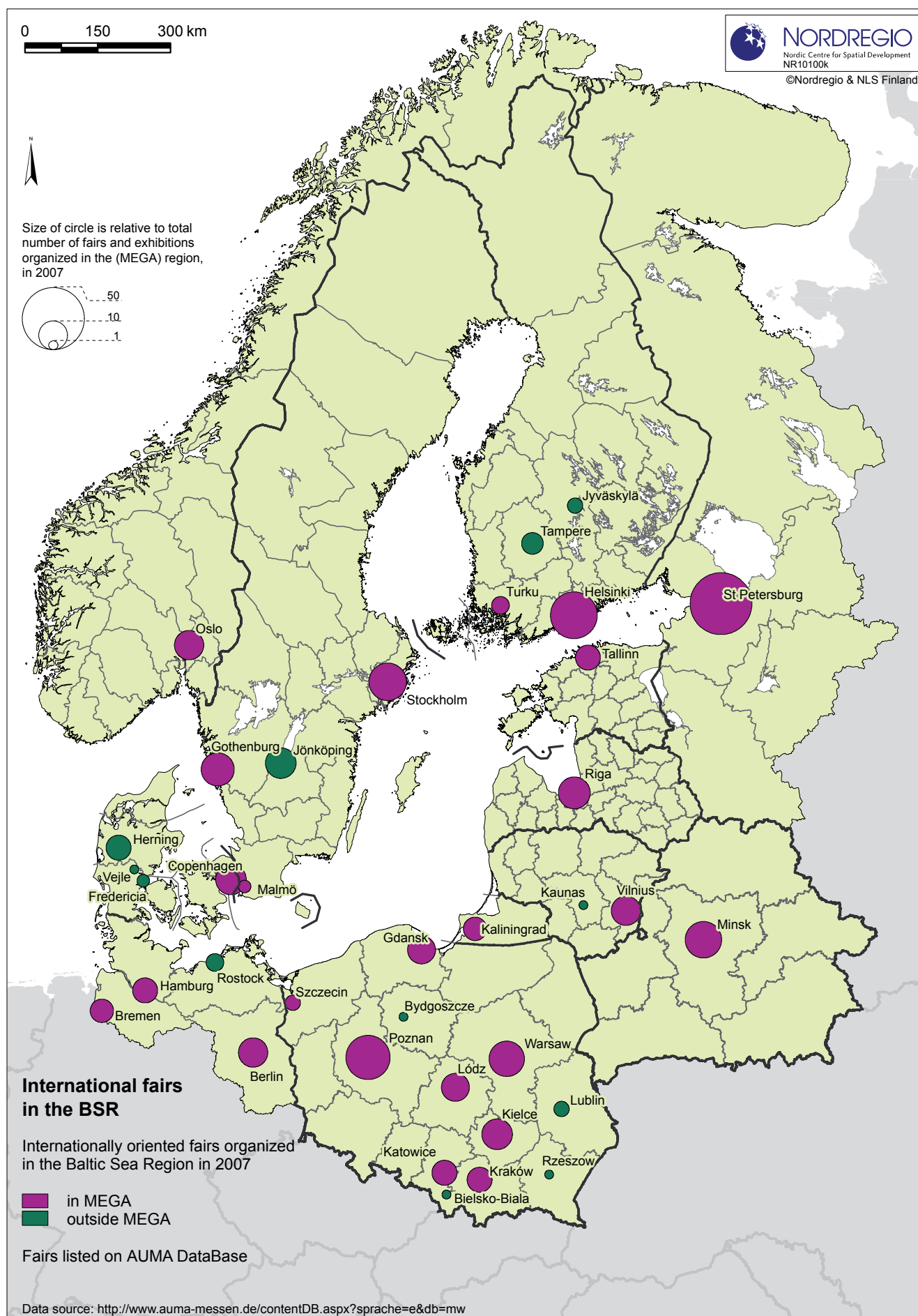
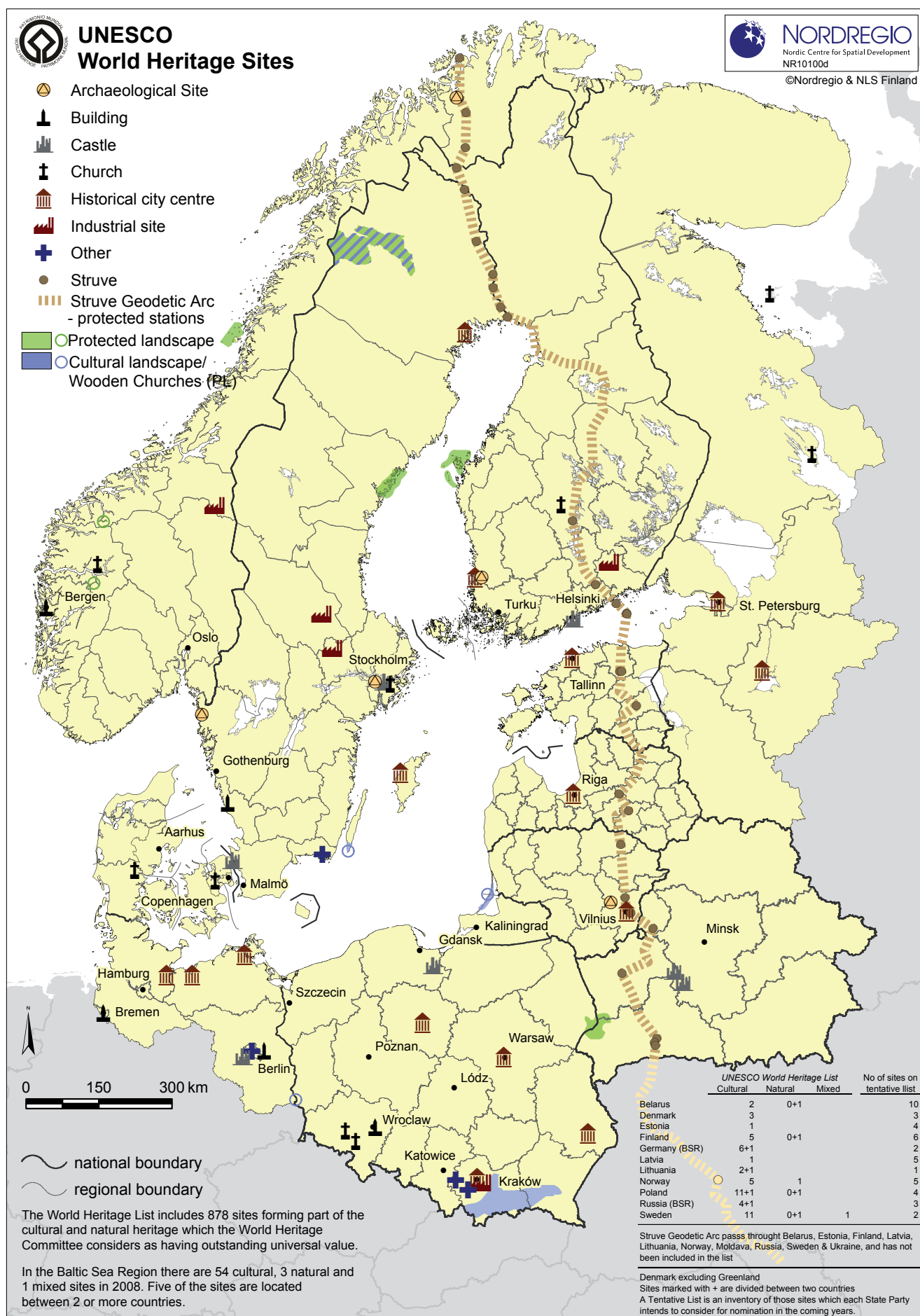


Figure 26: UNESCO World Heritage Sites



4. The role of transport networks, mobility and accessibility in the spatial integration of the BSR

The previous chapter highlighted the potential for increased competitiveness in an international perspective. The benchmarking of the main BSR metropolitan areas enables us to highlight their strengths and weaknesses as well as the potential to develop an integrated process of spatial development in the Baltic Sea Region, fostering both co-operation and competition. The aim of this chapter is to outline how this potential for increased spatial integration can be mobilised in terms of the current performance of transport networks and services as well as the mobility and accessibility of people and goods. The chapter will focus on how best to bring together the various seemingly disconnected parts of the BSR. Improving the internal accessibility of the region is thus understood as an attempt to bridge the main territorial divides within the region: north-south, east-west, metropolitan areas-hinterland, cross-border development etc. These territorial divides are the consequences of the rich but troubled history of the Baltic Sea Region. Looking forward thus necessitates the need to define potential strategies to overcome these divides.

Transport is traditionally associated with the notion of

accessibility. In fact, the transport system intrinsically frames the capacity for individuals and businesses in one region to access other actors within or beyond their region. That being said, the analytical work elaborated in the framework of the East-West Window project has brought into focus the notion of mobility as a central approach. The idea of mobility brings a more human dimension to the issues of transport, and connects directly with the concerns of future regional development. In more concrete terms, the transport system ought to be considered more as a means of enhancing mobility than as an end in itself. Consequently, chapter 4.1 is dedicated to transport concerns in order to highlight the dimensions of internal BSR mobility on a cross-border and transnational basis.

Such a detailed macro analysis of the state of the numerous transport systems in the Baltic Sea Region, does not, however, reveal a clear picture of accessibility as, traditionally speaking, the main 'product' of a transport system. Therefore a thorough discussion of the concept and the results of a survey on the various aspects of 'potential accessibility' in the BSR is presented in chapter 4.2.

4.1 Transport networks and mobility

The purpose of transport networks can be identified as enabling the mobility of persons and goods in order to create stronger spatial interactions between places. Consequently, the transport infrastructure should reflect this need for enhanced mobility. In concrete terms, these networks should be designed to serve the needs of people. This section aims to investigate the current situation in respect of transport networks around the Baltic in addition to flagging up some of the major planned and most needed infrastructures. These networks can be seen as both the relics of the region's fragmented past and as displaying its potentials for further integration. Indeed, the transport networks around the Baltic are strongly reflective of the

history and structure of the various countries that constituted it. With the latter in mind, the analysis here will focus in particular on the transnational and cross-border dimensions of transport networks rather than attempting to describe the sum of the various national perspectives. Consequently, the analysis focuses on the potentials that these infrastructures represent for enhanced spatial interactions between countries and regions, as well as identifying the structural, persistent, bottlenecks that hold back the integration of the whole region.

These bottlenecks can take different forms. First of all, the absence of infrastructure in some parts of the region obviously represents a hindrance to the development of

interactions between the cities and regions of the BSR. From a transnational perspective this is often translated as a lack of reliable and compatible connections between the different national transport networks, particularly in respect of road and rail infrastructures. Secondly, where functioning infrastructures do exist bottlenecks may nevertheless be found due to the lack of available services to exploit such facilities. In the first case, the elimination of the bottleneck is connected to the need for further infrastructure; in the second case, the bottleneck can be alleviated by providing incentives for actors to develop appropriate services.

The BSR is characterised by a dense, but unbalanced, network of roads and railways

Figures 27 and 28 display the extent of the existing road and rail infrastructure, as of 2007. The first impression gained from these maps is that the terrestrial transportation network, notwithstanding the carriage capacity of the road or railways, is rather dense, connecting all parts of the region. The rather densely populated parts of the BSR, such as Denmark, Poland and the German areas that belong to the BSR enjoy a rather dense network of roads. The contrast is sharp with the northern parts of Norway, Sweden and Finland, including the North-Western edge of the Russian Federation. These areas are considered as sparsely populated, i.e. with small settlements with long distances between them. In line with this unique settlement structure in the European context, the road network in those areas is less dense, but none the less covers the main small and medium-sized towns. Conversely, the road network is denser around the main metropolitan areas. This is obvious in the territories surrounding Hel-

sinki, St. Petersburg and Oslo, but can be assumed as applicable for all other larger metropolitan areas in the region.

Measuring the density of the road infrastructure endowment makes sense when analysing the potential of the transport network to enable short-haul, daily interactions. Indeed, if high capacity infrastructures such as highways, motorways or double-track railways permit good connectivity to/from the main metropolitan areas, the secondary transport networks correspond to the largest part of the transport networks and are important both for intra-regional travel while also enabling connections between each region and the primary networks (feeding function).

Figure 29 provides complementary inputs on the recent changes in the secondary road infrastructure in countries around the Baltic Sea. Changes in the total length of road networks can depend on the construction of new infrastructure (missing links) or on the upgrading of existing links (structural bottlenecks). Here one can identify two main dynamics. Lithuania, Belarus and Estonia belong to the first category of countries that have substantially improved the extent of their secondary road network. From 1993 to 2005, Lithuania augmented its secondary road capacity by more than 40%, Belarus by nearly 30% and Estonia by 25%. If this trend is mainly designed to improve the rather low quality of the network, it shows that movement towards a network of a higher quality standard, enabling an increase in traffic volumes, is desired. This is consistent with the account by Kovács/Spens (2006) of the state of the road network in the Baltic States, where they assess the main issues as being related to the low percentage of paved roads and a low capacity to support heavy vehicles, necessary for goods transportation.

Figure 27: Existing road infrastructure in the BSR

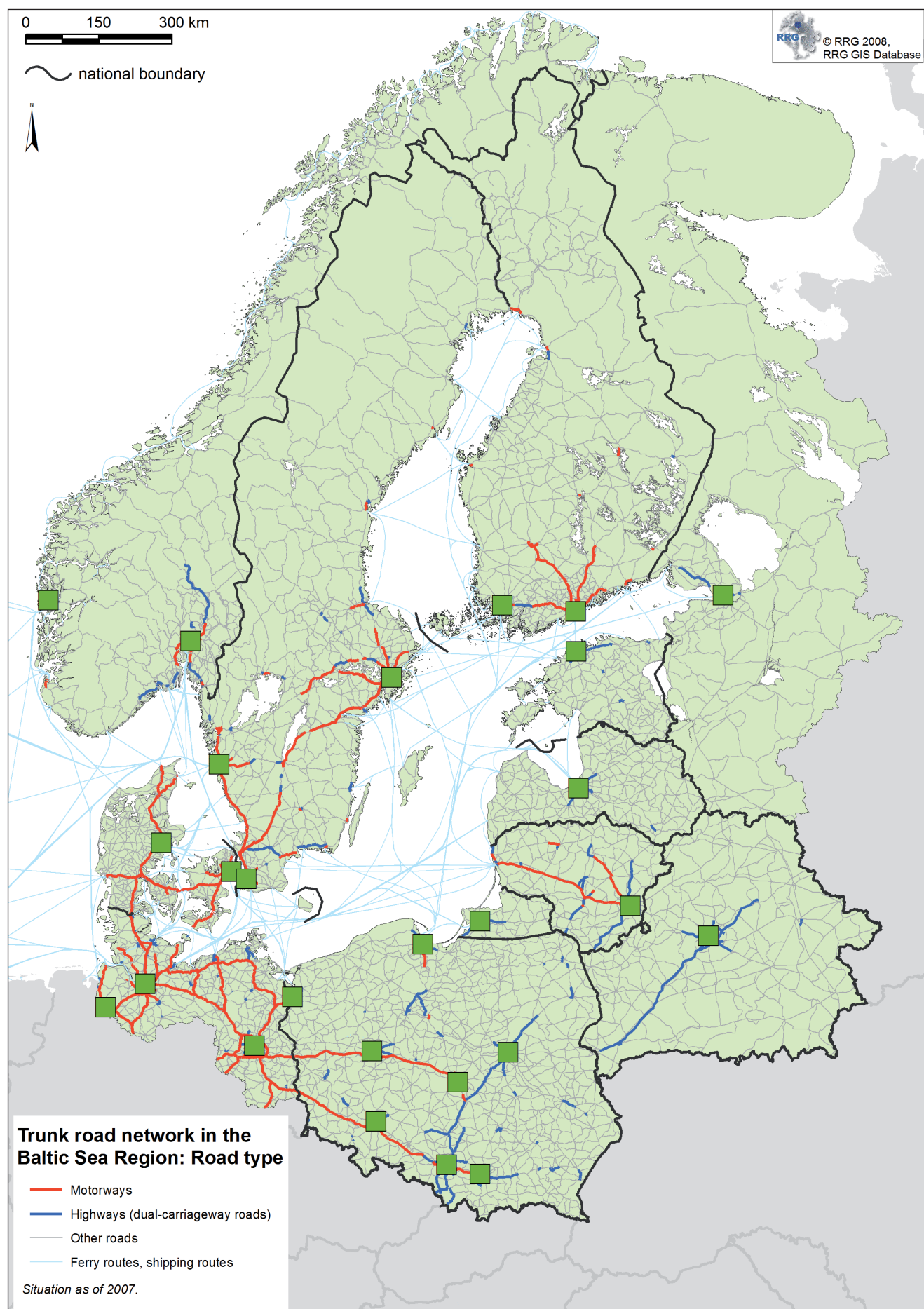


Figure 28: Existing rail networks in the Baltic Sea Region

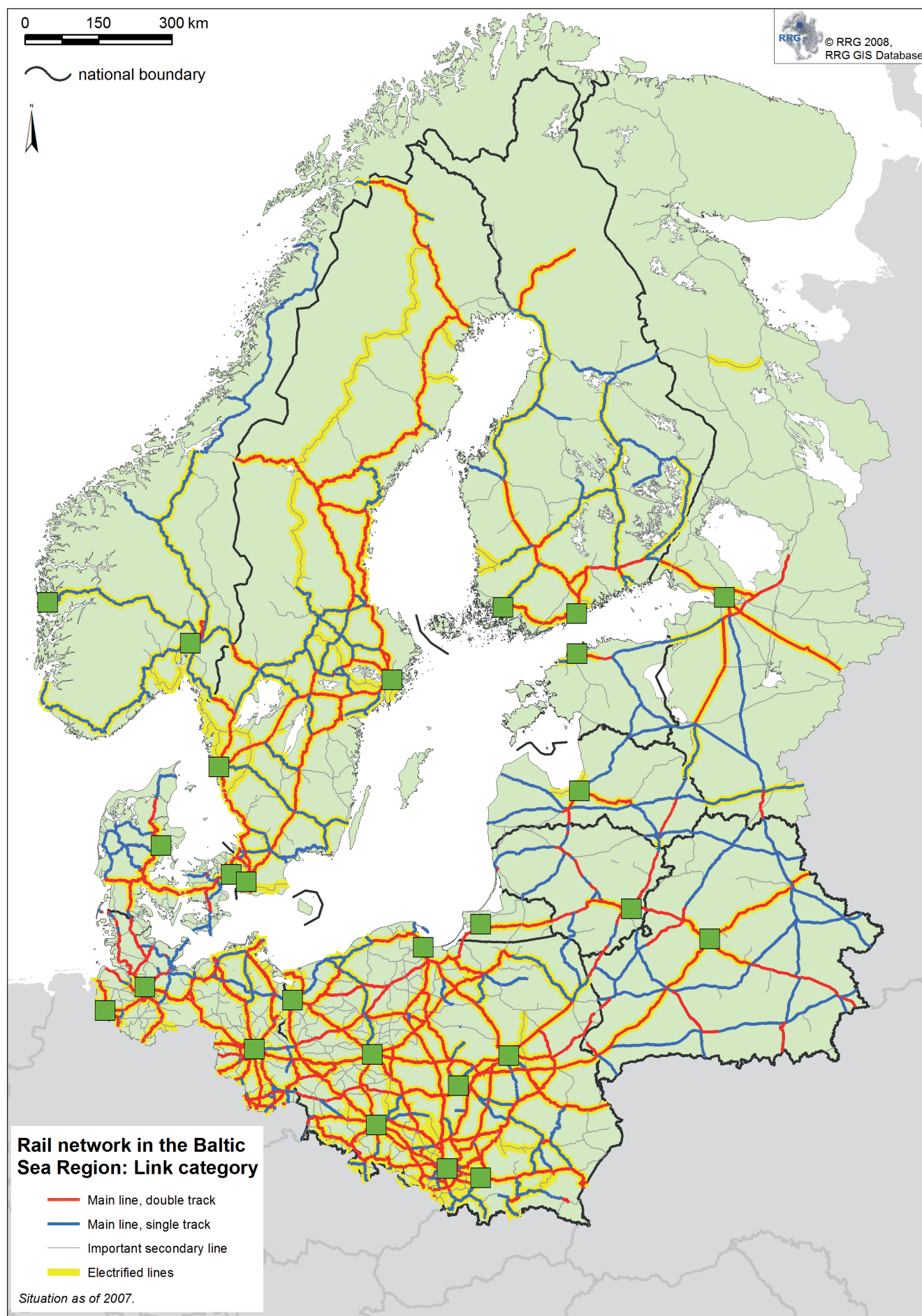
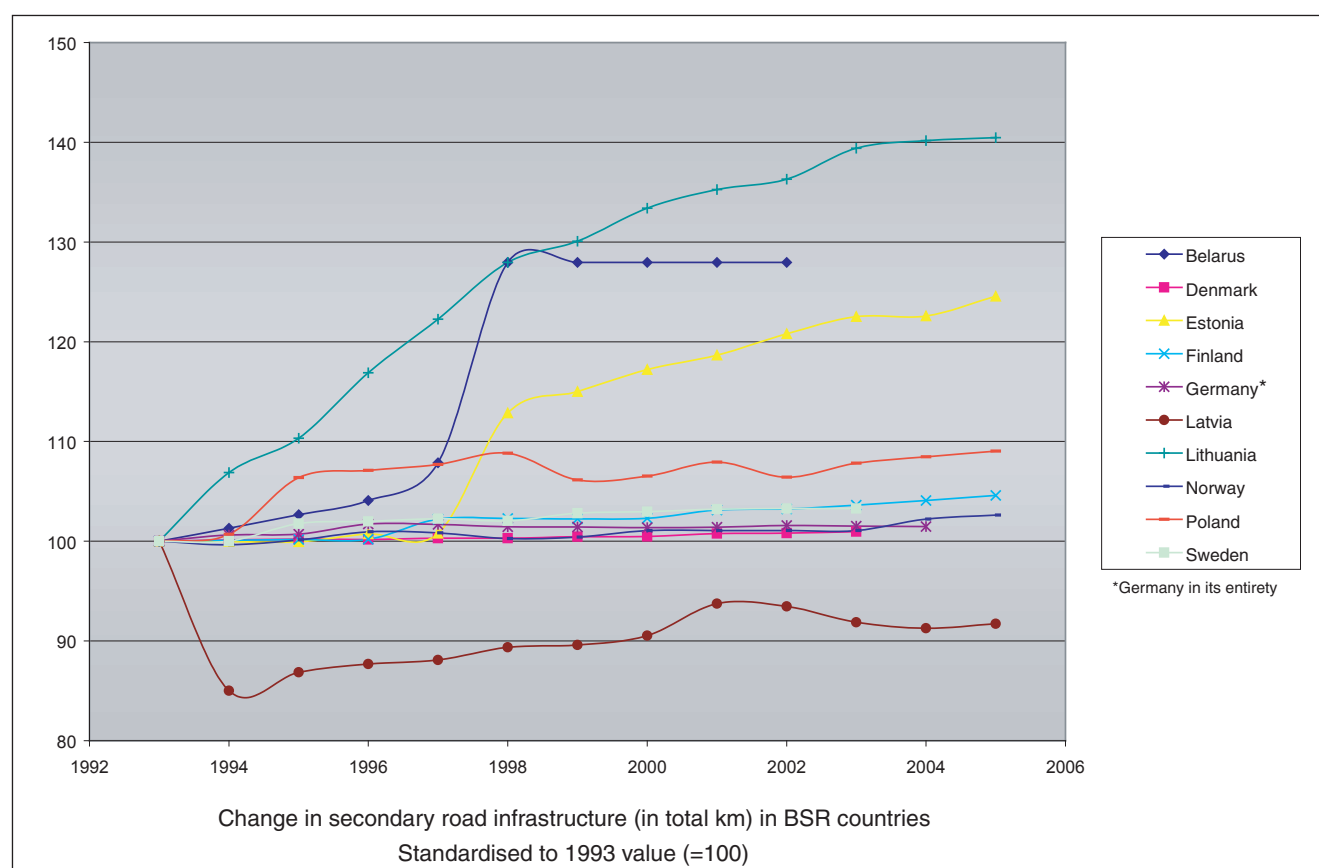


Figure 29: Change in secondary road infrastructure endowment



Source: UNECE (2008)

Other countries around the Baltic Sea have witnessed a rather minor if positive change when it comes to secondary road networks. This is hardly surprising for the Nordic countries and Germany, which already enjoy a high quality standard in terms of their road network. The small increases for Poland and Latvia (with the exception of a short decrease between 1993 and 1994 probably due to the downgrading of some secondary roads) might be due to a stronger focus on upgrading existing infrastructure instead of new building. However, in spite of this small increase, the endowment in secondary road infrastructure in Latvia is still below the 1993 level.

In conclusion, it is important to pinpoint the fact that the reliability and carrying capacity of the network, i.e. its capacity to support motorised traffic, is still one of the key challenges for the BSR.

A fragmented, but over-loaded, primary road network

If secondary road and rail networks are important preconditions for enabling intra-regional interactions, motorways, highways and main railway lines have significant importance in binding together the largest metropolitan areas in the region, essentially in the form of long-haul, goods transportation. Moreover, these metropolitanisation

trends render metropolitan areas even more important when it comes to national and regional economic development (Nordregio *et al.*, 2007).

Figures 27 and 28 have already provided a snapshot of the state of the motorway and railway systems in the BSR. However, in this section, the analysis of these figures will focus on the primary network. First and foremost we should note that the primary network remains fragmented. Indeed, Germany and Denmark, the most densely populated territories of the BSR, are the only parts of the region that present a rather dense and integrated network of motorways. To a certain extent, southern Fenno-Scandia and south-western parts of Poland can be deemed to be connected to this network.

In the other three Nordic countries studied, i.e. Norway, Sweden and Finland, most of the motorways radiate out from the main metropolitan areas: Oslo for Norway, Stockholm, Malmö and Gothenburg for Sweden and Helsinki for Finland. This creates a star-shaped pattern around these cities. In reality however in these three countries no national motorway network effectively exists. Indeed, only small sections of motorway or highway exist around other cities (Stavanger, Gävle, Sundsvall or Oulu), but these are not connected to a national motorway network *per se*. In the case of Sweden, it appears that the routes Stockholm-Malmö and Stockholm-Gothenburg are disrupted, thus

preventing Stockholm from being integrated into the 'continental' motorway network coming from Denmark. However, the recent construction of the Öresund Bridge between Copenhagen and Malmö has significantly improved the potential connection of Norway and Sweden to the rest of the European motorway network.

In Poland, the situation in respect of motorways and highways is rather complex. Two separate motorways link the main central Polish cities with Berlin. The routes Berlin-Poznan-Lodz-Warszawa and Berlin-Wroclaw-Katowice-Krakow thus enhance the potential for interactions between Poland and Germany, and more generally the integration of Poland with the populated areas of North West Europe. A highway also connects Katowice-Krakow with Warszawa. What is interesting in the Polish case is the lack of large road infrastructures (motorways) dedicated to intra-national connections. This results in fewer opportunities for regional integration within the country, whereas on a national level, the largest metropolitan areas are connected to external markets. In the rest of the country only scattered trunks of motorway/highway networks exist.

In the Baltic States, high capacity road sections are concentrated around the capital regions however connections between other urban areas and the capital regions are not effectively provided, though Lithuania does have a motorway connecting Vilnius and Kaunas with the seaport of Klaipeda. The Baltic States also lack high-quality road networks in a north-south direction (connecting the three Baltic states with each other), as well as high-quality East-West links connecting the three countries with Russia. In Kaliningrad and North West Russia, few roads have sufficient capacity to be considered as motorways. However, a few sections of motorway do exist around the city of Kaliningrad and St. Petersburg in the direction, respectively, of Gdansk and the Finnish border. In Belarus, the road connecting Minsk to Poland and Moscow is partially highway within Belarus. However, this specific road capacity is not pursued in either Russia or Poland.

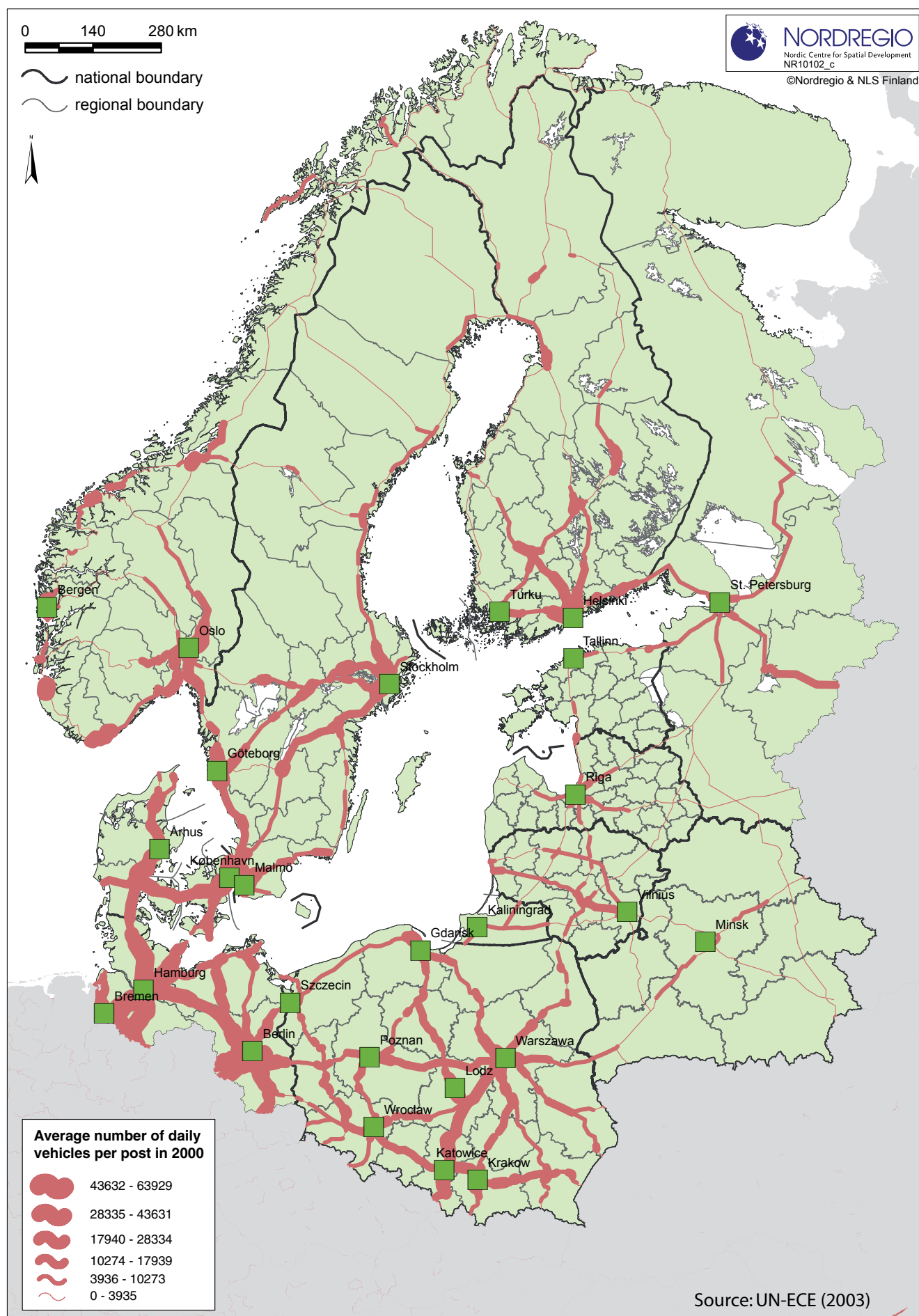
Consequently, one can identify three main bottlenecks related to the motorway and highway network in the BSR. First of all, as highlighted above, the existing networks are still highly influenced by the national systems. The fragmentation of the road network between countries acts as an obstacle to the further integration of the region and to the cross-border mobility of persons and goods. While improvements have been made in connecting the various national systems, especially on the borders of Poland (Kovács and Spens, 2006), many missing links remain, especially in the eastern part of the BSR, where Poland, the Baltic States, Russia and Belarus ought to be better connected to

each other with motorways. The lack of North-South connections is thus a hindrance to further integrating the BSR. Secondly, the quality of the existing infrastructure is still very uneven (Kovács/Spens, 2006). These issues, linked to infrastructure standards, act as a limiting factor in terms of the mobility of goods and persons and necessitate significant further investment in order to be overcome. Finally, while persistent structural bottlenecks remain in relation to the road system institutional bottlenecks can still also be experienced. Indeed, even if the recent accession of Poland and the Baltic States to the EU (2004) and the Schengen area (2008) reduces, considerably, the administrative obstacles to mobility, the lack of strategic fit in terms of national road infrastructures undoubtedly slows the process of integration throughout the region, especially with regard to Belarus and Russia.

While structural conditions are important factors in explaining persistent transport bottlenecks across the BSR, increased infrastructure usage undoubtedly puts a strain on the road infrastructure. Figure 30 displays the volume of the road traffic (all types of vehicles) on the main roads - the so-called E-roads - in the BSR. This map highlights the arguments stated previously in this section. Traffic loads in the BSR are highest around the German agglomerations of Berlin, Hamburg and Bremen. In those areas, the daily traffic volume goes up to nearly 100,000 vehicles on some sections. The traffic on the motorway linking Berlin and Hamburg is also very high, as it reaches on average nearly 50,000 vehicles per day. The traffic load on the Danish motorway system is among the highest in the region, with *circa* 50,000 vehicles, on average, per day on the busiest roads. Around Copenhagen traffic volumes reach the threshold of 75,000 vehicles per day.

In Sweden, Norway and Finland, the highest traffic volumes can be found around the capital regions on the roads linking the city centre to the suburbs. The volumes on these arteries can reach nearly 90,000 vehicles per day in Stockholm and more than 70,000 in Oslo, these being averaged over the year. In Helsinki, traffic volumes are somehow lower, attaining approximately 35,000 vehicles per day. Outside the capital regions, the busiest motorways are those connecting the main metropolitan areas, i.e. between Turku, Tampere and Helsinki in Finland and between Malmö, Gothenburg and Stockholm in Sweden. On these roads, the average annual daily traffic fluctuates between 10,000 and 20,000 vehicles per day, on average. Other E-roads in the Nordic countries show rather low daily traffic volumes, with the exception of limited sections near medium-sized towns (Stavanger, Umeå or Oulu).

Figure 30: Traffic volumes on the main arteries of the BSR road network



In Poland and the Baltic States, traffic volumes are much lower than in the previously mentioned regions. The axis Katowice-Warsaw sees average daily traffic of approximately 30,000 vehicles per day on average. However, this artery has shown a rather pronounced increase in traffic. Otherwise, traffic volumes are particularly high in the vicinity of the main agglomerations. Traffic around Warsaw can reach up to 40,000 vehicles per day, and around Wrocław, Katowice and Krakow 20,000 per day, while around Riga, Vilnius, Tallinn and St. Petersburg, the daily traffic volumes reach nearly 12,000 vehicles; all these traffic figures are not however maximum peaks but rather averages made on the basis of yearly traffic.

Lack of interoperability: an obstacle to the integration of national rail networks around the Baltic Sea

Increasing traffic loads and sluggish investment in respect of improving the standard and quality of such infrastructures have been identified as the main challenges in the case of the road network. Varying quality of infrastructure, persistent missing links across borders and co-existence of two different technical standards in the BSR are challenging the creation of an integrated BSR rail network.

As for the rail networks (cf. Fig. 28), the lack of interoperability, stemming from the existence of different technical standards between the various national networks, acts as a clear limiting factor in enhancing the mobility of persons and goods on a transnational basis. Before describing the reasons behind this lack of interoperability, a brief overview of the main characteristics of the railway networks in the BSR is necessary. Of particular interest here are the lines that can support a high level of traffic between cities. In that regard, focusing on the extent of double-track and electrified lines across the region provides a good overview of the potential for the railway system to sustain and support increasing mobility needs.

Both BSR-Germany and Poland enjoy a dense network of electrified and double-tracked railway lines. These two systems are connected at a half a dozen crossing points. The quality of the infrastructure between the crossing points varies as some are only equipped with non-electrified lines and some with single-track lines. However, the connectivity between the two systems can be deemed to be fairly good. Sweden, Norway and Denmark enjoy a good level of inter-connectivity in terms of their railway system as the electrified double-track lines network shows no disruption at the borders. Connectivity to the Danish and wider 'continental' networks has been improved with the construction of the Öresund Bridge. Although the Danish and North German railway systems are connected to each other with double-track lines, these lines are not electrified, which may limit, for instance, the use of high-speed trains from Germany to Scandinavia.

The situation in the Baltic States is much different. The

network of electrified and double-track lines is still in its infancy, despite the fact that rail has traditionally been the most used means of transportation in these countries. Moreover, the lack of modern north-south rail connections linking the Baltic national networks is a clear hindrance to any attempt to enhance the intra-Baltic mobility of persons and goods. The existing shape of the rail network in these countries undoubtedly betrays their former history as adjuncts to the Soviet Union. Indeed, the emphasis on East-West connections, physically linking the Baltic States to Moscow but not to each other has for years acted as a hindrance to more efficient rail transportation.

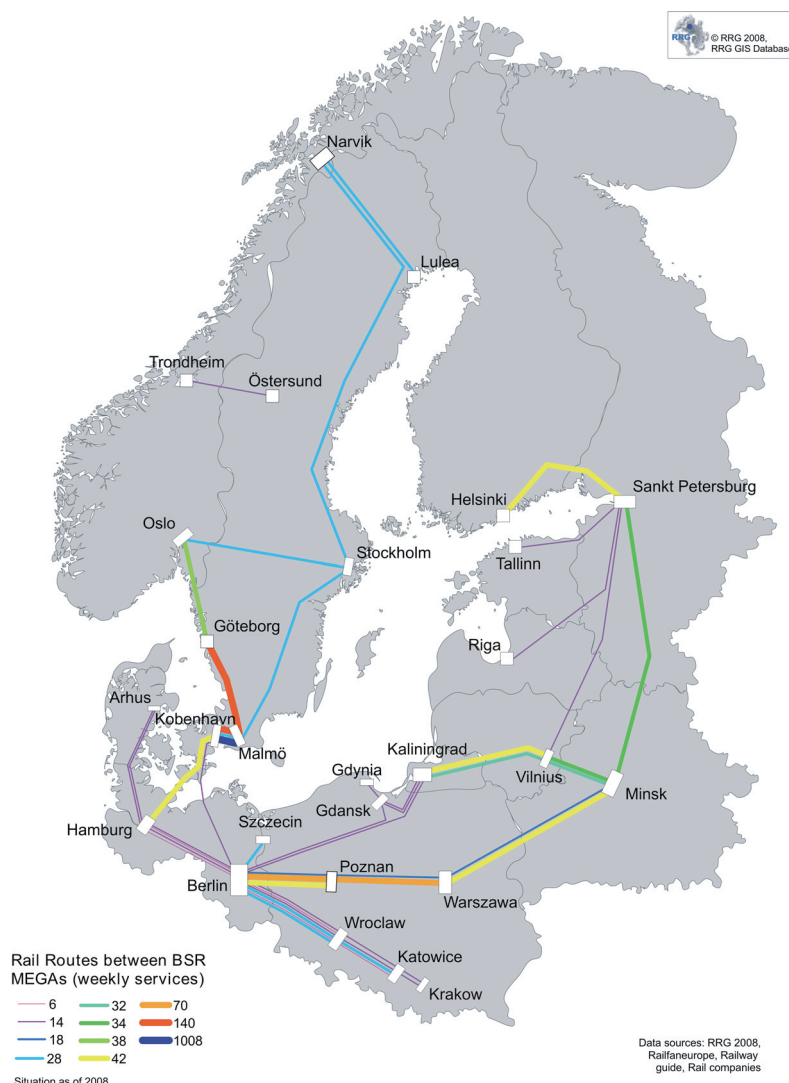
In the case of Kaliningrad, the importance of East-West connections to the rest of the Russian Federation, via Vilnius and Minsk, rather than the development of north south connections to Gdansk or coastal parts of Lithuania, is a reminder that a significant amount of institutional and political inertia is at play here in the region. North West Russia is connected to Finland by a double track line. To date, the line is totally electrified on the Russian side and only partly electrified on the Finnish one. This strong inter-connectivity of the railway systems of southern Finland and North-West Russia is hardly surprising as the Finns had strong trade and commercial ties with Russia during the Soviet era.

Overall, the network of electrified, double-track railway lines in the BSR can be deemed to be as only partially integrated. The process of integration has thus far functioned via the integration of different 'blocks': Germany-Poland, Denmark-Sweden-Norway, Finland-NW Russia and Baltic States-Kaliningrad-Belarus-NW Russia, although the integration of and within the latter block is undoubtedly the weakest across the whole BSR. The potential for further integrating the region as a whole lies in the capacity to improve the inter-connectivity of these different 'blocks'.

Notwithstanding this, a significant challenge, in the form of a lack of structural compatibility between the national rail infrastructures, remains. Here, the problem lies in the differences in the standard of rail gauge. On the one hand, Germany, Scandinavia and Poland have the same technical standards making it possible to cross the border without changing train on one or the other side of the border. Moreover, these countries share the same technical standards as the rest of continental Europe, which, for instance, facilitates the transportation of goods from these countries to the rest of Europe. Finland, Russia, Belarus, and the Baltic States have a different standard in rail gauge. The standards between these two groupings of countries are not compatible, which means that rail transportation across these countries necessitates a change of train at crossing points. This, of course, acts as a bottleneck as it slows cross-border traffic. These bottlenecks materialise in concrete terms on locations along the Polish border, Poland acting as the interface between the two groupings.

Figure 31 illustrates the cross-border rail services avail-

Figure 31: Route frequency on main cross-border rail connections in 2008 (weekly)



able between the BSR's main metropolitan areas. Firstly, it stresses the importance of certain cities as 'international hubs' in the BSR rail network. This is especially true for Berlin, but also, although to a lesser extent, for Copenhagen and Warsaw. Indeed, Berlin plays a central role in the connection of Poland to the rest of continental Europe. The main route from Berlin is connected to Warsaw and Poznan, with respectively 70 and 42 direct weekly connections. However, the importance of Berlin in the BSR rail system is as due to the multitude of connections to many different destinations in Poland. As for Copenhagen, its geographical location makes it the natural gateway for southern Scandinavia. Trains from Stockholm, Gothenburg and Malmö are connected to the Danish capital, which, in a similar way to Berlin, enables passengers to continue on towards destinations in the rest of continental Europe. Warsaw plays a similarly important role as a hub for Belarus and indirectly also for Lithuania and North West Russia.

Secondly, figure 31 stresses the still poor level of cross-border connectivity between the main metropolitan areas on the Eastern shore of the Baltic Sea, i.e. between Poland,

the Baltic States, Western Russia and Belarus. Focus here is also placed on direct connections, i.e. without having to change train. On this account, it confirms that the level of rail connectivity between Poland and the Baltic states is very low. There are, to date, no trains linking directly (i.e. without changes) the following cities: Warsaw, Vilnius (or Kaunas), Riga and Tallinn. As noted previously, this is due to the fact that there are no rail infrastructures capable of supporting such services. This lack of connectivity between the Polish and Baltic capitals is still probably the most serious bottleneck for the complete integration of the Baltic Sea Region. Of course, as shown in the following chapters, air and maritime connections may act as a substitute for the relative weakness of the rail system.

A final interesting note in respect of figure 31 is the fact that the rail system on the eastern shore of the BSR still bears the mark of association with the former Soviet Union. Indeed, if Tallinn, Riga and Vilnius are barely connected to each other, they all have direct connections to St. Petersburg, even if the frequency of the routes is rather low (6 weekly direct trains each). In this regard, Minsk appears to be central here in acting as the hub for connections between North West Russia, Kaliningrad and Poland in addition to Belarus itself. Indeed, Minsk has not only direct rail connections to Warsaw, Vilnius, Kaliningrad and Warsaw, but is also a necessary way-station for mobility between these cities.

Table 7 provides further indications on the implications of the poor connectivity of the rail system on the Eastern shore of the BSR by assessing the time that it takes to travel between these cities. The travel times displayed in table 7 reinforce the perception of an eastern shore of the BSR in need further integration. The poor quality of the rail infrastructure in this part of the BSR and the lack of cross-border interoperability of the existing track networks not only cause longer travel times, but also necessitate a great effort is made on the part of the traveller as multiple changes are often needed along these journeys. To travel from Warsaw to Tallinn, it takes no more than 40 hours and 6 changes to complete the journey. The main problem related to rail infrastructure is witnessed between Poland, Lithuania, Latvia and Estonia. For the journeys between capital regions, bus connections are often faster, as, for instance, between Warsaw and Vilnius. There is still, to date, no train connection between Tallinn and Riga. In an earlier report commissioned by VASAB (Nordregio *et al.*, 2000), it was already stated that no train connection was available between these two cities in 1999: nearly a decade after, the situation is still the same. Of course, the lack of

integrated rail infrastructure between Latvia and Estonia is not problematic *per se* for the transport of passengers: bus and air connections act as very efficient substitute to train connections. However, when it comes to the exchange of

goods between the two countries, the absence of rail infrastructure implies an increased use of the road infrastructure with all of the negative environmental effects this may bring.

Table 7: Shortest travel times between main cities on the eastern shore of the BSR

Shortest travel time between main BSR cities in Hours: Minutes (Number of train changes or Bus connection)		TO					
		Minsk	Vilnius	Kaliningrad	Riga	Tallinn	St. Petersburg
FROM	Warsaw	8:38 (3) 9:16 (0)	9:00 (Bus) 9:26 (2)	8:04 (1)	13:20 (Bus) 24:31 (4) 24:32 (3)	17:00 (Bus) 40:36 (6) 41:18 (2)	22:27 (4) 28:32 (0)
	Minsk		4:30 (0)	11:03 (0)	14:57 (2)	29:31 (1)	13:33 (1) 13:52 (0)
	Vilnius			6:15 (0)	4:20 (Bus) 14:49 (1)	34:26 (2) 9:30 (Bus)	13:08 (0)
	Kaliningrad				22:14 (2)	14:10 (Bus) 41:20 (2)	20:33 (1) 25:21 (0)
	Riga					4:25 (Bus) No train route	12:20 (0) 14:20 (Bus)
	Tallinn						8:02 (0) 8:00 (Bus)
	St. Petersburg						

Source: Deutsche Bahn (2008), Eurolines (2008)

The future backbone of the BSR's road and rail infrastructure

From the analysis undertaken in the previous sections it has become clear that major infrastructural investments are still needed in the BSR in order to make enhanced spatial integration possible. Each country around the Baltic Sea has developed specific sectoral plans regarding the development of transport infrastructure within their own national borders. One redundant shortcoming of the BSR transport system is the lack of integration in respect of terrestrial networks (road and rail) at the border crossing points, thus hindering smooth mobility from one country to another. In that regard, transnational BSR co-operation remains a priority in fostering the compatibility and integration of both spatial development and transport national plans. Previous accounts of the state of the BSR transport infrastructure (Nordregio *et al.*, 2000) have already raised this issue.

Since 2004 and the accession of Poland and the Baltic States to the European Union, the EU has become a major actor in making the development and integration of large-

scale transport axes a reality in the region. Indeed, the implementation of the Transnational European Networks (TEN) represents a key part of the EU's strategy to achieve an integrated internal market. Consequently, it is not surprising that the main identified issue relates to "the interconnection and interoperability of national networks as well as access to them" (TEN-T homepage). The TEN-T programme is divided into 30 priority projects, of which 6 are either entirely or partly located in the BSR region.

- The Öresund fixed link project was completed in 2000 when the bridge was opened to the public. The bridge provides a fixed connection between the cities of Copenhagen and Malmö by both rail and road.
- The Nordic Triangle project aims at connecting the four Nordic capitals as well as the most densely populated region of the respective countries. The project can be divided into two main parts: first, the connection of the cities of Stockholm, Oslo, Gothenburg and Malmö; second, the connection of the southern Finnish cities (Turku and Helsinki to the Russian bor-

der). The project intends to develop both road and rail connections.

- The project known as the Fehmarn Belt aims at improving road and rail connection between the most densely populated regions of Denmark (Sjælland and Copenhagen) and the northern German cities of Hamburg, Bremen and Hanover. The road section of the project mainly consists in the construction of a bridge from the Danish city of Rødby.
- The priority axis “Motorways of the Sea” has a crucial importance for the Baltic Sea Region. The Baltic Sea is a water body shared by most of BSR countries, and the development of maritime links, both for cargo and passengers, is central to improving connectivity within the region.
- The Gdansk-Warszawa-Brno axis (motorway) is of prime importance in improving connectivity between the Polish coast and the capital region of Poland, but also between the BSR as a whole and the rest of the countries of Central and Eastern Europe.
- The Rail Baltica project, linking the Baltic capitals (Tallinn, Riga and Vilnius) with each other but also with Warszawa in Poland, is often perceived as the project of prime importance for the whole BSR as it would resolve of the main accessibility challenges in the region, i.e. the poor north-south connections on the Eastern shore of the BSR.

The following figures 32 and 33 provide an overview of the planned TEN-T projects in the BSR. The linkages with non-EU countries, such as Russia or Belarus are traced in reference to the TRACECA network, an intergovernmental commission set up upon the signing of multilateral agreements on international transport in respect of the development of the Transport Corridor Europe-Caucasus-Asia.

Overcoming the Baltic Sea: air and maritime transportation

The state of the road and rail infrastructure is a significant determinant of the spatial integration of the BSR. Yet, the geographical characteristics of the macro-region, with the Baltic Sea acting as a natural obstacle for terrestrial connections, force the development of complementary strategies to overcome or bridge the Baltic Sea. In that regard, air and maritime transportation are central assets sustaining the further expansion of transnational mobility patterns, relating to the transportation of both goods and persons, within the BSR. The air and maritime transportation networks are very different in their nature than road and rail networks. Indeed, the infrastructure is not made of terrestrial links but of nodes and ‘intangible’ linkages. Consequently, both are often defined as point-to-point transportation systems. Air and maritime connections are undeniably intangible, but they depart from and arrive to very tangible infrastructure points: the ports and seaports

are the necessary infrastructure to develop air and maritime connections from any location. Moreover, the development of airlines and ferry companies is necessary for the operationalisation of these connections.

This section will focus on the transnational dimension of operationalised routes and connections between BSR airports and seaports. The main characteristics of the airports and seaports have already been displayed in chapter 3.3. Intra-national connections will not be analysed in this regard, as the body of literature in each country dealing with such aspects is already substantial. The focus on the relational dimension will however enable us to identify the relative intensity of connections between the main regions and cities around the Baltic Sea. Hence, in this section the analysis will focus on the currently existing patterns of air travel connections between the main metropolitan areas of the BSR, emphasising in particular the transnational dimension of these interactions, i.e. with origin in one BSR country and destination in another. As noted previously, these types of passenger trips are essential to the development of connected business or leisure interactions. The issue of connectivity with regard to other European and global destinations will be further developed later in this report.

The analysis of air travel connections provides a measurement of the intensity of interactions between the main metropolitan hubs of the region. The gains implied by the intensity of interactions have been identified in the literature as economies of density (Dobruszkes, 2006). These economies of density are generated by a trade-off between the number of routes departing from/arriving to one node (i.e. an airport) and the frequency of interactions for each route. In concrete terms, the place of the node is identified by using two analytical dimensions: broad/narrow network on the one hand, and dense/loose network on the other.

As noted previously in chapter 3.3 the network of routes and the intensity of interactions on these routes are of course dependent on the strategies of the various airlines. In that context, our analysis of air connections based on the number of flights between destinations is a rather good approximation of the intensity of interactions between cities and regions. Consequently, it enables us to identify the most privileged destinations for each region, i.e. the destinations that actors in one region have the most incentive to travel to. These incentives can be based on tourism interests or business interactions. This is a key dimension of the notion of accessibility: the transport system (here air transport) is a means to implement the mobility movements based on the needs of the regional actors.

Figure 34 displays the patterns of air travel between the main metropolitan areas (here termed as MEGAs, cf. chapter 3) in the BSR. At a first glimpse the map shows that there is a dense web of direct flights between these regions, which means that it takes rather little time for a person to travel directly from one BSR metropolitan area to

Figure 32: Planned TEN-T rail network in the BSR



Figure 33: Planned TEN-T road network in the BSR



another, as the flights are direct and thus do not necessitate to change airplane. At a closer look, however, one has to mention that specifically the smaller metropolitan areas do lack some direct connections to some BSR capitals as well as to other rather smaller or secondary metropolitan areas such as almost all the Polish metropolitan areas except for Warsaw, but also for instance Bremen, Bergen, and Kaliningrad. This means that one-day return trips as it is favoured in the business world are almost impossible for those stakeholders that are located in (or close to) these BSR metropolitan areas.

Figure 34 highlights the intensity of interactions by measuring the frequency of air connections per day. Clearly, the map illustrates the high degree of interactions between the metropolitan area situated in the Nordic countries, and not the least between the capital regions. This is due to strong institutional, cultural and historical ties between these countries, but also due to the rather high degree of integration between the labour markets and business structure. The Nordic capitals are, on average, connected by more than 30 daily routes, the most frequent route being between Copenhagen and Oslo (50 daily connections). Other routes of significance are Copenhagen-Stockholm (38), Stockholm-Helsinki (38), Stockholm-Oslo (34) and Helsinki-Copenhagen (28). Other Nordic metropolitan areas, such as Gothenburg, Malmö, Bergen, Århus and Turku, are as well tightly connected to this Nordic web. However, in this case, the connections are essentially directed towards their own capital region rather than directly to other Nordic destinations. The routes Oslo-Bergen, Stockholm-Gothenburg and Stockholm-Malmö are thus very frequent, with more than 20 daily connections.

A further analysis of the results gathered in figure 34 reveals that other air connections in the BSR are less frequently used than those within the Nordic countries. While the patterns of air connections are not as dense as those between the Nordic countries, nevertheless, some very important bilateral connections can be highlighted. In this respect, the most frequent route is between Helsinki and Tallinn with about 18 daily connections. The significant involvement of Finnish businesses in Estonian economic life, as well as the development of Estonia as a tourist destination, lies behind the high frequency of flight connections. This is further emphasised by the high frequency of ferry routes between the two cities, especially since the operationalisation of a high-speed ferry line.

The connection between Vilnius and Tallinn is the most frequent route within the Baltic States, with 12 daily connections on average. The routes Riga-Vilnius and Riga-Tallinn are much less significant, with only 6 daily connections each. In Poland, the patterns of air connections primarily show the predominant role of Warsaw Airport in the national system. Indeed, the most frequent interactions from/to Polish airports take place on national routes. The routes Warsaw-Wrocław (18 daily connections), War-

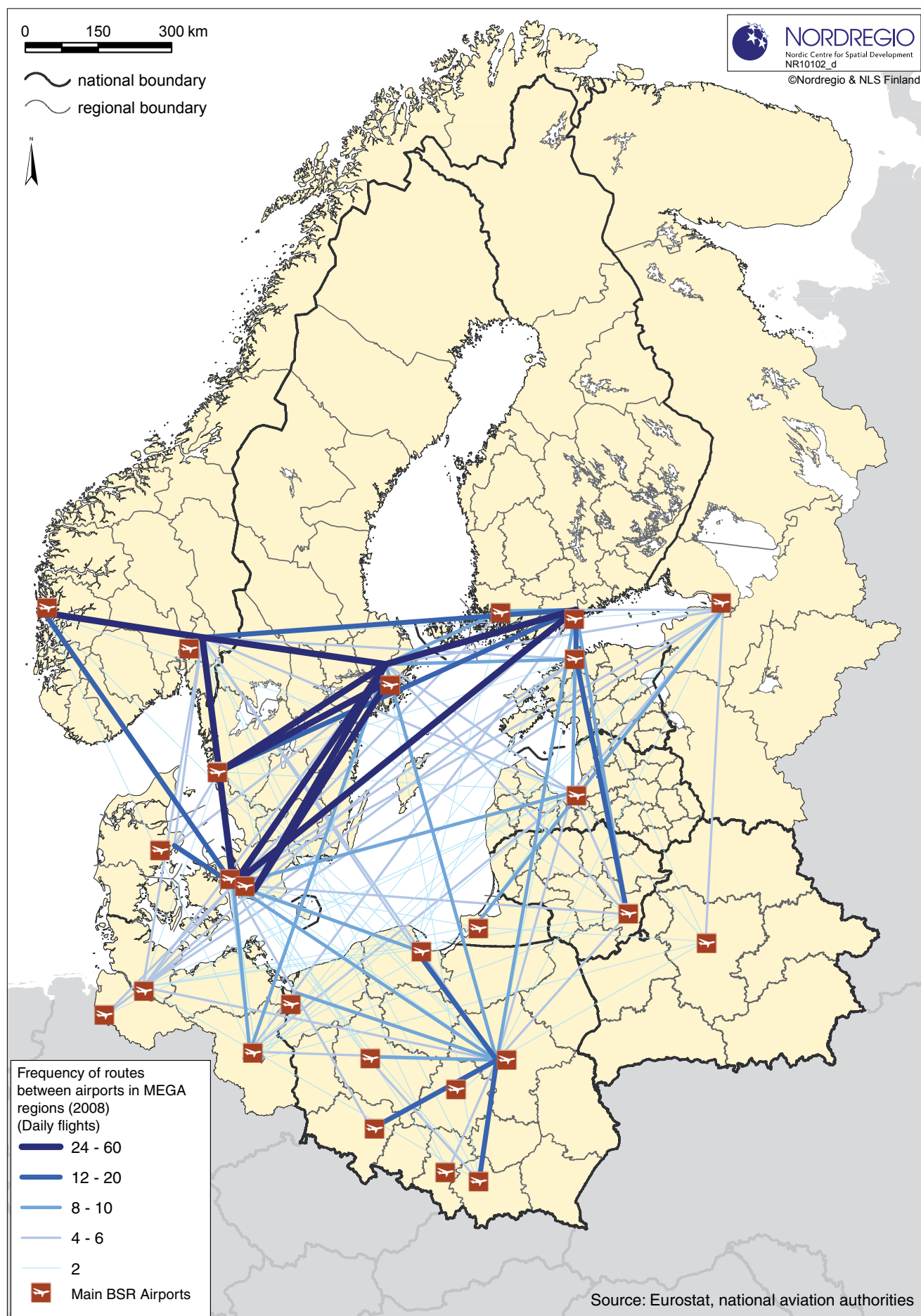
saw-Gdansk (14) and Warsaw-Krakow (14), and the enhanced connectivity of Warsaw to other BSR airports, clearly highlights the role of Warsaw as the national hub for Poland, and thus the gateway to international destinations for the rest of the country. In that regard, the pattern of air connections for Poland is in line with the pattern in other European countries.

Another interesting fact that can be drawn from figure 34 is the rather limited extent of internal-BSR connections from/to German metropolitan areas of the BSR. Airports in Berlin and Hamburg, and to a lesser extent Bremen, have a broad array of connections to other BSR metropolitan areas, but these connections are not that intense, in spite of the fact that Germany is traditionally one of the biggest trade partners of other BSR countries. There are two possible explanations for this. Firstly, one must bear in mind that neither Hamburg nor Berlin are hubs for the German national carrier, *Lufthansa*. A second explanation could be that Hamburg and Berlin privilege destinations situated in North-West Europe rather than other BSR destinations. The overview of European and global connections of BSR airports developed hereafter will highlight this possibility. Finally, as regards Russian and Belarusian airports, the most frequent route is between Kaliningrad and St. Petersburg, with 10 daily connections.

Looking more closely at airports in the BSR's metropolitan areas the figures 35 and 36 display the spatial distribution of airport facilities around the BSR. We do not attempt here to picture the full airport infrastructure, instead focusing on the main facilities, i.e. the facilities that attain a minimum threshold of passengers or cargo per year. Smaller airports may of course play a significant role in terms of local communities, especially as these airports are often connected to the capital region. Generally speaking however their volumes are too low to be of significance for our transnational study.

The airports located in the metropolitan areas of Copenhagen, Stockholm and Oslo represent the main nodes in the BSR airport network. The total number of passengers transiting these airports is of approximately 20,000,000. While this is a considerable number in BSR terms it is actually quite low in a broader European perspective. Copenhagen airport is, to date, the only airport located in the BSR that belongs to the top-20 group of European airports (Matthiessen 2004). The airports of Helsinki (Vantaa), Hamburg and Berlin (Tegel) belong to the second category of airports, with a total of yearly passengers approaching 10,000,000 in 2006. Consequently, the largest airports in the BSR are still located in the West. On the Eastern side, only Warsaw airport has passenger traffic volumes that approach those of BSR-Germany and the Nordic countries, with more than 8,000,000 passengers in 2006. Airports in Krakow, Vilnius, Riga, St. Petersburg and Tallinn belong to the group of airports that have a strong national/regional importance, but a low overall BSR significance. Most airports around the BSR have wit-

Figure 34: Air travel connections between MEGAs' airports within the BSR (2008)



nessed a sharp recent increase in their passenger volumes. The largest hubs, belonging to the first and second categories, have not however witnessed growth on a par with medium-sized airports. Indeed, airports in Warsaw, Tampere, Aalborg, Tallinn and St. Petersburg have shown yearly passenger traffic growth between 25 and 50%. This growth pattern has been even more evident in Berlin (Schönefeld), Riga, Gdansk, Katowice and Krakow, where it has reached thresholds above 50% per year. The evidence highlighted here clearly shows that overall there is a strong dynamism in the passenger traffic sector in the BSR, and that this dynamism is especially marked in airports of smaller sized. If this trend continues in a medium-term perspective, this will reduce the current imbalances between the Western and Eastern parts of the BSR and decreased the weight of some BSR metropolitan areas in this respect.

If the Baltic Sea presents a natural obstacle to the expansion of terrestrial means of transportation such as road and rail networks, it is an outstanding asset for the development of an integrated maritime transportation network between BSR countries and regions. In earlier sections of this chapter, we have emphasised the importance of seaports as nodes in a maritime transportation network. However, the identification and characterisation of the seaports do not enable us to draw conclusions on the degree of integration between them. In order to do so, it is necessary to first identify the availability of routes connecting the BSR seaports between them. Based on these identified routes, the intensity of interactions will be measured by collecting data on the frequency of connections per week. Figure 37 displays the result of this data collection. The most frequent routes are shown in dark blue and with thick strokes, whereas the least frequent are shown in light blue and with thin strokes. Figure 37 provides two main analytical dimensions, each highlighting two different ways for maritime transportation to promote integration in the BSR: on the one hand short-haul, cross-border interactions and on the other hand long-haul, transnational connections.

In the Baltic Sea, ferry lines are not only used for cruises or leisure trips, but also as a means of transportation for commuting journeys, especially for reaching out to the

many islands found in the Baltic Sea. Consequently, the development of ferry lines enables the connectivity of these islands to the mainland to increase, thus making it possible to develop a joint labour-market. This type of maritime traffic is characterised by short travel distances and rather high frequencies. This is the case for instance with the route Esbjerg-Nordby along the North Sea shore of Denmark (but belonging to the BSR) which had on average 560 weekly connections in 2007 (cf. Table 8). In Denmark and Norway, the physical geography of these countries, constituted by many different sets of islands, makes the use of maritime transportation essential in the national transport system.

Furthermore, the fact that many BSR countries are only separated by a narrow sea channel increases the possibility of using maritime transportation on a cross-border basis. In relation to these specific geographical contexts, maritime transportation becomes the most cost-efficient and reliable means of transportation: distances are too short to use air connections, and the building of bridges or tunnels would be, if feasible, too expensive and not profitable enough. The most used cross-border ferry line in the BSR is the route between Helsingborg in Sweden and Helsingor in Denmark (cf. Table 8). These two cities are the closest points between the two countries and strong interactions have been developed for centuries between them. In 2007, the average weekly frequency on the route was of 945 connections. Similarly, ferry connections are well developed between Germany and Denmark. The route Puttgarden-Rødby is the fourth most frequent in the whole BSR with 336 weekly connections. The increase in ferry connections between Tallinn and Helsinki has enhanced further the ongoing economic integration between the two regions. The development of a high-speed ferry connection between the two cities, cutting the journey to one-hour, has significantly increased the potential accessibility between the cities. In 2007, there were 392 weekly connections on average between Helsinki and Tallinn. On the eastern shore of the Baltic Sea, the ferry connection between Gdansk and Kaliningrad acts as an efficient substitute to road and rail transportation due, for instance, to the existence of differing national technical standards.

Figure 35: Main international passenger airports in the BSR (2006)

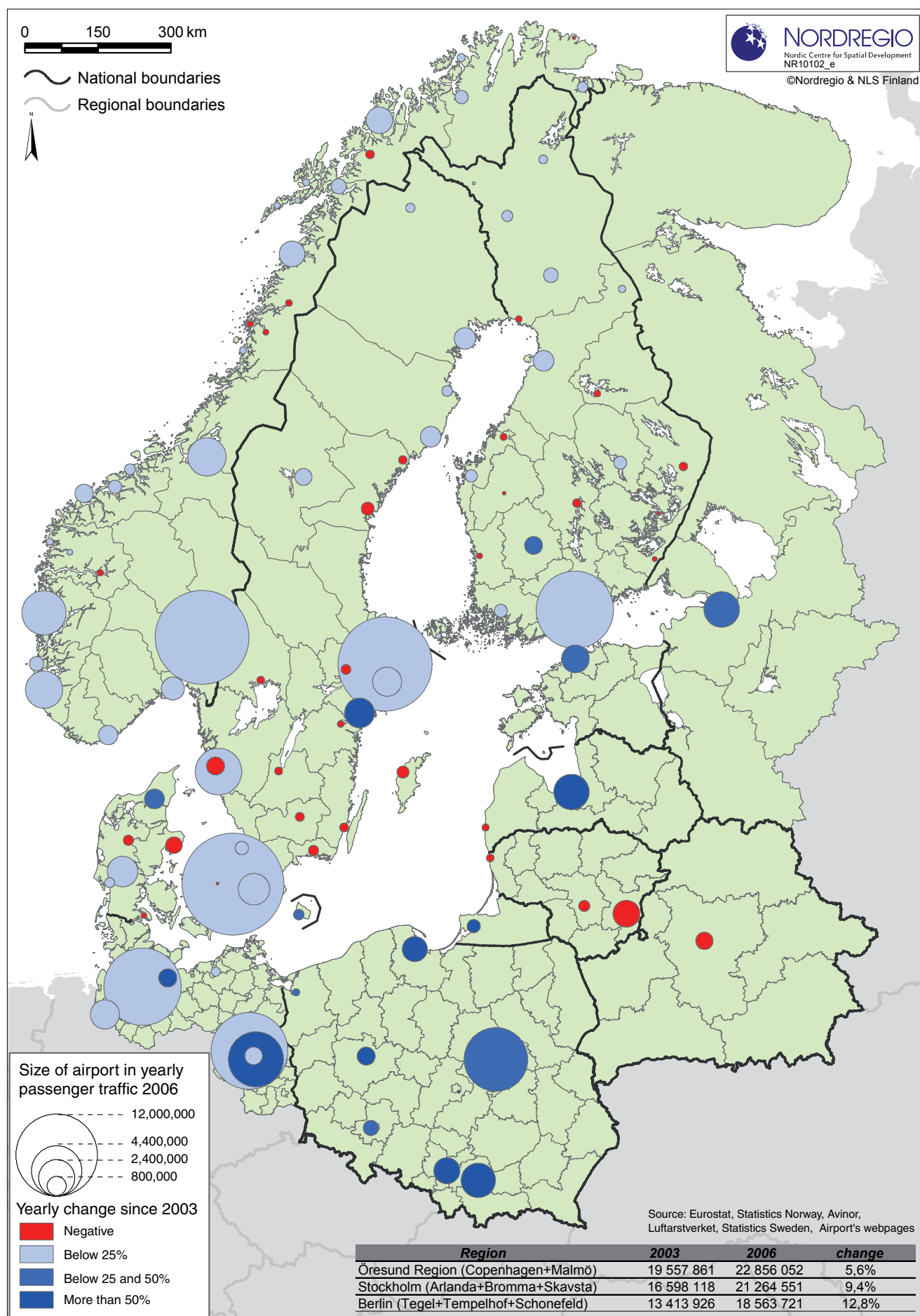


Figure 36: Main international cargo airports in the BSR (2006)

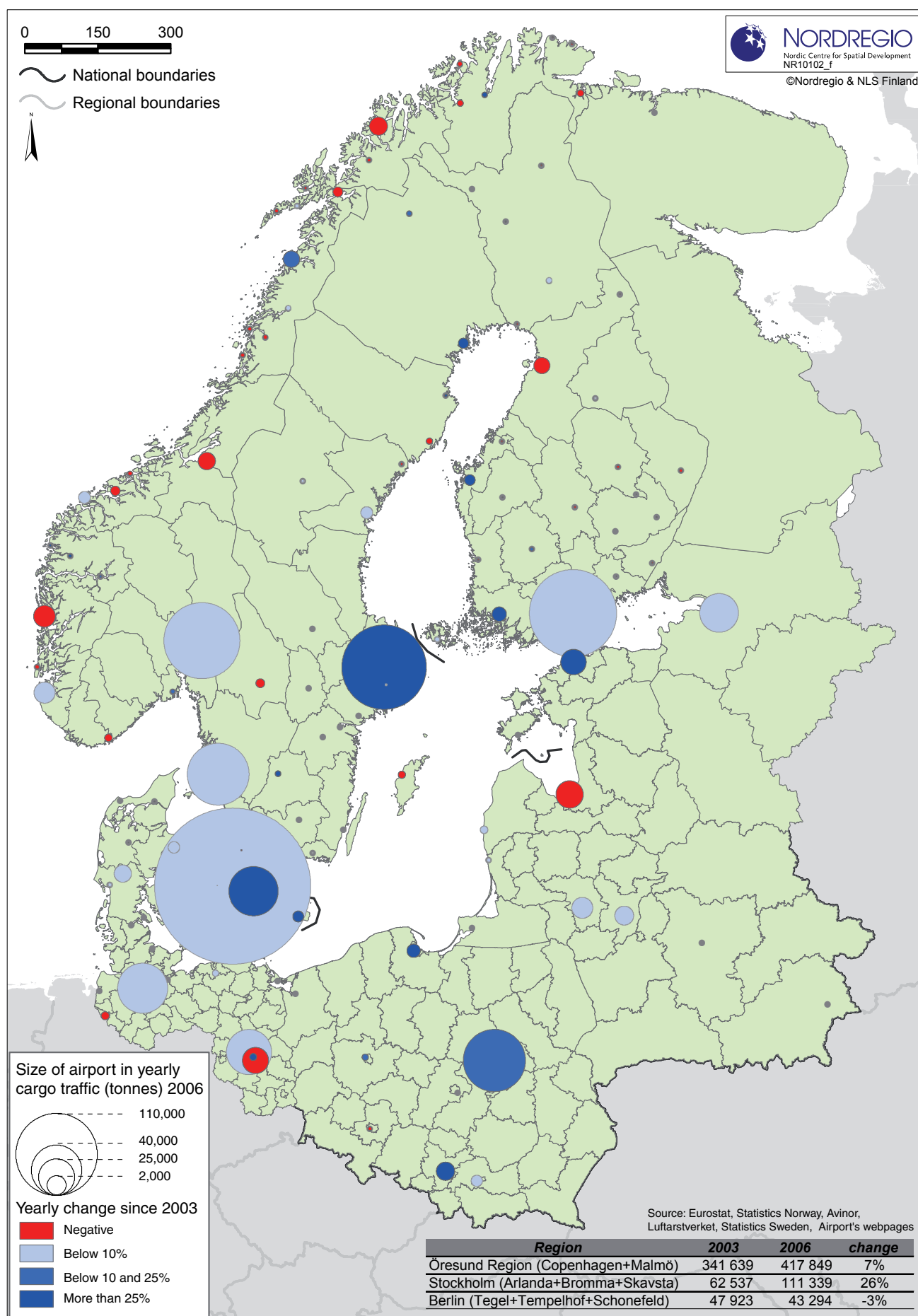


Figure 37: Most important ferry routes in the BSR (2008)

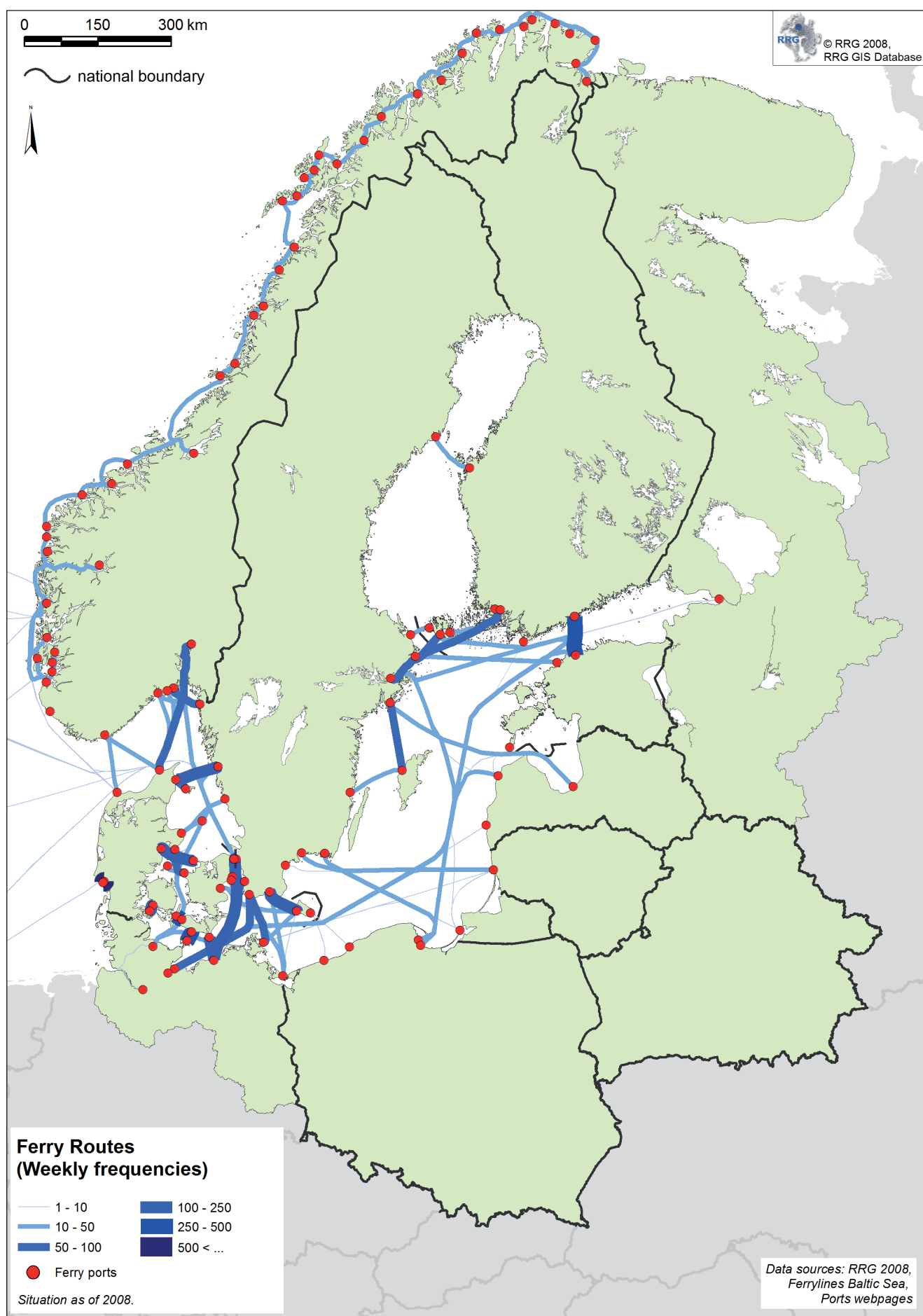


Table 8: Top 25 weekly frequencies of BSR ferry routes (2007)

Rank	ROUTE			Number of weekly ferry services route in BSR 2007
1	Helsingborg	Helsingør	Helsingborg	945
2	Esbjerg	Nordby Havn, Fanö	Esbjerg	560
3	Helsinki	Tallinn	Helsinki	392
4	Rodby	Puttgarden	Rodby	336
5	Tårs	Spodsbjerg	Tårs	252
6	Helsingborg	Rostock	Helsingborg	154
7	Gedser	Rostock	Gedser	154
8	Ystad	Ronne	Ystad	140
9	Aarhus	Odde	Aarhus	140
10	Gothenburg	Fredrikshaven	Gothenburg	133
11	Fynshavn	Bojden	Fynshavn	112
12	Frederikshaven	Vestero Havn, Laeso	Frederikshaven	98
13	Nynäshamn	Visby	Nynäshamn	84
14	Hirtshals	Oslo	Hirtshals	84
15	Aarhus	Kalundborg	Aarhus	84
16	Trelleborg	Rostock	Trelleborg	80
17	Stromstad	Sandefjord	Stromstad	77
18	Stockholm	Mariehamn	Stockholm	70
19	Trelleborg	Sassnitz	Trelleborg	70
20	Frombork	Baltiysk	Frombork	70
21	Stockholm	Turku	Stockholm	56
22	Malmö	Travemunde-Lübeck	Malmö	56
23	Elblag	Baltiysk	Elblag	56
24	Trelleborg	Travemunde-Lubeck	Trelleborg	49
25	Kristiansand	Hansthalm	Kristiansand	47
Source: Ports web pages, Ferry lines Baltic Sea				

These short-haul cross-border ferry connections are not only important in enhancing individual mobility but also for further integrating regional labour-markets. Ferry connections are also used by trucks and buses in order to transport goods across borders. In some cases, the use of ferry connections makes it possible for trucks to avoid long detours using the existing road network. This is especially the case for connections between Germany and Denmark, and between Germany and Sweden. Furthermore, Ferry routes are also attractive for lorry drivers because the time spent on the ferry can be used as a rest period even though the 'truck is moving'. This probably explains the continued

success of the ferry connection between Helsingborg and Helsingør despite the building of the Öresund-bridge. Consequently, short-haul, cross-border ferry connections can act as efficient substitutes for missing road and rail links.

In addition to this, maritime transportation is also well developed for longer journeys, essentially for connecting cities and regions on the shores of the Baltic Sea. These long-haul transnational connections are often very popular for leisure purposes, providing a rather cheap means of transportation for tourists wanting to visit other BSR cities, emphasised by the fact that many ferry routes run during the night, thus providing accommodation, amusement

and transportation. The most frequent routes are Stockholm-Mariehamn (70 weekly) and Stockholm-Turku (56 weekly).

In conclusion, it is clear that maritime transportation plays an important role in the integration of the regions of the Baltic Sea. In the preceding section we emphasised that this integration can be deemed to occur on two levels. Firstly, short-haul and frequent ferry connections may

provide a cost efficient solution to enhancing the integration of cross-border labour-markets. These often act as a substitute to missing terrestrial network linkages. Secondly, maritime transportation is also important in connecting more distant regions, separated by the Baltic Sea, and in improving the integration of the whole BSR by enabling the long-haul, transnational mobility of passengers (especially for leisure trips) and goods.

4.2 Accessibility potentials and challenges

Previous sections have provided a detailed picture of the state of the various transport systems in the Baltic Sea Region. It has been argued that transport networks (road, rail, air and maritime) are not interchangeable. The usage of one or the other is very much dependent on the purpose of the mobility, whether it is for local or international travel or whether it is for passenger or goods transportation. Consequently, each transport network fulfils a clear role in supporting and enabling regional development potentials and strategies across the macro-region.

In the following we focus on the concept of accessibility, which has traditionally been defined as the main 'product' of a transport system. A recent pan-European study has usefully provided us with a more precise characterisation of the notion of accessibility:

There are two main components in a measure of accessibility. The first is the transport infrastructure endowment. This includes all physical, logistical and organisational factors that contribute to connect a region to the outside world. These infrastructure elements are not necessarily located within each region's boundaries. An airport located outside a region's boundaries may for example be a critical component of its transport infrastructure. The second component of accessibility is the destinations made available by this transport infrastructure. The relevance of each destination, and its potential importance for a region's economic development, decreases when the effort required to reach it rises. This effort can be expressed in different ways, depending on the type of accessibility one investigates, e.g. airline distances, road distance, travel-time and transport cost. Inversely, the closer a destination is, the more it becomes attractive and so the more it contributes to the regional level of accessibility. European measures of accessibility generally express the size of the destination region in terms of economic weight (total GDP) or demographic mass (total population). The underlying hypothesis here is that the larger the destination-region, the more valuable it is to have access to. Measures

of size can indeed be taken as proxies for the extent and scope of the production inputs that can be imported from each region, and of potential opportunities to export products to it. Measures constructed on this basis will be a main focus of the present report. (Nordregio et al., 2007, p 23)

Consequently, the measurement of 'potential accessibility' for each region consists in evaluating how the transport infrastructure enables the region to access with relative ease other 'regions that matter'. A flaw in this picture is the hypothesis that the relevance of the destination is only a matter of size. It has been argued in the previous chapter that the development of bilateral connections is often a matter of shared history, economic interests or culture. Consequently, proximity is not only a matter of physical distances, but also one of institutional or organisational matching.

Nonetheless, accessibility measures can be valuable for national and regional actors in order to identify the main spatial patterns of accessibility across a certain territory, whether it is Europe, the nation-state or a region. Moreover, it highlights the potentials for the regions to increase their critical mass by being more highly connected to their neighbouring regions. In that respect, the transport network creates the link between regional and local communities. This development of a larger critical mass originating from the integration of neighbouring regions by means of adapted infrastructure can be said to be a central objective for spatial integration in the BSR.

Adapting the network to the territorial specificities of the BSR

The main purpose of transport infrastructure is to enable the mobility of goods and persons in a local (travel-to-work), cross-border (trade and commerce, short-time leisure trips) and trans-national (long-haul goods shipment, long-distance flights) perspective. As a matter of consequence, an essential characteristic of a transport network is its capacity to reach the largest share of the population.

This capacity is thus very much linked to the pattern of population distribution over the whole BSR territory.

The territory of the BSR can be divided into three main types of areas. Firstly, in many BSR countries a large share of the population lives in the largest metropolitan areas. The main metropolitan areas (as selected in chapter 3) re-group an increasing share of the BSR population (identified as 'green squares' in figure 38). Secondly, there are areas characterised by a dense network of small and medium-sized towns. This is especially the case in the BSR part of Germany, Poland as well as the Western part of Denmark and the southern part of Sweden and Finland. Finally, areas qualified as peripheral, i.e. distant from the main metropolitan areas of the BSR, and sparsely populated (dark red areas in figure 38), i.e. with a loose structure of smaller towns and villages, complete the picture and extend to the northern parts of the Nordic countries, the central and northern territories of North-West Russia (with the exception of Murmansk) as well as to the Western and Eastern parts of the Baltic States (cf. Gloersen *et al.*, 2006 for more precise definition of sparsely populated areas). The adaptation of the transport networks to these specific territorial conditions is necessary in order to ensure the mobility of goods and persons and access to services for businesses and individuals.

The mapping of the population potential in the BSR provides empirical material that highlights this specific territorial structure of the BSR (cf. figure 38). The population potential represents the total population that can be reached in a radius of 50km around each point in the BSR. The threshold of 50 km has been chosen as it represents the limits of the willingness to travel on a daily basis, for instance for work or other day-to-day activities. Indeed, it is often assumed that a certain critical mass of population should be reached in order to sustain the provision of basic services in a market-based approach. Areas with a high population potential (i.e. metropolitan areas) often enjoy both a more specialised and a more diversified range of services. In this respect, the transport networks, especially road and rail, are central as enablers and catalysers as regards these interactions. Nevertheless, taking into consideration the strong variations of the territorial structure in the BSR, the transport network should fulfil different requirements in different territories.

As for metropolitan areas, the main issue regarding intra-regional transportation is linked to traffic congestion and pollution. The terrestrial transport network, especially roads, should meet good quality standards, have a high carriage capacity and connect the suburbs to the city centre as well as offering a bypass possibility for suburb to suburb travel. Moreover, the development of reliable and frequent connections to other main markets and metropolitan areas, both in the BSR and in the rest of Europe, is a necessity in times of enhanced economic globalisation.

In the case of our second type of territory, characterised by a dense network of medium-sized towns, the capacity

of the transport network to connect these nodes with each other is essential in building an integrated critical mass, i.e. enabling us to aggregate local catchment areas into a larger territorial unit. Building such types of intra-regional transport linkages is, for instance, a central component of the notion of regional enlargement (*regionförstoring* in Swedish) used in the regional policy context in Sweden. In our last type of territory, the specificity of the territorial context, characterised by long distances between towns and/or a diffuse settlement structure, and often the thinning-out and/or ageing of the present population (cf. chapter 2) poses stark challenges to the development of a sound transport system in those areas, and poses a political trade-off between financial viability (construction and maintenance costs) and regional development policies, providing each region with the necessary 'tools' to sustain economic growth. For the two latter types of territories, the secondary road and rail networks play a vital role.

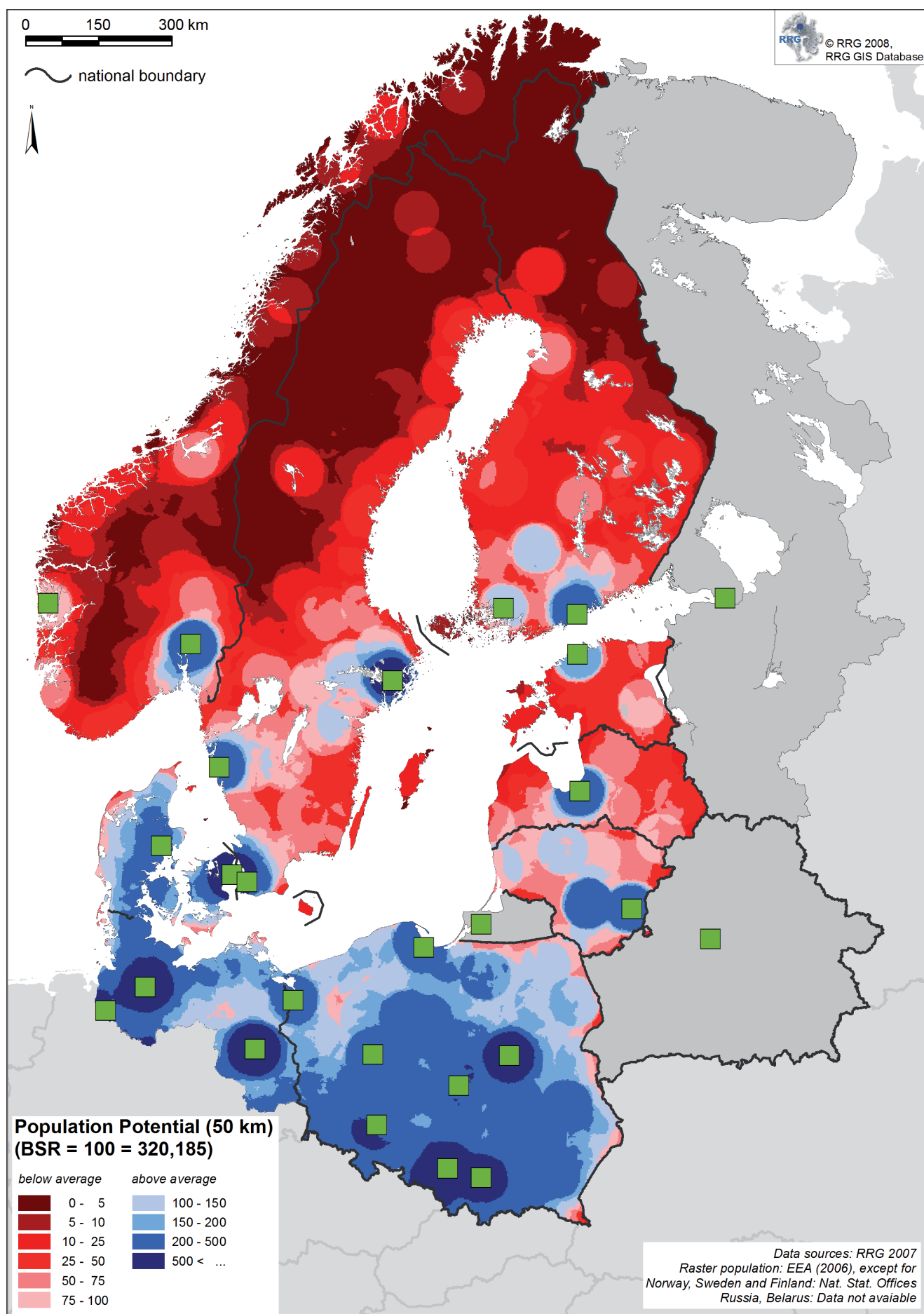
This section aimed at briefly introducing the importance of the transport networks, especially the terrestrial ones, in connecting the BSR regions. In this light it becomes clear that the increase in trade and commercial interactions within the BSR is tightly bound to the quality and capacity of the region's transport networks. The next section will focus on the existing road and rail infrastructures, focusing in particular on the discussion on potentials and bottlenecks.

Measures of potential accessibility in the BSR

Figures 39, 40, 41 and 42 display the results for accessibility by road calculated for 2.5 x 2.5 km grid cells. These 4 figures complement each other as they highlight both the European/BSR structure and the structure related to GDP/population distribution. Looking at the structure from a European perspective, it is clear that the regions enjoying the best accessibility, both in terms of population and GDP, are those in north-western Europe (Nordregio *et al.*, 2007, pp 23-26).

In general, with the exception of the northern part of Germany and western parts of Poland, BSR territories 'enjoy' a rather low level of accessibility. However, those specific features ought to be highlighted. Indeed, the difference in structure between the population and GDP map is striking in the case of Poland and the Baltic States. In addition, their potential is much lower when it comes to GDP than population. This is of course due to the relatively lower standard of economic development in those countries: when compared to the 'old' Member States, the size of their regional economies is smaller than the size of their population. However, the rather high accessibility potentials in western Poland show the market potential for these territories when the economic 'catching up' process has delivered comparable economic standards (in GDP). The status of the Nordic capitals is also worth noting. Here, the conclusion is reversed. Indeed, these metropolitan areas

Figure 38: Population potential in the Baltic Sea Region



display much higher standards in terms of accessibility to GDP than accessibility to population. This emphasises the high degree of economic development found in these regions. This also implies that the economic zone of influence of these regions goes well beyond their administrative boundaries.

As for the BSR territorial context, the maps (figures 40 and 42) highlight the potential for some cities to act as 'hubs' for the region. This is obviously the case for the analysed metropolitan areas in chapter 3. However, in less densely populated regions, it shows the importance of medium-sized towns in structuring the territory. These towns have the potential to act as regional 'hubs'. This is particularly so in the northern parts of the Nordic countries (such as Trondheim, Tromsø, Narvik, Sundsvall, Umeå, Luleå, Oulu, Rovaniemi), but also in the Baltic States (such as Tartu, Liepaja, Klaipeda, Siauliai).

In fact, these measures of accessibility can be used to identify the potential for some inter-regional or cross-border territories to further integrate. In concrete terms, it means that some territories already bear the potential to increase their 'critical mass' by integrating with each other. This is for instance the case between Liepaja (Latvia) and Klaipeda (Lithuania), but also for the territories between Riga and Vilnius. Consequently, proactive strategies fostering co-operation between actors could strengthen the potential to build larger cross-border labour-market areas, which could, partly, substitute for the lack of critical mass in each individual region. Such strategies are already well developed in the Nordic countries, where the integration of medium-sized labour-markets enables a clear policy objective (cf. the discussion on *regionförstoring* in Sweden).

It is nevertheless important to bear in mind that potential accessibility should not be interpreted as a measure of the economic development potential of the regions. Indeed, while they may provide an insightful picture of the general organisation of a given territory, e.g. Europe or the BSR, it is difficult for regional actors to use them as an evidence base for elaborating adapted regional development strategies. At most, these types of calculations enable us to highlight the regions that have potential, namely, the critical mass needed, to act as a 'hub' in the territorial structure in question, and thus to act as a meeting point for businesses and entrepreneurs (Nordregio *et al.*, 2007). Low access to population or to GDP does not imply a lack of potential in respect of developing long-term development strategies. Consequently, the use of such indicators should be made jointly with a more thorough investigation of the industrial and economic profiles of the regions, in order to identify the specific accessibility needs of each territory by answering those questions: what are the main clients for the dominant economic sector? Do sufficient transport and logistics infrastructures exist enabling a reliable connection to those target-regions?

Indeed, territories characterised as 'peripheral' have re-

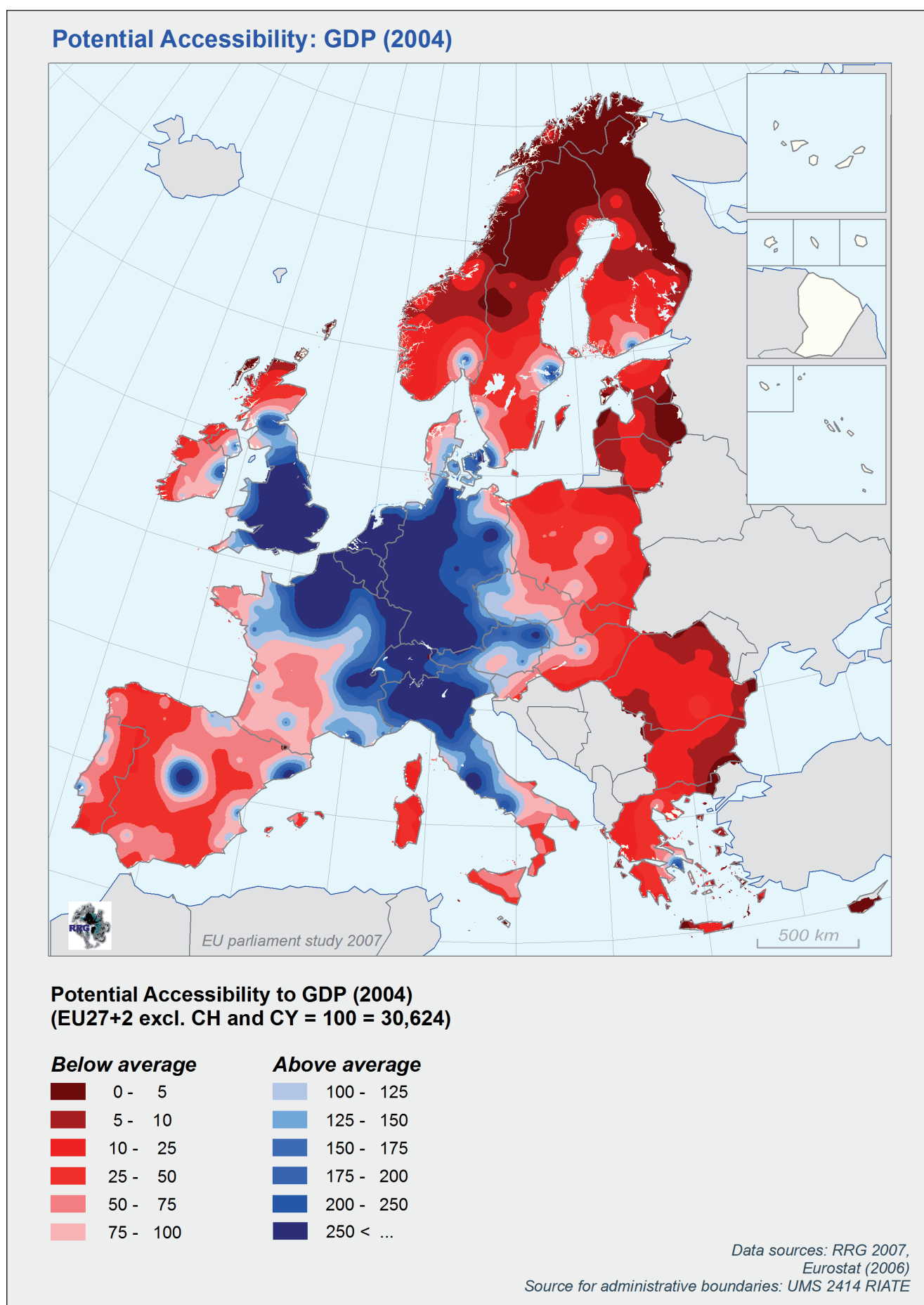
gional economic structures that are often much more specialised. For example, territories in the northern parts of the Nordic countries have developed 'niches' of global significance (e.g. iron ore, paper pulp) based on their regional comparative advantage, in this case their relatively good access to natural resources. This high degree of specialisation implies that these industries have clients and customers worldwide. Consequently, these regions have developed specific needs in terms of transport infrastructure as the latter needs to operationalise the necessity for them to have reliable connections with their customers, whether situated in close proximity or at the other end of the world.

Local access to services

The chapters 3.3 and 4.1 highlighted the importance of the location of transport facilities (airports, seaports, freight terminals etc.) in maintaining and increasing the competitive advantage of cities and regions in the BSR. Generally speaking however, other types of facilities are believed to be central in relation to regional development issues. Facilities such as universities and polytechnics act as structuring elements enabling the regions to operationalise their regional development strategies. Traditionally, the issue of quality of access to such services is tackled in terms of endowment by administrative regions. Recent studies (Nordregio *et al.*, 2007) have argued that this way of problematising the issue is however of little relevance. Firstly, this approach omits the importance of service location. What is thus of interest then is to identify *where* the services are provided, i.e. where the service facilities are located, and the proportion of the population covered by the service provision areas around these facilities. Secondly, the use of administrative units is misleading. Neighbouring regions also gain from their proximity to service facilities (airports, terminals, universities, but also hospitals), even where the facility is not physically situated in the region itself.

As a matter of consequence, a pertinent measure of access to services can be operationalised by calculating the travel-time that it takes for individuals and businesses located in all corners of the BSR to access such service facilities. The bottom-line is that above a certain time threshold, the effort that it takes to access the facilities is too high for their use to be cost efficient for the actors concerned. These measures of local accessibility are dependent on three main territorial characteristics: the distribution of the population over the territory, the territorial extent and coverage of the road (or rail) transport networks and the location of the service facilities on the territory. High local accessibility to services would thus be the result of a high degree of correlation between the three above-mentioned dimensions. The following figures 43, 44 and 45 display the resulting travel-time pattern for cargo terminals (maritime and air), facilities of higher education (universities

Figure 39: Potential road accessibility to GDP (2004), standardized to EU average



Source: Nordregio et al., 2007

Figure 40: Potential road accessibility to GDP (2004), standardized to BSR average

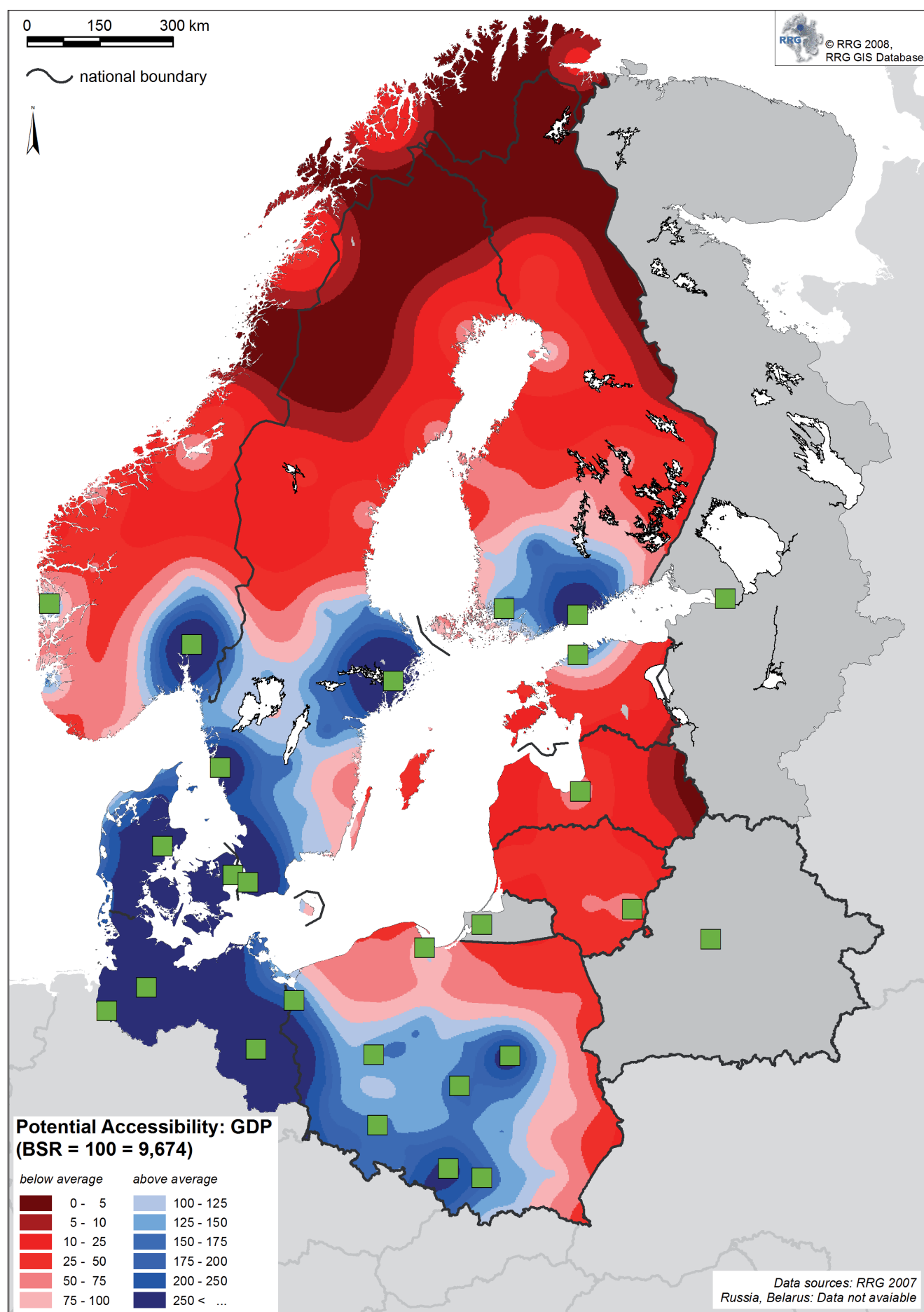
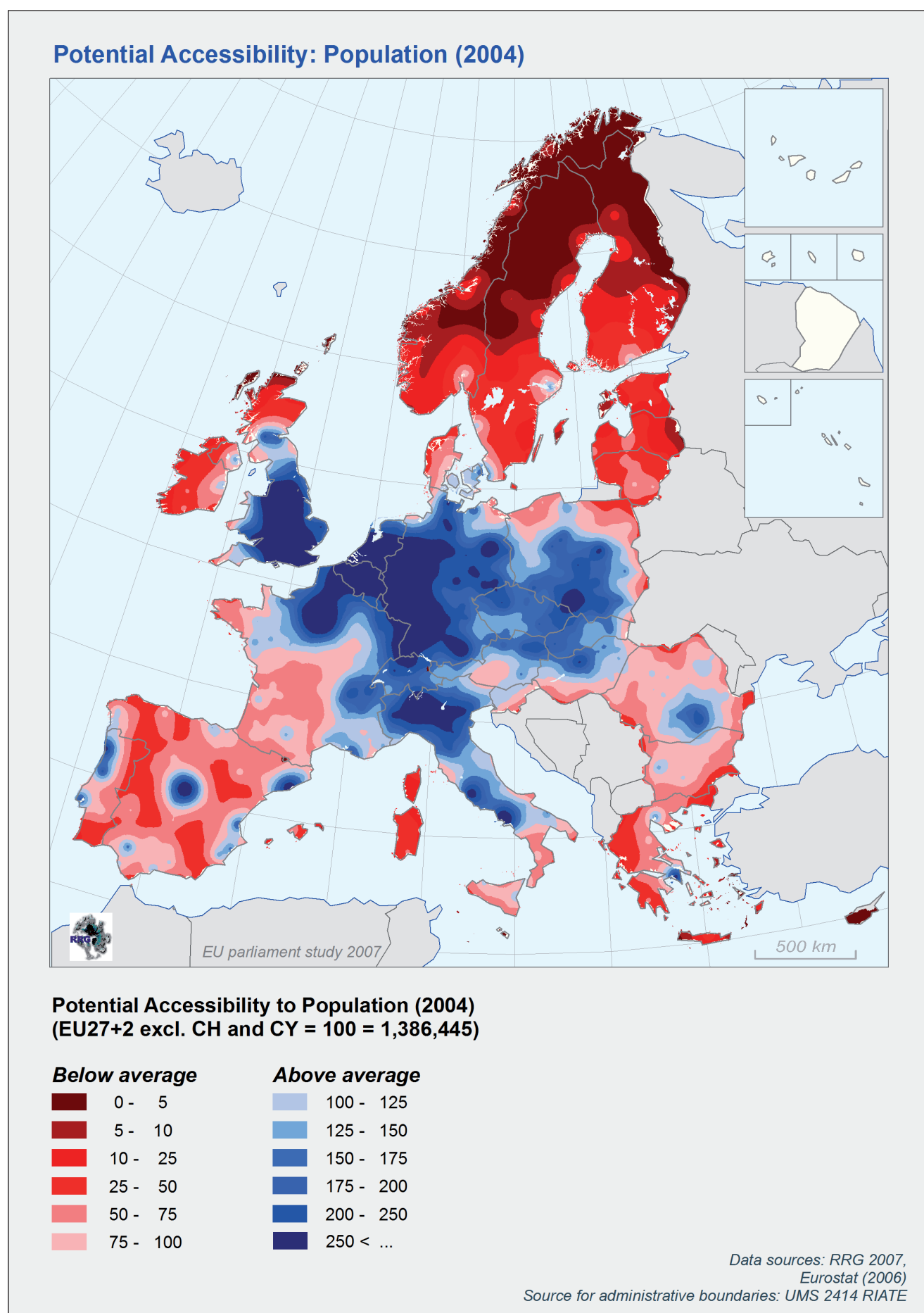
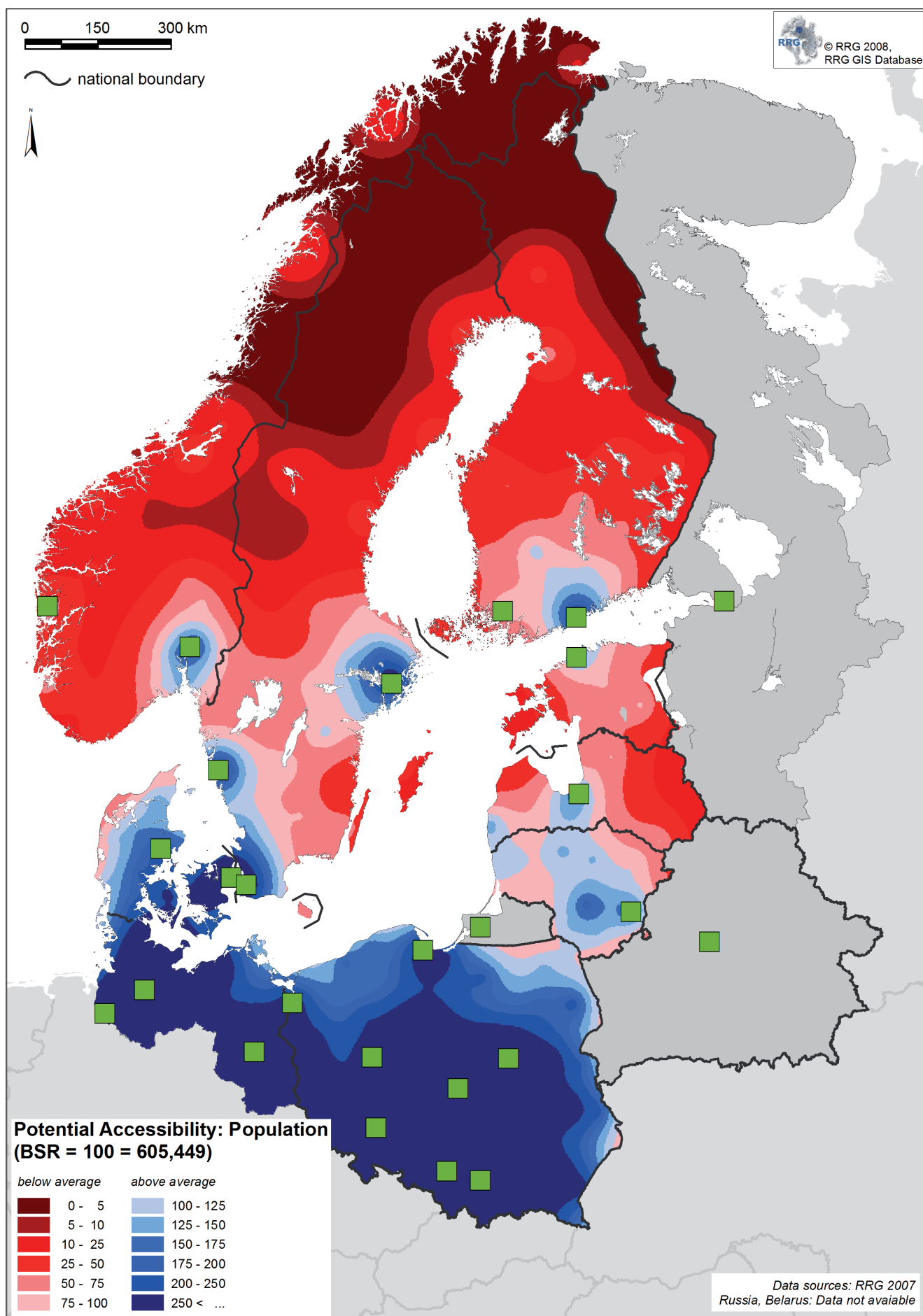


Figure 41: Potential road accessibility to population (2004), standardized to EU average



Source: Nordregio et al., 2007

Figure 42: Potential road accessibility to population (2004), standardized to BSR average



and polytechnics) and commercial airports.

The map for cargo/freight terminals shows that access to these terminals is rather good in most parts of the BSR. Not surprisingly, the high number of seaports on the Baltic and North Sea shores of the BSR provides these areas with a very high level of access to cargo terminals. The map also illustrates the importance of inland ports in improving accessibility levels to such facilities for those territories located further inland. This is obvious in western parts of Poland and in the lake districts of both Sweden and Finland. However, some other parts of the BSR have a much lower level of access to cargo terminals. This is the case for the northern, inland parts of the Nordic countries. For these territories, whose economies are dependent on the export of natural resources, this low access to cargo terminals poses a structural bottleneck in the development of their economic profiles. For these specific territories, the development of transversal, east-west road and in particular, rail, infrastructures would significantly enhance their access to cargo facilities. In North West Russia, the inland parts of the territory along the Finnish border also have long travel times to cargo terminals. The eastern parts of Poland (except around Warsaw) and Belarus again also experience long travel times to any type of cargo/freight terminals.

The map picturing the travel time to educational facilities however displays a different pattern. Many countries have implemented a decentralised strategy when it comes to the localisation of universities. This is obvious in the case of Poland where the spatial distribution of universities is very well balanced. Moreover, the localisation of the universities appears to be closely correlated to the distribution

of the population across the territory. Indeed, the parts that are deemed to be rather far away from this type of facility are also sparsely populated areas. The fact that good access to universities is made possible outside the largest metropolitan areas is a strong competitive advantage for BSR territories and for the BSR as a whole. In concrete terms, it implies that individuals who wish to pursue an academic degree have the possibility to stay in their region of origin. Moreover, universities are believed to be indispensable focal points for countries and regions to be able to profile their regional economy into the Knowledge Economy and to meet the targets of the EU Lisbon strategy. In Belarus, the rather centralised system of universities has, in consequence, a strong disparity in terms of access to secondary education between Minsk and the rest of the country. In NW Russia, the location of universities in Kaliningrad and St. Petersburg, but also in Murmansk, Novgorod, Pskov and Petrozavodsk, enables a fairly good coverage of the population in BSR-Russia. Other areas with low access to universities are the islands of the BSR, with the exception of Gotland.

The above section has highlighted the potential role that accessibility measures may have in framing the debates on regional development potentials in the Baltic Sea Region. However, these measures cannot be used as concrete facts for grounding regional development strategies by regional stakeholders. Recent studies (Nordregio *et al.*, 2007) have however shown that accessibility measures *may* have political relevance particularly in respect of the current ongoing debate on regional disparities and territorial cohesion (cf. chapter 2).

Figure 43: Travel-time to freight terminals in the BSR

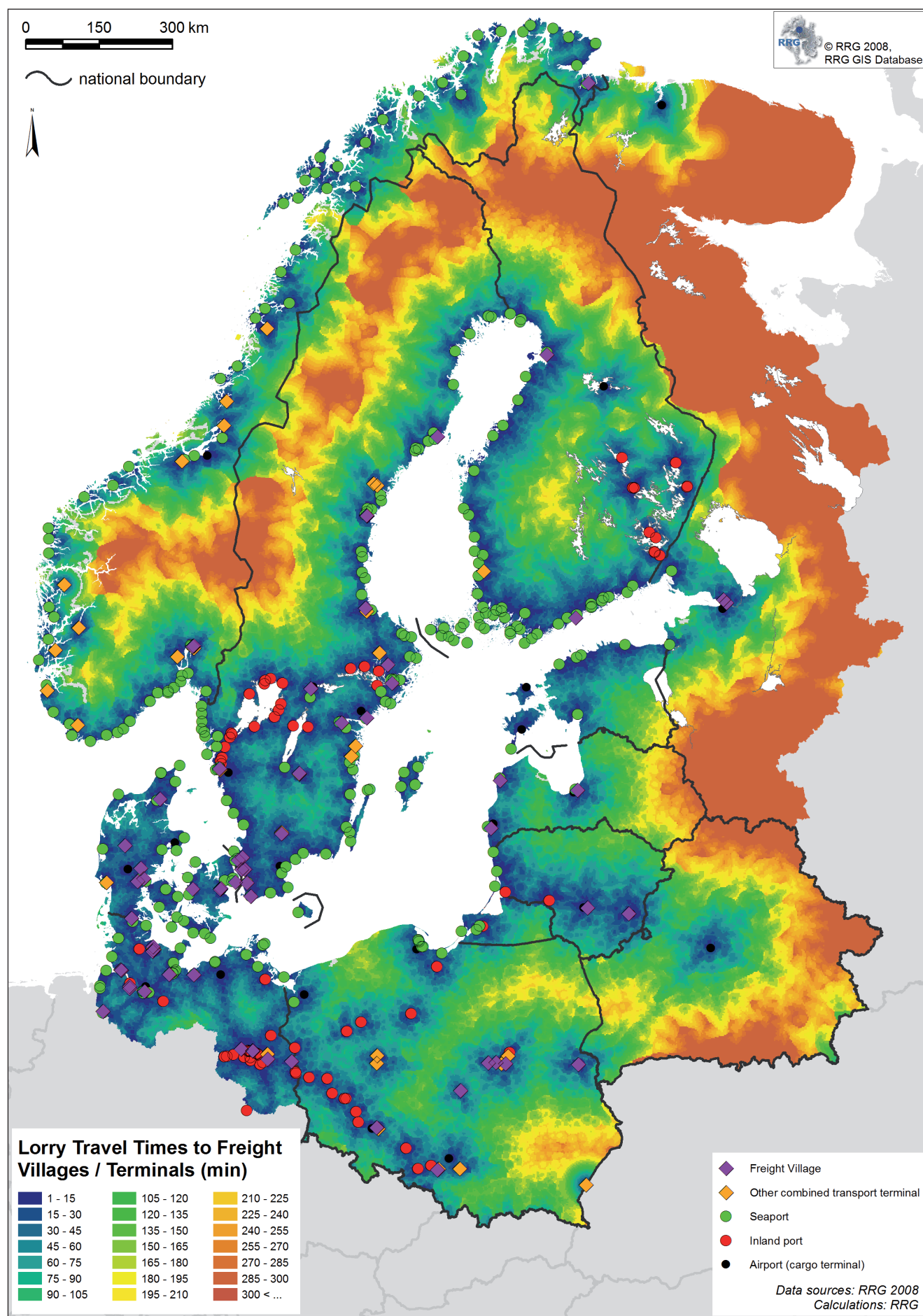


Figure 44: Travel-time to higher education facilities in the BSR

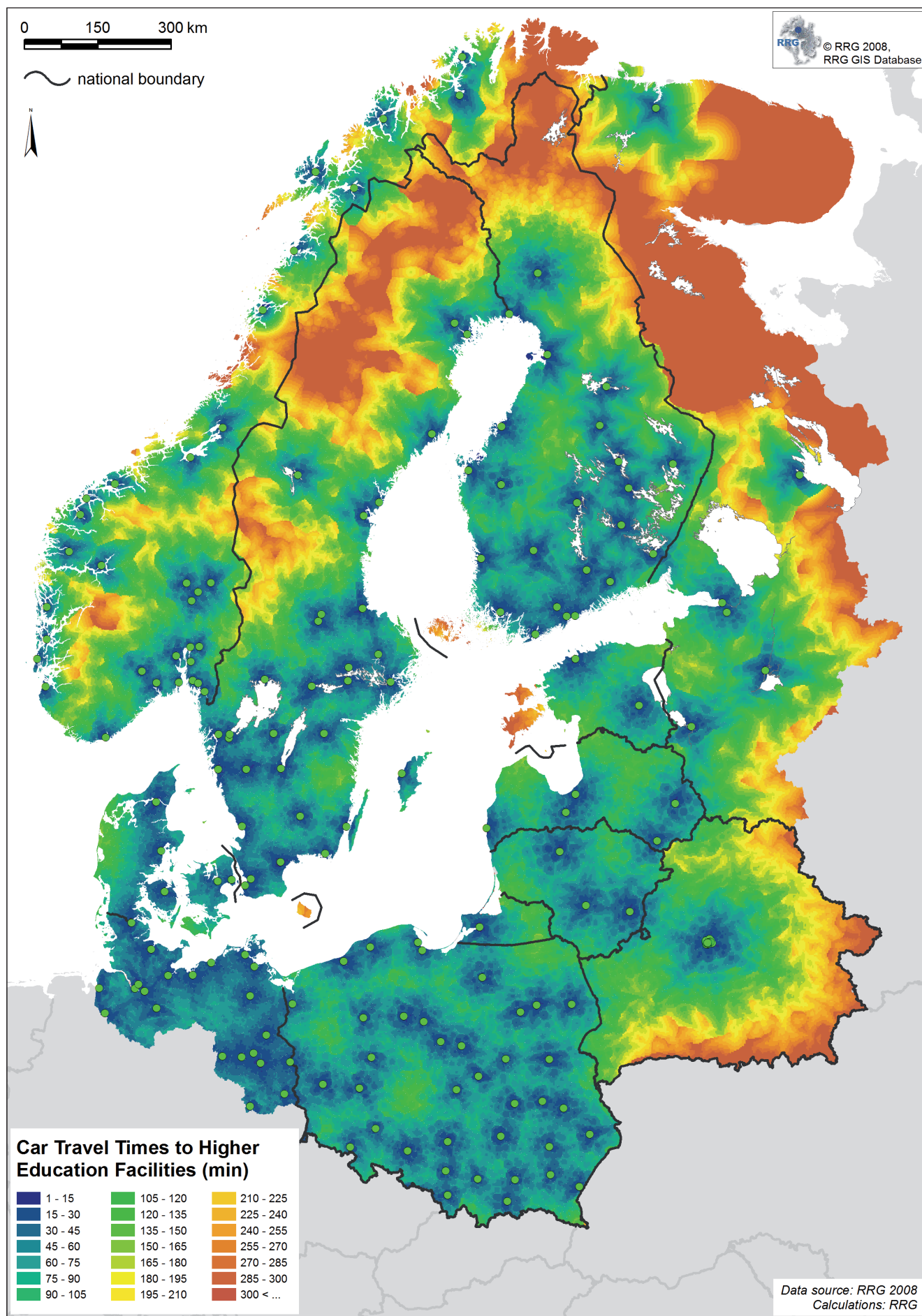
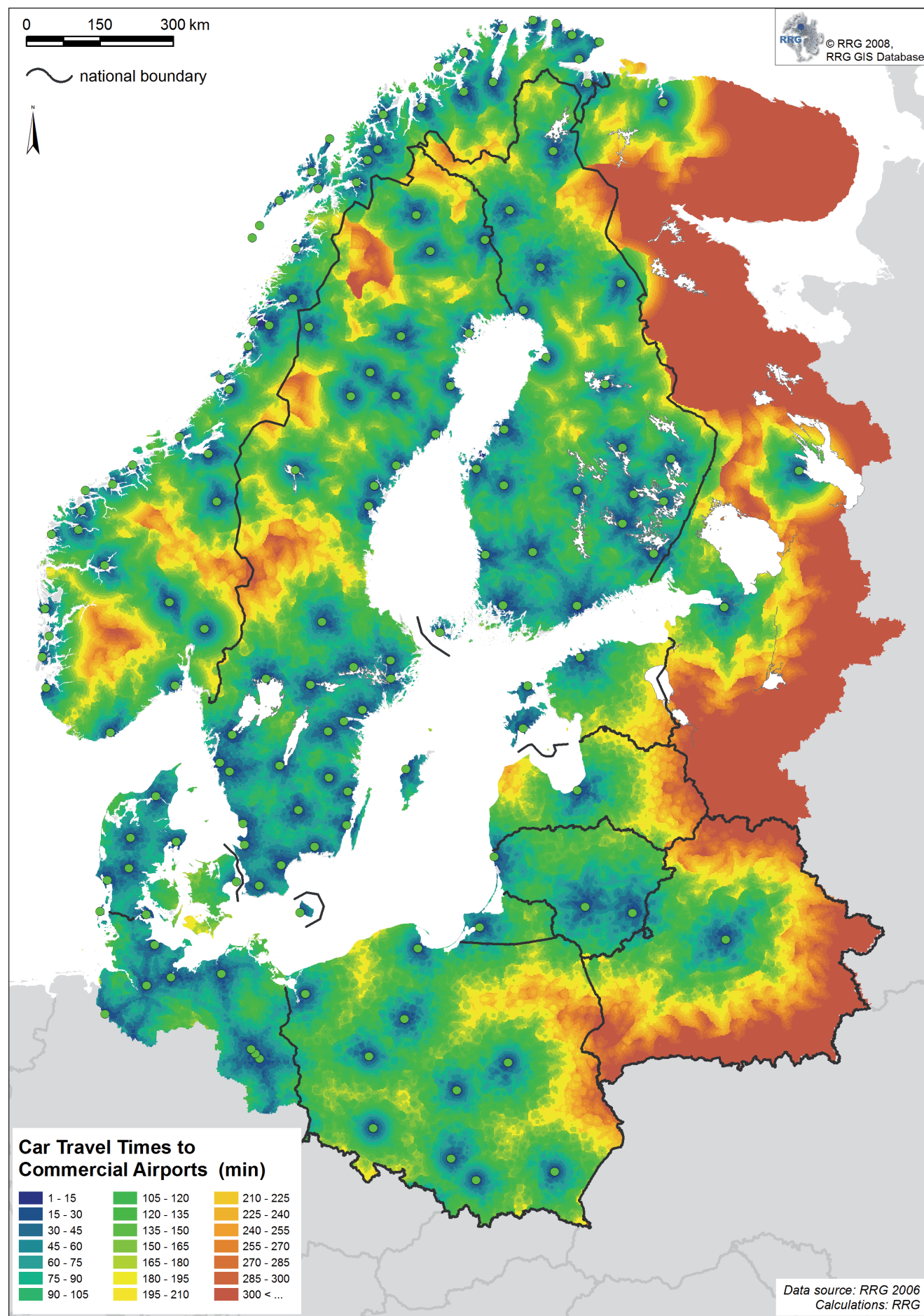


Figure 45: Travel time to commercial airports in the BSR



Source: Eurostat; Data not available for Russia and Belarus

5. The role of sectoral policies in framing BSR integration

In the following we cast our gaze over two sectoral policies with a particularly strong influence on spatial development processes, namely Energy and ICT. Both remain strong indicators of the BSR's territorial capital and as such are of critical importance in future strategies promoting a higher level of territorial cohesion across the BSR.

The field of Energy is directly linked to transport, but has far broader impacts on the BSR and its region's capacity to further integrate. In connection to energy, this report takes three different approaches. First, it highlights the different patterns of production of energy, looking in particular at the different types of energy produced in different parts of the BSR, and the capacity of the current energy infrastructure (pipelines, electricity networks etc.) to enable a further integration of the whole Baltic Sea Region. Second, the consumption of energy for different sectoral usages (industry, transport, agriculture etc.) provides an interesting insight into the various national and regional needs in terms of energy mix. Finally, the issue of renew-

able energies is highlighted in an attempt to provide prospective views on the future of the BSR's territorial capital in energy terms.

ICT is not always explicitly linked to the notion of accessibility. Yet, the development of ICT in many parts of the BSR has acted as a strong catalyst to regional development, and has contributed to making it one of the fastest growing regions in Europe. ICT has, in recent years, contributed to the concerted counteracted of the influence of 'peripherality': regions located farther from large markets now have the ability to develop contact-networks to potential customers and contractors using the latest technologies, the internet being the most emblematic. Yet, 'virtual' personal or business interactions do not replace transport journeys and face-to-face meetings, as they increase in fact the need for such physical interactions. Consequently, it becomes obvious that the integration of transport and ICT strategies should be based on the achievement of synergistic effects.

5.1 Energy – a challenge in the making for the BSR

Energy issues have become central to spatial development policies. Access to energy is necessary in order to pursue economic and social development across the Baltic Sea Region. For the Baltic Sea Region, the issue of energy is not however linked only to the development of integrated infrastructure. Of course, the interoperability of existing and future energy facilities and networks are important in order to create a shared energy market. The integration of transmission grids and pipelines is a prerequisite for building such a shared market. However, it is not sufficient in itself: energy issues are strongly impregnated by national interests and thus the development of a shared energy strategy implies the creation of new regulatory frameworks and the foundation of an interest shared by all countries in the BSR. In that regard, the role of the EU is not negligible, as it may provide a framework around which BSR policies can develop a shared understanding of their needs and potentials. The role of the EU is, moreover, of funda-

mental importance with regard to energy relations with Russia.

As with all liberalised markets, energy markets are driven by the rules of supply and demand. Consequently, the patterns of consumption and production have a significant impact on the access to energy sources. Ideally, the elaboration and implementation of energy-efficient spatial development policies in the BSR should focus on reducing the consumption of energy, without hampering the potential for the economic development of its regions. In this respect the decoupling of energy consumption and economic growth ought to be a central concern of spatial development strategies. One possibility here is to catalyse and support the production of regionally-based, renewable energy sources. A first step in that process would be to raise the awareness on the potential for each region to contribute to the effort that each country has to make to produce more in terms of renewable energy.

A prerequisite: Integration of energy networks

The integration of the BSR's energy networks is the necessary first step in creating an integrated energy system across the macro-region. In this respect, the electricity network is of particular importance as it is the form of energy used most directly by individuals and businesses. To date, the electricity transmission grids in the countries of the BSR have been essentially designed to supply their own domestic markets. Consequently, the technical solutions used in one country are often not the same as those used in the neighbouring ones. These differences in technological standards pose one of the main challenges to the interoperability of the BSR's electricity networks, i.e. the capacity of the networks to be integrated. Consequently, the integration of the transmission grids across the BSR countries is not only a matter of installing new cables from one country to another but also necessitates adaptation in the exploitation of electricity, thus necessitating the adaptation of national energy policies. Figure 46 displays the state of the electricity transmission grid in 2007.

In the Nordic countries, the creation of a joint energy body, *Nordel*, ensures the compatibility of the electricity transmission systems between the countries involved, by defining joint technical standards and through the development of joint regulatory frameworks. In concrete terms, the integration of the Nordic electricity networks enables providers to use the shared technical framework to connect the various electricity facilities (Hydropower stations, thermal power plants, nuclear power plants etc.) to the consumers notwithstanding the location of either. This enables the creation of a shared energy market ensuring access to energy based on the complementary nature of the various countries' policy decisions and natural endowments in respect of the factors of electricity production.

On the eastern shore of the BSR, the various electricity networks are however still very much based on the technology and industrial policy of the former Soviet Union. The transmission grids of the Baltic States, Belarus and Russia are rather integrated as they share similar technical standards due to the fact that all of these countries be-

longed to the Soviet Union. Poland has however sought to develop a different technical standard for its transmission grid which is, as yet, only barely connected to Germany, Belarus and Lithuania. Consequently, one of the main challenges for the Baltic Sea Region is to create the conditions to develop joint technical solutions enabling better interoperability and thus providing the conditions for a shared energy market across the region.

Main characteristics of energy production in the BSR

For national policymakers, securing access for their populations and businesses to the energy necessary to perform their daily activities drives the elaboration and implementation of energy strategies. These strategies in particular address the issues of production, i.e. how to find new sources of energy, and consumption, i.e. how to adapt the consumption of energy to the national production capacity and its economic development, of energy. In this respect, the territorial capital of a country or region plays an important role in defining these strategies. Indeed, for some types of energy, the availability on site of natural resources is a major determinant. For instance, hydropower and renewable energies are typically energy sources that need to be exploited and transformed into electricity *on-site*, whereas oil, coal or uranium can be transported in order to feed conventional thermal or nuclear power plants.

The analysis in the following will be divided in two parts. First, a general introduction will be provided on the specificities of energy production in the various BSR countries, thereafter, the analysis will focus on the identification of patterns of energy production at the regional level.

Table 9 provides an overview of the energy mix in the total production for each country. Production is divided by type of energy: coal, oil & gas, nuclear, hydropower, renewable energies and miscellaneous production of electricity and heat. The information presented in the table is very important as it enables us to understand the various

Table 9: Production of energy in the BSR by type, 2005

	Indigenous production of energy							Energy trade, in ktoe			Total Primary Energy Supply (TPES), in ktoe
	Total production in ktoe	% generated from source						Export	Import	Net exports	
		Coal	Oil & Gas*	Nuclear	Hydropower	Renewable energies	Electricity and heat				
Belarus	3 802	14,4	52,2	0,0	0,1	33,3	0,0	15 004	37 711	-22 707	26 590
Denmark	31 301	0,0	90,7	0,0	0,0	9,3	0,0	24 383	13 859	10 524	19 610
Estonia	3 722	80,8	0,0	0,0	0,1	19,2	0,0	511	2 000	-1 489	5 096
Finland	16 560	12,9	0,5	36,6	7,2	42,4	0,4	5 376	24 884	-19 508	34 961
Germany**	134 505	42,0	14,0	31,6	1,3	11,2	0,0	41 208	255 677	-214 469	344 746
Latvia	2 294	0,1	0,0	0,0	12,5	87,4	0,0	1 151	3 944	-2 793	4 716
Lithuania	3 927	0,4	5,8	69,8	1,0	18,8	4,3	7 843	12 715	-4 872	8 587
Norway	233 704	0,4	94,0	0,0	5,0	0,6	0,0	206 152	5 710	200 442	32 125
Poland	78 633	87,6	6,1	0,0	0,2	6,1	0,0	19 650	36 327	-16 677	92 969
Russia**	1 184 857	11,7	83,1	3,3	1,3	0,6	0,0	553 314	21 948	531 366	646 680
Sweden	34 781	0,9	0,0	54,2	18,0	26,1	0,8	12 595	32 702	-20 107	52 174

* Includes crude oil, petroleum products and natural gas

** Entire country for Germany and Russia

Source: International Energy Agency (2008)

Figure 46: Energy transmission grid in the BSR



national policies in respect of energy production, i.e. what are the current energy sources favoured by the various national authorities. In that respect, the table enables us to identify four main groups of countries, i.e. countries that share similar profiles in terms of energy production.

Norway, Russia and Denmark see the production of energy based strongly on the extraction of oil and gas; in Estonia and Poland, coal extraction represents the largest share of energy production (more than 80%); in Lithuania and Sweden, it is the production of nuclear energy that composes more than half of the total national energy production, respectively 69.8% and 54.2%; in Latvia, the production of energy by Combustible, Renewable and Waste represent 87.4% of the total energy production, which is unique in the region. Finally, three countries show a rather balanced mix of energy in their national production: Germany producing mainly coal (42.0%) and nuclear energy (31.6%); Finland mainly renewable energies (42.4%) and nuclear (36.6%); and Belarus essentially oil & gas (52.2%) and renewable energies (33.3%). Yet, in many countries, the national production of energy is a small part of the energy that is actually consumed in each country. Indeed, with the exception of Russia, Norway, and to a lesser extent Denmark, all BSR countries are net importers of energy. Consequently, those countries are dependent on energy imports in order to meet their consumption of energy. Energy dependence is now one of the most important topics of energy policy at both the EU and the national level.

As highlighted above, the lack of integration in respect of the region's electricity systems (with the exception of the Nordic countries) prevents the import and export of large amounts of electricity. In this respect, the domestic production of electricity is of the utmost importance in ensuring the necessary levels of supply to cover the daily needs of businesses and individuals. In fact, while in all BSR countries, oil and its related products are essentially to the transport sector, electricity remains a strategic source of energy elsewhere due to its cross-sectoral importance: it is used in the industrial sector, but also in the residential, commercial and public service related sectors.

The electricity production capacity represents the maximum quantity of electricity that can be produced by all the production facilities in a given region, if they function at full capacity. Of course, it is a highly theoretical measure as the production of electricity by some sources (hydropower, solar, wind etc.) remains dependent on natural phenomena which cannot be regulated. In figure 47, the size of the circles represents this maximum capacity for electricity production.

In addition to this, the production capacity usage, i.e. the ratio between the actual electricity production figure and maximum capacity, provides an idea of the regions that are under-using their capacity and those that are close to full capacity. This indicator is represented in figure 47 by the gradient of orange colour from light (low usage pertinent differences in production capacity usage not only

across the BSR, with a ratio of capacity usage ranging from 4% in Åland (Finland) to 78% in Hamburg (Germany), but also within countries. For instance, the production capacity ratio ranges from 4% to 78% in Finland. This indicator raises interesting questions in respect of development of BSR strategies: Which regions are under-utilising their production capacity? Which regions need further development help in respect of more efficient production facilities?

The electricity production capacity is very much connected to the infrastructure in place in each region and country, as it depends on the location of power facilities (nuclear plants, solar stations, windmills, hydropower plants etc.) on their territory. The production of electricity by region is dependent on this capacity, but also on energy needs.

Figure 48 displays another important aspect that needs to be taken into consideration when analysing electricity production, namely the ratio between the production of electricity and the regional or national population. The calculation of the production *per capita* indicator makes it possible to assess the variations across the BSR on how regional and/or national electricity production satisfies its indigenous needs: a high ratio would identify an over-production of electricity as compared to regional needs, and thus the potential to export excess electricity; while a low ratio would flag smaller margins and a necessity to import electricity from other parts of the region or beyond. BSR regions where the calculated ratio is high are situated in northern Sweden, in South-Western and Northern Norway and in Lüneburg (Germany). On the eastern shore of the BSR, the ratio is rather low with the exception of southern Poland and in the Leningrad and Murmansk *oblasts* of Russia. Evidently, large metropolitan areas, such as Oslo or Stockholm, show both a low production of electricity and a low ratio: this is due to the lack of space available to install large power plants combined with the high population figures.

Energy consumption in the BSR

The previous section highlighted the main characteristics of energy production in the Baltic Sea Region. This section will develop an analytical base enabling us to better understand the main features of the consumption of energy across the region. Indeed, the consumption of a specific energy source is often tightly related to the needs of a specific sector of a national or regional economy. Table 10 provides an overview of the distribution of energy consumption (all types considered), by sector, in the BSR countries. The identified sectors are the following: industry, transport, residential use, commercial and public services, agriculture and forestry, and finally, fishing activities. In each country, the largest share of energy consumption (approximately 80%) takes place in the industrial, transport and residential sectors, the others constituting only a negligible additional quantity.

Figure 47: Electricity production capacity in 2005

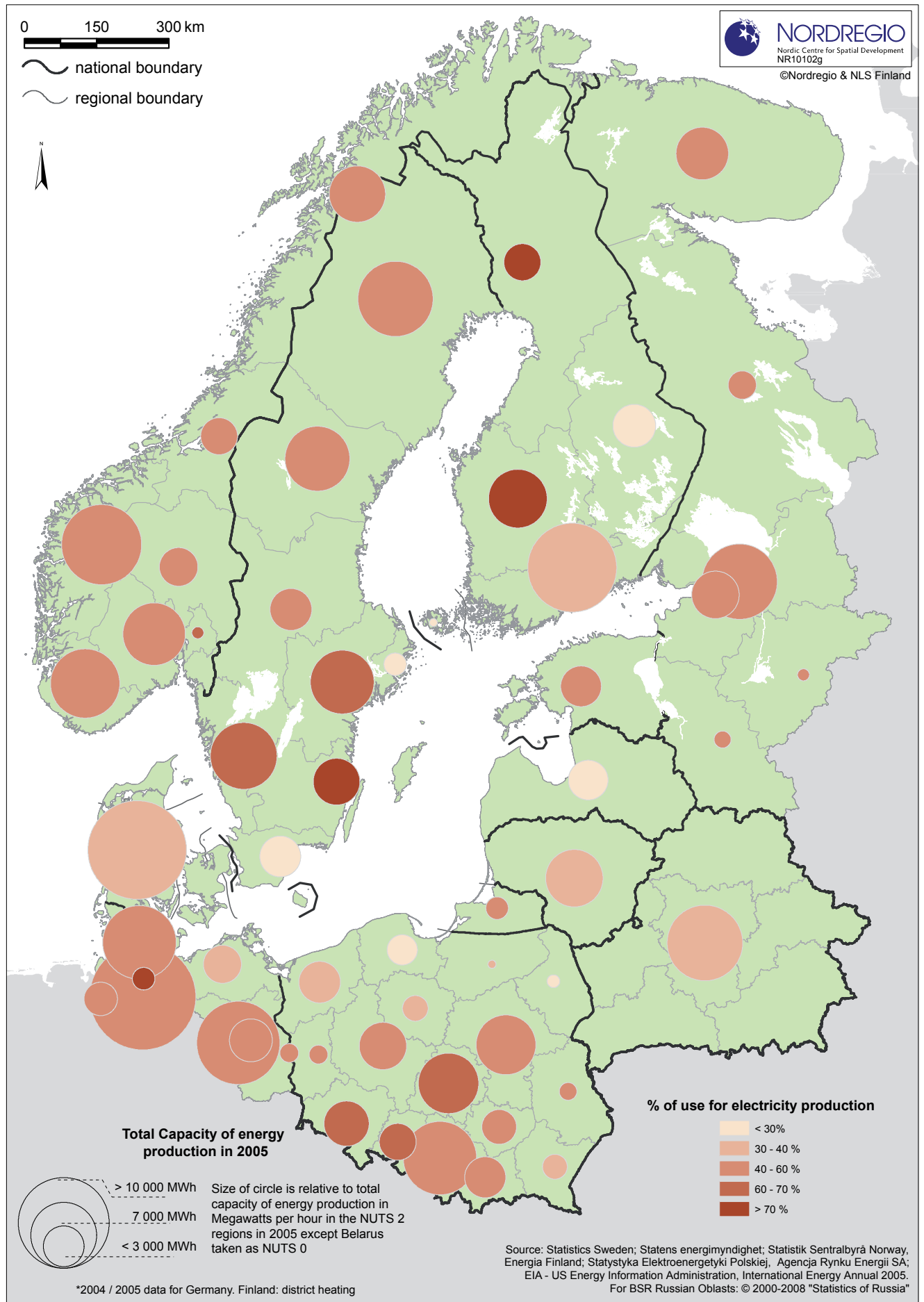


Figure 48: Electricity production per capita in 2005

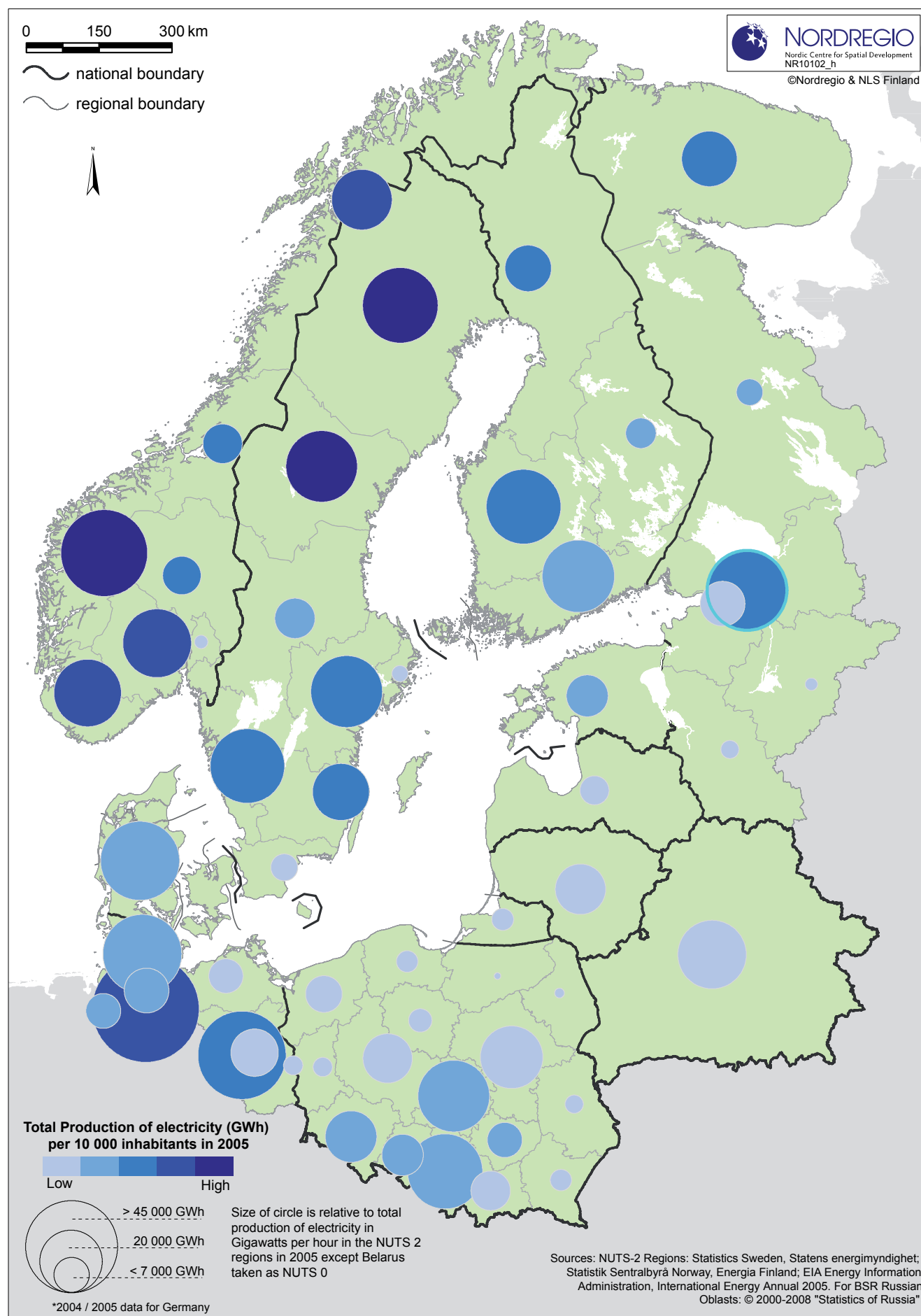


Table 10: Energy consumption in BSR countries, by sector (2005)

	Total consumption in ktoe	Energy consumption by sector (in ktoe)						
		Industry	Transport	Residential use	Commercial and Public Services	Agriculture / Forestry	Fishing	Non-Specified
Belarus	16 335	33,4%	12,4%	35,8%	10,2%	6,3%	0,0%	2,0%
Denmark	15 488	18,3%	34,7%	28,5%	12,7%	4,5%	1,2%	0,1%
Estonia	2 801	23,2%	26,5%	33,2%	13,5%	3,6%	0,0%	0,0%
Finland	24 783	46,3%	19,9%	19,6%	7,0%	2,9%	0,2%	4,0%
Germany*	235 662	24,6%	26,9%	27,0%	10,3%	1,1%	0,0%	10,1%
Latvia	4 043	20,7%	25,3%	35,9%	15,5%	1,9%	0,6%	0,0%
Lithuania	4 514	22,1%	32,2%	30,7%	12,6%	2,3%	0,0%	0,1%
Norway	18 642	35,2%	27,0%	20,4%	13,2%	1,7%	2,4%	0,1%
Poland	57 073	27,4%	22,1%	32,2%	10,4%	7,8%	0,0%	0,0%
Russia*	387 260	33,0%	24,5%	28,5%	8,9%	2,5%	0,1%	2,3%
Sweden	33 065	36,1%	26,2%	22,1%	13,0%	2,3%	0,1%	0,1%

* Entire country for Germany and Russia

Source: International Energy Agency (2008)

The share of energy consumed in the industrial sector as a proportion of total national consumption varies greatly between individual BSR countries. The minimum share is found in Denmark, where it amounts to 18.3% of national consumption, while this figure reaches 46.3% in Finland, which is the BSR maximum. Other countries which have an industrial energy consumption rate greater than 30% include Sweden (36.1%), Norway (35.2%), Belarus (33.4%) and the Russia Federation (33.0%). Surprisingly, Germany, despite its large industrial infrastructure, has an industrial energy consumption rate of only 24.6% of total national consumption, which is lower than many other BSR countries.

The transport sector is another important factor in respect of national energy consumption patterns. As stated previously, energy consumed in the transport sector is very much linked to the national consumption of oil and petroleum products as it remains the main source of fuel used by both private cars and commercial vehicles. As in the case of the industrial sector, the various national situations in this respect vary greatly. Denmark sees 34.7% of its total national energy consumption used in the transport sector while Belarus uses only 12.4%. Finland is the only other country that shows a share below 20%, with 19.9%, whereas Lithuania is the only other BSR country beyond 30% (32.2%). All other countries have a percentage of energy consumed in the transport sector between 20 and 30%.

The third item of importance regarding energy consumption corresponds to the use of energy by households. The residential use of energy is, on average, the largest energy use sector across the whole of the BSR. Finland is the BSR country with the lowest percentage of total energy consumption for residential use, with less than 20% (19.6%). Norway and Sweden also have rather low percentages for energy consumption for residential purposes with respectively 20.4% and 22.1%. The highest percentage is found in Latvia with 35.9%, followed closely by Belarus

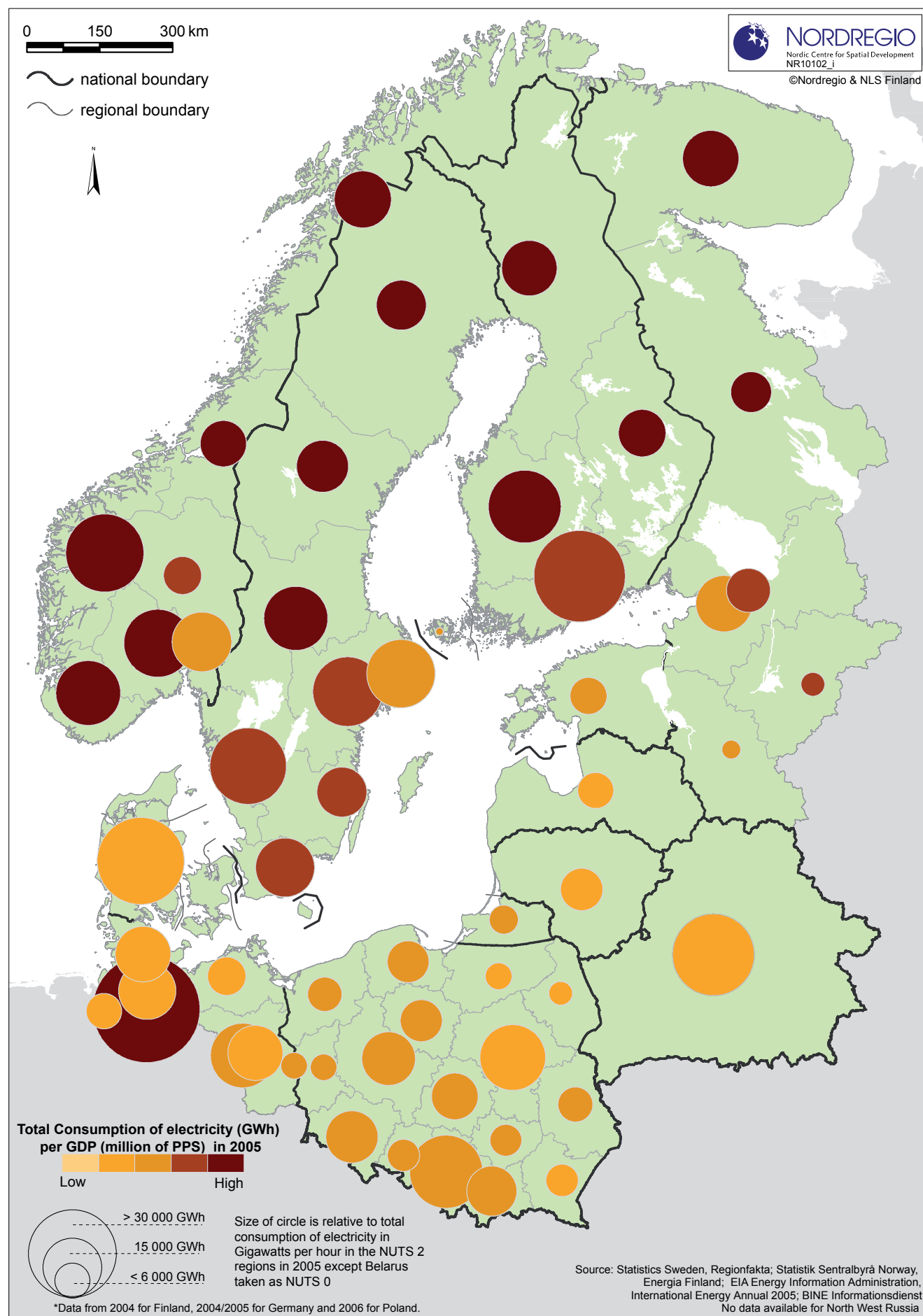
with 35.8%. Other countries show a percentage in the vicinity of 30% of their total energy consumption.

The connection between the production and the consumption of energy, as well as their impacts on the environment, is tightly linked to the notion of energy efficiency. In concrete terms, this notion introduces the idea that the consumption of energy should be adapted to the needs of the country or region, but with the aim of reducing at much as possible unnecessary waste. For the International Energy Agency, *“improvements in energy efficiency can reduce the need for investment in energy infrastructure, cut fuel costs, increase competitiveness and improve consumer welfare”* (IEA Homepage).

In the framework of this study, one way of measuring the energy efficiency of the various national and regional systems is to calculate the consumption of energy per point of GDP. Here, GDP is used as a proxy for the size of the regional economy. Figure 49 visualises such an attempt by indicating the ratio between the total regional consumption of electricity and the level of GDP at the NUTS 2 level (except Belarus at NUTS 0 level), as well as by visualising the total consumption of electricity (size of the circles) in each region.

As stated previously, electricity is a key type of energy as it is used across all sectors. The map provides a pertinent basis for benchmarking the electricity intensity of the various regional economies. From the map, two main inferences can be drawn. Firstly, there is a significant difference between the western part of the BSR (the Nordic countries and Germany) and the Eastern part (Poland, Russia, Belarus and the Baltic States). The regions in the former display much higher levels in respect of the calculated ratio. Secondly, important variations exist within the countries concerned, and particularly in the Nordic countries between metropolitan and non-metropolitan areas. Indeed, in general, metropolitan areas consume less electricity per point of GDP (PPS).

Figure 49: Consumption of electricity per point of GDP (PPS), in 2005



Renewable energies in the BSR

In light of the current debates raging over climate change and the related policy responses to adopt for its mitigation, renewable energy is now at the centre of the future energy strategies of both the European Union and its individual Member States. But what is renewable energy? Renewable energy is a generic term for a set of energy sources that can be regenerated either naturally or by human intervention: hydropower, wind power, municipal waste, biogas, primary solid biomass, solar photovoltaic, liquid biofuels, industrial wastes etc. Renewable energies are essentially used in the production of electricity and heat.

For the European Commission, the future development of the production of renewable energies is important for three reasons (taken from the European Commission's homepage, June 2008):

- *Renewable energy has an important role to play in reducing Carbon Dioxide (CO₂) emissions - a major Community objective.*
- *Increasing the share of renewable energy in the energy balance enhances sustainability. It also helps to improve the security of energy supply by reducing the Community's growing dependence on imported energy sources.*
- *Renewable energy sources are expected to be economically competitive with conventional energy sources in the medium to long term.*

The importance of renewable energies can be summarized in two points. First, the production of locally based renewable energies aims at bolstering energy independence by reducing the need for energy imports. The second point relates to the challenges linked to climate change: the production and consumption of renewable energies have lower impacts on the environment than carbon-based energies (coal, oil, gas etc.).

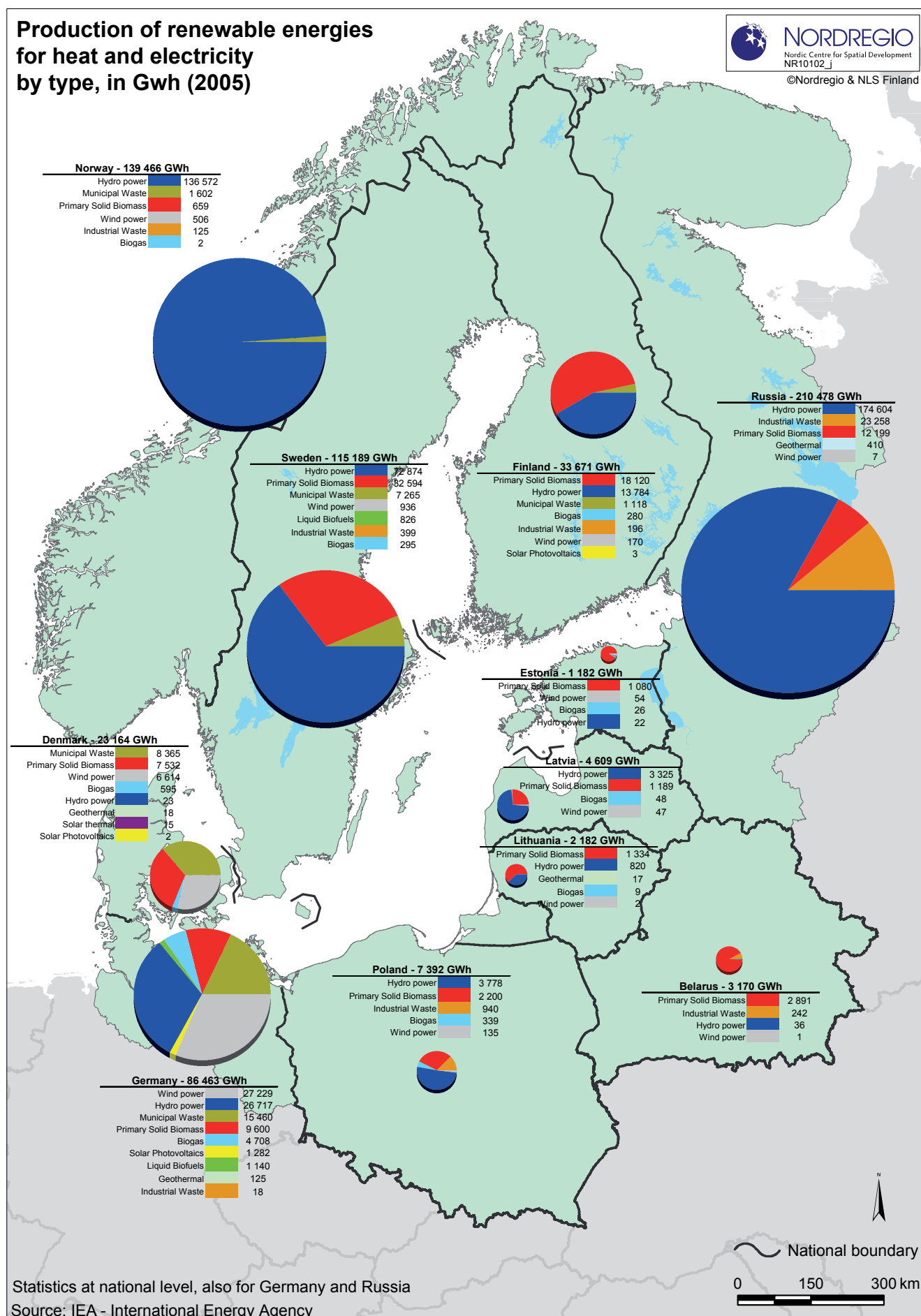
Being strongly dependent of the availability of specific renewable resources, the production mix of renewable energies differs significantly between individual regions and countries. Figure 50 provide a synthesis of this 'renewable energy production mix' at the national level.

Russia is the largest BSR producer of electricity and heat originating from the exploitation of renewable energies with a production total of more than 200,000 Gwh. However, this should be put into perspective: Russia is the largest country (in terms of area) in the world and is also one of the world's largest producers of energy; and the

share of renewable energies in the Russia energy production mix is almost negligible. The largest producers of renewable energies after Russia are, respectively, Norway (139,466 Gwh), Sweden (115,189 Gwh) and Germany (86,463 Gwh). Other BSR countries have a much more limited production of renewable energies. The smallest producer of such energies is Estonia, with a production of 1,182 Gwh. However, an interesting feature displayed in figure 50 is the composition of the production mix of renewable energies in each country. In this regard, one can identify three main categories of countries.

The *first* category comprises those countries that have hydropower as the dominant form of renewable energy. Norway, Russia, Sweden and Latvia belong to this category, making use of their extensive resources in terms of river basins. The *second* category consists of those countries where primary solid biomass is the dominant contributor to the production of renewable energies. As defined by the International Energy Agency, solid biomass is "*defined as any plant matter used directly as fuel or converted into other forms before combustion*", including wood. Finland, Estonia, Lithuania and Belarus belong to this category. It is worth noting that Sweden also produces solid biomass amounting to one third of its total production of renewable energies. The *third* category consists of those countries that have no dominant form of renewable energy, thus showing a more balanced production pattern. Germany, Denmark and Poland belong to this category. Interestingly, these three countries do not have the same profile when it comes to renewable energy production. The production of renewable energies for the generation of electricity and heating in Denmark originates from three, rather equal, sources: the combustion of municipal waste, the combustion of solid biomass and the conversion of wind energy; the first two are essentially for heating purposes, and the latter exclusively for electricity. In Germany, two sources of renewable energy constitute more than 60% of the total national production: Wind energy and hydropower. In absolute terms, Germany is the largest producer of wind energy and has developed an extensive park of windmills, not least on its North Sea coast. The combustion of municipal waste is also a well developed source of energy production, constituting approximately 20% of the total national production total. Finally, the Polish production of renewable energy originates mainly from hydropower (nearly 50%) and solid biomass. In absolute terms, the total Polish production of renewable energies is much lower than the German and Danish levels.

Figure 50: Production of renewable energies in the BSR in 2005



5.2 Information and communication technologies as a potential catalyst for regional development

Information and Communication Technologies (ICT) have become an integral part of regional development strategies aiming at improving the accessibility of a territory. New technologies such as mobile telephony or internet and broadband connections provide the opportunity to all 'wired' individuals and businesses to expand their contact networks, expand the market area for their products or just access information and knowledge more quickly. As in the case of transport and energy, ICT relates to the notion of accessibility not only in terms of available infrastructure, but also in terms of how these infrastructures are actually used by either individuals or businesses.

Many countries in the BSR are to the fore in broader European terms when it comes to ICT: Sweden and Finland, due to the existence of Ericsson and Nokia, have acted as world leaders in the production of ICT-related material; Norway, Denmark and Germany, as advanced economies, have rapidly developed adequate 'hard' (networks, broadband connections) and 'soft' (education, telecom operators, usage of those technologies etc.) infrastructure for their respective economies, to take advantage of these new developments. On the Eastern shore of the BSR, the development of ICT infrastructure and management necessarily emerged at a much later date and driven by the market led economic restructuring process after the fall of the Iron Curtain. However, while a gap still exists between various countries in the BSR, encouraging signs exist that this gap is being reduced. As an example, the fact that some countries on the eastern shore, principally Estonia and Poland, have developed eGovernment systems equivalent to the ones found in the Nordic countries (Nordic Council of Ministers, 2005) supports this idea of a reduction in disparities between countries in a medium-term perspective.

The idea behind the present chapter is to draw on various perspectives in looking at the development of ICT in the BSR. Unfortunately, due to the limited availability of comparable data for all BSR regions, the analysis here will focus on the national level. Three main perspectives will be developed: (1) how are the BSR countries positioned as compared to the rest of the EU or, more broadly, the OECD countries as a whole, (2) to what extent is there a 'digital divide' between the BSR countries, and finally (3) to what extent is there a 'digital divide' between different territories or users within these countries?

The BSR in international comparison

Recent statistics published by the OECD provide a number of interesting insights into the relative interna-

tional position of the BSR countries in the context of ICT development. As has been highlighted throughout this report, individuals and businesses are at the heart of the issues of accessibility, whether they are connected to transport, energy or Information and Communication Technologies (ICT). If even 5 years ago the advancement of ICT was best measured in terms of access to fixed or mobile telephone connections, the rising importance of the internet as a way of expanding social interactions and business opportunities now puts this technology at the heart of ICT development. As for fixed and mobile telephony, the current penetration rates show that the technology has matured in recent years and that the significant differences that existed at the beginning of the century are now more or less marginal. Consequently, the main challenges ahead in respect of ICT development relate to the capacity for both types of identified users, i.e. individuals and enterprises, to 'access' the internet which is the major determinant in enabling these groups to be part of the economic and cultural globalisation process (at least until the next technology emerges).

Figure 51 above sets the BSR countries in a wider international comparative perspective, here in relation to the OECD. Despite the fact that many of the BSR countries (Russia¹, Belarus, Estonia, Latvia and Lithuania) are not part of this international grouping of countries, the benchmarking of each BSR country to this standard is of significant interest as it provides a worldwide benchmark to the most advanced economies. Here, two main remarks can be made. Firstly, the Nordic countries and Germany are the only countries of the BSR that lie above the OECD average for internet usage for both households and for enterprises. Obviously, in the BSR, the Nordic countries and Germany have shown an outstanding capacity to be part of the pioneer countries in almost all ICT areas, as the importance of the ICT industry in their economies places them in an upstream position when it comes to adapting to new technologies. Secondly, in relation to the OECD average, disparities between countries are narrower in respect of businesses than households. Indeed, the Baltic States and Poland are much closer to the OECD average in the case of enterprises than in the case of households. Consequently, the 'digital divide' that is said to exist between the Western and Eastern shores of the BSR is much more a question of household access to ICT than an issue for businesses. One possible interpretation of this could be that market forces and trade prospects push the economic actors to adapt more quickly to new technologies and thus to take advantage of them. This aspect is of the utmost im-

¹ as of 2007 Russia and Estonia are in the accession programme

portance when taking the perspective of trade development within the BSR into consideration. In this respect, some countries in the BSR act as global driving forces in the Information Economy and Society. These countries have the capacity to support other BSR countries in adopting and developing ICT.

Disparities in access to ICT between BSR countries: the case of broadband connection

The previous section has given us an overview of the current position of BSR countries in an international context. Moreover, it has enabled us to identify the two main dimensions that should be focused on in order to highlight disparities in terms of ICT access between countries: individuals rather than enterprises should now be focused on, while new or 'edge' technologies rather than more mature ones, e.g. mobile phones should be addressed. Stemming from the assumption that disparities between countries are sharper in the context of emerging technologies, the present section will focus on the access to broadband networks for both enterprises and households across the BSR. Indeed, broadband has been identified by the OECD as the current technology has a 'tremendous potential' (OECD, 2008). Broadband technologies in particular are able to expand the use of internet, as they enable faster access and a greater connection capacity (OECD, 2008). Figure 52 aims at illustrating the development of broadband technology in the BSR countries by measuring the number of subscribers to broadband connections per 100 inhabitants.

In 2000, the use of broadband technology was marginal not only in the BSR countries but also in the rest of Europe. Since then however the use of the technology has expanded significantly. Not all of the countries around the Baltic Sea have however been able to keep pace with ongoing technological developments. Not surprisingly, the Nordic countries and Germany have displayed a greater capacity to adopt this new technology and are now at the forefront in respect of the development of broadband technology. The disparity between those five countries and the rest of the BSR is obvious, but it should not conceal the other.

In fact, Estonia and Lithuania belong to a group of close followers to the 5 most advanced countries. Estonia has reached a level that is close to that of Germany, while Lithuania also lies above the European average. Poland and Latvia belong to a third group of countries. The main reason they are lagging behind is the relatively late start they had in the broadband catching-up process. Indeed, whereas the rate of broadband connection already began to expand in Estonia and Lithuania in 2002, it only did so in Poland and Latvia in 2004. The relatively late start in respect of broadband expansion explains the laggardness of these countries as compared to their Baltic counterparts. Finally, Russia and Belarus belong to the fourth and last grouping of countries, where the state of broadband tech-

nology implementation remains in its infancy.

The evolution of take up subscriptions to broadband services in the various BSR countries highlights a rather common pattern when it comes to ICT access: first, for a given technology, disparities between countries are shrinking rather quickly and can thus be qualified as temporary rather than persistent disparities; second, the extent of disparities between countries at a given time essentially depends on the degree of technological maturity and on the degree of national economic development, as more advanced economies will tend to adopt new technologies more rapidly.

Understanding the territorial dimension of ICT: Intra-national disparities

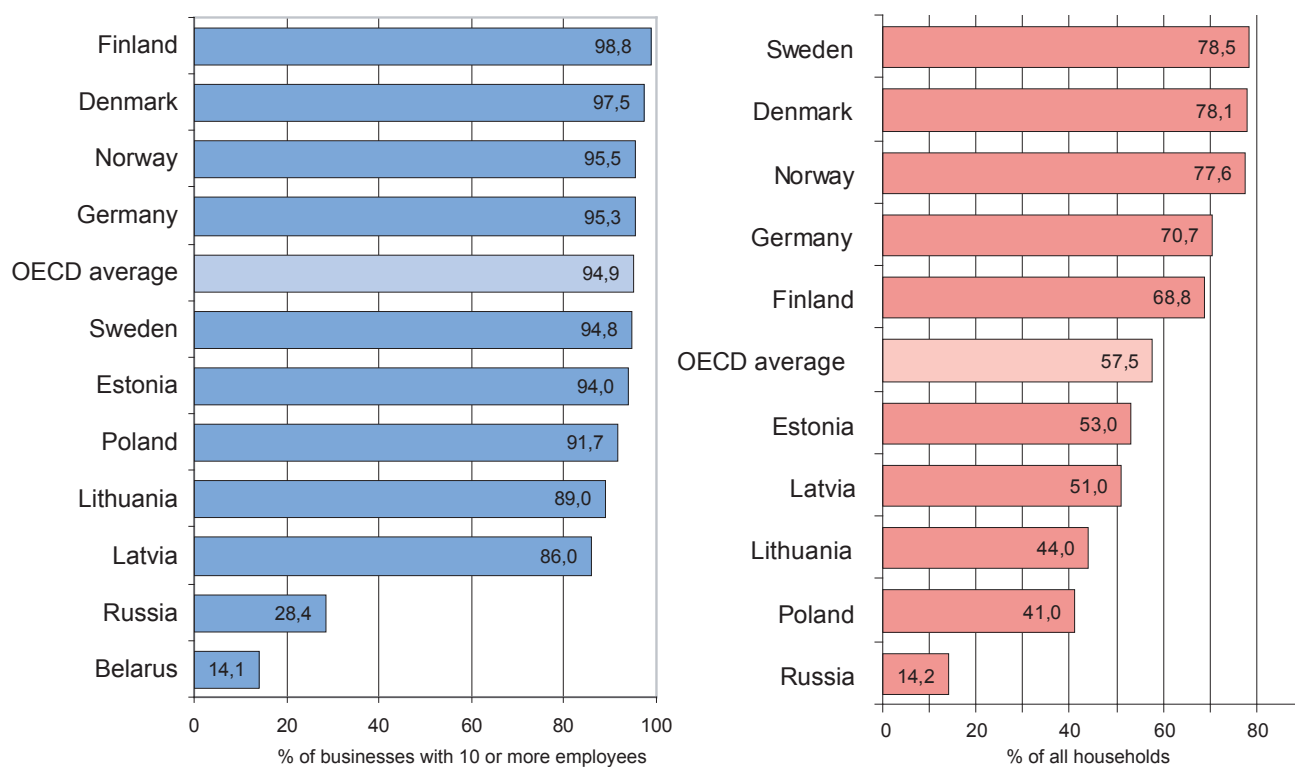
The previous sections highlighted the processes leading to the emergence of disparities between countries in terms of the penetration of different information and communication technologies. As stated previously, these disparities are the result of both hard (infrastructure) and soft (educational) matters. The capacity of nations to be not only involved, but also to act as drivers, in terms of the information society significantly depends on the business, societal and policy environments. Yet, enhanced disparities within countries reveal the territorial dimension of the ICT.

Indeed, the degree to which individuals have access to ICT services is still strongly influenced by location. In concrete terms, this territorial dimension of ICT is expressed by the fact that access to broadband connections is more advanced in densely populated areas (more than 500 inh/km²) than in sparsely populated ones (below 100 inh/km²). This assumption appears to be correct for all BSR countries.

Figure 53 illustrates this territorial dimension by measuring the usage of broadband connections in the two types of territories previously mentioned for 2007, as well as calculating the evolution of the ratio (densely/sparsely) between 2005 and 2007. When benchmarking (once again) BSR countries against each other for the broadband usage indicator in both territorial contexts, the picture reveals the same structure: Nordic countries are more advanced, followed by Germany and Estonia, and finally by Latvia, Lithuania and Poland. However, with the calculation of the ratio densely/sparsely broadband usage, another picture is revealed.

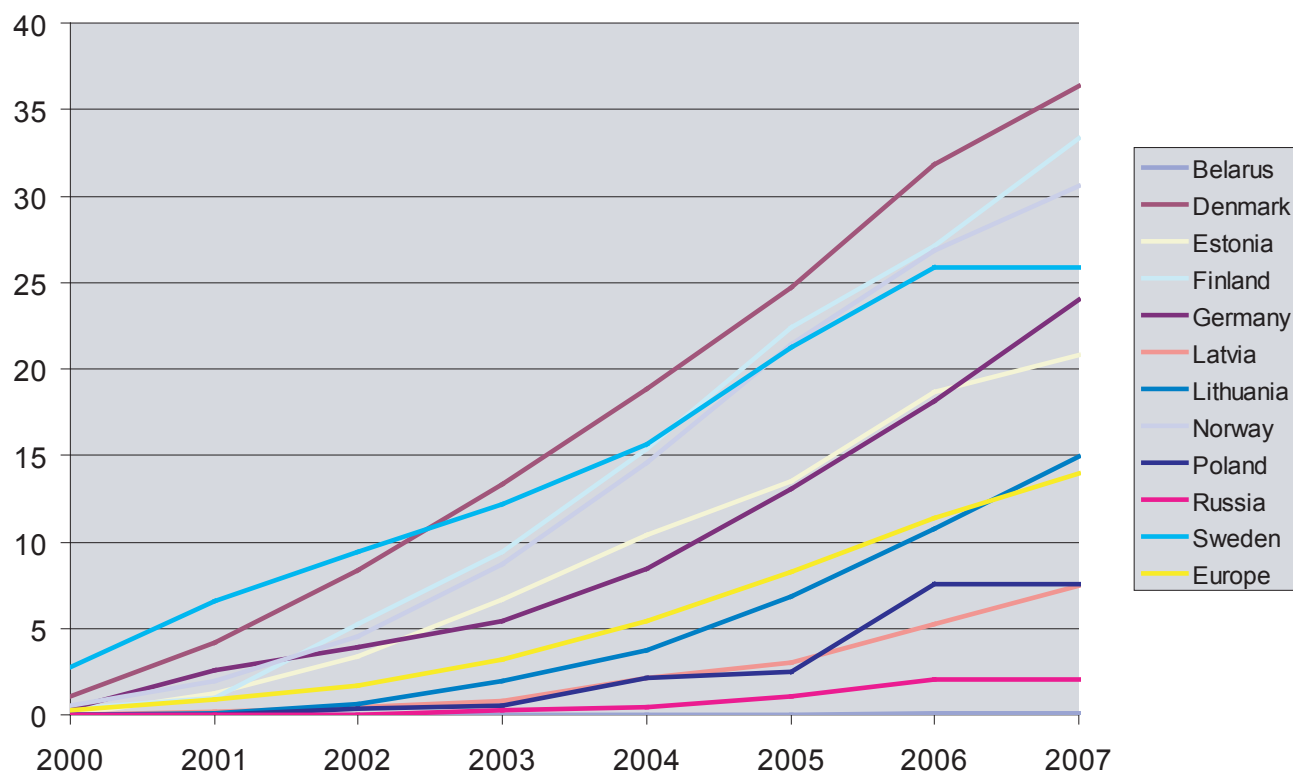
According to the figures for 2005, the BSR could be divided into fewer categories depending on the extent of the disparities between densely and sparsely populated regions: Sweden belonged to the top category (i.e. with the smallest disparities in terms of broadband usage between densely populated and sparsely populated regions); Finland and Denmark to the second one; Norway, Germany and Estonia to the third; and finally Latvia, Lithuania and Poland to the last. As for the 2007 ratio, we have used the same threshold for each category in order to better identify

Figure 51: Access to internet for households and enterprises (more than 10 employees) in 2007



Source: OECD, ICT database and Eurostat, Community Survey on ICT usage in households and by individuals, January 2008; Community Survey on ICT usage in enterprises, January 2008; NewCronos database, January 2008; UNCTAD, e-business database; and OECD, based on national sources.

Figure 52: Change in the number of broadband subscribers per 100 inhabitants between 2000 and 2007



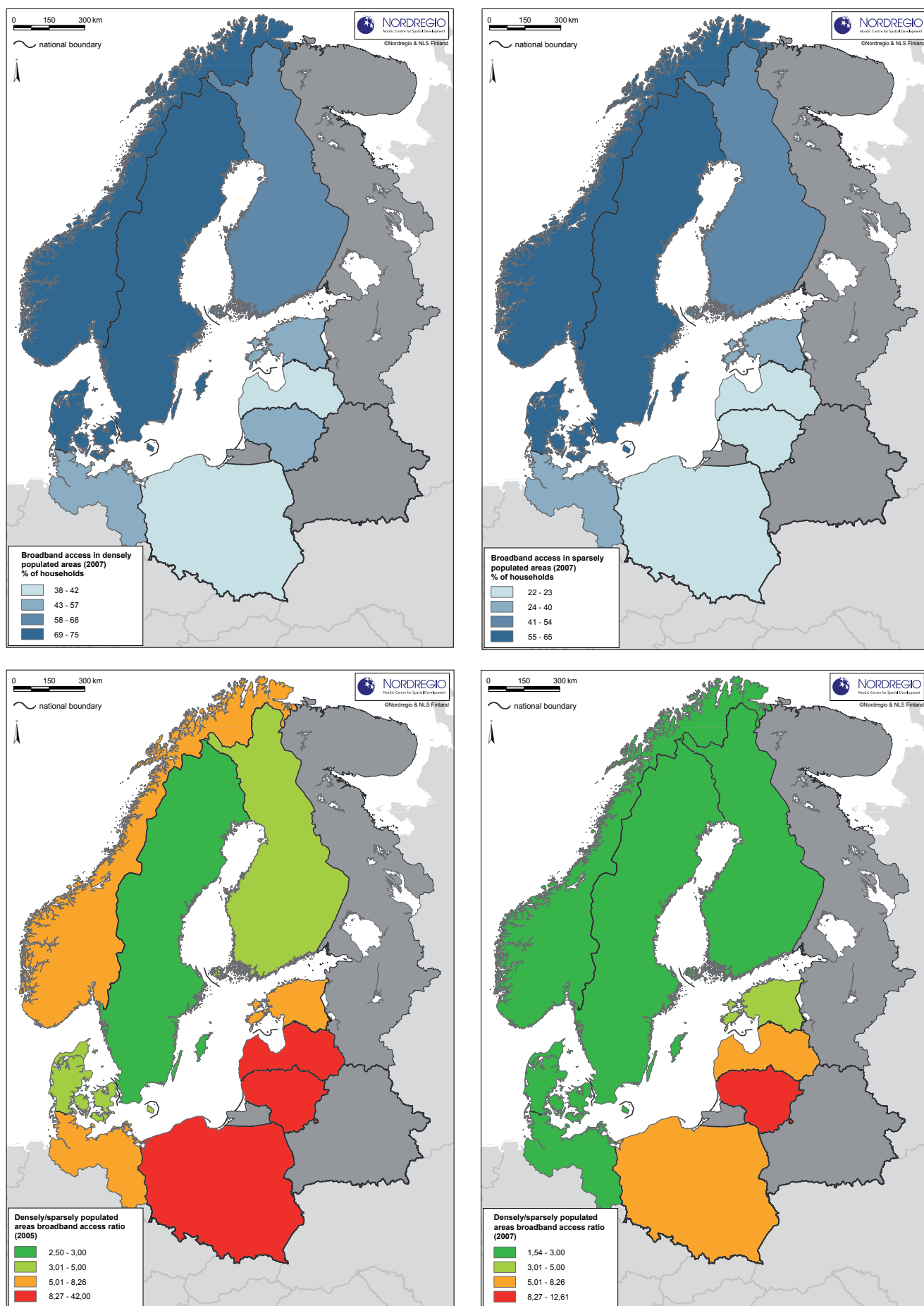
Source: WTI (2008)

the countries that have moved from one category to another. And the conclusions are stunning: Sweden has been joined by Norway, Finland, Denmark and Germany in the top category; Estonia has moved to the second category; Poland and Latvia to the third category; while Lithuania was still languishing in the last category, although its ratio had been reduced by half. In concrete terms, this shows that in the short period of only two years, all BSR countries have significantly reduced the disparities between the usage of broadband connections by households in densely and sparsely populated regions. Consequently, the 'digital divide', at least when it comes to broadband technology within these countries has been significantly reduced.

This chapter has highlighted the ways in which sectoral

policies related to energy and ICT have the potential to enhance spatial integration in the BSR. Transport strategies alone are not enough in order to ensure the reduction of territorial disparities and the embracing of territorial capital across the macro-region. The challenge for the elaboration of spatial development strategies, such as those currently being developed by VASAB and the European Commission, thus lies in ensuring the cross-fertilisation and synergy of transport, energy and ICT sectoral strategies. In particular, proactive, visionary strategies based on the rapid development of the production of regionally-based renewable energies and the expansion of the ICT infrastructure and its usage may be particularly beneficial in the exploitation of the territorial capital of those territories beyond the main metropolitan areas.

Figure 53: Share of households using broadband connection in densely and sparsely populated areas of the BSR



Source: Eurostat; Data not available for Russia and Belarus

6. Taking advantage of the BSR's territorial capital: An Agenda for strategic spatial planning

In what follows a number of strategic issues in respect of spatial planning, policy-making and programming are raised with a view to further contributing to territorial cohesion and spatial integration in the BSR. In so doing, we follow the structure of the previous chapters, starting with the delineation of general socio-economic trends with particular attention paid to small and medium-sized cities and towns, thereafter, the specific potential role of metropolitan areas is discussed. To conclude we discuss the potential role of transport networks, mobility and accessibility in view of spatial integration and, finally, reconsider energy and ICT as essential building blocks of the BSR's territorial capital endowment.

It is however important to stress that in the preceding chapters we have avoided drawing conclusions as we are of the opinion that in order to do so one needs a coherent picture of the BSR's territorial capital. We have therefore postponed our conclusions until the very end of this 'exploratory' document.

The pattern of growing and shrinking cities is becoming increasingly diverse

Current trends in the demographic development of the cities of the Baltic Sea Region show a slight overall decline in total population, driven by substantial natural losses (birth rate lower than mortality rate) which, for the most part outweigh migration gains. This trend has widened recently and will continue to do so, perhaps even with increased velocity, into the future. In addition, continuing overall urban growth goes hand in hand with rural decline, although with contrasting tendencies between the various countries involved. More specifically, we can observe a spatial polarisation of population towards capital areas, larger agglomerations and higher order urban centres across most of the BSR, which is followed by accelerating suburbanisation in and around the main metropolitan areas. Additionally, numerous small and medium-sized cities and towns on the fringes of the capital areas and other urban agglomerations see the most rapid population ex-

pansion of all due to significant in-migration flows.

The majority of small and medium-sized cities and towns, specifically those that are to be found in relatively peripheral situations, are not however expanding but are instead hampered by shrinking processes. In other words, 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. The systematic interpretation of population gains as positive, while population loss is negative, does not necessarily, however, hold true. A population loss may simply reflect an adaptation to a changing economic context or a technical evolution implying that some sectors require fewer employees. They are only problematic insofar as they threaten the coherence of local communities or jeopardise their long-term sustainability.

Taking into consideration economic indicators such as the labour market or the regional GDP *per capita* at PPS we still see sharp contrasts between several BSR cities and regions. In comparison to a previous study (Hanell/Neubauer 2005), in this respect, one can say that on the one hand the overall picture, namely the traditional East-West divide, remains. On the other hand we can however observe an ongoing differentiation, i.e. the mosaic of well- and less-well performing regions and those which are increasingly catching-up is becoming wider and increasingly diverse. Naturally, this differentiation can be interpreted as a kind of normalisation with regard to the larger cities and metropolitan areas in the BSR as they are simply following trends found elsewhere in Europe.

» Nevertheless, due to the spatial structure of the BSR, which – compared to the rest of Europe – is peculiarly impeded by a number of specific circumstances (such as long distances, isolated border-regions, sub-arctic climate, sparsely populated regions), the BSR needs to formulate a different approach (as compared to other European macro-regions) towards territorial cohesion.

The demographic question will impede many BSR cities and regions in their socio-economic development

The BSR will, in the future, face a significant demographic challenge. With the exception of the core regions in the Nordic countries, a general decrease in the overall population which goes hand in hand with the 'emptying' of rather peripheral areas and those that are characterised by somewhat isolated small and medium-sized cities and towns and their rural hinterlands, can be anticipated. Stable developments are for the most part to be expected in the larger metropolitan areas (here often at their fringes rather than in the cores) – some will even increase in population. The basic driving force of these trends and their territorial impacts is the low birth rate in the BSR, which can only be compensated for in a very few regions by immigration. Additionally, on the other hand, many countries and regions will be even more hampered by out-migration, not necessarily to other BSR countries, but also to other European countries or even beyond. As a consequence of this, most of the cities and regions in the BSR will increasingly suffer from a shrinking labour force (i.e. less people of working age) as well as from a greying population (i.e. more people of pensionable age).

One however needs here to bear in mind that the BSR, as with many other transnational areas, at least in Europe, is currently undergoing what is termed an advanced demographic transformation process. This process is characterised by substantial changes in the level and intensity of the course of basic demographic processes, such as the birth rate, mortality, migration, and both the creation and disintegration of families and households. The transformation's indications such as changes in the pattern of starting families, relationships, birth rate patterns, positive changes in the mortality rate and related life expectancy do call for specific, tailor-made policies. In relation to this the most obvious policy implications at the *macro-scale* are:

- » International companies will analyse where they have access to highly qualified labour before they consider setting up a new facilities. This is likely to be relatively advantageous to the Nordic countries as compared to the other areas of the BSR.
- » The relative population decline in the south and east of the Baltic Sea Region will increase the relative factor prices for labour, which, in turn, will enhance the pressure for the structural change of the economy in those areas.
- » The relative population increase in the Nordic countries will in return enhance further the relative importance (or weight) of the Nordic markets as compared to the rest of the BSR. This might increase their relative political influence over the Baltic Sea region, most likely at the expense of the German, Polish and Russian BSR areas.

At the national, regional and city-level (*micro-scale*) the following implications for policy-making can be derived:

- » The reality of a shrinking labour force demands that new strategies on how to attract qualified migrants from other countries to compensate for this be put in place.
- » Safeguarding public infrastructures and a certain level of public service provision within what will be, for the most part, 'greying societies' will become a central challenge up to the year 2013 and beyond.
- » The ongoing emptying of rural areas demands that new strategies be developed on how to use existing cultural and natural resources in the future. Alternative paths will have to be defined for such areas including the development and promotion of 'soft' tourism, recreation or nature conservation.
- » Enhancing the birth rate in most BSR countries, to contribute to the stable and sustainable reproduction of the BSR's population, is not necessarily only a national concern. Local and regional services can contribute enormously by supporting the ability of families to better combine family and work/education in their everyday's lives.

Current policies across the BSR to support the emergence of knowledge-based economies (specifically in respect of small and medium-sized cities and towns) are insufficient

By comparing the GDP *per capita* at PPS in 2005 at the regional level with the relative expenditures for Research and Development (as a share of the regional GDP), interesting insights can be gained in respect of the willingness to invest in future-oriented activities, which normally have more of an impact in the short term than in the long run. Here it has been very noticeable that, for instance, the Polish regions as well as all of the regions of Lithuania show the same pattern in respect of the size of R&D expenditures as compared to the Nordic Countries, i.e. some regions enjoy a relatively high share (i.e. more than 2% of the regional GDP, others a bit less), even though the GDP *per capita* is much lower. A much lower level of R&D investment activities could be found in NW Russia, including the Kaliningrad region, as well as in the southern regions of Latvia and in the rather rural areas of the BSR part of Germany. Nevertheless, we can easily see a clear privileging of metropolitan areas, which can in part be ascribed to their larger critical mass. In other words, small and medium-sized cities and towns in general – and particularly those located at a distance from metropolitan areas – are in a disadvantaged position in respect of receiving such policy attention.

- » Activation of the knowledge-based potentials of the BSR needs to be substantially backed-up with policies aiming at the specific needs in knowledge and qualifi-

cation. Due to increasing global competition and to the specific spatial structure of the BSR ambitions at the local, regional, national and EU-levels have to be strengthened to improve the ability of the BSR's small and medium-sized cities and towns' to compete.

- » The future role of VASAB and other pan-Baltic organisations could be to pinpoint the existence of enormous potentials with regard to further territorial cohesion around the Baltic Sea. In so doing they need to establish strategic alliances with each other, but also with those policy-makers dealing with sectoral issues in this respect (e.g. social politics, education and vocational training, transport and mobility, housing etc.).

Focus on processes, not on trends

In general, data showing that the overall economic and demographic trends of small and medium-sized cities and towns are correlated with their relative geographic position in the urban system are often taken as proof that the development potentials of small and medium-sized cities and towns depend, for the most part, on their integration in a metropolitan area. Rather than looking at these correlations as a constraint on public action, one should however highlight and analyse in detail the impact of geographical position on economic performance. The objective here is to determine to what extent these processes are contingent upon the types of actor behaviour which public policy has the potential to change. This implies that a number of alternatives exist to current policies on improving the connections between these towns and the metropolitan areas.

- » In other words, one has to bear in mind that all inductions of this type of analysis need to be confronted with the concrete challenges encountered in individual small and medium-sized cities and towns. The objective and rationale of such a bottom-up exploration of the structural factors of development is thus to approach the processes leading to the emergence of the *milieu* for collective action, and the policies that can promote them.

An improved understanding of the potential of small and medium-sized cities' and towns is indispensable

Evidence-based planning is currently fashionable in spatial planning. It is however important to bear in mind that the nature of the 'evidence' here is determined by statistical delimitations and by data availability, which had to be collected in the course of the East West Window project. This suggests the importance of the following:

- » A thorough understanding of the functional profiles, strengths and opportunities to be found in the city or

town at hand is needed. Where are the potential complementarities and how can they be activated? What are the critical flows of information or talents and their tacit knowledge? In other words, tailor-made policy recommendations have to be related to evidence-based approaches.

- » Being able to identify the tangible effects of cooperation is a prerequisite for the long-term involvement of stakeholders. The construction of an adequate and useful evidence base however presupposes that stakeholders are actively involved in its elaboration as policy design and implementation is not a linear process leading from evidence directly to action. It is rather a dynamic process in which the actors, territory and networks need to be defined in interaction with each other.
- » Specifically the definition of the relevant territory is critical in this respect: Within what boundaries can one expect social, economic and political actors to establish the milieu for collective action? Within what statistical boundaries should one analyse activity profiles and look for development potentials?

Strategic discourses will have an impact on regional, national and transnational policy agendas

The European Union's perspective and those of its Member States on small and medium-sized cities and towns has undergone something of a change in recent years. In the late 1990s, the European Spatial Development Perspective (ESDP) describes them, primarily, as nodes of rural regions, which need to be supported in order to preserve a general territorial balance. The 2007 Territorial State of the Union on the contrary stresses that small and medium-sized cities and towns in general can be involved in global networks and that economic performance is not determined by size. Strikingly, however, these considerations have not found their way into the Territorial Agenda, which is the policy document derived from the Territorial State of the Union. This reflects a general tendency to maintain a rather deterministic image of small and medium-sized cities and towns. Such assessments are underpinned by analyses focusing on overall trends rather than considering the variety of local activity profiles, of potential development-paths and of the territorial capital at hand (see above).

Concern for 'European territorial balance' has also been detrimental to the position of small and medium-sized cities and towns in European territorial discourses. First, the focus on developing a more territorially balanced system of metropolitan areas in Europe ('European metropolitan polycentricity') encourages increasing disparities at the regional and national levels. Second, the excessive interpretation of the role of metropolitan areas as 'international gateways' implies a neglect of small and medium-

sized cities' and towns' capacity to develop autonomous global connections. Third, the concern for growth maximisation and for the convergence of national economic performance figures has reduced the attention paid to the long term potentials of small and medium-sized cities and towns.

- » The BSR's small and medium-sized cities and towns need to communicate more actively to the outside world their concrete development opportunities and challenges and their success stories and best practices. The objective here is to contribute to the building of a strong discourse that can change the perspective on where and how growth can be created. If such a discourse is established, it will impact strategies pursued at the European, transnational, national and regional levels.
- » The LTP, the ongoing discussion on the EU green paper on territorial cohesion as well as the EU Strategy for the Baltic Sea Region (cf. the preface of this report) are central opportunities to facilitate such discourses. Here again VASAB, but also organisations such as the Union of the Baltic Cities (UBC) or Baltic 21 are appropriate fora for such a discourse, which has to be taken-up and strengthened, however, by other stakeholders in the many cities and regions around the Baltic Sea.

Making sense of the concept of polycentricity for the BSR

The last two sections also imply that the traditional perspective on European polycentricity, developing counterweights to the *Pentagon*, which is, geographically speaking, defined by London-Hamburg-Munich-Milan and Paris, is not a promising option for the BSR. Instead, the BSR (i.e. its stakeholders responsible for spatial planning at the various scales) should focus on the capacity of their own towns and cities to build more efficient regional alliances for integrated development and growth.

- » In so doing, a relational understanding of polycentricity is needed. This means to optimise each city's functional profile based on its position in transnational, national and regional urban systems. Only such an understanding of polycentricity can contribute to territorial cohesion across the BSR.
- » The underlying idea here is that the focus on territorial cohesion policies must be on fully exploiting local and regional territorial capital. This implies that some trade-offs may be needed between cities and regions, insofar as catering for peripheral regions' needs is concerned and in terms of the labour force and infrastructure which may indirectly limit growth in the most central parts.
- » This concerns small and medium-sized cities and

towns as well as metropolitan areas. Strategic alliances and labour divisions are also needed among metropolitan areas as the BSR simply lacks a classical global city (-region) to perform the necessary international functions such as Paris or London (cf. chapter 3). Here, in order to make use of synergies between the various metropolitan areas, among small and medium-sized cities and towns, and between the metropolitan areas and the small and medium-sized cities and towns, complementary networks are indispensable.

- » Thus from a BSR perspective, the only substantial potential usage for the concept of polycentricity lies in its functional or relational understanding as here it offers some insight into on how to optimise the cities' functions in a transnational, national and a regional context.

Developing adequate modes of territorial governance

Cities are increasingly important configurations as places for the generation of innovation, as melting pots for creative people, critical infrastructures etc. The promotion of strategic functional urban networks might then be a reasonable approach to making use of the distinctive urban profiles available in the BSR. Naturally, the regional level offers the best arena to promote them and to define tangible projects – but strategic alliances and projects have also to be established in respect of larger spatial configurations. The success of the interplay between cities within such 'projects' is not only however a question of their actual place-based collective competitive assets, but for the most part also of the willingness to cooperate and the governance of social interactions among private and political stakeholders.

The contribution of charismatic persons to the emergence of growth dynamics through strategic alliances, joint projects and new modes of governance is important in this context. The notion of 'political entrepreneurs' is also used, reflecting the tendency of some local politicians to manage and develop their municipality with methods taken from the private sector.

- » The critical issue is to preserve the respective role of each stakeholder, especially small and medium-sized cities and towns where local elites often only include a relatively small group of persons.
- » The institutional framework must therefore define the right degree of legitimacy, decision-making ability, flexibility, stability, commitment and finally, mix (private/public), of all actors involved. A mode of governance has to be defined in which the various territorial and substantial logics of actions, interests and rationalities can be negotiated (and finally harmonised). This is a necessary precondition for a balanced devel-

opment, taking into account not only economic efficiency, but also democratic embeddedness and social and ecological sustainability.

- » From a territorial perspective, institutions facilitating consensual decision making and trust are necessary preconditions for alliances between cities and towns at different levels at the urban hierarchy. Such alliances need to be established in order to promote solutions that are beneficial to all involved partners.

Metropolitan areas as key drivers of spatial integration in the BSR

Our study has revealed that the metropolitan areas in the BSR show some significant differences in terms of quantity but also, partly, in quality with regard to their international functions. Regional transformation and integration into global and European markets is obviously a long-term process. This is, nevertheless, a process which can be impacted in various ways, such that significant differences between the 'Western' and the 'Eastern' metropolitan areas to some extent remain in place.

- » On closer inspection a number of promising potentials seen as critical in supporting the process of spatial integration can be detected. These potentials should be highlighted and exploited in the most efficient way possible (cf. below).

BSR Metropolitan areas as international centres for decision and control

Sharp contrasts can be detected in respect of this specific function among the BSR's metropolitan areas. From a general point of view one can observe a significant difference between the 'Western' and the 'Eastern' BSR metropolitan areas. In the field of international financial services it is clear however that a strong network connecting with the Eastern metropolitan areas beyond the BSR has yet to be developed, the absence of which potentially impedes inward investment.

Our study also indicates that international financial services have not thus far established a strong and cohesive network in the BSR particularly in respect of connecting the NW Russian metropolitan areas to the rest of the BSR. One exception here is obviously that of Warsaw, which has, in many respects, caught up with some of its Western BSR counterparts such as Stockholm or Copenhagen. Questions must however be asked then why international banks have not established office locations in Kaliningrad, Minsk or St. Petersburg. This is, however, a huge and complicated subject. The issue boils down to (1) legal issues, (2) the market dominance by Russian state run institutions and (3) the fact that profit opportunities in Russia – compared to elsewhere – are still seen from outside as both risky and limited. Due to the potentially enormous market

size of the Eastern part of the BSR and the fast growing markets there, such an absence could be seen to impede inward investment.

The analysis of political institutions further underlines this picture: At the BSR level neither Kaliningrad nor St. Petersburg are major spatial integration drivers in respect of their decision and control functions. They are obviously more oriented towards their eastern hinterland giving the impression that the geo-political, institutional and psychological barriers remain in place. Overcoming these barriers remains a long term and complex process which goes far beyond the spatial policy realm.

- » The current lack of such services can however be interpreted as something of an institutional barrier to the further exploitation of the potentially enormous market size of the Eastern part of the BSR and the fast growing markets there. In other words, for the further spatial integration of the BSR to take place international financial capital flows need to be secured.
- » This also includes additional services for international companies as well as NGOs in order to ease their engagement into the BSR in general and its Eastern part in particular as such services are vitally important in developing a more balanced situation in respect of institutional, social and cultural proximity.
- » The metropolitan areas play a crucial role here because only they have the critical mass and the capacity (with regard to specified knowledge, foreign languages, talented researchers, transport infrastructures etc.) to build up those services in order to reduce institutional barriers and to mobilise the BSR's potentials here. Obviously the aforementioned metropolitan areas (plus many others particularly in the Eastern part of the BSR) do not yet fully exploit their critical mass here as only a few metropolitan areas can currently be regarded as important European players in this respect – none, however, can be labelled as global-city regions.
- » Pan-Baltic organisations in general and VASAB in particular should strive to promote the strengthening of international services in such metropolitan regions by pinpointing specific advantages (in terms of ongoing spatial integration) and definite minimum needs (in terms of corresponding institutional and legal basic principles, skilled labour etc.). These are likely to be indispensable pillars of a BSR internationalisation strategy.

BSR metropolitan areas as centres for innovation, research and development

In terms of the analysed indicators we can conclude that the East-West divide is somewhat narrower as regards the decision and control functions. Here numerous competences and significant potentials exist given the high criti-

cal mass of talented and creative employees and the strong research profiles across the BSR. With regard to the degree of internationalisation only one indicator was considered here (applications of patents to the EPO): the level of performance (in terms of the 'ambition' to secure intellectual property rights for European markets) of the Eastern BSR metropolitan areas remains, however, rather weak.

Specifically, the analysis of research facilities could be seen as a first step in opening up some avenues for specific pan-Baltic co-operation. No less than four different areas of competence are represented in almost every BSR metropolitan area by large research institutions (namely Health/Natural Sciences/Food, Agriculture and Fisheries, and Biotechnology/Nanosciences technologies, Materials and new Production Technologies). While cooperation across the BSR is important the safeguarding of intellectual property rights is also necessary. Here it is not necessarily infrastructural or material shortcomings that have to be stressed but rather the institutional and perhaps also cultural traditions, which could in the long run perpetuate the disconnectedness of e.g. NW Russia with the rest of the BSR. In other words we can conclude that, specifically, St. Petersburg, but also Kaliningrad and Minsk as well as a handful of other BSR metropolitan areas, have not yet fully exploited their critical mass in this respect.

- » Pan-Baltic co-operation and mutual learning processes have to be strengthened while new policy concepts are also needed to make the BSR's metropolitan regions and their R&D facilities more attractive in terms of the international competition to attract creative people. Here a concerted action plan is needed at the level of the entire BSR.
- » Again the role of spatial policy, in general, and pan-Baltic organisations such as VASAB in particular should perhaps however be of a rather more communicative nature: These potentials need to be promoted while at the same time the minimisation of institutional and legal barriers should be pursued. These organisations could for instance claim that specific research programmes (including the exchange of researchers) should be initiated across the BSR, which could be co-financed by the EU, Russia and Norway. The direct promotion of financial incentives targeted exclusively at research facilities in the BSR should be pursued by securing a high degree of involvement of e.g. NW Russian institutions.

Metropolitan areas as collective symbols and as gateways to markets and people

With regard to this specific metropolitan function we considered several classical transport aspects, which are dependent on the size, the capacity and the actual services that are carried out by these infrastructures. In addition we have also taken into account two further indicators, 'inter-

national fairs' and 'UNESCO World heritage sites'. In view of the East-West divide discussed above however we can draw a somewhat different conclusion. In respect of the classical transport aspects which enable the BSR's metropolitan areas to function as 'gateways' significant contrasts remain apparent. Numerous bottlenecks remain hampering the smooth flow of people and goods within the BSR and beyond (see below).

We should also bear in mind, however, that current air transport patterns are historically rooted and remain dependent on the long term strategies of airlines and of course their commercial viability in the highly competitive market for air transport. Current patterns in respect of sea transport, roads and rail have also been developed over a number of decades. As such, complete integration and the removal of all the bottlenecks would be hugely expensive and is thus highly unlikely in the medium term. Nevertheless, when taking into account the prevailing settlement patterns and regional structures in the BSR, we should not be thinking only in terms of additional large-scale infrastructures in order to balance these disparities. This could lead to ruinous competition and, in a purely BSR perspective, to the playing out of a zero-sum game.

- » Rather, maintenance of the existing structure and the development of 'complementary' services and, where needed, infrastructures, is instead to be recommended. One example here could be the fine-tuning of the hub-and-spoke system.
- » In so doing, pan-Baltic organisations should encourage the larger international airports in the BSR (and the airlines) to discuss how to optimise the BSR's (and beyond) hub-and-spoke system, in order to guarantee better accessibility both to and within this macro-region. Existing institutional bottlenecks (such as the extremely long border crossing times into the Schengen area, uncoordinated national and regional rail schedules etc.) should be addressed as an issue of transnational importance.
- » In addition, the stakeholders of the BSR metropolitan regions themselves should become more engaged as advocates for those issues thus placing them higher up the transnational political agenda.

In respect of the other 'softer' indicators ('international fairs' and 'UNESCO World heritage sites') we can draw a rather balanced picture. Here we can discern the existence of enormous potentials and a strong commitment by local stakeholders (also in the Eastern BSR metropolitan areas).

- » Concerning international fairs, we suggest that those located in the Eastern BSR metropolitan regions could be developed into strong keystones to further integrate their regional markets with others in- and beyond the BSR. The dense network of international fairs should thus be maintained and further developed

as a unique selling point for the BSR.

- » Specifically, St. Petersburg, Kaliningrad and Minsk could function as key entrance points to their home markets, something which must, however, go hand in hand with the functioning of the network of international financial services discussed above.

The various UNESCO World heritage sites in the BSR could also help to sharpen its international profile in general and its metropolitan areas in particular. Such a composition of cultural and natural heritage is perhaps of indicative use here; nevertheless it can help to anchor these and related potentials in the collective awareness and mental maps of stakeholders, potential investors and tourists in- and beyond the BSR.

- » A specific pan-Baltic communication strategy in this respect could have a significant impact here contributing to the emergence of greater transnational awareness for those living in the BSR while also producing positive images for consumption beyond the BSR.
- » As for tourism further such potentials could be developed into unique selling points as the BSR is, given its specific climatic conditions, not necessarily a preferred tourist destination, particularly for those residing in the region. In other words, a concerted branding initiative is needed within the BSR, but also beyond it, in order to trademark this particular resource.

In a nutshell, we can conclude that political stakeholders have to understand that if a balanced and sustainable spatial integration of the BSR is to be achieved, the BSR's metropolitan areas themselves must play a key role. Their specific international functions should be enhanced in order to support the flow of people, ideas, projects and knowledge as well as their financial capital and the goods and services they produce. These functions and potentials as well as the urgent problems faced have to be better understood at the political level and disseminated beyond that in order to ensure that such knowledge becomes the stock of an effective shared store of transnational understanding. As such then new Pan-Baltic concepts are needed to better position the BSR's metropolitan areas in terms of the ongoing international competition for 'creative people', investment, first-class infrastructure programmes and events.

BSR accessibility strategies need to be laid out on multiple levels

An underlying hypothesis of this report in respect of accessibility is that the different modes of transportation constituting the integrated transport system have different roles to play in improving access between places within and beyond the Baltic Sea Region (cf. chapter 4).

The road and rail systems were deemed to be fragment-

ed in their territorial extent and of a disparate nature (capacity, quality and technical standards). Because of their non-terrestrial nature, air and maritime connections hold the greatest potential with regard to the internal and external connectivity of the macro-region.

- » Defining an efficient accessibility strategy for the BSR necessitates taking into consideration the potential of these different modes of transportation in the 'global picture' of the BSR: an optimised division of labour between transport modes is needed. Consequently, a modern transport strategy for the BSR should integrate the multimodal and multi-scalar aspects of transport networks.

Global integration

For the transportation of heavy cargo, maritime transport is of crucial importance. Seaports thus act as key transit points for the export and import of natural resources, manufactured goods and high added-value goods. In order to manage the globalisation of the BSR, it is necessary that the region possesses a range of modern, large-scale ports that are able to handle any type of cargo.

- » Seaports should not however be thought of only as points, but should rather be seen as intermodal facilities, enabling goods and material to continue their journey to other places inland. Consequently, seaport facilities should be connected in situ to the road and rail transport systems.

The expansion of air traffic since the beginning of the millennium is a global trend and in this regard, the BSR is no exception: most of the passenger airports in the region have increased their traffic flows, by reaching more destinations, with higher traffic intensities. To date, our analysis has deemed that the main BSR airports on the eastern and western shores of the BSR (Copenhagen, Stockholm, Helsinki, Berlin, Warsaw and St. Petersburg) are showing complementarities in the destinations reached that are not as yet fully exploited. Connections between these hubs however remain limited.

- » Thus a denser and more intense exploitation of these connections would enable the BSR to significantly improve the ability of passengers (for both business and leisure purposes) to take advantage of the specificity of each hub.

The global dimension of the railway system lies essentially in the potential to transport heavy cargo between the Asian and European markets. In that respect, the BSR acts as an interface between the two systems. More precisely, St. Petersburg acts as the gateway for Europe and the BSR to Asia.

- » The main challenge resides in the different technical standards between the Russian and European systems. Specifically the completion of the TEN-T priority axis, the completion of the *Rail Baltica* project between Tallinn and Warsaw and the upgrading of the Tallinn-St. Petersburg line to the 1435mm (called European) gauge system would boost the potential for East- West Asian-European exchanges.

East-West trans-national integration

The empirical results gathered throughout the report have helped put under the spotlight the continuing chronic lack of integration between the eastern and western shores of the Baltic Sea. The Baltic Sea itself acts as a natural barrier for the expansion of the terrestrial (i.e. road and rail) infrastructure networks. Consequently, further East-West integration can only be implemented through the development of air and maritime connections. In that respect, if such connections already exist, there is a strong potential to develop them further. An obvious bottleneck in that regard is the lack of air and maritime connections from/to St. Petersburg to the other metropolises of the BSR despite its attractiveness in terms of tourism and business opportunities.

- » Building a strategic partnership between national authorities and the main air carriers and maritime companies is key here to the exploitation of this potential. Easing the visa requirements to North West Russia is also necessary to bring these territories closer to the “Schengen countries”.
- » In the northern parts of the BSR, i.e. in the territory extending from northern Norway towards Murmansk and the Republic of Karelia, the expansion and upgrading of east-west railway links could be seen as an opportunity for enhancing the trade around the exploitation of natural resources. Consequently, an integrated transport strategy for the BSR should support the implementation of such an axis. Partnerships with and between regional authorities are needed in order to facilitate such a transport corridor.

North-south trans-regional integration

The issue of north-south integration essentially deals with the integration of regions belonging to either the eastern or western shores of the Baltic Sea. In that regard, the railway system possesses both the best potential and the weakest preconditions to date. The current segmentation of the railway network in the BSR is the result of the strong domestic orientation of national transport strategies and the low prioritisation of cross-border and transnational connectivity issues.

The co-existence of two different gauge standards in the BSR is not a threat in itself to north-south trans-re-

gional integration. Indeed, all countries on the western side (Norway, Sweden, Denmark and Germany) have the 1435mm (European) standard while all the countries on the Eastern shore (Finland, Russia, Estonia, Latvia, Lithuania, Belarus and Poland) possess the 1520mm (Russian) standard. In fact, the main challenge corresponds to the differences in the technical quality of such transnational railway lines. The differences in the modern technical standards of the infrastructure can best be highlighted by reference to the uneven succession of single or double gauge and electrified or non-electrified line coverage.

- » The uneven quality of railway infrastructure represents a serious bottleneck in the development of bilateral connections, and should be addressed by the integration of national transport strategies.
- » However, while the completion of the TEN-T Rail Baltica axis with 1435mm gauge is an opportunity for the integration of EU members of the Eastern shore and beyond to central parts of Europe, it also raises the threat of disconnecting these countries to North West Russia.
- » As noted previously, a key piece of infrastructure is the Tallinn-St. Petersburg line: the expansion of the Rail Baltica to St. Petersburg is a pressing issue that should be discussed in the context of EU-Russia relations.

Cross-border and regional integration

National boundaries are not only seen as administrative boundaries, but also act as mental barriers in the BSR. To date, interactions beyond national boundaries occur more often between distant and larger metropolitan areas (such as Stockholm, Berlin, Warsaw and St. Petersburg) than between physically close but smaller regions on each side of a border.

- » Cross-border regions should not only however be perceived as local issues: cross-border regions act as an interface in the integration of national markets. They are the essential elements synergizing the construction of a ‘BSR of the regions’, enhancing an inter-regional style of collaboration rather than an inter-national one.

The integration of the regional economy and the regional labour-markets necessitate adapted infrastructure. In this regard, road, rail and maritime transportation are key transportation modes in the enhancement of this integration.

- » It is thus necessary to improve the state of the road infrastructure in some key cross-border regions: Szczecin (Germany-Poland), Narva (Estonia-Russia), Kaliningrad-Gdansk, Vyborg-Imatra, Kirkenes-Murmansk (Norway-Russia). This is also the case along

most the Finnish-Russian border (East Finland – Republic of Karelia).

- » Moreover, maritime routes may play an important role in integrating regional communities separated by a strip of water. This is, for instance, the case between Helsingør (DK) and Helsingborg (SE), between Tallinn and Helsinki and between Puttgarden (DE) and Rødby (DK), where these short-haul maritime connections are essential for the integration of local labour-markets. Some neighbouring areas in the BSR have the potential to develop such integrated 'cross-water' regions (e.g. Kaliningrad-Gdansk, St.-Petersburg-Tallinn, and Tammuna-Ventspils).

Modern accessibility strategies should strive for energy efficient and environmental-friendly solutions by going beyond sectoral barriers

Questions over the need to put in place an energy-efficient and environmentally friendly transport network have, in part, been dealt with in the previous points. Knowing how each transportation mode can contribute to the integration of the macro-region is already a way of optimising the potentials of the network.

- » The concept of intermodality, or, the ability to choose the most appropriate mode of transportation for the destination you wish to reach, should thus be seen as a central driving force here. This intermodality of the transport network should not however be solely driven by a concern for time-efficiency and cost.
- » Principles such as energy efficiency and environmentally friendly transport networks should be highlighted at the level of the elaboration of the strategies, but also in their operationalisation (e.g. at the project level).
- » Consequently, modern accessibility strategies for the BSR should integrate both energy and environmental concerns. Energy efficiency should be dealt with on two main dimensions: firstly, via a reduction of dependence on oil products (used by cars, ships and airplanes) which can be achieved by expanding the usage of rail where possible and by supporting a technological change in the consumption of less-polluting fuels (e.g. biofuels) by transport vehicles.

A second possible track to explore here is the decoupling of the integration and mobility processes. In concrete terms, this would mean that further functional integration between parts of the BSR should not systematically lead to an increase in the mobility of persons.

- » In this regard, the development of the ICT infrastructure and its usage may enable it to act as a substitute to

mobility to a certain extent. The mainstreaming of the use of ICT for individuals and businesses across the BSR would facilitate an increase in the internationalisation of trade patterns and limit the need for higher mobility in the chase for new markets.

- » Moreover, the transition from a manufacturing to a service-based economic structure (especially for the countries on the eastern shore of the Baltic Sea) should reduce the need to ship heavy cargo and goods between BSR territories.

Consequently, it is clear that the elaboration of accessibility strategies should be the result of the integration of sectoral needs and concerns, in order to render it better able to answer the concrete challenges posed in the long term. Accessibility strategies should be able to combine, as highlighted in figure 54, many sectoral concerns.

The diversity of territorial capital requires territorially-adapted accessibility strategies

This report has attempted to highlight the needs and pre-conditions of the different types of territories across the BSR. As such, it is clear that metropolitan and sparsely populated areas are not subject to the same challenges. Whereas metropolitan areas need to secure their place in the European and worldwide urban system by developing connections to the major markets, sparsely populated regions are faced with more immediate challenges such as the need to develop good access to structuring facilities such as airports or universities. For them such issues represent their main concerns in respect of regional development.

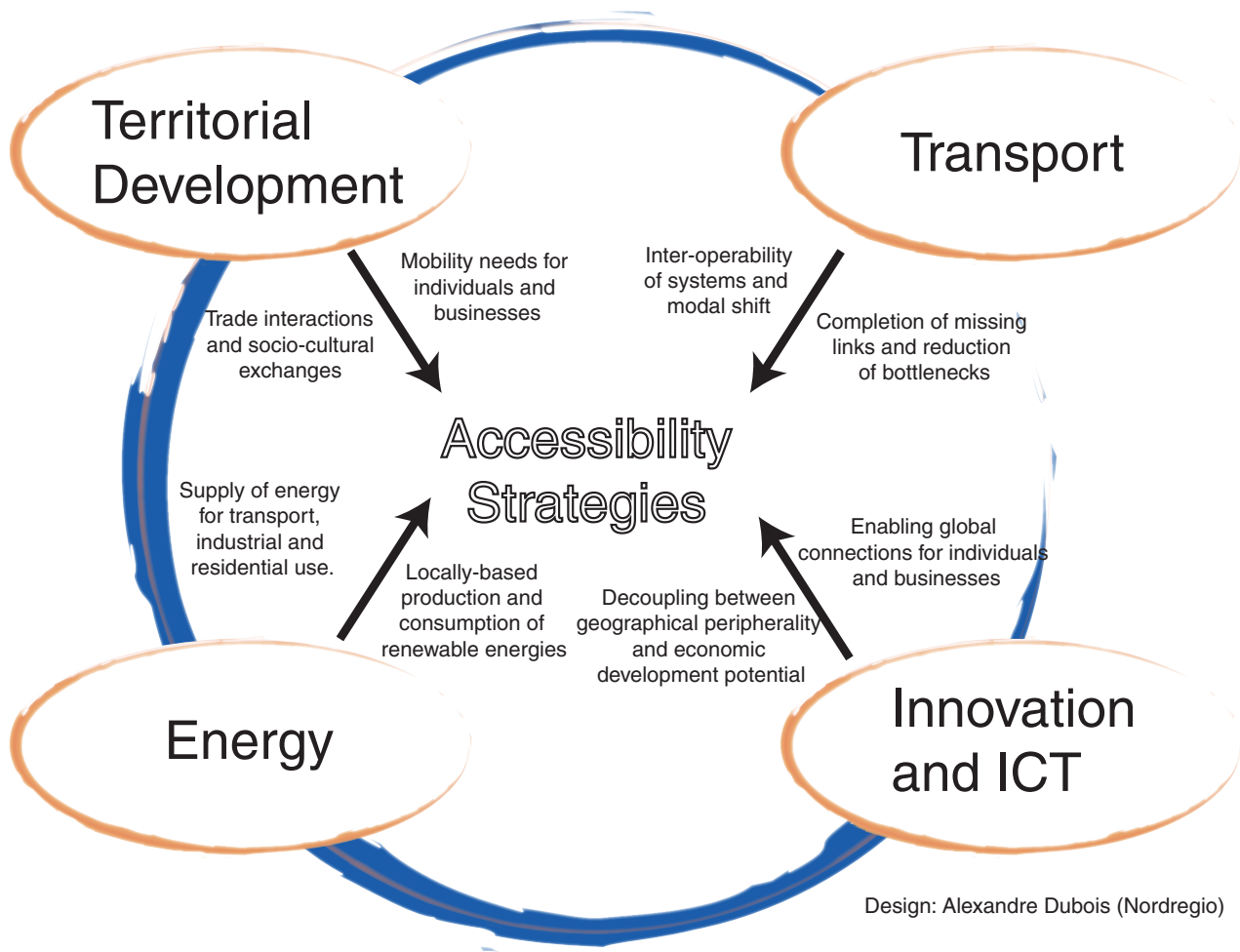
Efficient accessibility strategies should thus from now on focus on the territorial dimensions rather than on the sectoral dimension of the future strategy, facilitating the elaboration of territorial accessibility strategies adapted to the specific needs of the areas concerned. Such a strategy would ensure that each region is able to optimize its territorial potential and participate in both the national and BSR-defined objectives of economic development.

Such a territorial differentiation could be as follows:

- metropolitan areas;
- regions with a dense network of small and medium-sized towns;
- sparsely populated regions;
- island and mountain regions;
- cross-border regions at the interface of two (or more) national systems;

The issue of access to service and transport facilities is central to the achievement of greater territorial cohesion within the BSR.

Figure 54: Inter-sectoral dimensions of accessibility strategies



In view of further spatial integration in the BSR: Going beyond geographic proximity

The preceding issues represent something of a framework agenda for strategic spatial planning in the BSR and have made it clear that a further exploitation of the region's territorial capital as well as improving the degree of spatial integration challenges our perceptions as well as many policy-making assumptions. Central however to this is the fact that not only 'hard' investments in physical infrastructure projects is needed in order to improve the geographic proximity of the many cities and regions but rather more importantly perhaps, institutional, organisational and mental proximity related questions must also be addressed. As the examples in this report have indicated the need remains for reliable transactions thus necessitating the creation of corresponding institutionalised frameworks. Indeed, it appears that the creation of these frameworks is at least as important as the need to overcome the problems associated with distance. Only then can the BSR's territorial capital be fully exploited.

- » The role of VASAB and other pan-Baltic organisations is thus to pinpoint the enormous potentials with regard to further spatial integration while at the same time promoting improvements in the institutional, and organisational structure of the region and in its mental proximity. In so doing pan-Baltic organisations need to establish new strategic alliances with each other.
- » Due to the fact that spatial planning (and the responsible ministries in the BSR) in general, and the mandate of VASAB in particular, integratory or coordination-based in nature, their tool box is rather limited as regards their ability to actually implement concrete incentives. Therefore they also need to establish strategic alliances with those policy-makers dealing with sectoral issues (e.g. higher education, research, transport, ICT, energy etc.). Only with their support with sound financial backing can such strategically integrative concepts as the Long-Term Perspective (and perhaps also the EU Baltic Sea Strategy) be implemented.

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Appendix: UNESCO World Heritage sites located in the BSR

Name of site	Location	Date of inscription (extension)	Criteria	Type
Belarus				
Mir Castle Complex	Grodno Province, Korelichi District	2000	2,4	cultural
Architectural, Residential and Cultural Complex of the Radziwill Family at Nesvizh	Minsk Province	2005	2, 4, 6	cultural
Belovezhskaya Pushcha	¹ Grodno Province (BY) / Podlasie Voivodship (PL)	1979 (1992)	7	natural
Denmark				
Jelling Mounds, Runic Stones & Church	Vejle municipality, Region Syddanmark	1994	3	cultural
Roskilde Cathedral	Roskilde municipality, Region Sjælland	1995	2,4	cultural
Kronborg Castle	³ Helsingør municipality, Region Hovedstaden	2000	4	cultural
Estonia				
Old Town of Tallinn	³ Tallinn municipality, Harju county	1997	2,4	cultural
Finland				
Fortress of Suomenlinna	³ Helsinki municipality, Uusimaa region	1991		cultural
Old Rauma	Rauma municipality	1991	4,5	cultural
Petäjävesi Old Church	Petäjävesi municipality, Keski-Suomi region	1994	4	cultural
Verla Groundwood and Board Mill	Municipalities of Jaala and Valkeala, Kymenlaakso region	1996	4	cultural
Bronze Age Burial Site of Sammallahdenmäki	Satakunta region	1999	3,4	cultural
Kvarken Archipelago (and High coast)	¹ Gulf of Bothnia (5600 islands, 2 zones)	2000 (2006)	8	natural
BSR part of Germany				
Hanseatic City of Lübeck	Lübeck, State of Schleswig-Holstein; 3 sites	1987	4	cultural
Historic Centres of Stralsund and Wismar	Cities of Stralsund and Wismar, State of Mecklenburg-Western Pomerania; 2 cities	2002	2, 4	cultural
Museumsinsel (Museum Island) in Berlin	³ Berlin city state	1999	2, 4	cultural
Palaces and Parks of Potsdam and Berlin	³ States of Brandenburg & Berlin; 500 ha of parks & 150 buildings	1990 (1992, 1999)	1, 2, 4	cultural
Town Hall and Roland on the Marketplace of Bremen	³ Bremen city state	2004	3, 4, 6	cultural
Muskauer Park	¹ German (2.1 km ²) and Polish (3.5 km ²) sides of the Lusatian Neisse river	2004	1, 4	cultural
Latvia				
Historic Centre of Riga	³ City of Riga	1997	1, 2	cultural

Lithuania

Vilnius Historic Centre	³	City of Vilnius	1994	2, 4 cultural
Kernavė Archaeological Site (Cultural Reserve of Kernavė)		Kernavė town, Vilnius county	2004	3, 4 cultural
Curonian Spit	¹	Klaipėda Region (LT)/ Zelenogradsk District (Kaliningrad, RUS)	2000	5 cultural

Norway

Bryggen	³	Bergen municipality, Hordaland region; 62 buildings	1979	3 cultural
Urnes Stave Church		Luster municipality, Sogn og Fjordane region	1979	1, 2, 3 cultural
Røros Mining Town		Røros municipality, Sør Trøndelag region; app. 80 houses	1980	3, 4, 5 cultural
Rock Art of Alta		Alta municipality, Finnmark region; 5 sites	1985	3 cultural
Vegaøyan - The Vega Archipelago		A dozens of islands on Vega municipality	2004	5 cultural
West Norwegian Fjords – Geirangerfjord and Nærøfjord		Møre & Romsdal and Sogn & Fjordane regions; 2 sites	2005	7, 8 natural

Poland

Cracow's Historic Centre	³	City and County of Cracow	1978	4 cultural
Wieliczka Salt Mine		City and County of Wieliczka, Malopolska Voivodship	1978	4 cultural
Auschwitz Birkenau German Nazi Concentration & Extermination Camp (1940- 1945)		Oswiecim County, Malopolska Voivodship; 2 sites	1979	6 cultural
Historic Centre of Warsaw	³	City and County of Warsaw	1980	2, 6 cultural
Old City of Zamocze		City and County of Zamocze, Lublin Voivodship	1992	4 cultural
Castle of the Teutonic Order in Malbork		City and County of Malbork, Pomeranian Voivodship	1997	2, 3, 4 cultural
Medieval Town of Toruń		City and County of Toruń, Kuyavian-Pomeranian Voivodship	1997	2, 4 cultural
Kalwaria Zebrzydowska: the Mannerist Architectural and Park Landscape Complex and Pilgrimage Park		Malopolska voivodship	1999	2, 4 cultural
Lutheran Churches of Peace in Jawor (under the invocation of the Holy Ghost) and Swidnica (under the invocation of the Holy Trinity)		Jawor and Swidnica counties, Dolnoslaskie Voivodship; 2 sites	2001	3, 4, 6 cultural
Wooden Churches of Southern Little Poland		Gorlice, Nowy Targ, and Bochnia counties, Malopolskie Voivodship; Brzozów County, Podkarpackie Voivodship	2003	3, 4 cultural
Centennial Hall in Wrocław	³	Silesia Region	2006	1, 2, 4 cultural
Biaowieża Forest	¹	Grodno Province (BY) / Podlasie Voivodship (PL)	1979	7 natural
Park Muzakowski	¹	German (2.1 km ²) and Polish (3.5 km ²) sides of the Lusatian Neisse river	2004	1, 4 cultural

NW Russia

Cultural and Historic Ensemble of the Solovetsky Islands		Solovetsky Islands (x 6), White Sea	1992	4 cultural
Kizhi Pogost		Lake Onega, Karelian Autonomous S.S.R.	1990	1, 4, 5 cultural
Historic Centre of Saint Petersburg and Related Groups of Monuments	³	81 sites in St. Petersburg region	1990	1, 2, 4, 6 cultural
Historic Monuments of Novgorod and Surroundings		11 sites in Novgorod region	1992	2, 4, 6 cultural
Curonian Spit	¹	Klaipeda Region (LT)/ Zelenogradsk District (Kaliningrad, RUS)	2000	5 cultural

Sweden

Royal Domain of Drottningholm	³	Ekerö municipality, Stockholm region	1991	4 cultural
Birka and Hovgården	³	Uppland municipality, Stockholm region	1993	3, 4 cultural
Engelsberg Ironworks		Fagersta municipality, Västmanland region	1993	4 cultural
Rock Carvings in Tanum		Tanum municipality, Väster Götaland	1994	1, 3, 4 cultural
Skogskyrkogården	³	City of Stockholm	1994	2, 4 cultural
Hanseatic Town of Visby		Gotland region	1995	4, 5 cultural
Church Village of Gammelstad		Luleå municipality, Norrbotten region	1996	2, 4, 5 cultural
Laponian Area		Gällivare, Jokkmokk and Arjeplog municipalities, Norrbotten region; 9 sites	1996	3, 5, 7, mixed 8, 9
Naval Port of Karlskrona		Karlskrona municipality, Blekinge region	1998	2, 4 cultural
Agricultural Landscape of Southern Öland		Öland island, Kalmar region	2000	4, 5 cultural
Mining Area of the Great Copper Mountain in Falun		Falun municipality, Dalarna region	2001	2, 3, 5 cultural
Varberg Radio Station		Varberg municipality, Halland region	2004	2, 4 cultural
High Coast (/Kvarken Archipelago)	¹	Härnösand, Kramfors & Örnsköldsvik municipalities, Västernorrland region / Gulf of Bothnia	2000 (2006)	8 natural

International

Struve Geodetic Arc	²	34 protected stations in Belarus (5), Estonia (3), Finland (6), Latvia (2), Lithuania (3), Norway (4), Moldova (1), Russia (2), Sweden (4), Ukraine (4)	2005	2, 3, 6 cultural
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¹ Located between two countries² Located between 10 countries, 8 in BSR³ Located in MEGA region

The Criteria for Selection

To be included on the World Heritage List, sites must be of outstanding universal value and meet at least one out of ten selection criteria (from 2005):

- 1 to represent a masterpiece of human creative genius
- 2 to exhibit an important interchange of human values, over time or within a cultural area, on developments in architecture, technology, monumental arts, town-planning or landscape design
- 3 to bear a unique or at least exceptional testimony to a cultural tradition or to a civilization
- 4 to be an outstanding example of a type of building, architectural or technological ensemble or landscape which illustrates (a) significant stage(s) in history
- 5 to be an outstanding example of a traditional human settlement, land-use, or sea-use which is representative of a culture (or cultures), or human interaction with the environment especially when it has become vulnerable
- 6 to be directly or tangibly associated with events or living traditions, with ideas, or with beliefs, with artistic and literary works of outstanding universal significance
- 7 to contain superlative natural phenomena or areas of exceptional natural beauty and aesthetic importance
- 8 to be outstanding examples representing major stages of earth's history, including the record of life, significant on-going geological processes in the development of landforms, or significant geomorphic or physiographic features
- 9 to be outstanding examples representing significant on-going ecological and biological processes in the evolution and development of terrestrial, fresh water, coastal and marine ecosystems and communities of plants and animals
- 10 to contain the most important and significant natural habitats for in-situ conservation of biological diversity, including those containing threatened species of outstanding universal value from the point of view of science or conservation

Source: UNESCO World Heritage <http://whc.unesco.org/en/list>

Exploring the Baltic Sea Region – On territorial capital and spatial integration

Nordregio Report 2008:3

The findings contained in this report and developed within the East-West Window project, financed under the umbrella of the BSR INTERREG IIIB-Neighbourhood programme (TACIS strand), provide valuable insights into the search for evidence-based information on the Baltic Sea Region's territorial capital and its potentials for spatial integration, which can be meaningful for the current elaboration of two transnational strategic policy papers for the Baltic Sea Region (BSR), namely, the Long Term Perspective (LTP) for the BSR, on the one hand, and the EU Strategy for the Baltic Sea Region, on the other. The first is tasked with identifying the most important challenges currently hampering spatial integration within the region and between the region and its surroundings as well as with pinpointing the most important elements for a spatial strategy or vision with a time horizon up to the year 2030. The intention here is to approve the Long Term Perspective (LTP) at the VASAB Ministerial Conference in September 2009. The second policy paper with DG Regio in the lead has as its aim to coordinate the efforts of various actors in the Baltic Sea Region so that by working together they promote a more balanced development of the region. The Strategy will be presented to the European Council in June 2009 and will feature as one of the main priorities of the Swedish EU Presidency during the second half of 2009. The ongoing EU level debate, launched by the European Commission's Green Paper (October 2008) on Territorial Cohesion is also connected to this process. The goal of this debate is to come to a better and shared understanding of territorial cohesion and its implications for policy-making and territorial cooperation.

The current report contains multifaceted analytical findings regarding the BSR's territorial capital. Issues such as population development, labour market dynamics (specifically in small and medium-sized cities and towns), the international functions of metropolitan areas, transport networks, mobility, accessibility, ICT and finally, energy production and distribution are explored. The report concludes with an extended discussion of current strategic issues in respect of spatial planning, policy-making and programming with a view to further contributing to territorial cohesion and spatial integration in the BSR.



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